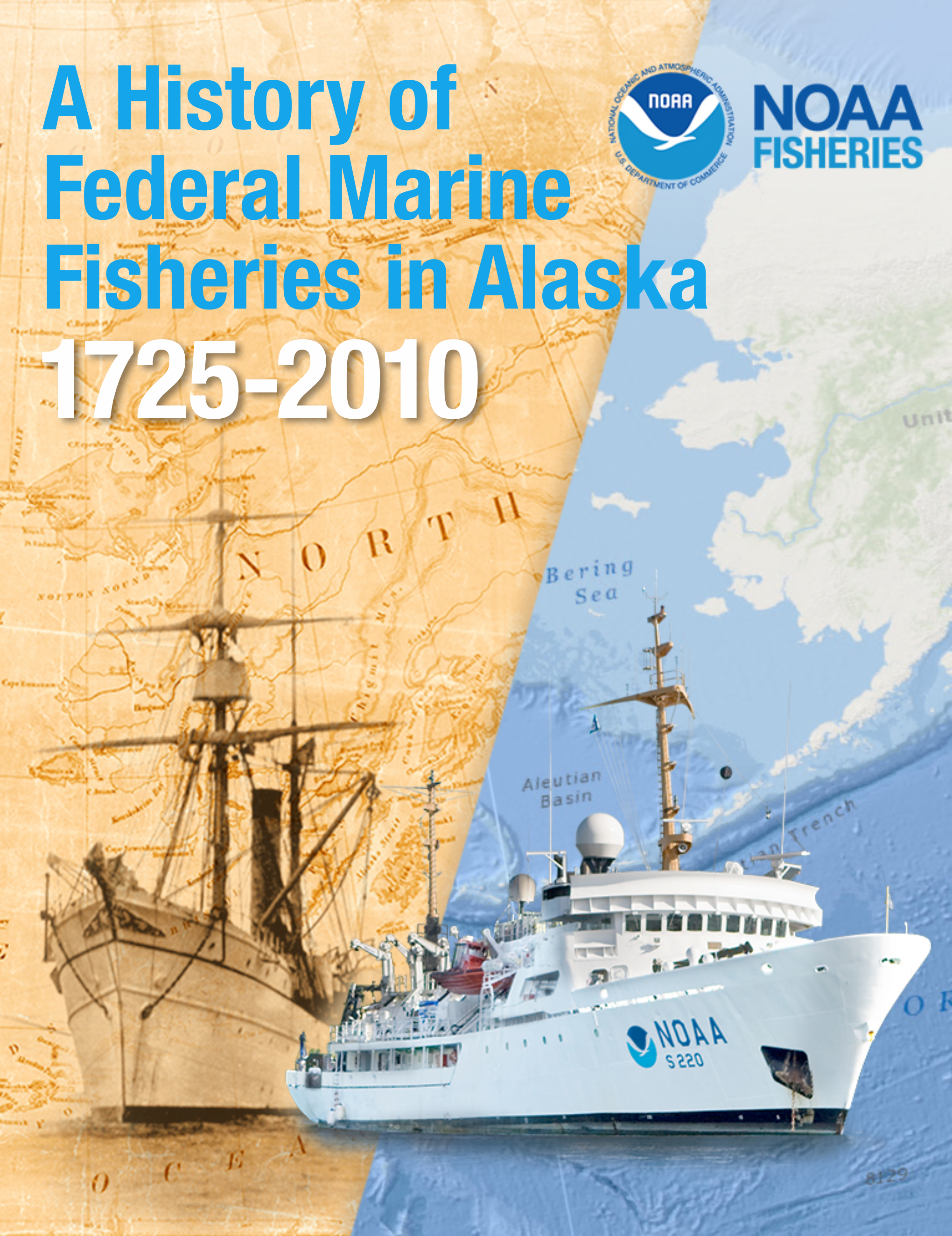
A History of Federal Marine Fisheries in Alaska 1725-2010

NOAA FISHERIES



Introduction

The evolution of the United States government's concern regarding marine fisheries in Alaska began in the early 1700s. Today the Alaska Fisheries Science Center continues to expand and advance federal marine fisheries research in Alaska.

Introduction

A History of Federal Marine Fisheries Research in Alaska: 1725-2010

From the early 1700s through the present, numerous noteworthy events were meaningful to the evolution of the U.S. Government's concern regarding the Alaska marine fisheries.

The history of the Alaska Fisheries Science Center (the Center) can be traced back to 1867, when Alaska, with its vast untapped marine mammal and fishery resources, was purchased from Russia for $7.2 million. By 1872, U.S. Fish Commission scientists had conducted the first surveys of northern fur seals on the Pribilof Islands in the Bering Sea, and in 1888, scientists aboard the U.S. Fish Commission vessel *Albatross* were conducting the first fisheries investigations off the Alaska coast. Over 125 years later, research at the Center continues to expand and evolve from those early investigations.

This book presents events, places, people, research, ships and technology that have shaped federal marine fisheries research in Alaska.

Timelines
Track the many historical events that helped shaped our history since 1725.

Facilities
Learn about the science centers, research laboratories, and field stations.

Early Pioneers
Meet some people who played key roles in agencies preceding the Alaska Fisheries Science Center.

Research and Management
See how the study of Alaska marine species and their environment, along with fisheries management, has evolved over time.

Technology
Discover some of the inventions, tools, devices, and methods developed. Topics include aircraft, food preservation (i.e., canning and curing), and diving programs.

Vessels
Find out about the many boats and ships used in Alaska for fisheries enforcement, research, surveying, transportation, rescue, and other areas of operation.

Introduction

A selection of Alaska Fisheries Science Center historical photos

Timelines

From the 1700s through the present, numerous noteworthy events were meaningful to the evolution of the U.S. Government's concern regarding the Alaska marine fisheries.

Timelines

Timeline of Significant Events

These pages present historical timelines highlighting many key events that shaped the evolution of the Center as well as fisheries research in Alaska. These chronologies were compiled using material originally published in the Alaska Fisheries Science Center *Quarterly Report* (since 1982), its predecessor the *Monthly Report* (1971-1982), yearly Bureau of Fisheries (BOF) reports, and many other sources.

To complete the story, the name changes that the Center and its parent agencies have undergone since 1871 are also detailed here. Accounts are provided that trace the changes in the Center's research divisions through several federal government reorganizations and as well as shifts in research responsibility.

A cannery in a scenic setting near Wrangell, Alaska, in the late 1800s. U.S. Fish Commission photo, 1898

Timeline Sections

1725-1869
1870-1884
1885-1899
1900-1909
1910-1919
1920-1929
1930-1939
1940-1949
1950-1959
1960-1969
1970-1979
1980-1989
1990-1999
2000-2010

AFSC Historical Corner: Alaska Fisheries Federal Agency Timeline (click to expand)

1725-1869

Early Russian Events and the Purchase of Alaska

1725 Russian Czar Peter the Great dispatches Vitus Bering to explore the Alaskan coast. “Russia had a keen interest in this region, which was rich in natural resources and lightly inhabited." (U.S. Dept. of State website).

1741 Georg Wilhelm Steller becomes the first European to see northern fur seals as part of Vitus Bering's "voyage of discovery" in the North Pacific.

1786 The Pribilof Islands are discovered by the crew of the Russian ship *St. George* under the command of Gerasim Pribilof.

1867 Alaska, with its vast untapped marine and anadromous fishery resources, is purchased from Russia for $7.2 million. Spencer Fullerton Baird, Assistant Secretary of the Smithsonian Institution, plays a key role in influencing Congress to approve the purchase.

1868 Furs, rather than fishes, are Alaska's most prominent resource, and on 27 July, Congress, concerned about the exploitation of northern fur seals, outlaws the killing of seals within the territory of Alaska. The U.S. Treasury Department assumes responsibility for fur seals on the Pribilof Islands.

Map of North Western America ceded by Russia to the United States, 1867.

1869 By Joint Resolution of 3 March, the Pribilof Islands, Saint Paul and Saint George were declared a special conservation reservation for government purposes. The fur seals were now protected with regards to breeding and birthing both on land and during their sea migration.

"Seward's Folly"

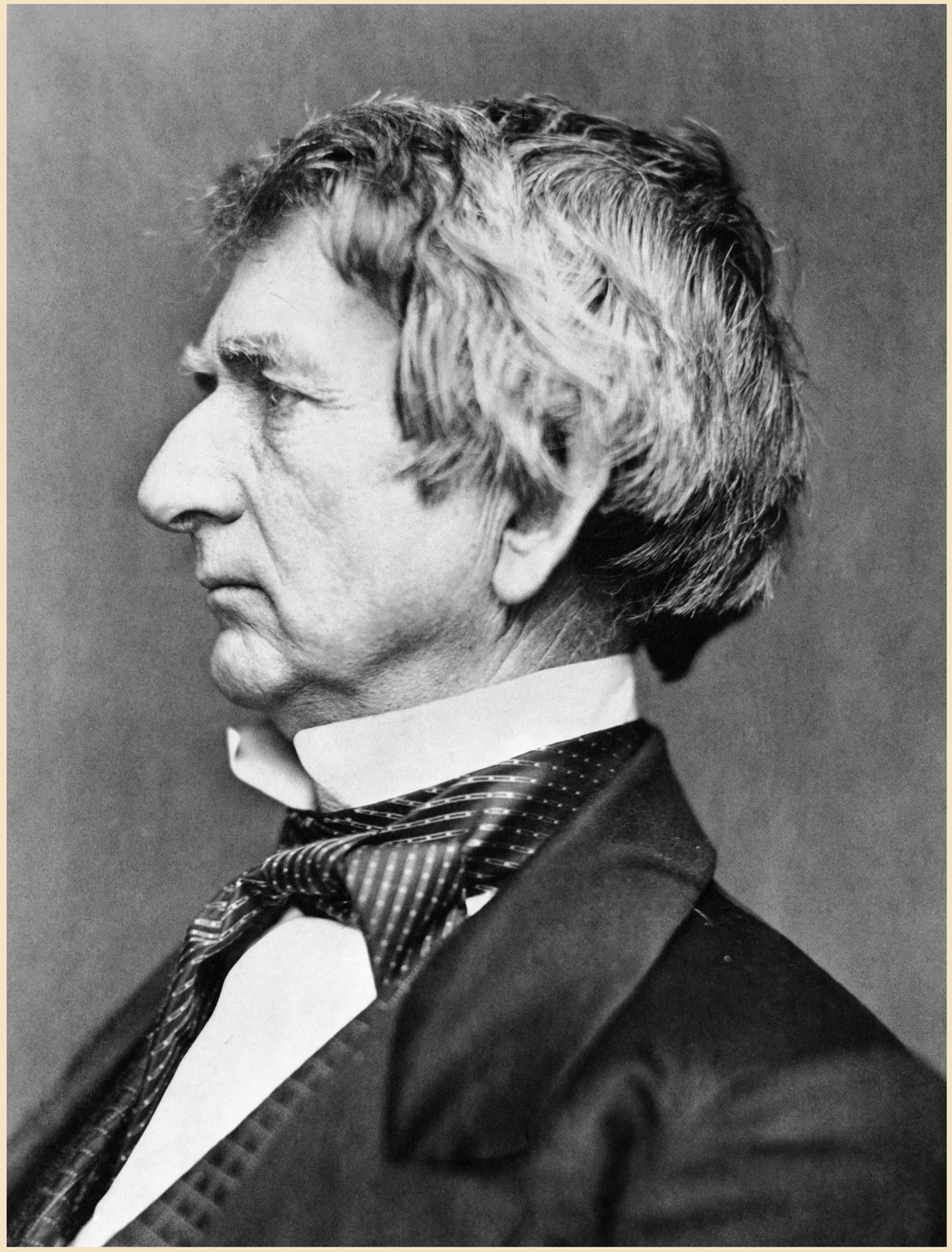
As the United States expanded westward in the early 1800s, Americans soon found themselves in competition with Russian explorers and traders. Moscow, however, lacked the financial resources to support major settlements or a military presence along the Pacific coast of North America and permanent Russian settlers in Alaska never numbered more than four hundred. Defeat in the Crimean War further reduced Russian interest in this region.

Russia offered to sell Alaska to the United States in 1859, believing the United States would off-set the designs of Russia's greatest rival in the Pacific, Great Britain. The looming U.S. Civil War delayed the sale, but after the war, Secretary of State William Seward quickly took up a renewed Russian offer and on March 30, 1867, agreed to a proposal from Russian Minister in Washington, Edouard de Stoeckl, to purchase Alaska for $7.2 million. The Senate approved the treaty of purchase on April 9; President Andrew Johnson signed the treaty on May 28, and Alaska was formally transferred to the United States on October 18, 1867. This purchase ended Russia's presence in North America and ensured U.S. access to the Pacific northern rim.

For three decades after its purchase the United States paid little attention to Alaska, which was governed under military, naval, or Treasury rule or, at times, no visible rule at all. Seeking a way to impose U.S. mining laws, the United States constituted a civil government in 1884. Skeptics had dubbed the purchase of Alaska "Seward's Folly," [or "Seward's Icebox"] but the former Secretary of State was vindicated when a major gold deposit was discovered in the Yukon in 1896, and Alaska became the gateway to the Klondike gold fields. The strategic importance of Alaska was finally recognized in World War II. Alaska became a State on January 3, 1959." (U.S. Dept. of State)

See Also

- Willliam H. Seward, Political Fixer *49 History, The Blog of the Alaska Historical Society*



William Seward. Library of Congress photo.

1870-1884

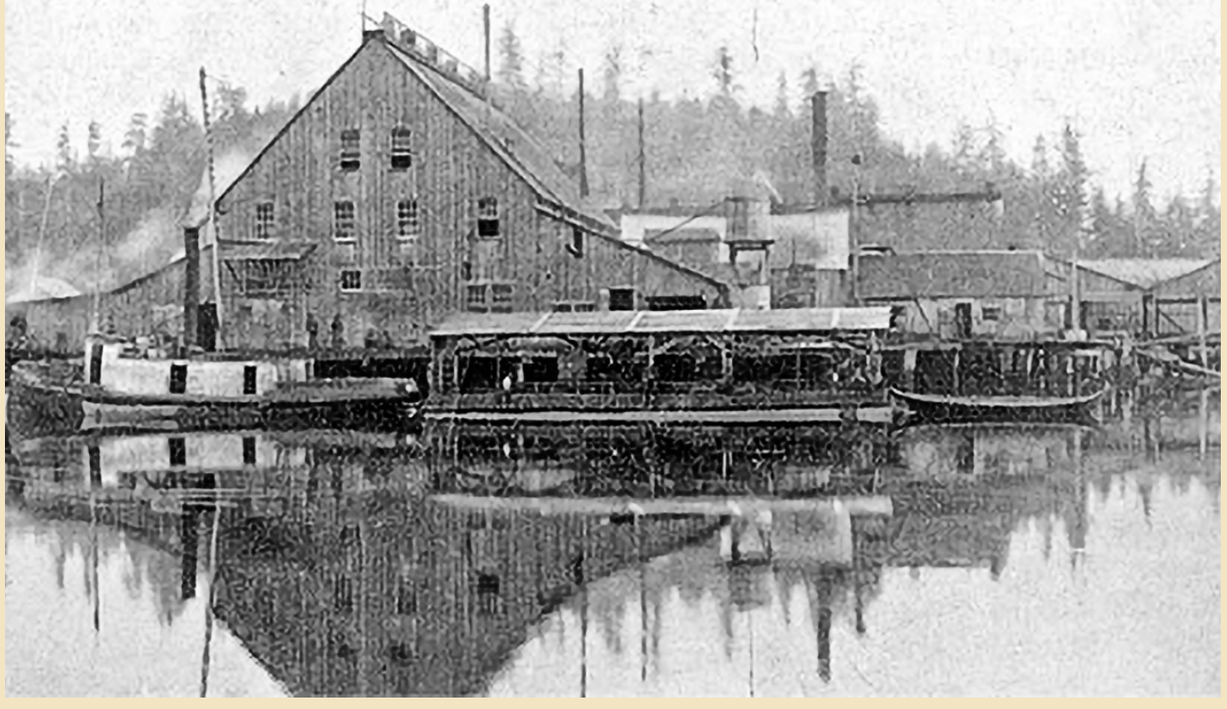
U.S. Fish Commission and the First Fur Seal Surveys

1870 The Federal Government assumes management of the Pribilof Islands' fur seal resource and welfare of the Aleut communities.

The Alaska Commercial Company, operating out of San Francisco, is granted a 20-year lease to harvest male fur seals at the Pribilofs.

1871 On 9 February, the United States Commission of Fish and Fisheries is established as the first federal agency concerned with natural resource conservation. Spencer Fullerton Baird becomes its first Commissioner. The Commission is directed by Congress "... to determine whether a diminution of the number of food-fishes of the coast and lakes of the U.S. has taken place; and, if so, to what causes the same is due; and whether any and what protective prohibitory or precautionary measures should be adopted in the premises....". Baird immediately initiates a broad spectrum of ecological research.

1872 Henry Wood Elliott of the U.S. Treasury Department is sent to the Pribilof Islands to conduct the first surveys of northern fur seals and to supervise their



The cannery at Klawak established in 1877. U.S. Fish Commission photo, 1898.

management. His objective is to determine the most profitable manner of managing the island's great seal herds for a sustainable harvest.

1877 The first salmon cannery in Alaska is established at Klawak.

1880 Systematic research on Pacific salmon is conducted by Tarleton H. Bean.

1882 In March, the 234-foot U.S.S. *Albatross* is launched, becoming the first U.S. vessel built exclusively for fisheries and oceanographic research. The iron-hull, twin-screw ship is designed to conduct its marine investigations in any part of the world's seas. The *Albatross* later becomes the first commissioned vessel to conduct research along the U.S. West Coast and Alaska.

1885-1899

The U.S.S. *Albatross* and Fishery Studies in Alaska

1888 On 20 January, Congress establishes the U.S. Fish Commission (**USFC**) as an independent agency of the federal government and terminates its administrative relationship with the Smithsonian Institution. Marshall McDonald is appointed Commissioner at a salary of $5,000 per year.

On 4 July, the first federal fishery studies along the North Pacific coast begin as the USFC vessel Albatross, leaves San Francisco, California, to collect marine samples and observe fish and other aquatic life. The 234-foot *Albatross* conducts the first fisheries research investigations, primarily on Pacific cod, off the coasts of California, Oregon, Washington, and Alaska.

The Pacific halibut fishery is inaugurated as a sailing schooner returns to Seattle with its catch.

1889 Pacific halibut is shipped to the U.S. East Coast by rail, and as the market develops and demand grows, the fishery gradually expands farther offshore.

The *Albatross* is ordered to escort four members of the Senate Committee on Indian Affairs to visit the principal Indian settlements in southeast Alaska.

Congress authorizes a study into the habits, abundance, and distribution of Alaska's salmon.

Livingston Stone compares the Pacific salmon of Alaska to the buffalo and calls for the formation of a "National Salmon Park".

1890 The U.S. Government awards a 20-year lease to the San Francisco firm, North American Commercial Company, to harvest male fur seals at the Pribilof Islands.

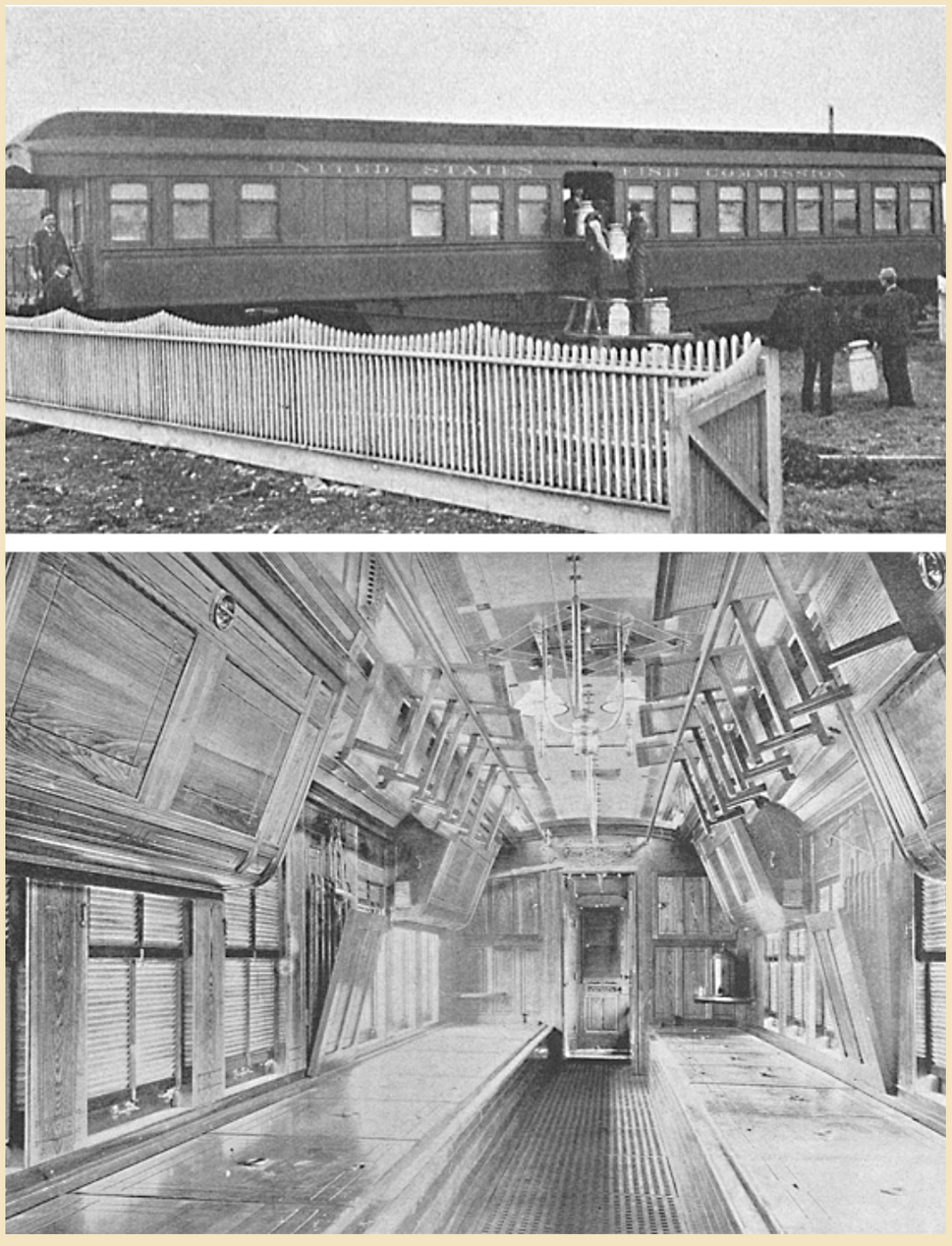
1892 Based on Livingston Stone's recommendations, Afognak Island in Alaska is set aside as a Forest and Fish Cultural Reserve by proclamation of President Harrison.

1893 The U.S. Fish Commission becomes responsible for northern fur seal research.

The *Albatross* carries two presidentially appointed commissions in the 1890s that study the plight of the fur seal. Their reports confirm that seal populations were being seriously harmed by pelagic (high-seas) hunting.

1896 Salmon research from the *Albatross* leads Congress to regulate Alaska salmon fishing with net restrictions, closed seasons, spawning escapement requirements, etc.

Dead fur seal pups are counted on all Pribilof Island rookeries for the first time as part of seal mortality studies.



U.S. Fish Commission transport car (top). The interior (bottom) shows berths closed and chairs hung up so that compartments for fish can be opened. U.S. Fish Commission photos, 1897

1898 In response to commercial obstruction of Alaska's Karluk River, Congress passes its first salmon protection law.

1899 The U.S. Rivers and Harbors Act allows Alaska fishermen to secure a permit granted by the U.S. War Department to buy salmon traps. The War Department's sole interest in the matter is to ensure that the traps will not obstruct navigation.

Rivers and Harbors Act of 1899

The Act is the oldest federal environmental law in the United States. It makes it a misdemeanor to discharge refuse matter of any kind into navigable waters, or tributaries thereof, of the United States without a permit; this specific provision is known as the Refuse Act.

The Rivers and Harbors Act also makes it a misdemeanor to excavate, fill, or alter the course, condition, or capacity of any port, harbor, channel, or other areas within the reach of the Act without a permit.

Although many activities covered by the Rivers and Harbors Act are regulated under the Clean Water Act, the 1899 Act retains independent vitality. The Rivers and Harbors Act is administered by the U.S. Army Corps of Engineers.

Congress passed an act of the same name in 1882, and overrode a veto by President Arthur.

(from "Rivers and Harbors Act of 1899" Wikipedia™)

1900-1909

U.S. Bureau of Fisheries

1902 Auke Lake is claimed by William Win and Martin Needham for establishing a fish hatchery, which was built but never operated.

1903 By a Congressional act on 14 February, the U.S. Fish Commission and the Office of the Commissioner of Fish and Fisheries are placed in the Department of Commerce and Labor, which is also created by the new Act. The transfers take place on 1 July.

The formerly independent Fish Commission is named the U.S. Bureau of Fisheries (BOF). The new Bureau retains the scientific responsibilities of the Fish Commission and incorporates other fishery-related functions; that is, jurisdiction, supervision, and control over the fur seals of Alaska are assumed from the U.S. Department of the Treasury.

David Starr Jordan is chosen to head a committee appointed by President Theodore Roosevelt to investigate the causes for the decline in the salmon fisheries of Alaska.

The first salmon-marking experiments were begun by *Albatross* naturalist Fred Chamberlain of the Bureau of Fisheries in southeastern Alaska.

Yes Bay salmon hatchery built in 1905. Bureau of Fisheries photo, 1921.

1900-1909

The U.S.S. *Albatross* USFC photo, 1900

1905 The first federal hatchery in Alaska is established on McDonald Lake at Yes Bay in southeastern Alaska. Claudis Wallich is appointed to supervise the construction.

1906 During a raid on the Pribilof Islands seal rookeries, five poachers from the Japanese pelagic sealing fleet are killed by BOF personnel acting in self-defense, and a dozen others are jailed.

The *Albatross* sails on a lengthy research cruise to the Aleutian Islands, Japan, and Korea, making extensive biological collections and discovering hundreds of new genera and species of fishes. The Captain, Lieutenant Commander LeRoy Mason Garrett (U.S. Navy), is thrown from the vessel and lost at sea during a violent storm on the return trip.

1907 The second federal hatchery in Alaska is built at Afognak Lake (Litnik Lake) on Afognak Island, near the site selected in 1889 by Livingston Stone and on the reserve established earlier by Presidential Proclamation.

1909 Dr. Charles H. Gilbert, an associate of David Starr Jordan, is named scientist in charge of the Bureau's Pacific Fishery Investigations group – based at Stanford University for the next 22 years as the Agency's fisheries research hub for the Pacific coast and Alaska.

During this decade, the western-style purse seine is first used in the Pacific herring fishery and gradually replaces the Norwegian style of oar-propelled seine boats.

1910-1919

Pribilof Islands Management Change and the Signing of an International Treaty

1910 Owing to the abuses connected with pelagic sealing, the Bureau of Fisheries assumes the entire administration of the Pribilof Islands including all matters relating to the northern fur seal and fox populations; as well as the care, education, and welfare of the Native population.

Under a Congressional act on 21 April, the U.S. Treasury Department turns over jurisdiction of minor fur bearing animals in Alaska to the U.S. Department of Commerce and Labor.

Dr. Charles H. Gilbert begins applying a new method for ageing Pacific salmon. This adaptation of the European method involves counting ridges on the scales of certain fish. Within 10 years, this ageing method is experimentally tested and universally accepted with regards to Atlantic salmon.

1911 On 4 March, the Sundry Civil Bill is approved, establishing the Alaska Fisheries Service, which is formally organized as a division of the Bureau of Fisheries on 1 July. The Service now administers the services for fur seals, other fur bearing animals, Pacific salmon, and various fisheries in Alaska. These species had been managed previously by the Division of Scientific Inquiry with respect to food fishes.

Due to the decreasing supply of halibut reported on the Pacific coast, the Bureau of Fisheries conducts a preliminary investigation of possible fishing banks west of Southeast Alaska aboard the steamer *Albatross*, which leaves Seattle on 25 May.

On 7 July, the United States, Great Britain (for Canada), Japan, and Russia conclude a convention and establish the North Pacific Fur Seal and Sea Otter Treaty for the protection of the marine mammals that had been virtually decimated by overhunting on the high seas. This provides a sound basis for managing both species.

On 25 August, 40 reindeer are brought to the Pribilof Islands for the first time as an experiment to assist the local economy by providing meat, milk, hides, and to serve as burden carriers. This number grows to 1,700 over the next 26 years.

The International Council for the Exploration of the Sea (est. 1902, headquartered in Copenhagen) officially invites the United States to become a member. Represented by the Department of Commerce and Labor, and the Bureau of Fisheries, the United States joins the organization in 1912,

withdraws during World War I, and does not rejoin again until 1973.

1912 The eruption of Alaska's Mount Katmai covers the Bureau of Fisheries' Afognak salmon hatchery with nearly a foot of volcanic ash, hampering operations and causing heavy losses to both eggs and fry due to suffocation. An estimated 20,000 salmon are killed at Litnik Lake and thousands more are driven from blocked tributary spawning streams back into the ocean. Temporary field stations are erected nearby at Eagle Lake and Kodiak Island. Questions and studies of the potential impact of volcanic ash on lake fertilization ensue.

A 5-year closed period (established by a Congressional bill resulting from the 1911 fur seal treaty) begins, prohibiting the killing of seals on the Pribilof Islands except for those used as food by the Native residents.

A Congressional act (24 August) creates a territorial legislature for Alaska, providing for uniform fishery taxes; the prohibiting of water pollution from lumber industry waste (e.g., sawdust harmful to fish); the prohibiting of non-U.S. fishing for fish, whales, and other marine animals; and certain restrictions on fish traps and fishing areas.

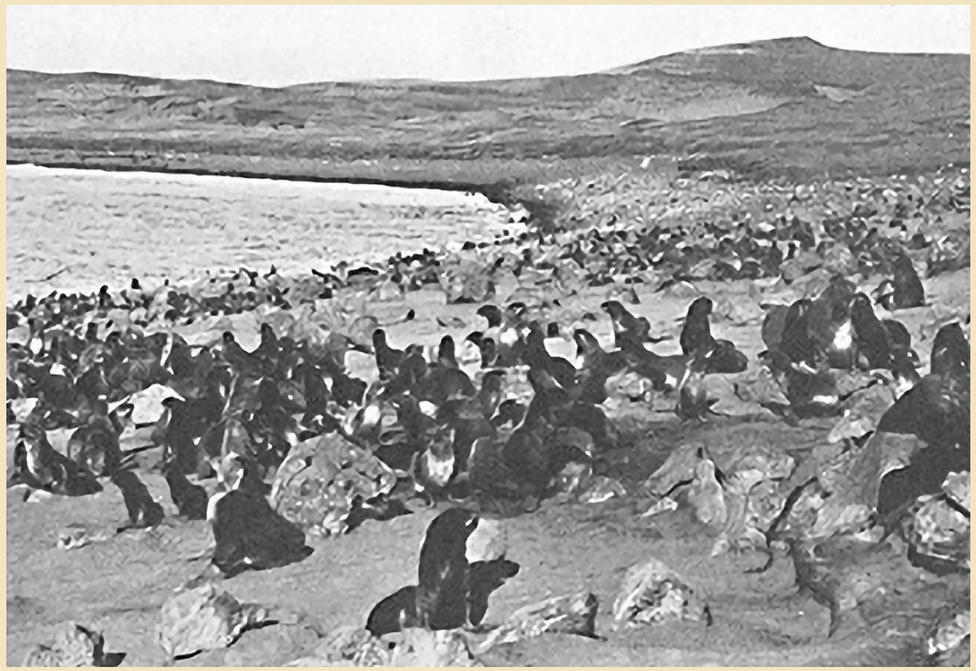
The coal-burning steamer *Wigwam* was purchased by the Bureau in the fall for $17 million. Renamed the *Osprey*, it became the first Bureau of Fisheries vessel used for fisheries patrol in Alaska.

As a result of the pelagic seal hunting ban, George A. Clark who works for the Bureau of Fisheries, conducts the first complete census of the various classes of seals on the Pribilof Islands. During the summer, Clark and M. C. Marsh (Pribilof Islands naturalist), with local help, permanently mark seals for scientific purposes at the islands, using hot iron branding for the first time. Prior to 1912, the marking of seals – by shearing or clipping an area of fur from the top of the head – was temporary, with the mark disappearing within a year as the fur grew back.

1913 Fur seal skins from the Pribilof Islands, which until now had been sent to London for sale, are now shipped by rail from San Francisco to Messrs. Funstein Bros. & Co. in St. Louis for processing and auction.

A 1913 Bureau of Fisheries report stated: "The fall of 1912 was the first in which there was complete absence on the rookeries of the bodies of seal pups dead from starvation because of the mothers being killed at sea".

1914 A small office opens in Seattle's historic Smith Tower Building as a temporary administrative center for the Bureau of Fisheries Pacific coast operations.



Fur seals on Tolstoi Beach, St. Paul Island. Bureau of Fisheries photo, 1914.

The U.S. Department of Labor is separated from the U.S. Department of Commerce, which retained the Bureau of Fisheries.

Seattle replaces San Fransisco, California, as the base for purchasing supplies transported to the Pribilof Islands by ship. Skins from the islands were now being brought to Seattle for rail transport to St. Louis.

1915 In New York, the Bureau of Fisheries purchased Robert Peary's steamship Roosevelt – noted for Peary's Arctic explorations – for use as its first dedicated Pribilof Islands tender. Two years later, the renovated ship was sent to the Pacific Northwest to begin service.

William F. Thompson, an early student of David Starr Jordan, begins his study of the halibut fisheries of the North Pacific. He later becomes the director of investigations for the International (halibut) Fisheries Commission, the International Pacific Salmon Fisheries Commission, and the Fisheries Research Institute of the University of Washington. This halibut research is the first scientific study made on the Pacific coast fishery aimed at fishery management.

1916 The canning of clams begins in the Cordova District of Alaska.

1917 A telegraph service is started by the Bureau of Fisheries and the Washington-Alaska Military Cable & Telegraph System to provide several coastal Alaska towns with the daily prices of certain fish being sold in Seattle and Ketchikan. This information proves beneficial to fishermen who are now able to market their products at current prices.

The *Roosevelt* arrives in Seattle and becomes the first ocean-going ship to enter Lake Washington when it leads a flotilla of vessels during the 4 July dedication for the opening of the Government Locks connecting Puget Sound with the Lake Washington Ship Canal. Soon afterwards, the *Roosevelt* begins her sailings as the Bureau of Fisheries first Pribilof Islands tender, dedicated to transporting supplies and personnel to and from the islands.

The Bureau of Fisheries sister boats *Auklet* and *Murre* were the first vessels built specifically for the Bureau of Fisheries enforcement work in Alaska.

To prevent any possible disturbance of the fox and fur seal herds, all dogs are banned from the Pribilof Islands.

1918 The Bureau of Fisheries begins using temporary employees during the fishing season acting as "stream watchmen" to patrol against fishing violations and protect the salmon spawning grounds in Alaska. Initially, 10 men using small boats were employed in the southeastern districts. By 1931, the number grew to 220 men employed throughout the territory.

1919 Due to concern over the threatened Pacific salmon supply, Dr. Charles H. Gilbert and future Bureau of Fisheries Commissioner Henry O'Malley conduct a special investigation of the salmon fishery at several locations in central and western Alaska.

As a result of a 23 December Bureau of Fisheries order, a heightened effort begins to erect markers at the mouths of streams indicating areas prohibited for fishing.

On 15 July, the Bureau of Fisheries' first Pribilof Islands tender *Roosevelt* is sold for $28,000. To serve as its replacement, the *Idaho* was acquired and renamed the *Eider*.

Additional Reading on the Mt. Katmai Eruption

Schaaf, J. M. (for the National Park Service). 2004. Witness, Firsthand Accounts of the Largest Volcanic Eruption in the Twentieth Century (Katmai). Nat. Park Serv. brochure.

Evermann, B. W. 1914. "Eruption of Katmai Volcano", (excerpt from) Alaska Fisheries and Fur Seal Industries in 1913 (Doc. 792), p. 59-64. In Bureau of Fisheries Report of the United States Commissioner of Fisheries for the Fiscal Year 1913 with Appendixes. Wash. G.P.O.

See Also

- "The Katmai Eruption" A 5-minute video found on Vimeo website

Division of Scientific Inquiry

The work of the Commission (of Fish and Fisheries) was arranged under three divisions, one of which was the Division of Scientific Inquiry. The division was charged with the "investigation of the fishing grounds relative to their resources and characteristics, their depletion and the methods suited to their replenishment; and also with the study of the habits and development of fishes as a basis for fish culture, legislation and fishery methods..."

(from "Guide to Washington and its Scientific Institutions" International Congress of Geologists. Fifth Session, Washington. 1891. 62 p.)

North Pacific Fur Seal and Sea Otter Treaty of 1911

"Under the auspices of the United States Department of State an international conference was convened in Washington on May 5, 1911, for the purpose of concluding a treaty affecting the fur seals of the North Pacific Ocean. The powers attending the conference were Great Britain, Russia, Japan, and the United States. The principle that guided the negotiations seems to have been an acknowledgment of the right of the pelagic sealers to compensation for giving up their preying on the seal herds outside territorial waters. At any rate, the governments possessing seal rookeries agreed to pay the others 15 and 10 percent of the sealskins taken. A treaty was signed on July 7, 1911, and after ratification became effective on December 15, 1911, and was to continue in force for a period of 15 years from that date and thereafter until terminated by 12 months' written notice given by one or more of the parties to all of the others, which notice may be given at the expiration of 14 years or at any time afterwards.

By this treaty pelagic sealing was forbidden in the waters of the North Pacific Ocean north of 30° north latitude and including the Seas of Bering, Kamchatka, Okhotsk, and Japan, with the exception that 'Indians, Ainos, Aleuts, and other aborigines' may carry on pelagic sealing in canoes without firearms under certain conditions specified, among them that these aborigines must not be "under contract to deliver the skins to any person." There is nothing, however, forbidding these aborigines to sell the skins. Otherwise no person or vessel shall be permitted to use any part of the territory of any of the signatory powers for any purposes whatsoever connected with the operations of pelagic sealing, nor shall any sealskins not certified to have been taken legally be permitted to be brought into the territory of any of these powers.

The latter agree to enact and enforce such legislation as may be necessary with appropriate penalties for violations, and to cooperate with each other in taking such measures as may be appropriate and available for the purpose. In addition, the United States, Japan, and Russia agree to maintain a guard or patrol in the waters frequented by their respective seal herds. This would entitle Russia to maintain a guard off the Japanese coasts during the winter and spring migrations of the Commander Islands seals.

(from: Stejneger, L. 1926. Fur Seal Industry of the Commander Islands, 1897 to 1922, p. 289-332. In Bulletin of the United States Bureau of Fisheries, Vol. XLI, 1925. Wash. G.P.O.)

1920-1929

A Focus on the Pacific Salmon Fisheries

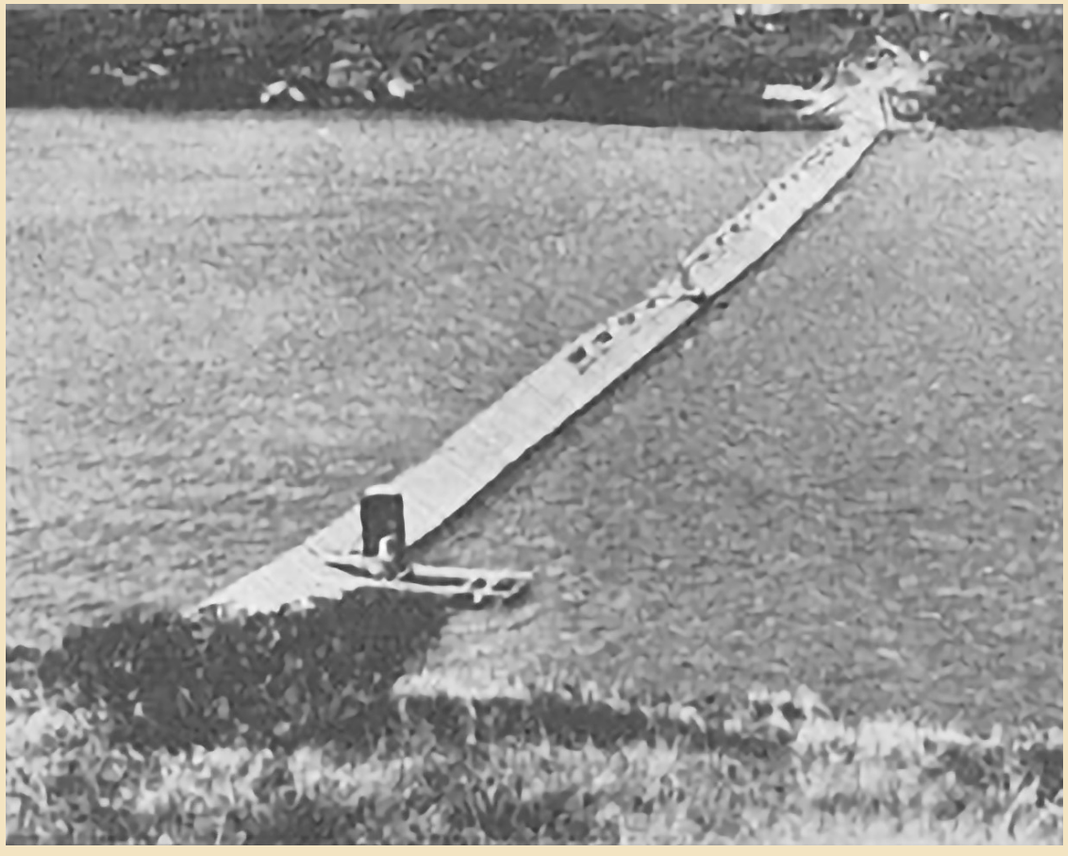
1920 On 31 May, an act is passed transferring the Agriculture Department's jurisdiction over walruses and sea lions in Alaska to the Department of Commerce. New regulations are approved by the Secretary of Commerce governing the killing of these animals within the territorial limits of Alaska.

An elaborate plan is initiated by which certain vessels provided by the U.S. Navy, U.S. Coast Guard, and U.S. Coast and Geodetic Survey are assigned to cooperatively conduct fishery patrol work in Alaska. The commanding officers and other officers are authorized to conduct searches, arrests, and seizures in connection with enforcing the laws and regulations.

A cooperative effort begins in the Bristol Bay district between the Bureau and salmon packers that organizes an expedition to eliminate predatory fishes in certain waters of the region.

Dr. Charles Henry Gilbert and Willis H. Rich begin conducting extensive Pacific salmon tagging experiments around the Alaska Peninsula and Kodiak Island. They use consecutively numbered aluminum tags attached to 4,000 red salmon, which are released and (20%) recaptured. The goal was to determine what feeding grounds are used by the Bering Sea red salmon, and what spawning streams they return to.

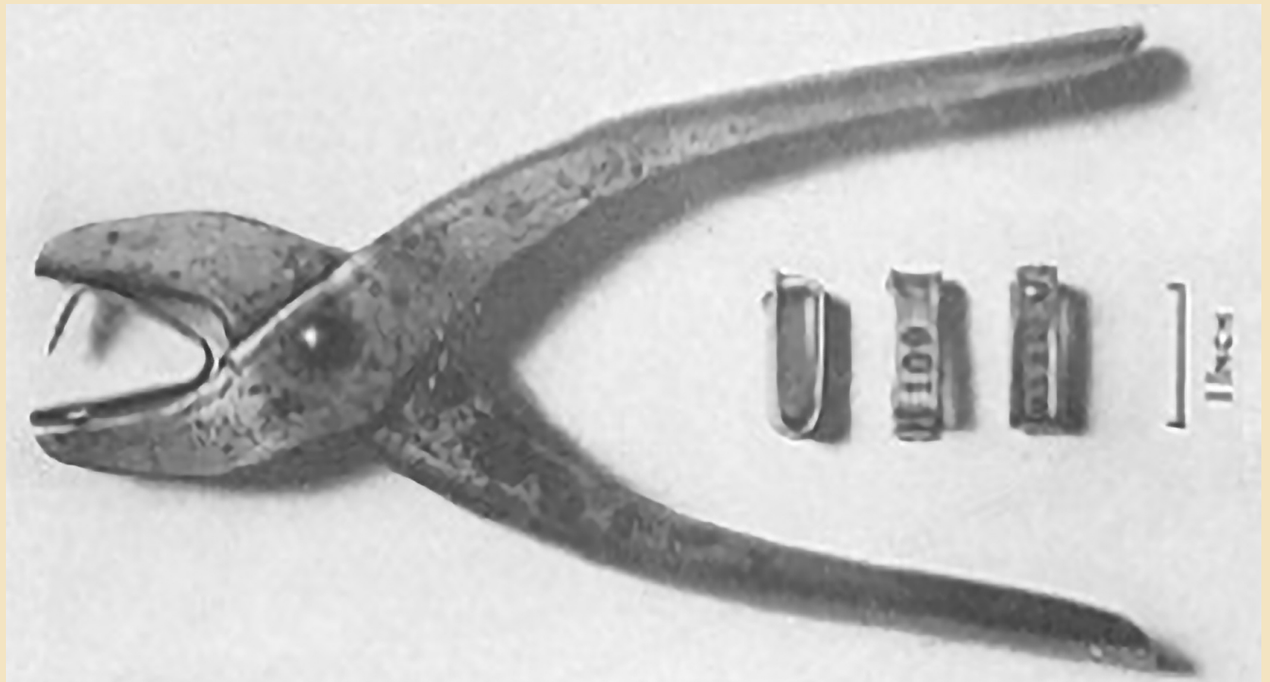
A stable elevated tripod platform for counting fur seals on the



The Karluk River weir/rack used for counting salmon ascending to the spawning grounds. Bureau of Fisheries photo, 1922.

Pribilof Islands is used experimentally for the first time. It proves far superior to any elevating structure previously tried.

1921 An intensive Pacific salmon study, involving extensive scale sampling, is conducted each year by Dr. Charles Henry Gilbert at Bristol Bay, Karluk Lake, and Karluk River – the most important Alaska salmon stream in terms of harvest. To facilitate this work, a salmon counting weir/rack was built across the Karluk River, near its mouth, (see photo) and began receiving yearly maintenance.



Tong and tags used for salmon tagging. Bureau of Fisheries photo, 1922.

1922 Willis H. Rich, former student of David Starr Jordan and field assistant working on Alaska salmon issues with Charles Gilbert, becomes chief of the Bureau's Division of Scientific Inquiry. He later heads the Pacific Fishery Investigations at the Bureau's Stanford station (California), and in 1943 becomes Director of the Montlake Laboratory in Seattle.

1923 As part of an exhausting cross-country trek to meet Americans, Warren G. Harding becomes the first U.S. president to visit the Alaska territory and delivers a public address on 27 July in Seattle. In his speech he stresses the importance of the Alaska fisheries industry, whose current product value "is more than double that of all metals and minerals", and calls for conservation of Alaska salmon through enforced regulations. Having strained his health, President Harding dies suddenly 6 days later.

An investigation of the resources and biology of Alaska clams begins and continues through 1924. These studies show that in comparison with clams on the Washington coast, Alaska clams are fewer in number and grow significantly slower, requiring roughly twice the time to reach a marketable size. They are also less resistant to heavy fishing and slower to return to productivity when depleted.

1924 The 6 June Alaska Fisheries Act (White Act), which amends the 26 June 1906 act, is passed by Congress and approved by the President. This new act (and its later revisions) provides for further conservation and protection of the Alaska fisheries by authorizing the Secretary of Commerce to limit catches, set seasons, and restrict (but not limit the amount of) gear in respect to the taking of all fisheries products from U.S.-controlled Alaska waters. It sets a 50% escapement level for streams where fish could be counted or reliably estimated. The act also allows Bureau of Fisheries employees to serve as peace officers, with powers to arrest

persons and seize property in violation of the act. Bureau of Fisheries Commissioner Henry O'Malley then visits Alaska from July to September to gather first-hand knowledge of the fisheries, so to best advise on any additions or modifications to the act.

Salmon tagging is conducted in Southeast Alaska for the first time.

A 7 June act for the protection of the North Pacific halibut fishery became effective, establishing for the first time an annual closed season (for 3 months, beginning mid-November) on halibut fishing for U.S. and Canadian vessels. This legislation was provided for in the North Pacific Halibut Treaty, resulting from the 2 March 1923 convention between the U.S. and Great Britain.

Bureau of Fisheries Assistant Agent E. M. Ball directed the preliminary studies of the shrimp fishery in Southeast Alaska, concerning the location, movements, and spawning period of shrimp, as well as improvements to fishing gear.

Henry O'Malley, Bureau of Fisheries Commissioner and a member of the Halibut Commission, sent Bureau of Fisheries biologist Harlan Holmes to Seattle to find working space for the Bureau. A small staff of Bureau employees worked at the University of Washington's Fisheries Hall, Number 4, until construction of the Montlake Laboratory was completed in 1931.

1925 The International Pacific Salmon Investigation Federation is established to address regional fishery problems through coordinated research and discussion. The organization consists of the Bureau of Fisheries, the Biological Board of Canada, and fish commissions from California, Oregon, Washington, and British Columbia.

Fishery research biologist George A. Rounsefell's annual biological herring investigations at several Alaska areas began in the spring. During the following year, studies became more extensive and a program started for the tagging of herring and subsequent tow-net collection of larvae. Rounsefell stated; "The growing use of herring for food and manufacture into oil and meal has aroused considerable anxiety concerning the danger of depletion."

1926 A detailed annual study of razor clam beds begins in Alaska, in which collected data on growth rate is used to regulate the fishery based on the understanding of their life history.

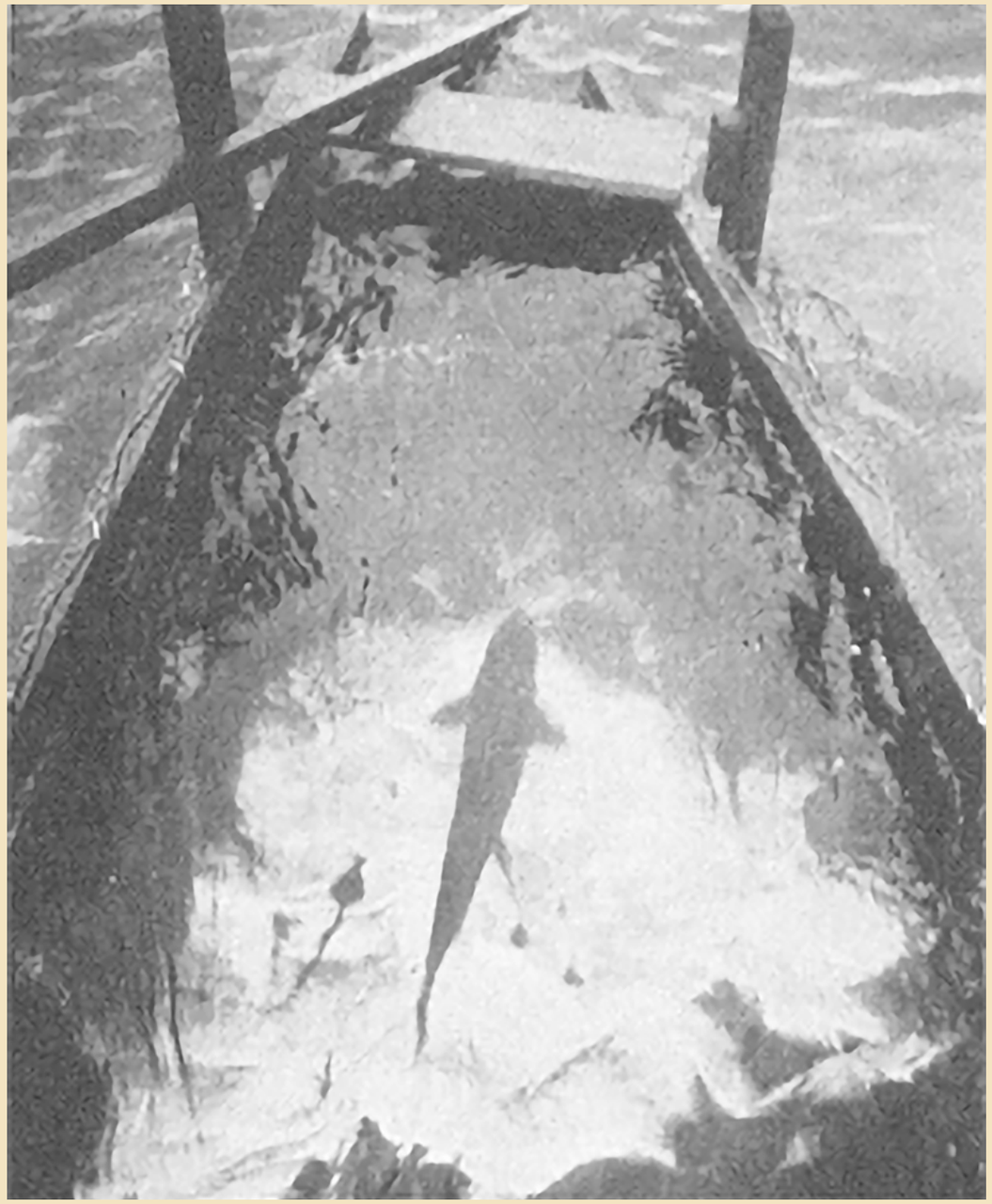
Additional Pacific salmon studies are conducted in Chignik, Alaska, under the leadership of Bureau of Fisheries biologist Harlan Holmes.

The extensive robbery of fish traps in Alaska was potentially curtailed by a 16-17 September trial ruling (United States v. Val Klemm, et al.), which defined that fish trap owners have legal property ownership over the fish caught within their traps while still in the water. This was not the general impression prior to the case. The defendants were found guilty of larceny and sentenced to 3 years in a federal penitentiary.

Technological studies began on how to utilize the wastes and by-products that are generated during the short Pacific salmon canning season. That year, a record 6,652,882 cases of Alaska canned salmon were produced.

1927 The continued destruction of predatory trout near the Bureau's Yes Bay and Afognak hatcheries proved beneficial to the rearing of salmon fry.

1928 A very large Pacific herring return in the Aleutian Islands leads to the development of a major fishery based in Dutch Harbor. Simultaneously there is a major collapse of the herring fishery in Southeast Alaska.



Salmon pass through a weir gate over white canvas fastened to the bottom to improve visibility for counting. BOF photo, 1927.

The International Fisheries Commission issues its first report on Pacific halibut. Studies continue on the collection of eggs and larvae and environmental parameters.

1929 New investigations begin on the sockeye salmon in Bristol Bay under Alan Taft and on the Copper River under Seton Thompson. Investigations on the pink salmon of southeastern Alaska begin under Fred Davidson.

Enforcement of Pacific salmon regulations is emphasized, and the Bureau employs 228 agents using 24 vessels. For the first time, an aircraft is utilized for patrol work, which is experimental and limited to the use of a seaplane by agents from Juneau and Ketchikan in Southeast Alaska.

1930-1939

Comprehensive Alaska Salmon Studies Begin and the Montlake Laboratory Opens

1930 The Sockeye Salmon Fisheries Convention is signed to address conflicts between U.S. and Canadian fishermen in Puget Sound and the Strait of Georgia, where they compete for sockeye salmon bound for the Fraser River in B.C. Despite the Convention, questions remain unresolved, including the role of the Pacific Salmon Commission in regulation of the fishery, the division of catch between the fishermen of the two countries, and the agencies responsible for investigations.

C. M. Hatton (BOF) conducts the first recorded aerial survey in Alaska – in the Lake Clark district of Bristol Bay.

1931 On May 22 the Montlake Laboratory opens in Seattle to become the Bureau of Fisheries' West Coast and Alaska field station. Present at the open house are Henry O'Malley of the Bureau; Miller Freeman, editor of the *Pacific Fisherman*; and U.S. Senator Wesley Jones, author of the Jones Act. Also attending were local Bureau staff and members of the International Fisheries Commission (commonly known as the Halibut Commission). Joseph Craig is appointed the first Laboratory Director. Two months later the Halibut Commission moved into the new facility

A 1931 report by Henry O'Malley stated: "... Personnel and equipment of the Stanford field station [California] were transferred to the new Fisheries Biological Laboratory in Seattle, along with all of the Bureau's Pacific biological investigations dealing with Pacific Coast fishery problems, except shellfish and the cooperative work on California trout".

1932 An extensive herring tagging program begins in southeastern Alaska using the new metal "belly" tag, made of pure nickel, which could be recovered by a magnetic detection system installed on the conveyer belts at processing plants. George A. Rounsefell and Edwin Dahlgren's ideas led to the development of this tag. Dahlgren refined the tags in 1935 and further developed electronic and magnetic systems for recovering the tags as fish pass through the reduction plant.

As an attempt to establish an additional food source, the Bureau of Fisheries vessel *Murre* and her crew assisted B. E. Smith, of Ketchikan, in transporting and planting approximately 300,000 seed oysters of the Japanese variety in waters of the southern district of Southeast Alaska.

1933 Frederick Davidson is appointed director of the Montlake Laboratory and focuses on the statistical analysis of fisheries research. He hires a statistical analyst. About the same time, the Halibut Commission begins to apply Baranof's theory of fishing to the regulatory problems of the halibut fishery.

Both of the Alaska federal hatcheries, at Yes Bay and Afognak Lake (Litnik Lake), operate for the last time and are closed after the end of the season.

1934 Temporary Little Port Walter field facilities for pink salmon survival studies are built on Sashin Creek on the southern tip of Baranof Island in southeastern Alaska. They include the weir cabin, built in Seattle, barged to Alaska, and is still in use (as of 2011).

An extensive program of stream improvement in southeastern Alaska is undertaken as a project of the Civil Works Administration. One year later, the Works Progress Administration funds the projects for the improvement of salmon-spawning streams in southeastern and central Alaska.

1936 Resource utilization research at the Seattle Biological Laboratory examines the use of fish products in poultry feed, and various product preservation techniques.

The Sockeye Salmon Fisheries Convention between the U.S. and Canada is ratified by the U.S. Senate.

1937 A U.S.-Canada treaty sets up the International Pacific Salmon Fisheries Commission to manage those regional fisheries and coordinate extensive salmonid research programs. W. F. Thompson is Director of Investigations.

1938 George B. Kelez initiates an expansion of the Alaska fishery research program at the Seattle Montlake Laboratory begins with a large, comprehensive two-part program of study on the salmon runs in the Bristol Bay area of the Bering Sea. A field station and experimental area are established on Brooks River. One part studies the freshwater life history of the Bristol Bay sockeye salmon and the environmental factors affecting their survival. The other part studies the ocean life history of salmon and is done in close cooperation with the U.S. Coast Guard using the cutter Redwing. The studies end in 1941 with the outbreak of World War II and Japan's invasion of the Aleutian Islands.

Congress authorizes $25,000 to establish a permanent fishery laboratory at the existing Little Port Walter facility in Alaska for "an orderly program of fishery investigation".

1939 On 3 April, the Commerce Department's Bureau of Fisheries and the Agriculture Department's Bureau of Biological Survey are transferred to the U.S. Department of Interior as part of the 1939 Presidential Reorganization Plan No. II.

1940-1949

The New Fish and Wildlife Service and Wartime Fisheries Research

"In every major war fought by the United States, the fishing fleet has formed a second line of naval defense, fishing boats and fishermen being employed in various capacities for patrol, as mine sweepers, in supplying protein food to the armed forces and the civilian population."

– Charles E. Jackson, Acting Bureau of Fisheries Commissioner, 1942.

1940 Reorganization Plan No. III, effective 30 June, merges the Bureau of Fisheries and the Biological Survey as part of the Interior Department's Fish and Wildlife Service (FWS); in addition, it provides for the establishment of five regional fisheries offices.

The Bureau's Alaska Technological Laboratory is set up in Ketchikan; it moves to Kodiak in 1971.

Congress appropriates $100,000 for a 1-year study by the U.S. Fish

The "White House" laboratory building, opened in 1940, is part of the Little Port Walter facility. Photo provided by William Heard (AFSC).

and Wildlife Service (FWS) of the potential of an Alaska king crab fishery. The investigation is directed by Roger W. Harrison, head of the Seattle Fishery Technological Laboratory. Research identifies potential harvest areas, fishing gear, preservation and canning techniques, and the fishery potential.

The Little Port Walter Station headquarters building, commonly known as "the White House", was opened and (as of 2011) remains the longest continuously operating fisheries research laboratory in Alaska.

1941 Construction of a permanent field laboratory station began on Brooks River.

Tagging of fur seal pups is initiated in Alaska.

On 23 October, Japan terminates the international fur seal convention (Fur Seal Treaty of 1911), but protection for the Pribilof herd is arranged by a provisional agreement between Canada and the United States.

1942 "Fish for war is the present aim of the fishery biological investigations of the [Fish and Wildlife] Service," states the Department's Annual Report. TA 108-page supplement to the May issue of the *Fishery Market News* reviews "The Alaska King Crab," noting that Alaska waters hold "... an enormous reserve of edible fish – notably 'sole' and pollock – which is at present wholly unutilized."

"In every major war fought by the United States, the fishing fleet has formed a second line of naval defense, fishing boats and fishermen being employed in various capacities for patrol, as mine sweepers, in supplying protein food to the armed forces and the civilian population." - Charles E. Jackson, Acting Bureau of Fisheries Commissioner.

1944 The Bureau of Fisheries' Ketchikan Laboratory is asked to investigate potential emergency sources of marine foods in the event military activities in Alaska cause food shortages. It studies various sharks and the Steller sea lions, as well as groundfish and shellfish.

The War Food Administration frees sperm whale oil from restricted civilian use, allowing it to be used for grinding oils, carbon paper, mimeograph inks, typewriter ribbon, etc.

The War Manpower Commission emphasizes the need "for encouraging employees to adapt more fishing jobs to the employment of women ... women can do much of the work in fish processing plants that formerly was considered for men only."

Selective Service State Directors are given authority to recommend draft exemptions for 18-25-year-old captains of fishing vessels of 20+ gross tons. Of the 600 fishing boats requisitioned for emergency use by the U.S. Army, Navy, and Coast Guard, 142 are released to the War Shipping Administration by the military; 13 are returned to their original owners.

1945 President Harry S. Truman issues a proclamation asserting U.S. jurisdiction "... over the natural resources of the continental shelf under the high seas contiguous to the coasts of the United States and its territories, and providing for the establishment of conservation zones for the protection of fisheries in certain areas of the high seas contiguous to the United States."

1947 Rebuilding after the hurricane at Woods Hole, Massachusetts, begins – a small number of research investigations there resume.

While progress in establishing conservation zones in the Pacific and other waters to protect salmon and other fisheries is temporarily suspended, the State Department advises of its "firm intention to resume attention to this highly important matter at the earliest possible opportunity".

The FWS vessel Black Douglas begins its long-awaited studies of the Alaska fur seal.

Using a mounted F-56 Fairchild aerial camera, George B. Kelez and G. J. Eicher, Jr. begin experimental vertical aerial photographic surveys of the Bristol Bay region as a means of permanently recording salmon spawning counts.

1948 Aerial photographs are taken of all fur seal rookeries as an experimental censusing technique.

For the first time, ridges circling the extracted teeth from freshly killed fur seals are counted as a reliable means of age determination.

Exploratory Fishing and Gear Development Section operations are initiated within the Seattle Technological Laboratory under Maurice Stansby. The aim is to organize a working group to operate on the Pacific coast. More >>

1949 The Seattle Exploratory Fishing Project is officially transferred from the Technological Laboratory to function as a separate entity.

The FV *Oregon* begins using a LORAN (terrestrial radio LOng RAnge Navigation system), making it the first Fish and Wildlife Service fishing-survey vessel to employ a long-range aid to marine navigation.

Delegate E. L. Bartlett of Alaska introduces a bill in Congress to provide for the gradual reduction and ultimate elimination of salmon traps in Alaska waters – a Department of Fisheries is created by Alaska's Territorial Legislature.

1950-1959

The Bureau of Commercial Fisheries, Alaska's Statehood, and Two New Research Vessels

1950 A sixth regional fisheries office is established in Alaska to facilitate administration of Alaska's fisheries.

The Fish and Wildlife Service (FWS) vessel John N. Cobb is commissioned with a public open house at Seattle, Washington. Both she and the newly built boat, John R. Manning, are tasked with exploratory fishing and gear research in Alaska and other areas in the Pacific Ocean. The *Cobb* remains in service for 58 years.

The FWS vessel fleet is dealt a blow when its 20-year old Pribilof Islands tender *Penguin* is severely damaged from a fire at Lake Union in Seattle and sold the following year. Fortunately, within a week, the U.S. Army surplus ship *Lt. Raymond Zussman (FS-246)* is acquired nearby as the replacement tender. She is renamed the *Penguin II* a few months later.

An independent Western Fish Disease Laboratory is established by the FWS at the University of Washington's College of Fisheries. Facilities include a large bacteriology laboratory, consisting of a wet lab with three large aquaria, 16 4-foot troughs supplied with heated and chilled water, and support facilities for researchers.

1953 Preliminary explorations for salmon in the offshore waters of the Aleutian Islands are made by the *John N. Cobb*, mainly to develop

The *John R. Manning*. Fish and Wildlife Service photo.

techniques for fishing salmon with gill nets on the high seas.

The International Convention for the High Seas Fisheries of the North Pacific Ocean establishes the International North Pacific Fisheries Commission.

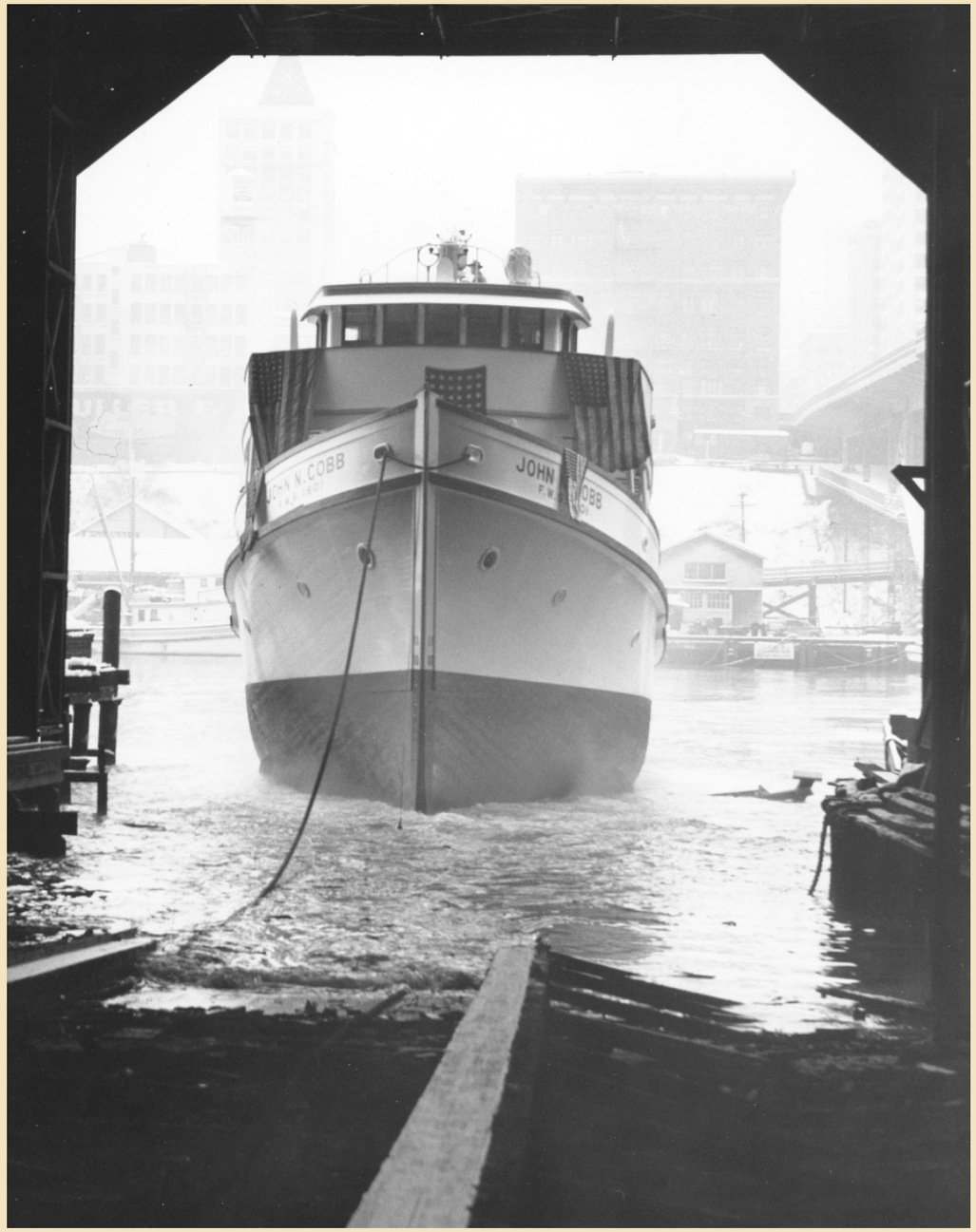
1954 Fisheries biologist George B. Kelez and four other Fish & Wildlife Service employees lose their lives in a tragic plane crash in Alaska.

1955 The first survey to determine the distribution of salmon in the eastern North Pacific Ocean is made in the spring by the *John N. Cobb*, and is followed later this year by similar cruises with two chartered halibut schooners, the *Mitkov* and the *Paragon*. The general distribution of North Pacific Ocean salmon will be firmly established by 1961.

1956 In 1956, the new Fish and Wildlife Act creates the U.S. Fish and Wildlife Service, consisting of two Bureaus: the Bureau of Commercial Fisheries– the descendant from the original U.S. Fish Commission – and the Bureau of Sport Fisheries and Wildlife. The Alaska Fisheries Science Center would later evolve from the Bureau of Commercial Fisheries. The Act also declares a National Fishery Policy recognizing the Nation's fish, shellfish, and wildlife as valuable renewable natural resources.Federal responsibility for most of the wildlife activities historically managed by the U.S. Fish Commission and Bureau of Fisheries – including pinnipeds and cetaceans – is given to the Bureau of Commercial Fisheries. The responsibility for sea otters, manatees, walruses and birds is assigned to the Bureau of Sport Fisheries and Wildlife, along with sport fish research and most of the freshwater fish hatcheries.

All biological research associated with the Alaska finfish fisheries (except that being performed for the International North Pacific Fisheries Commission) is transferred from the Montlake Laboratory in Seattle to Juneau.

From 1956 through 1964, the Montlake Laboratory studies and



The *John N. Cobb*, launched on 16 January 1950. Fish and Wildlife Service photo.

defines the biology and populations of king crab in the eastern Bering Sea.

All biological research associated with the Alaska finfish fisheries (except that being performed for the International North Pacific Fisheries Commission) is transferred from the Montlake Laboratory in Seattle to Juneau, Alaska.

1957 Exploratory fishing operations by the Bureau of Commercial Fisheries off Alaska locate new Pacific ocean perch and shrimp resources. Exploratory research in the central, eastern, and northern Pacific reveals that Japanese and American fishermen are exploiting the same stocks of albacore.

1958 Congress passes the Alaska Statehood Act on 7 July.

In 1958 and 1959, Congress appropriates $430,000 for the construction of the Auke Bay Laboratory 12 miles north of Juneau, Alaska.

Japan agrees, under terms of the North Pacific Fisheries Convention, to abstain from salmon fishing on the high seas of the North Pacific east of longitude 175°W, while research continues to determine the proper line to divide Asian and North American salmon stocks equitably. Research shows that sockeye salmon of the North American type appears to predominate in the North Pacific as far west as longitude 175°E.

The Western Fish Disease Laboratory moves to a vacant warehouse at the nearby Sand Point Naval Air Station in Seattle. The U.S. Navy provides the carpentry, plumbing, and electrical work needed to furnish a well laid-out laboratory.

The Bureau of Commercial Fisheries Biological Laboratory at Stanford obtains indices of air circulation changes over the North Pacific for a 32-year period (1926-57) and studies their effects on sea temperatures, upwelling, and fish populations.

1959 The Alaska territory becomes the 49th state on 3 January 1969 and the Federal management of Alaska's commercial fisheries ends.

The Bureau of Commercial Fisheries is called upon to intensify fishing treaty enforcement and foreign fishing surveillance in international waters, especially off the Alaska coast where Japan and the Soviet Union have concentrated their greatest fishing efforts.

1960-1969

Alaska Fisheries Research Facility Opens in Juneau

1960 Federal management of Alaska's commercial fisheries is turned over to the new state's agencies: Alaska Board of Fish and Game, and the Alaska Department of Fish and Game.

The Bureau of Commercial Fisheries' northern fur seal and whale research studies are combined in Seattle and designated as the Marine Mammal Biological Laboratory.

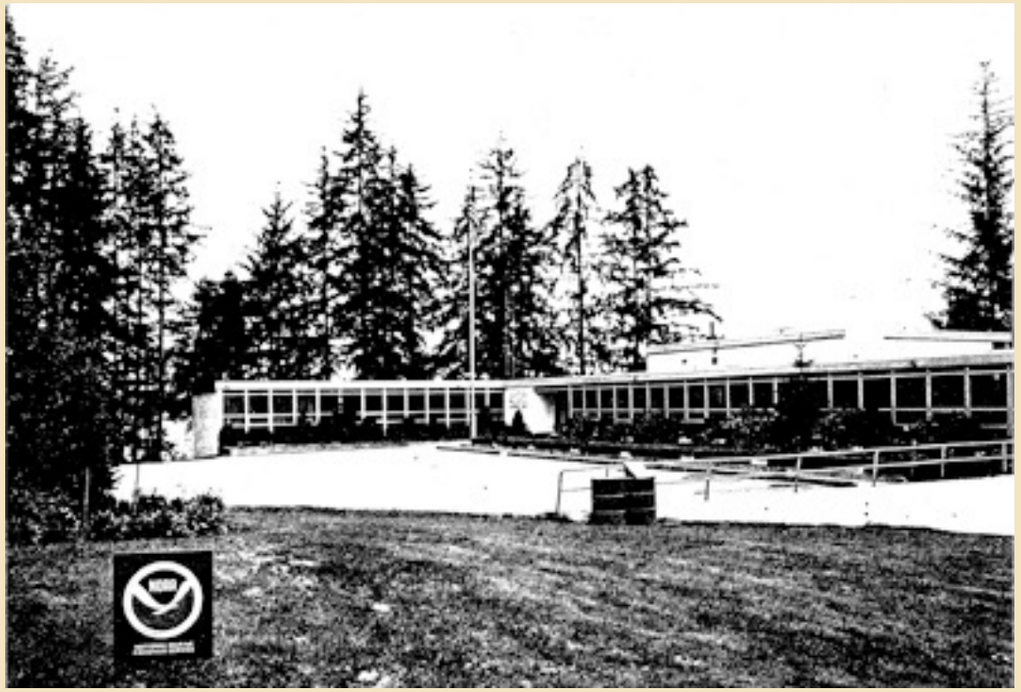
The Auke Bay Laboratory near Juneau opens to house the Alaska fisheries research programs.

In July 1960, a new Alaska fisheries exploration and gear research program is initiated, based at Juneau. Its purpose is to obtain greater knowledge of the untapped fishery resources off the coast of Alaska so that orderly development of these resources may take place.

Scientists begin using radioactive materials in biological research.

1961 In response to increasing numbers of foreign vessels fishing along U.S. coasts, the Bureau increases its surveillance efforts to ascertain possible effects on U.S. fisheries.

The Center's Marine Mammal Biological Laboratory conducts its first studies on bowhead whales.



The Auke Bay Laboratory, opened in 1960. NOAA document photo.

1962 The transport ship George B. Kelez is acquired for the Seattle Laboratory from the U.S. Navy. The vessel allows the Bureau's oceanographic and high-seas salmon studies to be extended into the winter season for the first time.

The Bureau makes its first whale marking and observation cruise off southern California and northern Baja California to determine the condition of the North Pacific whale stocks and those pursued by the two U.S. whaling companies.

A 2-year emergency Alaska salmon research program concludes, having determined the carrying capacity of the freshwater spawning and nursery areas of the state. The program also provided a better understanding of the Pacific salmon runs and their management, and the data needed for renegotiation of the International North Pacific Fisheries Convention in 1963.

The Bureau's first winter high-seas salmon survey cruise in the North Pacific finds a significant concentration of immature red salmon in a broad area about 200 miles south of Kodiak Island and helps toward understanding the distribution and survival of salmon at sea. Methods are also developed to distinguish between North American and Asian pink salmon.

By this time, scientific studies in Alaska include the long-established biological programs at Little Port Walter, Karluk, and Brooks Lakes. Newer projects are undertaken at Kasitsna Bay, Olsen Bay, Traitors Cove, Naknek River, Hollis, Old Tom Creek, Wood River, and Kvichak. Research expands to focus on environmental impacts on the growth of young salmon.

1963 U.S. biologists are placed on some Japanese trawlers and factory ships in the Bering Sea and the Gulf of Alaska, obtaining data on the catch by species, area, and quantity, and on gear efficiency.

1964 The Bureau of Commercial Fisheries' Seattle Technological Laboratory initiates research on the Pacific whiting, then called "hake," – another potentially large fishery.

The "Bartlett Act," Public Law 88-308, of 20 May, prohibits fishing in U.S. territorial waters by foreign-flag vessels unless allowed by treaty. This Act establishes 3-mile territorial waters along most U.S. coastlines.

Scientists at the Bureau's Seattle Biological Laboratory use the results of pioneering studies in serology, or blood group analysis, to identify several subpopulations of salmon in the eastern North Pacific Ocean.

1965 Seattle Biological Laboratory scientists find scale characters useful in distinguishing Asian from Bristol Bay, Alaska, sockeye salmon, and for identifying stocks of intermingled salmon in the Gulf of Alaska from various North American river systems. Pink salmon are also identified to their area of origin by scales.

1966 Marine resource concerns lead Congress, under Public Law 89-454, to authorize on 17 June the creation of the "Commission on Marine Science, Engineering, and Resources." Later chaired by Julius A. Stratton of the Ford Foundation, it is simply called the "Stratton Commission." Public Law 89-454 also sets up the National Council on Marine Resources and Engineering Development.

In response to the increased foreign fishing activity off the U.S. coasts, Congress passes Public Law 89-658, extending the U.S. fisheries territorial sea to a 12-mile zone in which the United States will exercise the same exclusive rights in respect to fisheries as it has in its territorial sea.

Scientists with the Ketchikan Technological Laboratory discover a new method for peeling Alaska's pink shrimp quickly and for maintaining their quality and color, thus overcoming a major obstacle to commercial production.

A biologist at the Auke Bay Biological Laboratory in Alaska devises a new type of lightweight, simple, and inexpensive

plastic driftcard to chart surface ocean currents. A patent on it is secured for the Bureau.

The Northern Fur Seal Act is passed to protect the fur seal herd and administer the Pribilof Islands in the Bering Sea.

Between late January and March, the MV *G. B. Kelez* and MV *Argo* conduct the first winter season oceanographic measurements in the western Subarctic region of the North Pacific Ocean.

1967 On 9 January, President Lyndon B. Johnson appoints the 15 members of the "Stratton Commission" who immediately begin their study of the Nation's marine problems and needs.

A new $4 million, 215-foot ocean research vessel, the *Miller Freeman*, is launched; being designed with laboratories and equipment especially for North Pacific oceanographic and fisheries studies.

1968 Scientists from the Bureau of Commercial Fisheries and Japan cooperatively study several U.S. fish species as potential ingredients for "surimi," a frozen fish product used in Japan to make fish sausages and fish cakes. Studied are the spiny dogfish, starry flounder, and several Pacific coast rockfishes.

1969 The "Stratton Commission" presents its final report on 11 January and recommends the creation of a new federal entity - a "National Oceanic and Atmospheric Agency" (NOAA) to include initially the Bureau of Commercial Fisheries and other federal marine and anadromous fishery functions, the National Sea Grant College Program, and other agencies.

Three Bureau of Commercial Fisheries diver-scientists participate with the U.S. Navy, NASA, and other diver-scientists in the new TEKTITE I project. The scientists spend a record 2 months on the ocean floor, working from an underwater laboratory situated at a 50-foot depth.

Scientists at the Seattle Biological Laboratory provide estimates of growth, mortality, and other data for Pacific whiting and Pacific ocean perch. This research forms the basis for the U.S. position in discussions with the U.S.S.R. to reduce the Soviet whiting fishery.

Auke Bay Laboratory scientists provide U.S. negotiators and management agencies with background data on king crabs in the Bering Sea and Gulf of Alaska. The data helps U.S. representatives obtain a 48% reduction in the king crab quotas of Japan and the U.S.S.R.

The Exploratory Fishing & Gear Research group based at the Montlake Laboratory (Seattle, WA) obtains its first **SCUBA** dive team.

The Bureau and the University of California study 175 female northern fur seals found at San Miguel Island, California; the first confirmed record of these seals breeding on other than the Pribilof Islands.

1970-1979

National Oceanic and Atmospheric Administration (NOAA) and a Reorganization

1970 On 3 October 1970, U.S. President Richard M. Nixon signs Executive Order No. 11564 to consolidate various fishery, oceanic, and atmospheric agencies into a new agency, the National Oceanic and Atmospheric Administration (**NOAA**), in the Department of Commerce.

Robert White is appointed the first NOAA Administrator. The new organization is directed toward a better understanding of the Nation's living marine resources, their environment, and the interaction between the two.

The Bureau of Commercial Fisheries becomes a component of NOAA and is renamed the National Marine Fisheries Service (**NMFS**).

1971 Robert White establishes four major "offshore" fisheries research centers throughout the Nation: the Northeast Fisheries Center, Southeast Fisheries Center, Southwest Fisheries Center, and North Pacific Fisheries Research Center, all of whom report to NMFS headquarters. Three "coastal" fisheries research centers, which report to Regional Directors, are also established: the Gulf Coast Fisheries Center (**GCFC**), Atlantic Estuarine Fisheries Center (**AEFC**), and Middle Atlantic Coast Fisheries Center (**MACFC**). The basic five-regional office structure is retained.

Established in September 1971, the North Pacific Fisheries Research Center is soon renamed the Northwest Fisheries Center (**NWFC**) that year on 28 November. Dayton Lee Alverson is appointed Acting Director and Dr. Brian Rothschild is Deputy Director. Located at the Montlake Laboratory in Seattle, Washington, the NWFC is staffed by approximately 200 employees and composed of a Center Director's Office and five divisions:

- the Marine Fish, Shellfish, and Oceanography Division
- the Coastal Zone and Estuarine Studies (CZES) Division
- the Fisheries Data and Management Systems (FD&MS) Division
- the Environmental Conservation (EC) Division, which consists of individuals from four of the existing independent BCF Seattle research groups: the Seattle Biological Laboratory, the Exploratory Fishing and Gear Research Base, the Biometrics Institute of Seattle Biological Laboratory, and the Pioneer Research Laboratory.

The original NOAA logo, whose design was chosen from three options by NOAA employees in 1971.

NOAA's first administrator Robert White remarked about the design: "A white, gull-like form links the atmosphere to the sea or Earth. The Earth and atmosphere and the interrelationships between the two are, of course, major concerns of NOAA. The line defining the top of the gull's wings also resemble the trough of a foaming ocean wave against the blue sky. A creature of sea, land, and air, the gull adds an ecological touch to the Earth-sky motif."

- the Marine Mammal Management and Monitoring Division – formed from the existing Fur Seals Research and Marine Mammals Laboratory.

The inaugural issue of the Center's Quarterly Report is published in September with the inception of the North Pacific Fisheries Research Center. Initially published as a monthly report, the AFSC *Quarterly Report* continues to highlight the research and general activities of the Center.

Center scientists successfully rear coho salmon in floating saltwater pens, a technique that shows great promise as a commercial salmon production venture.

Center staff develop a computer program to plot fishing stations of the RV *George B. Kelez* in the North Pacific.

NMFS Exploratory Fishing and Gear Research scientists in Seattle develop steel wire pots for harvesting sablefish.

Other inexpensive and lightweight deep-water fish traps are developed at the Center. They are found to be effective and are adopted commercially.

NMFS' Auke Bay Laboratory scientists survey prior to and after the detonation of a nuclear device at Alaska's Amchitka Island; no significant damage to marine fauna or environment is found.

Center scientists and technicians aboard the NOAA ship *John N. Cobb* complete a survey of waters off southeastern Kodiak Island. More >>

U.S. commercial whaling ends as of 31 December.

A salmon-counting sonar device is developed for enumerating salmon in glacially turbid Bristol Bay and Cook Inlet streams where visual counts are impossible.

1972 NMFS Director Philip Roedel announces that the Agency, under NOAA, has a much broader charter than its predecessor agencies and is now resource-oriented rather than user-oriented.

Through 1973, major ships from NMFS fisheries, National Ocean Survey (NOS), and Environmental Research Laboratories (ERL) integrate in phases to form a consolidated NOAA fleet, operated by the Office of Fleet Operations (OFO), a component of NOS. Under this system, the Fleet Allocation Council (FAC) manages and allocates vessel time for each ship based on user requests.

The Coastal Zone Management Act is passed to provide guidance, expertise, and funding to help states protect and manage U.S. coastal areas.

1973 The Endangered Species Act is passed to protect species and populations whose numbers are small or declining. NMFS is responsible for marine species under the law.

1974 On 1 July, the Auke Bay Laboratory (ABL) in Alaska becomes a part of the Northwest Fisheries Center as a separate division.

An automated database is developed for North Pacific whaling statistics.

An acoustic-electronic device is developed to remotely measure trawl opening dimensions and trawl distance to seabed.

Center staff collaborates to develop a conceptual model of the Bering Sea ecosystem.

The NMFS-wide Marine Resources Monitoring Assessment and Prediction (MARMAP) program is established. The project forms the basis for uniform data collection necessary for fisheries management and critical to the ecosystems approaches now being developed by fishery management councils.

More >>

1975 On 23 November, the Marine Fish and Shellfish Division is split into the Resource Assessment and Conservation Engineering (RACE) and Resource Ecology and Fisheries Management (REFM) divisions.

In August, the Auke Bay Laboratory uses the power barge *Murre II* to conduct the first cruise for acquiring information on the abundance and distribution of humpback whales in Southeast Alaska.

Gravel incubators are used to enhance pink salmon return to Auke Creek, Alaska. More >>

NOAA receives over 100 acres of land on Sand Point in Seattle in which to build the Western Regional Center campus

Some 195 cases are investigated relating to the Marine Mammal Protection Act as are 381 cases involving endangered species and related products including seizures of quantities of sperm whale oil and teeth, raw baleen, and scrimshaw.

A baseline survey is conducted (to describe the demersal fish and shellfish resources of the eastern Bering Sea. More >>

1976 Center scientists investigate the effects of Cook Inlet, Alaska, crude oil on shrimp and crab larvae. More >>

The Fishery Conservation and Management Act (FCMA) is passed and establishes eight regional fishery management councils and the 200-mile fishery conservation zone (FCZ).

The Polish Zooplankton Sorting Center in Szczecin, Poland, opens as a multinational effort to process marine life sampled in the massive research efforts during the ICNAF era. Scientists from the Northeast Fisheries Center (NEFC) are instrumental in training Polish staff to identify and classify zooplankton and in helping to establish laboratory procedures.

On 1 October, The Northwest Fisheries Center officially becomes the Northwest and Alaska Fisheries Center (NWAFC) as a result of the Auke Bay Laboratory joining the Center.

A division is added to the NWFAC when the existing technological laboratories in Seattle and Alaska are combined to form the Utilization Research (UR) Division. In Alaska, this change results in the Ketchikan operation moving to Kodiak.

1977 A Center scientist is appointed to the NMFS Committee investigating the fishery application of satellites.

U.S. and foreign scientists collaborate to assess the compatibility of age readings for walleye pollock and hake.

The first observers are placed on foreign fishing vessels – fishery data processing begins. More >>

A sea lion census conducted by the Center's Marine Mammal Division off Alaska indicates a population decline of Steller sea lions. More >>

1978 On 1 April, four NMFS biologists set up camp in snow caves at Cape Lisburne, Alaska, to study and count endangered bowhead whales during their spring migration.

Using hydroacoustic techniques, Auke Bay Laboratory scientists find that schools of juvenile and adult Pacific herring occupy the same wintering grounds off Southeast Alaska.

The first U.S. female biologist is placed as an observer on a foreign groundfish vessel fishing in Alaska waters.

More >>

Steller sea lion bull. NOAA Corps, 1978

1979 On 1 February, the NWAFC's Marine Mammal Division is designated as the National Marine Mammal Laboratory (NMML).

For the first time in the history of the Groundfish Assessment Task, two women become Chief Scientists during research vessel surveys in the eastern bering Sea.

The first U.S. survey of seamount marine life is made in the Gulf of Alaska. More >>

1980-1989

NOAA Western Regional Center Opens at Sand Point in Seattle

1980 In January, Dr. Lee Alverson retires. Francis Fukuhara, followed by Murray Hayes, both serve as Acting Center Directors until September, when Dr. William Aron is named director of the Northwest and Alaska Fisheries Center.

On 12 March, scientists of the NWAFC Resource Assessment and Conservation Engineering (RACE) Division discover a large concentration of walleye pollock eggs in Shelikof Strait, Alaska, near Kodiak Island. In subsequent years, researchers measure the spawning population and trace the movements of the eggs and larvae. This research expands into the Fisheries- Oceanography Coordinated Investigations (FOCI) program, a joint effort with NOAA scientists at the Pacific Marine Environmental Laboratory.

The original Fishery Conservation and Management Act is officially renamed the Magnuson Fishery Conservation and Management Act (MFCMA) in honor of Washington State Senator Warren Magnuson.

NOAA's Sand Point facility dedicated in 1983. NOAA photo.

A computer program is created to retrieve photographs of whales stored on computer. More >>

1984 - Four Whale Biologists Survive Crash in Arctic Ocean

Three NMML biologists, **David Rugh**, **Barb Taylor**, and **Ann Sinclair**, along with **Jim Cubbage** of the Cascadia Research Collective (Olympia, WA), were involved in a plane crash while conducting photographic surveys of bowhead whales. Both engines of their DeHaviland Twin Otter had stalled 1,000 feet over the Beaufort Sea, some 6 miles from shore. Since these planes were built with the wheels fixed down, they almost always flipped over when hitting the water. Life rafts were not normally carried due to the unlikely chance of survival, but in this case a raft was acquired and loaded aboard the plane after persistent requests made by the task leader.

The skill of pilot **Robert "Bob" Platt** may have saved the lives of six people that day. Platt turned the plane into the wind and they coasted down to the sea. Although the plane did not flip over, it did hit with a bang causing the belly window to burst open. The plane immediately began to fill with water. During the few minutes before the plane sank, everyone managed to swim free, salvaging only the life raft and four of the five NMML survival suits that had been on board. Within minutes one helicopter responded to their distress call. Another helicopter then arrived with an additional life raft 30 minutes later. The *Arctic Surveyor*, an Esso survey ship, picked them up and they were later transported by helicopter to the hospital in Inuvik (NW Territories, Canada). Though some of the survivors were in a mild state of shock, there were few apparent injuries. The crash served as a valuable warning to both this team and to others working in the Arctic as to what additional survival gear should be carried.

Though the story ended safely for all aboard, there is a tragic ending to this tale. Bob Platt was killed in a plane crash less than a month later. (*From Northwest and Alaska Fisheries Quarterly Report, July-Sept. 1984*)

1981 NOAA facilities are completed at the Oregon State University's Hatfield Marine Science Center in Newport to serve the scientific needs of various organizations and government agencies.

1982 The Northern Pacific Halibut Act is passed to enforce the terms of the U.S.-Canada agreement prohibiting fishing by unauthorized foreign vessels.

1983 On 10 March, the fishery conservation zone (FCZ) is designated as the U.S. Exclusive Economic Zone (EEZ) by Presidential Proclamation.

The Northern Pacific Halibut Act was passed to enforce the terms of the U.S.-Canada agreement prohibiting fishing by unauthorized foreign vessels.

On 28 October, dedication ceremonies are held for NOAA's new Western Regional Center at Sand Point in Seattle, Washington.

1984 In September, the National Marine Mammal Laboratory (NMML), becomes the first group to move into Building 4 at the new Seattle Sand Point facility. Later in the year, the NWAFC's Center Director's Office, Resource Assessment and Conservation Engineering (RACE) Division, and Resource Ecology and Fisheries Management (REFM) Division also make the move. The Utilization Research (UR) and Environmental Conservation (EC) Divisions remain at Montlake because of the extensive laboratory space available there. The Coastal Zone and Estuarine Studies (CZES) Division also stay at Montlake because of its fish-rearing facilities.

Longline sablefish index surveys are planned by Auke Bay Laboratory (ABL) scientists. More >>

On 18 August, a plane carrying four biologists from the National Marine Mammal Laboratory crashes into the frigid waters of the Arctic Ocean during bowhead whale surveys. Miraculously, all survive. More >>

1985 The Association of Primary Production and Recruitment Processes in Subarctic Ecosystems (APPRISE) study is initiated in Auke Bay. More >>

1986 Early in the year, the Fisheries Data and Management Systems Division is disbanded and mainframe computer services are carried on by the Office of Fisheries Information Systems (OFIS) group of the Center Director's Office.

1988 Marmot Island northern fur seal observations and research begins. More >>

In October the National Marine Fisheries Service (NMFS) receives a report of three gray whales trapped in the ice near Barrow, Alaska. Over a 3-week period, NMFS led an international rescue endeavor named "Operation Breakthrough", which allowed two of the whales to swim free from the ice. Another rescue effort that month saved 27 beluga whales stranded off Anchorage.

Genetic diversity of chum salmon is studied for Southeast Alaska streams. More >>

1989 On 24 March, the oil tanker *Exxon Valdez* runs aground on Bligh Reef, Alaska, spilling 11 million gallons of crude oil into Prince William Sound. This event led to years of Center research on the effects of oil spills on Alaska marine ecosystems.

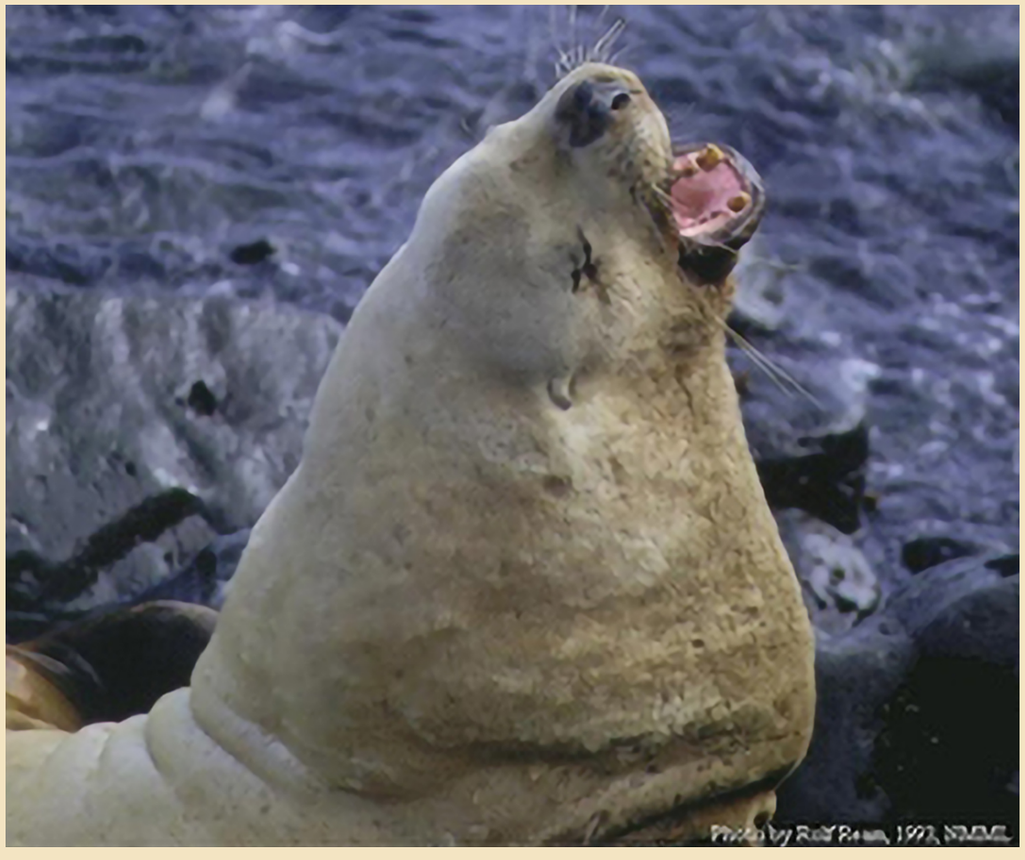
1990-1999

A Dividing of the Center and Important AFSC Research

Throughout the 1990s, the Alaska Fisheries Science Center managed the Nation's largest fishery observer program. It also continued the examination of impacts from the 1989 *Exxon Valdez* oil spill on Prince William Sound in Alaska, the study of declining Steller sea lion populations, and long-term surveys conducted on northern fur seals at the Pribilof Islands which began in 1872.

1990 The NWAFC is divided into the Alaska Fisheries Science Center (AFSC) – made up of Auke Bay Laboratories (ABL), National Marine Mammal Laboratory (NMML), Office of Fisheries Information Systems (OFIS), and the Resource Assessment and Conservation Engineering (RACE) and Resource Ecology and Fisheries Management (REFM) Divisions – and the Northwest Fisheries Science Center, with the Coastal Zone and Estuarine Studies (CZES), Environmental Conservation (EC), and Utilization Research (UR) Divisions. Both are in Seattle. The restructuring plan emphasizes continued Division interaction. The RACE, REFM, and UR Divisions, and the NMML, with program responsibilities which apply to both the Northwest and Alaska regions, support the ecosystem.

1992 The Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean is signed in Moscow by Canada, Japan, Russia, and the United States, establishing the North Pacific



The AFSC made significant studies in the 1990s regarding the population decline of Steller sea lions. R. Ream (AFSC), photographer, 1993.

Anadromous Fish Commission. The North Pacific Anadromous Stocks Convention Act repeals the North Pacific Fisheries Act of 1954 and implements protective measures for salmon and shad.

The High Seas Driftnet Fisheries Enforcement Act is passed to maintain a list of nations that allow large-scale driftnet fishing (which entangles protected mammals and fish as well as commercial fish) beyond their EEZ.

1994 A South Korean fishing company, whose vessel was caught poaching fish from U.S. waters in the western Pacific, settles in U.S. District Court for a $1 million fine and agrees to have its fleet of 17 fishing vessels tracked by satellite for 5 years. The provision allowing satellite tracking by U.S. authorities is unprecedented.

1995 Management of the Pacific halibut and sablefish fisheries off Alaska is converted from an open-to-entry "derby-style" system to individual fishing quotas, allowing an 8-month season, improved product quality, and availability of fresh halibut and sablefish to the consumer.

The first research cruises for the Ocean Carrying Capacity study in the North Pacific Ocean began successfully in October through a joint effort by scientists from the ABL and the Biological Laboratory (Canada Department of Fish and Oceans, Nanaimo, B.C.).

A small group of scientists establish the AFSC Diversity Panel to expand the Alaska Fisheries Science Center's educational outreach activities. The mission of the Diversity Panel is "to chart and coordinate AFSC's activities in promoting community outreach programs, training opportunities for current employees, and establish cooperative programs with regional educational institutions to encourage interest in the disciplines of mathematics and science."

1996 On 3 January, Dr. William Aron retires as Director of the Alaska Fisheries Science Center. On 16 August, Dr. James W. Balsiger is appointed Director of the Alaska Fisheries Science Center.

1996 The Alaska Fisheries Science Center website goes public.

2000-2010

Continuing the Research into a New Century

Emerging into the 21st century, the Alaska Fisheries Science Center has played a key role in developing the knowledge needed for the management of the walleye pollock and other groundfish stocks in the North Pacific.

Center scientists have, and continue to make, significant contributions toward understanding the biology and population dynamics of other major species necessary for effective fishery management in the regions of the Bering Sea, Gulf of Alaska, and Aleutian Islands.

The protection and restoration of marine mammal populations in Alaska is an especially important objective. Numerous studies are focused on identifying and evaluating the ecosystem structure and variability, essential fish habitat, and the genetic structure of fish and marine mammal species. During the progression into the new century, considerable effort has been expended towards the impacts of climate change on the myriad of marine life found in Alaska waters.

2001 On 7 October, Dr. Douglas DeMaster is named Director of the Alaska Fisheries Science Center. More >>

2003 The NOAA ship Oscar Dyson is launched on 17 October in Pascagoula, Mississippi. The ship is the first of four new ships built by NOAA and is considered one of the most technologically advanced fisheries survey vessels in the world. The *Dyson* is homeported in Kodiak, Alaska, where the vessel is commissioned on 28 May 2005.

2005 On 21 August, REFM's North Pacific Groundfish Observer Program formally becomes the Fisheries Monitoring and Analysis (FMA) Division as part of the AFSC. More >>

2006 The AFSC Committee on Outreach, Education, and Diversity (COED) is formed from the former AFSC Diversity Panel. Its goal is to develop, maintain and improve education and outreach activities that support the AFSC's mission to communicate scientific information generated to protect, conserve, and manage living marine resources in Alaska.

2007 In May, the Auke Bay Laboratories moves into the new Ted Stevens Marine Research Institute at Lena Point in Juneau, Alaska. Scientists and staff plan to occupy 85 offices and 14 laboratories in the new 69,000 square foot facility.

2008 On 30 August, AFSC scientists, in collaboration with scientists from the University of Washington and University of Alaska, successfully complete a historic research cruise

to the Beaufort Sea. The project, funded by Minerals Management Service, gathers information on fishes in the offshore waters of the Beaufort Sea during the brief ice-free season. The only fish survey to occur in the offshore waters previous to this was opportunistic and took place in 1977. More >>

On 13 August, the NOAA ship *John N. Cobb*, the oldest wooden boat in the NOAA fleet, is decommissioned in Seattle. More >>

2009 NMML's Polar Ecosystem Program conducts an extensive study on seals in the Bering Sea. The research cruise focuses on locating, capturing, sampling, and applying satellite-linked tags to ribbon and spotted seals. In addition, an evaluation is made of the utility of Unmanned Aerial Systems (UAS) technology to improve ice seal abundance and distribution estimates by flying sensor test flights and limited line transect surveys with an Insight A-20 UAS.

AFSC scientists and partnering researchers make a historic cruise to the Beaufort Sea.
E. Acuna (AFSC), photographer, 2008.

Facilities

The long history of federal fisheries research in Alaska led to the construction of a number of far-flung facilities to support the Agency's scientific efforts.

Facilities and Field Stations

The long history of federal fisheries research in Alaska led to the construction of a number of far-flung facilities to support the Agency's scientific efforts.

These facilities have ranged from small field camps necessary to support seasonal research both in Alaska and along the U.S. West Coast -- such as salmon life history studies -- to state-of-the-art laboratories located in Alaska, Washington, and Oregon.

While some facilities were abandoned because of shifts in research priorities, others have been transferred to various scientific agencies that still support research activities.

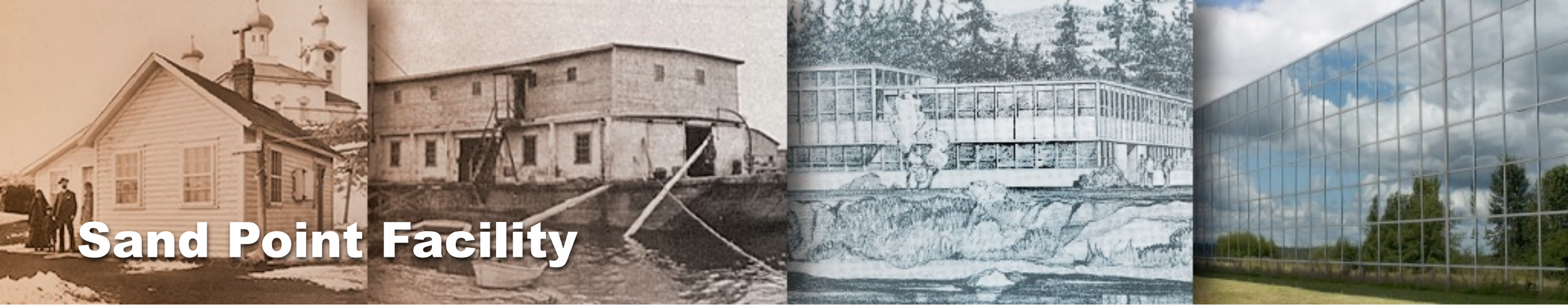
Additional reading

Vernberg, F. J., et al. 1963. Field Stations of the United States. American Zoologist, 3(3): 245-386.

Tanonaka, G. K. 1982. The Northwest and Alaska Fisheries Center, 1971-1981. Pages 9-17, *In* Rae R. Mitsuoka, Roger E. Pearson, Laura J. Rutledge, and Samuel Waterman (editors), Fifty Years of Cooperation and Commitment: 1931-81, The Northwest and Alaska Fisheries Center. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-34.

Featured Sections

Sand Point (Seattle, WA)
Montlake (Seattle, WA)
Newport, OR
Auke Bay Labs, AK
Kodiak Lab, AK
Little Port Walter, AK
Brooks River, AK
Kasitsna Bay, AK
King Salmon, AK
Olsen Bay, AK
Pribilof Islands, AK
Traitors Cove, AK



NOAA's Sand Point Facility in Seattle

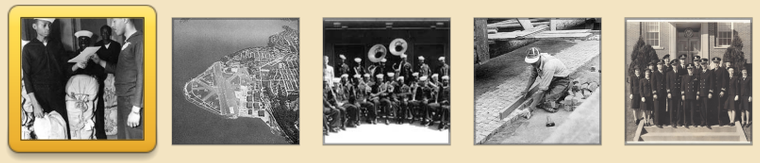
Extending into picturesque Lake Washington, the 400-plus-acre Sand Point peninsula in Seattle, Washington, originally consisted of small farms. The land was acquired in 1920 by the county for the U.S. Navy, which took out a 10-year lease in 1923 on 268 acres at $1 per year. With its unobstructed access, among other favorable features, Sand Point was a highly desired location for an airfield. During the 1920s, the Navy slowly developed the area creating a runway, control tower, hangars, barracks, and other buildings. Despite the unreliable conditions of the dirt runway brought about by frequent rain, the location offered alternative access by float planes and amphibious craft.

For nearly 50 years, the Sand Point Naval Air Station continued to serve as an airport and aviation training facility. Growing over the years, the base was most heavily used during World War II, when it was occupied by 8,000 personnel and 150 various structures. The airfield closed in 1970.

In 1975, the National Oceanic and Atmospheric Administration (NOAA) received over 100 acres along the north end of Sand Point for building its Western Regional Center (WRC) campus. Some initial preparations and road work started in 1977, however, the major construction was curtailed until 1979 while local concern over the presence of large NOAA ships being on the lake was resolved.

On 28 October 1983, the Center's dedication was held, The 2-day event included local speakers and self-guided tours of the buildings, exhibits, and the shoreline trails. Final construction was complete in 1984 and the last of the new buildings was ready for its occupants. Early that fall, several groups from the Northwest and Alaska Fisheries Center

African American sailors report for duty at Naval Air Station Sand Point, 1944 Photo by U.S. Navy, Courtesy National Archives



Sand Point Facility

(NWAFC), operating out of the overcrowded Montlake Laboratory nearby, moved into Building 4, known then as "Research II", or "R2" for short.

The first division to make the move was the National Marine Mammal Laboratory (NMML), which had been operating at Sand Point in an old dusty World War II hanger left over from the air station. This was followed by the relocation to Building 4 of the NWAFC's Center Director's Office, Resource Assessment and Conservation Engineering (RACE) Division, Resource Ecology and Fisheries Management (REFM) Division, Marine Mammal Library, and the Office of Fisheries Information Systems (OFIS), along with their Burroughs 7800 mainframe computer.

The new "Research II" building provided over 90,000 square feet of office and laboratory space primarily used by Center staff. NMML scientists were able to utilize a real wet lab for the first time and OFIS benefited from a doubling of working space for their computer equipment and personnel. The building also held a graphics lab, the NMML Library and several conference rooms.

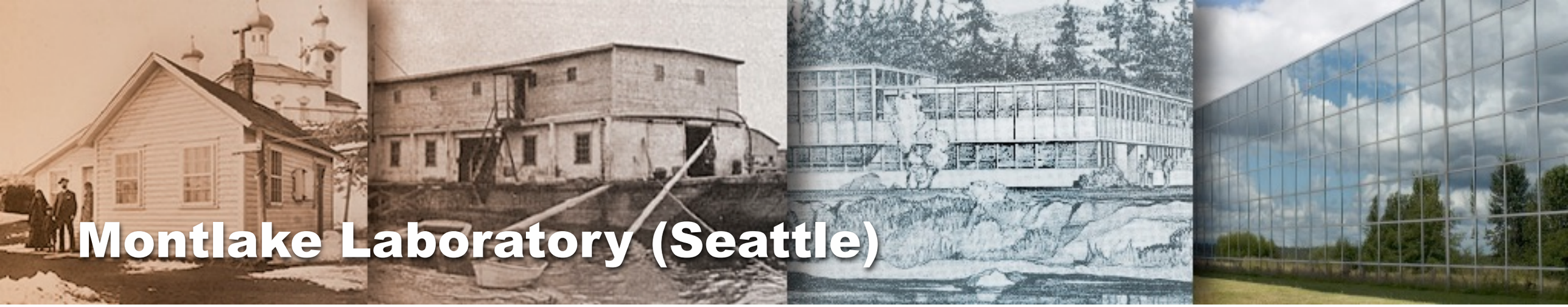
In addition to elements of the National Marine Fisheries Service, other NOAA agencies also established operations at the WRC, such as the Seattle Forecast Office of the National Weather Service, the Pacific Marine Environmental Laboratory (PMEL), the NOAA Diving Center, and the Northwest Ocean Service Center. The campus offered employees the benefit of a nearby cafeteria and dining area, auditorium, public artworks, and park areas.

Sand Point Naval Air Station history source: HistoryLink.org website

The Alaska Fisheries Science Center building is part of the NOAA Western Regional Center at the Sand Point campus on the shore of Lake Washington in Seattle. K. McKinney (AFSC), photographer, 2005.

See Also

- NOAA's Development of the Western Regional Center (NOAA website)



Montlake Laboratory (Seattle)

Montlake Laboratory

On 22 May 1931, the U.S. Bureau of Fisheries (BOF) held an "Open House" for its new biological laboratory on Montlake Boulevard, located between Lake Washington and Lake Union in Seattle, Washington. The U.S. Commissioner of Fisheries reported that the lab "provides the much needed facilities for the Pacific Coast biological staff of the Bureau as well as for certain of its other personnel and the staff of the International Halibut Commission."

"East" building. NOAA publication photo, 1965.

The new 3-story brick building was fireproof throughout and originally contained 29 offices – many of which could convert into working laboratories with gas, water, steam, air and vacuum connections. In addition were storage areas, photography dark rooms, two chemical labs, a large library, and a heating plant. Outside was a dock capable of berthing the Bureau's numerous vessels.

Following the opening, the fisheries staff and equipment that had been located at the Stanford University field station were gradually reassigned to the Montlake facility, since most of the staff were involved with field work during the summer months. The Halibut Commission was transferred in July. Included in the move were all of the BOF's Pacific coast biological studies involving fishery issues, with the exception of shellfish and the cooperative work on California trout.

Other than a new group created to study sockeye salmon runs in Puget Sound, the six programs from Stanford that dealt with Alaska salmon and herring continued their work at Montlake. Another BOF program at the time was providing salmon-run information to the U.S. Army Corps of

Montlake Laboratory (Seattle)

The original "west" building at the Montlake campus. Northwest Fisheries Science Center photo.

Engineers (USACE) to assist them with the design of a new dam on the Columbia River, an area of major expansion in fisheries projects.

Many prominent figures in fisheries research and management studied at Montlake, such as Richard VanCleve, future Dean of the University of Washington's (UW) College of Fisheries; John Kask, who later headed several U.S. and Canada fishery agencies; and Lauren Donaldson, internationally known for his contributions in salmon and trout selective breeding research.

In 1938, government funding for the study of salmon runs in the Bristol Bay region led to the first significant growth in Alaska fishery research taking place at Montlake. The oceanographic work, in cooperation with the U.S. Coast Guard, was the first actual federal investigations of salmon ocean life history. The new Alaska field station built on the Brooks River near the Brooks Lake outlet proved an ideal study site for the spawning-related aspect of this research.

During World War II, much of the science done at the Montlake Laboratory was put on hold, after which an effort was made to revitalize research with different and exciting programs.

Montlake Laboratory (Seattle)

By the early 1950s, Alaska salmon studies were still being done, but at new locations, such as fertilization at Bare Lake on Kodiak Island, and intertidal spawning investigations at Sashin Creek near Little Port Walter. Open water salmon biology research in the North Pacific was started in connection with the 1952-53 treaty of the International North Pacific Fisheries Commission. Other programs ensued which dealt with Alaska stocks of salmon, halibut, herring, and crab – very little being known about king crab in the eastern Bering Sea.

In the early 1960s, a huge searchable compilation of salmon research publications to date was attempted for the first time at Montlake. The lab expanded its oceanographic studies and continued to provide salmon related information to the USACE for their dam projects. Construction of an additional wing, which started in 1964, was completed early the following year. Located in the new 65,000-square-foot "east building" were a library, auditorium/ conference room, and a state-of-the-art laboratory.

Following the 1970 formation of the National Marine Fisheries Service, the Northwest Fisheries Center (NWC) was established at Montlake in 1971. Included as part of the NWC was the Auke Bay Laboratory (ABL) in Alaska. The NWC was later officially renamed the Northwest and Alaska Fisheries Center (NWAFC) on 1 October 1976.

Limited funding at this time affected vessel operations connected with the NWC – the NOAA ship *Miller Freeman* was deactivated for 5 years and the RV *George B. Kelez* was decommissioned. The Center also had to curtail certain projects and reduce staff. By the mid-1970s, recovery brought about renewed activities and a shift towards "management biology", which utilized the vast amount of research data accumulated over the years.

In 1984, the following groups from the overcrowded Montlake lab were relocated nearby to the newly built NOAA Western Regional Center at Sand Point:

- Auke Bay Laboratory (ABL)
- National Marine Mammal Laboratory (NMML)
- Office of Fisheries Information Systems (OFIS)
- Resource Assessment and Conservation Engineering (RACE) Division
- Resource Ecology and Fisheries Management (REFM) Division

Because of its substantial laboratory facilities, Montlake retained the following divisions:

- Utilization Research (UR)
- Environmental Conservation (EC)
- Coastal Zone and Estuarine Studies (CZES)

In 1990, the NWAFC was divided into two Seattle-based centers:

- the Northwest Fisheries Science Center at Montlake (with UR, EC, and CZES divisions)
- the Alaska Fisheries Science Center (AFSC) located at Sand Point (with ABL, NMML, OFIS, and RACE and REFM divisions)

Initially, the restructuring emphasized continued divisional interaction. The RACE, REFM, and UR divisions and NMML supported the ecosystem, with program responsibilities that applied to both the Northwest and Alaska regions.

Moving into the new century, the Montlake Laboratory continued to conduct science that influenced federal decisions on conservation and management of living marine resources in the Pacific Northwest – its research mandated by laws such as the Marine Mammal Protection Act, the Endangered Species Act, and the Magnuson Fishery Conservation and Management Act.

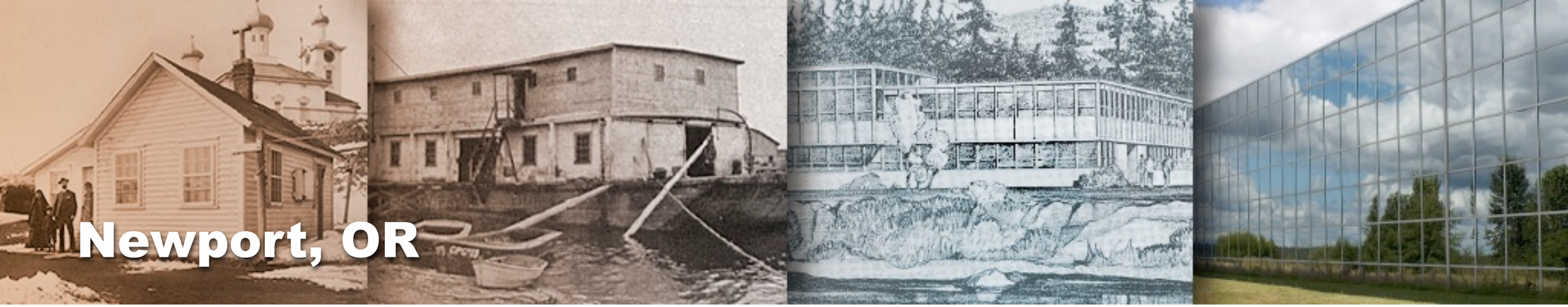
Montlake Laboratory (Seattle)

Additional Reading

Atkinson, C. E. 1988. The Montlake Laboratory of the Bureau of Commercial Fisheries and its Biological Research, 1931-81. Pages 19-46, *In* R. R. Mitsuoka, R. E. Pearson, L. J. Rutledge, and S. Waterman (editors), Fifty Years of Cooperation and Commitment: 1931-81, The Northwest and Alaska Fisheries Center. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-34.

See Also

- NOAA's Northwest Fisheries Science Center
- Celebrating 70 years of Fisheries Research at Montlake.



Fisheries Behavioral Ecology Laboratory

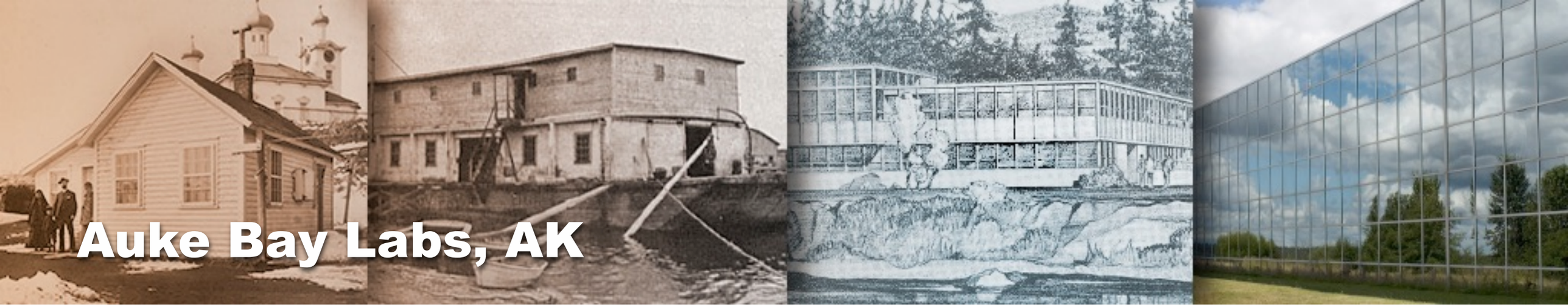
Established at the Hatfield Marine Science Center (Newport, Oregon) in 1983, the Fisheries Behavioral Ecology (FBE) laboratory was a program of the Cooperative Institute for Marine Resource Studies program and of the AFSC's Resource Assessment and Conservation Engineering (RACE) Division. The FBE Program's overarching goal was to understand and conserve populations of economically important marine species and their habitats.

Located on the 49-acre Hatfield campus near Yaquina Bay, the FBE Program continues to conduct laboratory research on the behavioral responses of commercially important marine fishes to environmental factors that are critical to controlling distribution and survival from egg to adult.

Research has also focused on defining the factors which affect postcapture survival and mortality of fish that are caught as bycatch. Species of recent interest include walleye pollock, sablefish, and Pacific halibut.

The FBE experimental laboratories currently consist of over 17,000 cubic feet of tank space housed in over 18,000 square feet of wet laboratory space supplied with 500 gallons per minute of high quality seawater, 200 gallons per minute of which can be chilled to 3° C.

The Hatfield Marine Science Center in Newport, Oregon. AFSC website photo.



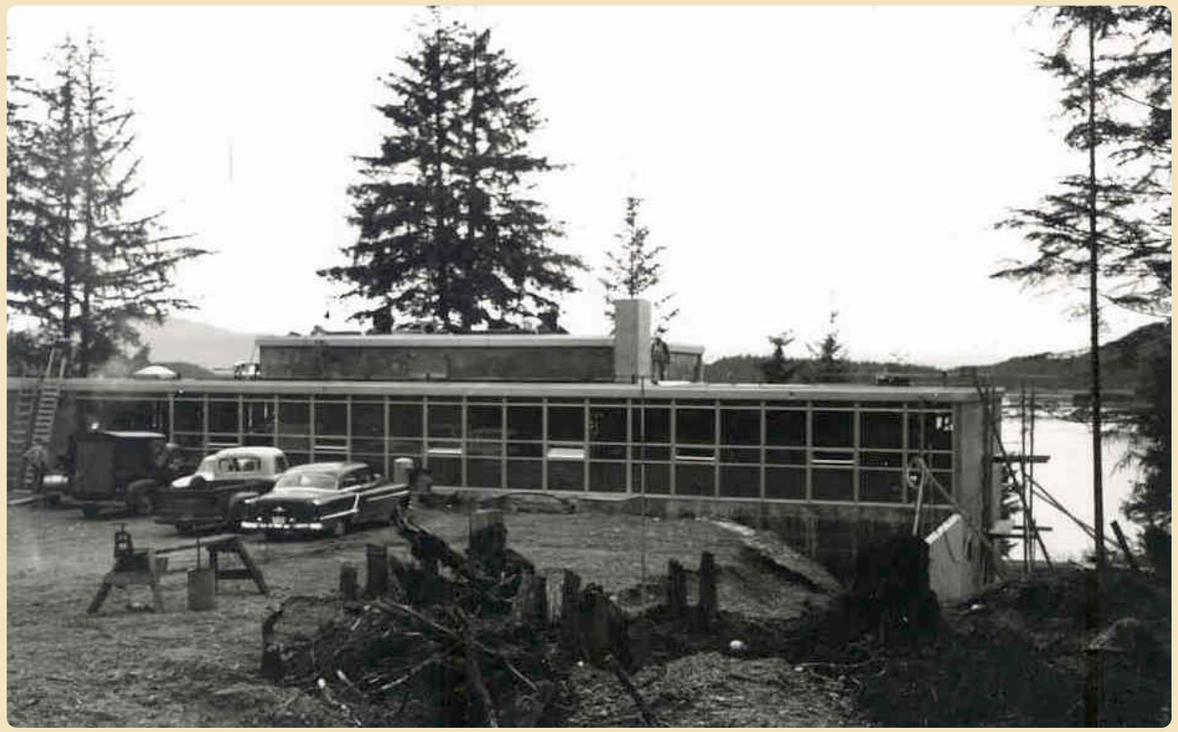
Auke Bay Laboratory/Auke Bay Laboratories

After Congress appropriated $430,000 for construction in 1958 and 1959, the Auke Bay Laboratory (ABL) was completed and occupied in 1960 under the directorship of Dr. George Harry. This new facility was situated overlooking picturesque Auke Bay, 12 miles north of Juneau, Alaska, and its 14,000-square-foot building housed 50 people.

The facility initially conducted estuarine studies and supplied saltwater to laboratory aquaria. Natural freshwater experimental areas were conveniently nearby at Auke Lake and Auke Creek. Outlying field stations were soon established to geographically extend the activities of the Auke Bay Laboratory.

Over time, the focus of study went from watershed environments to estuarine environments. The general research was also shifted from the field to the Laboratory, which was being enhanced with fresh and saltwater systems and newly converted spaces for a chemistry and physiology laboratory.

By the 1970s, the facility's research and development focused on salmon ocean ranching, impacts by petroleum and other disturbances to fish habitat and population, and population



Auke Bay Laboratories. NOAA

Auke Bay Labs, AK

assessment of herring and shrimp. In 1976, the Auke Bay Laboratory became a part of what was later called the Northwest and Alaska Fisheries Center. In 1978, the facility began focusing on causes underlying recruitment variability in marine ecosystems, including research on early-life stages of pink and coho salmon, herring, walleye pollock, and rockfish. The Laboratory also provided biostatistical support for salmon research within the National Marine Fisheries Service and was responsible for monitoring the Japanese fishery and their take of North American salmon, which included the establishment of the foreign salmon fishery observer program.

On 1 May 2007, Auke Bay Laboratories moved into the new Ted Stevens Marine Research Institute (TSMRI) at Lena Point, Juneau Alaska.

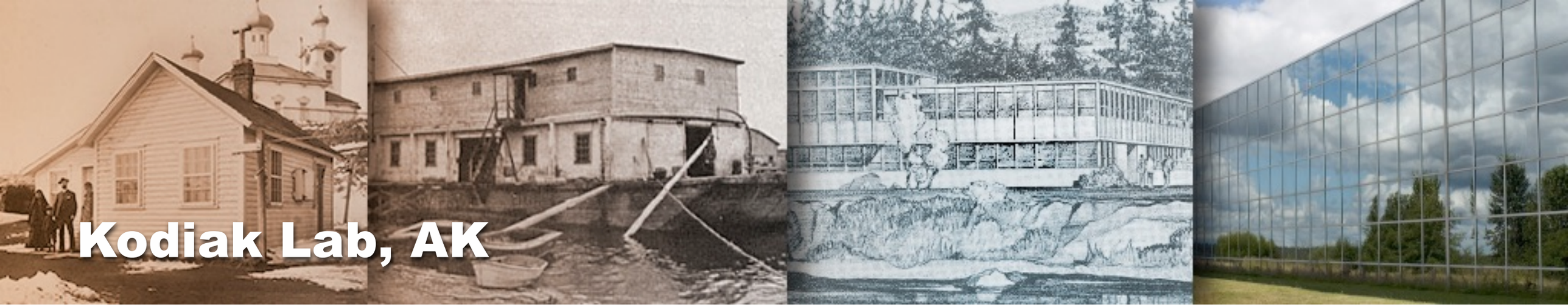
Additional Reading

Simpson, R. R. 1982. Biological Research at Auke Bay Laboratory. Pages 47-54, *In* R. R. Mitsuoka, R. E. Pearson, L. J. Rutledge, and S. Waterman (editors), Fifty Years of Cooperation and Commitment: 1931-81, The Northwest and Alaska Fisheries Center. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-34.

See Also

- Auke Bay Laboratories website

Work is done by hand to build an addition to the original salmon studies building at Lake Brooks. Auke Bay Laboratories photo, 1957.



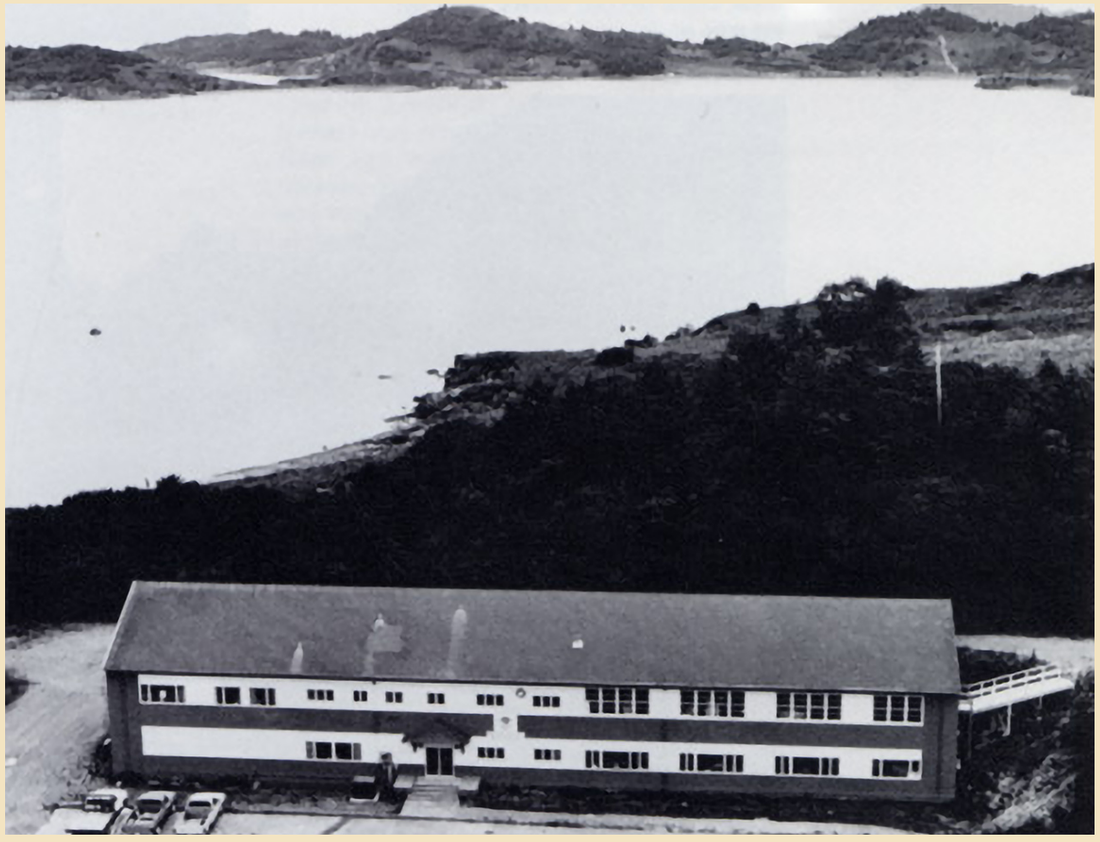
Kodiak Laboratory

Kodiak has served as a base for marine research carried out by the University of Washington, the U. S. Navy, and several nations including Japan, Poland, and Russia. With the establishment of salmon research and management programs in the early 1930s, Kodiak also became an important base for federal fisheries activities.

In 1940, a special act of Congress funded a king crab exploratory fishing and research program that was instrumental in developing extremely valuable crab fisheries around Kodiak and in the eastern Bering Sea. Exploratory fishing and research for shellfish in the Gulf of Alaska provided part of the basis for establishing large shrimp fisheries as well as scallop fisheries.

On 8 March 1965, land at Gibson Cove site on Kodiak Island was transferred to the Bureau of Commercial Fisheries (BCC) by the U.S. Navy. At the time, this small site served as a temporary station for the BCF while a replacement warehouse, office and dock were being constructed. Improvements followed, such as a new generator, road, water line, live-tank facility, aquarium, and dry laboratory.

In 1971, the Northwest Fisheries Center's Shellfish Assessment Program moved from Seattle to Kodiak, along with portions of the Center's Juneau-based Exploratory Fishing and Gear Research Program and the Ketchikan Fish Products Technology Laboratory (see



The Shellfish Assessment Program occupied the U.S. Coast Guard Support Center at Womens Bay from the early 1970s until 1998. NMFS photo, ca. 1990.

Kodiak Lab, AK

adjacent box). Initially, the National Marine Fisheries Service's (NMFS) Enforcement Program occupied the new facility at Gibson Cove, while the Shellfish Assessment Program and the Utilization Research Laboratory were housed in the U.S. Coast Guard Support Center at Womens Bay nearby.

With the passage of the Fishery Conservation and Management Act of 1976, the development of enormous groundfish fisheries in the Gulf of Alaska and Bering Sea made the NMFS research facility in Kodiak a strategic necessity.

The new Kodiak Laboratory opened in 1998. AFSC photo.

In October 1998, NMFS personnel from the Alaska Fisheries Science Center (AFSC), the Alaska Regional Office (ARO), and the Northwest Fisheries Science Center moved into the new office and laboratory facilities at the Kodiak Fisheries Research Center (KFRC) on Near Island in Kodiak, Alaska. Currently (2011) the $19.4 million research facility is owned by the Kodiak Island Borough and leased to NMFS, the National Park Service, the Alaska Department of Fish and Game (ADF&G), and the University of Alaska.

Located on approximately 7 acres, the Kodiak Fisheries Research Center presently consists of a pump house, housing for visiting researchers and students, and the main building, which in addition to offices and traditional laboratories, has a modern seawater lab, necropsy lab, an aquarium, interpretive center, museum, and conference rooms for public use. The award-winning design of the Center was created by ECI/Hyer-NBBJ Associated Architects in association with five additional specialized firms.

At the NMFS level, the Kodiak Fisheries Research Center currently (as of 2011) houses portions of five programs:

•The AFSC's Shellfish Assessment Program conducts and reports results of surveys designed to establish time series estimates of the distribution and abundance of crabs and other commercial shellfish resources in Alaska. The program is the largest component of NMFS research in the building and the largest research program at the new facility.

- The AFSC's Kodiak field office of the North Pacific Groundfish Observer Program debriefs observers upon their return from fishing vessel trips to gather information on the species and size composition of the catch, and to ensure that data were properly collected and recorded.

Kodiak Lab, AK

- The AFSC's National Marine Mammal Laboratory (NMML) conducts specialized biological research on Steller sea lions, large whales, and killer whales.
- The AFSC's Resource Assessment and Conservation Engineering Division's (RACE) Groundfish Assessment Program conducts bottom trawl assessment surveys for groundfish and king and Tanner crabs in the eastern Bering Sea, in cooperation with the Shellfish Program.
- The Alaska Regional Office of the Sustainable Fisheries Division disseminates information concerning regulations, openings, closures, and the progress of fisheries.

The new Kodiak facility also meets the needs for a base of operations for field research, expanding management and observer coordination in groundfish fisheries and timely cooperation with the ADF&G on shellfish surveys and fishery management decision-making.

Additional Reading

- Anonymous. 1971. Secretary Stans Dedicates New Kodiak Marine Fisheries Center, p. 3. In NOAA Week newsletter. 23 July 1971, 2(29):8.
- Kodiak Laboratory web page

The Ketchikan Lab (1940-71)

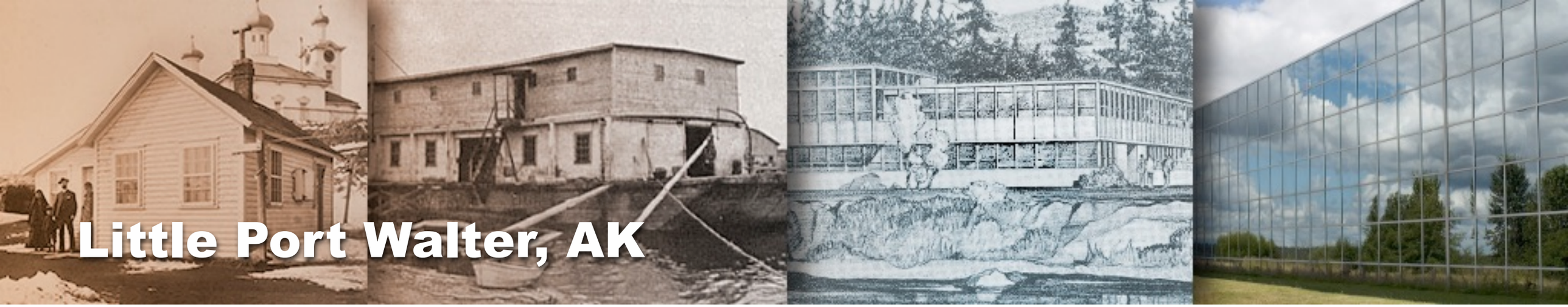
In November 1940, the Agency's new Fishery Products Laboratory began operation in Ketchikan with staff from the Seattle Montlake Laboratory. At the time, the fish catch in Alaska was essentially salmon, herring, and halibut. The interest for developing new Alaska fisheries led to the establishment of the Ketchikan facility, with funding provided by both the Federal Government and Territory of Alaska.

The focus of research at the Ketchikan laboratory began with crabs and clams, followed by the study of handling and preservation processes for shrimp – an industry that eventually grew to become over 20% of the Alaska fishery harvest by the 1980s.

In 1943, the laboratory was tasked with investigating the use of marine species, such as sharks and Steller sea lions, as potential emergency food sources in the event of a shortage brought about by World War II.

Recognizing the importance of shellfish resources, work at the lab increased to the point where nearly all efforts in the early 1960s was in shellfish utilization. A new method of efficiently peeling Alaska shrimp during commercial production was discovered in 1966 by scientists at the lab.

The station, now called the Ketchikan Technological Laboratory, closed by the end of the decade. In 1971, personnel and equipment from the lab was relocated to the newly built Kodiak facility.



Little Port Walter Facility - 50 Years of Fisheries Research

In 1917, Wakefield Fisheries established a processing facility for herring and salmon at Little Port Walter (LPW) on the inland bay near the southern tip of Baranof Island in southeastern Alaska. A young Bureau of Fisheries (BOF) scientist, George A. Rounsefell, made the first of several visits to the area in 1925 while studying herring. By 1932, Rounsefell had convinced Dr. Fred Davidson to move the Bureau's salmon research at Olive Cove on Etolia Island, Alaska, to Little Port Walter where "herring and salmon personnel could work together". Temporary field facilities were first established, including the weir cabin on Sashin Creek in 1934; still in use today (2012).

Under the direction of Sam Hutchinson, a permanent weir was built in 1939. In 1940, with a $5,000 budget, the main three-story headquarters building was constructed using bricks from the abandoned Wakefield plant. Both the weir and headquarters were built with Civilian Conservation Corps and U.S. Forest Service aid. In 1984, a new sheet metal roof purchased at a bargain price was three times the total cost of the original building. Since 1940, the station has been occupied on a year-round basis.

Research priorities at Little Port Walter have changed remarkably over the years and can be divided into roughly three time periods. During the first 35 years or so, research focused on the ecology, population dynamics, and life histories of Sashin Creek fishes, including salmon,

The laboratory building at Little Port Walter. Auke Bay Laboratory photo.

Little Port Walter, AK

Sashin Creek weir, 1956. Auke Bay Laboratories photo.

Little Port Walter station, 1999. Photo provided by William Heard (AFSC).

trout, and sculpins. Initially, researchers concentrated on a variety of environmental factors affecting the freshwater survival of pink salmon. In the 1940s, scientists worked on Sashin Creek in environmental conditions that were unusually harsh, including both dry spells and flooding.

In the late 1950, however, scientists began to notice that although few adults spawned in the upper part of Sashin Creek, the area produced the most fry. This observation changed the research emphasis at Little Port Walter and began the second era of study. Researchers found that substrate type and stream gradient had an important effect on both egg production and egg and fry mortality.

Studies on pink-coho salmon interactions in Sashin Creek in the 1960s led first to classical life history work on coho salmon, then to initial salmon enhancement research in the early 1970s and the start of the third period at the station. In addition, Agency scientists conducted studies on spot shrimp in the bay at Little Port Walter during the late 1960s.

From the early 1970s on, the emphasis shifted towards enhancing several salmon species and increasing their numbers in the local fisheries. The State of Alaska established a major fisheries enhancement program in 1972. Since then, cooperative research on salmon enhancement technology with the Alaska Department of Fish

Little Port Walter, AK

and Game, regional aquaculture associations, and private hatchery groups was a prominent part of the activities at the Little Port Walter facility. The initial enhancement research focused on coho, pink, and chum salmon. This work involved a broad range of research, including:

- short-term fry culture
- time and size-at-release studies on smolts
- estuarine net-pen research
- lake stocking of fry for smolt production
- vaccination studies for improved ocean survival
- development of floating raceways

Some research was also conducted with sockeye salmon, and beginning in 1976, on Chinook salmon, when about 60,000 Chinook salmon eggs from two Behm Canal stocks were transplanted to Little Port Walter. In the 1980s, Chinook research focused on the technology needed to put more Alaska fish in local fisheries to alleviate pressure on depressed coastwide stocks. Research was coordinated as a vital part of a formalized southeastern Alaska Chinook enhancement plan. Little Port Walter produced over 2 million Chinook eggs from anadromous returns in 1984 after making significant fishery contributions. About three-fourths of these eggs were utilized by other agencies. More important, however, was the considerable body of new knowledge on Chinook biology and the resulting enhancement opportunities for Alaska.

Taken in part from: Heard, W., and S. Ignell, edited by M. Seamans. Date unknown. Fifty Years of Fisheries Research Commemorated at Little Port Walter.

AFSC Quarterly Report "Items". p. 5-7.

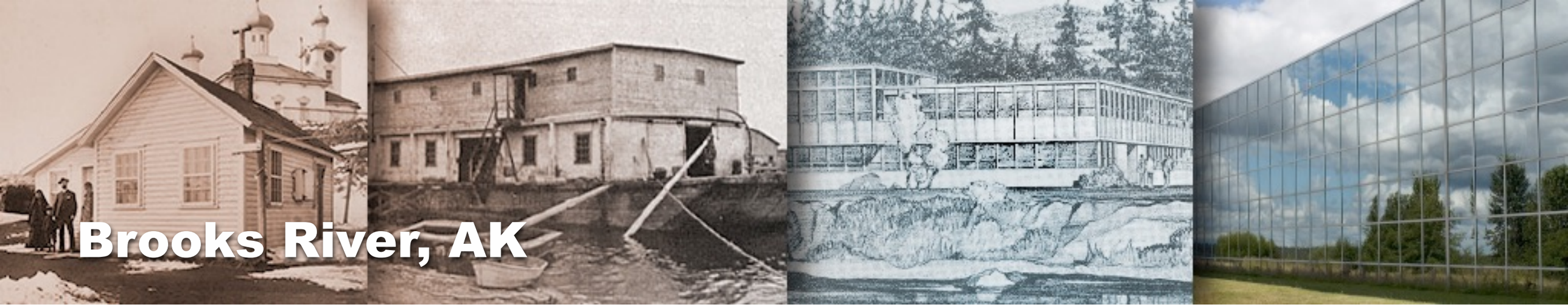
See also

View a video of Little Port Walter's 75th anniversary celebration

Additional Reading

Heard, B., G. Duker, and V. Lundquist. 2009. A History of Little Port Walter Marine Station, p. 9-11. Alaska Fisheries Science Center Quarterly Report for April, May, June 2009

A History of Little Port Walter Marine Station
AFSC's Little Port Walter Marine Station web page



Brooks River Field Station

Shortly after World War I, the U.S. Bureau of Fisheries (BOF) decided to undertake a predatory fish destruction program in the various major Bristol Bay tributaries because salmon at that time was the only fish desired by local canneries. Any species that preyed on salmon was considered undesirable, and trout were specifically identified for destruction.

As part of that effort, the Bureau sponsored a broad survey of fish populations in the Naknek River system as well as other major Bristol Bay drainages. In 1928, the BOF established a fisheries station 5 miles upriver from Naknek and maintained a salmon-counting weir at the site until 1932.

In 1936, biologists showed renewed interest in the Brooks Lake area, which had been added to Katmai National Monument 5 years earlier. They noticed that Brooks Falls was a block to red salmon during seasons of low water. In other years they observed that many salmon died unspawned below the falls, presumably because of injury caused in attempting to negotiate the falls. Based on that overview, the biologists made plans for "blasting steps in the falls" in the spring of 1937. Those plans, however, were put on hold.

Brooks Lake field station, salmon weir and tagging trap. Ted Merrell, photographer.

In 1938, concern about Japanese offshore fishing in the Bristol Bay area brought about a renewal of interest in Katmai's fisheries resource. Congress directed an investigation of the salmon fisheries of Bristol Bay. In 1940, the BOF decided to concentrate their Naknek basin research efforts along the mile-long Brooks River. Fisheries personnel were well aware of the stream's abundant fish runs and felt that the stream was representative of others draining into Bristol Bay.

Brooks River, AK

Modern appearance of the laboratory, 1998. Janet Clemens, photographer.

Lake Brooks field laboratory in 1957. Warren Steenburgh, photographer. National Park Service .

The 1940 Reorganization Plan No. III merged the Bureau of Fisheries and the Biological Survey as part of the Interior Department's new Fish and Wildlife Service (FWS). Because of the BOF's earlier decision to concentrate on the Brooks River fish runs, the FWS began building a field laboratory at the eastern end of Brooks Lake in 1941. That same year, FWS personnel also built and began operating a second station just below the Naknek River rapids, a few miles southwest of the field station. In addition, the FWS constructed a salmon-counting weir and a rough road connecting Brooks and Naknek lakes. Based on those improvements, the Agency carried on a successful fish research and management program, one that was to last at that location for more than 30 years.

Fisheries research in the Naknek drainage continued during World War II. Construction of a wooden weir each year allowed FWS fisheries personnel to make an exact fish count; the weir was set up and removed each season. At war's end, FWS biologists began tagging studies on Brooks River and aerial spawning ground surveys on the entire Bristol Bay watershed. "Index areas" were identified on each of the main river systems and photographed each year. Researchers then counted fish in the photographs and, as before, developed annual statistics.

For the remainder of the 1940s, The Fish and Wildlife Service focused its management activities at its Brooks Lake field laboratory and at other sites within the salmon-rich Naknek River drainage. Recognizing the value of the Brooks River salmon run, Agency personnel made repeated attempts to construct a fish ladder to circumvent 8-foot-high Brooks Falls. As noted above, the Bureau of Fisheries had initially proposed a fish ladder in 1937, and in the early 1940s, new plans emerged for the project. But the latter attempt was foiled due to a reduction in personnel caused by the onset of World War II.

In 1947, engineers and biologists at the FWS's Montlake Laboratory at Seattle unveiled a new proposal for a Brooks River fish ladder. Unencumbered by financial or personnel difficulties, the Agency's proposal was quickly put into action. The following year, a 4-man crew arrived at the site and began constructing a ladder on the south side of the falls; the ladder had seven pools, each 1 foot above the other. After more than 2 years of construction, the ladder opened on 7 August 1950.

Brooks River, AK

Some National Park Service (NPS) officials were chagrined that the FWS had built the facility without the NPS's permission; Regional Director Owen Tomlinson, for example, protested that "this structure hardly complies with NPS principles relating to the preservation of natural structures." But the FWS insisted upon the right to continue using the structure. For over 20 years the fish ladder remained in operation.

During most of the 1950s, the Agency's Bristol Bay research efforts were influenced by funding levels. In 1952, the first installation of the permanent weir at Brooks Lake took place. Aluminum pickets in bipeds fitted on jackhammer bits were sunk in the rock at the bottom of the river. Additional funding during the 1950s allowed tagging programs, foot and photograph surveys, and similar research efforts. In some years, the FWS decided to focus its Alaska research efforts away from Bristol Bay. Regardless of funding levels, the Agency continued to staff the Brooks Lake field laboratory and maintain the adjacent weir.

The fish ladder at Brooks Falls, 1954. Victor Cahalane, photographer.

In 1960 the Bureau of Commercial Fisheries (BCF) (a descendant of the BOF and original U.S. Fish Commission) decided to expand its fisheries research from Brooks River to the entire Naknek drainage system. The Brooks Lake field laboratory became a coordinating center, and to provide for its expansion, new housing was added.

By 1962, studies were being conducted at remote sites within the Katmai National Monument. To support those studies, the BCF built several remote cabins in the Monument. Three temporary camps were still active as of 1971. The BCF, during the 1960s and early 1970s, also had fish weirs and counting fences on Hardscrabble Creek and at the outlet of lower Kaflia Bay. Meanwhile, the salmon counting activities along the Brooks River – the mainstay of the BCF's work for more than 25 years – were discontinued after the 1967 season, and the fish weir was removed for the last time.

A continuing sore point between the National Park Service and the Fish and Wildlife Service throughout the 1950s and 1960s was the Brooks River fish ladder. Throughout the 1950s, for example, the NPS wanted to get rid of it, while the FWS defended it.

In 1970, the Bureau of Commercial Fisheries was renamed the National Marine Fisheries Service (NMFS) and Brooks Lake facility was transferred to NMFS. In 1973, NMFS conducted the second year of a Naknek Lake salmon incubator project and also conducted limnological and biological sampling of the lake system. The following winter, however, the incubators froze and the project was abandoned. NMFS did not staff the Brooks Lake field laboratory in 1974 or thereafter.

In 1977, NMFS transferred Brooks Lake facilities to the National Park Service. In 1979, the NPS rehabilitated the two Brooks Lake cottages. The Brooks Lake field laboratory (then known as the Brooks Lake National Marine Fisheries Research Station) was converted into a residence.

Additional Reading

Clemens, J., and F. Norris. 1999. Fisheries Research and Management. In: Building in an Ashen Land - Historic Resource Study of Katmai National Park and Preserve (Chapter 10).

Brooks River, AK

Brown Bear Burglers

"Marauding brown bears, hungrier than usual because of a shortage of spawning salmon, caused at least $6,000 damage to seven National Marine Fisheries Service buildings in the Bristol Bay area of Alaska last month. Heaviest damage was at Brooks Lake, where they broke down heavily bolted wooden doors, tore off sturdy shutters, and smashed picture windows of two residences and a field laboratory, and broke up refrigerators, freezers, small appliances, and glassware, and shredded furniture and bedding.

The only NMFS employee who had not vacated the premises after spending from April through September there was trapped in an inner room when one of the bears smashed open the kitchen door, emptied the garbage can, and departed without venturing beyond the kitchen -- to the extreme relief of the biologist. Emergency repairs were made on the NOAA installations, and the buildings will be renovated when the field stations are opened next spring.

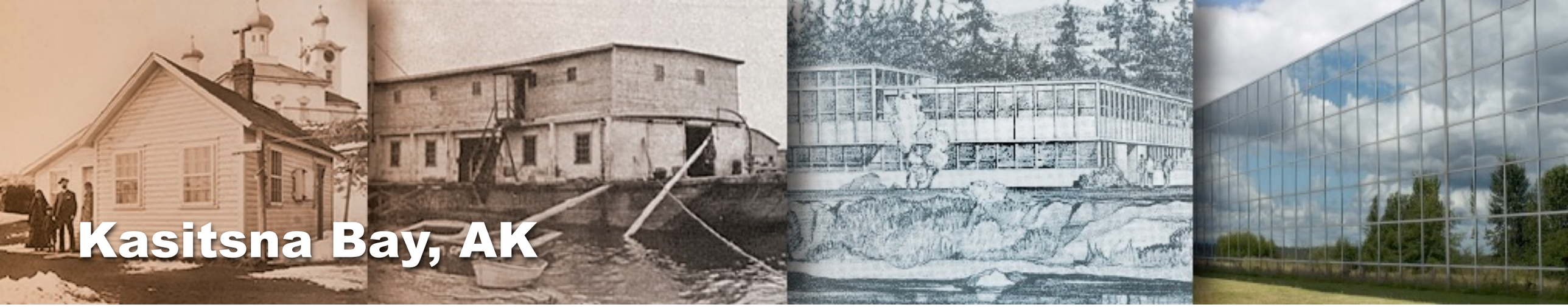
Brown bears, which can weigh up to 1,400 pounds, and are the largest land carnivores on earth -- larger than grizzlies and polar bears -- consume enormous amounts of salmon, particularly during spawning periods. Because of increasing reports of bear intrusions into housing on the Katmai National Monument grounds this year, U.S. Park Service administrators injected tranquilizers into several of the creatures near the Brooks Lake site, and transferred the bears to other habitats some distance away." (NOAA Week newsletter, 10-27-72 3(44), p. 5).

Burgling Brown Bears Strike Again

"Not content with the $6,000 damage they inflicted upon National Marine Fisheries Service buildings in Alaska last fall, burgling brown bears struck a month later in the Brooks Lake area. They gained access to the main NMFS laboratory building through windows and doors, and rampaged through equipment and furniture, causing about $12,000 damage.

Furnishings and fixtures, including a large chest freezer, were completely demolished and the rubble piled in the middle of the floor. A boarded-up stairwell leading to stored scientific and electronic equipment did not deter them -- they tore out several thicknesses of ceiling to gain entrance to the loft. They smashed a $1,500 radio and other gear, but fortunately did not venture into all sections of the storage area."

(NOAA Week newsletter, 12-29-72 3(53), p. 3).



Kasitsna Bay Field Station

Research at Kachemak Bay (Cook Inlet) can be traced back to 1957 when the Bureau of Commercial Fisheries (BCF) started studying shellfish in the bay.

To support these research activities a small year-round field station was constructed in 1960 at Kasitsna Bay on 27 acres of the lower Kenai Peninsula – on the south shore of the mouth of Kachemak Bay across from Homer, Alaska. The site was chosen for shellfish research because of its accessibility to clean salt water and close proximity to year-round commercial fisheries for king, Tanner, and Dungeness crabs; along with shrimp, salmon, and halibut.

Early research focused on the life history, population dynamics, and behavior of pandalid shrimp in the Gulf of Alaska. Studies at the station focused on the description and life history of Alaska shrimp and crab species populations and the dynamics leading to derivation of regulated annual harvest levels for Kachemak Bay shrimp.

NOAA's Kasitsna Bay Laboratory in Seldovia, Alaska.

In 1978, changes in research priorities and problems associated with logistics led to the transfer of research activities to the Northwest and Alaska Fisheries Center's Kodiak Laboratory. While NOAA retained ownership of the property, the Environmental Research Laboratories' (ERL) Outer Continental Shelf Environmental Assessment Program (OCSEAP) used the facility for the next 3 years. In 1981, the University of Alaska began using the station for shellfish research.

Kasitsna Bay, AK

Kachemak Bay was designated as the 23rd reserve in NOAA's National Estuarine Research Reserve system in 1999. That year NOAA's National Centers for Coastal Ocean Science (NCCOS) took over the responsibility for the Kasitsna Bay Laboratory. In the early 2000s, over $12.5 million in renovations and new construction had been done to the facility by local contractors.

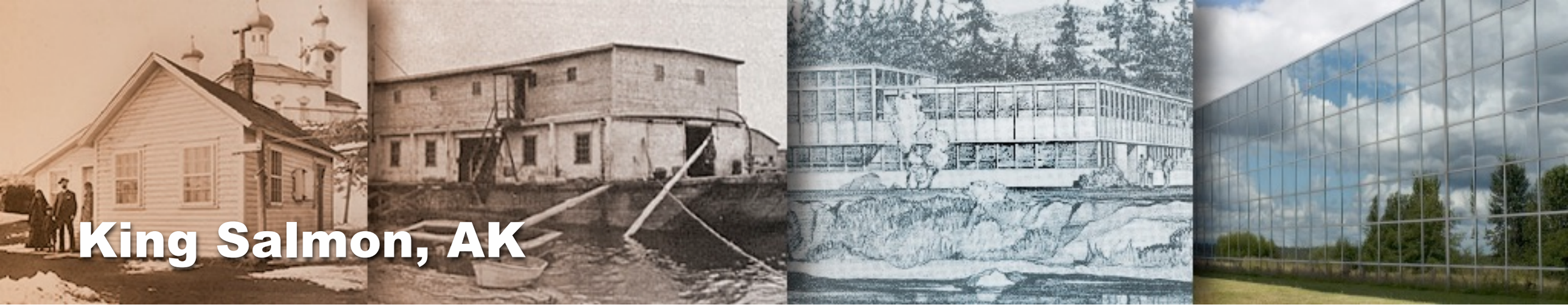
Moving into the 2010s, the Kasitsna Bay Laboratory carries on the research that began in the early 1960s. It is used primarily by the University of Alaska Fairbanks (UAF), under a Memorandum of Understanding, as a place where people can learn about subtidal, intertidal, seagrass, and terrestrial communities. The laboratory also supports an active cold-water diving facility used by the National Undersea Research Program at UAF.

In 2014, Kachemak Bay was selected by NOAA as a habitat focus area due to its importance to recreational, subsistence, and commercial fishing; marine transportation; tourism; and threatened and endangered species. The ecological richness of this area is vulnerable to impacts associated with development activities, changes in ocean acidity, and changes in water conditions due to melting glaciers. The region has experienced significant declines in shrimp and Dungeness crab that have not recovered despite fisheries closures.

Dungeness crab. They range from the Bering Sea to the central coast of California and grow to approximately 9 inches. AFSC photo

See Also

- Kasitsna Bay Lab. National Centers for Coastal Ocean Science (NCCOS)



King Salmon Base (Naknek River)

From the time it was first occupied until 1974, The King Salmon facility served principally as the logistics and maintenance base (Bristol Bay Fishery Management Center) for outlying field camps associated with the Auke Bay Laboratory where research activities were undertaken.

Located along the Naknek River, King Salmon's early development can be traced back to the 1930s, when the growth of the small native village was fueled by the creation of an air navigation site. At this isolated site, a U.S. Air Force base was built in 1942 during World War II. After the war, a road was constructed in 1949 connecting King Salmon to Naknek at the mouth of Naknek River in Kvichak Bay.

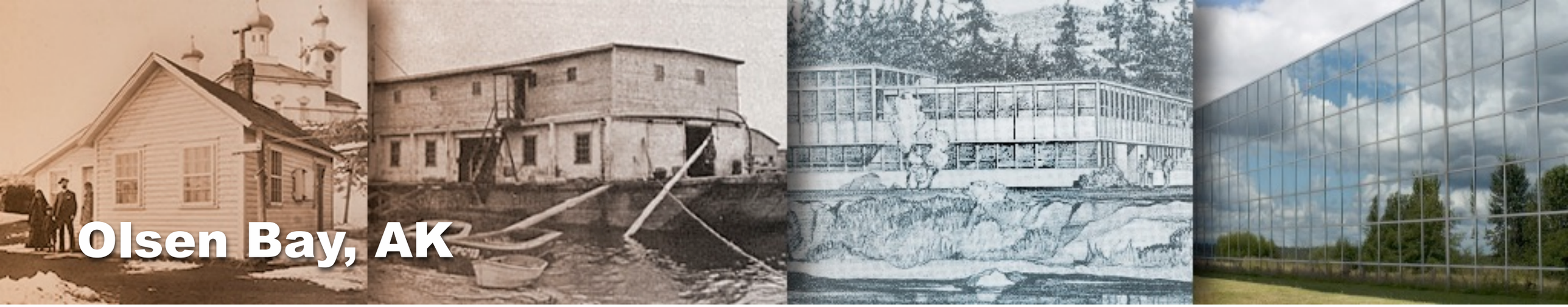
By the end of the 1940s, the Fish and Wildlife Service's (FWS) King Salmon fish management station had been established on the river at (or near) the air field. The station served as a regional office in connection with the river weir and salmon counting projects around Bristol Bay. The FWS also made use of the airport. In addition to transporting personnel in and out of King Salmon, FWS aircraft hauled supplies and building materials into Karluk Lake and other field camps in the area.

Early aerial photo taken in the northeast region of Bristol Bay, possibly a Naknek River cannery. Auke Bay Laboratories photo, date unknown.

The King Salmon facility was most active during the latter period of federal management of Alaska fisheries and during 1956-60, when it supported the seasonal activities of nearly 100 full-time permanent and temporary personnel.

With a change in research emphasis brought about by Agency budget constraints, the facility was underutilized for several years. The field station was placed in a caretaker status after experiments were abandoned in 1976 for testing eyed egg transplants as a means of increasing salmon fry recruitment in sockeye salmon nursery lakes.

Since 1978, the U.S. Fish and Wildlife Service has been using the base as a logistics center and headquarters for the Bechanof National Wildlife Reserve.



Olsen Bay Field Station

Research by the National Marine Fisheries Service and its predecessor agencies at Olsen Bay in Prince William Sound, Alaska, began with the Bureau of Fisheries (Department of Commerce) during the early 1930s when a weir was constructed across the intertidal zone to enumerate salmon spawners. The weir was operated for about 3 years and it was found that up to 75% of the spawning by pink salmon in Prince William Sound took place in the intertidal portions of the streams.

Staff from the Fish and Wildlife Service (FWS) office in Cordova, Alaska, once again constructed an intertidal weir at Olsen Bay (Olsen Creek) and operated it during 1953-56. The Bureau of Commercial Fisheries (BCF, part of the U.S. FWS) unit in Juneau started juvenile salmon research at Olsen Bay in 1957 that continued through 1958.

In January 1961, the BCF research unit in Juneau moved into the newly constructed Auke Bay Laboratory (ABL) and initiated a long-term study of intertidal spawning by salmon at Olsen Creek.

Prior to 1960, only one small cabin for weir personnel existed at Olsen Creek. A boat warehouse on the bay and

The intertidal area at the Olsen Bay field station in the spring of 1961. Photo by Jack Helle (Auke Bay Laboratories, AFSC, retired).

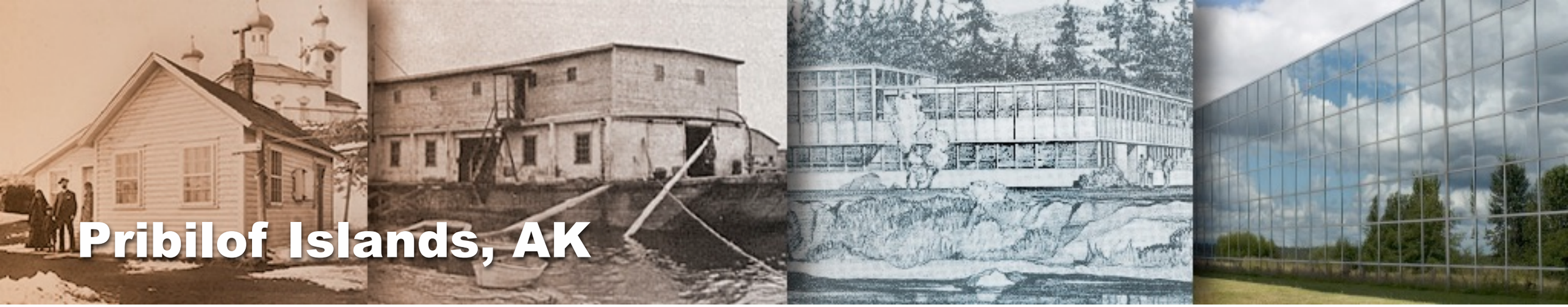
Olsen Bay, AK

separate buildings (laboratory, cook house, workshop, bath-house, and three bunk houses) were constructed next to the stream in 1960-61. At this time the site was designated as the Olsen Bay Field Station.

The Good Friday Alaska earthquake on 27 March 1964 resulted in major physical changes to many pink salmon spawning areas in Prince William Sound. Uplift associated with the earthquake was estimated to be about 3-4 feet in the Olsen Bay area. Using baseline studies that had started in 1960, ABL scientists were soon studying how returning adult salmon would respond to these ecological changes and how productivity might be affected over the long term. They found that the distribution of pink salmon spawning in intertidal areas in 1964 was similar to that of previous years at the same tide levels. Despite uplift or subsidence of stream areas, pink salmon behavior was normal in regard to intertidal use. Spawning fish did not 'home' to uplifted areas, instead, they chose the newly formed intertidal zone. Research on pink salmon continued at the Olsen Bay Field Station until 1979.

In the summer of 1965 the BCF also began a study of intertidal invertebrates in the Olsen Bay area of Prince William Sound, which included an evaluation of the effect on intertidal organisms of uplift caused by the 1964 Alaska earthquake. Intensive sampling of four areas representative of the three most common types of habitat in this protected bay revealed a vertical distribution and abundance of invertebrate species strongly influenced by substrate composition and tidal exposure. This research on the impacts of the earthquake in the area would continue for over 10 years.

ABL research on mussel beds at Olsen Bay began in 1977 and continues today (2011). Starting in 1980, the station was also used as a base or operations for sea otter research by the U.S. Fish and Wildlife Service. Presently, nearly 80 years after the initial research activities, ABL scientists are back at Olsen Creek monitoring chum and pink salmon for marine age and size along with otolith marks.



The Pribilof Islands

Nor long after Vitus Bering's voyage to Alaska in 1741, the number of sea otter and fox in the North Pacific had greatly diminished from excessive harvesting. The Steller sea cow quickly became extinct from over-hunting following its discovery (Note: Wilhelm Steller, who accompanied Bering, provided the only account of this animal [Hanna, 2008*]). At the time, the furs from these animals, especially seals, had high value when traded in China for salt, and later tea.

Russian mariners now focused their attention on finding large populations of northern Alaska fur seals. In June 1786, during their attempt to follow the seals, the crew of the Russian vessel *St. George* under the command of Gavriil (Gabriel) Loginovich Pribylov discovered the uninhabited Pribilof Islands. Immediately recognized as the sole breeding grounds for the seals, the two main islands were named St. George and St. Paul after Bering's ships.

Aleuts from various villages in the nearby Aleutian Islands were taken by the Russians to hunt seals in the Pribilof Islands, which eventually became their home. During the first year of hunting, 40,000 fur seal skins were taken along with 2,000 otter skins and 14,400 pounds of walrus ivory (Scheffer, 1984**). Prior to the mid-1880s, the Russians struggled with developing a successful curing (drying) technique in the Pribilofs' damp climate for protecting the furs from mold and decay. Consequently, the poor quality of skins by the time they arrived in China led to the suspension of trade. During this time, however, some seal skins were being shipped directly to St. Petersburg, Russia, and later to the United States. A smaller market in England was also growing. Around 1853, at the suggestion of a London furrier, the Russians began using salt to preserve the pelts – an effective technique that took them several years to perfect.

St. George Village, date unknown. National Archives and Records Administration - Pacific Alaska Region photo, record group 22, U.S. Fish and Wildlife Service.

Pribilof Islands, AK

In the year following the 1867 sale of Alaska by Russia to the United States, fur seals on the Pribilofs were being harvested by the Aleuts and at least half a dozen companies. In 1869, the U.S. put a halt to the sealing and placed the islands "off-limits" under military supervision. Only subsistence hunting by the Aleuts was permitted and to prevent any disturbance to the fur seal and fox populations, dogs were officially banned on the islands (and again in 1917). The U.S. Treasury Department assumed full responsibility in 1870, although the U.S. Army maintained their presence throughout the summer.

From 1870 to 1889, The Alaska Commercial Company leased the Pribilof sealing business from the U.S. Government and was contracted to abide by an initial annual killing quota of 100,000 seals from the two islands combined. In 1890, a new 20-year lease was issued to the North American Commercial Company with a starting annual quota for 60,000 seals. To preserve populations, the number of seals killed was controlled by the U.S. Government and was often suspended over several seasons.

Henry Wood Elliot, a Smithsonian Institution artist and private secretary, was sent to the Pribilofs as a special Treasury agent and naturalist in 1872. His published reports provided valuable insight to the biology, breeding habits, habitat (rookeries, hauling grounds, etc.) and exploitation of the fur seal.

Owing to the abuses connected with pelagic sealing, a Congressional act on 21 April 1910 repealed the continued leasing of the fur seal operation at the islands. That year, the Bureau of Fisheries (BOF) assumed the entire administration of the Pribilof Islands, including all matters relating to the northern fur seal and fox populations. The Bureau's responsibility also extended to the care, education, and welfare of the Native population. The restoration of the Aleuts' trust and confidence in the Government was a primary objective.

A 1919 Bureau of Fisheries report stated that its duties involved:

- purchase, transportation, and distribution of supplies for the 'natives' of the seal islands
- transportation of Government employees and 'natives' to and from the islands
- maintenance of schools
- maintenance of medical staff
- general care of the 'natives'
- handling and investment of funds belonging to the 'natives'
- care of buildings and other Government property
- supervision and protection of the seal herds
- maintenance of a patrol for the protection of the seal herds
- taking, preserving, packing, shipping, and selling of seal skins
- operations of a by-products plant for utilizing seal carcasses
- protection and care of blue foxes, and the taking, shipment, and sale of their pelts
- care, utilization, and improvement of reindeer herds
- construction of roads, maintenance of proper sanitary conditions, improvement of landing facilities, etc.

In August 1911, 40 reindeer were successfully introduced on the islands as a potential pack animal that could also provide milk, meat and hides to the Aleuts. By the late 1930s, the number of reindeer had risen to nearly 2,000.

The Pribilof skins were taken to London for the last time in 1912. That year the net proceeds of seal skin sales were $130,640.57. Beginning in 1913, all skins (including those of small mammals) were now being shipped south and taken by rail to St. Louis, Missouri, where they were dyed and prepared for auction under contract by Messrs.

Pribilof Islands, AK

Fur seals being driven to slaughter on St. Paul Island in 1940. Auke Bay Laboratories photo. Victor B. Scheffer, photographer.

Funsten Brothers & Company; and later by the Fouke Fur Company, contracted in 1921. This change to the St. Louis market not only provided a safer passage with war breaking out in Europe, but also saved transportation costs and promoted American industry.

Fox skins were highly valued as well and provided considerable revenue for the U.S. Government well into the 1900s. During the first 20-year sealing lease (1870-89), nearly 25,000 skins (both blue and white foxes) were reported taken by trapping – and about 16,600 fox skins taken during 1890-1910.

Table showing counts of fur seals in heard and skins taken from the years 1910-1939 (click to icon enlarge)

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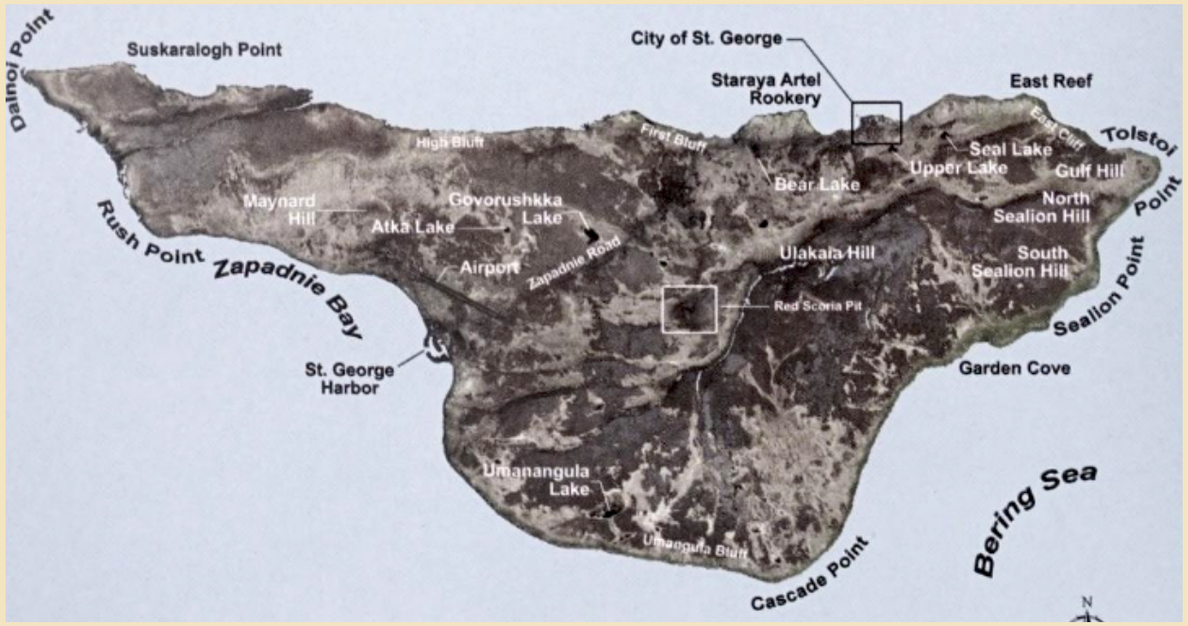
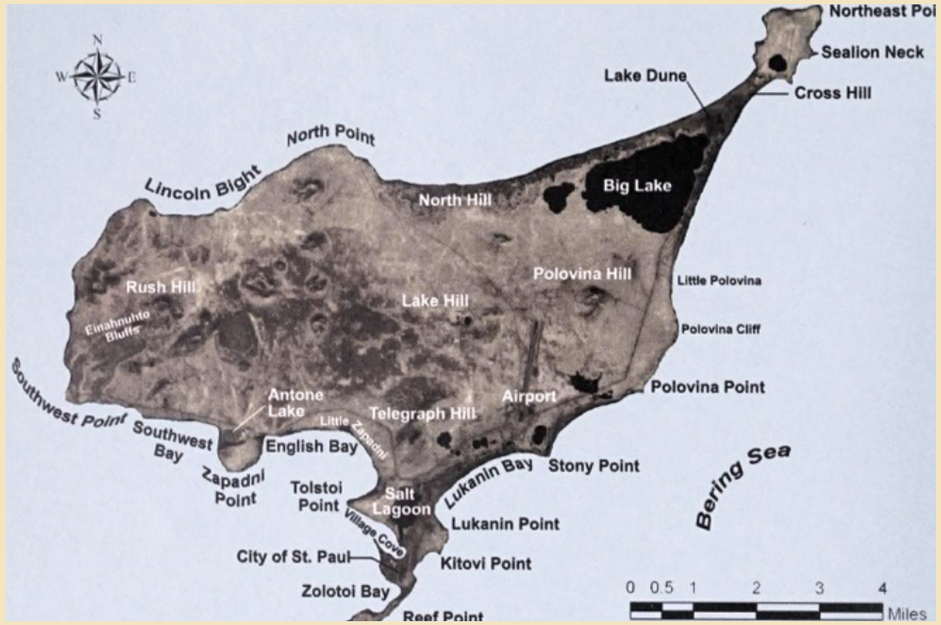
Over the next few years, several improvements at the Pribilofs took place. By 1914 both St. Paul and St. George were communicating with one another through small wireless radio stations. In 1916, St. Paul had its first motion picture projector with the Bureau providing 100,000 feet of mostly news/education films and some dramas and comedies. Funded by a $25,000 special allotment, a small electric lighting plant and a by-products plant were installed on St. Paul Island in 1918, providing the buildings with light for the first time in history – which sparked considerable curiosity from the local inhabitants.

Also that year, three 1-ton Ford trucks, with attachments, arrived for use in road construction and for hauling materials and supplies. Other new buildings and structures were erected around this time, such as the "wash house" that contained large wooden tanks for washing, cooling and blubbering – removing blubber from the pelts with curved knives – prior to salting.72

Pribilof Islands, AK



St. George Island, Alaska. Pribilof Islands, Alaska: The People



St. Paul Island, Alaska. Pribilof Islands, Alaska: The People

See Also

- "Federal Medical Services at St. Paul Island" and "The Pribilof Islands Tender Vessels"
- Watch: "People of the Seal" video on NOAA's Office of Response and Restoration website.

Significant Events

1911 Assistant Bureau agent Dr. Harry D. Chichester, who studied health and sanitary conditions on the Pribilofs, and naturalist Dr. Walter L. Hahn, who studied various animals, plants, and meteorological phenomena, both die from the effects of exposure after capsizing their boat in the icy waters of a St. Paul Island lagoon during high winds on
31 May.

On 25 August, the first 40 reindeer are brought by the BOF to the Pribilofs as an experiment to assist the local economy by providing meat, milk, hides, and to serve as burden carriers. This number grows to over 1,700 in 1937.

1914 Seattle is selected over San Francisco as the city in which to purchase annual supplies for the Pribilofs.

1915 The Bureau acquires its first vessel dedicated to servicing the Pribilofs, the Roosevelt, though she did not begin transporting goods and personnel until 1917.

1921 On St. Paul Island, the washing and blubbering of seal skins is done for the first time on a

commercial scale within a building constructed specifically for this work.

1925 In an experiment, 12 black-footed lemmings from St. George Island are introduced to St. Paul Island to determine if they can be established there. After two previous failed attempts, initial observations of this transfer show success.

1926 A Bureau of Fisheries exhibit at the Philadelphia Sesquicentennial displays its Pribilof Islands operations.

1941 The tagging of fur seal pups begins.

1948 As an experimental censusing technique, aerial photographs are taken of all fur seal rookeries. An ageing process is developed based on counting ridges on fur seal teeth, which leads to the routine field work of collecting teeth at the Pribilofs for age determination.

1973 Residents of St. Paul Island will soon see a type of "closed circuit" television in their homes for the first time. (from NOAA Week newsletter, 9-21-73).

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Federal Medical Services at St. Paul Island (Pribilofs)

As far back as the late 1800s, the U.S. Government – in support of its harvesting of fur seals and other fur-bearing mammals on the Pribilof Islands (St. Paul and St. George) – had provided a resident doctor for the St. Paul community (as well as for St. George). From that time on, the U.S. Bureau of Fisheries (BOF), and its succeeding agencies, had identified its responsibility to the native Aleuts of the Pribilofs for maintaining their good health, in addition to other social issues. These people were regarded as essential to the sealing operation and were recognized for performing the bulk of manual labor involved (slaughtering, skinning, curing, procurement of byproducts, shipping of pelts, etc.)

St. Paul Island dispensary, late 1800s. Gary and Hereford Photo Collection, ca. 1880, ASL-P185-13. Alaska State Library photo.

In 1910, the Bureau assumed full administration of the Pribilofs and immediately attempted to improve the welfare of the Aleuts, who 50 years prior to this had been living in underground hovels; conditions which the visiting physicians compared to places such as coal mining camps. The BOF became aware of the Natives' initial mistrust of government agents, which included doctors, thus creating the problem of community negligence in following medical instructions as far as tending to the sick.

The Bureau soon identified the need to reform community attitude towards matters of sanitation, hygiene, nutrition, morality, and disease prevention to curtail the spread of tuberculosis (25% afflicted in 1913) and other communicable diseases. The number of pulmonary disorders was also significant. In 1914, the visiting BOF Agent in Charge, Walter Lembkey, reported his concerns over "evil" and immoral behavior among the Aleuts, such as intoxication and "inbreeding".

Improvements in these areas were made gradually by the Bureau, in part, through friendly persuasion and education. School children were provided instruction on fundamental health issues, including exercise. On St. Paul Island, a motion picture projector purchased in 1916 was widely thought to have been a great investment towards the education process. Two years later, another projector was put in use at St. George. In

Federal Medical Services at St. Paul

1918, St. Paul received medical-related slides from the Public Health Service that were shown to the inhabitants during motion picture presentations. Throughout this period, the need for better housing and water supply was also recognized by the acting physicians as being essential to improved health conditions.

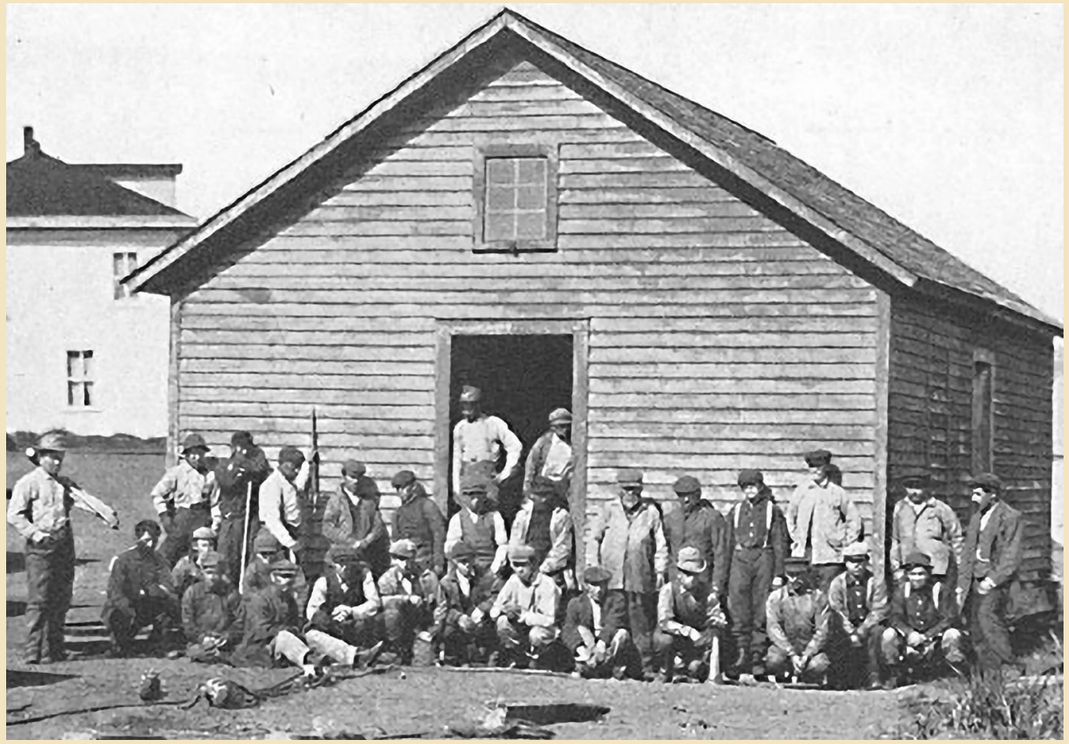
In 1917, the authority of the Pribilof physicians over all health and sanitation matters was better defined when St. Paul's Dr. W. Byrd Hunter issued instructions to both islands on 11 September. These instructions identified the physicians' responsibilities concerning:

- the condemnation of foodstuffs
- regular inspections of all housing facilities and live stock
- reporting of health violations
- accurate and thorough record keeping for all treated medical cases
- regular reporting to the Agent in Charge and Fisheries Commissioner of all medical issues and census information (births, deaths, names, gender, etc.)
- limiting the required chores by the physician to those directly relating to his duties

A new hospital

When the Bureau of Fisheries took control of the Pribilofs, an old dispensary and physician residence had been in place on St. Paul Island since the late 1800s. A hospital was also required, however, as there were medical cases that required special care or isolation, and the patients' homes were often too unsanitary and poorly ventilated to provide the proper environment for recovery.

Beginning in August 1914, a small but sturdy building used for storing salt was converted into the hospital. Supported on a rockwork foundation, the building was laboriously moved some 200 yards over physical obstacles and uneven ground to the main street opposite the



Workers relocate the new St. Paul hospital building in 1914. Bureau of Fisheries photo.

dispensary (see top photo). Throughout the fall, remodeling and preparation of the hospital included a new roof, chimneys, an enclosed front entrance addition, and another addition containing the side kitchen entrance, toilet, and coal room. On 1 January 1915, the new hospital opened, though the current resident physician, Dr. William Byrd Hunter, with knowledge of dentistry, still lacked a needed dental facility.

Shortly after the hospital's opening, Aleut girls were given a thorough education in nursing and participated in surgical operations. By the end of 1915, the Native people on St. Paul had been given physical examinations and instruction on proper bodily hygiene, including

Federal Medical Services at St. Paul

dental care. In subsequent years there was a high turnover, often annually, of doctors and dentists for St. Paul. Eventually, each of the two islands had a dedicated physician assigned by the Bureau. It was common for the doctor to also perform dentistry, and at times have his wife assist him as a trained nurse. In summer 1920, Dr. H. A. Swanson became the first of many dentists to visit the Pribilofs. He stayed only a few months, however, being replaced by another dentist the following August who remained throughout the winter.

The hospital and well-stocked dispensary were much appreciated, especially during disease outbreaks and whenever surgery was required. In 1918, a major operation was successfully performed at St. Paul by Dr. Hunter on Dr. Harold Heath, a naturalist from Stanford University, who fell 45 feet from a trail and landed upon jagged rocks below. Prompt medical attention saved Dr. Heath after he suffered fractures to both legs and numerous facial bones.

During the 1920s, however, the need for more modern well-equipped medical facilities resulted in new construction. The building of a 28- by 48-foot cement replacement dispensary, which contained a laboratory and physician living quarters, began in 1924 and was completed and occupied in the following year. From 1929 to the winter of 1930-31, a larger 28- by 40-foot hospital was also built, with concrete basement walls and new frame construction. In 1935, sod was planted around the new hospital and dispensary with a cement walk created between them.

Disease

The isolation of the Pribilof Islands helped to protect the inhabitants from contagious and infectious diseases occurring in other parts of the region, however, the frequent threats of outbreaks required the St. Paul physician's active involvement in prevention. In October 1917, an epidemic of influenza at St. Paul adversely affected many villagers and their ability to continue the normal sealing work. The following year, diphtheria broke out aboard the Bureau's Pribilof Islands transport tender *Roosevelt*, which prevented the vessel from bringing

St. Paul dispensary and physician's residence built in 1925. Bureau of Fisheries photo, 1928.

much-needed supplies to the islands. During the *Roosevelt's* quarantine at Unalaska on Dutch Harbor (the nearest port to the Pribilofs), the St. Paul physician was able to provide antitoxin to prevent the disease from affecting the Pribilof Islands.

Influenza broke out in the region again in 1919, killing nearly 40 people at Unalaska. Once again, vessels from Unalaska were barred from arriving at the Pribilofs, an action which undoubtedly spared the islands from the disease. In 1922, there were several cases of impetigo on St. Paul Island, a contagious acute skin disease. Scarlet fever hit St. Paul in July of 1936, resulting in 17 cases – all of which fully recovered after antitoxin was rushed to the island by the U.S. Coast Guard cutter *Alert*.

Federal Medical Services at St. Paul

More recently

Over time, the relationship the Pribilof Aleuts had with federal agents changed as they assumed full rights as American citizens and gained more control over their own political, social, and personal affairs. Following Alaska's statehood, the Bureau – now the Bureau of Commercial Fisheries (BCF, as of 1956) – discontinued sealing at St. Paul Island on 7 August 1960 and limited their involvement to fur seal research.

In cooperation with tribal government, the BCF continued to administer the use of several structures, including the two medical buildings. Certain areas on the islands, including several buildings, became known as the "Seal Island Historic District"" and were designated a National Historic Landmark on 13 June 1962.

In 1970, the BCF evolved into the National Marine Fisheries Service (NMFS), as part of the new National Oceanic and Atmospheric Administration (NOAA). The dispensary and hospital were then connected in 1974 with an enclosed addition that served as the clinic. The joined medical facility on St. Paul, known as the "Old Clinic Building", along with other structures, were placed on the National Register of Historic Places in 1986.

Agreements between NMFS and the Department of Health, Education and Welfare, followed by the Indian Health Service/Bureau of Indian Affairs, allowed the historic St. Paul clinic to continue operating as the Island's medical center until 2006, when a new health facility was built. In 2009, a structural engineering contract was made to assess the physical condition of the "Old Clinic Building"" and provide alteration plans for the potential use of the building by NMFS as a research facility.

St. George Island. The "Old Clinic Building" in 1985, consisting of the physician's house, dispensary, and hospital joined by an addition in 1974.
National Marine Mammal Laboratory Photograph Library photo

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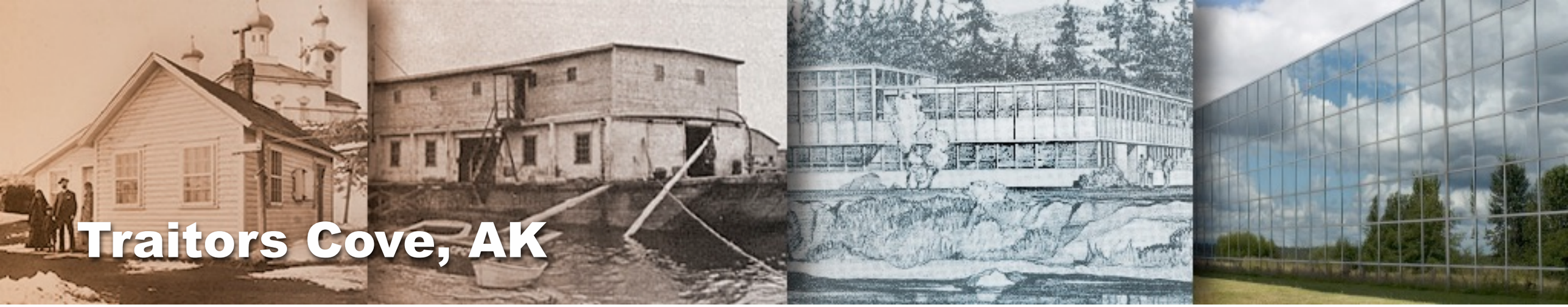

Traitors Cove

Following a survey of streams in Southeast Alaska in 1960, personnel from the Auke Bay Laboratory (ABL, part of the U.S. Fish & Wildlife Service) selected Traitors Creek on northwest Revillagigedo Island, Alaska, as a site to study the early life history of the chum salmon. The stream and its estuary appeared to be almost ideal for basic chum salmon research with the only possible drawbacks being the relatively high seasonal stream discharges and its remote location. Both of these drawbacks would prove challenging and deadly in later years. Investigations at the site focused on the effects of temperature, predation, competition for food, flooding, and other environmental factors on survival and growth of salmon in freshwater.

To inaugurate studies there, the Bureau of Commercial Fisheries vessel MV *Murre II* transported personnel and materials for building a weir to Marguerite Bay at the entrance of Traitors Cove during the summer of 1960. In early August 1961, the *Murre II* dropped off materials for a Pan Abode® prefab cabin to serve as staff living quarters. Over the next few years warehouses, a boat house plus floatplane pier, and other buildings were constructed at the field station.

Floating scow with seaplane pier (at left) that served as the field station at Traitors Cove.
Ted Merrell, photographer.

Traitors Cove, AK

"Traitors Cove is a small fiordlike estuary in southeastern Alaska. It is divided into two basins by a narrow constriction, where a reversing tidal falls forms. Four oceanographic surveys of the estuary between 1963 and 1965 showed that this tidal falls creates a region of strong turbulence and destroys the stratification of the water near it. Surface currents in the estuary are predominantly seaward on ebb tide and toward the head of the estuary on flood tide." (McLain, 1963 *)

Access (by boat) to the field station would prove to be difficult because strong tidal currents and rocks made navigation dangerous. The inner cove leading to the station could only be entered by small craft at slack water, which is very short in duration and changes direction very suddenly. In April 1964, Richard "Dick" Rowland drowned after the 14-foot skiff he was operating got swept into the passage connecting the inner and outer bays when the tidal condition was extremely turbulent.

The BCF vessel Heron towing the rigging scow from the cove to Betton Island in 1968. Chet R. Mattson, photographer.

Later in 1964, a used cannery scow was purchased and renovated to serve as a safe floating base for biological studies. It appeared to be the most economical solution to the particularly difficult logistics problem at Traitors Cove. The scow had adequate living quarters, along with work and equipment storage space for project personnel studying salmon fry in the estuarine and marine environment. In winter, the scow was stored at Ketchikan, Alaska, near Sunny Point, and towed to Marguerite Bay of Traitors Cove each spring were it was anchored.

By 1967, Auke Bay Laboratory researchers were spray marking juvenile pink and chum salmon with fluorescent pigments to make successive population estimates to assess early sea life natural mortality, and also to determine the migration characteristics of the pink and chum salmon from Traitors Cove. The station is known to have been operating at least until 1969. Although the field station was long closed after that time, Traitors Creek once again became an active site for ABL research on chum salmon in the 1980s under the U.S. Canada transboundary Pacific salmon research program.

Traitors Cove, AK

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Early Pioneers

Throughout the history of the federal marine fisheries in Alaska, many people have played important roles in its evolution.

Early Pioneers and Key Figures in Alaska Fisheries

Throughout the history of the federal marine fisheries in Alaska, many people have played important roles in its evolution. From Spencer Fullerton Baird, who first headed the newly formed U.S. Fish Commission in 1871, to Seton Hayes Thompson, a notable biologist who retired in 1969 after serving with the Agency for 40 years.

Presented in this section is just a sampling of the individuals, including scientists, conservationists, and government agents, recognized for their significant contributions to this history. Other areas of these historical pages contain references to the unnamed, who devoted much of their lives to their work, often spending long periods in remote, isolated, and severe environments. The "Leadership" box below lists the names of those who held higher administrative positions as commissioners and directors within the Agency.

Significant Events

1978 **Jennifer Sassano** became the first U.S. female biologist to be placed as an observer on a foreign groundfish vessel fishing in Alaska waters. Sassano would spend 2 months on the factor trawler *Katangly I* sampling the Soviet catch in the Gulf of Alaska. In 1977, one U.S. female biologist had served as an observer aboard a Polish hake vessel operating off Washington, Oregon, and California. In 1978, Japanese, Polish, and Soviet groundfish vessels agreed to have U.S. female observers aboard. As a result, 10 trips were scheduled during the summer for female observers in the northeastern Pacific Ocean and Bering Sea. (Sept. 1978 Monthly Report, Resource Ecology and Fishery Management Division).

1984 Four whale biologists survived a plane crash in the Arctic Ocean. Three National Marine Mammal Laboratory (NMML) biologists, **David Rugh**, **Barb Taylor**, and **Ann Sinclair**, along with **Jim Cubbage** of the Cascadia Research Collective (Olympia, WA) were conducting photographic surveys of bowhead whales when the engines of their plane failed. Both engines of their DeHaviland Twin Otter had stalled 1,000 feet over the Beaufort Sea, some 6 miles from shore. More >>

Early Pioneers

Spencer Fullerton Baird (1823-1887)
Tarleton Hoffman Bean (1846-1916)
Henry Wood Elliott (1846-1930)
George Brown Goode (1851-1896)
Charles Henry Gilbert (1859-1928)
John Nathan Cobb (1868-1930)
William Francis Thompson (1888-1965)

Other Individuals

Agency Commissioners & Directors 1871-2008
Center Directors 1931-2001
(click to expand)

Title photo (opposite) / Early fisheries commissioners: S. F. Baird (center), G. B. Goode (top-right), M. McDonald (top-left), J. J. Brice (lower-left) and G. M. Bowers (lower-right). Paul Galtsoff, photographer. NEFSC photo.

Spencer Fullerton Baird

Spencer Fullerton Baird, the First Commissioner

From: History Makers: Honorable Mentions. NOAA Celebrates 200 Years of Science, Service & Stewardship website

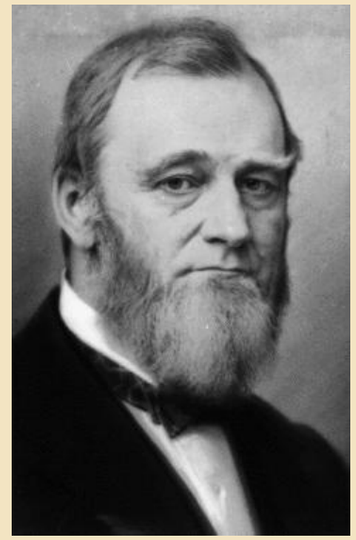
The following is excerpted material.

Spencer Fullerton Baird (1823-1887) was a naturalist whose early reputation was based on a vast knowledge of ornithology coupled with editorial talent and facility in several languages.

These capabilities led to his selection as the first assistant secretary of the Smithsonian Institution in 1850 and, after the death of Joseph Henry in 1878, the Secretary.

Baird, while retaining his Smithsonian position, was appointed the first Commissioner of Fish and Fisheries (a forerunner of the National Marine Fisheries Service) in 1871. He encouraged the rapid development of fish culture in the United States, founded the Woods Hole fisheries laboratory [Mass.], and commenced building and acquiring fisheries research vessels, notably the Albatross and the *Fish Hawk*.

Although Baird had great interest in the operations of the Fish Commission, much of the day-to-day operations and development of the science was passed to other men, notably George Brown Goode, as fisheries was but one aspect of Baird's multi-faceted career."



Spencer F. Baird. NEFSC photo.

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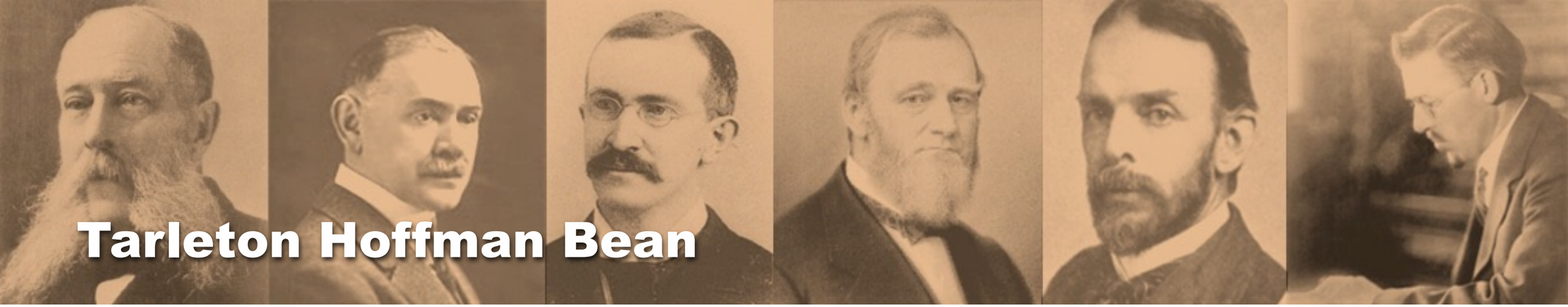


Tarleton Hoffman Bean

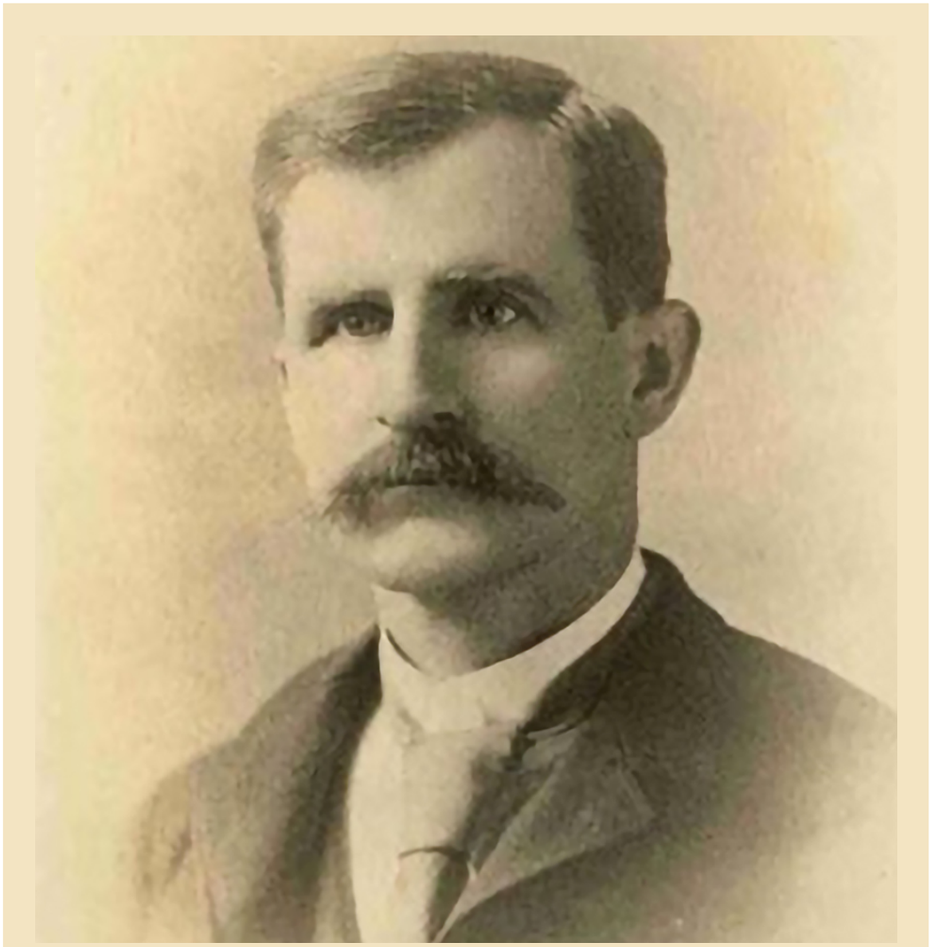
Tarleton Hoffman Bean (1846-1916)

"Tarleton Hoffman Bean has the distinction of being the first Curator of Fishes at the Smithsonian Institution. As an effective manager of collections, a field collector, a researcher, and a prolific writer, he contributed greatly to the development of American ichthyology. He was also an internationally known authority on fish culture, the artificial propagation of game and food fishes.

Tarleton Bean was a native Pennsylvanian, born and raised in the small town of Bainbridge, on the lower Susquehanna River. He attended college at the state normal school at nearby Millersville, where he specialized in botany. After graduating in 1866, he taught for several years and served as the principal of Wilkes-Barre high school from 1871 to 1874. There he became an assistant to J. T. Rothrock, botanist to the U. S. Geological Survey. Bean's interest clearly lay in science rather than teaching, and in 1874 he made two important moves.

That summer he began his association with the U. S. Fish Commission, working at the Commission's summer station at Noank, Connecticut. Then he moved to Washington and began medical studies at Columbian College (now George Washington University). He was granted an M.D. degree in 1876 but never became a practicing physician. Instead, he turned his full attention to the Smithsonian and the Fish Commission, which in those days were closely intertwined.

Over the next two decades, Tarleton Bean assumed a variety of duties in both organizations. In 1877, he became a full-time staff member of the U.S. National Museum, first as Assistant in Ichthyology and then as Curator of Fishes in 1879.



Tarleton H. Bean ©Smithsonian Institution photo.

Tarleton Hoffman Bean

Throughout this period, he continued to work for the Fish Commission. Most summers found him in the field at one of the Commission's shore stations or aboard one of its vessels. In 1880, he spent a good part of the year in Alaska, exploring the fishes of the region under the auspices of the Census Bureau and the Fish Commission. The work resulted in the description of many new species, and eventually led to his long-time interest in Alaska fishes. Following the 1880 census, the Museum received larger collections of fishes than ever before, and Bean increasingly spent time managing collections, supervising the day-to-day functions of preserving and cataloging fishes, and displaying them in the Museum's exhibit halls. By 1882, for example, the Department of Fishes had 20,000 'reserve' specimens, 20,000 specimens on exhibit, and 10,000 duplicates. Bean's detailed instructions found in the 'Directions for Collecting and Preserving Fish' reveal the extent of the work that went into managing the ichthyological collections. In addition, he supervised the work of artists who were engaged in preparing illustrations of fishes for the department.

In 1883, the Fish Commission and the Smithsonian participated in the Fisheries Exhibition in London. Bean assisted G. Brown Goode, who was in charge of the American exhibits, and published a catalog of 450 fish specimens that were displayed in London. While in Europe, he visited natural history museums in Berlin, Paris and Genoa, studying the American fishes held in their collections. From 1878-1886, he was the editor of the Proceedings of the U.S. National Museum and supervised the printing of the Bulletin. By 1888, his duties with the Fish Commission had become so demanding that he reduced his Smithsonian title to Honorary Curator and took his pay entirely from the Fish Commission. About the time of this administrative change, Tarleton Bean's younger brother, Barton Appler Bean (1860-1947), who had been working as assistant since 1882, became Assistant Curator of Fishes, a position he held until 1932."

From Smithsonian website

"...such was the importance of the Karluk fisheries that studies were commenced as early as the summer of 1889, when the United States Fish Commission sent Dr. Tarleton H. Bean to Alaska. He spent from August 2 to September 27 at Karluk, and August 17 to 21 at Karluk Lake. In this first published report (Bean 1891*) on the Karluk salmon runs he describes the spawning in various streams and includes a reconnaissance survey of Karluk Lake and a portion of Karluk River. He took samples of young fish to determine the hatching dates, sampled the other fishes, and made a series of temperature observations."

From Rounsefell, G. A. 1958. Factors Causing Decline in Sockeye Salmon of Karluk River, Alaska. FWS Fish. Bull. 130(58). p. 83-169.

"In 1889, Tarleton Bean was appointed the editor of the Commission's publications, while continuing to hold the title of Ichthyologist. Most of his work at the Commission related to fish culture. In 1893, he represented the Commission at the World's Columbian Exposition in Chicago. By this time, Bean's reputation as a fish culturist was such that the New York Aquarium asked him to be its director and to oversee its reorganization and rebuilding. He served there with notable distinction from 1895-1898, when political changes led to his resignation. For the next eight years, he occupied a series of temporary positions. He served as the director of the forestry and fisheries exhibit for the United States at the Paris Exposition in 1900 and as chief of the departments of fish, game and forestry at the World's Fair in St. Louis from 1902-l905. In 1905, he approached the Field Museum in Chicago about collecting fishes in Bermuda. His request was approved, and he spent that summer and fall collecting and preserving fishes in Bermuda. The resulting catalog of Bermuda fishes was published by the Field Museum in 1906. In that year, Bean was appointed head fish culturist for the State of New York, a position he held until his death in 1916.

Bean's name will always be linked with that of his colleague, G. Brown Goode, with whom he wrote some 39 papers, culminating in the classic Oceanic Ichthyology. Their first joint paper was published

in 1877, a description of two deep-water fishes collected while they were both aboard the Fish Commission steamer *Speedwell*. This incident left a deep impression on both of them and is recounted in the introduction of their last work, Oceanic Ichthyology, published the year Goode died and the year after Bean left Washington. Bean published more than 300 papers over the course of his career, about eighty percent of them dating from the time when he was at the Smithsonian and the Fish Commission. Most of his shorter systematic papers appeared in the Proceedings of the U. S. National Museum. Among his larger works, besides Oceanic Ichthyology, are The Fishes of Pennsylvania (1893), Catalogue of the Fishes of Long Island (1901), Food and Game Fishes of New York (1902), and Catalogue of the Fishes of New York (1903). Most of his later papers dealt with fish culture, and he published numerous popular articles in Forest and Stream magazine. Although the great majority of his work was on fishes, Bean also had considerable expertise in forestry and conservation. By the end of his life, he was generally considered to be the premier fish culturist in the world. His accomplishments were widely recognized in his time, and he received numerous awards from the US and other countries."

From: Smithsonian website

Additional Reading

- Bean, T. H. 1891. Report on the Salmon and Salmon Rivers of Alaska, with Notes on the Conditions, Methods, and Needs of the Salmon Fisheries, p. 165-208 + plates (drawings, photos, & maps). In Bulletin of the United States Fish Commission, Vol. IX, for 1889. Wash. G.P.O. 504 p.

Henry Wood Elliott (1846-1930)

"In 1872 Henry Wood Elliott, a young artist-naturalist, traveled as a U.S. Treasury Department special agent to Alaska's Pribilof Islands, assigned to study the fur seals and to oversee the fur seal harvest.

Since the United States government received substantial royalties from the trade in seal skins, Elliott's objective was to determine the most profitable manner of managing the great seal herds of the Pribilof Islands for a sustainable harvest.

Earlier, in response to widespread seal slaughter and to protect its financial interests, the United States had leased the rights to fur seal harvesting on the islands to the Alaska Commercial Company and declared the open waters of the eastern Bering Sea off-limits to sealers from any nation.

But rather than protecting the seals, these actions led to offshore, open water sealing by other nations, decimating the herd. This slaughter and mismanagement of the fur seal harvest spurred Elliott to work vigorously on behalf of fur seal conservation. His tireless efforts led to the North Pacific Fur Seal Treaty of 1911, the first international treaty for wildlife conservation and a forerunner of the law that gave NOAA stewardship of marine mammals–the Marine Mammal Protection Act of 1972.

Elliott's initial studies in 1872 indicated a herd of approximately four million seals. He came back to the Pribilofs in 1874 and 1876 and concluded from his studies that 100,000 bachelor males per year could be harvested without undermining sustainability, "provided no abnormal cause of destruction occurred."

The most valuable commercial pelts came from the three-year-old bachelor, and it was the three-year-old males that native Aleut harvesters culled out of the herd. Shooting females was particularly

Henry Wood Elliott was one of the first Americans to study the northern fur seal, working vigorously on behalf of their conservation. Photo by: Kets Kemethy

Henry Wood Elliott

destructive as three seals were effectively killed–the female, a nursing pup ashore in the rookeries that relied on the female for food, and a seal embryo. Mismanagement of the land harvesting operations on the Pribilof Islands led to taking females and immature males in the rush to profit.

Elliott returned again to the Pribilofs in 1890. He was outraged at the incompetence and malfeasance of both government officials and commercial interests who allowed the seal herds to be decimated. As a result, he became an untiring advocate of the fur seal. However, the U.S. government and commercial sealing interests were not yet ready for concepts of managed conservation and cooperation between nations to assure marine mammal conservation on the high seas.

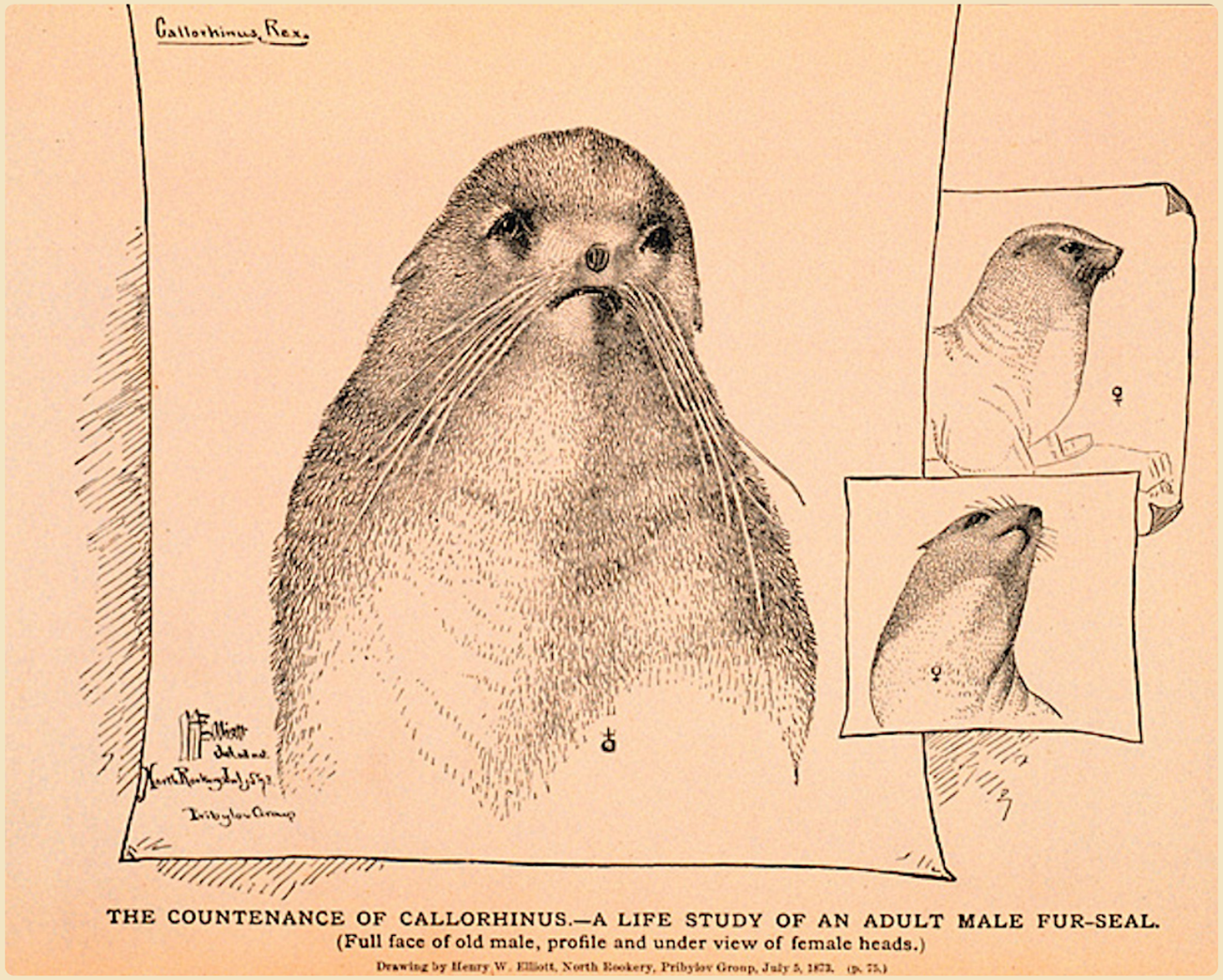
In 1905 Elliott, in partnership with U.S. Secretary of State John Hay, drafted a treaty for managing the seal herds. Unfortunately, Hay died and it was not until July 1911 when the four nations most concerned with sealing -– Russia, Japan, Great Britain, and the United States –- were sufficiently shocked and revolted by the indiscriminate slaughter of the seals to sign a treaty outlawing open water sealing and accepted on-shore management of the seal herds by the United States."

Text and images from "North Pacific Fur Seal Treaty of 1911" ("NOAA Celebrates 200 Years of Science, Service, and Stewardship").

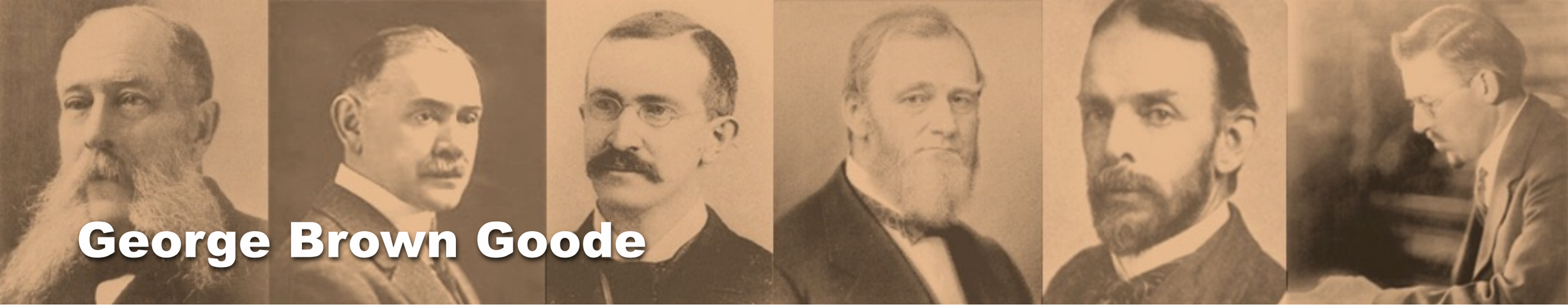
See Also

- "Henry Wood Elliott: Defender of the Fur Seal" video (NOAA Office of Response and Restoration website)
- The Pribilof Islands, Preserving the Legacy (NOAA Fisheries website)

A series of sketches by Henry Wood Elliot following his study of fur seals on Alaska's Pribilof Islands in the 1870s.



The Countenance of Callorhinus - A Life Of An Adult Male Fur-Seal



George Brown Goode

George Brown Goode (1851-1896)

"The eminent ichthyologist (fish scientist), George B. Goode (pronounced good´ee), worked for the U.S. Commission of Fish and Fisheries, the first predecessor organization of NOAA's National Marine Fisheries Service, from 1872 until 1888. When he then became an assistant secretary of the Smithsonian Institution. Goode continued a working relationship with the Fish Commission until his death in 1896.

His greatest contributions to fisheries science were as an administrator, curator, field biologist, and taxonomist. Goode also served as the U.S. Fish Commissioner from 1887-1888. From 1873 onwards he organized and administered the biological and fishery development research of the Fish Commission while placing in order and developing the taxonomic and ichthyologic work of the Commission and the Smithsonian Institution. He also organized and directed the Fish Commission and Smithsonian exhibits at international and national expositions between 1875 and 1884.

A fine writer, Goode authored more than 100 scientific notes and contributions in the reports of the Fish Commission and the Smithsonian Institution in addition to compiling catalogs and guides to exhibits. Goode, however, preferred writing books and monographs in which he could address and describe all facets of a subject, be it a fish, scientific problem, or the life of a colleague. His many books, often co-authored with Tarleton H. Bean, include *The Fisheries and Fishing Industries of United States*, a seven-volume work compiled from data gathered during the 1880 Census; *American Fishes* (1888); and *Oceanic Ichthyology* (1895).

Goode was born in New Albany, Indiana, on February 13, 1851, and attended Wesleyan University in Middletown, Connecticut. His interest in natural history, and fish in particular, continued in graduate work at Harvard College where he worked in the marine science field schools led by Dr.

George Brown Goode

George Brown Goode

Louis Agassiz. In 1871, Goode became curator of Wesleyan University's Museum of Natural Science and there began developing a major collection of flora and fauna.

In 1872, Goode first went to work for the Fish Commission as a volunteer researcher in Maine, where he met Spencer Fullerton Baird, then Fish Commissioner and Assistant Secretary of the Smithsonian. Goode became Baird's assistant and chief of the Division of Fisheries at the Smithsonian Institution in 1873 and, until 1877, divided his time between Fish Commission summer fieldwork, Wesleyan University, and the Smithsonian. Because of the close administrative link between the Fish Commission and the Smithsonian Institution, Goode effectively ran the fish research program of both organizations from 1873 to 1887.

His fieldwork yielded significant collections of unknown species of fish and other marine life, and Goode systematically cataloged these collections, dividing specimens between the two museums. He published the Catalog of the Fishes of Bermuda in 1876, contributed scientific papers to the annual reports of the Fish Commission and the Smithsonian Institution, and prepared his monograph The Natural and Economical History of the American Menhaden, published in 1879. During a five-year period, Goode established the protocols for Fish Commission research and for the care and maintenance of the museum collections.

Goode was appointed assistant curator at the Smithsonian Institution in 1877 and devoted his time to the work of the Fish Commission and the development of the fishery division. In addition, the U.S. State Department used his expertise in statistics and fish biology during negotiations with Canada over fishing rights (1877), and, in 1879-1880, he was in charge of the fishery section of the United States Census. He represented the United States Fish Commission at the international expositions in Berlin (1880) and London (1883). He organized national natural history exhibits for the expositions in Philadelphia (1876), and New Orleans, Cincinnati, and Louisville (1884).

Although Goode succeeded Baird as U.S. Fish Commissioner in 1887, he relinquished this position and chose to remain with the Smithsonian Institution as assistant secretary when the Fish Commission became an autonomous agency in 1888. Goode continued his connections with fisheries and fishery research, however. He based his penultimate book, *Oceanic Ichthyology*, on material gathered during the cruises of Fish Commission vessels *Albatross* and *Fish Hawk*, and the Coast and Geodetic Survey vessel *Blake* in the northwestern Atlantic.

Goode died on September 6, 1896, just after completing a study of the first 50 years of the Smithsonian Institution. The Smithsonian published this book as a memorial to him in 1897. His life and work in ichthyology and taxonomy represented one of the most productive periods in both disciplines, and Goode set the methods and standards still used in fishery research today."

Text and image from: "George Brown Goode: Eminent 19th Century Fish Scientist"

("NOAA Celebrates 200 Years of Science, Service, and Stewardship" website)

Additional Reading

Spencer Baird and Ichthyology at the Smithsonian, 1850-1900 - Ichthyologists - George Brown Goode (1851-1896) Smithsonian website

Illustrations from "The Fisheries and Fishing Industries of United States" ("NOAA Celebrates 200 Years of Science, Service, and Stewardship") website

Charles Henry Gilbert

Charles Henry Gilbert (1859-1928)

Charles Henry Gilbert was a pioneer ichthyologist of particular significance to natural history of the western United States. Born in Rockford, Illinois, on December 5, 1859, he spent his early years in Indianapolis, Indiana, where he came under the influence of his high school teacher, David Starr Jordan. When Jordan became a Professor of Natural History at Butler University in Indianapolis, Gilbert followed, and received his B.A. degree in 1879. Jordan moved to Indiana University, in Bloomington, in the fall of 1879, and Gilbert again followed, receiving his M.S. degree in 1882 and his Ph.D. in 1883. His doctorate was the first ever awarded by Indiana University.

Charles Henry Gilbert, ca. 1903

Jordan and Gilbert explored the streams and rivers of Indiana and the southeastern United States in the late 1870's, describing a number of new fishes. In 1879, Jordan was asked by Spencer Fullerton Baird of the U. S. Fish Commission to undertake a survey of the fisheries of the Pacific Coast of the United States. Jordan took a leave of absence from Indiana University, chose Gilbert as his assistant, and headed west to San Francisco, California, in December, 1879. Their one year pioneering survey of fishes of the West laid the foundation for nearly 50 years of study of Pacific fishes and fisheries by the team of Jordan and Gilbert.

By the time Gilbert received his Ph.D. degree at the age of 24, he was the author or co-author of over 80 scientific papers. Gilbert served at Indiana University from 1880-1884, first as instructor, then as Assistant Professor in Natural Sciences and Modern Languages. In 1884, he accepted the Professorship of Natural History at the University of Cincinnati, in Ohio, remaining there until December, 1888. In 1889, Gilbert returned to Indiana University as Professor of Natural History.

Jordan became President of Indiana University in 1885. However, in 1890, Senator and Mrs. Leland Stanford chose Jordan to be the founding president of a new university to be established in Palo Alto, California, in memory of their deceased son, Leland Stanford, Jr. Among Jordan's first appointments to the new faculty was the Chairman of the Zoology Department, Charles Henry Gilbert.

Charles Henry Gilbert

Gilbert then began a career at Stanford University which spanned nearly 37 years. He concentrated on Pacific fishes, mostly marine, and participated in numerous expeditions aboard the U. S. Fish Commission Steamer *Albatross*. These cruises included three to Alaska, two off California, and one each to the Hawaiian Islands and the Japanese Archipelago. As a pioneer descriptive ichthyologist, Gilbert described either alone or with others about 117 new genera and 620 species of fishes. Around 1909, Gilbert turned his attention to the study of Pacific salmon (*Oncorhynchus* spp.) and soon became the foremost expert on these economically important fishes. He studied salmon from California to Alaska, but concentrated his efforts in British Columbia (from about 1912 to 1921) and in Alaska (from about 1918-1927). He was the first to apply the scale method to aging of Pacific salmon; he pioneered racial studies using scales; and he was instrumental in establishing tagging programs on salmon in Alaska. He was the first to confirm the "home stream" theory for spawning Pacific salmon. Additionally, he was also one of the very first scientists to consider the population dynamics of northwest stocks of salmon.

In his later years, Gilbert became an outspoken champion of the need for conservation of Pacific salmon resources, warning all who would listen that this resource was in dire jeopardy unless overfishing was curtailed. His world view was far ahead of his time, and he urged the U.S. Bureau of Fisheries to instigate data collection programs for Alaska salmon.

Always formal and proper, and a man of high moral standards, Gilbert nevertheless was a demanding person with a sharp eye and an even sharper temper. He supervised the graduate studies of several notable ichthyologists, among them William Francis Thompson and Carl Levitt Hubbs.

Gilbert died in 1928 at the age of 68, but he has been remembered and honored by ichthyologists and fishery biologists for his many contributions. The Gilbert Fisheries Society was established in 1931 at the College of Fisheries, University of Washington. This organization was short lived, however, and the Society was reconstituted in 1989 as the Gilbert Ichthyological Society. A United States Bureau of Commercial Fisheries research vessel was commissioned in 1960 as the Charles H. Gilbert and, recently, a new building at Stanford University was named the "Charles H. Gilbert Biological Sciences Building".

From: "Who was Charles Henry Gilbert?" The Gilbert Ichthyological Society, University of Washington "Fish Collection"

Additional reading

Dunn, J. R. 1996. Charles H. Gilbert, Pioneer Ichthyologist and Fishery Biologist. Mar. Fish. Rev. 58(1-2):1-2.

Dunn, J. R. 1996. Charles Henry Gilbert (1859-1928), Naturalist-in-Charge, and Chauncey Thomas, Jr. (1850-1919), Commanding: Conflict aboard the U.S. Fish Commission Steamer *Albatross* in 1902. Mar. Fish. Rev. 58(1-2):3-16.

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Pietsch, T. W. and J. R. Dunn. 1997. Early collection building in Puget Sound and adjacent waters: the 1880 expedition of David Starr Jordan (1851-1931) and Charles Henry Gilbert (1859-1928). p. 279-290. In T. W. Pietsch and W. D. Anderson, Jr. (editors), Collection Building in Ichthyology and Herpetology. Amer. Ichthy. Herp., Spec. Publ., 3.

John Nathan Cobb

John Nathan Cobb (1868–1930)

"John Nathan Cobb, author, naturalist, conservationist, and canneryman was one of the last of a breed of men who attained a high position in academia without the benefit of a college education.

In a career that began as a printer's aide for a newspaper, Cobb worked as a stenographer and clerk, a newspaper reporter, a "Field Agent" for the U.S. Fish Commission (and its successor, the U.S. Bureau of Fisheries), an editor for a commercial fishing trade magazine of the Pacific Northwest, and as a supervisor for companies in the commercial fishing industry. He later authored various publications for the Bureau of Fisheries from 1895-1904.

He subsequently served with distinction as Assistant Agent of the Salmon Fisheries of Alaska, Editor of Pacific Fisherman (published by Miller Freeman), Assistant General Superintendent of the Alaska Packers Association, and President of the Pacific Fisheries Society.

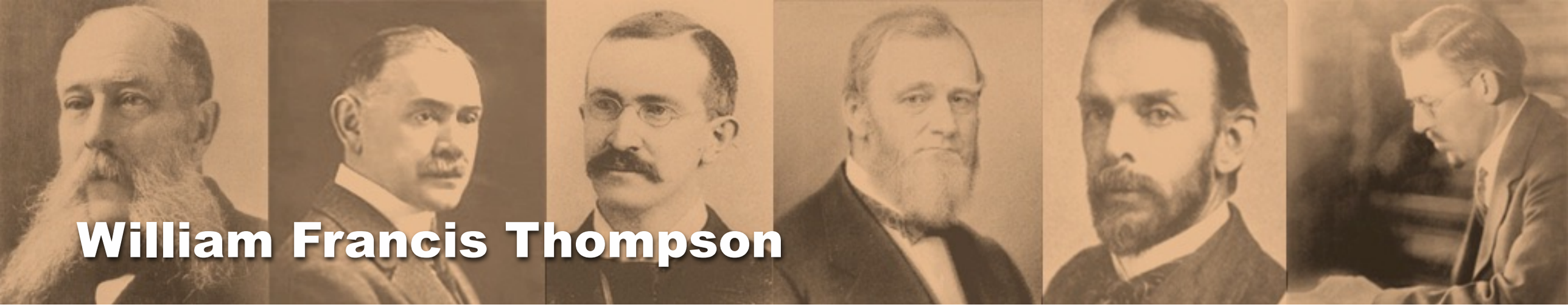
From 1919 to 1930, John Cobb was the founding Director of the College of Fisheries, University of Washington: the first fisheries school in the United States. As Dean of the College of Fisheries in 1924, Cobb later became instrumental during a major battle in the salmon vs. dams debate over the Priest Rapids hydroelectric dam proposed on the main stem of the Columbia River. He spoke in opposition to this dam at a time that predated "environmentalists" and tried to implement creative solutions such as fish hoists and passage baskets in order to enable salmon to overcome modern barriers."

From: Dunn, J. R. 2003. John Nathan Cobb (1868–1930): Founding Director of the College of Fisheries, University of Washington, Seattle. Marine Fisheries Review. 65(3):1-24.

John N. Cobb [ca. 1918]. Photo taken from Marine Fisheries Review 65(3), 2003. University of Washington Archives photo, U.W. 18608.

See Also

- "John N. Cobb Photographs" (University of Washington Libraries: Digital Collection)



William Francis Thompson

William Francis Thompson (1888–1965)

"William Francis Thompson was a major figure in fisheries research on the west coast of the United States in the early and mid 20th century. He came to prominence in an era of increased awareness in the United States of the need for conservation of wildlife, and for over 50 years he was a major contributor to fishery science and management as well as to fishery education. During this period Thompson was arguably the most widely known fishery scientist in North America.

Born in St. Cloud, Minnesota, in 1888, Will Thompson moved west with his family to Everett, Wash., in 1903. He demonstrated an early interest in the study of natural history and majored in zoology at the University of Washington, Seattle, from 1906 to 1909.

David Starr Jordan (1851–1931), President of Leland Stanford Jr. University in Palo Alto, Calif., learned of Thompson's drive and dedication. Jordan offered Thompson a scholarship, and in 1909 Thompson transferred from the University of Washington to Stanford University where he became a research assistant to Jordan. Thompson graduated with a B.A. degree in zoology in 1911 and published ten papers on the taxonomy of marine fishes during 1910–14, mainly as junior author with Jordan.

Pursuing graduate work at Stanford University in the fall of 1911, Thompson came under the influence of Charles Henry Gilbert (1859–1928), a zoology professor and eminent early fishery biologist. Gilbert thought highly of Thompson and arranged jobs for him during the summers between university semesters, first with the California Fish and Game Commission (1911) and then with the British Columbia Provincial Fisheries Department of Canada (1912– 13). These assignments entailed surveys of shellfish resources.

William F. Thompson, ca. 1951. Photo taken from Marine Fisheries Review 63(2), 2001. Photo courtesy of the University of Washington Archives, Seattle. W.F. Thompson papers, Accession Number 2597-77-1, Folder 39.

William Francis Thompson

“ Thompson was a major figure in fisheries research on the west coast of the United States in the early and mid 20th century. During this period Thompson was arguably the most widely known fishery scientist in North America. ”

Excelling in these studies, Thompson was then entrusted by the Provincial Fisheries Department to undertake a comprehensive, full-time investigation of the Pacific halibut, *Hippoglossus stenolepis*, in British Columbia. Thompson conducted an intensive study of this species from 1914 to 1917 and published the results in seven landmark papers.

In 1917 research on the halibut began to wind down as concern intensified in Canada over the ravages of World War I. Thompson was then hired by the California Fish and Game Commission to investigate that state's marine fisheries. While there, he helped found, and direct, the Commission's first marine fisheries research laboratory. Thompson focused his investigations initially on the albacore tuna, *Thunnus alalunga*, and then on the Pacific sardine, *Sardinops sagax*, as the commercial harvest of this latter species began to increase.

The International Fisheries Commission (now the International Pacific Halibut Commission) was established in 1923 by treaty between the United States and Canada to investigate and regulate the fishery for Pacific halibut. Thompson, the logical choice, was appointed Director of Investigations for the newly formed Commission, left California, and began his work for the Commission in Seattle in 1925. Expanding his earlier Pacific halibut studies, he engaged a small staff of scientists that undertook the applied research necessary for the scientific management of the halibut fishery. Thompson remained as Director of Investigations for the Commission until 1939. During his tenure halibut abundance increased, as did the commercial harvest. The halibut fishery ultimately was considered a model of a well-managed fishery.

Thompson was appointed Director of the School of Fisheries (now the School of Aquatic and Fishery Sciences), University of Washington, in 1930. This appointment was initially a part-time position in addition to his duties at the International Fisheries Commission.

The International Pacific Salmon Fisheries Commission was established in 1937 to restore the sockeye salmon, *Oncorhynchus nerka*, runs of the Fraser River, British Columbia. Thompson, by then recognized as one of the premier fishery scientists of the era, was chosen to be the director of this newly formed organization. He initially retained his other positions as Director of the 'Halibut Commission' and of the U.W. School of Fisheries, thus holding three jobs simultaneously! Thompson followed his previous approach to fisheries research by building a small but talented staff of scientists and broadly attacking a wide range of research projects pertinent to the current fisheries problems. He directed the research that resulted in the construction of fish ladders at Hell's Gate on the Fraser River. These ladders were built to enable salmon to bypass migration obstructions caused by certain high water-level conditions. Thompson and the Commission were generally credited with restoring the abundance of salmon in the Fraser River. He resigned from the 'Salmon Commission' in 1942 and returned to the University of Washington as the full-time Director of the School of Fisheries.

Thompson was the Director of the School of Fisheries for over 17 years (1930–1947). During his tenure, the school developed into a preeminent facility to train fishery scientists, and it graduated many individuals who subsequently became prominent fishery scientists and leaders in fisheries research and administration.

After the close of World War II, the salmon packers of Bristol Bay, Alaska, became concerned about the declining abundance of salmon in Alaska. In 1945 they asked Thompson to undertake a preliminary study of the situation and to make recommendations for action. Thompson visited Bristol Bay, reviewed much of the available data on the salmon fisheries of the region, and wrote a report to the packers. He called for long-term studies of the runs to various watersheds of Bristol Bay and noted that such investigations were then lacking. The salmon packers funded an expanded investigation by Thompson in 1946 and 1947. The salmon canners of southeastern Alaska soon thereafter asked that Thompson also undertake scientific investigations in that region.

Realizing that a comprehensive investigation of salmon in Alaska would ultimately require a relatively large organization, Thompson organized the Fisheries Research Institute at the University of Washington. The University's Board of Regents approved the institute in 1947 and placed it administratively in the Graduate School and therefore distinct from the School of Fisheries. Thompson resigned the directorship of the School of Fisheries in 1947 and was named Research Professor and Director of the new institute.

Over the years The Fisheries Research Institute undertook detailed studies of Pacific salmon in various areas of southeastern, central, and western Alaska. In the early years, this research was funded mainly by the Alaska salmon industry. Later, the Federal Government provided major support for these studies. The institute, well known for the high quality of its research, made major contributions over a 50-year period to knowledge of Pacific salmon biology. During the early part of this era, Thompson became the 'expert' on salmon of Alaska and the Pacific Northwest, and he was involved in most aspects of salmon research. Thompson maintained close relations with the Alaska salmon industry that, in turn, respected and trusted him. He generally received broad support from industry and government for his research.

Thompson retired from the directorship of the Fisheries Research Institute in 1958 at the age of 70. He remained active as a consultant to various fishery agencies, including the Bureau of Commercial Fisheries (now the National Marine Fisheries Service), the International North Pacific Fisheries Commission, and the U.S. Army Corps of Engineers. Thompson also remained close to the salmon fishing industry as an advisor. Many scientists and administrators held him in high esteem and welcomed his honest and forthright comments and criticism.

Will Thompson died on 7 November 1965. He left a legacy as a preeminent fishery scientist of his era. He influenced a myriad of fishery scientists by studying the characteristics of the fisheries, rather than the environment, to develop management strategies. Thompson's work with the halibut and salmon of the Pacific Northwest and Alaska became classic, but at times controversial, studies of commercial fisheries. He published about 150 scientific papers and was known for his original studies of population dynamics of commercial fishes.

Under Thompson's leadership, the School of Fisheries at the University of Washington became world-renowned. He was the doctoral advisor for many of the principal scientists who carried out fishery work on the Pacific coast after World War II. He was also the major fishery researcher on the West Coast during the interlude between the two World Wars. Thompson was known as a highly focused individual and an intense worker who, at times, was possessed of a difficult personality.

Always possessing a high concern for ethics, Thompson helped found the American Institute of Fishery Research Biologists in 1956 to insure high standards in the profession. Thompson's pioneering accomplishments remain in high esteem today."

From: Dunn, J. R. 2001. William Francis Thompson (1888–1965): a Preeminent Fishery Biologist of the Early and Mid Twentieth Century. Marine Fisheries Review. 63(2):1-4.

William Francis Thompson

Additional Reading

Dunn, J. R. 2001. William Francis Thompson (1888–1965): a Preeminent Fishery Biologist of the Early and Mid Twentieth Century. Mar. Fish. Rev. 63(2):1-4.

Dunn, J. R. 2001. William Francis Thompson (1888–1965) and His Pioneering Studies of the Pacific Halibut, *Hippoglossus stenolepis*. Mar. Fish. Rev. 63(2): 5-14.

Dunn, J. R. 2001. William Francis Thompson (1888–1965) and the Dawn of Marine Fisheries Research in California. Mar. Fish. Rev. 63(2):15-24.

See Also

- William Francis Thompson (1888-1965) (AFSC website)

Other Individuals

Other Notable Individuals of Early Fisheries History

Livingston Stone (1836-1912)

Livingston Stone "was a pioneer fish culturist, Deputy Commissioner of Fisheries for the Pacific coast from 1872 to 1898, and senior fish culturist of the U.S. Fish Commission from 1898 to 1903. He was an ordained Unitarian minister, although he resigned from his clerical duties in 1866, which may have influenced his passionate dedication to salmon conservation in his later career."

"Stone began his career in fish culture in 1866 as a private citizen. He joined the Commission of Fish and Fisheries in 1872 and was assigned to establish Chinook salmon hatcheries in California. He built the first federal fish hatchery on the McCloud River, an endeavor that ultimately led to the establishment of over 100 hatcheries during his tenure. Stone was one of the first to see the decimation of the Pacific salmon stocks and, in 1889, advocated the establishment of a 'national salmon park' for Alaska."

"On the basis of his recommendation, Congress set aside part of Alaska's Afognak Island as a 'forest and fish cultural reserve' in 1892. Although the United States government rescinded the protected status of Afognak Island in the 1930s, Stone's efforts stand as a precursor to the modern movement to establish marine protected areas. The Fish Commission publication *Culture of Fish* in 1898 represents the capstone of Stone's work and continues to be a standard reference document."

From: History Makers: Honorable Mentions. NOAA Celebrates 200 Years of Science, Service & Stewardship website

Livingston Stone, ca. 1905. Photo source unknown.

Other Individuals

Dr. David Starr Jordan (1851-1931)

David Jordan "was one of the best known naturalists and educators of his time. He wrote more than 50 books and published over 600 scientific papers on topics ranging from ichthyology (the branch of zoology dealing with fish) to advancing world peace. In 1879 (age 34), Dr. Jordan became president of Indiana University. In 1891, he was selected as the first president of Stanford University, a post he held for 25 years. He was also a member of the California State Fish Commission, and his investigations of the exploitation of the salmon and fur seal populations helped save these species."

From: NOAA Marine Operations website

During the late 1980s, Jordan also worked in association with the closely linked U.S. Fish Commission and Smithsonian Institution, publishing much of his work in their journals. His connection with these agencies took him on expeditions to Alaska and other areas in the Pacific Ocean.

In the forward of his 1922 book, *The Days of a Man, Volume 1*, he describes his "lives" as having been "first, and for the love of it, that of naturalist and explorer; second, also for the love of it, that of teacher; and third, from a sense of duty, that of minor prophet of Democracy."

See Also

- "Ichthyologists - David Starr Jordan (1851-1931). Spencer Baird and Ichthyology at the Smithsonian, 1850-1900".
- Jordan, D. S. 1922. The Days of a Man, Volume One, 1851-1899. World Book Co., New York, NY. 710 p. (at books.google.com)

George Archibald Clark (1864-1918)

Clark was born in Eden Prairie, Minnesota. He graduated from the University of Minnesota and served as Academic Secretary of Stanford University from 1891-1918. Clark was Secretary of the Bering Sea Fur Seal Commission from 1896 to 1898 and was later involved in the special investigation – to include counting and branding – of fur seal herds at the Pribilof Islands for the Bureau of Fisheries (BOF) from 1909 into the 1910s. During his 1912 and 1913 visits to the islands, Clark made topographical charts detailing the number and approximate position of the seal harems on each rookery.

William (Willis) H. Rich (1885-1972)

Rich had a diverse career as an educator and fishery scientist. He earned his B.S. degree while attending Lombard College (Illinois) in 1905. Rich went on to receive an A.B. degree in 1909, an M.A. in 1918 and a Ph.D. (zoology) in 1924, all from Stanford University. He taught biology, zoology, and physiology intermittently at Stanford from 1907 to 1950, when he became an Emeritus Professor.

As a Bureau of Fisheries field assistant (1918-22), Rich worked in Alaska during the early 1920s with Dr. Charles Gilbert in connection with salmon tagging work. Willis also developed the fish ladders that helped to remedy the declining salmon runs on the Columbia River.

Rich eventually became head of the Bureau's Division of Scientific Inquiry at the Woods Hole fisheries laboratory in Massachusetts. He was promoted to Chief Investigator of Salmon Fisheries from 1926-1930 at Stanford. In

Willis H. Rich. Paul Galtsoff, photographer. NEFSC photo

1943 he was named Director of the Montlake Laboratory (Seattle, Washington). Rich held many other positions, some concurrently, and was involved with several organizations.

Seton Hayes Thompson (1906-1994)

Thompson attended the University of Washington College of Fisheries, receiving his B.S. degree in 1927 and M.S. degree in 1929. He pursued additional graduate work in zoology and physiology at Stanford University.

In 1926, Thompson began his federal career with the Bureau of Fisheries, investigating the razor clam beds and other commercial fisheries of central Alaska. He was appointed aquatic biologist at the Stanford University field station in 1930 and continued his research on the fish and shellfish of central Alaska, devoting particular attention to the red salmon of Copper River. With his wide knowledge of the territory, Thompson thoroughly understood and appreciated the problems involved in managing the marine resources of Alaska. He authored a number of publications in connection with his work.

In 1931, Thompson became Assistant Chief of the Bureau's Division of Alaska Fisheries (BOF), a position he held off and on until 1947, when he was promoted to Chief. Thompson served for 5 years in the U.S. Navy during World War II. He finished his government duties in the Gulf/South Atlantic area as a regional director with the Bureau of Commercial Fisheries from 1957 to 1969. Thompson was also active in numerous organizations and treaty negotiations, many associated with international fisheries. For a time after his retirement, Thompson became extensively involved in local community activities, worked with the Gulf Oceanographic Development Foundation, and consulted for companies with foreign interests.

George B. Kelez (1908-1954)

Kelez chose his career in fisheries, which in a way was connected to the history of boat builders in his family – his father, Norman M. Kelez, being a notable "pioneer" shipbuilder in Seattle. Majoring in fisheries, Kelez earned his B.S. and PhD degrees from the University of Washington and his M.A. degree in 1932 from Stanford University.

Kelez began his service with the Bureau of Fisheries in 1929, when he joined biologist Harlan Holmes and Ed Power on a program at Chignik, Alaska. For the next 4 years, Kelez attended Stanford while spending his summers in Alaska at Chignik and Karluk while working with herring studies. He then took over at Chignik in 1933. In 1938, Kelez was appointed Chief of the Inland Water Studies of the Bristol Bay Investigation and initiated a research program which incorporated aerial and ground surveys for sockeye salmon.

Kelez served in the military during World War II and later moved to Juneau around 1950 to head all federal fisheries work in Alaska. He was an assistant Fish and Wildlife Service administrator in 1954 when he lost his life in a tragic plane crash. That same year, Mt. Kelez, in the Brooks Range, Alaska, was named after him.

In 1961, a 177-foot U.S. military cargo ship, built in 1944, was acquired by the Bureau of Commercial Fisheries and renamed the *George B. Kelez*. The vessel's dedication cememony took place on 20 July 1962 in Seattle. Among the participants were George's mother and brother. A dedication plaque aboard the vessel read: "Wherever this living ship goes, there goes also the spirit and faith of George B. Kelez, who dedicated and gave his life to conservation of our fishery resources".

See Also

- Wilbanks, W. 1999. George B. Kelez, p. 53-55. In: Forgotten Heroes, Police Officers Killed in Alaska 1850-1997. Turner Publishing Co. Paducah, KY. 192 p.

Other Individuals

George A. Rounsefell

Rounsefell was a fisheries research biologist who led the biological investigations of Alaska herring beginning in the spring of 1925. Assisted by Edwin Dahlgren, he studied the spawning, migration, maturity age, fishery effects, and segregation of the various races and the physical proportions of herring as a means of distinguishing races within the fish population. In the 1930s, both men were in Southeast Alaska tagging some 5,000 herring with special metal tags that, by the use of magnetic devices, could be later recovered from recaught fish at the herring reduction plants. In 1936, Rounsefell assumed the study of Puget Sound sockeye salmon while with the Bureau's Columbia River program. He went on to publish his research co-authored by George B. Kelez. Rounsefell retired in 1963 as Director of the Bureau of Commercial Fisheries' Galveston Biological Laboratory in Texas.

Samuel J. Hutchinson

Hutchinson was well acquainted with Alaska fishery problems, engaging in fishery investigations in Alaska for the Fish and Wildlife Service (FWS) for several years. He was in charge of pink salmon investigations in southeastern Alaska, basing his operations chiefly at the Fishery Biological Laboratory at Little Port Walter on Baranof Island. In 1944, Hutchinson was detailed to serve as field supervisor in Alaska for the administration of the Halibut Allocation Order. He was a FWS aquatic biologist when he was promoted to area coordinator of fisheries for Alaska in 1945.

G.A. Rounsefell tagging haddock at the Fisheries station, about 1952-1953. Credit: NOAA Fisheries.

Research and Management

As part of the 1880 U.S. Census, extensive fisheries surveys in Alaska and along the West Coast were initiated. These initial research ventures were followed by the first written account of the U.S. interest in fishing and canning.

Fisheries Research and Management

As part of the 1880 U.S. Census, extensive fisheries surveys in Alaska and along the West Coast were initiated. These initial research ventures were followed by the first written account of the U.S. interest in fishing and canning, which identified that only scarce halibut and cod fishing was being done in Alaska waters – mostly uncharted at the time.

Research Sections

- Species Research
- Federal Hatcheries
- Fisheries Management
- Environmental and Ecosystem Monitoring

To better understand the potential for these fisheries, a series of annual surveys and oceanographic testing were conducted throughout the North and western Pacific Ocean using the U.S. Fish Commission's steamer, *Albatross*.

"The first systematic researches bearing upon the economic marine fishes of the western coast of North America were conducted in 1879 and 1880, by Dr. David S. Jordan and Prof. Charles H. Gilbert, for Washington, Oregon, and California, and by Dr. Tarleton H. Bean, for Alaska. Not having suitable facilities for investigating the fishing-grounds, the work of these naturalists was chiefly limited to collecting and studying the fishes obtainable along the shores and from the fishermen, but, nevertheless, exceedingly important results were accomplished by them."

Fishermen ready to begin dressing codfish, Pirate Cove, Popof Island, Alaska, 1913. University of Washington Archives no:286

From: Rathbun, R. 1894. Summary of the Fishery Investigations Conducted in the North Pacific Ocean and Bering Sea From July 1, 1888, to July 1, 1892, by the U.S. Fish Commission Steamer *Albatross*. In Bulletin of the U.S. Fish Commission, Vol. XII, for 1892. Wash. G.P.O.

In the early 1900s, research along the Pacific coast and in Alaska was centered at Stanford University in California, with Charles Gilbert assigned as scientist in charge. He was joined by Willis H. Rich in 1918 to work on Alaska salmon studies. In May 1931, the personnel and equipment from Stanford were moved into the new Montlake Laboratory in Seattle, Washington. Included in the move was the

biological research program that had been working for the last 10 years on salmon runs in the Columbia River.

Other programs that transferred to Montlake were the Southeast Alaska/Prince William Sound herring investigations, and four Alaska sockeye salmon programs that began in the 1920s at Chignik, Karluk, Bristol Bay, and Copper River.

"The first major expansion of the Alaskan fishery research program at the Montlake laboratory occurred in 1938 when funds were made available for the beginning of a large, comprehensive program of study on the salmon runs in the Bristol Bay area of the Bering Sea. The program which developed was divided into two major parts. One part of the study was on the freshwater life history of the Bristol Bay sockeye salmon and the environmental factors that would affect their survival. A field station and experimental area was established on Brooks River, near the outlet of the lake. This was a beautiful site for study in the Bristol Bay area; it was accessible by float plane from King Salmon, and the lake and river were large enough to provide normal access and spawning and rearing conditions, yet the site was small enough to allow studies of environmental conditions in some limnological detail. During the first year of study, an adult counting weir was installed in Brooks River, near the outlet of the lake, and the collection of samples of downstream young migrants was started, not only for Brooks Lake but in four other river systems of Bristol Bay as well. *George Kelez* was transferred from Chignik to take charge of this phase of the Bristol Bay studies."

From: Atkinson, C. E. 1988. The Montlake Laboratory of the Bureau of Commercial Fisheries and its Biological Research, 1931-81. In R. R. Mitsuoka, R. E. Pearson, L. J. Rutledge, and S. Waterman (editors), Fifty Years of Cooperation and Commitment: 1931-81, the Northwest and Alaska Fisheries Center, p. 19-46. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-34.

Fishery technologist performs lab tests, 1947. E. P. Haddon, photographer. Auke Bay Labs photo.

Also check out: the "Technology" section

Events

Exploratory Fishing and Gear Development Operations, 1948

"By 1947 it was apparent that an exploratory fishing and gear development unit was to be set up shortly. During 1948, exploratory fishing and gear development activities were initiated within the Seattle Technological Laboratory under Maurice Stansby. The aim was to organize a working group that would be ready to operate on the Pacific Coast as soon as the new activity could be developed. Funds

totaling $92,680 were made available to the Laboratory for exploratory fishing operations on 1 July 1948."

"Late in 1949 the Seattle Exploratory Fishing Project was officially transferred from the Technological Laboratory to function as a separate entity." (Greenwood, 1982 *).

Gulf of Alaska Survey, 1971

Center scientists and technicians continued their schedule of marine studies begun early in the summer aboard various research vessels. The NOAA ship *John N. Cobb* returned to Seattle on 24 August after completing a 52-day cruise off Kodiak Island in the Gulf of Alaska.

From 13 to 18 July, the relationships between the vertical distribution of shrimp and certain environmental features (such as amount of available light) were studied. Twenty-six tows were made in the Marmot Bay area with a vertical distribution sampler.

The *Cobb* pollock survey began on 20 July. A total of 62 trawl hauls were made in 26 days. The survey covered a 4,500 square mile area off southeastern Kodiak Island. Most of the sampling (52 hauls) took place on Albatross Bank; 10 hauls were made in Shelikof Strait. Trawling took place at preselected stations within the depth range of 30 to 170 fathoms.

The only substantial catches of pollock (500 to 1,800 pounds per 0.5 hour of fishing) on Albatross Bank were made in depths of 60 to 130 fathoms. Later the vessel returned to stations that had catches exceeding 1,000 pounds per 0.5 hour of fishing, and catches between 1,710 and 3,800 pounds were made in 0.5-hour tows. Hydroacoustic soundings revealed few fish in waters less than 60 fathoms with greater numbers between 60 and 100 fathoms. Fishing based on relatively strong off-bottom acoustic signals produced catches between 1,200 and 2,600 pounds of mainly juvenile fish, (21-33 cm long). Juvenile pollock were taken with trawls both on and off the bottom. Adults were never taken in any great amounts in trawls off the sea bottom, suggesting that the fish may have been confined to near bottom depths.

In Shelikof Strait, off the mouth of Uganik Bay and Uyak Bay, few pollock were taken in off-bottom hauls. Bottom trawls in the same area produced catches varying between 22 and 2,100 pounds per 0.5 hour. Most fish were between 33 and 43 cm.

The charter vessel *Tonquin* completed two research cruises. During the first cruise (6 July - 2 August) samples of fish inhabiting the coastal waters were collected from Vancouver Island southward to Oregon, for the U.S. survey of heavy metals in fishery resources. Samples of Pacific hake were also collected to determine the relative abundance of year classes." (From Northwest Fisheries Center Monthly Report, Jan. 1972).

First U.S. survey made of seamount marine life in the Gulf of Alaska, 1979

In June and July 1979, RACE scientists aboard the chartered vessel Sunset Bay conducted the first survey by U.S. investigators to determine the kinds and quantities of marine life associated with seamounts (undersea mountains) in the Gulf of Alaska. During the 44-day cruise, nine of the shallowest seamounts in the Gulf of Alaska were surveyed. These nine seamounts rise abruptly from the ocean basin from depths of 1,000 to 2,000 fathoms to within 90-400 fathoms of the ocean surface. Exploratory fishing was successfully carried out over all of the seamounts except Applequist Seamount.

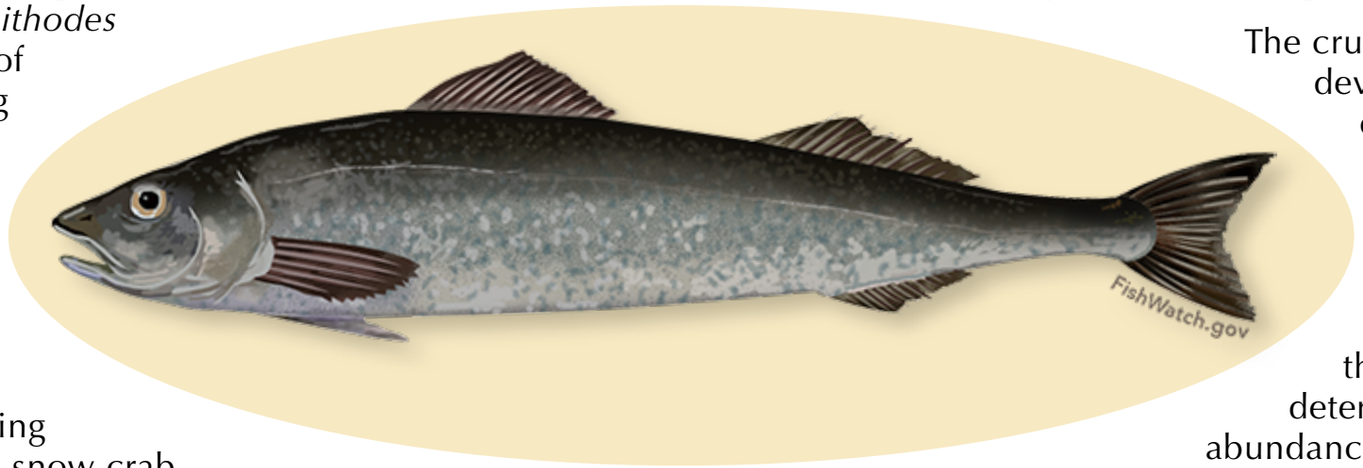
Because there were few soundings of seamounts on charts, it was necessary to determine their depth and topography prior to conducting any exploratory fishing. This was done by plotting echosoundings along a series of transects – after the depths and topographical features of each seamount were recorded, a decision was made on what kinds of fishing gear to use.

The kinds of gear available included sablefish traps, king crab pots, midwater trawls, bottom setlines, line-fished lures near the surface,

and a newly developed autonomous deep-sea camera system. Sablefish-traps and king crab pots were found to be the most useful for fishing on top of the seamounts. They could be deployed on comparatively rough and hard bottom and in confined spaces between the many pinnacles typical for seamounts. Most of the area over the seamounts was judged to be unsuitable for bottom trawling or was at or beyond the maximum depth capability for effective trawling from the Sunset Bay.

Sablefish were caught in traps on all of the seamounts. Other fishes taken in the traps and pots were an occasional pectoral rattail, longspine thornyhead rockfish, and rougheye rockfish.

A surprising feature of the survey was the large number of crabs that were caught. Deep-sea red king crab, provisionally identified as *Lithodes couesi*, were caught on all of the seamounts. Golden king crab were taken on Dickins, Patton, and Surveyor seamounts, and snow (Tanner) crab (*Chionoecetes tanneri*) were caught on all of the seamounts except Dickins. Many of the deep-sea red king crab, golden king crab, and snow crab were carrying maturing clutches of eggs, and most of the sablefish were ripe, spawning, or recently spent. Additional studies are underway to examine the genetic relationship of sablefish found on the seamounts with those taken on inshore grounds over the continental shelf and slope.



Dominant species in the bottom trawl were sablefish and rattail with a few small longspine thornyhead rockfish also being taken. One deep sea sole (*Embassichthys bathybius*) was caught while bottom trawling on Surveyor Seamount and another on Patton Seamount. They were the only flatfish caught during the survey.

Catches in the midwater trawl mainly consisted of numerous species of small bathypelagic fishes and squids. deep sea smelts (Bathylagidae), lanternfishes (Myctophidae), and viperfishes (Chauliodontidae) were the most commonly taken of the small bathypelagic fishes. Among the rare species caught were spookfishes and barreleyes (Opisthoproctidae) and dreamers (Oneirodidae).

Six near-surface hauls with the midwater trawl made directly over seamounts yielded 28 Pacific salmon. Several salmon were also caught on lures trolled near the surface over the seamounts. Although certainly not conclusive, this suggests that the seamounts may be preferred feeding or schooling places for salmon.

The cruise also incorporated a newly developed autonomous camera to obtain information on the fauna, as well as geologic and topographic features of the deep-sea floor. The third leg 1979 Gulf of Alaska seamount survey was devoted to utilizing the modified still camera to determine distribution and abundance of marine life associated with the tops of some of the shallower seamounts. This was the first attempt by U.S. investigators to survey marine life on seamounts in the Gulf of Alaska with a modified free-vehicle photographic system. The modified autonomous deep-sea 35mm camera system consisted of photographic and auxiliary components.

The photographs of the seafloor showed many interesting features of the geology and fauna of the seamounts. Geologically, differences in microrelief and sediment composition were revealed by the photographs. The deep-sea camera system also produced the first

photographs of the marine life which inhabited these seamounts. Two species of rattail fishes (Family Macrouridae), tentatively identified as *Coryphaenoides pectoralis* and *C. cinereus*, were photographed on Quinn and Giacomini seamounts. The largest number of rattails was photographed on Quinn Seamount. In addition to documenting the presence of rattails, the photographs also provided evidence of how the long slender tail of rattails is used in swimming. Other fish species were much less in evidence. Sablefish, one of the most abundant species captured in fish traps during the survey, were not photographed on any of the seamounts. Another fish species, a member of the genus *Sebastolobus*, was photographed on Patton and Giacomini seamounts.

The most prominent invertebrate species photographed on the seamounts were crabs. Red deep sea crabs were photographed on all three seamounts, while snow (Tanner) crabs were only photographed on Quinn and Giacomini seamounts. Also pictured were the walking and resting postures of both crab species and the fine furrows in the soft sediment on Giacomini Seamount made by the dactyls ("toes") of the crabs as they moved across the seafloor. Other photographed invertebrates included hydroids; sponges; bryozoans (ectoprocts); polychaete worms (serpulid tubes); anthozoans (gorgonian skeletons, sea pens, and sea anemones); mollusca (the gastropod *Fusitriton oregonensis*, several chitons, and small scallops); and several asteroids (sea stars).

The exploratory cruise from the Sunset Bay provided the first glimpse of marine life associated with seamounts in the Gulf of Alaska. The survey was carried out on but a few of the many seamounts that dominate the bathymetry seaward of the continental shelf in the Gulf of Alaska over a relatively short period in late spring-early summer.

“It would be useful to conduct more studies at other times of the year and over additional seamounts to better understand their effects on the fauna and oceanographic regime. " (From Northwest and Alaska Fisheries Center Monthly Report, Nov. 1977).

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Species Research

Marine Species Research

The importance of identifying and understanding the various marine life found in Alaska is evident by the U.S. Government's investment of funds and personnel throughout history. These efforts have ranged from the earliest studies of migratory and breeding behaviors of the northern fur seal, to exploratory surveying for significant fish and shellfish (crab, shrimp, etc.) populations, to learning about how to preserve and restore threatened and endangered species.

Over the years, several federal groups and programs have emerged within the Agencies (Bureau of Fisheries, Fish & Wildlife Service, etc.), each in connection with the research of certain Alaska wildlife.

Featured Species

Salmon
Other Fish
Fur seals: 1786-1899, 1900-1939, 1940-1959, 1960s-onward
Whales / Whaling
Marine Mammals
Red King Crab
Invertebrates

◁ Research and Management

Salmon Research

"The history of the Alaska salmon industry...[prior to 1927] has been one of consistently increasing exploitation without regard to its effect on existing salmon supplies. In every district, as salmon stocks dwindled under this régime, the intensity of fishing effort was redoubled, and the attempt to maintain unimpaired, or to increase if possible, the size of the commercial pack. The necessity of making provision for future runs was ignored. No attention was given to the number of spawning fish that succeeded in escaping the nets. No one concerned himself with the size of the spawning reserves or their adequacy to maintain the runs. The congressional regulations in effect were hopelessly inadequate and the Bureau of Fisheries was without power to act.

Such a system could have only one result – the eventual depletion of the salmon supplies and the final extinction of the industry. This result was clearly foreshadowed in the years succeeding the close of the Great War...To meet this emergency, Congress in 1924 enacted a law for the protection of the fisheries of Alaska...of preventing furthur depletion of the salmon runs and of restoring them as nearly as possible to their former condition of abundance."

From: Gilbert, C. H., and W. H. Rich. 1927. Investigations Concerning the Red-Salmon Runs to the Karluk River, Alaska. U.S. Bureau Fish., doc. 1021, 69 p.

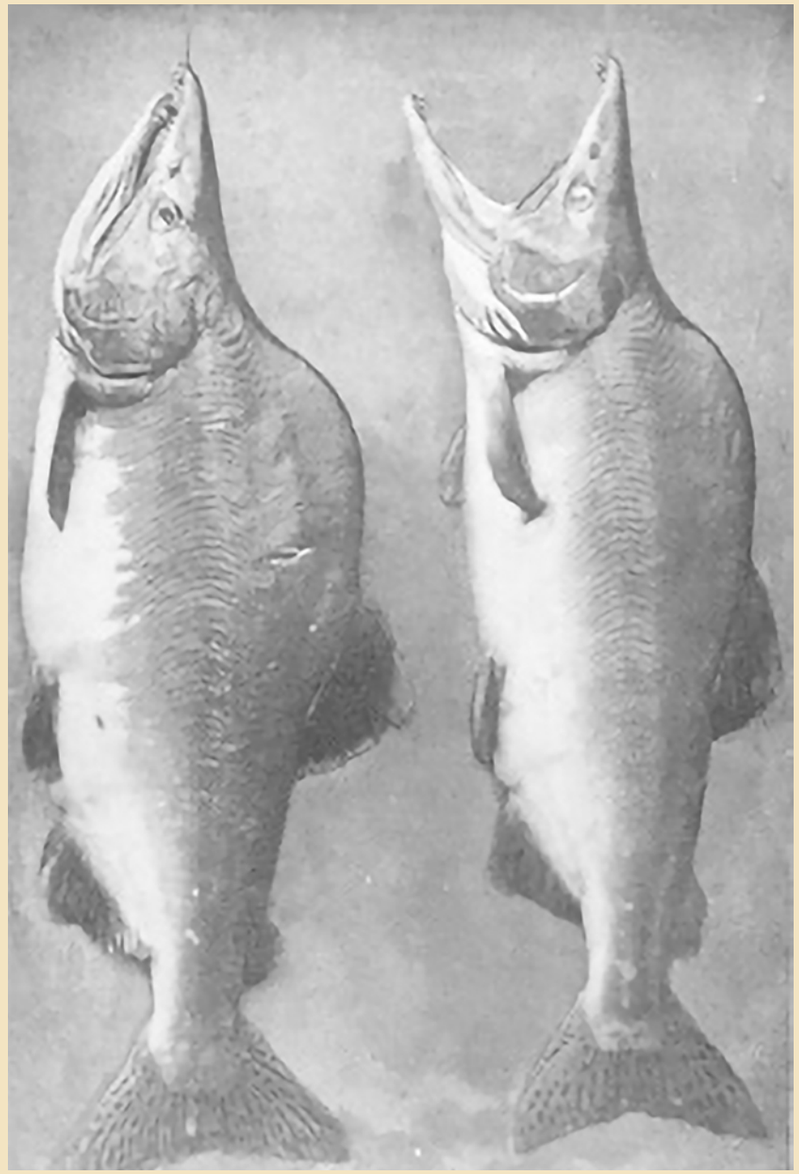
See Also

- Early (Federal) Salmon Hatcheries in Alaska
- Alaska Canneries

Events

Fish tagging/marking experiments, 1920s-1950s

In the early 1920s, Charles Henry Gilbert and Willlis H. Rich began extensive tagging of salmon in the Alaska Peninsula. In 1923, roughly 10,000 numbered aluminum tags were attached to red salmon with reliably reported recaptures during the commercial fishing season. Tongs were used to attach the 3-inch long bent tags to the upper lobe of the tail



Humpback salmon. U.S. Fish Commission image, 1899.

at its base. From: Gilbert, C. H., and W. H. Rich. 1925. Second Experiment in Tagging Salmon in the Alaska Peninsula Fisheries Reservation, Summer of 1923 (doc. 991), p. 27-75 + figs. In Bulletin of the U.S. Bureau of Fisheries, Vol. XLII, 1926. Wash. G.P.O. 385 p.

In the spring of 1930, the first known attempt to mark pink salmon fry as they migrated from streams was done at the Duckabush River hatchery – 36,000 fry were marked. The process involved using finger nail clippers to remove the dorsal and adipose fins, widely separated on the body. Both fins were removed because mature salmon often lose one of them from natural causes. Despite the loss of fins, the mortality of the fry was apparently unaffected.

In 1932 a sizable herring tagging program had begun conducted by Dr. George A. Rounsefell, Edwin Dahlgren, and Samuel Hutchinson in southeastern Alaska using the Bureau's motor launch *Heron*. Some 5,000 herring were tagged and released using new metal "belly" tags, made of pure nickel, that could be recovered by a magnetic detection system on the conveyer belts at processing plants. Three years later, Dahlgren refined the tags and developed electronic and magnetic systems for recovering the tags as the fish pass through the reduction plant.

By the mid-1950s, the common type of tag had evolved to to the "Petersen-disk", consisting of two plastic disks, about one-half inches in diameter, attached on each side of the salmon by a 2-inch pin inserted through the fleshy part of the back below the dorsal fin. A "tagging box", built to waist-height and used on the water, had a padded cradle to hold each fish while being tagged and a foot-lever-operated door that opened to release the fish into the water.

Gravel incubators for enhancing pink salmon returns, 1975

The return of 11,137 adult pink salmon to the Auke Creek hatchery weir as of September 9 reinforces our confidence in the effectiveness of gravel incubators. This is the largest escapement of pink salmon ever recorded at Auke Creek, which formerly had about 2,500 spawners annually. A total of 1,347,000 fry (1,079,000 unfed hatchery fry and 268,000 creek fry) were released in the spring of 1974.

The return of marked fry strengthens the argument for at least two genetic stocks of pink salmon that spawn in Auke Creek; 79,743 hatchery fry, marked with fin clips, were released between February 27 and March 19, 1974, as they emerged from gravel incubators. A similar release of 79,909 fry, marked with a different fin clip, took place April 10-22. The former originated from the first mode of a bimodal escapement of spawners in 1973 and the latter from the second mode of spawners. Early spawners entered the weir before August 20 and late spawners after August 20. As of September 9, 137 pink salmon with the early type of mark and 663 with the late type of mark had entered the weir.

(From Northwest Fisheries Center Monthly Report, Sept. 1975).

Genetic diversity of chum salmon studied for Southeast Alaska streams, 1988

Staff of the Auke Bay Laboratory collected chum salmon (*Oncorhynchus keta*) from 32 southern Southeast Alaska streams in 1986, 1987, and 1988 for genetic analysis. The objective of the analysis is to determine if sufficient genetic divergence exists among fish from streams in southern Southeast Alaska near the U.S.-Canada boundary to be useful for stock separation in multistock fisheries. A subsample of fish from each of the 32 populations has been examined using protein electrophoretic methods. These data were analyzed to test for stream-specific differences or regional differences useful for stock separation. Electrophoretic data were obtained for 26 loci and 3 isoloci. Of these, seven loci and one isolocus were monomorphic for all populations examined.

Preliminary examination of the population subsamples indicates that genetic differentiation in chum salmon has a geographical basis and that, at least in southern Southeast Alaska, populations within a region are relatively similar. Separation between regions was

significant. Comparisons of genetic data from Alaska with data reported by Canada indicate that populations from the Queen Charlotte Islands are distinct from populations from Prince of Wales Island. These results are sufficiently encouraging to warrant 1) analysis of the remaining tissues and 2) continued development of a genetic baseline for chum salmon which uses all the variable loci so far identified and includes stocks from northern British Columbia.

(From: Northwest and Alaska Fisheries Quarterly Report, Oct.-Dec. 1988).

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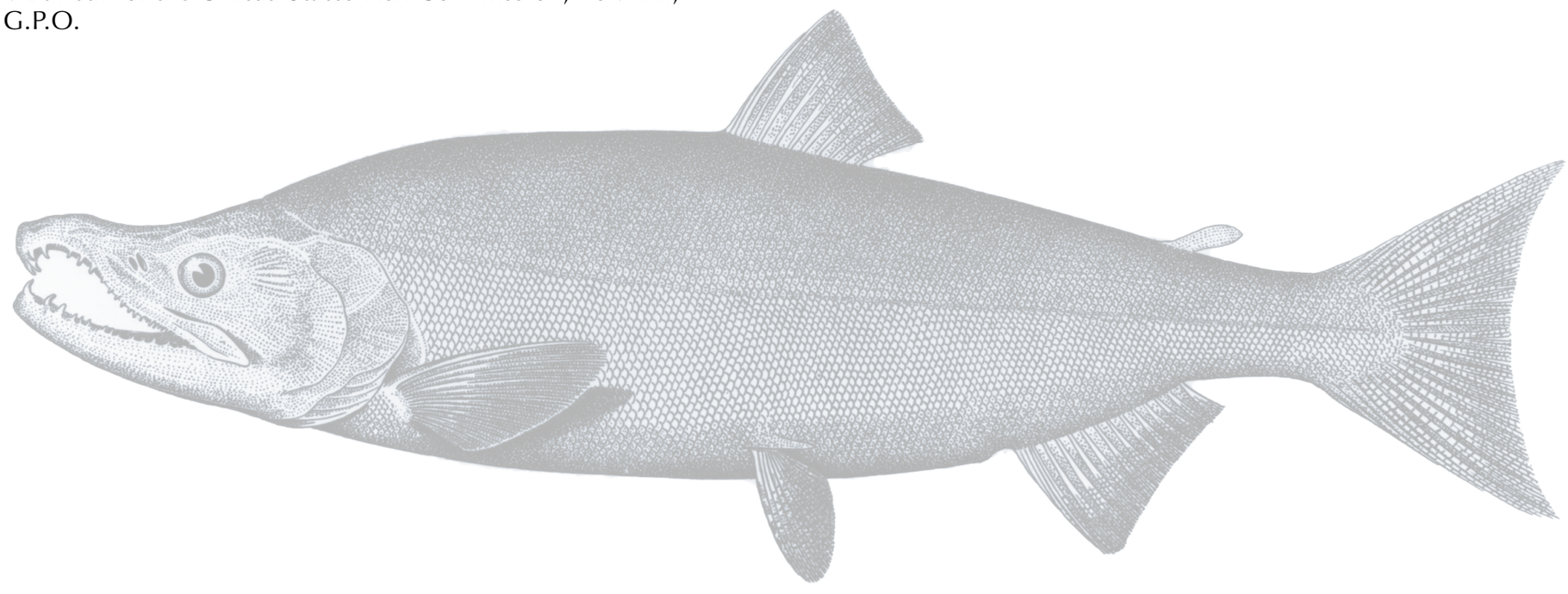

◁ Research and Management

Fish Research

Halibut

In the late 1800s, the demand for halibut being fished along the East Coast rivaled that for salmon, mackerel, and other oily fish. With the Atlantic stocks of halibut being depleted, the fishery in Alaska and along the Pacific coast began with crude and disappointing attempts. Prior to 1894 profits were little if any, however, with perseverance and capital from interested New England fish merchants, the halibut industry slowly gained momentum. Seattle and Tacoma (Washington) were the primary towns where the catch of halibut was taken for transport to New York or Boston. Over time, new fishing banks were discovered, fishing competition increased, and improvements were made to the fishing methods, preservation of fish, transport by rail.

In 1923, over 12 million pounds of halibut were taken in Alaska and an agreement was established between the U.S. and Great Britain for the preservation of the fishery in the North Pacific.

In 1970, the National Marine Fisheries Service (NMFS) (NOAA) reported that a record 420-pound, 8.5-foot halibut was caught by a long-line fishing vessel at Kodiak, Alaska. The fish sold for $125.

Egg experiments at Olsen Bay, Alaska, ca. 1960. Ted Merrell, photographer.

Herring

The first commercial use of herring in Alaska was in the manufacture of oil and fertilizer. Fishing for herring in Alaska was initially done by beach seining. One large company began using a large seine net strung between 2 row boats 20-30 feet apart. In the late 1920s, a few were still fishing this way, however, most were purse seining from power boats crewed by 5-7 men – a method started soon after 1900. Gill-netting was also practiced in some areas.

During the 1920s, the growing use of herring for food and manufacture into oil and meal began to cause concern over the depletion of the species. Between 1924 and 1927, an average 160 million pounds were being taken annually. In 1925, the significant growth to the industry in

Herring purse-seiners in Red Fox Bay, Gulf of Alaska. Bureau of Fisheries photo, 1926.

Southeast Alaska was due primarily to the new herring fishery around Afognak Island and the increased output of fertilizer and oil. Large commercial vessels were also being developed to serve as movable floating processing plants that followed the seasonal runs of herring.

Under George A. Rounsefell, biological investigations (spawning, migration, maturity age, fishery effects, etc.) of the species began in the spring of 1925, which included extensive studies on the segregation of the various races and the physical proportions of herring as a means of distinguishing races within the fish population. A tagging program was also undertaken in which 3,000 herring were tagged in 1927.

Rockfishes

The systematics of the speciose genus *Sebastes*, rockfishes, particularly in the North Pacific, have challenged ichthyologists and others even casually interested in these fishes for well over a century. Fernholm and Wheeler (1983) detailed problems associated with the early descriptions of *Sebastes*. The first scholarly reference to a rockfish was by Linnaeus (1761) who included Norway and Italy as the range of a fish he described in 1758 and named *Perca marina*.

From: Kendall, A. W., Jr. 2000. An Historical Review of *Sebastes* Taxonomy and Systematics. Mar. Fish. Rev. 62(2):1-23.

Events

Hydroacoustic techniques to locate Pacific herring, 1978

Schools of juvenile and adult Pacific herring occupied the same wintering grounds in southeastern Alaska waters during a 3-year hydroacoustic survey. Other species, including juvenile walleye (Alaska) pollock, also occupied the same waters. These factors made it even more difficult to accurately forecast the quantity of adult herring that could be harvested from these waters.

During the winters of 1976, 1977, and 1978, NMFS biologists (from the Marine Fisheries Investigations group of the Center's Auke Bay Laboratory) made hydroacoustic surveys to assess the abundance of major stocks of Pacific herring in southeastern Alaska. The surveys were carried out in conjunction with herring surveys conducted by Alaska Department of Fish and Game biologists, as part of a cooperative agreement for joint research on herring.

At the same time as hydroacoustic surveys were being made we sampled schools of fish by midwater trawl to verify species composition and life stage of the fish. We occasionally noted schools with groups of fish that appeared (on the fathometer) distinct from the main part of the school. Typically, these segments were higher in the water column or closer to shore than the remainder of

Other Fish

the school. The trawl samples we took from these distinct groups turned out to be juvenile herring."

(From Northwest and Alaska Fisheries Center Monthly Report, Apr. 1978).

International collaboration on age readings for walleye pollock and hake, 1977

During January [1977] the age reading unit at the Seattle Laboratory was involved with comparing age readings of walleye (Alaska) pollock by United States and Japanese readers and readings of Pacific hake by United States and Polish readers. Readings of pollock scales by Hirotsune Yamaguchi of the Far Seas Fisheries Research Laboratory in Shimizu, Japan, are being compared to Seattle Laboratory readings from otoliths of the same fish. Comparisons are being made of U.S. and Polish readings from otoliths of Pacific hake. The otoliths are from catches of a Polish research vessel in the eastern Pacific Ocean. A scientist from the Sea Fisheries Institute in Gdynia Poland made the Polish age readings. The purpose of the comparisons is to assess the compatibility of the age determinations among the agencies.

(From Northwest and Alaska Fisheries Center Monthly Report, Jan. 1977).

Massive spawning concentration of walleye pollock found near Kodiak Island, 1980

During a NMFS Marine Resources Monitoring Assessment and Prediction (MARMAP) cruise in the Kodiak Island region on the NOAA ship *Miller Freeman*, a mass of spawning walleye pollock was found in deep waters of Shelikof Strait. Half-hour drags produced catches of 20,000 to 30,000 pounds. The mass of fish covered an area roughly 70 miles by 5 miles. Studies were initiated to estimate the biomass by hydroacoustical means and to determine drift of eggs and larvae, oceanographic conditions, and schooling behavior.

(From Northwest and Alaska Fisheries Center Monthly Report, March 1980).

Pot fishing and other techniques for capturing sablefish, 1971

"The sablefish, a relatively deepwater species, has been the object of considerable effort on gear research and resource assessment by NMFS scientists since 1969. This species is believed to be one of the larger underutilized fishery resources in the eastern North Pacific Ocean. Pot fishing and other techniques are being developed for its capture.

The NOAA ship *John N. Cobb* returned to Seattle on October 28 after completing a 17-day cruise in Oregon coastal waters off the Columbia River. A primary objective was to compare sablefish catches in an otter trawl with catches in pots (traps with a steel frame, 3 × 3 × 8 ft). Results indicated that pots are extremely selective for large fish. The average length of sablefish taken in pots was 66.6 cm compared to smaller trawl-caught sablefish (53.4 cm). The average weight of pot-caught sablefish was double that for trawl-caught fish (6.8 to 3.4 lb). The percentage of marketable sablefish by weight (4 lb or heavier) was 93.3% for those taken in pots and only 57.2% for those taken in the trawl. Several species of red rockfish and sole were common in the trawl catches but were never found in the pot catches."

(From North Pacific Fisheries Research Center Monthly Report, Oct. 1971).

See Also

- "NMFS scientists develop new fish harvesting gear, 1971"

Other Fish

Longline sablefish index surveys, 1984

To obtain better indices of sablefish abundance, longline gear may be used in addition to traps in future index surveys. With seven consecutive years of data (1978-84), the trap index has provided valuable information to fishery managers concerning the abundance and size composition of sablefish in southeastern Alaska. However, the survey has been limited by the fact that traps can only be fished where the bottom is relatively smooth. Much of the ocean off southeastern Alaska, its floor too rugged to be fished with traps, has not been sampled in the survey. Longlines, which are presently used in the commercial fishery for sablefish in Alaska, can be effectively fished on these rough bottoms. Therefore, in 1985, scientists at the Auke Bay Laboratory plan to experiment with using longline gear to survey sablefish stocks as a possible supplement to present trap index survey.

The sablefish index survey may also be expanded geographically to include regions of the central and western Gulf of Alaska. The domestic sablefish fishery in these areas has developed rapidly, from essentially nothing in 1982 to a multimillion dollar industry in 1984. As in southeastern Alaska, fishery managers will need information on annual condition of sablefish stocks to provide rational and efficient fishery management of this valuable resource.

(From Northwest and Alaska Fisheries Quarterly Report, July-Sept. 1984).

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See Also

- The Fish Collection at the Smithsonian Institution's National Museum of Natural History" ("NOAA Celebrates 200 Years of Science, Service, and Stewardship")

◁ Research and Management

Northern Fur Seal Research and Management, 1786-1899

To present a chronological medley of topics, the following text on these northern fur seal pages was taken from select sections of:

Scheffer, V. B., C. H. Fiscus, and E. I. Todd. 1984. History of Scientific Study and Management of the Alaska Fur Seal, *Callorhinus ursinus*, 1786-1964. U.S. Dep. Commer., NOAA Tech. Rep. NMFS SSRF-780, 70 p.

The Russian Period, 1786-1899

The first European to see an Alaska fur seal was Georg Wilhelm Steller, on the voyage of discovery of Alaska. At dusk on 10 August 1741, south of Kodiak Island, he watched a "sea-ape" playing about the ship. He did not then or later recognize it as a seal. In the following summer, while shipwrecked on Bering Island, he saw fur seals returning to land to breed.

The species became known to science through the posthumous publication of his "De Bestiis Marinis", containing a full description of seals he saw on Bering Island. After Steller's 1751 description, little information on the northern fur seal, *Callorhinus ursinus,* was published for a century.

The Pribilof Islands, sole breeding grounds of the Alaska fur seals, were discovered by the crew of the Russian ship St. George under command of Gerasim Gavrilovich Pribilof.

Historical Summary of Sealing in the Russian Period
(click to expand)

Bull fur seal at Polovina Rookery on St. Paul Island. Victor B. Scheffer, photographer. Date unknown.

Fur Seals 1786-1899

Change of Ownership

Alaska was transferred to the United States in 1867 after the Russians had taken the annual seal harvest. In 1868, at least four private companies set up sealing camps on the Pribilofs and recklessly took several hundred thousand seals. Original records for the events of 1868 are practically nonexistent and subsequent statements are often exaggerations or apocryphal. Certainly the San Francisco business men that sent ships to seek out the trading potentialities wanted no publicity. There was no government either on the mainland or the islands.

While the slaughter was under way, Congress enacted on 27 July 1868 a stop-gap measure of protection. It forbade the killing of seals within the Territory of Alaska and obligated the Secretary of the Treasury "to prevent the killing of any fur seal....until it shall be otherwise provided by law". In 1869, the sealskin harvest was taken by two private firms under Treasury Department regulation. The Secretary also permitted the Aleuts to "kill such small numbers [of seals] as may be absolutely necessary for their sustenance and clothing". Congress, by Act of 1 July 1870 decided to lease the privilege of sealing on the Pribilof Islands to a monopoly operator.

An early attempt to salvage fur seal carcasses was made in 1871-1872. About 8,000 gallons (30,000 1b) of seal oil were rendered, but the costs of making it and shipping it to San Francisco were greater than the price it brought.

By 1872 the Government had recognized the need for information on the fur seal herd, particularly for information on its size. Henry Wood Elliott was therefore sent to the islands. As surveyor, naturalist, author, lecturer, artist, and lobbyist he was the first man to give wide publicity to the habits, environment, and exploitation of the Pribilof seals. On his first assignment he was astonished to find no written record of the location or size of any rookery or an estimate of the number of seals thereupon. Elliott spent at least six summers on the Pribilofs; 1872-74, 1876, 1890, and 1913.

In 1874, Lieutenant Washburn Maynard, U.S. Navy, was sent to the Pribilofs to inspect the operations of the Alaska Commercial Company and to obtain general information on the fur seal herd. In July, he and Elliott mapped the rookeries of both islands, using in part the rookery maps made by Elliott in 1872-73.

One of the first studies of the pelagic life of the fur seal was carried out by James G. Swan, a long-time resident of the Olympic coast of Washington. He arrived at Neah Bay on 27 March 1883 to study...the habits of the fur seals of Cape Flattery, in order to ascertain in what respect, if any, they differ from the fur seals of the Pribilof Islands.

The Modus Vivendi of 1891-93

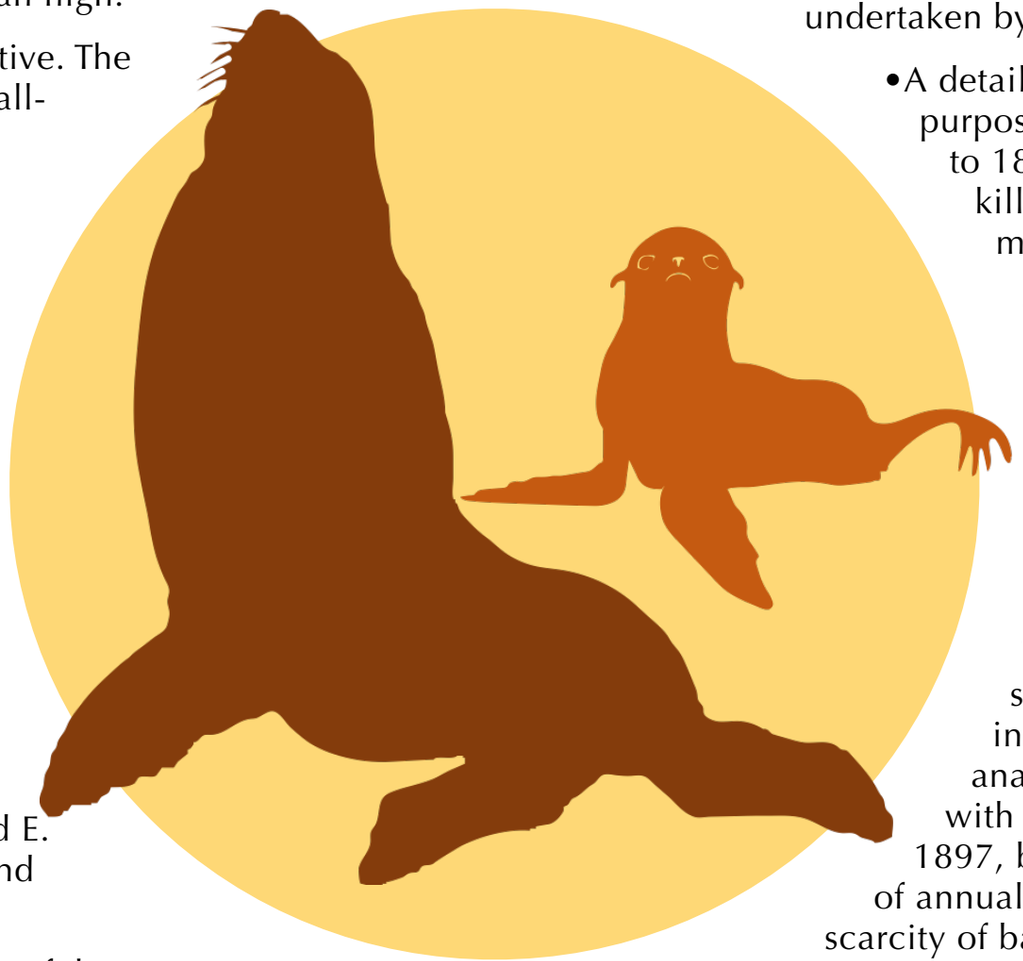
By 1891 the disastrous results of pelagic sealing had become so evident that the governments of the United States and Great Britain agreed upon a modus vivendi (temporary arrangement) on 15 June 1891. It closed the eastern part of Bering Sea to pelagic sealing and limited the killings on the islands to 7,500 annually--the number required by the Natives for food. The modus vivendi was extended to cover the seasons of 1892 and 1893. Its essential provisions were 1) the appointment of a commission to make investigations concerning the habits of the fur seal, pelagic sealing, and the management of the herd on the islands; and 2) the reference of all matters in dispute to a tribunal of arbitration.

The tribunal met in Paris on 23 February 1893 and reached a decision on 15 August 1893. It had been asked, essentially, to judge whether pelagic sealing or land sealing was the cause of the decline of the herd. In a conservative Old World milieu, it decided against most of the claims of the United States and it established certain regulations which would allow pelagic sealing to continue. The regulations were applicable only to citizens of the United States and Great Britain. Meanwhile, Japanese nationals, not being bound by the Paris regulations, began to hunt seals more intensively, even within 3 mi (5 km) of the islands. When, in 1894, the Paris

Fur Seals 1786-1899

regulations went into effect and supplanted the terms of the modus vivendi, the newer ones were seen to be useless. The pelagic take in Alaska waters doubled in 1894 over that of the previous year. American feeling against pelagic sealing ran high.

The Paris regulations of 1893 were ineffective. The reported pelagic kill for 1894 reached an all-time high of 61,838 seals while the kill on land was only 15,033. The United States, therefore, requested Great Britain to consider the revision of the regulations. This request was declined, and in 1896 this country accepted the proposal of Great Britain that the two countries institute independent scientific investigations of the entire matter. The second joint commission visited the Pribilofs in the summers of 1896 and 1897. Its members were, for the United States: David Starr Jordan, Jefferson F. Moser, Leonhard Stejneger, Frederic A. Lucas, Charles Haskins Townsend, George Archibald Clark, and Joseph Murray. Those representing Great Britain were D' Arcy W. Thompson, Gerald E. H. Barrett-Hamilton, James M. Macoun, and Andrew Halkett.



The scope, the personnel, and the itinerary of the investigation of 1896-97 were summarized by Jordan and Clark. Among the results were the following important contributions to fur seal biology:

- The best "census" of seals up to then was prepared in 1897, and a preliminary census for 1896 was refined. The estimates were based on complete counts of harem bulls and partial counts of harem females and pups. The total estimate of Pribilof seals "present at one time or another, season of 1897" was 402,850.

- A critical review of existing rookery maps was undertaken by Moser during 10 days in July 1896.

- A detailed record of all seals killed for all purposes, by rookery and by day, from 1870 to 1897, was compiled by Murray. The total kill for the 28 years was 1,977,337; the mean annual kill was 70,619.

- Anatomical studies of the fur seal were carried out by specialists attached to, or cooperating with, the Jordan Commission.

- The studies by Lucas on breeding behavior and physiology of the seal were especially important. Dissections by Charles Haskins Townsend in 1892 aboard pelagic sealing vessels had brought to light information on fundamental female anatomy. Later studies at sea, combined with Lucas' work on land in 1896 and 1897, brought evidence on the estrus, the fact of annual rather than biennial breeding, and the scarcity of barren individuals.

- The causes of mortality among seals were described and their effects were evaluated. The hookworm *Uncinaria* sp. was discovered. Dead pups were counted on all rookeries for the first time in 1896. The seal louse *Antarctophthirus callorhini* was described by Herbert Osborn. In 1897, upward of 12,000 carcasses of worm-infested pups were collected on Tolstoi and Zapadni and burned. In the same year, large boulders were placed in rows on the sand flats at Zapadni for pups to climb on.

Fur Seals 1786-1899

A theory was then held that hookworm infestation is correlated with sandy "death traps."

- Lucas tabulated the food items found in stomachs of 409 seals taken in Alaska waters. He also described the contents of pup and bachelor stomachs examined on land. Townsend had been the first naturalist to obtain evidence of food habits when, on 2 August 1892, on the deck of the United States revenue cruiser *Corwin*, he opened the stomachs of 33 seals.
- The methods and results of pelagic sealing were summed up by Townsend, at a time when about 100,000 seals were being killed annually at sea. Data on the distribution and migration of seals, obtained during the peak of pelagic sealing, will perhaps never again be surpassed in volume, though certainly in refinement of detail. Townsend's map, based on a total take of 304,713 seals from 1883 to 1897, showed the position of sealing vessels in all months of the year except October and November. The suggestion is often heard that pelagic sealing was, and could be again, a practical method of harvesting fur seals. But Townsend gave counter arguments, among them the difficulty of law enforcement, the unreliable statistics of the kill, the waste through buck-shot-riddled skins, the loss of seals by wounding and sinking, the inhumanity of pups starving on land, and the hazard to men and ships.
- The first attempt to mark seals by hot-iron branding was conducted by Murray (a cattleman from Colorado) on North Rookery in August 1896. Totals of 337 female pups and 11 female adults were branded in 1896 and 7,251 female pups and 118 female adults in 1897. The purpose was to deliberately scar the pelts in order to make them unattractive to pelagic sealers. The program was continued through 1902 on St. Paul and 1903 on St. George. We [Scheffer, et al.] believe that no adults were branded after 1897 A nearly complete record of the female pups, numbering at least 22,833 branded from 1896 to 1903, was compiled by [G. Dallas] Hanna.
- In addition to branding, a second experiment designed to discourage pelagic sealing was carried out in 1896-97. The plan was to round up large numbers of bachelors after the close of the sealing season, to hold them for a month in a corral, and to release them in autumn when the pelagic sealers were leaving the Bering Sea. Conceived in desperation, the plan did not give birth to a management system.
- On 19 August 1896, the sex ratio of pups on Gorbatch Rookery was found to be 246 males, 212 females. Many years later, on 4 August 1950, [K. W.] Kenyon and Scheffer repeated the study, finding 505 males, 495 females.
- Jordan and Clark gave the specific name *alascanus* to the Pribilof seals on account of the slight, though permanent and constant differences from Asian seals. The name stuck until [Leonhard] Stejneger pointed out that it was preoccupied by Walbaum's 1792 name *cynocephalus*. Finally, [Ford] Wilke showed that Asian and North American seals cannot be told apart on anatomical grounds, and the name *ursinus* for the northern fur seal came again into use.

No scientific studies were made from I898 to 1903, inclusive. Walter Irwin Lembkey was [U.S. Fish Commission] agent in charge from 1898 or 1899 to 30 June 1913, during the years when the seal herd was declining to its lowest level in history. He made routine counts of seals but was opposed to exploratory research.

Northern Fur Seal Research and Management, 1900-1939

The following is excerpted material.

On 1 July 1908, Capt. A. W. Baber, of Seattle, took motion pictures at Gorbatch Rookery which he showed in a "biograph exhibition" at the "Eskimo village" concession of the Alaska-Yukon-Pacific Exposition in 1909. These were undoubtedly the first motion pictures of fur seals.

Fur seal pup on Gorbatch Rookery, St. Paul Island. Bureau of Fisheries photo, 1914.

The Department of Commerce and Labor was created by an act approved 14 February 1903. On 1 July 1903 the Alaskan Fur-Seal Service was transferred from the Treasury Department to the new department where it was placed under the immediate direction of the chief clerk, Frank H. Hitchcock. Also on 1 July 1903 the Bureau of Fisheries was created out of the old Fish Commission which had been an independent agency of the Government from its start in 1871. The fur seal service was not, however, immediately placed in the Bureau. David Starr Jordan urged in December 1905 that this be done. George M. Bowers, Commissioner, Bureau of Fisheries, created on 12 January 1909 a "Fur-Seal Board" of five employees.

Throughout U.S. ownership of the Pribilofs, sealing managers have tried with varying effort to take seals of selected kinds. They have concentrated on the 2-, 3-, and 4-yr males, and the fur market has developed on the basis of skins from animals of these ages. Until 1913, however, the managers had no way of knowing the true age of a seal. They killed for size, and a measure of their judgment was disclosed later when the salted skins were graded for size in London. By 1892, and probably earlier, records were being kept in London, not only of grades but also of weights of the salted skins.

From 1904 to 1923, though not in each year, it was the custom to mark a specific number of bachelor seals before, during, or following the killing season. The operation was referred to as "shearing," "clipping," or "branding," though it meant clipping, with sheepshears, a round patch of the pelage from the top of the head. The annual bull count was established as routine in 1904.

In a letter dated 16 January 1906, David Starr Jordan wrote to the President urging that a naturalist be appointed to the Pribilofs. He reiterated that "the fur-seal question is now chiefly, almost wholly, biological". Official reports from the islands indicated that no adequate study was being made of hookworm, changes in harem areas, the bull-to-cow ratio, and other biological matters. Millard C. Marsh, whom we [Scheffer, et al.] may regard as the first "fur seal biologist," was assigned to the Pribilofs in 1906. His main duties as outlined in a letter dated 28 April 1906 were to "census" the seal

population and to investigate pup mortality. During Marsh's first summer on the islands he found no hookworms, though he evidently looked at no more than a dozen pups. He sketched the harem outlines for most of the rookeries and photographed on Ardiguen and Kitovi. He recorded fur seal body temperatures. He assisted in the counting of harem bulls on both islands. The counting of pups was interrupted when pelagic sealers appeared offshore. In order not to frighten the rookery animals into firing range of the sealers, the Government forbade all visits to the rookeries.

Pelagic Sealing

The first successful experiment in weaning silver pups was carried out in 1909-10 by boatswain Thurber on board the revenue cutter *Bear*. Two pups, "Bismark" and "Mamie," were captured on St. Paul Island on 8 and 9 October 1909. They were fed at first on evaporated cream mixed with bits of fish, later on fish alone. They were eventually delivered by boat and rail to the Bureau of Fisheries Aquarium in Washington, D.C., in January 1910. Here they died in 1918.

Japanese and Caucasians on Japanese schooners, continued recklessly to hunt seals in the coastal waters of the Pribilofs. It is difficult now to imagine the tension under which the administrators and scientists on the islands must have lived in the last years of pelagic sealing. In 1908 the watchmen on guard at Northeast Point reported on half a dozen occasions that they had observed the small boats from the schooners to form a line a mile or so in length and, in that formation, advance abreast on the rookery. When close to shore, the occupants of the boats would begin a fusillade with their shotguns, the noise of which would drive off a number of seals from the rookeries and hauling grounds. The boats would then withdraw a safe distance from shore and there pursue and seek to capture those seals which had just been driven off the land by them. In 1908 no attempt was made to count pups on any of the rookeries for the reason that during the latter part of July and early August hardly a day passed that there were not one or more Japanese sealers operating off the rookeries.

[An] important "act to protect the seal fisheries of Alaska, and for other purposes" was approved on 21 April 1910, effective 1 May 1910. It continued the ban on pelagic sealing by U.S. nationals and the ban on killing females and pups on land. It declared the Pribilofs a special reservation for government purposes. Most important, it did away with the leasing system and made the Secretary of Commerce and Labor directly responsible for the Pribilof Islands and the fur seal industry. When the lease of the North American Commercial Company expired on 1 May 1910, the Government took control of sealing.

Walter Louis Hahn

On 24 August 1910, Walter Louis Hahn, formerly head of the biology department at South Dakota State Normal School, arrived at St. Paul Island to be permanent naturalist. He was to "have charge of all matters pertaining to the investigation, study, and management of the fur-seal herd, the blue foxes, and all other life on the islands" and to "give advice to the agent in charge regarding the number of seals and foxes to be killed each season". His duties were to survey the possibility of introducing reindeer, sheep, poultry, muskrats, mussels, crawfish, mink, otter, water lilies, and other useful animals and plants; also to experiment in the artificial rearing of fur seal pup. Heath recommended that "a museum be installed on the islands, containing, so far as is practical, specimens of all the animals and plants. And equally desirable is a library, comprising all works that in any way are concerned with the biology of the country." After the death of Hahn in 1911, Millard C. Marsh, pathologist of the Bureau of Fisheries, was appointed chief naturalist of the Pribilofs.

Fur Seals 1900-1939

Population Recovery

Between 1913 and 1922 the [U.S.] Government developed a new method for processing and selling Alaskan sealskins in the United States. The 1912 catch had been sold in London on 17 January 1913. The 1913 catch was sold in St. Louis by Funsten Brothers and Company on 16 December 1913, representing the first American sale. Processing began at St. Louis in December 1915. The first sale in the United States of processed (as against salted) sealskins was held in St. Louis on 20 December 1916. The Funsten firm went bankrupt in 1920, following a severe depression in the fur market. On 15 February 1921, the Department of Commerce cancelled its contract with Funsten and negotiated a new one for 10 years with the Fouke Fur Company.

On 7 July 1911 a treaty which was to endure for 30 years was signed by representatives of the United States, Great Britain (on behalf of Canada), Russia, and Japan. It became effective on 15 December 1911. It had no formal name but was referred to as "the convention...for the preservation and protection of the fur seals and sea otter which frequent the waters of the north Pacific Ocean. As the year 1912 opened, the fur seal herd was freed from a 30-yr drain upon its breeding stock, especially upon the female element of the stock. It became important therefore to know the exact status of the herd and a full count of the pups was undertaken and successfully accomplished by [George A. Clark, who] had helped with the partial counts of 1896-97 and 1909.

In 1912 he counted 70,035 pups on St. Paul and 11,949 on St. George, a total of 81,984. (When the herd finally recovered, about 1940, the annual pup recruitment had risen to about 530,000.) For 5 successive years, 1912-16, and in 1922, all pups on the Pribilofs were counted. After 1922, the task became too difficult; it was never repeated.

Pelagic sealing had brought death by starvation to thousands of orphan pups on the islands. Now, in the absence of pelagic sealing, Millard Marsh began in 1912 to study mortality factors at the beginning of the new regime.

Osgood, Preble, and Parker

The Secretary of Commerce on 26 May 1914 appointed a commission of three eminent zoologists to visit the seal islands...George H. Parker of Harvard University, Wilfred H. Osgood of the Field (Chicago) Museum of Natural History, and Edward A. Preble of the Bureau of Biological Survey. The three had been nominated by the National Academy of Sciences, the Smithsonian Institution, and the Department of Agriculture, respectively. The work assignment of Osgood, Preble, and Parker was staggering. It was to "census" the Pribilof herd by age and sex components, to evaluate past influences upon it, to evaluate current sealing methods, and to recommend future practices which would lead to restoration of the herd. Other assignments included study of the welfare of the native peoples, the taking of motion pictures for publicity use, and studies of foxes, reindeer, and birds. The more important scientific accomplishments [from their field work included the following:

- Contour maps representing each of the 22 rookeries and showing the approximate locations of harems were printed.
- A method of computing the number of seals in certain age classes, and of computing total herd size, was established.
- Evidence on the effect of pelagic sealing was obtained.
- Measurements of 2-year-olds were first established from marked animals.
- [They] realized that important zoological data – future rates of increase of the herd and survival rates of young seals to killable age – could be obtained from complete pup counts.

Fur Seals 1900-1939

- The team stressed the value of permanently branding a number of 3-year-old males each year in order to ensure a future breeding stock.
- The team pointed out that body length of a seal, from nose to root of tail, on the killing field, is a better index of its age than is skin weight. They designed the first calipers for use in the field.
- At the conclusion of their report, the team noted that "no bibliography relating to the Pribilof fur seals has ever appeared". They met the need with a list of over 200 titles.

The management recommendations of Osgood, Preble, and Parker in 1914 were largely accepted by the Bureau of Fisheries. Under the careful leadership of Ward T. Bower, routine techniques for counting bulls and pups, for measuring rookery areas, for photographing the rookeries, and for estimating the age composition of the annual kill were gradually developed. These tasks fell to the island managers, administrative assistants, storekeepers, or schoolteachers. At the same time, many improvements in methods of harvesting seals and of processing their skins were made. Unfortunately, as we shall point out, no biologists or naturalists were on the scene, and scarcely any zoological research on fur seals was carried on during the 25-year period.

In 1921, two wooden towers with elevated approaches or "catwalks" were erected on the Reef to improve visibility for bull counting. Many other towers have been erected on the rookeries since. Before 1921, the annual bull count had been made from high points on land, from ladders, from portable tripods, and from boats. The bull count first became an annual event in 1904. In 1922 at least 95 percent of all pups on the Pribilofs were counted under the direction of Edward C. Johnston, storekeeper. A full count has not been made since.

[Other] Scientific and Technological Advances from 1915 to 1939

- In 1915 a U.S. [sealskin] industry was born.
- In 1917, Arnold C. Reynolds and G. Dallas Hanna measured the space occupied by breeding seals on the Pribilofs.
- All of the Pribilof rookeries were photographed at the peak of the breeding season in mid-summer 1895 and in at least 5 other years: 1905, 1917, 1922, 1925, and 1948. The first aerial survey of the rookeries was made in 1938.
- Experiments in the use of seal by-products were conducted in 1917 during a wartime economy. Bones, intestines, blubber oil, flipper gelatine, salted shoulders, and other products were examined. The first unit of a reduction plant was built on St. Paul Island in late 1918, to prepare meal and oil from seal carcasses.
- In 1917 dogs were prohibited on the Pribilofs. Further to avoid disturbing the seals, sight-seeing trips to the rookeries and hauling grounds were first regulated in 1920.
- The Fur Seal Treaty of 1911 was slated to be reviewed in 1926. Partly to stimulate public discussion of a new treaty, five concerned naturalists of the American Association for the Advancement of Science formed, on 4 August 1921, a "Committee on Conservation of Marine Life of the Pacific".
- In 1923, the Bureau of Fisheries decided to ensure escapement of males for the breeding reserve by marking and sparing a prescribed number during the harvest. That year, 10,017 seals were marked by shearing or hot-iron branding, or both.
- Nothing had been known of the food habits of fur seals during migration south of the Gulf of Alaska. In the 1930s, four studies were carried on by fishery agencies of the United States and Canada, designed to evaluate the importance of predation by seals upon salmon and other commercial fishes.

Northern Fur Seal Research and Management, 1940-1959

The year 1940 is important in fur seal history for three reasons:

By 1940 or thereabouts, the Pribilof seal herd had reached a population plateau. Limited by its natural environment and by commercial cropping, the herd was no longer able to grow. The fact was not recognized in 1940.

On 23 October 1940, the Japanese Government gave formal notice of abrogation of the Treaty of 1911, on the grounds that the increased number of fur seals in the North Pacific was causing serious damage to its fishing industry. This break eventually led to a better treaty in 1957 containing a provision for a sustained research program.

On 30 June 1940, the U.S. Fish and Wildlife Service was created. As a result, mammalogists and fur seal managers, brought together for the first time in the same Service, were able to take a fresh look at fur seal biology and the fur seal population. Since then (except for the war year 1942), the seal herd has been under continual study by one or more biologists.

A tagged 9 year old male seal weighs in at 415 lb. Victor B. Scheffer, photographer, 1 July 1949.

The *Black Douglas*

With the Fur Seal Treaty due to expire in October, the U.S. Government made plans early in 1941 to investigate the food habits and migration routes of fur seals at sea. The main purpose was to find out how many Pribilof-born seals were wintering in waters off Japan, and what they were eating there. The Secretary of the Interior wrote to the [U.S.] President on 7 March 1941 recommending that funds be made available to support a sea-going vessel, a staff of five biologists, and clerical help. The sum of $290,000 was appropriated on 30 June. When funds were appropriated, the following biological staff was assembled: Victor B. Scheffer (in charge), A. Henry Banner, Kelshaw Bonham, Wilbert M. Chapman, Donald D. Shipley, and Ford Wilke. A 3-masted motor vessel, the *Black Douglas*, was purchased and refitted for pelagic research. When the United States entered World War I1 on 7 December 1941, the vessel

Fur Seals 1940-1959

was given to the U.S. Navy and all plans for pelagic research were shelved.

In 1947, after the war, plans to reactivate the *Black Douglas* and to undertake pelagic fur seal research were laid. In 1947, the *Black Douglas* cruised 17,256 mi (27,771 km) in two trips out of Seattle. The first one took her to the Pribilofs and return, with side trips, from May to August. The second one took her to Attu Island, the westernmost of the Aleutians, from September to November.

The Fur Seal Treaty expired on 23 October 1941. By an exchange of notes between the United States and the Dominion of Canada, a provisional arrangement was made on 19 December 1942, in which the United States was to receive 80% and Canada 20% of the annual sealskin take. A domestic Fur Seal Act embodying all important features of previous protective legislation was signed by the President on 26 February 1944. The provisional agreement remained in effect until 1957. An important feature of the 1944 Fur Seal Act was that it provided for the killing of fur seals "for scientific purposes under special permit issued therefor by the Secretary (of the Interior)". It also required each party to report at the end of each calendar year the number of seals taken for research use, and the data obtained from them.

Wartime

In the spring of 1942, the Aleutian Islands became an active war theater. By military order, the residents of the Pribilof Islands were moved on 16 June and were relocated in Funter Bay, southeastern Alaska. The people were returned in early summer 1944. Fur seal research came to a halt. Wilbert M. Chapman continued for several months to study the bony skeleton of fishes.

1946: A newborn, 9-lb (4 kg) seal pup was placed in a tank of seawater. It swam vigorously for 20 min, disproving a longheld contention that the pup must be taught to swim.

Sealing was resumed in 1943 under a wartime blackout. The take of 117,164 skins, was the largest since the uncontrolled slaughter of the year 1868. Lawrence J. Palmer, a Fish and Wildlife Service biologist with long experience in studies of reindeer, was stationed on St. Paul Island. His main assignment was to record the number of branded male 2- and 3-year-old seals appearing in drives, and from the resulting data, to estimate the total size of each age group.

Up to 1945, no naturalist had described an early fetus of the fur seal. On 16 January 1945 a fisherman found a seal tangled in his net off the Oregon coast. It was delivered to the Marine Mammal Biological Laboratory in Seattle and found to contain a fetus of 372 g. Scheffer and the first of a long series of summer biologists, Norman O. Levardsen, spent the summer of 1945 on the Pribilofs, mainly in collecting, measuring, and photographing material from known-age seals. On 24 and 25 August they placed large tags, larger than either of those used in 1941, on 973 pups on Tolstoi Rookery. The tags were later found to be successful, though at the time of application, they seemed too large.

Fur seals had long been known to have worms. [Charles W.]Stiles and [A.] Hassal were first to identify the stomach roundworm as *Ascaris decipiens* Krabbe, 1878." After examining a collection of

worms sent to him in 1946, [H. A.] Baylis reaffirmed (in 1946) that *Porrocaecum decipiens* (Krabbe) 1878" is the common stomach worm. At time of writing (1965) we [Scheffer, et al.] believe that *Phocanema decipiens* is the only ascarid worm recorded from *Callorhinus* [northern fur seal] in the eastern North Pacific.

Aerial Photography

The first planned attempt to use aerial photography as an aid in counting seals was made on the afternoon of 9 July 1945. At the request of the Fish and Wildlife Service, the U.S. Navy sent an amphibious plane (PBY) from Adak. The aircraft flew at elevations between 300 and 500 ft (90 and 150 m). A photographer shooting through a hatch in the floor of the tail took at least 83 photographs of St. Paul Island rookeries.

The year 1948 marked an important breakthrough in population studies. On the mornings of 14 and 15 July, in brilliant weather, Scheffer and [K. W.] Kenyon flew over all of the Pribilof rookeries in a twin-engine land plane equipped with an F-56 camera with an 8.5-in lens. They photographed the rookeries from directly above, at elevations of 900 to 1,200 ft (275 to 365 m), and at a ground speed of about 90 mph (145 km/h). On photo enlargements, Kenyon estimated the area occupied by breeding animals and pups on each rookery. From counts made on foot the following year of the number of pups on six sample rookeries, he extrapolated to the total number of pups born in 1949, or 580,000.

In July 1949 a useful technique was discovered by accident. Scheffer had extracted and cleaned the teeth of a bachelor seal and was about to photograph them when he noticed four ridges on the root of each large tooth. Could these correspond to the age of the seal in years? Upon examination of known-age teeth, the answer was "probably." Annual ridges up to about the sixth can be counted on the surface of the seal's tooth. In the late 1950s, biologists Abegglen, Fiscus, Roppel, and Wilke perfected a sectioning technique by means of which at least 26 annual layers can be counted.

Early in 1950, plans were made to tap a new source of research information, namely, pelagic sealing by aborigines. The main objective was to investigate the pregnancy rate of females killed on their winter feeding grounds. A sample taken here should, in theory, be more representative of the female class than one taken on the Pribilof "maternity wards." Throughout history, aborigines living along the west coast of North America have been privileged to hunt fur seals by primitive methods. The aborigines (Aleuts and Indians) are no longer primitive and they rarely exercise the privilege of sealing.

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While the need was recognized in 1951 for renewed studies of the Pribilof herd, funds were short and the Fish and Wildlife Service conducted only a modest program of research that year. The old, unsatisfactory laboratory on St. Paul Island was still in use. Its facilities were overcrowded in summer by five collaborators and visiting scientist. Funds being short, only 1,000 seal pups were tagged in 1951. For the first time a plot of breeding ground was marked off as a counting area for estimating pup mortality during summer.

Fur Seals 1940-1959

An attempt to photograph Polovina Rookery, St. Paul Island, from a captive-balloon camera in 1947. Victor B. Scheffer, photographer.

Studies in the Harvesting of Female Seals, 1953-1957

In the early 1950s, biologists concerned with the Pribilof herd realized that it had ceased to grow, yet they were uncertain what changes to recommend in harvesting practice to meet the new situation. They agreed that release of population pressure was called for. One thought was to increase the kill of males by 6% or 7% per annum. Another thought, and the one which was translated into action, called for the killing of females. This proposal would both reduce the herd and correct a possible imbalance of sexes. Steady pressure from the Japanese Government to reduce the herd was still being felt, as it had been in 1941 when the United States cropped an extra 30,000 males. Furthermore, the joint investigation of 1952 had shown that the pregnancy rate of Pribilof seals was low. If due to a low ratio of males to females, some argued, then killing of females would be desirable.

The idea of killing "sacred cows" met resistance at first from the Aleut inhabitants, steeped as they were in the traditions of the islands, and from Fouke Fur Company employees who considered the subadult male Government Alaska Sealskin a "gold standard" among furs. Females were first deliberately killed in 1953 on an experimental basis. The most in a single year, 47,413 were killed in 1957. After 1963 the kill was held to a sustained annual level of about 18,000.

The kill was useful in two ways: it showed that "harem raiding" is a poor way to harvest females and it produced the first good evidence on age, pregnancy rate, and body size among rookery females throughout an entire sealing season. By 1955 the mass of research data including tag numbers recovered from seals, body measurements, and information on reproductive condition, had grown to the point where it called for automatic data processing. Simple Keysort cards were used at first, and in 1957 the IBM system was adopted.

During the 1956 kill, a record was kept for the first time of the color of the whiskers (vibrissae) of females. The purpose was to find an age index which could quickly be spotted on the killing field. The 5-year-old (entering 6th year) was found to exhibit the greatest variability in color; most younger seals having black whiskers, most older ones white.

Scientific studies of the fur seal received new emphasis in 1956. During the summer...the new laboratory on St. Paul Island was occupied for the first time. On St. George Island, a small laboratory was set up in the hospital, pup tagging was initiated, and a summer biologist was first assigned to the island. More tooth samples were collected in 1956 than ever before. Biologists extracted, cleaned, and counted layers on the right upper canine of about 7,000 males and 4,000 females.

Fur Seals 1940-1959

The Three-Nation Investigation of 1952

Canada, Japan, and the United States agreed in 1952 to launch a joint investigation of the distribution and food habits of northern fur seals. The agreement entered into force with respect to the United States and Japan on 8 February, and with respect to Canada on 1 March. The Soviet Government declined [to join] but expressed an interest in reestablishing international arrangements for the conservation of the seals.

Two expeditions were, therefore, organized in February 1952. One using six vessels operated off the coast of northeastern Japan from 19 February to 17 June; the other using two vessels off the coast of North America. Seals were examined by biologists with respect to presence or absence of a tag or marks, the sex, age (determined by tooth-ridge counts), stomach contents, body length and weight, and length and weight of fetus when present.

The investigation showed that three nations can jointly explore the biological bases for a treaty. It provided North American biologists with a chance to develop a pelagic sealing technique which they were later to use on many occasions.

The Four-Nation Investigations of 1958-64

The long-awaited North Pacific Fur Seal Conference opened in Washington on 28 November 1955. Representatives of Canada, Japan, the U.S.S.R., and the United States met to negotiate a treaty to replace the one which had been in force from 1912 to 1941. On 9 February 1957, an Interim Convention on Conservation of North Pacific Fur Seals was signed; it came into effect on 14 October 1957. Its main provisions included the following:

- Pelagic sealing was prohibited except for research purposes.
- A 6-year cooperative research program was set up to determine the measures necessary to achieve maximum sustainable productivity.
- The [U.S. and Soviet] seal harvests were to be shared [with Canada and Japan].
- A four-man commission was established.

Northern Fur Seal Research and Management, 1960s-Onward

1960

1960: Larry R. Nygren successfully fed a captive pup. [He wrote:] "One pup learned to suck warm fur seal's milk from a human baby bottle. The hole in the tip of the nipple had been enlarged to accomodate the thick milk. To my knowledge this was the first successful bottle-feeding involving a captive fur seal pup." Nygren wrote that the pup had been taken by caesarean section in late June or early July and was still alive in September.

On 1 January, the State of Alaska assumed responsibility for its own fisheries, though the Federal Government continued to manage the fur seal industry.

On 7 August, sealing was terminated by the Government on St. Paul Island, partly on the advice of Fouke Fur Company employees who judged that the proportion of "stagy" skins had reached a critical level. In later discussion it was agreed that a few standard sealskins in critical molt should be processed and sent to the Pribilofs for the future guidance of the men responsible for closing the sealing season.

The skulls of 24 bull seals were collected on St. Paul Island in 1960 and were sent to Soviet fur seal biologist Sergei Vasilievich Dorofeev (in 1961). About 1963, bull skulls from Soviet seal rookeries were received in exchange. Dorofeev had proposed to make a systematic comparison of Asian and North American seals

Marine Mammal Species: Northern Fur Seal
Produced by NOAA Ocean Media Center and NMFS AFSC

In 1960 the first recognized post-partum animal that had delivered twins on land was killed on Reef Rookery. She was a 4-yr-old taken in a sealing drive; her pups were not identified. Another female killed was carrying a full term fetus in her abdominal cavity; the placenta was entwined among the intestines. This the only record of ectopic pregnancy.

Fur Seals 1960s Onward

In the summer of 1960, [W. M.] Chapman visited the Pribilofs in order to familiarize himself with research operations, such as tagging, upon which his statistical analyses for nearly a decade had been based. Upon his return, he was in a position to discuss past and future statistical work with a new appointee to the Laboratory. Chapman also developed "a simple model...on the premise that reduced survival [to age 3] is due to pressure on the food supply around the islands which affects the survival of the seal pups in their first year."

W. J. L. Sladen (Johns Hopkins University) began in 1960 a study of upper respiratory infections of Pribilof Islanders. He had been a biologist and medical officer in 1947 and later. His interest soon extended to fur seals; he collected blood samples and biopsies in 1960 and 1961. He isolated *Clostridium perfringens* from seals in 1961; this probably causes enteritis in pups.

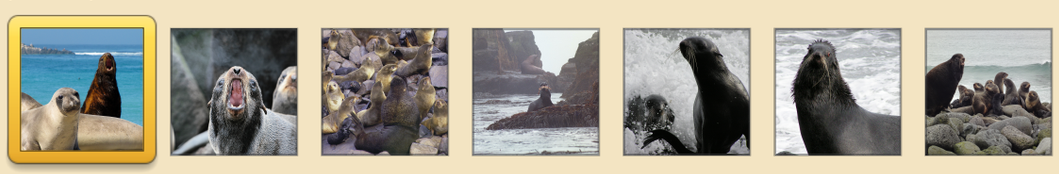
The first of many attempts to anesthetize or tranquilize fur seals for research purposes was made in 1960. The Palmer "Cap Chur Gun," firing a drug-loaded syringe, had been released for sale in 1958 in Georgia. It soon became a popular research tool for wildlife managers. Against fur seals in 1960 it was not a success. Between 1961 and 1964, however, [Richard S.] Peterson and [Mark Chenault] Keyes carried on further experiments in immobilizing seals and were satisfied with the results.

Also at the Pribilofs in 1960 were three Soviet observers representing the first U.S.S.R.-United States exchange of visitors as provided for by the Convention of 1957.

A Breakthrough in the Long and Discouraging Study of Hookworm [Summer 1961].

The stomachs of four seal pups were examined at St. Paul Island in October 1961. The contents included sandfish, walleye pollock, smelt, and amphipods. The sample was small but important; it contributed to our still meager knowledge of the weaning food of the seal.

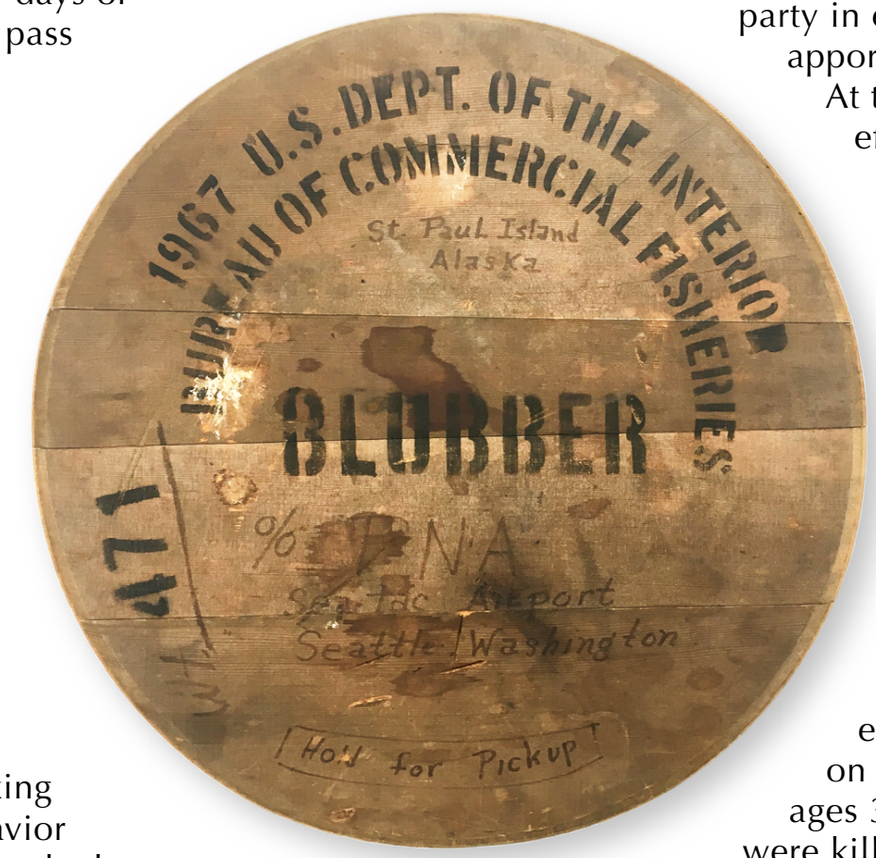
Northern elephant seals (*Mirounga angustirostris*) and an adult male northern fur seal (*Callorhinus ursinus*) on San Miguel Island, California. Eric Boerner (NOAA).



Fur Seals 1960s Onward

[E. T.] Lyons and [O. W.] Olsen found that the fur seal pup gets its initial infection through mother's milk. Larvae wintering over in the rookery soil are not essential in the life cycle of the worm...an egg passed in the feces of an infected pup develops to a third stage strongyliform larva, within its egg case, in rookery soil. In late summer it hatches into a free-living third stage larva. Some larvae penetrate the naked flippers of adult female seals and migrate to the belly blubber and mammary tissue. Others winter over in the soil. In certain years free-living third stage larvae are hard to find in soil in summer or spring. During the first few days of lactation, larvae enter the mother's milk and pass into the intestine of the nursling. In about 2 weeks, or in the latter half of July, the larvae mature in the lower intestine and enter their most destructive phase. This is the only intestinal phase of the worm; it lasts 4 or 5 months, or until autumn. Almost no worms can be found in the intestine in September.

An important 3-year study of the behavior of fur seals on land was started in 1961 by Richard S. Peterson. He was attracted to the problem because fur seals are among the very few mammals in the world whose behavior can be easily observed and documented without disturbance, and [there is] need for knowledge of comparative mammal behavior. He developed new and useful techniques for immobilizing and marking seals, and for defining and categorizing behavior traits. He marked 1,300 seals, concluding that the best method was to shear a pattern in the pelage and follow with a peroxide foam bleach.



In 1961, yearling seals were tagged for the first time, to get evidence on mortality rates from birth to age 1 year and from age 1 to 3. The number tagged was disappointingly low; yearlings were hard to find.

On 8 October 1963 a protocol amending the Interim Convention on Conservation of North Pacific Fur Seals was signed in Washington, D.C., by representatives of the four parties. It entered into force on 10 April 1964. It extended the Convention for another 6 years, or until 14 October 1969. It relaxed certain research requirements such as the number of seals to be collected at sea by each party in each year. It changed slightly the apportionment of sealskins to Canada and Japan. At the request of Japan, it called for study of the effectiveness of each method of sealing from the viewpoint of management and rational utilization of fur seal resources for conservation purposes (and) quality of sealskins by sex, age, and time and method of sealing.

At the close of the 1963 season, a halt was called to "herd reduction," an operation which had been designed to reduce the herd to the level of maximum sustainable productivity. During the 8-year period 1956-63, the herd reduction program on the Pribilof Islands had removed 270,054 female seals. One visible effect was the decline in numbers of females on hauling grounds. Where 16,498 females of ages 3 and 4 year were killed in 1958, only 646 were killed during a comparable period in 1963. In the last year, methods of harvesting and curing had been so improved that over 97% of the female skins taken were cured; fewer than 3% were condemned and destroyed on the islands.

Fur Seals 1960s Onward

Northern fur seals. AFSC photo.

Curing was performed for the first time in history by Government employees. Former employees of the Fouke Fur Company were hired by the Government to train new men in blubbering, brining, and the other operations of curing.

An important pup shearing program, designed to provide an early estimate of the population, was initiated in 1963. Galvanized stakes were set in concrete early in the summer to mark off sample

transects; 21,929 pups were sheared in late July and early August. To obtain an estimate of the population, the marked-to-unmarked ratio in samples of 25 pups was ascertained a week or two after marking. From the results, it was estimated that 229,900 pups were alive at time of shearing on St. Paul Island.

The first general "glossary of terms used in fur seal research and management" was published in 1963. It defined 114 terms. Some of the terms and several new ones were later defined by [A. Y.] Roppel, et al [in 1965]. Ten veterinary terms were defined by [M. C.] Keyes [in 1964].

One or more Fish and Wildlife Service biologists had been studying the fur seal herd almost continuously since 1940. In December 1963 the Service began to publish their research findings in two series of annual progress reports, one dealing with Pribilof studies and one with pelagic studies. The publications were retroactive to the field season of 1962.

Summer of 1962 on St. Paul Island

William G. Reeder and James W. Nybakken (University of Wisconsin) spent 2 wks...making a preliminary study of fur seal vocal patterns, particularly those contributing to mother-young recognition.

The first motion pictures for specific use in television were taken on St. Paul Island...by Warren Garst (Don Meier Productions), starring Marlin Perkins, director of the St. Louis Zoological Park.

Events

Seals to radio their voyages to scientists, 1975

Scientists at the National Marine Fisheries Service's Northwest Fisheries Center in Seattle, Washington, will equip fur seals with sound this summer [1975] to gain more information on their feeding, movements, and behavior.

Harnesses with radio transmitters will be attached to 50 young male fur seals when they return to St. George Island in July. St. George and St. Paul are two of the Pribilof Islands in the Bering Sea used for breeding grounds by approximately 80% (1.3 million) of the world's northern fur seals.

Fur Seals 1960s Onward

Fur seals are harvested each year on St. Paul Island by NOAA under the provisions of the Interim Convention on the Conservation of North Pacific Fur Seals. Commercial harvesting on St. George Island was stopped in 1973 to permit scientists to study a protected population of northern fur seals.

Practically nothing is known about the normal cyclic activity of the young males because they have traditionally made up most of the annual harvest, which normally took place in June or early July. Lack of this knowledge reduces the accuracy of population estimates for young males. A count of these animals on land cannot give the total population because there are always animals feeding at sea and many are as late as October in arriving on the island. The census is further complicated because of differences in behavior due to age and because the ratio of the number of animals on and offshore probably changes because of weather and human disturbances.

The use of telemetry equipment is essential in studying the behavior of young males because, unlike adult males and females with pups, they do not confine themselves to a particular land area, but move readily from one land area to another, and it is difficult to keep an accurate record of their movements.

The transmitters have a range of about one-half mile and will be monitored for a little over 3 months. Each has a different frequency and pulse repetition to permit the scientists to identify the individual seals.

The seals to be equipped with the radios will be between 2- and 5-years-old and weigh 50 to 115 pounds. (Full grown males weigh 400 to 600 pounds.) The harnesses will be recovered from the seals. However, in the event any harness is not recovered, a saltwater corrosion mechanism will release it, and prevent any adverse long term effect on the animal's movement. (From NOAA Week newsletter, 13 June 1975, 6(24), p. 1, 3).

View the fur seal photos in the AFSC Multimedia Gallery

Additional Reading

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See Also

- The Pribilof Islands
- Northern Fur Seal (*Callorhinus ursinus*). National Marine Mammal Laboratory (Alaska Fisheries Science Center) website
- Northern Fur Seal Photo Archive. National Marine Mammal Laboratory (Alaska Fisheries Science Center) website
- North Pacific Fur Seal Treaty of 1911 ("NOAA Celebrates 200 Years of Science, Service, and Stewardship") website

◁ Research and Management

Whale Research and Whaling

Events

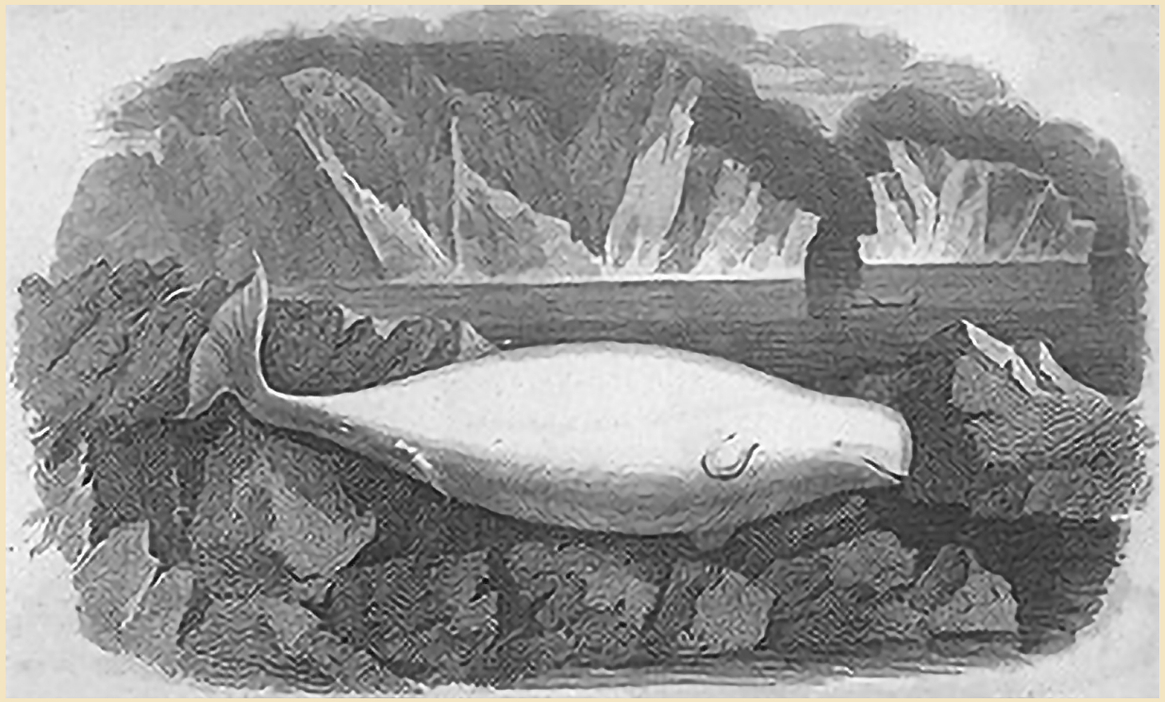
Automated database for North Pacific whaling statistics, 1974

Dr. Michael Tillman and Jeffrey Breiwick completed major steps in the development of an automated database for whaling statistics of the North Pacific Ocean. Breiwick completed placing the catch, effort, and length distribution data for 1972-73 onto data cards.

Tillman finished a preliminary validation of the extensive 1966-71 data set (over 10,000 cards) received from Dr. K. Radway Allen, Chairman, IWC (International Whaling Commission) Scientific Committee. A comparison of segments of this data set with the raw data sheets showed a considerable number of validation problems, the correction of which will substantially delay the formation of an automated database. Consequently, U.S. assessments for the special December meeting of the IWC Scientific Committee at La Jolla, California, will again have to rely on Japanese summaries of raw data from the North Pacific.

Breiwick also completed computer runs of his population assessment model for Antarctic sei whale stocks and is in the process of writing his results. Sei whales are members of the rorqual group, are found in all oceans and are black above, shading to bluish gray. These results will be included in a population estimate of the species for the IWC.

(From Northwest Fisheries Center Monthly Report, Sept. 1974).



Arctic beluga (or white whale). Drawing, 1820.

Computer program for retrieving whale photographs, 1980

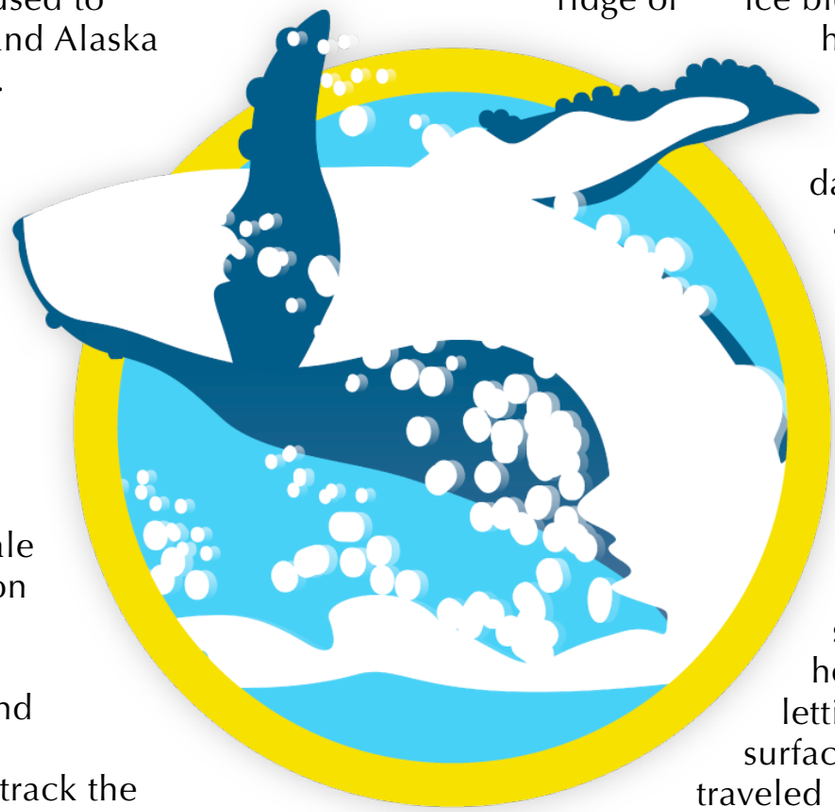
PISAR is the acronym for the Endangered Cetacean Task's Photographic Identification Storage and Retrieval Program developed by Mark Towner and William Lawton. Beginning in the summer of 1976, the group has amassed a large slide collection of photographs of flukes and dorsal fins of humpback whales as well as associated environmental, and behavioral data. These photographs were obtained from studies done by the National Marine Mammal Laboratory as well as contributions from private researchers. The photographs are used for individual identification and location. Current research effort is directed toward delineation of distribution, abundance, and migration of humpback whales in the northeastern Pacific Ocean.

Whales and Whaling

Photographs are identified with a six-digit sequential integer and classified according to 25 variables; i.e., data, location, percent white, extent of scarring, etc. The data for each are entered and stored on a Cyber 6400 computer at the University of Washington, Seattle. DATALIB, a software package available at the University's Academic Computer Center, is used to manipulate the database. (From Northwest and Alaska Fisheries Center Monthly Report, Jan. 1980).

Gray whales rescued in "Operation Breakthrough", 1988

Members of the National Marine Mammal Laboratory (NMML) played important roles in "Operation Breakthrough," the animal rescue effort receiving worldwide attention which freed two gray whales trapped in the ice near Barrow, Alaska, in October.



Dave Withrow and Dr. Jim Harvey, gray whale experts from the NMML, arrived in Barrow on 21 October to join ranks with a rescue team working round-the-clock in near-record low temperatures to save the whales. Withrow and Harvey had arrived prepared to attach radio transmitters to the trapped whales' backs to track the animals if a rescue effort was successful. The two biologists, however, quickly determined that attaching the transmitters was not appropriate because of the whales' sizes, conditions, and surfacing patterns, and because of limited tracking resources.

Withrow and Harvey worked in close collaboration with Rescue Coordinator Ron Morris of the National Marine Fisheries Service Alaska Region. Withrow, Harvey, Morris, and other members of the rescue team brainstormed a list of every possible rescue alternative. These rescue alternatives were then researched and prioritized.

Howard Braharn (NMML Director) and Marilyn Dahlheim (NMML) assisted in researching the rescue alternatives by checking a variety of facts ranging from calculating the whales' weights from their estimated lengths for possible airlift attempts to talking with explosive experts about ways to remove a huge 30-foot pressure ridge of ice blocking the whales path to open water without harming the whales' or other marine animals.

As part of their rescue effort, Withrow and Harvey also monitored the whales' conditions daily. They checked the types and severity of the animals' wounds and recorded the whales' dive times to examine their dive patterns, an indication of the whales' overall condition and degree of stress. They also conditioned the whales to move along a string of breathing holes leading toward open water. Working with Inupiat Eskimo ice crews equipped with chain saws and de-icing machines, the biologists devised a means of teaching the whales to move from hole to hole, by enlarging some holes, increasing the distances between holes, and back filling older holes with ice or letting them refreeze. This allowed the whales to surface more normally and increased the distance they traveled under the ice. The whales quickly learned to follow the sound of the chain saws and de-icing machines, sounds which they associated with help and better surfacing conditions.

NOAA also requested that the U.S. State Department ask the Soviet Government to send an ice-breaker to aid in the rescue effort since the massive pressure ridge was the last, but most formidable obstacle left. The Soviets complied with the request and on 28 October the whales were successfully freed.

(From Northwest and Alaska Fisheries Quarterly Report, Oct.-Dec. 1988).

Whales and Whaling

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One of the three gray whales trapped by sea ice. Dave Withrow (AFSC), photographer.

See Also

- Anonymous. 1989. NOAA Aids Rescue of Gray, Beluga Whales. Mar. Fish. Rev., 51(1):51.
- NOAA's Big Miracle Worker. 2012. NOAA Fisheries Service web page

Pinnipeds and Other Marine Mammal Research

Steller Sea Lions

Ranging from California to Japan across the North Pacific Ocean, Steller sea lions, also known as northern sea lions, are the largest of the eared seals, gathering to breed at over 40 rookeries. They were named after Georg Wilhelm Steller, who first described the species in 1741. Subsistence harvesting of the Steller sea lion provided food, clothing, and skins for sea kayaks. In the 1800s, the whiskers were sold as tobacco-pipe cleaners.

Research on the species increased during the late 1900s. From 1976-1990 the western stock of Steller sea lions declined in numbers, believed to have been brought about by contributing factors such as incidental take in fisheries, poaching, diseases, predation, and indirectly from fishing and climate change. Consequently, the Steller sea lion was listed as threatened under the Endangered Species Act in April 1990 and declared endangered 7 years later. After a slow recovery in their population since the 1980s, the species was relisted as threatened.

Events

Sea lion census, 1977

"The northern or Steller sea lion is the most abundant sea lion in North America, estimated at 200,000 animals, ranging from off California northward into the Bering Sea. The greatest number of these animals occurs from the Gulf of Alaska to the western limits of the Aleutian Islands.

Steller sea lion underwater. AFSC photo.

Few comprehensive studies of abundance and distribution have been conducted on this species, especially on the Aleutian Islands. The eastern Aleutian Islands have been surveyed five times since the late 1950s. Estimates of abundance have ranged from 45,000 to 50,000 during the earlier studies to less than 25,000 in recent years.

Because of proposed action to return management of this species to the State of Alaska and because of pending oil and gas exploration on the continental shelf near the Aleutian Islands, a population study

was initiated in 1975 to more effectively evaluate the status of the stock.

From June 1975 to July 1977, six aerial surveys were conducted, along the eastern Aleutian Islands and north coast of the Alaska Peninsula to determine the distribution and abundance of the northern sea lion. Counts of sea lions on rookeries and haul-out sites were compared with counts made in 1957, 1960, 1965, and 1968.

When these data were rigorously compared to counts from 1975 to l977, a chronological population decline of 40 to 50% over the past 20 years was evident. Factors which may have contributed to the decline are 1) a westwardly shift in distribution, 2) an increase in fisheries interactions in the survey area, 3) removal of pups during commercial harvest, and 4) an, as yet, unidentified population controlling factor."

(From Northwest and Alaska Fisheries Center Monthly Report, Dec. 1977).

Marmot Island northern sea lion research: June 1988 preliminary results

Members of the National Marine Mammal Laboratory (NMML) conducted field studies of northern sea lions, *Eumetopias jubatus*, at Marmot Island, Alaska, 20 June to 6 July 1988. This research was a continuation of work initiated in 1987 to assess the trend in abundance of northern sea lion populations and to devise methods for determining the cause of observed population declines. NMML staff were joined by two scientists from the Soviet Union, Dr. V. Vladimirov (VINRO, Moscow) and Mr. V. Shevljagin (Glavrybvod, Moscow). The cooperative involvement by the Soviet scientists was made possible by a grant from the Trust for Mutual Understanding and administered through the U.S. Department of Interior as part of the U.S.-U.S.S.R. Cooperative Program on Protection of the Environment.

The principal research objectives on Marmot Island were to 1) count the number of live pups, juveniles, and adult sea lions by sex at each beach; 2) test the effectiveness of Telazol as an anesthetic for sea lions and attach radio transmitters to anesthetized animals; and 3) apply brands and flipper tags to pups for long-term survival studies, and monitor animals tagged during 1987.

A total of 3,136 live pups were counted, approximately 200 more than in 1987. NMML staff did not count dead pups during the live pup count since the number of dead pups on the beach at time has no meaning to the overall number of pups that may have died. Dead pups frequently are washed off beaches during tidal cycles or are removed by eagles, foxes, or other scavengers. Field crew members visited all rookeries and haul-out sites on 29 June and using binoculars and spotting scopes counted adult and juvenile animals. The count total was 3,206 sea lions which included 2,221 females, 155 territorial males, 321 other males, and 509 juveniles and "others." The count was less than in 1987 on 13 - June (3,788) and 3 July (3,335), but these differences could be accounted for by varying daily haul-out patterns. Nevertheless, a significant decline in numbers of adults and juveniles has occurred since 1985 (4,9813 sea lions) and 1979 (6,381).

(From Northwest and Alaska Fisheries Quarterly Report, Apr.-June 1988).

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Alaska Red King Crab Research

Alaska red king crab (*Paralithodes camtschaticus*) were exploited as early as the 1930s by foreign harvesting. From 1940 through 1961, a series of bottom-trawl surveys was conducted to determine the biology, distribution, and means of commercially exploiting the red king crab population in Alaska waters.

The first surveys (1940-1949, 1957) were wide-ranging explorations, as well as cooperative arrangements between government research agencies and the private fishing industry, with the intent of identifying crab concentrations and harvest methods needed to create a self-sustaining U.S. red king crab canning industry.

The later surveys (1955-1961) were conducted on a predetermined grid station pattern in the eastern Bering Sea and run by researchers at the Seattle Biological Laboratory, or "Montlake Lab," to monitor the effect of the red king crab fishery on crab populations. Due to large-scale program changes over many years, knowledge of these surveys has been lost to the research community.

Exploratory Bottom Trawl Surveys, 1940-1949, 1957

The primary motivation for launching the Alaska red king crab investigations was to determine the information needed (areas of abundance, crab capture methods, and canning techniques) to develop a domestic crab fishing industry, as it was noted that Americans were purchasing millions of pounds of canned Alaska crab meat taken by Japanese and Russian vessels operating in Alaska waters. The first red king crab exploration was undertaken in the fall of 1940 aboard the *Tondeleyo* and *Dorothy*, and it was completed aboard the *Dorothy*, *Champion*, and *Locks* in 1941.

Alaska red king crab exploratory cruises were discontinued during World War II, 1942–45, but at the end of the war the potential for

King crab caught on the NOAA ship Miller Freeman in 1967. These crabs average 6-8 pounds, of which about 25 percent is edible. Archival photograph by Mr. Steve Nicklas, NGS/RSD. NOAA Photo Library.

harvesting underutilized marine resources reported from the 1940–41 explorations resulted in the government-financed conversion (via the Reconstruction Finance Corporation or RFC) of the *Pacific Explorer* into a factory processor and the construction of four smaller

fishing vessels; the *Alaska*, *Washington*, *Oregon*, and *California*. Part of the vessel lease agreement from the RFC to the Pacific Exploration Corporation (PEC) included allowing government researchers to participate in the cruises. To complement this vessel construction effort, a North Pacific Exploratory Fishing and Gear Research (EF&GR) program was established at the FWS's Montlake Lab in Seattle in 1948. During this era, EF&GR staff participated in three individual vessel cruises in 1947, 1948, and 1949; a 10-vessel fishing cruise with the *Pacific Explorer* factory processor in 1948; and a 1957 exploratory cruise aboard the *Tordenskjold*.

The 1947 cruise was a private venture to catch, process, and freeze Bering Sea red king crab, operated by the PEC using the RFC-purchased vessel Alaska. In early 1948, a fleet of 10 catcher vessels which included the *Bear, Borris*, Dorothy, *Foremost*, *Jeanette F., Kiska*, *Mars*, *Pearl Harbor*, *Sunbeam*, and *Tordenskjold*, in support of the factory vessel *Pacific Explorer*, went to the Bering Sea to catch, process, freeze, and can seafood.

Ownership of the *Washington* was transferred from the PEC to the Montlake Lab in July 1948 through special Congressional funding, which also supported vessel operations. That fall the BCF used the vessel to explore the Norton Sound and St. Lawrence Island area of the northern Bering Sea, complementing previous research farther to the south.

The 1949 cruise was conducted aboard the chartered vessel *Deep Sea*, another RFC venture operated by Lowell Wakefield's Deep Sea Trawlers (later called Wakefield Seafoods). The northern Bering Sea and Norton Sound area were finally explored on this cruise in the relatively good weather of summer, but found only 115 red and blue king crab in 51 tows.

The *Tordenskjold* was chartered with Saltonstall–Kennedy Act funds in 1957 to explore for commercial quantities of red king crab in the region from Davidson Bank to the Shumagin Islands because of large red king crab catches in Pavlof and Canoe bays taken during the 1940–41 exploration, during the spring of 1948 by the Pacific Explorer fleet, and during the fall of 1948 by the *Washington*. Despite prospecting with a bottom trawl, a shrimp trawl, and king crab pots, no large quantities of red king crab were found.

Monitoring/Gridded Surveys 1955–61

The era of long-term monitoring and grid-patterned red king crab bottom trawl surveys, designed for abundance estimates and stock monitoring, began with strong international cooperation. The International North Pacific Fisheries Commission (INPFC) was established in 1952 and initiated a cooperative U.S.–Japan red king crab monitoring program in 1954 (INPFC, 1954a) out of concern that the stock was already being fully exploited in the Bering Sea.

The first trawl survey with preplanned stations was conducted aboard the *Tordenskjold* in the summer of 1955 working on a 26-station (INPFC, 1956) diagonal grid (14' latitude by 25' longitude intervals) covering the southeast Bering Sea between Amak and Port Moller. With the addition of a 27th station placed near Amak Island, the same stations were trawled by the Tordenskjold in 1956 in two rounds, 9–20 July and 20 Aug.–1 Sept.

The *Mitkof* was chartered for the 1957 survey, which initiated a new, square-gridded station pattern with stations at intervals of 37 km (20 nmi). This station pattern, with rows designated by letters and columns designated by two-digit numbers, is still used today (2008), but the reason this new station pattern supplanted the 1955–56 station pattern is not documented.

The *Tordenskjold* 1958 survey essentially replicated the 1957 survey, except that tows were increased to 60 min duration and there were two rounds of trawling, 29 April–3 June and 8 June–11 July. In 1959, the *Tordenskjold* was chartered again for the red king crab survey. Round 1 of trawling, 2–19 May, which occupied only the western two-thirds of stations due to rough weather, consisted of 60-min tows. Round 2, 2–20 Aug., was a dedicated tagging cruise, in which

repeated trawls for 30 or 60 min were made in a few locations, such as off Unimak Island, to meet a tagging quota.

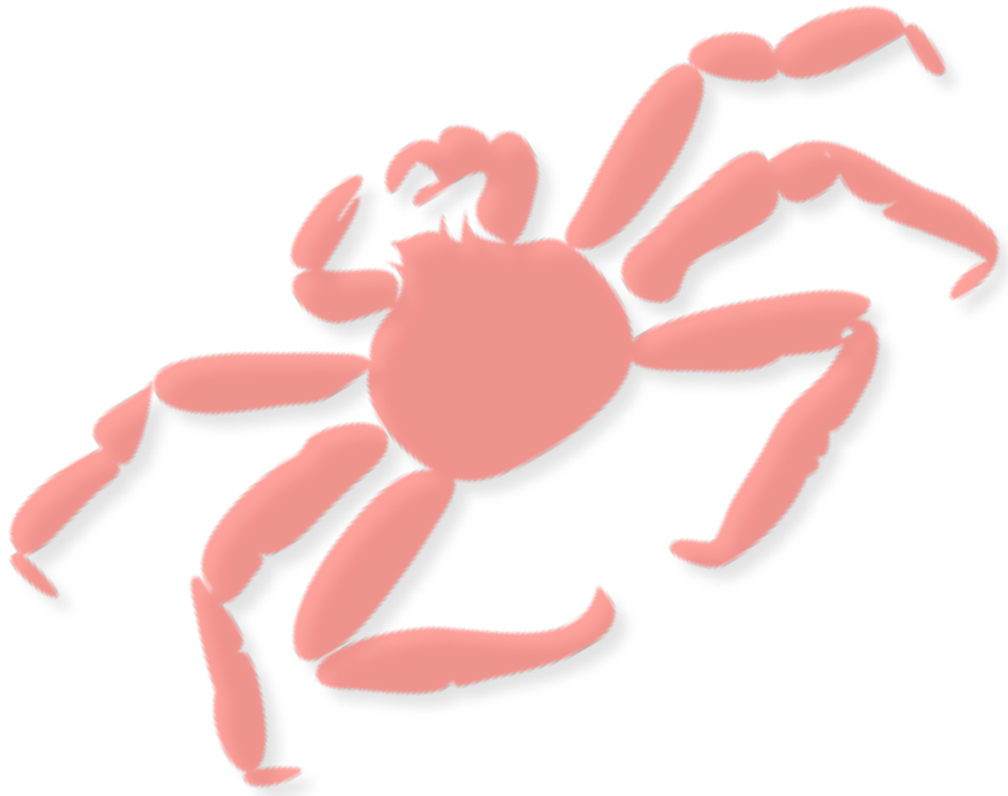
The *Paragon* was chartered for the 1960 and 1961 surveys, each of which conducted 60-min tows in a single round. The surveys in both years were intended to cover a greater geographic extent so that the western, northern, and eastern red king crab distribution limits in the Bering Sea would be defined, but, in retrospect, this effort failed to completely encompass the bounds of the red king crab distribution.

Conclusion

Large-scale changes in the 1960s and 1970s in the fisheries research organizations involved in the Alaska red king crab program led to disruptions in the Bering Sea bottom trawl survey. Following Alaska statehood in 1959, an EF&GR base was established at Juneau, Alaska, in 1960 and the responsibilities of the Seattle EF&GR base concerning Alaska commercial fisheries, including the Alaska Crab Investigation Program, were transferred to Juneau, although only two of the Seattle staff made the move north. The 1961 red king crab survey was the last conducted by staff at Montlake, and the 1966 *Sonny Boy* king crab survey was the first by the staff at Auke Bay, but these data sheets have not yet been located. The Juneau EF&GR lab was moved again, to Kodiak in 1970 along with the Oregon. Annual Bering Sea bottom trawl surveys were conducted by Kodiak staff aboard the Oregon from 1971–80.

In 1975, the Seattle-based Marine Monitoring, Assessment and Prediction program (MARMAP), in coordination with the Bureau of Land Management's Outer Continental Shelf Environmental Assessment Program (OCSEAP), conducted the largest Bering Sea bottom trawl survey in terms of areal extent to date. A follow-up survey in the spring of 1976 also covered a vast area. Together these surveys became recognized as the beginning of a new research program rather than the continuation and expansion of the earlier red king crab surveys, perhaps because the Kodiak Laboratory was still conducting Bering Sea red king crab bottom trawl surveys on the Oregon. Thus, the official start of the current Bering Sea trawl survey time series is 1975, and the title of that trawl survey report includes the phrase "In the baseline year of 1975," even though the gridded trawl surveys of 1955–61 are briefly mentioned in the text. Knowledge of the 1940–61 surveys and the findings of the biological sampling programs have been lost to the research community and largely forgotten.

From: Zimmermann, M., C. B. Dew, and B. A. Malley. 2009. History of Alaska Red King Crab, *Paralithodes camtschaticus*, Bottom Trawl Surveys, 1940-61. Mar. Fish. Rev. 71(1):1-22.



Snails, Shrimp, Clams, and Other Invertebrates Research

Snails in the Eastern Bering Sea, 1970s

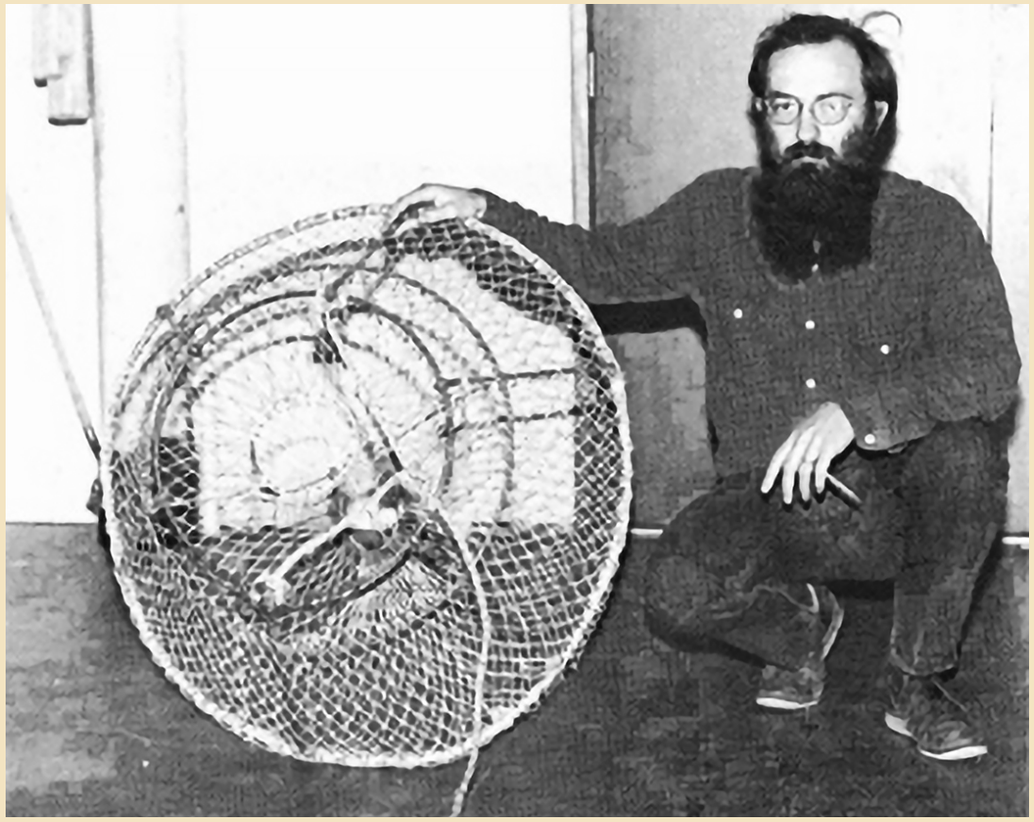
Fish and crab resources are well known and have long been exploited by many fishing nations; potential resources, like eastern Bering Sea snails, are virtually unknown. Several species of large snails occur in relatively high abundance in Alaskan waters and offer considerable fisheries potential.

Japan has harvested snails in the eastern Bering Sea since the early 1970s (at least 1971) and there is potential for the development of a U.S. domestic fishery as well. Numerous trawl surveys have been conducted in the Gulf of Alaska, but very little attention has been paid to the snail resources of the area.

During the summer and fall of 1975, the Northwest and Alaska Fisheries Center of the National Marine Fisheries Service (NMFS) conducted a comprehensive trawl survey over 566,000 km2 (218,600 miles2) of the eastern Bering Sea shelf and upper slope. This survey was designed to identify principal demersal fish and shellfish communities of the eastern Bering Sea which could be affected by development of continental shelf energy sources.

Data on fish and epibenthic invertebrates were gathered from several hundred locations with a modified 400-mesh eastern otter trawl. The resulting data offered significant insight into the population and biological characteristics of numerous species of snails.

Until 1977, the number of vessels involved in the fishery was unknown. In some years, the Fisheries Agency of Japan licensed 21 vessels but it is unlikely that all of these vessels actually took part in the fishery. Patrols of NMFS in the eastern Bering Sea observed only



Snail pot used by the Japanese fishery in the eastern Bering Sea. Photo from MacIntosh, 1980

14, 5, 0, and 6 vessels fishing snails in the years 1971 through 1974, respectively, and no vessels in 1975 and 1976.

The 1978 season began in May and ended in November. There was a considerable increase over 1977 in both effort and catch, with about 2,200 t of snail meats taken in about 760-vessel days (average 2.9 t/day). Fishing effort peaked in August when nine vessels fished northwest of the Pribilof Islands.

Invertebrates

A quadrant is used to sample sea urchins, ca. 1960. Ted Merrell, photographer.

Fishing gear consists of pots fished at intervals on a groundline. Little is known about Japanese fishing techniques, but in 1973 one vessel fished about 6,000 pots on 12 groundlines (500 pots/groundline) and took 3 days to pick and re-bait the entire set of gear.

All processing of the snail catch now [1980] occurs on board the catcher vessel. This consists of crushing the shells, briefly cooking the meats, and removing any soft parts and shell fragments. The meats are graded by size and quality and quick frozen in trays. Small snails in the catch may be frozen whole.

Although there has been little progress toward a domestic snail fishery in the Bering Sea, seafood processors have made several recent attempts to initiate fisheries in other parts of Alaska. In Prince William Sound, as in many other areas of the Gulf of Alaska, snails are regularly taken in crab pots despite the large mesh used.

[As of 1980,] the prospects for rapid development of Alaska's snail resources are uncertain. Snail stocks in the Gulf of Alaska are essentially unexploited and eastern Bering Sea stocks may well be underexploited. Domestic fishermen and processors have expressed interest in the Alaskan snail resource, but their future involvement is more uncertain than the future involvement of Japan. The rapidly expanding and highly profitable king and snow crab fisheries are currently dominating domestic fishing activities in the area.

While crab vessels would be well suited to snail pot fishing, most crab fishermen are looking at Gulf of Alaska and eastern Bering Sea bottomfish stocks as an alternate or supplemental activity. Attempts to initiate a snail fishery in the Gulf of Alaska have not been productive to date [1980]. They have been exploratory in nature but show promise as potential off-season operations in the next few years. As in the eastern Bering Sea, the resource and harvesting capacity now exists. Innovative processing and marketing techniques as well as continued increase in the value of the traditional frozen meat product will be necessary conditions for the initiation of a domestic snail fishery.

From sections of: MacIntosh, R. A. 1980. The snail resource of the eastern Bering Sea and its fishery. Mar. Fish. Rev. 42(5):15-20.

Shrimp

In the early 1920s, opinion varied as to the biology, movement and location of shrimp schools in Alaska. In 1924, preliminary studies were conducted by the Bureau of Fisheries on the potentiality of a shrimp fishery in southeastern Alaska. Regulations at the time prohibited commercial fishing for shrimp in March and April throughout the region. The need was expressed for more efficient

shrimp catching apparatus and improved gear for use on rough and rocky sea floors where other trawls could not operate successfully.

Clams

Resources in Alaska were actively utilized by early 1920s. As a result, some of the more productive beds were quickly being depleted – in Cordova, intense clam digging and canning had taken place since 1916. From 1923-24, an investigation of clam resources and biology was conducted. It showed that in comparison with clams on the Washington coast, Alaska clams were fewer in number and grew significantly slower, requiring about twice the time to reach a marketable size. Alaska clams also less resistant to heavy fishing and slower to return to productivity when depleted. In 1924, regulations were established limiting the take of clams with less than 4.5-inch shells first to 5% of the total taken, then to 3% by the end of the year.

Oysters

In March 1932, as an attempt to establish an additional food source, the Bureau of Fisheries vessel *Murre* and her crew assisted B. E. Smith of Ketchikan in transporting and planting approximately 300,000 seed oysters of the Japanese variety in waters of the southern district of Southeast Alaska.

Additional Reading

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Damkaer, D. M. 1999. A Century of Copepods: the U.S. Fisheries Steamer *Albatross*. Mar. Fish. Rev. 61(4):69-84.

MacIntosh, R. A. 1980. The Snail Resource of the Eastern Bering Sea and its Fishery. Mar. Fish. Rev. 42(5):15-20.

Large weathervane scallops (*Patinopecten caurinus*) on the MV *John R. Manning* in the Gulf of Alaska. NOAA Central Library Historical Fisheries Collection photo. NOAA Photo Library

Federal Hatcheries

Early Federal Salmon Hatcheries in Alaska

In the late 1800s some of the Alaska cannerymen recognized the need to artificially repopulate the salmon runs that were being threatened by the many canneries in operation. In addition, the 1889 federal Fisheries Act (amended in 1900) "required each person, company or corporation to establish a fish hatchery near their fishing operation and to produce 'four times' the number of mature salmon taken during the fishing season." (U.S. Forest Service).

As a result, several canneries in the Karluk area of southeastern Kodiak Island collaborated to build a hatchery on the Karluk River lagoon in 1891. The lack of good water, decent equipment and experience resulted in the hatching of only one-fifth of the 2.5 million eggs taken in. The next year the station closed due to operational disagreements among the parties involved.

Much credit is due to Captain John C. Callbreath (1826-1916), a local cannery manager and long-time Alaska resident who had realized that the abundant salmon supply would eventually diminish. He built a crude hatchery in 1892 on Kuiu Island, which unfortunately lost the eggs collected that year to an exceptionally high tide. Having also lost his nearby cannery to a fire only a few months earlier, Callbreath relocated to Etolin Island in Southeast

Fortmann hatchery built in 1901 on Heckman Lake. Bureau of Fisheries photo, 1914.

Federal Hatcheries

Alaska and built a red salmon hatchery in 1893 on a stream at the head of McHenry Inlet – it was soon moved to a more suitable site on a nearby lake.

Dams were constructed across the stream to prevent spawning humpback salmon, dog salmon, and any other undesirable species from entering the lake. The red and coho salmon that reached the base of a dam through trap openings in the rack downstream were lifted over the dam with hand-held dip nets to the pools above from where they could continue on to the lake.

Callbreath conducted extensive experiments on artificial spawning involving fertilization methods with milt. His hatchery remained in operation nearly 20 years before it was forced to close when both Callbreath's funds and eyesight failed him.

Additional reading and photos: Callbreath Hatchery p. 302-308. In Moser, J. F. 1902. Alaska Salmon Investigations in 1900 and 1901. Bulletin of the United States Fish Commission.

Other low-scale cannery-owned and private hatcheries sprang up in Alaska until the mid-1890s when the first significant plant was built (Karluk Hatchery, see bullet below). Into the 1900s criticism grew concerning hatchery matters such as the high salmon mortality rates and outdated, ineffective propagation methods (i.e., the locations chosen for planting fry). In addition, to help offset the canning taxes, the U.S. Government began paying rebates based on the number of fry planted, without consideration to their condition or survival rate. Another concern was the ease of falsifying records, since hatchery inspections were infrequent.

Federal Hatcheries

On 3 March 1905, a sundry civil bill was passed by Congress which appropriated $50,000 for the U.S. Bureau of Fisheries (BOF) to construct and operate salmon hatcheries in Alaska. Potential building locations were evaluated and narrowed to three: the lower Wood River in Bristol Bay, Afognak Island in the Gulf of Alaska, and Yes Bay in southeastern Alaska. Two sites were soon chosen for establishing the federal hatcheries; first at Yes Bay in 1905, then at Afognak Lake (Afognak Island, central Alaska) in 1907 (completed in 1908). While there had been several non-government hatcheries in Alaska over the previous 15 years, only the following three were still active in 1906 when the Yes Bay plant was operational:

- Karluk – In May 1896, the Alaska Packers' Association (APA) began work on Alaska's first large hatchery near the outlet of Karluk River located on the southwestern part of Kodiak Island. Initially capable of holding several million eggs, the plant grew each year, reaching a capacity for about 40 million eggs by 1905. To hasten the incubation of eggs, a unique, but short-lived, experiment was tried in which a furnace and pump were used to raise the water temperature at the plant. Eventually, as more was known about fish culture, it became apparent that because of its location and fish culture methods, the Karluk hatchery was overall ineffective. It was closed in 1916.
- Klawak – The North Pacific Trading and Packing Company built a hatchery in 1897 near the head of Klawak stream by Klawak Lake on Prince of Wales Island. The 50-foot long building contained 8 hatching troughs. That fall, less than 40% of the sockeye eggs taken actually hatched. The next year the hatchery was dismantled and rebuilt at a more desirable location three miles away on Threemile Creek. In 1916, the number of eggs taken (8.16 million) reached the hatchery's capacity. The station was closed the following year, primarily because a superintendent could not be retained.
- Fortmann – The APA-owned Fortmann Hatchery was built in 1901 on Heckman Lake, about 25 miles north of Ketchikan. The station, with a capacity of 110 million eggs, was the largest and most expensive in the world. In January 1907, nearly all of the 6 million eggs collected were lost to excessively cold temperatures. An important part of the salmon-culture work at the station was in

Federal Hatcheries

minimizing the risks to salmon and their eggs. In 1907, the Fortmann hatchery removed 40,000 predatory sculpins ("bullheads") using baited traps, and dynamited nearby pools to eliminate trout prior to planting fry in nearby Naha stream. An experiment in 1908 attempted to provide additional food for salmon fry by propagating plankton within cow manure. During its record brood year in 1911, the hatchery released just over 100 million fry from the 107.5 million eggs taken. Because of insufficient funds, the successful Fortmann hatchery closed in 1927.

The federal Yes Bay and Afognak hatcheries grew and by 1911 their combined total capacity was 144 million red salmon eggs, compared with 189 million for the five private stations in operation. Fish culture work at the two government hatcheries continued for over 20 years until their closures in 1933-1934. Two years later, the last of the cannery-owned hatcheries also closed.

Federal salmon hatchery built in 1907 on Afognak Lake. Bureau of Fisheries photo, 1919

At this time the focus of controlling Alaska's salmon supply was in the regulation of fishing rather than artificial propagation. With the exception of an experimental BOF hatchery at Little Port Walter, the interest in salmon enhancement ("aquaculture") projects wasn't renewed until 1951, at which time new hatcheries and research stations began to emerge.

The U.S. Bureau of Commercial Fisheries (1956-1969) made significant research in fish culture – especially in the development of easily attainable nutritious and transportable fish food – at its Auke Bay Laboratory facility in Alaska, which opened in 1960. Since then, only state-run salmon hatcheries were in operation until the mid-1970s, when new legislation allowed non-profit privately owned hatcheries to open. With 1976 legislation, aquaculture associations representing local fishing and community groups were created as active participants in regional salmon enhancement programs – many of these associations operating hatcheries. More recently, controversy exists concerning the ecological and health effects of intensive salmon aquaculture.

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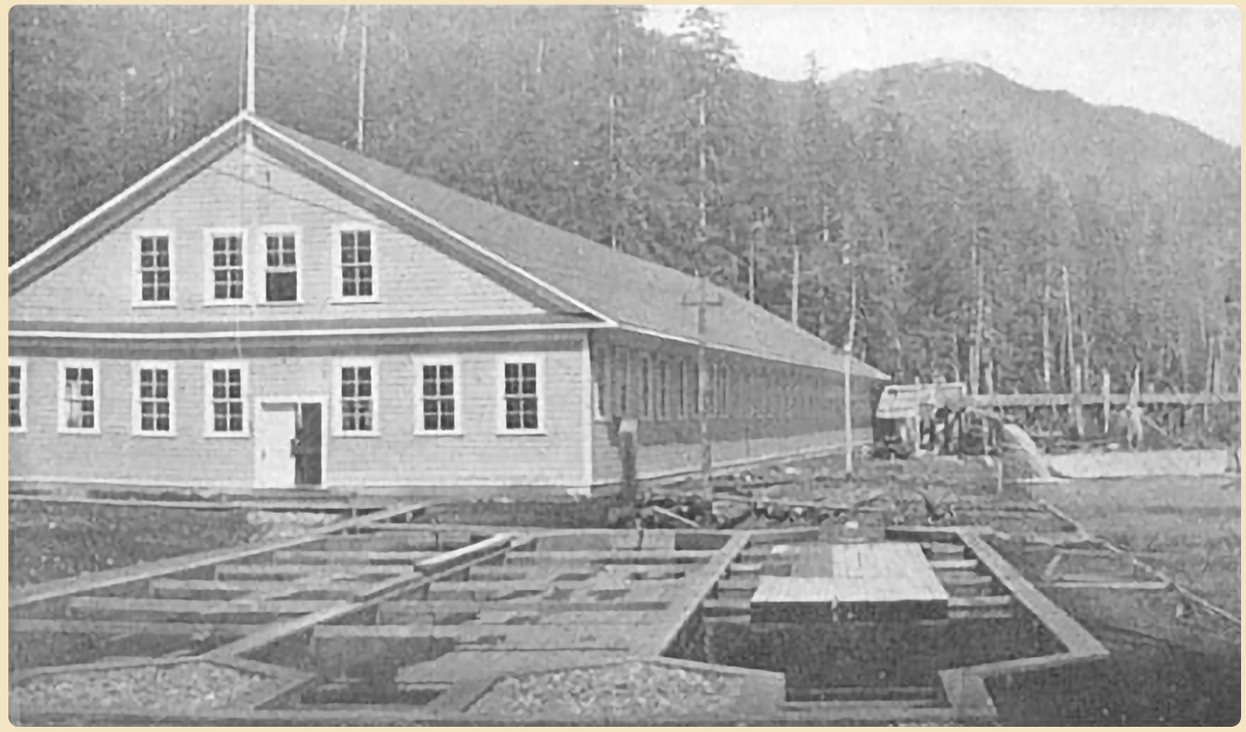
Yes Bay

Yes Bay/McDonald Lake Hatchery

On 1 February 1906, a Presidential Proclamation allocated approximately 55 square miles in Southeast Alaska as a Bureau of Fisheries (BOF) hatchery reserve for fish propagation. In addition to land, the site consisted of Yes River that flowed into the bay; the river's large source, Yes Lake (later becoming McDonald Lake); and a principal tributary, Walter Creek (renamed Hatchery Creek), with a falls for supplying water and power. The location also was near established transportation and mail routes connected to Ketchikan, only 45 miles away – a town which could provide labor, lumber from its sawmill, and seagoing transport, since the town was a major port in the region.

The initial construction challenge in 1905 was that of creating a one-half mile long overland tramway connecting saltwater Back Bay with McDonald Lake. The tram, which was used throughout the life of the station, allowed supplies from the bay to be taken overland to the lake where they could be hauled by barge to the hatchery.

The tram project was followed by the creation of a water system, in which an elevated wooden plank flume (or chute), over three quarters of a mile long, was built to carry 4-5



Yes Bay salmon hatchery and rearing ponds. Bureau of Fisheries photo, 1919.

Yes Bay

thousand gallons of water per minute from the base of the falls to the hatchery. Prior to completion of the hatchery building in early 1906, the flume served as a temporary incubator that held baskets containing 7.44 million sockeye eggs taken from a large salmon run the previous September. It quickly became obvious that the winter freezing of the water system was a significant problem – ice had to be chopped out of the flume by hand. For years, the hatchery's superintendent from 1907 to 1915, H. A. Hancock, unsuccessfully lobbied Washington D.C. to fund a pipeline, which was eventually built in 1920.

The building site for the station was selected about one quarter mile upstream from the lake. A major problem, however, was its susceptibility to flooding, which at times became both a hinderance and a threat to the eggs and fry. H. von Boyer, a BOF engineer and architect, designed the hatchery, which used troughs sized and configured similar to other U.S. Bureau hatcheries. The construction was supervised by Claudis Wallich, who had experience managing the Clackamas, Oregon, hatchery in Oregon. In addition to the hatchery building, a steam-heating plant, workers quarters and messhouse were also added. Within a year the cost for the station was just over $25,000.

In May and June 1906, over 6.6 million sockeye salmon fry were released, which was 94.4% of the eggs taken. In the following year, the number rose to 54.6 million (released 12-21-06 to 5-31-07). By 1925, the hatchery's capacity had grown to 72 million eggs. Fishing was prohibited at all times on the reserve, except when salmon counts exceeded the hatchery's capacity.

Several additional improvements to the buildings and equipment were made in 1913-14. This work included the construction of an electric lighting plant, three 12-foot by 60-foot salmon-rearing ponds, and 160 hatching troughs that were immediately put into operation.

Years later, in 1920-1921, the hatchery's deteriorating buildings and equipment required extensive repairs to the extent that no eggs were collected locally and only a limited number from outside were brought in for incubation. Using the hatchery's yearly appropriation, these restorations and improvements included new building foundation timbers and flooring, 240 new hatching troughs with a 196-foot supply trough, the new pipeline water-supply system, and various property renovations. Extensive work was done again in 1927.

Following a visit from the Commissioner of Fisheries, the Yes Bay hatchery was ordered to be shut down in July 1933 – about the same time as the Bureau's Afognak hatchery. Over the next year, the station was dismantled and abandoned. Barges and ships hauled away the equipment, most of which going to the Pribilof Islands facility or other Bureau hatcheries. In 1935, President F. D. Roosevelt revoked the earlier "reserve" designation of the land, which then became part of the Tongass National Forest. What remained of the Yes Bay station was transferred to the U.S. Forest Service and made into a Civilian Conservation Corps camp.

Additional accounts and photos from 1914 of Yes Bay and other hatcheries are found on p. 74-92 in: Jones, L. E. 1915. Report of Alaska Investigations in 1914, 155 p.

Additional Reading

Roppel, P. 1982. The Federal Government Hatcheries (Ch. V): Yes Bay Hatchery, p. 193-216. In P. Roppel, Alaska's Salmon Hatcheries 1891-1959. U.S. National Marine Fisheries Service, Portland, OR., 299 p.

Alphonse Kemmerich's Remarks About Yes Bay, Alaska (with pictures taken by Alphonse and Pauline Kemmerich). Parts 1-5. (Halliday family) website

Afognak Lake

Afognak Hatchery

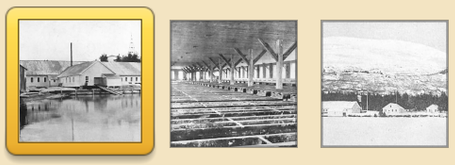
Shortly after the Bureau of Fisheries' (BOF) first hatchery at Yes Bay/McDonald Lake was built, construction on a second one began at Afognak Lake (or Litnik Lake), on Agognak Island in central Alaska. It became partially operational during the 1908-1909 season, however, the light run of sockeye salmon that year yielded 46.3 million eggs, well less than the 76 million taken in the following year.

An 85-foot long, 16-foot high dam was erected above the rapids of Hatchery Creek, which provided a continuous water supply. Since the dam also prevented fish from continuing upstream, salmon were caught by seining at the creek's opening, then later by the use of several seines and racks located at the lake's headwaters.

In 1911, dynamite was used to create a fish ascent runway in the falls of Afognak River. To facilitate the counting of salmon entering the lake, a rack was also built across the river. That same year, an experiment was conducted to determine the ideal ripeness for producing the highest quality eggs.

For 3 days in June 1912, the eruption of Mount Katmai dropped 3-10 inches of ash over Afognak Island. Salmon

The Afognak hatchery eventually became a recreation center for the U.S. Navy until the end of the 1960s. Bureau of Fisheries photo, 1914.



Afognak Lake

were either forced back to deeper water or had perished in the streams and lakes that were clogged with mud and volcanic deposits. BOF Agent E. M. Ball reported that at the lake's head, 8,000 to 10,000 fish were killed (an unknown number were covered in ash) and 4,000 had died at the lake weir. At the hatchery ash had accumulated in the troughs, and over the next two seasons both eggs and fry were lost to suffocation.

A significant drop in the amount of eggs taken was experienced over the next 4 years. In spring of 1913, the streams were still subjected to the ash from rain and thawing snow. Ball felt, however, the low salmon count was due essentially to the commercial fishing in the area that was restored in 1912. In 1917, the numbers were back to over 50 million.

In 1913, two temporary experimental field stations, with hatching troughs, and additional counting racks were constructed nearby at Eagle Lake and Uganik Lake. The locations proved undesirable and were not used beyond the next year.

To rehabilitate the Afognak Lake salmon runs, sockeye and pink salmon eggs were taken in 1914-16 from a favorable site at Seal Bay, on the island's northeast coast, and transferred to the Afognak hatchery. Eggs were also brought in from the Yes Bay hatchery in 1915. These transfers were discontinued in 1917 when the runs at the lake greatly increased.

Operations at the Afognak hatchery continued throughout the 1920s. In 1920, a weir/rack was constructed across the Afognak River for counting the returning sockeye salmon to ascertain if commercial fishing should be allowed in Afognak Bay. In May and June of 1921, a disease epidemic resulted in a high loss of eggs. This was thought to have been caused by a reduced vitality in the parent fish (passed on to the eggs and fry), brought about by unusual low water during the previous summer, when the eggs were taken. In 1924, the station was closed for repairs due to diminished salmon runs in the previous year and extensive storm damage (e.g., much of the protective waterfront bulkhead lost, the boathouse destroyed, the 100-foot wireless tower ruined, uprooted trees).

As was the fate of the Yes Bay Hatchery, Afognak was closed after 1933 "owing to economy requirements and some question as to the value of operations" (Leach, 1934 *). The station eventually became a recreation center for the U.S. Navy until the end of the 1960s.

Leach, G. C. 1934. Propagation and Distribution of Food Fishes, Fiscal Year, 1933, p. 451-484. In Report of the Untied States Commissioner of Fisheries for the Fiscal Year 1933. Wash. G.P.O. 484 p.

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Accounts and photos from 1914 of Afognak and other hatcheries, p. 74-92. *In* Jones, L. E. 1915. Report of Alaska Investigations in 1914, 155 p.

Fisheries Management

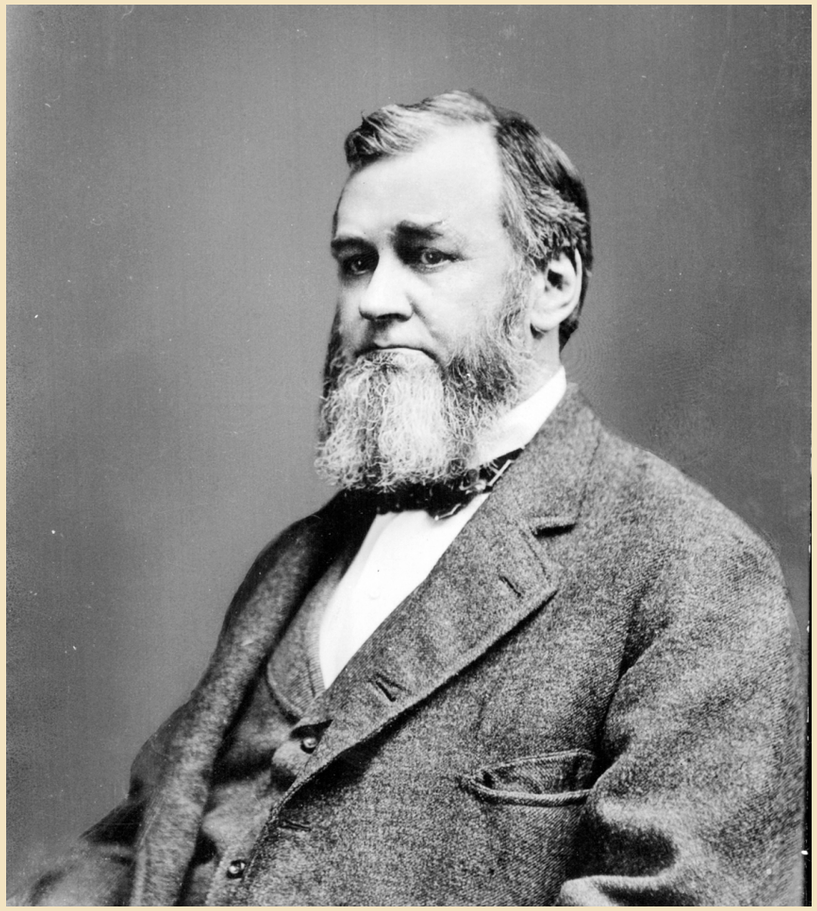
Fisheries Management

The following material is excerpted.

Basic [fishery] research began, in North America as well as in northern Europe, in the middle of the last century [1800s], and was stimulated by the age-old role of fisheries in society. The fisheries of eastern North America had been the magnet that attracted daring seamen from Scandinavia and southwestern Europe nearly a millennium ago and remained as one of the primary resources for the people of eastern North America until after the establishment of this laboratory. They were vital to the early settlers because they provided profitable employment and winter food before the settlers could be sustained by farming. This kind of role is not unlike the roles of the fisheries in many of the lesser developed countries in recent times.

By the middle of the nineteenth century some of the fishery resources had already declined by alarming amounts, as they had in the Northeast Atlantic, where the causes were hotly disputed. Trout culture had started as a business, both in Europe and North America, and it was suggested that declining wild resources could be restored by stocking. But many people felt that more facts were needed, so Congress authorized creation of the U.S. Commission on Fish and Fisheries in 1871. Spencer F. Baird was appointed Commissioner, and he returned to Woods Hole annually, during the summers, to work in the area with which he had become familiar during earlier vacations.

His appointment set the course of fishery studies in the United States for many years. He was a zoologist and naturalist who pursued biological studies of the fishery animals with great zeal, and who encouraged many nongovernmental scientists (some from Europe and Canada) to use the U.S. and



Spencer Fullerton Baird portrait. Credit: NOAA Fisheries

Fisheries Management

Marine Biological Laboratory (MBL) facilities that had become available at Woods Hole. For about 50 years, this station was the summer center for marine biology in eastern North America. The beginnings of fishery research in the United States were part of the growing concern about the environment and the public support of research to achieve conservation. The American Fish Culturist's Association was formed in 1870, and it, significantly, named Baird as well as Samuel Wilmot (who later became the Superintendent of Fish Breeding in Canada in 1876) as honorary members in 1872. This Association broadened its mission in 1884 with a change of name to the American Fisheries Society.

More general support for conservation research came when, in 1873, the American Association for the Advancement of Science (AAAS) urged application of research to forestry problems and the reformation of forest management policy. The AAAS also supported the formation of the U.S. Geological Survey in 1879 and the U.S. Biological Survey of the Department of Agriculture in 1885, the same time the fishery buildings were constructed here in Woods Hole, Mass. Soon after, in 1895, a major voice for conservation appeared, one of our leading sportsmen's magazines, Field and Stream... The scientists who came pursued their own specialities more or less in isolation while the Commission pursued descriptions of the fisheries...Few fishery laboratories were established before the 1920s. They emerged as the limnological and aquatic biological laboratories gradually incorporated fishery studies. In addition, a few laboratories began to study salmonid culture, notably the problems of nutrition and disease. Still later, fishery technological laboratories concerned with the handling of the products were organized, mostly after World War II. All of this research, the basic research and the attempts to deal with the ongoing and urgent social, economic, and political problems of the fisheries, had established a dichotomy between the researchers and the managers of the fisheries. The researchers had to approach the scientific problems one by one, whereas the managers faced the overall challenges of making decisions about a complex human activity with the help of a few facts about the fisheries. The researchers had time and isolation; the managers had deadlines for decisions in a political arena...

Desk work at the Little Port Walter field station. Photo provided by William Heard (AFSC, retired).

...1885 to about 1950 was a period of slowly increasing research, but the findings had very little effect on fishery management. Conservation was fundamentally a political issue (Smith, 1966). The freshwater regulations were based on common sense, avoiding waste, protecting young animals so they could grow, protecting breeding animals so they could reproduce, and spreading the catches through the prevention of any excessive ingenuity in the use of nets. When the fish became scarce, waters were stocked from hatcheries (as this station did for so many years). The marine fishery regulations, on the other hand, were very few, and there was little regulation

Fisheries Management

By the middle of the nineteenth century some of the fishery resources had already declined by alarming amounts, as they had in the Northeast Atlantic, where the causes were hotly disputed.

of marine fisheries in this country, aside from inshore shellfisheries and perhaps the inshore herring fishery of New England, until recent years. What regulations there were, were largely designed to promote orderly marketing and orderly fishing, not really for the purpose of conservation in the usual sense that we think of it...

The profession of fishery science began to emerge in the 1950s. The experience with the Halibut Commission and the confidence that had been gained helped, but still left this broad problem--how to get at the management...public acceptance of a science-based fishery management was very slow. It clearly intruded on established political and legislative prerogatives. An example of the difficult transition occurred in the management of the Alaskan salmon resources. There the salmon production reached a peak of about 200,000 metric tons annually in the middle 1930s and then steadily declined to about half that level by 1945. The Federal management had no acceptable explanation so the salmon industry asked the University of Washington and W. F. Thompson for help...The Federal government continued its basic research on salmon biology, with no attention to research on the management system, until after a radical reorganization of the Alaskan office of the U.S. Fish and Wildlife Service in 1955, but then it was too late. The residents of the Territory of Alaska voted overwhelmingly for statehood in 1958, many of them because of their perception of a failure of Federal fishery management. The new State of Alaska took over the regulation of the fishery in 1960, continued to refine its regulations (assisted by some favorable weather conditions), and production recently returned to its peak level of about 200,000 metric tons...

The failure of the one Federal fishery management program in Alaska and the new Federal responsibilities for fishery management under the numerous treaties after 1945 led to a major reorganization with the adoption of the Fish and Wildlife Act of 1956 that established the Bureau of Commercial Fisheries in the Fish and Wildlife Service. The Bureau brought the Federal research much closer to the management responsibilities...

The new fishery treaties and the new environmental laws that became effective during the 1950s and 1960s were enough to change greatly the practice of fishery science, but an even greater stimulus for change came in the 1970s....Perhaps it was a quirk of fate that at this same time, in the early 1970s, the expansion era of the world's fisheries ended..."

Source: Royce, W. F. 1985. The Historical Development of Fisheries Science and Management (Taken from a lecture given at the Fisheries Centennial Celebration (1985) by William F. Royce). (NEFSC website).

Events

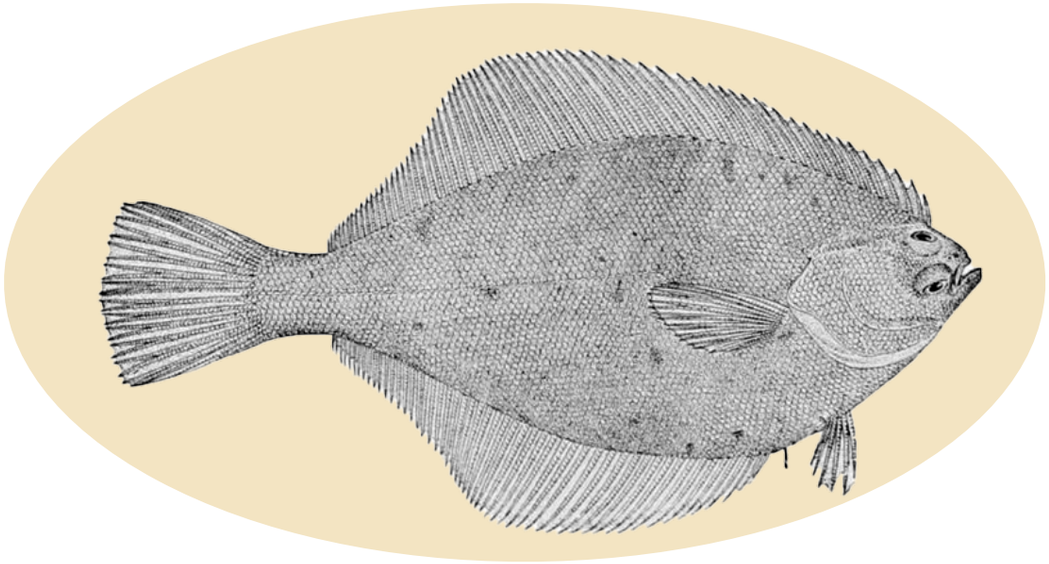
The following material is excerpted.

Baseline survey in the eastern Bering Sea, 1975-76

In the summer of 1975 and the spring of 1976, the Northwest and Alaska Fisheries Center (NWAFC) conducted multivessel surveys of the demersal fishes and commercially important invertebrates of the shelf and upper continental slope waters of the eastern Bering Sea. These surveys, carried out under NOAA's Outer Continental Shelf Environmental Assessment Program (OCSEAP) and NMFS's Marine Resources Monitoring Assessment and Prediction (MARMAP)

Alaska Fisheries Totals, 1906-39 (from Bureau of Fisheries annual reports) **(click to expand)**

Fisheries Management



program by NOAA research vessels and chartered commercial fishing vessels, were the most extensive ever conducted in the Bering Sea in terms of area and habitat coverage and biological data collection.

The study area, an important region for commercial fishing, may contain substantial petroleum reserves; sites are under consideration by the Bureau of Land Management (BLM) for leasing to allow the exploration and development of petroleum. NWAFC surveys had, as one of their objectives, to provide BLM with information on the distribution, abundance, and biological features of demersal resources of the eastern Bering Sea – which could be used to prepare an environmental impact statement, assessing the risks involved in development of the potential offshore petroleum reserves. The surveys, a part of the Center's involvement in the MARMAP program, also contributed a large body of scientific information to this program.

The final results of the study are summarized below, including (1) a brief review of the importance of the area to commercial fisheries; (2) the relative importance of species in the eastern Bering Sea; and (3) the distributions and current conditions of the principal commercial species.

--Productivity and Commercial Utilization of Demersal Resources

The eastern Bering Sea is a highly productive ocean region containing some of the largest marine mammal, fish, and crab populations in the world. Almost all major fish and shellfish resources of the region are under commercial exploitation, principally by the distant-water fisheries of Japan and the U.S.S.R. Since 1970, the annual catches of demersal fish and shellfish have exceeded 1.7 million metric tons (t); in the peak year of 1972, the catches reached almost 2.4 million t. Compared to other fishery regions of the Northern Hemisphere, catch per unit area in the eastern Bering Sea – 2.9 t per square kilometer – was exceeded only by that of the North Sea – 3.3 t per square kilometer. In 1974, landings of demersal fish and shellfish from the eastern Bering Sea were valued at over 400 million dollars.

Japan was the first foreign nation to develop post-World War II fisheries in the Bering Sea, starting in 1954; the U.S.S.R. launched a fishery in 1959. During these years and through the early 1960s, the target species of these nations was yellowfin sole. Following the removal of 11.5 million t of yellowfin sole within a 3-year period (1960-62), the catch declined drastically as did the average size of fish. The stock remained in a depressed condition until the early 1970s, when the appearance of strong year-classes (spawned in the mid-1960s) resulted in an increase in the fishable population. Since 1969 the yellowfin sole fishery has operated in winter months (October to March) in shelf waters north of Unimak Island. Yellowfin sole catches in other areas are mainly incidental to walleye pollock landings.

With the decline in the yellowfin sole population and development of techniques for processing "surimi" (a semi-processed wet fish protein) at sea in 1964, walleye pollock became the target of the Japanese fishery. The Soviet Union also turned to walleye pollock as its principal target species but in somewhat later years. Since the mid-1960s, pollock has formed by far the major part of foreign catches with average annual landings reaching 1.7 million t during 1971-74. Pollock catches come mainly from along the outer shelf and continental slope, extending from Unimak Pass to Cape Navarin. Largest catches come from just northwest of Unimak Pass and southwest of St. Matthews Island. Other commercially important fishes taken incidentally by

the pollock and yellowfin sole fisheries (or by fisheries directed to these species) are flathead sole, rock sole, arrowtooth flounder, Greenland turbot, Pacific cod, sablefish, Pacific ocean perch, and Pacific herring.

The current North American fishery for groundfish in the eastern Bering Sea is small in comparison to that of foreign countries, consisting of a Canadian and United States setline fishery for Pacific halibut. Catches of halibut by North American fishermen peaked in 1962 and 1963 at 4,400 and 4,900 t, but in 1970-74 catches ranged from only 143 to 685 t. This decline in catches resulted from a deterioration of the stock condition caused, at least in part, by incidental catches of halibut by foreign trawlers. The closure of certain areas in the southeastern Bering Sea to foreign trawling during part of the year has substantially reduced this incidental catch. Evidence of increased abundance of juvenile halibut, provided by surveys of the International Pacific Halibut Commission indicates that these closures may have reversed the downward trend in abundance of this species.

Shellfish have also been targets of Japanese, U.S.S.R., as well as U.S. fishermen. U.S. crab fisheries in the eastern Bering Sea, which began in 1947, remained much smaller than those of Japan and the U.S.S.R. until the mid-1960s, but became dominant in the 1970s. The U.S.S.R. ended its participation in the king crab fishery in 1971, and Japan in 1974. The U.S. catch of king crab first exceeded that by Japan and the U.S.S.R. in 1971 (2.4 million crabs); in 1975 the U.S. catch reached 9.1 million crabs – an all-time record catch for this species.

The United States did not have a fishery specifically for snow (Tanner) crab prior to 1974, although some were taken by the king crab fishery. A purposeful U.S. snow crab fishery began in 1974 and has grown very rapidly with catches reaching 8.9 million crabs in 1976 – about equal to the Japanese catch of 9.2 million crabs in the same year. The U.S.S.R. has not participated in the snow crab fishery since 1971.

Pink shrimp has also been a commercially important species. The main fishing area for this species is northwest of the Pribilof Islands with less important grounds off Cape Navarin and in the Gulf of Anadyr. Exploitation of shrimp stocks in the Pribilof Island area has been mainly by Japan; the U.S.S.R. also fished for eastern Bering Sea shrimp in 1963 and 1964 but has not reported the extent of their catches. Japanese catches reached a peak of 27,000 t in 1963 but, due to overfishing and adverse environmental conditions, declined to only 200 t or less in 1972-74. Shrimp are not considered to be a viable commercial fishery due to the poor condition of the resource, but the recent trawl survey indicated that the stock condition may be improving.

Source: Northwest and Alaska Fisheries Center Monthly Report, 1977

Observers on foreign fishing vessels, 1977

Progress continues on the training and placement of qualified observers on foreign fishing vessels, preparation of computer programs for processing and listing observer data, and the plans for the integration of surveillance data on vessel disposition and foreign catch data into the information system.

One observer initially placed aboard a Japanese stern trawler in the Bering Sea in February continued his observations in March after fishing was resumed following implementation of the Fisheries Conservation and Management Act of 1976. Data on catch rates and species composition were received for March 3-20.

By mid-April seven additional observers were placed on foreign vessels: five were assigned to Japanese stern trawlers and two to USSR stern trawlers. On

Fisheries Management

April 19 four observers flew to Tokyo to board two Japanese motherships leaving for the Bering Sea on April 22. These observers will serve for approximately two months. Some of the vessels to which the observers were assigned were scheduled to leave the fishing grounds before the end of the sampling period; replacement vessels will be sought.

New computer programs were completed for listing observer data and for integrating the data into the information system. These include listings of catch rates and species composition by nation, area, and month categories, and incidence of certain selected species (Pacific halibut, crab, and salmon) by the same categories.

Source: Northwest and Alaska Fisheries Center Monthly Report, Apr. 1977

First woman observer on a foreign fishing vessel in Alaska, 1978

Jennifer Sassano became the first U.S. woman biologist to be placed as an observer on a foreign groundfish vessel fishing in Alaskan waters. Sassano will spend 2 months on the factor trawler Katangly I sampling the Soviet catch in the Gulf of Alaska.

In 1977, one U.S. woman biologist had served as an observer aboard a Polish hake vessel operating off Washington, Oregon, and California. In 1978, Japanese, Polish and Soviet groundfish vessels agreed to have U.S. women observers aboard. As a result 10 trips have been scheduled for women observers this summer in the northeastern Pacific Ocean and Bering Sea.

Source: Northwest and Alaska Fisheries Center Monthly Report, Sept. 1978

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See Also

- Developing and Delivering the Promise of U.S. Fishery Management. ("NOAA Celebrates 200 Years of Science, Service, and Stewardship") website
- Fishery Conservation and Management Act (1976). ("NOAA Celebrates 200 Years of Science, Service, and Stewardship") website

Environmental and Ecosystem Monitoring

Environmental and Ecosystem Monitoring

Monitoring Alaska's marine environment has been an important focus over the last century.

- Following the eruption of Mt. Katmai volcano in 1912, a Bureau of Fisheries inspector was instructed to make a special investigation to determine the effects upon the fisheries, animals, and plant life on Afognak Island.
- In 1958, 32 years of collected data on the air circulation changes over the North Pacific was studied with regard to their effects on sea temperatures, upwelling, and fish populations.
- Many years after the 1989 *Exxon Valdez* oil spill in Prince William Sound, Center scientists continue to monitor the long-term recovery of the environment.
- Moving into the 2000s, a chief issue is climate change and its effects on the Alaska and northern Pacific environment; such as the receding glacial areas that are important to harbor seals that pup and nurse their young on the floating ice calved from tidewater glaciers.

Taking measurements at Little Port Walter. Photo provided by William Heard (AFSC)

Environmental and Ecosystem

Some topics worthy of mention

Pollution and its impact to marine ecology was addressed by the U.S. Congress when it mandated the Magnuson Fishery Conservation and Management Act of 1976, requiring the Secretary of Commerce to initiate a comprehensive program of fishery research, including the impact of pollution on the abundance and availability of fishery resources. In 1978, the National Ocean Pollution Research, Development, and Monitoring and Planning Act specifically named the National Oceanic and Atmospheric Administration (NOAA) as the leading Federal agency to plan and coordinate ocean pollution monitoring and research.

Prior to this period, the impact of pollution on marine organisms was addressed primarily after environmental catastrophes had occurred. Lacking adequate information on how toxic chemicals altered living marine systems, it was often impossible to identify, much less quantify, the acute effects of even a massive spill of hazardous material. Even more lacking was information on long-term effects from major spills or from the gradual degradation of the environment from continuous, low-level estuarine and marine pollution. (Malins, 1982 *)

The *Exxon Valdez*, three days after the vessel ran aground on Bligh Reef.

Following the *Exxon Valdez* oil spill in 1989, several studies have been done in connection with oil contamination exposure and energy flow at the ecosystem level. Summer surveys sampled numerous mussels, sediment, salmon, sand lances, and other species for analysis of hydrocarbon concentrations in tissues and sediments. Affected beaches were cleaned of oil.

The following material is excerpted.

Climate change: More recently, there has been a growing recognition that global climate conditions are changing. Understanding what these changes are and how they impact the Earth's marine ecosystems have become two of NOAA's strategic goals. In response, Alaska Fisheries Science Center (AFSC) scientists have collaborated with climate scientists and oceanographers at NOAA's Pacific Marine Environmental Laboratory (PMEL) to develop new modeling tools to better project how climate change will alter the production and distribution of commercial fishes off Alaska. The models provide science-based support for long-range spatial planning and management of these commercial fisheries.

From Hollowed, A. B., et al. 2011. Integrating Ecosystem Aspects and Climate Change Forecasting into Stock Assessments. AFSC Quarterly Report Feature, July-Sept. 2011. 6 p.

- **Sea ice** [in the Bering Sea] plays an important role in the timing of the spring phytoplankton bloom, which in turn has impacts on benthic and pelagic communities (Stabeno and Overland 2001). It has also provided a hunting and transport platform to walrus, polar bears, and Alaska Natives. It is assumed Arctic foxes (*Alopex lagopus*) originally made their way to the Pribilof Islands by sea ice (Preble and McAtee 1923, 104–105), and local residents have reported foxes using sea ice to move between islands in modern times. Government log books for the Pribilof Islands indicate polar

bears, not normally found on the islands, have occasionally arrived and left by ice.

From "Island Setting: Role of Sea Ice". Pribilof Islands: a Historical Perspective.

- **Ocean Acidification:** Global climate change studies have revealed that the rate of increase in atmospheric carbon dioxide (CO2) concentration has increased substantially since the industrial revolution in the mid-1700s. The world's oceans have absorbed between 30% and 50% of that new CO2. The increase in oceanic CO2, when incorporated into the carbonate system, has resulted in an average decrease of ocean surface pH by 0.1 units, the equivalent of a 30% increase in acidity. The increased acidity reduces the saturation of calcium carbonate, making it more difficult for some calcifying organisms to sequester calcium and carbonate to build shells.

From Foy, R. J., et al. 2012. Ocean Acidification: Monitoring and Measuring the Physiological and Population Response of Living Marine Resources in Alaska. AFSC Quarterly Report Feature, July-Sept. 2012. 8 p.

Vessel impact on marine species is a concern being investigated by Center scientists now for the last several decades:

- **Traffic:** Recent concerns for harbor seals have arisen due to increased vessel traffic and disturbance by sightseeing and cruise ships in several tidewater glacial regions.
- **Noise:** The significant increase of Low Frequency Active noise in the world's oceans has been a subject of concern among marine mammal scientists since the 1980s. Vessel traffic, geophysical exploration, long-range sonar, and other sources of underwater anthropogenic noise are often regarded as a source of potential disturbance to aquatic animals.

Effects of fishing, plastic and other refuse:

- **Ghost fishing**, which occurs when lost or abandoned fishing gear continues to trap and kill aquatic organisms, can have substantial economic and ecological effects. Lost nets can continue to ensnare animals, including birds and mammals, while lost crab or fish pots keep on attracting animals. Pots can be particularly damaging because they are often sturdily constructed and can last a long time and because animals that die inside them become bait that lures in the next set of victims. Ghost fishing gear is also non-discriminatory in that it will capture both fishery and non-fishery species, as well as individuals that would usually not be harvested, such as reproductive females.

From Foy, R. J., et al. 2012. Ocean Acidification: Monitoring and Measuring the Physiological and Population Response of Living Marine Resources in Alaska. AFSC Quarterly Report Feature, Jul-Sept. 2012. 8 p.

- **Habitat Areas of Particular Concern** (HAPCs) highlight specific habitat areas deemed especially vulnerable to anthropogenic impacts, having extremely important ecological functions and/or areas that are especially vulnerable to human-induced degradation. Fishing gear can damage corals and habitats used by a fish species for the processes of spawning, breeding, feeding, or growth to maturity. Gorgonian corals, especially red tree coral (*Primnoa* sp.), are HAPCs that are thought to be particularly vulnerable to the impacts of fishing gear. Skate nurseries in the eastern Bering Sea are exceptional areas of the Essential Fish Habitat (EFH) identified for skates.
- **Marine debris:** Society has developed an increasing number of uses for plastic due to its lightweight, strength, durability, versatility, and low cost. Products include bags, bottles, cups, six-pack yokes, balloons, strapping bands, plastic sheeting, resin pellets, packing materials, and fishing gear. When dumped, lost or abandoned in the marine or aquatic environments, plastic debris not only looks bad, but can harm the environment and wildlife.

Environmental and Ecosystem

- Environmental impacts arise from entanglement of marine animals in plastic debris and from ingestion of plastic by aquatic organisms. Marine debris poses a threat to humans when divers, ships, or boats become fouled in debris. Beaches and waterfronts are becoming littered with plastic garbage requiring costly cleanup procedures. In 1989, the Marine Plastic Pollution Research and Control Act made it illegal to dump plastics at sea and in all U. S. navigable waters.
- **Entanglement** in marine debris, specifically in plastics associated with the commercial fishing industry, has been documented for a number of species of seals and sea lions. Northern fur seals (*Callorhinus ursinus*) become entangled in plastic debris and scraps of fishing nets as they forage in the open ocean. Such entanglement, especially in scraps of net, is a source of mortality for this species and has been the focus of research examining recent declines in the northern fur seal population on the Pribilof Islands.

  From Fowler, C. W., and T. J. Ragen. 1990. Entanglement studies, St. Paul Island, 1989: Juvenile male northern fur seals. NWAFC Processed Rep. 90-06, 39 p.

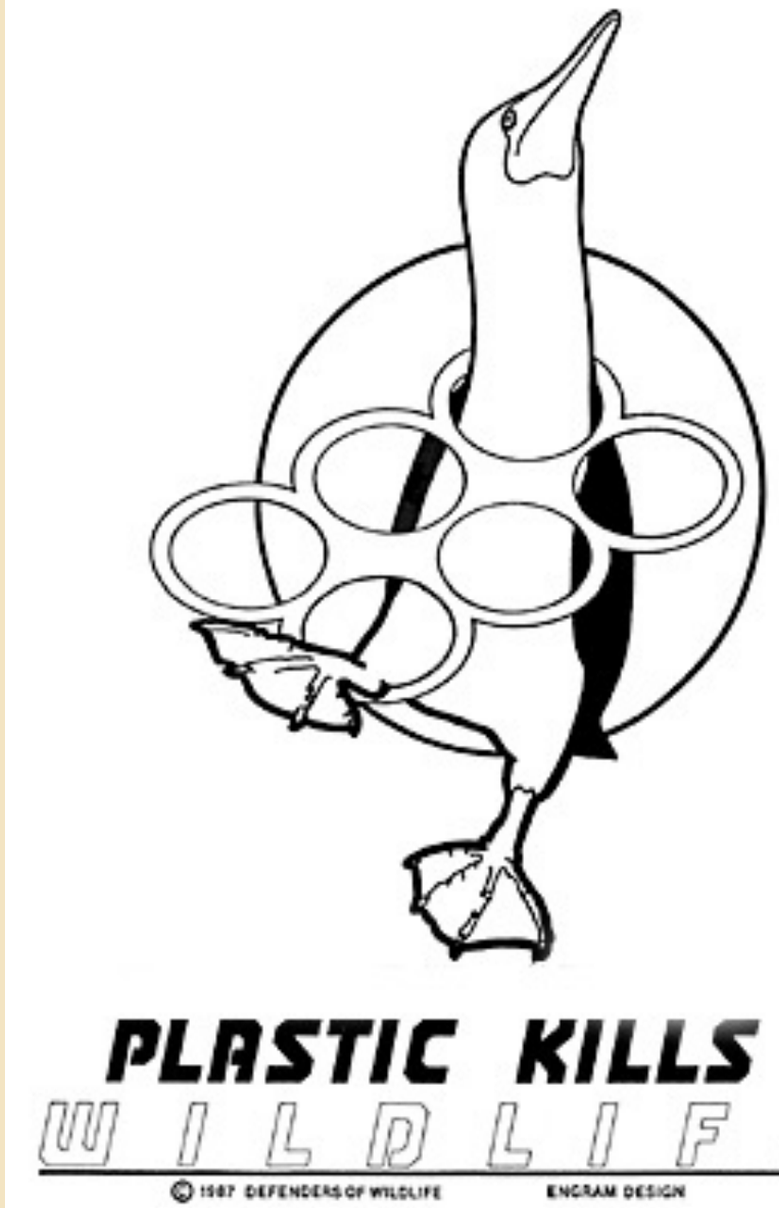
- In response to the northern fur seal entanglement problem and the 1984 [Fate and Impact of Marine Debris] FIMD workshop, the United States set up the Marine Entanglement Research Program in the National Oceanic and Atmospheric Administration (NOAA). This program is charged with formulation and execution of research, mitigation, and education activities to address the marine debris problem in U.S. waters.

  From Coe, J. M. 1990. Marine debris research, education, and mitigation in the North Pacific. In R. S. Shomura and M. L. Godfrey (editors), Proceedings of the Second International Conference on Marine Debris, April 2-7, 1989, Honolulu, Hawaii, p. 19-49. NOAA Tech. Memo., NMFS-SWFSC-154.

Events

- **Center scientists investigate the effects of Cook Inlet, Alaska, crude oil on shrimp and crab larvae, 1976**

  An investigation of the effects of the water-soluble-fractions (WSF's) of Cook Inlet crude oil on coonstripe shrimp and king crab larvae has been completed by Anthony Mecklenburg. This series of experiments was designed to show the



A page from the 1989 Marine Debris Coloring Book; an educational NOAA publication

influence of Cook Inlet crude oil on molting for both larval species. Data analysis has been completed, and this information is being incorporated with previous studies describing acute toxicities on the same species. Preliminary findings indicate that stage I larvae of both king crab and coonstripe shrimp are more susceptible to oil during molting than in the intermolt stage.

From Northwest Fisheries Center Monthly Report, July 1976.

- **APPRISE study initiated in Auke Bay, 1985**

  Field work was initiated in early March on a cooperative study of the Association of Primary Production and Recruitment Processes in Subarctic Ecosystems (**APPRISE**). Participants in the study include scientists from the University of Alaska at Juneau and Fairbanks, the Oceanic Institute in Hawaii, and the NWAFC's Auke Bay Laboratory. Auke Bay will serve as the study ecosystem in this investigation. The Laboratory's role involves assessing the density, distribution, and seasonal dynamics of zooplankton in Auke Bay and providing assistance to University of Alaska scientists preparing a summary report of existing knowledge of the chemical, physical, and biological oceanography and marine biology of Auke Bay.

  According to Fishery Biologist Dr. Bruce Wing, the initial sampling of zooplankton was carried out the second week of March. Participating scientists included Dr. Bruce Wing (ABL), and Dr. Lewis Haldorson and John Watts (both with the University of Alaska-Juneau).

  The initial set of samples yielded modest catches of calanoid copepods (primarily *Pseudocalanus* sp.) and small numbers of planktonic fish eggs and larvae. Two species of fish eggs (walleye pollock and an unidentified flatfish) and several species of larval fish were found in surface tows with 0.20 m2 Norpac plankton nets and 0.56 m2 rectangular midwater trawl tows to 50 m depth taken at the Auke Bay Monitor Station. The larval fish catches included *Bathylagus stilbius* (California smoothtongue), possibly two species of cottids (sculpins), and two distinct stichaeids (pricklebacks).

  Hydroacoustic assessment of the seasonal density and distribution of zooplankton and associated off-bottom fishes is due to begin in April.

From Northwest and Alaska Fisheries Quarterly Report, Jan.-Mar. 1985.

Additional Reading

Malins, D. C. 1982. Effects on Environmental Stress on Fisheries Use and Enjoyment: A Historical Overview. In R. R. Mitsuoka, R. E. Pearson, L. J. Rutledge, and S. Waterman (editors), Fifty Years of Cooperation and Commitment: 1931-81, the Northwest and Alaska Fisheries Center, p. 133-145. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-34.

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Shomura, R. S. and M. L. Godfrey (editors), Proceedings of the Second International Conference on Marine Debris, April 2-7, 1989, Honolulu, Hawaii, p. 19-49. NOAA Tech. Memo., NMFS-SWFSC-154. .

Technology

The Alaska Fisheries Science Center and its predecessors, in collaboration with fishing industry partners, pioneered many technological advances in both fisheries research and the fishing industry in Alaska.

Technology

NOAA Fisheries' Alaska Fisheries Science Center and its predecessors, in collaboration with fishing industry partners, pioneered many technological advances in both fisheries research and the fishing industry in Alaska.

In this section discover some of the inventions, tools, devices, and methods developed. Topics include aircraft, seafood transportation and preservation, diving programs, and techniques for surveying fish and reducing bycatch.

Technology Sections

- Aircraft for fishery enforcement, surveying, and transportation
- Agency diving programs
- Methods
- Tools, gear and equipment
- Alaska canneries

Additional Reading

Stansby, M. E., and J. A. Dassow. 1982. Technological Research. In R. R. Mitsuoka, R. E. Pearson, L. J. Rutledge, and S. Waterman (editors), Fifty Years of Cooperation and Commitment: 1931-81, the Northwest and Alaska Fisheries Center, p. 81-106. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-34.

Rounsefell, G. A., and W. H. Everhart, 1953. Fishery Science, Its Methods and Applications. John Wiley & Sons, Inc. 444 p.

See Also

- "Hydrographic Survey Techniques" ("NOAA Celebrates 200 Years of Science, Service, and Stewardship" website)
- "Evolution of the Fisheries Science Enterprise: 1970-2007" ("NOAA Celebrates 200 Years of Science, Service, and Stewardship" website)
- "Fisheries Research and Management" section

Aircraft

Aircraft for Fishery Enforcement, Surveying, and Transportation

Fisheries Enforcement

Introduced in 1929, the use of aircraft for the protection of Alaska fisheries provided an important and efficient auxiliary patrol to the Bureau of Fisheries (BOF) enforcement boats that had been in service since 1912.

Initially, the Bureau contracted with Alaska-Washington Airways, a commercial company, for the limited service of a seaplane. The few flights that were made successfully demonstrated the efficiency of aerial patrol over the long, irregular coast of Alaska, a territory having numerous channels, bays, inlets, and mountainous regions where traveling by boat was often slow and difficult. In his 1929 annual report, the Bureau's Alaska Fisheries Division chief, Ward T. Bower, stated that "it would seem that aircraft will have a definite place in patrol work in the future."

Patrolling by air proved to be an effective deterrent to illegal fishing operations. A plane's fast approach kept violators from removing or adjusting their fishing gear in time to escape detection. Bureau agents were also on the lookout for

A 450-hp DeHaviland Beaver used by the Fish and Wildlife Service (FWS) in the 1950s. Auke Bay Laboratories photo, 1954.

Aircraft

fish traps that had not been properly closed whenever fishing was prohibited. One drawback, however, was that any rough water would prevent landing a plane to make the proper investigations of an observed infraction.

At first, patrol flights were confined to the southeastern district and occurred primarily during the closed fishing periods between Saturday and Monday. These trips were made from Juneau and Ketchikan by BOF agents. In the summer of 1930, a warden would cover over 1,000 miles of flying a day. During the 1930s the region patrolled widened to areas such as Prince William Sound and Bristol Bay. In 1939, six charter aircraft companies were providing service over a 31-day period in which 64 hours of flying time covering 6,859 miles was reported.

In addition to enforcement patrol, chartered aircraft also provided Bureau agents with quick transportation to isolated districts in connection with their observations of certain salmon spawning grounds and general supervisory work of the Alaska fisheries.

Aerial Survey and Transport Use

A 1920 annual BOF report stated: "The possibility of practical use of aeroplanes in various branches of the fisheries is one of the most interesting developments in aviation. The most obvious purpose that aeroplanes may serve is in the offshore fisheries in determining the location of whales and schools of surface-swimming fishes, like mackerel and menhaden, and in promptly communicating this information to fishing vessels or to shore stations. Other uses of aircraft in connection with the fishing industry will doubtless arise."

Ten years before the Bureau's use of aircraft in Alaska, the value of aerial surveying was first thoroughly tested in 1921, using Naval Aviation Service seaplanes to spot schools of menhaden in waters of the eastern U.S. The experiment proved quite favorable

Bob Bell loads salmon into the hatch of a Fish & Wildlife Service plan to be flown to Gulkana for scientific study. Photo by Bob and Ira Spring

and contributed to the eventual expeditious aerial surveying of numerous Alaska spawning streams, many of which being remote and otherwise hard to reach.

In 1930, the first recorded stream survey in Alaska by air was conducted in the Lake Clark district of Bristol Bay by BOF special employee, C. M. Hatton. The following year, BOF Bristol Bay Management Agent, Dennis Winn, attempted the first extensive aerial surveying of salmon spawning grounds, but had limited success due to poor weather conditions. In 1938, another Bureau agent, George B. Kelez, started a sockeye salmon research program which utilized aerial and ground surveys. Using a mounted F-56 Fairchild aerial camera in 1947, Kelez and G. J. Eicher, Jr. began experimental vertical aerial photographic surveys of the Bristol Bay region as a means of permanently recording salmon spawning counts.

To facilitate counting fur seals at the Pribilof Islands, an elevated runway (left) and tripod (both photos) are used. The tripod was used experimentally for the first time in 1920. Bureau of Fisheries photos, 1922 (left), 1921 (right).

The FWS Fleet

Among the first aircraft by the FWS since 1940 were probably two planes purchased by Alaska fisheries employees, Clarence Rhode and Sam White. Some Grumman Widgeon planes were initially acquired at no cost as surplus property from the U.S. Navy and other agencies. Built for the U.S. Navy during World War II, the Widgeon was a smaller version of the Grumman Goose and was short-lived with the FWS, since replacement parts for the motors were difficult to find. It first flew for the Service in the southeastern region of the Alaska territory, used for hauling passengers/freight and surveying wildlife.

By the mid-1940s, the U.S. Congress was finally persuaded to provide funding for the aircraft and the FWS's Alaska fleet quickly grew. $400,000 was appropriated for a facility at the Anchorage Airport, complete with office/hangar space and equipment. The fleet consisted largely of the surplus Goose models purchased inexpensively from various places. Many of these smaller float planes were ideal for transportation into shoreline facilities, such as

the Karluk Lake experimental fisheries station and the field camp at Olsen Bay. Other airplanes were rigged with skis for conducting game observations over ice and snow landing areas.

By Alaska's statehood in 1959, the (now) U.S. FWS was flying about 35 aircraft in the territory – many of which still being the Grumman Goose. FWS Director (1946-52) Al Day later recounted that the use of airplanes was "the best enforcement tool that we had. The pilot could fly along behind a hill and suddenly jump over the hill and down on a fishing boat in closed waters; snap a few pictures and go on his way. Several fine cases of illegal fishing convictions were made on that type of a thing." And with regard to survey use, Day stated: "We found that you could actually get a good reading on the densities and runs of salmon...you could actually fly over and photograph and count the number of salmon and establish key observations and estimates from airplanes. They became more and more useful all the time."

Other oral history accounts of aircraft use in Alaska can be found on the FWS National Digital Library website

Additional Reading

Aerial Methods of Assessing Red Salmon Populations in Western Alaska. By George J. Eicher, Jr. Journal of Wildlife Management, 1953.

Wilbanks, W. 1999. "#11 George B. Kelez", p. 53-55. In Forgotten Heroes, Police Officers Killed in Alaska 1850-1997. Turner Publishing Co. Paducah, KY. 192 p.

Accidents

George B. Kelez (FWS Assistant Fisheries Administrator) was killed when the twin-engine Grumman Goose he was flying in lost its wing after hitting a tree and went down on Admiralty Island, Alaska, on 1 September 1954. The crash also claimed the lives of four other wildlife employees, Robert Schuman, Larry Kolleon, Patte D. Bidwell, and the pilot, Bob Meeks. The lone severely injured survivor, Gus Hilsinger, was rescued after crawling 1.5 miles over rugged beach and signaling a plane. To memorialize Kelez, a mountain in the Brooks range of Alaska (1954) and a Bureau of Commercial Fisheries vessel (1962) were both named after him. See also Wilbanks*

Stan Fredericksen (Alaska FWS agent from 1953-58) died on 21 August 1958 along with USFWS Regional Director Clarence Rhode and his son Jack when their plane hit a rock and exploded in the Philip Smith Mountains (north central Alaska). The Grumman Goose they were flying had been missing until it was discovered by a hiker 21 years later.

In 1984, four U.S. whale biologists fortunately survived a plane crash in the Arctic Ocean while conducting photographic surveys of bowhead whales. Both engines of their DeHaviland Twin Otter stalled 1,000 feet over the Beaufort Sea, some 6 miles from shore. More >>

Diving Programs

Agency Diving Programs

The National Oceanic and Atmospheric Administration (NOAA) Diving Program was created in May of 1971 from the newly formed line offices of the National Ocean Service and National Marine Fisheries Service (NMFS) to be part of the Agency's Manned Undersea Science and Technology Program (MUS&T).

NOAA's predecessors, the Fish and Wildlife Service (FWS) and the U.S. Coast and Geodetic Survey, used diving for undersea research in the late 1940s and early 1950s and provided the foundation for NOAA's diving program in the 1970s.

Diving was first used by the FWS in Alaska around 1948, to assess abalone stocks. Between 1957 and 1960, divers of the Bureau of Commercial Fisheries (BCF, formed under the U.S. FWS in 1956) in Seattle, Washington, began trawl diving studies to evaluate configurations of experimental net designs. During this same time, operating standards and regulations were developed for BCF diving activities. With minor changes, these regulations and operating polices were used as the template for structuring the NOAA Diving Program.

The NOAA Diving Program became a standalone program in 1979 to train scientists, engineers, and technicians how to

Diver and crab. Photo by Bill Heard (ABL).

Diving Programs

Scientists diving in icy waters. Photo by Bill Heard.

dive to conduct research and to achieve operational objectives. During these formative years, NOAA implemented diving regulations and established a Diving Safety Board and a Medical Review Board. The NOAA Diving Program was instrumental in developing a nitrogen-oxygen (nitrox) breathing mixture along with decompression tables, as well as working to standardize equipment throughout the Agency, ensuring improved safety and cost savings. Recently (as of 2012), over 300 NOAA divers have averaged about 10,000 dives each year with an impressive 99.97% dive safe statistic.

The Kodiak Dive Unit

AFSC's Resource Assessment and Conservation Engineering (RACE) Division has supported a dive program in Kodiak since the early 1970s to conduct research on life history, habitat use, and behavioral ecology of commercially important green sea urchins and Tanner and king crab. Currently (2012-13), the dive unit focuses on essential habitat, larval supply, recruitment processes, and fine-scale movement patterns of juvenile red king crab. Recent research also focused on assessing the feasibility of crab enhancement. This includes benthic surveys to identify suitable release sites for hatchery-raised red king crab.

In the fall of 2013, the dive team plans to track an experimental release of crab near the remote village of Old Harbor on Kodiak Island, Alaska, to quantify habitat use, movement, and species interactions as a function of crab density.

The Seattle Dive Unit

During 1971-75, William High served as one of NOAA's three national program coordinators and contributed significantly in the evolution of the NOAA Dive Program in Seattle. Throughout this period, much of the diving done by the Alaska Fisheries Science Center (AFSC) in Seattle involved research on the design and instrumentation of trawl nets.

By the end of the 1980s, NOAA dive program facilities were consolidated and the NOAA Diving Center (NDC) in Seattle was created at the Western Regional Center (WRC) campus on Sand Point. A diving tower and an administrative support facility were built in Seattle and an 80-inch hyperbaric chamber was completely refurbished prior to its installation at NDC. Also part of the Sand Point facility was a 40,000 gallon, 30-foot-high dive tank, used to train NOAA divers and test various diving equipment.

More recently, RACE Division scientists Bob Lauth and Scott McEntire installed underwater time-lapse cameras and conducted transects to study the nesting habits of Atka mackerel in the Aleutians.

NDC dive tank in Seattle. NOAA photo.

National Marine Mammal Laboratory (AFSC-NMML) scientists used diving to catch juvenile Steller sea lions underwater for physiological and behavioral studies.

AFSC divers in Seattle have also been involved in various projects including:

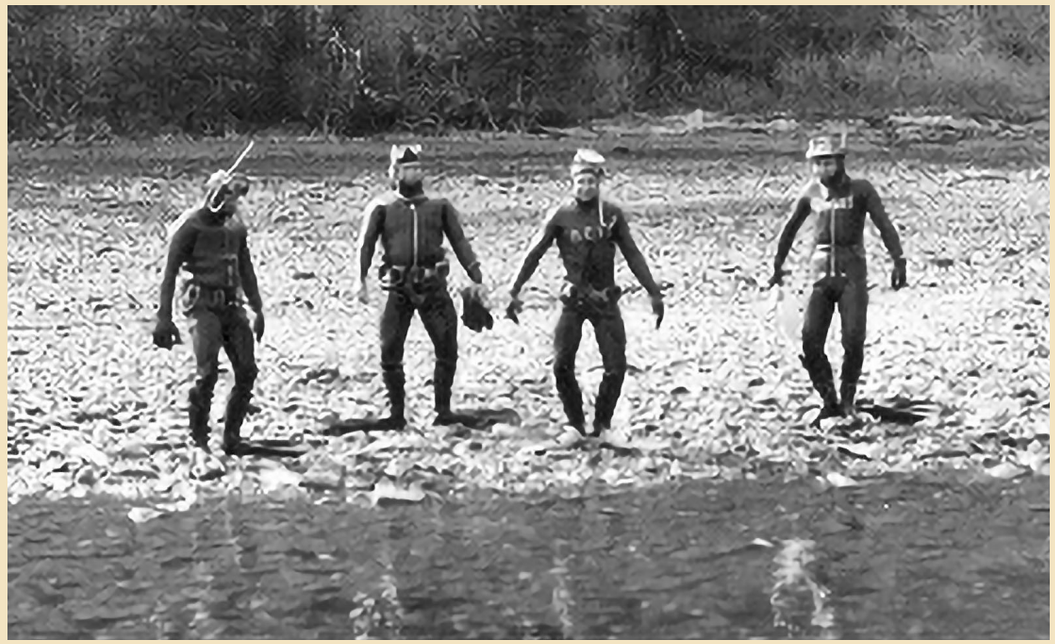
- installing acoustic marine mammal deterrent devices in the Ballard Locks (Seattle) to protect migrating salmon
- constructing a net pen at NMFS' Manchester facility (Puget Sound) to temporarily hold Springer (video), an orphaned killer whale
- maintaining and assessing the sea lion floating trap in Shilshole Bay (Seattle)

Auke Bay Dive Unit

The first dives by the Auke Bay Dive Unit in 1957 were for the Bureau of Commercial Fisheries. These were in Brooks Lake to explore the possibility of using diving in ecological studies of sockeye salmon in nursery lakes. From these earliest dive ventures, Bureau biologists developed a keen interest in using SCUBA as a research tool. In 1959, eight biologists from the region attended formal dive training at the U.S. Navy Torpedo School in Keyport, Washington.

The pioneer years of research focused mostly on early life history of salmon, the biology and ecology of Alaskan crabs, nearshore ecological studies, observations of fishing gear performance, and of course, testing of early gear and diving techniques.

As an outgrowth of the very active diving program at the Auke Bay Fisheries Laboratory (ABL) since the late 1950s, Laboratory divers became participants in several advanced diving projects outside Alaska, such as the saturation diving projects, which studied extended underwater living to conduct marine research. These projects, while having marine biological research as important objectives, were often more heavily slanted towards diving technology and studies of human behavior and physiology during extended underwater missions. In other



Divers at the Little Port Walter (LPW) field station. Photo by Bill Heard (ABL).

words, although the biologist divers were pursuing interesting and worthwhile marine research, they were themselves objects of study by yet another layer of researchers

During its long history, the Auke Bay Dive Unit grew to number more than 25 divers at times and has always been "on call" for milestone projects, including those that come with little or no advance notice. Auke Bay divers collected data before and after the nuclear testing on Amchitka Island in the late 1960s and were among the first responders to the Exxon Valdez oil spill in March 1989. Diving was a critical tool for the oil spill studies, providing baseline data as well as post-spill assessments of marine ecosystems. Auke Bay divers dove the entire measurable path of the spill from Bligh Reef to the Shumagin Islands, collecting thousands of samples along the way.

Today's diving mostly involves research in support of Agency mandates such as Essential Fish Habitat and other emerging issues such as Ocean Acidification. Auke Bay divers have conducted tens of thousands of working dives from British Columbia to the Bering Strait, although current diving activity is quite low compared to historic levels.

The words of Auke Bay's very first Unit Diving Supervisor, Bill Heard, still ring true, "Diving, when used appropriately, like a microscope, a gill net, or thermometer, can be an indispensable tool in fisheries research".

Content provided by Rod Towell (NMML), Pete Cummiskey (RACE) and Bob Stone (Auke Bay Laboratories).

Additional reading

What Lies Beneath? The NOAA Diving Program Helps Find Out

High, William L. (Bill). March 1993. Report Describing Aspects of Diver Supported Ghost Net Recoveries.

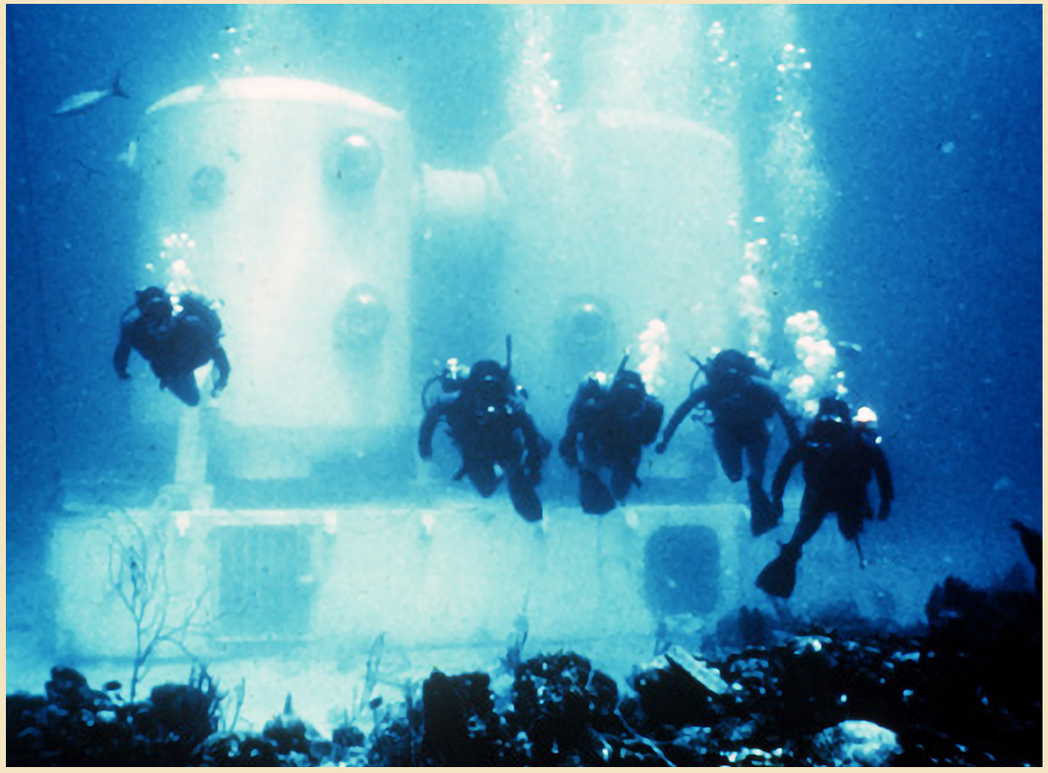
◁ Technology

Auke Bay Laboratories' Participation in Saturation Diving Projects

The importance of manned undersea research in the United States government's approach to ocean management was clearly stated in the foreword to the first edition of the National Oceanic and Atmospheric Administration (NOAA) Diving Manual:

> Since its inception in 1971, NOAA's Manned Undersea Science and Technology Program has been concerned both with scientific accomplishment - through the use of submersibles, undersea habitats, and diving techniques - and with the physical and biological technology required to improve the Nations' civilian underwater capability. To obtain a true understanding of our marine environment, and gain adequate knowledge of the marine resources, we must continually seek better and safer ways to explore, perform research, and undertake analysis of the underwater realm. In many situations this work must be done by men and women divers who can provide the degree of direct observation and control of experimentation, the' ground truth,' that cannot be accomplished by instrumentation controlled from a remote surface location.

Two advanced projects were investigations into the use of saturation diving for conducting in situ marine research by biologist-divers living underwater for extended periods. By living at a depth near that of the study sites, divers can operate for extended times in the water without having to undergo decompression between dives. Only at the end of the entire mission do the divers undergo a single, extended decompression period to permit their safe return to surface pressure. Thus, the use of saturation diving allows researchers to spend vastly more time actually engaged in on-site, underwater work than can be accomplished by normal, surface-based bounce diving techniques.



Divers and the TEKTITE I habitat. OAR/NURP photo, NOAA Photo Library.

Tektite II

The first of these saturation diving programs involving Auke Bay biologist-divers was Tektite II, conducted in the U.S. Virgin Islands from April to November, 1970. This program enabled 11 successive teams to conduct biological, physical, and chemical studies in a tropical coral reef environment. Each team consisted of four scientist-divers and one engineer-diver to manage the support systems of the Tektite habitat. Divers lived in the habitat at a depth of about 50 feet which allowed unlimited working time within a depth

Saturation Diving

range of 25 to 65 feet. The shallow limit was the physiological minimal safe excursion depth for divers saturated at 50 feet. The deeper limit was simply the greatest depth that could be reached within reasonable swimming distance from the Tektite habitat. (The physiological lower depth limit was established at 100 feet.)

The Tektite habitat was supplied with air, electricity, water and communications via an umbilical running from a constantly manned control station ashore several hundred feet from the habitat. During all scuba-equipped excursions away from the habitat, divers were followed by a safety team in a skiff overhead. The total decompression time required following saturation in the Tektite habitat was approximately 20 hours and was carried out in a surface decompression chamber after transfer of the divers from 25-feet depth to the surface chamber in a pressurized personnel transfer capsule.

Two Auke Bay Lab biologists, Lou Barr and Bob Ellis, participated in the Tektite II program as members of two separate teams. They were both primarily involved in population and behavior studies of spiny lobsters and arrow crabs, but they also assisted other team members in their studies. Barr was a member of the sixth team and occupied the habitat for 20 days (23 July - 12 August). Ellis was on the eighth team and also spent 20 days (2-22 September) in the habitat.

A side note to the Tektite program is that its origin goes back to an interest by the National Aeronautics and Space Administration (NASA)into the effects of isolation and confinement on crews assigned to extended missions. NASA and the Office of Naval Research discussed possible similarities in behavior patterns of crews isolated in space and those underwater. NASA psychologists expected that data applicable to the behavior and effectiveness of crews living and working underwater could be extrapolated to future space station missions. Therefore, NASA, as one of the cooperating agencies in the Tektite program, devised an intensive study of all the inhabitants of the Tektite habitat. The study included background histories and psychological testing of all participants and 18-hour a

Tektite I, Philadelphia Navy Yard Dry Dock, 1968

day behavioral monitoring, via closed-circuit TV and open microphones, of all the divers while they were in the habitat.

The study even extended to testing on the divers prepared frozen meals being developed to be used on later space missions. Thus, in a small way, the Auke Bay Lab contributed to the then future development of manned space stations.

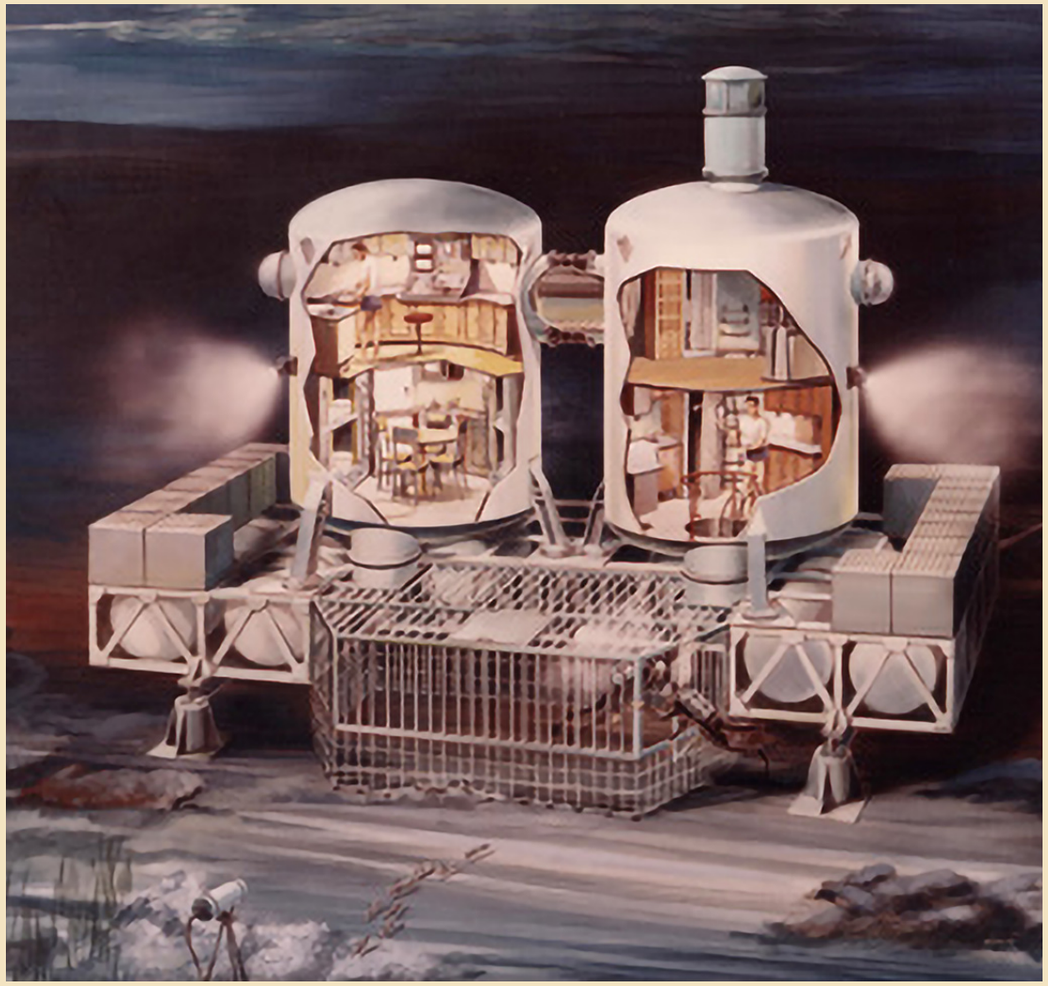
In addition to the above studies, the divers were also subjected to an extensive battery of biomedical tests before, during, and after each team's mission. These tests were intended to identify any adverse

medical effects to the divers that might have resulted from their living for extended periods in confined, hyperbaric conditions.

Helgoland

Helgoland, the second saturation diving program involving an Auke Bay biologist, took place off the coast of Massachusetts during September-November, 1975. This program used an underwater habitat built in Germany and designed to operate autonomously, without any direct physical link to constant, manned support on the surface. Instead the habitat was supplied with compressed air, electricity, and fresh water from an automated support station, called the energy buoy, tethered by an umbilical to the habitat and floating on the surface overhead. Communication with the control and monitoring station ashore was accomplished via a radio transmitter/receiver on the energy buoy.

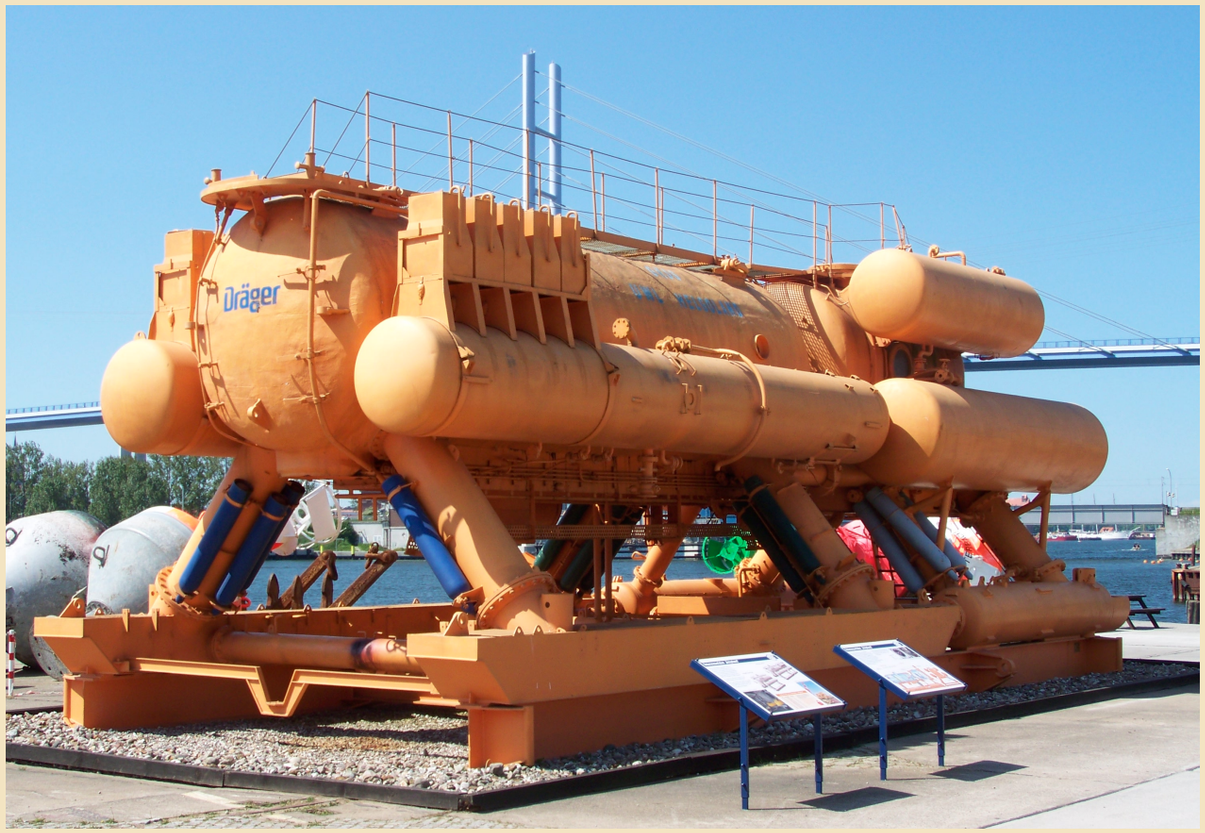
The Helgoland habitat was emplaced at 110 feet depth on Jeffrey's Ledge, about 8.5 miles offshore of Cape Ann and 10 miles from the shore-based control center at Rockport. Excursion depths for the divers in the Helgoland ranged from 100 feet to 140 feet. Surface support personnel could only reach the habitat site by a long boat trip from Rockport or Gloucester when weather conditions permitted. Saturated crew members in the Helgoland habitat were dependent on the functioning of the energy buoy or the backup electrical batteries and compressed gas storage tanks aboard the habitat that kicked in during interruptions in operation of the systems at the surface. Whenever there was a generator or compressor failure on the buoy, the underwater team operated conservatively on the backup supplies until a surface support crew could reach the buoy and restore normal operation. During diving excursions away from the habitat, which occurred at any time during day or night, the divers were totally on their own; there was no surface safety team following as there had been during the Tektite program.



Artist's cutaway view of Tektite II habitat. NOAA Photo Library.

Although the Helgoland program contained a set of biological and equipment studies that occupied the saturated team living in the habitat, a major objective of the overall program was to test the entire saturation system in an open ocean, offshore location without constantly available surface support. In this program, as in Tektite II, the divers were also subjected to biomedical studies to look for

Saturation Diving



Main chamber of the Helgoland underwater habitat. Photo by Klugschnacker, Wikipedia Commons

effects of living for an extended period under hyperbaric conditions and an altered oxygen/nitrogen breathing medium.

The Helgoland program supported four successive teams of saturated divers; the first, a team of two German engineer-divers who checked out the newly emplaced habitat, was followed by three teams, each consisting of three biologist-divers and one engineer-diver. Lou Barr of the Auke Bay Lab was a member of the second science team and spent a total of 16 days living in and working out of the habitat. (See "Additional reading" reference below.)

The planned mission lengths for each science team was about two weeks, however the threat or reality of severe weather effectively shortened (in one case to less than six days) or lengthened each mission.

Following each mission the saturated team was required to undergo a decompression period of about 50 hours. Unlike Tektite II, where decompression was about 20 hours and took place in a surface decompression chamber, the Helgoland divers planned to be decompressed for over two days in a decompression chamber within the habitat. They were then able to return directly to the surface after completion of the decompression period on the bottom.

None of the four missions ended as planned. The first, carried out with the German engineer-divers surfacing to severe weather conditions led to the death of one of the engineers. The second team's mission was aborted early because of the threat of an approaching hurricane and they had to be brought up in a pressurized personnel transfer capsule to be decompressed in a surface chamber ashore. The third team was held over an extra day because of heavy weather, spending about 70 hours in the decompression chamber in Helgoland, and still surfacing during gale conditions. The fourth and final team surfaced after the planned decompression within the habitat, but after surfacing and aboard the pick-up vessel, one team member lost consciousness and collapsed; he had to go through a further period of recompression and decompression before recovering.

A few final comparisons of the Tektite II and Helgoland programs are of interest. While Tektite II took place in a relatively shallow (25-65 feet) tropical environment, Helgoland occurred at more than twice the depth (100-140 feet) in the much colder north Atlantic. Tektite II extended over a period of about eight months and involved 53

saturated divers in 11 teams each living in the habitat for periods of 5 to 20 days. Helgoland took place in less than three months and involved 16 saturated divers on four missions each lasting 5 to 16 days. Tektite II occurred with no serious mishaps or injuries. Helgoland was plagued with numerous system failures, severe weather problems and injuries (one fatality and one case of decompression sickness). Both programs, however, were challenging and rewarding experiences and contributed to future NOAA involvement in manned undersea activities.

Returning to the first edition of the NOAA Diving Manual for a concise summary of the early U.S. involvement in scientific saturation diving:

> Early underwater habitat operations were directed primarily toward hardware, technique, and physiology projects rather than experimental studies in marine science. These habitats and diving apparatus were neither technically nor logistically perfected nor designed to accommodate the average diving scientist. Rather, they were designed to determine engineering feasibility or to demonstrate the capability of humans to survive the rigors of the undersea environment.

Events

- In 1969, three BCF diver-scientists participated with the U.S. Navy, NASA, and other diver-scientists in the new TEKTITE I project. The scientists spent a record 2 months on the ocean floor, working from an underwater laboratory situated at a 50-foot depth. Also that year, the Exploratory Fishing & Gear Research group based at the Montlake Laboratory (Seattle, WA) obtained its first SCUBA dive team.

Additional Reading

Barr, Lou [ABL biologist]. 1977. "Helgoland" Diary: Sixteen Days Under the North Atlantic. Oceans 10(1):16-21.

Methods

Technological Methods, Techniques, and Ideas

For similar topics check out: "Tools, Gear, & Equipment" and the "Research and Management" pages.

Fishing

Owing to the severe weather conditions at sea and working around heavy equipment, fishing has always been a very hazardous occupation in Alaska. According to Alaska Fishermen's Union records, nearly 60 men drowned from 1905-1909. Improvements to vessels, gear, techniques, and safety, and the organizing of more unions, helped alleviate some of these risks.

The oldest and most popular apparatus in the Pacific coast salmon fishery has been the gill net – the "drift net" and "set net" being the two kinds used in purse seining. Many types of floating traps, from the one invented by Mr. J. R. Heckman, of Ketchikan, Alaska, were used in southeastern Alaska, the first having been installed in 1907. Native fishing methods in Alaska have included the use of wickerwork traps, the bow and arrow, spears and gaffs, and fish wheels, whose first operation in coastal waters was in Taku River, Southeast Alaska, in 1908.

George B. Kelez takes soundings in Iliamna Lake. Auke Bay Laboratories photo.

Methods

Additional Reading

Cobb, J. N. 1921. Apparatus and Methods of the Fisheries, p. 75-91. In J. N. Cobb, Pacific Salmon Fisheries, Appendix I to the Report of the U.S. Commissioner of Fisheries for 1921 (doc. 902). Wash. G.P.O. 268 p. + figs.

Collins, J. W. 1892. The Fishing Vessels and Boats of the Pacific-Coast, p. 13-48 + plates. In: Bulletin of the United States Fish Commission, Vol. X, for 1890. Wash. G.P.O. 450 p.

West, C. W. 1985. Harvesting Technology in the Pacific Whiting, *Merluccius productus*, Fishery. Mar. Fish. Rev. 47(2):47-54.

Taylor, H. F. 1921. Preservation of Fish Nets (doc. 898), 35 p. In Report of the United States Commissioner of Fisheries for the Fiscal Year 1920. Wash. G.P.O. 306 p.

Ageing

An important aspect of developing appropriate fisheries management polices was the study of age and growth of fish. In 1910, Charles Gilbert adapted an existing European method of ageing Pacific salmon that entailed counting ridges on the scales.

An important breakthrough in the fur seal research occurred around 1948, when a biologist extracted 36 teeth from a freshly killed animal to photograph dentition. During the process he noticed faint ridges circling the root of each tooth and hypothesized that each ridge might indicate 1 year of life. His theory proved to be correct and, as a result, a routine part of the field operations on the Pribilof Islands after that time was the collection of teeth for age determination.

Fish otoliths (ear bones) have been used in age determination. Under a microscope, the thickness of individual rings on an otolith are measured in order to estimate fish growth.

The following material is excerpted.

Determining fish ages from reading otoliths underwent a revolution during the early 1980s when it was determined that older specimens of many species aged from otolith surfaces were being underaged. At the AFSC, the

Magnified fish scale ridges taken in 1919. Auke Bay Laboratories photo.

Age and Growth Program began applying a new technique of ageing otoliths, the break and burn method, in 1981. The break and burn method entails taking a transverse cross section by breaking (usually sawing) an otolith in half and then exposing the transverse surface to an alcohol flame. This process makes finer marks associated with later annual marks more visible than viewing from the otolith surface.

From: Kimura, D. 2007. A Bit of AFSC Ageing History. In AFSC Quarterly Report, July-Sept. 2007.

Bomb-derived radiocarbon (C-14) has been a method more recently used in age validation studies. "During the Cold War era in the 1950s to 1960s, above-ground testing of atomic bombs led to a substantial increase in marine

Methods

C-14. Any marine organism alive at that time incorporated bomb-produced C-14 in their calcified hard parts, providing a time stamp for age estimation. The bomb radiocarbon age validation method relies on fish of known age that were alive during the era of increasing C-14 and on measurements of C-14 in their otolith cores to create a reference."

From: Kastelle, C. 2009. Fish Age Validation with Radiocarbon from Atomic Bombs. In AFSC Quarterly Report, Apr-June 2009.

Additional Reading

Kimura, D. K. 2008 (rev.) A Brief History of Age Determination of Walleye Pollock (*Theragra chalcogramma*) at the Alaska Fisheries Science Center. (AFSC Age and Growth Program page)

Kimura, D. K., and D. M. Anderl. 2005. Quality Control of Age Data at the Alaska Fisheries Science Center. Mar. Freshwater Res. 56:783-789.

Kastelle, C., and T. Helser. 2010. Regional Environmental Factors Affecting Bomb-Derived Radiocarbon Age Validation Studies. In AFSC Quarterly Report Feature, April-June 2010, 5 p.

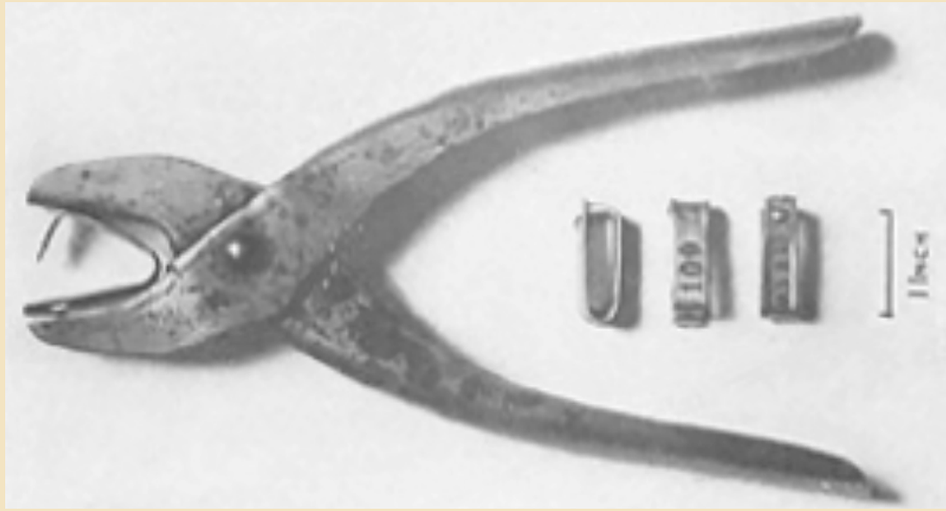
Events

The following material is excerpted.

- **Fish tagging/marking experiments, 1920s-1950s**

In the early 1920s, Charles Henry Gilbert and Willlis H. Rich began extensive salmon tagging in the Alaska Peninsula. In 1923, roughly 10,000 numbered aluminum tags were attached to red salmon with reliably reported recaptures during the commercial fishing season. Tongs were used to attach the 3-inch long bent tags to the upper lobe of the tail at its base.

From: Gilbert, C. H., and W. H. Rich. 1925. Second Experiment in Tagging Salmon in the Alaska Peninsula Fisheries Reservation, Summer of 1923 (doc. 991), p. 27-75 + figs. In Bulletin of the U.S. Bureau of Fisheries, Vol. XLII, 1926. Wash. G.P.O. 385 p.



Tong and tags used for salmon tagging. Bureau of Fisheries photo, 1922

In the spring of 1930, the first known attempt to mark pink salmon fry as they migrate from the streams was done at the Duckabush River hatchery – 36,000 fry were marked. The process involved using finger nail clippers to remove the dorsal and adipose fins, widely separated on the body. Both fins were removed because mature salmon often lose one of them from natural causes. Despite the loss of fins, the mortality of the fry was apparently unaffected.

A sizable herring tagging program began in 1932 conducted by Dr. George A. Rounsefell, Edwin Dahlgren, and Samuel Hutchinson in southeastern Alaska using the Bureau's motor launch *Heron*. Some 5,000 herring were tagged and released using new metal "belly" tags, made of pure nickel, that could be recovered by a magnetic detection system on the conveyer belts at processing plants. Three years later, Dahlgren refined the tags and developed electronic and magnetic systems for recovering the tags as the fish pass through the reduction plant.

By the mid-1950s, the common type of tag had evolved to to the "Petersen-disk", consisting of two plastic disks, about one-half inches in

Methods

Mobile subsistence laboratory of the Research and Development branch. 1947

diameter, attached on each side of the salmon by a 2-inch pin inserted through the fleshy part of the back below the dorsal fin. A "tagging box", built to waist-height and used on the water, had a padded cradle to hold each fish while being tagged and a foot-lever-operated door that opened to release the fish into the water.

- **NMFS laboratory tags Tanner crabs**

A team of National Marine Fisheries Service Auke Bay Biological Laboratory scientists, headed by John Karinen, project supervisor, has developed a method for tagging Tanner crab with identification that is retained through molting. Up to now, there had been no known method for accomplishing this task. After small-scale tagging studies, laboratory scientists report that of nine male crabs fitted with Floy anchor tags in the area of the third walking leg, 30 percent molted successfully and retained the tag. It is believed that molting success of tagged crab can be improved by modifying the tag and method of insertion. The tagging problem also has shown that Tanner crabs return to a "home" area to molt and mate each year. Scuba divers recently recovered a tagged male Tanner crab in 30 feet of water at the Auke Bay Biological Laboratory dock that was one of ten tagged in March 1970 and released at the same location. Further tagging of Tanner crabs is underway to learn more about their migration and behavior.

From: NOAA Week newsletter.4 June 1971, 2(22):4.

- **Fishery acoustic surveys**

Fishery surveys are used to estimate the total population of a fish stock–information that is critical to making fishery management decisions. Since 1970, NOAA's Alaska Fisheries Science Center has pioneered the development of acoustics, or sound waves, to conduct these surveys. Innovative technologies, such as digital data collection systems or multi-beam sonar, as well as techniques for collecting acoustic data developed by the Center have improved the quality of data collected, allowing better overall management of our nation's fisheries.

From: "Breakthroughs: Honorable Mentions" ("NOAA Celebrates 200 Years of Science, Service, and Stewardship" website)

- **New way to ship live crabs to market is perfected by NMFS, 1973-74**

see "Canning, Curing and other Preservation Techniques"

Additional Reading

Rounsefell, G. A., and J. L. Kask. 1945. How to Mark Fish. Trans. Amer. Fish. Soc. 73(1):320-363.

"Regional Fisheries Data Sets" ("NOAA Celebrates 200 Years of Science, Service, and Stewardship" website).

Tools & Equipment

Tools, Gear, and Equipment

Also

- Visit Methods, Techniques, and Ideas and the Research and Management section
- Find out about Unmanned Aircraft Systems (UAS)

Events

The following material is excerpted.

Blish distance finder, 1894

This simple and admirable little instrument was devised by John B. Blish, lieutenant, United States Navy. It has been used to advantage on board this vessel [the *Albatross*] for about two years, and we have found it particularly valuable at night and in stormy weather. With the course and distance and two bearings of a point of land, without computation or reference to books or charts, the instrument will give the distance of the point at the time of the first and second bearings, the distance to be run from the second bearing to bring it abeam; also the distance at which it will be passed if the course is maintained. Repeated observations will show whether the vessel is actually making her course.

From: Tanner, Z. L. 1896. Report Upon the Operations of the United States Fish Commission

Fish and Wildlife Service (FWS) scientist with a gas chromatograph. FWS photo. Alan Levitt, creator.

Steamer *Albatross* for the Year Ending June 30, 1894, p. 240-241 + illustration plate. In U.S. Commission of Fish and Fisheries, Report of the Commissioner for the Year Ending June 30, 1894, Part XX. Wash. G.P.O. 718 p.

High-speed plankton sampler, late 1940s

High-speed towable plankton sampling gear was developed by A. C. Hardy and first used during the mid-1920s. Unfortunately, the Hardy Plankton Recorder could only sample at a single depth and the organisms that were crushed in the device were unidentifiable. An experimental model designed by Elbert Ahlstrom and O. R. Smith is similar to Hardy's collector. The cylindrical net can be attached to the towing cable at various points to provide plankton sampling at different depths.

From: Ahlstrom, E. H., J. D. Isaacs, J. R. Thrailkill, and L. W. Kidd. 1958. High-Speed Plankton Sampler, p. 187-214. In Fishery Bulletin of the Fish and Wildlife Service, Vol. 58. G.P.O. Wash. 525 p.

Projection device used to determine age from fish scales, 1950s

Satisfactory results have been made using a microprojector (originally developed in 1938-39) to study the ages of the California sardine or pilchard from markings on their scales. The improved scale reader was built by aquatic biologist, Kenneth H. Mosher, and consists of a microscope, 90° prism silvered on one face with a glass mirror, projection screen and light source.

From: Mosher, K. H. 1952. Description of a Projection Device for Use in Age Determination From Fish Scales (bulletin 54), p. 405-407. In: Fishery Bulletin of the Fish and Wildlife Service, Vol. 51. G.P.O. Wash. 488 p.

The sonic tag and electronic fish counter, mid-1950s

Another valuable development at the Montlake Laboratory was the sonic tag – a small capsule with a battery-operated, sound-emitting device which is attached to a fish for continuous tracking in a stream or in the ocean. Also significant was the development of the electronic fish counter which was found to be quite accurate in counting the numbers of salmon ascending the fishways at the Hiram M. Chittenden Locks in Seattle.

From: Atkinson, C. E. 1988. The Montlake Laboratory of the Bureau of Commercial Fisheries and its Biological Research, 1931-81. In R. R. Mitsuoka, R. E. Pearson, L. J. Rutledge, and S. Waterman (editors), Fifty Years of Cooperation and Commitment: 1931-81, the Northwest and Alaska Fisheries Center, p. 19-46. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-34.

Oceanographic buoys

Equipment for oceanography...A new transponding, free-floating oceanographic buoy was successful in first tests. Later several buoys were released 300 miles off the Washington Coast and recovered as they approached the Coast. These buoys responded to radio signals from the Bureau research vessel George B. Kelez and provided radio-fixed locations for establishing drift direction and speed. The buoys are being equipped with pressure sensors and quartz thermometers to sample pressure and temperature to a depth of 984 feet.

From: Report of the Bureau of Commercial Fisheries for the Calendar Year 1964. Principal Accomplishments, p.17.

Bycatch reduction devices

Shrimp trawling has been identified as the largest source of human-caused sea turtle mortality in the United States, as turtles become trapped in shrimp nets and can not escape. To combat incidental death of protected turtles, in the early 1980s, NOAA scientists designed and developed Turtle Excluder Devices (TEDs). These devices allow sea turtles to be safely released without any loss of shrimp harvest. The successful development, introduction, and enforced effective use of TEDs by NOAA has reduced incidental death of sea turtles by shrimp trawling by 97 percent while allowing the shrimp fishery to continue unfettered.

Pelagic (open ocean) longline fishing gear used to catch swordfish has also been a source of sea turtle bycatch. Experiments on the Grand Banks (2001-2003) demonstrated that feasible modifications to this gear resulted in

significant reductions in the bycatch of sea turtles while maintaining the catches of swordfish. Using 18/0 circle hooks and mackerel bait, scientists observed reductions of 65 percent in leatherback turtle catches and 90 percent in loggerhead catches. The circle hooks also reduce the percentage of loggerheads swallowing the hooks (69 vs. 27), which presumably indicates a reduction in mortality. Tools developed during this experiment can be used to remove fishing hooks and line from the turtles that are captured, further reducing their mortality. This technology (circle hooks and gear removal tools) is now required in both the Atlantic and Pacific U.S. pelagic longline fleets, drastically reducing mortality of protected resources, and is being exported worldwide.

From: "Breakthroughs: Honorable Mentions" ("NOAA Celebrates 200 Years of Science, Service, and Stewardship" website)

Passive integrated transponder tags for fisheries research

The passive integrated transponder (PIT) tag is a small, internal tag that allows individual fish to be passively identified as they pass detection stations. Unlike other much larger electronic tags that require batteries or external tags or marks that require recapturing fish, the PIT-tag will continue to identify and provide valuable information about a tagged fish throughout its lifetime without the need to rehandle the fish.

The PIT-tag was developed after Mr. Earl Prentice, a scientist at NOAA's Northwest Fisheries Science Center, took a conceptual vision of using electronic tags to identify people and translated it into a device that has revolutionized fisheries research by allowing scientists to collect data on the migratory timing, passage, behavior, and survival of many fish populations under different environmental conditions. Mr. Prentice began working on the tag in 1982, and has since guided its development and helped refine many of the applications of the technology.

Today, PIT-tags are used in many types of fisheries research and have revolutionized certain aspects of experimental biology by providing a rapid, non-lethal means of identifying individual experimental animals. The tags have been used extensively to evaluate management actions associated with Pacific Northwest salmon, and the tags are now used with sturgeon, halibut, red drum, bass, gar, eels, crayfish, king and tanner crab, seals, sea otters, turtles, and alligators.

From: "Breakthroughs: Honorable Mentions" ("NOAA Celebrates 200 Years of Science, Service, and Stewardship" website)

NMFS scientists develop new fish harvesting gear, 1971

A new innovation has been introduced into one of the oldest fisheries on the Pacific Coast through research at the National Marine Fisheries Service's Seattle Exploratory Fishing and Gear Research Base. Scientists at the base have developed steel wire pots for harvesting sablefish, or black cod, as it is more commonly known in the industry.

The fishery for this large, cod-like fish began in the 1890's off Washington and British Columbia, spreading to California, Oregon, and Alaska. This deepwater fish is traditionally taken either with otter trawls--large, bag-like nets towed along the seabed – or with set lines consisting of many baited hooks attached to a longline set on the seabed. Both have disadvantages. While the set lines must be retrieved frequently to prevent the fish from dying or from being eaten by other fish, the pots serve as cages to protect the catch from predators.

Sablefish caught in trawls often have missing scales or punctures from spines of other fish, or part of the catch may be crushed as the net is lifted aboard the vessel. On the other hand, those taken in pots are generally of uniformly high quality. The pots have still other advantages. They can be fished on rougher or more precipitous grounds than either setlines or trawls. The size of the individual fish retained in the pot can be regulated by the size of the meshes, so that undersized fish escape to grow for future harvest. The pots are also highly selective.

Very few species other than sablefish have been caught in pots at bottom depths of 1,200 to 2,400 feet. To insure that lost pots do not continue to trap fish, depleting the resource, panels of cotton mesh, which deteriorate with

time, letting fish out, are incorporated into the walls of the pots. Scientists at the Seattle base have labeled such panels "escape hatches". The utility of both rigid cylindrical and collapsible rectangular pots is being investigated, with the collapsible retangular units having the added advantage of reducing the storage area needed for pots on the deck of the vessel.

NMFS scientists plan to use the pots as a research tool to assess the relative abundance of sablefish on the Continental Shelf and Slope in the northeastern Pacific from California to the Arctic Ocean. This information will be used to establish the size of the sablefish resource and provide data to insure that stocks will not be overfished by an expanding domestic and foreign fishery.

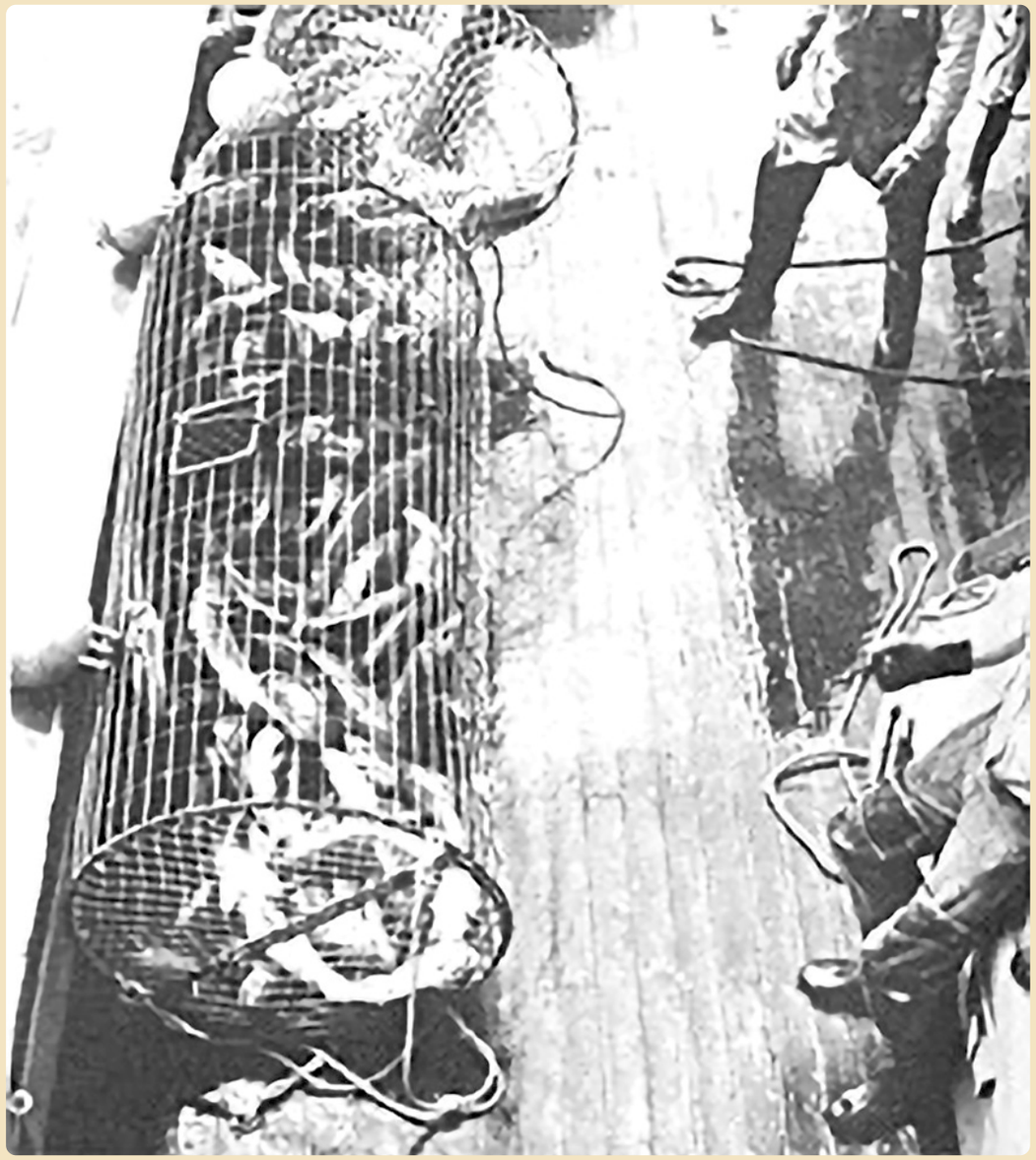
Catches of sablefish have ranged up to 1,000 pounds in a single pot lifting. In cooperation with commercial fishermen, NMFS scientists have perfected the pot fishing system to the point where several vessels have been outfitted with the new gear. With fishing pots on a longline with 6 to 12 pots per line, one commercial vessel has landed up to 30,000 pounds of dressed sablefish in a ten-day trip.

From: NOAA Week newsletter. 3 March 1971, 2(10):4.

Salmon-counting sonar device developed with NMFS support, 1971

A salmon-counting sonar device has been developed under the fisheries grant-in-aid program administered by the National Marine Fisheries Service. The counter was developed by the Electrodynamics Division of the Bendix Corporation under contract to the Alaska Department of Fish and Game for enumerating salmon in glacially turbid Bristol Bay and Cook Inlet streams where visual counts are impossible. The device can also be used to replace weirs and counting towers where such stations are not practical or desirable.

The counter uses an array of 30 transducers secured to a plastic frame that resembles a ladder. The frame is submerged, perpendicular to the shore, along the route of salmon migration. The transducers "illuminate" a 50-foot path with sound from the bottom upward. As fish swim through this path, sound bounces off them and triggers a counter that resembles the odometer of an automobile. Echoes returning from surface air and surface-floated debris are electrically disregarded. A 12-volt



Sablefish pot with a 600-lb catch. NOAA photo.

battery will power the system for about three weeks. The entire unit weighs little more than 300 pounds, and can be loaded into a small bush plane for transportation. It can be installed by two or three men in about half a day.

Development of automatic nonvisual counting methods is an important step in the proper management of the salmon resource because many major runs are now largely unenumerated due to glacially turbid rivers, remoteness of area, and cost requirements. At present the Alaska Department of Fish and Game has nine counting units in operation; others are being operated by the Canadian Department of Fisheries and the Washington State Department of Fisheries, and one has been delivered in England.

From: NOAA Week newsletter, 23 April 1971, 2(16):5.

Computer plotting of North Pacific fishing stations, 1971

Murray Amos completed a computer program in Fortran for the IBM 1130 for plotting a Mercator projection chart with the Calcomp 563 plotter. The chart can include any latitude and longitude of the Northern Hemisphere for boundaries. Optional features include plotting of positions on the chart, track lines between plotted positions, printing beside plotted positions, construction of internal latitude and longitude lines at stipulated intervals, and a stylized outline of coastlines and islands. The latter feature is prepared separately from the plotting program and presently includes data to plot the North Pacific Ocean-Bering Sea rim from Baja California to the Kamchatka Peninsula.

The program has been used to depict the summer cruise of the RV *George B. Kelez* including fishing stations and dates in the North Pacific, and to produce a series of charts showing the locations at which fur seal samples were collected off the coast of Washington on the basis of the residual food items found in their stomachs. Further uses will include plotting of oceanographic stations occupied by research vessels of all nations investigating the North Pacific during the past 10 years with overlays relating research findings to catches by foreign fishing fleets.

From: North Pacific Fisheries Research Center Monthly Report, Sept. 1971.

Electronic acoustic trawl measuring device, 1974

Last year [1973] the Conservation Engineering Program, Marine Fish Shellfish Division, initiated the development of an electroacoustic instrumentation system which can be attached around the mouth opening of a fish trawl to measure the opening's dimensions while the trawl is actually being fished underwater. In the case of bottom trawls, which are fished on or near the seabed, the system also provides a measure of exactly how close to the seabed the trawl is being towed. These measurements of the actual underwater configuration of the trawl mouth opening are essential to (1) developing a more complete understanding of how both commercial and research vessel trawls operate and to (2) provide a foundation for improved trawl design. Also, the data obtained by the trawl measuring system are especially critical for accurate estimates of the abundance of fish stocks which are extrapolated from the catches made on trawl sampling surveys. For these surveys it is necessary to calculate the area "swept" by the mouth opening of a trawl, and it has been found that calculations made solely on the basis of theory and measurement made when the gear is not underwater are unsatisfactory. This is because the actual dimensions of the trawl underwater are a function of a variety of interacting forces whose effects cannot be accurately predicted without direct observation.

Prior to the present project, a study was made of existing trawl mensuration systems. It became apparent that those developed to date were unsuitable for our present purposes and budget. Some systems, developed for engineering studies of trawls, were more sophisticated than required, while others were too limited in their capabilities. Subsequently, the Center contracted with the Applied Physics Laboratory (APL) of the University of Washington, Seattle, for the design and construction of a suitable system.

Specifications were discussed with APL personnel and final selection tailored to availability of funds. This resulted in a number of compromises, including the elimination of measurement of some parameters. The final design included provision for measuring wing spread, headrope height from bottom, footrope height from bottom, and distance between the headrope

and footrope units. Data are recorded on a cassette tape located in the headrope unit with the wing transducer information telemetered to it by wire and the footrope unit data by an acoustic link. The repetition rate for recording data is variable from about 3.3 to 26 seconds (i.e., one reading of each parameter is recorded at whatever rate is selected. Tape life at the fast 0.3 sec) rate is about 20 hours and proportionally greater at the slower rates. Battery life of both the headrope and footrope units is about 40 hours at the fast repetition rate. Depth capability is greater than 300 fathoms.

At present, readout of tapes is with a digital display device and data transcribed manually from the readout. This is a time consuming activity and ultimately the tapes will be transcribed and the data printed out by computers. A capability for adding parameters and a real time readout has been designed into the present system.

Initial work with the system was done by the Center during late 1973 and early 1974 aboard the NOAA fishery research vessel *John N. Cobb*. Objectives were to evaluate the instrumentation performance and to begin measurement of various trawling systems. Minor problems in performance were noted in initial trials and were mainly associated with the abuse the gear received in handling aboard the vessel. These problems have been largely resolved.

Experiments to date have been carried out in Puget Sound with emphasis on evaluation of trawling gear used in the Center's resource survey work. These include the 400-mesh Eastern-trawl and a 61-ft shrimp sampling trawl. In addition, some-work has been done-with a 91-ft semi-balloon shrimp trawl used in the Kodiak shrimp fishery.

From: Northwest Fisheries Center Monthly Report, April 1974.

Conceptual model of the Bering Sea ecosystem, 1974

Dr. Michael Tillman (Food Chain Dynamics Subtask) and Hiroshi Kajimura (Pelagic Fur Seal Investigation Subtask) coordinated research plans to prevent duplication of effort in defining the structure of the food web in the eastern Bering Sea. A possible subsystem would involve the interactions between northern fur seal, walleye pollock, and several other species of fish. Current plans call for Food

The Nimbus G meteorological satellite. Called Nimbus 7 after launch on 24th October 1978, this satellite is being inspected by technicians prior to launch.
NASA photo, 1978

Chain Dynamics to define the fish component of this subsystem. Both Subtasks will identify the major species comprising their particular component and quantify predator-prey relationships, as much as possible, in terms of weight and numbers. These will be among inputs ultimately used to develop a conceptual model of the Bering Sea ecosystem.

From: Northwest Fisheries Center Monthly Report, Oct. 1974.

Fishery application of satellites, 1977

Dr. Felix Favorite was appointed the Center's representative to the NMFS Mimbus-G Satellite. Coastal Zone Color Scanner (CZCS) Committee. The satellite will be launched in 1978. One of a number of experiments will be quantitative measurements of ocean color in four spectral resolution channels over a swath width of 1500 kilometers; specific ocean areas will be viewed as often as every 3 days or less, clouds permitting. The NMFS Committee will investigate fishery applications and coordinate participation in the Nimbus-G program.

Emphasis will be on sensor validation, but ocean color measurements will provide indicators of currents, sediment distribution, chlorophyll concentrations, and other processes related to fish distribution. Earlier NMFS satellite studies in the Gulf of Mexico have shown relations between water color and fishing success for menhaden, and there is evidence that delineation of turbid water may serve as a locator for groundfish and shrimp. The ability to examine ocean conditions with real color, along with thermal and false color imagery information currently being used will enhance our ability to analyze bio-environmental relations.

From: Northwest and Alaska Fisheries Center Monthly Report, Jan. 1977.

Added note: The Nimbus G satellite was launched from Vandenberg Air Force Base on October 24, 1978, by a Delta 2910 launch vehicle. It was placed in a circular, near-polar orbit with an inclination of 99.3 degrees and a period of 104 minutes. Similar to the other satellites in this series, Nimbus G was butterfly-shaped.

Spacecraft and experiment data were transmitted to Earth stations immediately, or stored in an onboard high-speed tape recorder for subsequent playback when the satellite was in view of a ground acquisition station. Nimbus G was the first satellite to provide continuous, worldwide environmental data to help scientists throughout the world determine the physical characteristics of the global atmosphere, the oceans, the dynamic atmosphere-ocean interface, and the Earth's heat balance. For the first time, the European Space Agency (ESA) received and processed direct Nimbus G data at Lannion, France.

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Sundstrom, G. T. (Illustrator). 1957. Commercial Fishing Vessels and Gear. Fish and Wildlife Service Circular 48. 48 p.

Alaska Canneries

The following is a general overview of historical seafood preservation topics (not necessarily relevant to government or Alaska).

Alaska Canneries

The importance of the salmon fishery in Alaska was greatly increased with the canning process. The first salmon canneries in Alaska were built in the spring of 1878 at Klawak (North Pacific Trading & Packing Co.) and Old Sitka on Baranof Island (Cutting Packing Co.). The number of canneries in Alaska rapidly grew as other coastal states struggled to keep up with the increased demand for canned salmon. By 1888 there were 17 Alaska canneries in operation with an output of 412,115 cases and 20 more canneries were added the following year (714,196 cases).

Production soon exceeded demand, so to reduce the number of operating plants, the canneries began merging permanently; the first being the formation of the Alaska Packer's Association in 1893. Over the next 30 years demand continued to rise, however, and the daily yield per cannery rose from 150-200 cases to 2,500-4,000 cases. In 1923, there were 130 canneries operating in Alaska.

The salmon being brought to the plants by ship were at first shoveled by hand into bins on the wharfs. This laborious process was later improved upon by the use of a slanted conveyor (or

The cannery at Hoonah, Alaska, celebrated its 100th aniversary in 2012. Bureau of Fisheries photo, 1921.

elevator) whose lower end could be inserted into the holds to scoop up the fish onto the belt and into the building. The methods of dressing, cutting, salting, canning, cooking and packing the salmon had also improved, with the use of specialized devices and machinery.

In 1916, the canning of clams began in the district of Cordova, Alaska.

Additional Reading

An in-depth account of Alaska canneries in the late 1800s. From Moser, J. F. 1899. The Salmon and Salmon Fisheries of Alaska; Report of the Operations of the United States Fish Commission Steamer *Albatross* for the Year Ending June 30, 1898, p. 1-178. In: Bulletin of the United States Fish Commission, Vol. XVIII, for 1898. Wash. G.P.O.

Jones, L. E. 1915. Salmon Industry. In Report of Alaska Investigations in 1914. Wash. G.P.O., 155 p.

Cobb, J. N. 1921. Methods of Preparing Salmon, p. 111-203. In J. N. Cobb, Pacific Salmon Fisheries (doc. 902). Wash. G.P.O. 268 p.

Alaska's Historic Canneries: Celebrating Alaska's canneries from Ketchikan to Akutan and all ports in between.

Mild Curing

The following material is excerpted.

1914 - Mild curing is a very desirable and popular way of handling the salmon and makes of it a most palatable food. The process consists of lightly salting the fish and keeping them at a low temperature until ready for the consumer or for smoking, as is often the method of treatment before they are finally marketed.

The mild-curing business has reached considerable proportions and the popularity of the product has extended over two continents. The industry is confined to the utilization of king salmon and, to a small extent, to cohos...

From: Jones, L. E. 1915. Report of Alaska Investigations in 1914, 155 p.

Fish Cars

Initially, fish fry were transported in railway baggage cars to the U.S. West Coast in 10-gallon ice-cooled milk cans that required frequently aeration. Government "messengers" rode along to care for the fry. The Fish Commission purchased its own baggage car in 1881 and renovated it into a dedicated fish car. The Bureau's fleet grew. "No. 4" was one of the heaviest railroad cars in the country, "No. 7" in 1916 was the first steel car and had 50 percent more capacity than it predecessors, and the Bureau's last car, "No. 10" (1929), was an immense 81 feet long with insulated compartments for the fry. Over time, improvements were also made to the design of the cans (e.g., pails with built-in spaces for ice) and aeration techniques. Trucks (and airplanes) replaced trains as a more efficient means of transporting fish and in 1947 the last fish car, "No. 10", was removed from service.

New Way to Ship Live Crabs to Market is Perfected by NMFS (1973-74)

The following material is excerpted.

About four tons of live Dungeness crabs were trucked to West Coast retail outlets over comparatively long distances recently in a unique system developed by National Marine Fisheries Service scientists. Heretofore only minor amounts of live Dungeness crabs have been airshipped to markets.

The new shipping method, successfully tested twice by NMFS laboratories at Seattle, Wash., may make possible the sale of new varieties of live shellfish to customers far from the site of the catch. The NMFS investigations were undertaken in response to the request of a commercial fishing company which supplied equipment and financing.

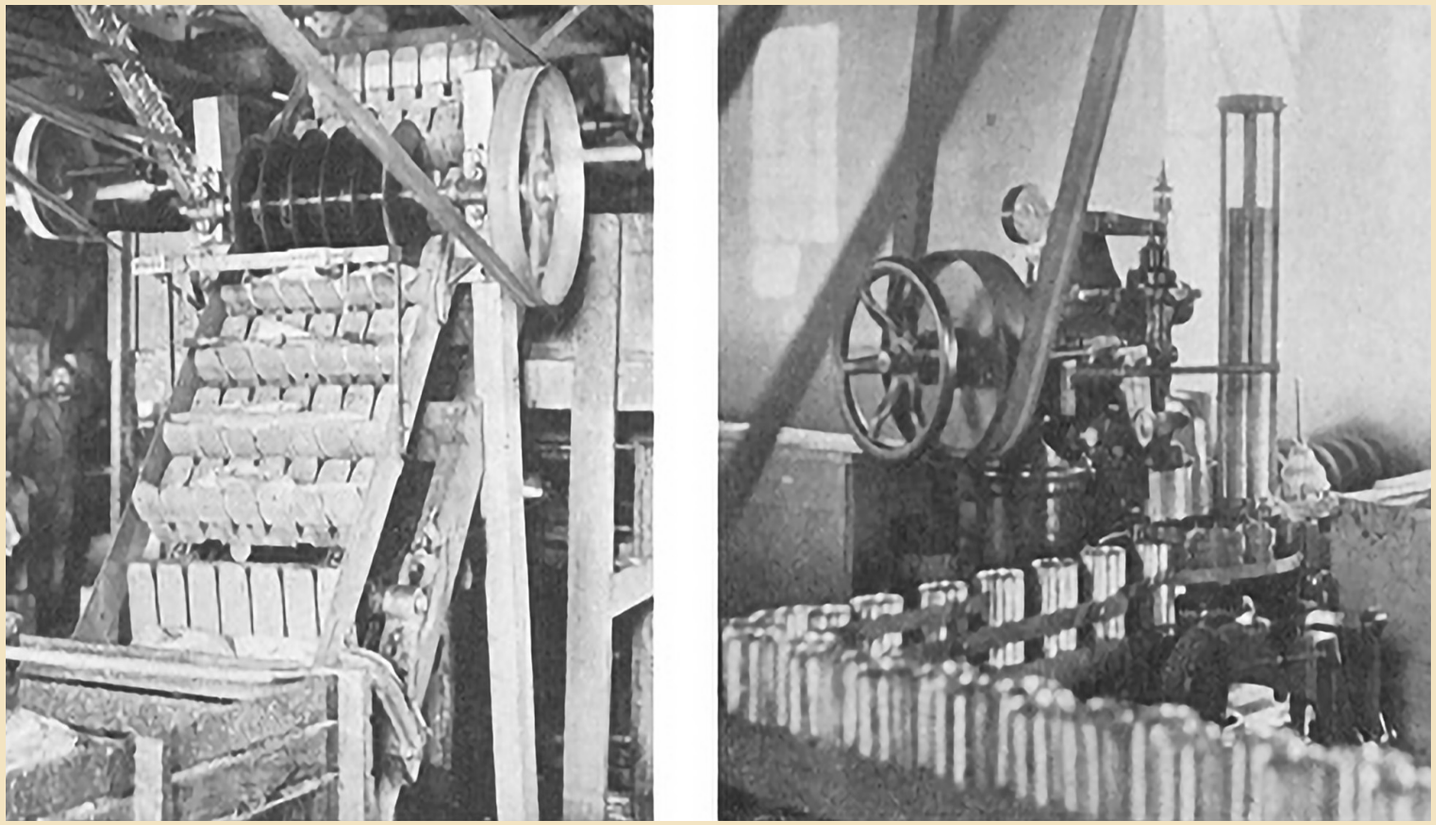
Experimentation involved the use of a 27-foot Fiberglass-lined trailer truck, equipped with a specially built system which circulates refrigerated water from a 400-gallon capacity reservoir fixed to vehicle's underside. The trailer accommodates 4,800 large crabs, each in its individual compartment,

into and out of which chilled salt water flows continuously, and then is filtered and recirculated.

The water system was of particular significance to the survival of the crabs -- in earlier experiments, the scientists had ascertained that dehydration of the crabs' gills during shipping periods was a leading cause of mortality. Also important to the crabs' well-being were low temperatures (43°F.), high humidity (90+ percent), and as little handling as possible.

Losses -- considered acceptably low for such shipping methods -- amounted to four percent for the first shipment, five percent for the second. The surviving crabs (96 and 95 percent) were lively, healthy, and undamaged when they reached their destinations. Seafood market proprietors to whom the live crabs were delivered reported favorable customer reaction to the new product.

From: NOAA Week newsletter 5(5), January 25, 1974, p. 3.



Alaska salmon cannery machines for cutting fish (left) and putting lids on full cans (right). Bureau of Fisheries photos, 1914.

Additional Reading on Refrigeration

Gamgee, J. 1879. On Artificial Refrigeration, p. 901-972. In Report of The Commissioner for 1877 (Part V). Wash. G.P.O. 981 p.

Taylor, H. F. 1927. Refrigeration of Fish (Doc. 1016), p. 501-633. In Report of the United States Commissioner of Fisheries for the Fiscal Year 1926. Wash. G.P.O. 633 p.

Other Additional Reading

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Barnett, H. J., F. E. Stone, G. C. Roberts, P. J. Hunter, R. W. Nelson, and J. Kwok. 1982. A Study in the Use of a High Concentration of CO2 in a Modified Atmosphere to Preserve Fresh Salmon. Mar. Fish. Rev. 44(3):7-11.

Vessels

The immensity of Alaska and the diversity of responsibilities led to the use of many types and sizes of vessels to support federal fisheries research, enforcement, and other activities such as transportation, navigational maintenance, and search and rescue.

Alaska Fisheries Vessels, 1882 - 2013

Starting with the early explorations by the Fish Commission's steamer *Albatross*, federal fisheries activities in Alaska have been dependent on a variety of vessels. The immensity of Alaska and the diversity of responsibilities led to the use of many types and sizes of vessels to support federal fisheries research, enforcement, and other activities such as transportation, navigational maintenance, and search and rescue.

Some of the boats were built specially for these duties, while others were purchased, or obtained as transfers from other government agencies – that is, military surplus vessels, or the "bear" boats received from the Alaska Game Commission. These vessels were then refitted or modified for fisheries service in Alaska waters.

Featured Sections

- The steamer *Albatross*, 1882-1921
- Early fisheries patrol boats, 1912-39
- Fish & Wildlife Service vessels, 1940-60
- Newer research ships, since 1949
- Pribilof Islands tenders, 1915-75
- Launches/small patrol craft, and others

Over the years, the original Fish Commission evolved into the Bureau of Fisheries (BOF) in 1904; the Fish and Wildlife Service (FWS) in 1940; the Bureau of Commercial Fisheries (BCF) in 1956; and in 1970, the National Marine Fisheries Service (NMFS) as part of NOAA.

During these transition periods, most of the vessels were retained within the Bureau's Alaska fleet. Some, however, were transferred to other agencies; for example, to the State of California, University of Washington, and the Alaska Department of Fish and Game around 1960 following Alaska's statehood.

Several of the vessels presented in the featured sections, such as the *Auklet*, *Eider*, *Teal*, *John N. Cobb*, *Murre II* and *Miller Freeman*, proved to be the most notable workhorses, performing a variety of tasks and providing many years of continued fisheries service in Alaska.

As one digs deeper you also find a forgotten Alaska fleet of marine poaching enforcement and general support vessels. In fact, several generations of boats had connection with fisheries research in Alaska with each generation meeting the specific needs of Bureau activities. The service requirements often resulted in multipurpose boats not only used for the aforementioned activities, but for the transportation of cargo and passengers including government officials and dignitaries visiting Alaska.

Most of these boats and ships were designed, built, and launched without all the fanfare that is associated with the construction of modern fisheries vessels. Most worked hard and were hard-worked in Alaska waters for many years, some continuing on long after their government service. Like their humble beginnings, many of these fine vessels disappeared quietly at the end.

The accounts within these featured sections are based on various information sources, many of which being agency reports that describe some of the vessels that were used in Alaska; including construction details, vessel specifications, years of operation, and primary and secondary responsibilities. Other resources have been newspaper and magazine articles, books, libraries, museums, FWS oral histories, fleet listings, and first-hand communications with some of the vessel owners themselves. Where possible, anecdotal information is also included to describe the outstanding

Vessels

An unknown launch finds itself on the rocks, 1915. Photo credit: U.S. Coastal and Geodetic Survey Season's Report Quillian 1915-1977. NOAA Photo Library.

NOAA ship *Miller Freeman* fights 30-foot seas to rescue a disabled fishing boat in the Bering Sea. Auke Bay Laboratories photo.

contributions of these vessels made possible by the individuals who served aboard them.

Unfortunately, the available history for several of these boats is sparse. Although a few vessels are known to have been restored, and still exist as of 2013, the fate of many others is unknown.

Historical vessels presented in the AFSC Multimedia Gallery

Additional reading

Anonymous. 1944. The Alaska Fisheries Patrol Fleet. Pacific Motor Boat, Nov. 1944. p.34, 37.

NOAA's Fleet: A History of Keeping Research at Sea Afloat (NOAA Celebrates 200 Years of Science, Service, and Stewardship website)

Troyer, W. 2010. Bear Wrangler: Memoirs of an Alaska Pioneer Biologist. Univ. Alaska Press. 256 p. (several first-hand accounts aboard FWS vessels in the 1950s).

Nelson, S. B. 1971. Oceanographic Ships Fore and Aft. [For sale by the Superintendent of Documents, U.S. Govt. Print. Off. in Washington]. 240 p.

Vessels

As the primary author and compiler of this historical vessel section I would like to acknowledge the following individuals for their valuable contributions of information and materials which greatly helped to make these pages as comprehensive as they are: Chris Beaudin (Crane owner, Crane Adventures), Robert Budke (BCF, retired), Michael Burwell (Minerals Management Service), "Snapper" Carson (former Crane owner), Gary Duker (AFSC, retired), Jon Franklin (Oregon owner), Mark Freeman (Fremont Tugboat Co.), Jack H. Helle (AFSC, retired), David Janka (Auklet II owner, Auklet Charter Services), Paula Johnson (AFSC, retired), Bob Hitz (NOAA, retired), John Lindsay (AFSC), Mr. & Mrs. Walt Masland (Pelican owners), Paul McIntosh (U.S. Forest Service, retired), Kit Pingree (Teal owner), W. R. Roebling (re: Black Douglas), Robert Schwemmer (NOAA Office of National Marine Sanctuaries), Michael Skalley (Foss towboating author), George Schneider (hobby-historian), Bruce Wing (AFSC, retired), and Michael Yourkowski (former Kittiwake II owner, Alaska Bear Tours)

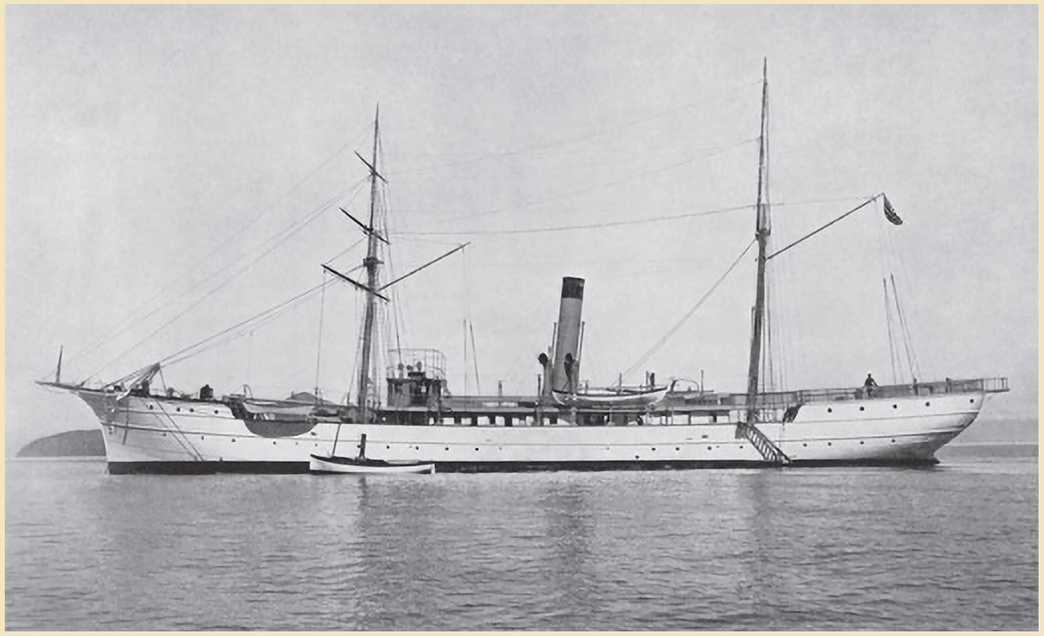
Thank you,

Victor Lundquist (AFSC, 2014)

The Albatross, 1882-1921

The *Albatross*, 1882-1921

Albatross Details			
Year built	1882	Tonnage	1,074
Builder	Pusey & Jones Shipyard	Original engine	steam, twin screws
Designer	Charles W. Copeland	Speed	8 knots (10 knots max.)
Length	234'	Cruising range	3,200 miles
Breadth	27.5'		



The *Albatross* and one of her small steam-powered runabouts. U.S. Fish Commission photo.

In March 1871, Congress was persuaded by Spencer Fullerton Baird to establish the U.S. Fish Commission, which he then directed from 1871 to 1887. In the Commission's first 10 years, Baird made use of the hatchery ship *Fish Hawk* in the northwest Atlantic, collecting numerous specimens while conducting both biological and physical surveys. During this time Baird felt the need for an improved deep-sea research vessel, which he convinced Congress of – the result being a $103,000 appropriation in 1881. After receiving construction bids, it was obvious that more funds were required and in 1882, an additional $87,000 was granted. This decision was influenced by Baird's list of significant benefits for building the new ship:

The Albatross, 1882-1921

Albatross cabin

- Exploration and study of known fishing areas.
- Location of new fishing grounds in the Atlantic, the Gulf of Mexico, and off the Pacific coast.
- Major economic benefits would accrue to the Nation's seafaring industry by increasing the yield of American fisheries.
- The development of U.S. fisheries could make use of the British North American inshore fisheries unnecessary.
- *Albatross* was a national security asset since, in case of need, she could be taken over by the Navy for use as a warship. In fact, this did occur during the Spanish American War and World War I.
- And finally, Baird acknowledged his basic scientific interest when he stated: "As incidental to the economical inquiry, but of very great interest to the naturalist," the ship will collect "objects of natural history in large quantity otherwise unobtainable".

Source: Allard, D. C. 1999. The Origins and Early History of the Steamer *Albatross*, 1880-1887. Mar. Fish. Rev. 61(4):2-21.

The following material is excerpted.

In August 1882, the United States Commission of Fish and Fisheries launched the first vessel built especially for marine research by any government – the steamer *Albatross*. Perhaps even more impressive than being the first government vessel equipped throughout with electric lights, *Albatross* has been credited with discovering more new marine species than any other research vessel.

Albatross was specially designed with 4,500 fathoms of 3/8-inch galvanized wire rope and a winch for dredging and collecting bottom samples and animals at any depth. Electric lamps attracted fish and other animals to night light stations, allowing scientists to make underwater observations of marine organisms at night. Two onboard laboratories were used to preserve and study biological materials and chemically analyze water samples.

Source: NOAA's Fleet historical website

Transfer to the Pacific

The following material is excerpted.

The Albatross, 1882-1921

The building, in 1882, of a staunch sea-going steamer, thoroughly equipped for the purposes of the U. S. Fish Commission, afforded, for the first time, the proper means for studying the extensive ocean fishing-grounds adjacent to the Atlantic seacoast of tho United States. Duriug the five years following her completion the steamer *Albatross* was actively employed, and with marked success, in this special field of work, the region covered by her operations extending from off Newfoundland to the northern shores of South America.

The interest aroused by these investigations, the utility of which had been fully demonstrated, led to a demand for the transfer of the *Albatross* to the North Pacific Ocean, a proposition which met the approval of the late Commissioner of Fisheries, Prof. Spencer F. Baird, and was later sanctioned by Congress. Extensive arrangements were necessary in preparation for so long a cruise, but they were satisfactorily, completed in the fall of 1887, and on November 21 of that year the ship left Norfolk, Va., for San Francisco...

The program arranged for the steamer *Albatross* contemplated, in the beginning, a somewhat rapid survey or reconnoissance along the entire western coast line, with the object of ascertaining the contour and condition of the bottom wherever the depths were suitable for fishing, the positions and outlines of all distinctive fishing-grounds, and the character and abundance of the food resources...

The *Albatross* reached San Francisco in May, 1888, and within three years from that time she had completed these preliminary surveys from San Diego to the Strait of Juan de Fuca; along the southern side of the Alaska Peninsula, from Middleton Island to Unalaska; and in the southeastern part of Bering Sea, from Unalaska to the head of Bristol Bay and Cape Newenham.

Source: Rathbun, R. 1894. Summary of the Fishery Investigations Conducted in the North Pacific Ocean and Bering Sea From July 1, 1888, to July 1, 1892, by the U.S. Fish Commission Steamer *Albatross*, p. 127-201. In Bulletin of the United States Fish Commission, Vol. XII, for 1892. Wash. G.P.O.

The U.S. Fish Commission Steamer *Albatross* made its first cruise to Alaska in 1888 primarily to research the Pacific cod, *Gadus macrocephalus*; however, Pacific salmon *Oncorhynchus* spp., was also to be studied, if time permitted. In 1889, concern for salmon overharvesting prompted Congress to authorize an investigation into the habits, abundance, and distribution of Alaska's salmon, and in 1890 the *Albatross* returned to Alaska. Over the next 20+ years the *Albatross* made many other productive and pioneering research voyages to Alaska, the last in 1914.

Since June, 1891, the ship had also been used to investigate certain problems concerning the habits of the fur seals in the North Pacific Ocean and Bering Sea, and to conduct a survey for a potential cable route between California and the Hawaiian Islands.

Roppel, P. 2004. The Steamer *Albatross* and Early Pacific Salmon, *Oncorhynchus* spp., Research in Alaska. Mar. Fish. Rev. 66(3):21-31.

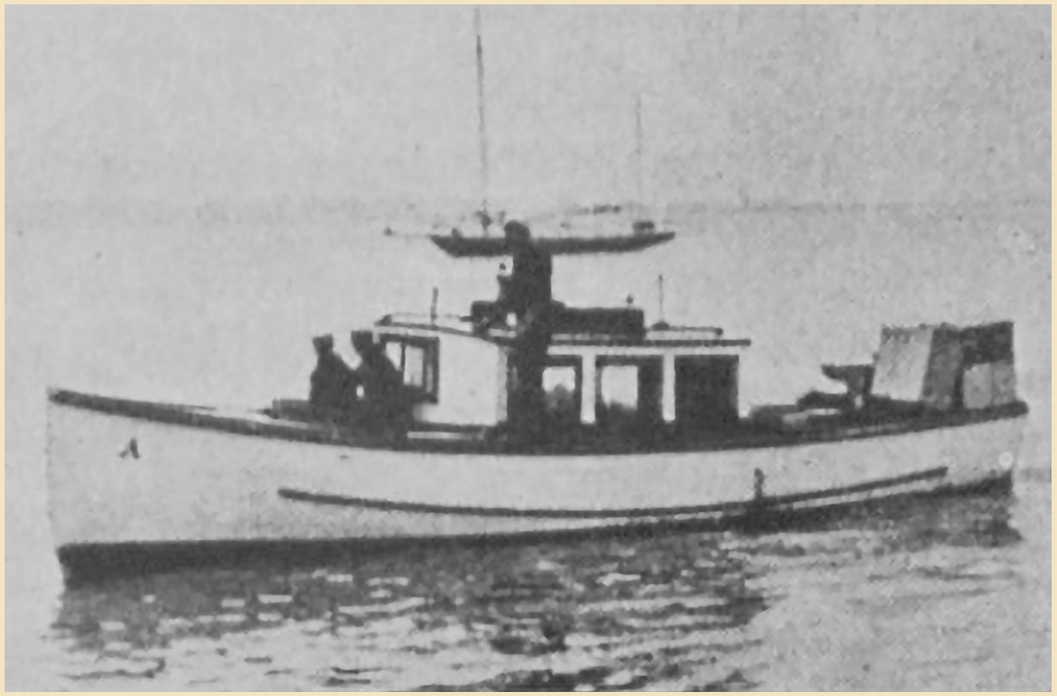
The 1900s

[the iron-hulled *Albatross*] wrested the sea's secrets from Labrador to Tierra del Fuego on the east coasts of North and South America, sailed throughout the eastern Pacific Ocean and into the Bering Sea, down through the eastern islands and marginal seas of Asia, and as far south as New Zealand.

But the *Albatross* was more than a fisheries research ship. Out of 6,000 deep-sea soundings tabulated by Sir John Murray in the early 1900s, more than 800 were observed by the *Albatross*. The ship took water samples and serial temperatures throughout the eastern Atlantic, Caribbean Sea, and Pacific Ocean. It also spent a number of years patrolling the fur seal rookeries of Alaska's Pribilof Islands and Aleutians to protect the animals from poachers.

The *Albatross*...benefited from the interaction of naval officers and civilian scientists. Its two most famous commanding officers were Commander Zera Luther Tanner, an inventive man who designed and modified much of the equipment on the ship, and Commander Jefferson Moser, who wrote a number of reports on the fur seals and salmon fisheries of Alaska. The most

The Albatross, 1882-1921

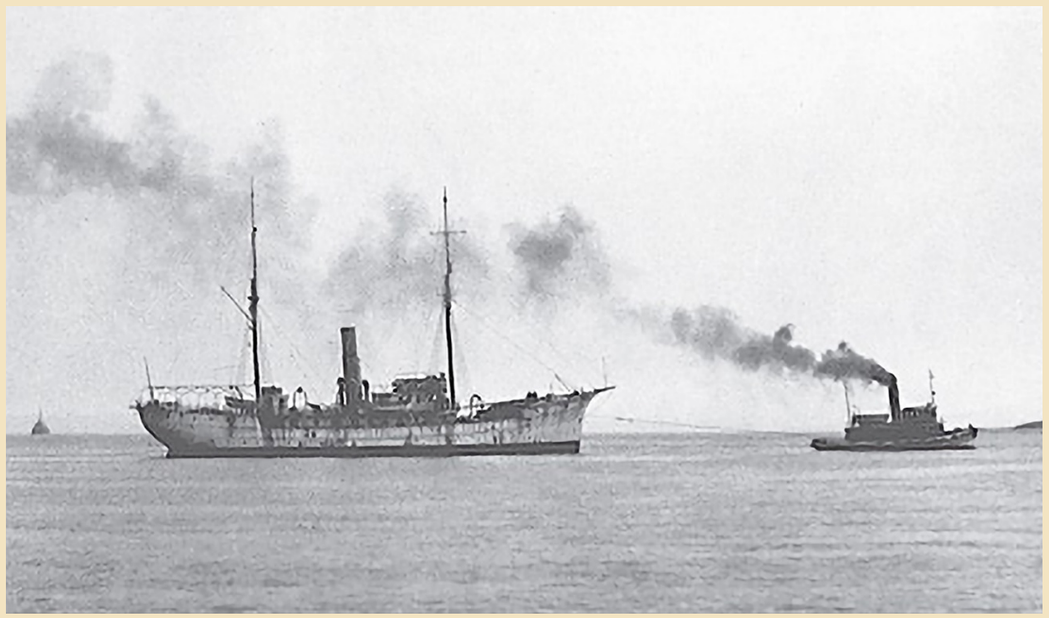


Motor tender for the *Albatross*. Photo from Pacific Motor Boat, Feb. 1918.

famous scientist to use the *Albatross* was Alexander Agassiz, who participated in many expeditions throughout the Pacific Ocean.

George Brown Goode's great work, Oceanic Ichthyology, drew heavily on specimens collected by the *Albatross*. Roy Chapman Andrews of the American Museum of Natural History, a man who many believe was the model for Steven Spielberg's 'Indiana Jones', sailed on the *Albatross* during its Philippine expedition of 1907-1910.

Hugh McCormick Smith, deputy director of the U.S. Bureau of Fisheries (formerly the Fisheries Commission), led the Philippine expedition and oversaw the collection of more than 27,000 fish species from Philippine waters. This collection was the largest ever to be received by the Smithsonian Institution, and is now housed in NOAA's National Systematics Laboratory, co-



After nearly 40 years of service the *Albatross* was decommissioned, a full decade past her planned retirement date. Northeast Fisheries Science Center photograph archives photo.

located with the Smithsonian Museum of Natural History in Washington, DC. From the standpoint of oceanic exploration, the *Albatross* dwarfed all other U.S. efforts during the early 20th Century...

...Dr. Paul Bartsch, of the Smithsonian Museum of Natural History, included a eulogy for the *Albatross* in a commemoration of Dr. Hugh Smith, a former Director of the Bureau of Commercial Fisheries. He noted that 'Of all the ships devoted to biological explorations of the sea, none has surpassed the endeavors conducted on board the U.S. Bureau of Fisheries Steamer *Albatross* during her 39 years of service from 1882 to 1921'

Source: Breakthrough Years, 1866-1922 Ocean Explorer website

After her famous Philippines expedition, the vessel returned to continue the West Coast surveys and Alaska research. She was used

The Albatross, 1882-1921

for an intensive survey of San Francisco Bay from 1912 to 1914, then resumed her West Coast dredging and hydrographic surveys. During World War I, when she was sent to Guantanamo, Cuba, under the U.S. Navy's control to patrol the Caribbean and Gulf of Mexico. After the war, the *Albatross* worked along the East Coast from Maine to Cuba.

Due to the excessive cost of coal and other operating expenses, the *Albatross* was decommissioned on 29 October 1921 at Woods Hole, Massachusetts, She was later sold at auction on 24 June 1924 to Thomas Butler and Company of Boston for $2,276. In July 1928 the vessel sailed for Europe as a training ship for nautical cadets and in October was detained in Hamburg, Germany, for indebtedness -- the crew's demand for unpaid wages resulted in a court decision to auction the ship. No record has been found, however, of an auction or her disposition beyond that time. The *Albatross* was undoubtedly scrapped for her metal if she was still in Germany at the beginning of World War II.

***Albatross* photos in the AFSC Multimedia Gallery**

Additional Reading

Allard, D. C. 1999. The Origins and Early History of the Steamer *Albatross*, 1880-1887. Mar. Fish. Rev. 61(4):2-21.

Rathbun, R. 1894. Summary of the Fishery Investigations Conducted in the North Pacific Ocean and Bering Sea From July 1, 1888, to July 1, 1892, by the U.S. Fish Commission Steamer *Albatross*, p. 127-201. In Bulletin of the United States Fish Commission, Vol. XII, for 1892. Wash. G.P.O.

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Early Fisheries Enforcement Patrol Boats

Early Fisheries Enforcement Patrol Boats (1912-1939)

Patrol Boats Acquired 1912-1930 (length, year built)

1912	***Osprey***	(72 ft, 1895)
1917	***Auklet***	(48 ft, 1917)
1917	***Murre***	(48 ft, 1917)
1918	***Swan***	(36 ft, 1917)
1919	***Kittiwake***	(70 ft, 1908)
1919	***Petrel***	(54 ft, 1917)
1919	***Merganser***	(54 ft, 1909)
1920	***Tern***	(38 ft, 1920)
1921	***Widgeon***	(57 ft, 1914)
1922	***Scoter***	(65 ft, 1920)
1923	***Ibis***	(30 ft, ?)
1924	***Blue Wing***	(55 ft, 1918)
1924	***Sea Gull***	(31 ft, ?)
1926	***Brant***	(100 ft, 1926)
1926	***Red Wing***	(40 ft, ?)
1927	***Teal***	(78 ft, 1927)
1928	***Crane***	(92 ft, 1928)
1929	***Coot***	(50 ft, 1929)
1930	***Pelican***	(78 ft, 1930)
1930	***Eider***	(88 ft, 1913)*
1931	***Heron***	(36 ft?, 1913)**

*Eider transferred from service as a Pribilof Island tender in 1930

**Non-enforcement research launch

Note: Also find out more about the smaller craft and stream watchmen used in fisheries enforcement.

In the early 1900s, the increased amount of fishing in Alaska resulted in the need for a radical change in the way fishing industries were being governed since 1889. In June 1906, a new Alaska Alien Fisheries Act for the protection and regulation of the Alaska fisheries established restrictions on the use of fishing apparatus and cannery operations, and authorized the Bureau of Fisheries (BOF) to enforce these regulations.

This responsibility brought about the urgency for appropriating additional resources for governing these industries in the large territory, and requests were made each year thereafter for more personnel and vessels.

The vessels used for patrol work during this time were either chartered or provided by other agencies, like the U.S. Coast Guard revenue cutters that, for the most part, protected the seal migrations from illegal takings. Other craft, such as open dories, proved too small and often dangerous for the exposed Alaska waters.

Boats were frequently used to transport supplies and personnel to and from Seattle, Washington, and areas around the Alaska territory. The local canneries often provided free transportation to the government agents

Early Fisheries Enforcement Patrol Boats

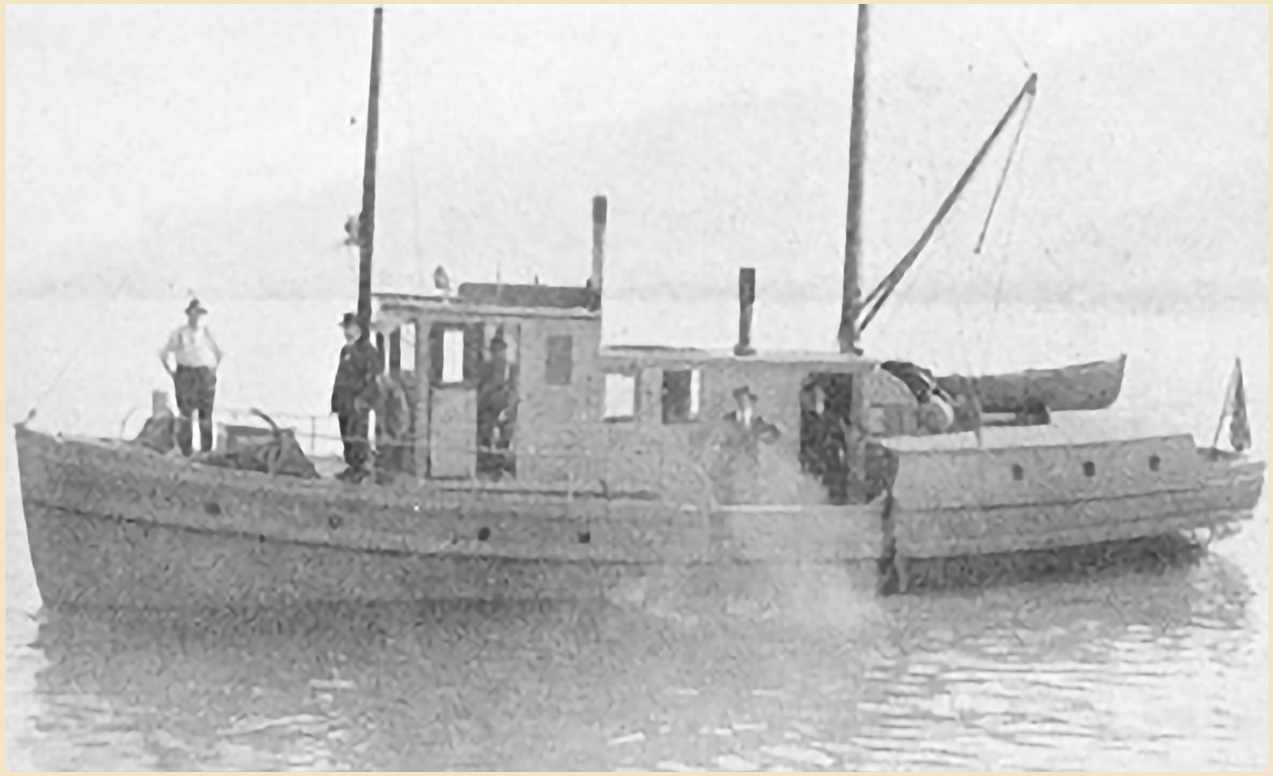
on their vessels which, while considered gratuitous and unethical, was unfortunately the only means for the Bureau to get into certain remote and otherwise inaccessible areas.

These factors led to the Bureau purchasing its first patrol boat, the *Wigwam* (renamed the *Osprey*), for $13,000 in 1912. In July of the following year, appropriation for a crew was effected and the vessel was put into commission. A week later she was sailing for Alaska. The *Osprey* was followed by a pair of sister boats in 1917, the *Auklet* and *Murre*, both built for the BOF's fisheries enforcement work in Southeast Alaska.

After World War I, the BOF purchased and built more enforcement vessels, while others were removed from service. In 1920, an elaborate plan (see box below) was even devised to create a significant fleet of enforcement ships, including those from other agencies. By 1930 the number of Alaska fisheries boats grew to nearly 20, with each one usually assigned to patrol in a given district. As was typical of the earlier federal vessels in Alaska, they were named after water birds common to the territory.

In addition to salmon fishing enforcement, some boats were used regularly to patrol the northbound spring fur seal migrations in Alaska and off the Washington coast. On 25 October 1928, several BOF vessels were tasked to assist in enforcing the provisions of the 1924 Northern Pacific Halibut Act, whereby their operators were granted all powers of search and seizure in accordance with the act. By the 1930s, some of the boats were supplementing their patrol duties by assisting in salmon spawning stream surveys, water obstruction removal, fish tagging, and other projects.

The BOF's fleet of Alaska enforcement vessels proved invaluable, not only for fisheries patrol and transportation of



Early fishery enforcement boat (probably the *Auklet* or *Murre*) patrolling the waters of Southeast Alaska. Bureau of Fisheries photo, 1918.

goods and personnel, but for towing other vessels, rescues, and assisting in the various research done by the BOF and other federal agencies in Alaska. The boats would often spend their winters in Seattle for overhauling and repairs. In the winter of 1933-1934, an allotment of $20,000 by the Public Works Administration funded the overhauling of nearly all the Bureau's Alaska fleet.

Early Fisheries Enforcement Patrol Boats

A Request for Enforcement Boats in 1909

“The most urgent need of the Alaska salmon-inspection service is proper vessels for carrying on its work. In no part of Alaska are means of local communication other than very meager. The regular steamship lines visit only the more important points, and in some sections the call of such steamers will not average more than one or two a month. Then, as they cover a wide area in their travels, the steamers can remain but a few hours at any one place, a time not sufficient for an inspector to look over the fishing grounds, which are usually off the regular line of travel. Even if these vessels were available, however, the inspectors should not be compelled to depend upon them, for the fishermen would in this event be able to prepare for the arrival of the vessel with the inspector aboard, and thus to conceal any illegality that might be in practice.

Owing to the lack of suitable vessels it was found impossible in 1908 and 1909 to inspect any of the fisheries of central Alaska. In these sections vessels of sufficient size and seaworthiness can not be chartered. In the protected waters of southeast Alaska launches can be used, but as they must, under present conditions, be chartered with their crews, it is almost impossible to prevent notification of the fishermen in advance. Frequently, also, when a launch is most needed, all of the few available will be under charter and the trip must be abandoned.

More inspectors, also, are needed in order to cover the territory properly. But it is useless to have these unless there are vessels available for their use. Under existing conditions the additional inspectors would merely be marooned for weeks at a time, and, as the salmon fishing season in central and western Alaska is comprised within four months' time at the most, almost nothing could be accomplished.

Three vessels are needed for this service. In southeast Alaska a comparatively small launch (about 60 feet long, 12 feet beam, and fitted with a 60 horsepower gasoline engine) would answer the purpose. In western Alaska a much larger vessel is needed, one of at least 100 tons displacement, as the waters in this section are open and storms are frequent.

The Dominion of Canada, although having only about one-fifth as much coast line on the Pacific as Alaska, maintains two steamers, and is now building a third, for the purpose of protecting her fishing grounds."

From: Marsh, M. C., and J. N. Cobb. 1909. Fishery Laws and Their Enforcement - Needs of the Service, p.27. In: Fisheries of Alaska in 1909. Bureau of Fisheries Report of the Commissioner of Fisheries for the Fiscal Year 1909.

Early Fisheries Enforcement Patrol Boats

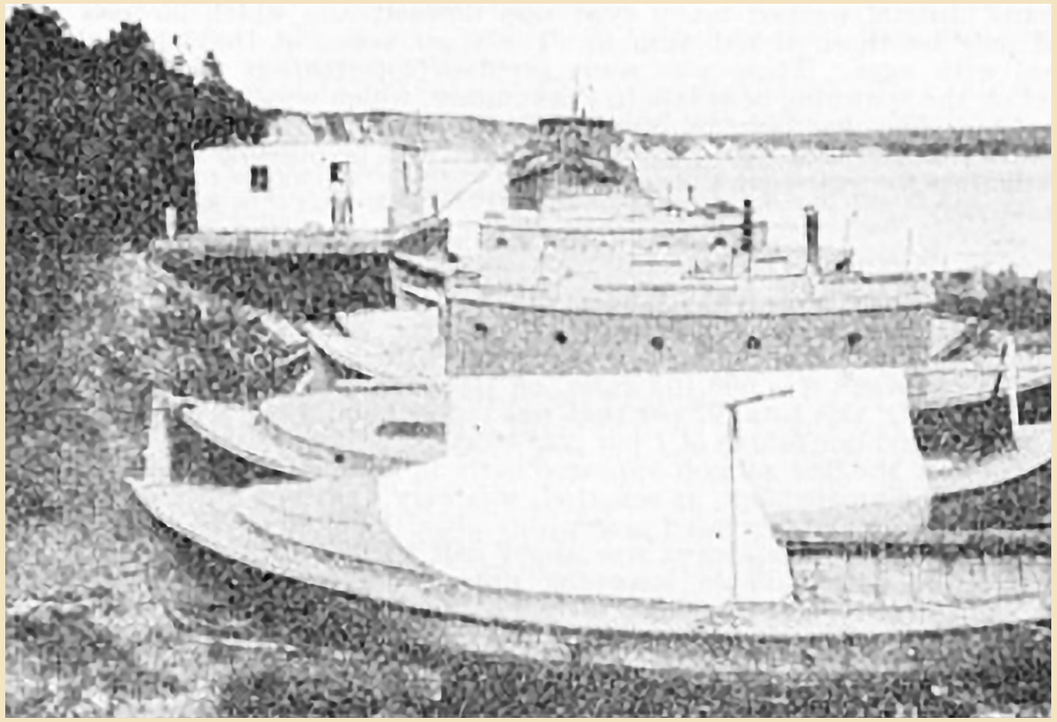
Bristol Bay marine ways

Regional districts had been established throughout Alaska where each enforcement vessel was typically assigned to patrol during the summer fishing seasons. For the large Bristol Bay area the BOF set up its district headquarters on the Naknek River at their marine ways. Built in the summer of 1925, the ways provided care and winter storage for the power launches and other small boats that operated in the region (see photo below). Originally acquired in the mid-1920s, these small low-draft launches, identified by numbers rather than names, were ideal for use on the region's rivers, streams, and lakes.

In addition to the Bureau's fisheries patrol fleet operating throughout the Alaska waters, several other boats were being chartered each year. Small private power boats were also used for enforcement work by the "stream watchmen", wardens and other special employees.

For added patrol during fishing seasons, three speedboats were built by the BOF in the spring of 1933, each one powered by an 82-horsepower Chrysler motor. More speedboats and engine upgrades followed, including one in 1938 with a 225-horsepower motor. By 1940, the acquisition of these boats, coupled with the growing use of aircraft, resulted in fewer vessels chartered. By the early 1950s, 11 speedboats and about 60 small outboard-powered craft were being used.

In 1940, the Bureau of Fisheries merged with the Bureau of Biological Survey to become the Fish and Wildlife Service (FWS), and the existing BOF boats became part of the new FWS fleet. During World War II, some of the vessels were requisitioned by the U.S. Navy and U.S. Coast Guard to provide transportation, support coastal lookout stations and patrol the waters of Alaska against enemy forces. After the war, the FWS's Alaska fleet changed as new vessels dedicated to exploratory fishing and research were acquired. In 1956, the Bureau of Commercial Fisheries (BCF) emerged as a part of the USFWS. Several of the vessels were transferred around 1960 to other agencies – primarily the Alaska Department of Fish and Game (ADFG) – as a result of Alaska's statehood in 1959. The boats remaining with the BCF now focused on research and the work of fisheries enforcement was adopted by the ADFG.



Bristol Bay patrol boats at the Bureau's marine ways on Naknek River. At the far end facing forward is probably the 65-foot lead ship, *Scoter*. Bureau of Fisheries photo, 1926.

Additional Reading

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Early Fisheries Enforcement Patrol Boats

An Elaborate Plan

In an effort to increase the presence of enforcement vessels after World War I, an arrangement was made in March of 1920 between the Governor of Alaska and heads of the U.S. Navy Department, U.S. Treasury Department (Coast Guard), and U.S. Department of Commerce (DOC - Coast and Geodetic Survey), whereby certain boats from each department would be used for fishery patrol work.

This fleet consisted of the Navy's *Eagle 57* and two submarine chasers; the Treasury Department's *Algonquin*, *Bear*, *Bothwell*, *Earp*, and *Unalga*; and the *Explorer*, *Lydonia*, *Surveyor*, and *Wenonah* from the Department of Commerce. The *Eagle 57* was disabled after striking a reef at Gambier Bay in July and was replaced a month later by the mine sweeper *Swallow*. The Coast Guard continued its annual patrol of the North Pacific and Bering Sea as it had done since 1867, and at times extended coverage to the cod fishery in the Aleutian Islands region.

Some of the officers on these ships were commissioned as deputy U.S. marshals; at least one was appointed U.S. Commissioner. They were authorized to conduct searches, seizures and arrests in compliance with the 1906 Alien Fisheries Act. These boats also engaged in other services, such as providing medical assistance to the native Alaskan people; aiding distressed vessels; and transporting people, mail, and various supplies to isolated communities.

Heron, Flagship Research Launch (1931-35)

As the only vessel in the Agency's Pacific coast scientific fleet for many years, this little boat was considered a flagship. The Heron was built in Tacoma, Washington, just after World War I as a small Pacific cod fishing vessel christened the *Kayak*. After many fishing trips she was rebuilt into a pleasure boat of teak and white sails.

The Bureau of Fisheries (BOF) purchased her in July 1931 after being persuaded by its Seattle Laboratory biologists that a small vessel of this kind was needed for their work in Alaska. The *Kayak* was renamed the *Heron* and became the Bureau's first gas powered boat used exclusively for scientific work on the Pacific coast and in Southeast Alaska.

The *Heron* is believed to have been 36 feet long, with a 10.5-foot beam and 10.5-foot draft. She was powered by a 30-horsepower Frisco-Standard engine and served as a workhorse used not only for research but for transporting Bureau personnel and materials around Alaska. Aboard the boat was laboratory space and comfortable living quarters. She was assigned to Dr. George Rounsefell to facilitate his field work studies of the Alaska herring.

The motor launch *Heron* in Port Conclusion, Alaska. Bureau of Fisheries photo, 1935.

In her initial year of BOF service, the *Heron* was used in 1931 to obtain, for the first time, racial herring samples from Saginaw Bay (Frederick Sound), Gut Bay (Chatham Strait), Point Lull (Peril Strait), Point Augusta (Icy Strait) and Anita Bay (Zimovia Strait). During an extensive herring tagging program begun in 1932, she was used by Dr. George A. Rounsefell, Edwin Dahlgren, and Samuel Hutchinson in southeastern Alaska, where some 5,000 herring were tagged and released using new metal "belly" tags that could be recovered by a magnetic detection system on the conveyer belts at processing plants.

In addition to being a valuable research tool, the *Heron* was used as a transport for fishery officials, a tow boat, logging boat, and fishing boat. She also helped clear timber during the construction of the Little Port Walter field station.

In 1935, after gradual deterioration, the little *Heron* was condemned and auctioned off – the end of the Pacific scientific fleet for a time and a sad event to many of the Seattle Laboratory staff.

Osprey, Bureau of Fisheries' First Alaska Patrol Boat

Osprey Details			
Year built	1895	Draft	6'
Location built	San Francisco, CA	Tonnage	50 gross, 31-40 net
Builder	unknown	Cruising range	50 miles
Designer	unknown	Known skipper	Edwin Hofstad (1913-21)
Other names/id	Wigwam (1895-1912), (1921-24?) Foss 19 (1924-65) Kiowa (1965)	Fisheries Service:	1912-21
Length	72'	Disposition:	sold in 1921
Breadth	17'		

The steamer *Osprey*. Bureau of Fisheries photo, 1914.

With the urgent need to protect Alaska's fishing products valued at nearly $17 million in 1911, the Bureau of Fisheries (BOF) acquired its first patrol vessel. In the fall of 1912, the coal-burning steamer *Wigwam* was purchased for $13,000 from the Alaska Packers Association, who had previously rebuilt the ship to top condition in compliance with the Steamboat-Inspection Service's recommendations. Prior to her BOF service, the "little old steamer" was "one of the first cannery tenders to operate in the Alaskan salmon packing business."

(Petersburg Weekly Report, Alaska, VII:17, 4-8-21, p. 1.).

The vessel was renamed the *Osprey* by the Bureau and kept upon the ways at Semiahmoo, Washington, where it awaited Congressional appropriation for a crew prior to her commissioning. On 1 July 1913, the appropriation was effected and 7 days later the *Osprey* sailed north to

Osprey

begin patrol work and other duties in the southeast district of Alaska. Her six-man crew consisted of the master, engineer, two firemen, seaman, and cook. By the end of 1913 over 8,000 miles had been logged.

Built in 1895 in San Francisco, California, the *Osprey* was equipped with a steam winch on the forward main deck and had two masts. The pilot house area on the boat deck quartered three crewmen, while immediately beneath was the galley and dinning room on the forward main deck. Six of the crew could be quartered in the below forecastle and four more could be accommodated in the after cabin which had folding berths and was finished in Spanish cedar.

The vessel experienced several difficulties during her service with the Bureau. A major concern was soon expressed that the engine should to be converted to oil or gas. With the afterhold being impractical for holding additional sacks of coal, the *Osprey* had limited bunker space which allowed stowage for only 7.5 tons of coal. This resulted in a steaming radius amounting to about 350 miles, much less than the distance required for the demanded service. Another factor was that the cost of coal at that time was $8.50 to $12.75 a ton and was usually obtained at Unalaska on the Aleutian Islands. It was estimated that an engine conversion would save up to 90% in reduced fuel costs.

In addition, a problem with using coal was that the smoke emerging from her stack easily identified the ship from afar. This provided an early warning to those in violation of the fishery laws since there were very few steam-powered cannery tenders in operation at that time in the area. The BOF never did replace the *Osprey's* aging and problematic boiler, opting rather to make the necessary repairs when required.

The Bureau also found it hard to retain good crewmen aboard the vessel because provisions for subsistence allowances were not included in the fixed pay rates established by Congress. After paying his mess expenses, a crewman, who in 1914 was earning $50-$60 a

The Foss 19 seen listing ashore near logs. Photo from the Captain Lloyd H. "Kinky" Bayers collection, 1898-1967: book 32, album 16, photo 2. Alaska State Library Historical Collections.

month, found himself left with too little pay to be considered incentive for employment. The need was also expressed for the crew to be increased by one or two seamen for the necessary ship maintenance during the constant running while on active patrol duty.

Another mark against the *Osprey* was her poor state. After inspectors George H. Whitney and Peter A. Peltret surveyed the vessel in 1915, it is believed that she was scheduled to be condemned at Ketchikan, Alaska, due to her unseaworthiness. She somehow avoided this fate and was kept in service for another 5 years.

Over the years the *Osprey* was headquartered in Juneau, Alaska, while maintaining the enforcement of the salmon fishing laws and

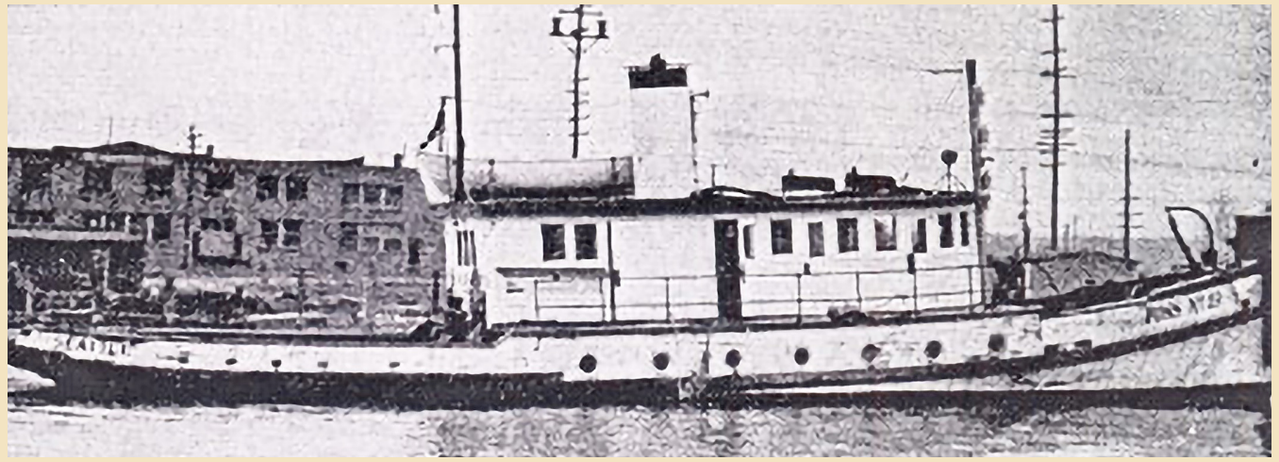
Osprey

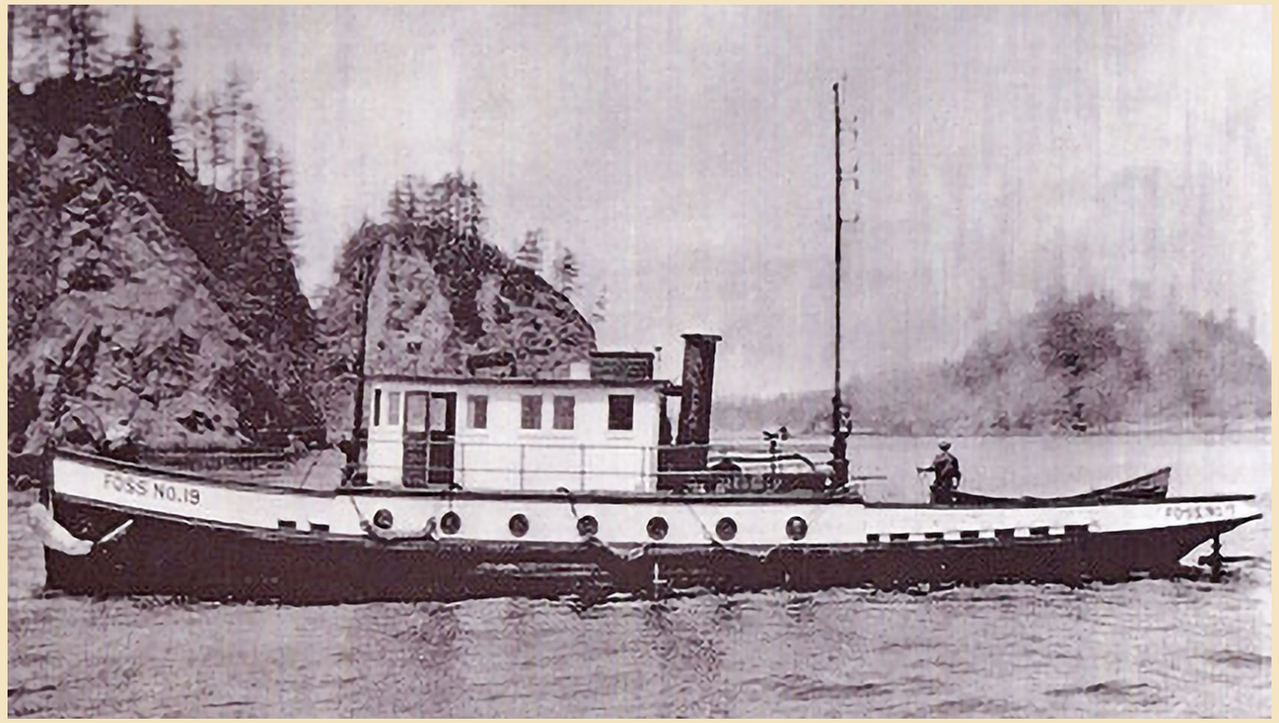
regulations in the southeastern region during summer seasons. In 1916 she was used at Wrangell, Alaska, for stream investigation work in the spring and then was sent to Seattle, Washington, in October for repairs. The vessel remained in Seattle for over a year until January of 1918 when she returned to Alaska.

In 1918 the *Osprey* participated in two notable rescues in Alaska. Late in the spring, she towed the boat Good Tidings – in danger after breaking down during a storm – 10 miles to Ketchikan. Then in late October and most of November, the Osprey joined the BOF vessels *Auklet* and *Murre* in Alaska to search for bodies from the Canadian Pacific steamship *Princess Sophia*, which struck Vanderbilt Reef on 25 October, losing 343 lives with no survivors.

In June of 1919, the *Osprey* was transferred to Alaska's central district where she patrolled until August, at which time she was sent to be laid up at Cordova. The vessel proved unseaworthy to the point that no further significant expenditures were made in her upkeep. It was also decided to condemn the boat and sell her after another year of service.

The *Osprey* was beached near Cordova in the spring of 1920 to have her hull cleaned and copper painted. On 25 May, in what seemed like an act of defiance, the *Osprey* settled in the gravel, fell over on her side away from the shore, filled with water and was partially submerged. She remained this way for about a week until the Coast Guard cutter *Algonquin* was able to render assistance. A scow owned by the Bering River Coal Company was then used to float the *Osprey* so that the water could be bailed out of her. For next few months she was used in the southeast region for summer patrol and salmon stream marking work in September. She left her





Two views of the diesel tug Foss 19 before and after her 1940 deckhouse remodel – significantly changed since her *Osprey* days with the BOF. Top: Foss Maritime Co. photo. Bottom: from Pacific Motor Boat, Dec. 1947.

Osprey

Alaska service, towed by the *Auklet* to Seattle for disposition.

The newspapers in Seattle and throughout Southeast Alaska advertised the 14 April 1921 public auctioning of the *Osprey*. Two credible sources give conflicting details of the sale:

- Poor attendance for the sale produced a high bid of only $515, which was rejected as being too low. On 29 June, the vessel was again auctioned and sold for $700 – buyer unknown. (BOF Fisheries Service Bulletin, May 1921);
- "Wrangell, April 14 – The United States Fisheries boat *Osprey* was sold at public auction here today to Mayor J.G. Grant for $550." (The Alaska Daily Empire, Juneau, 4-14-21)
- After the sale it appears that the owner (Mayor Grant?) may have restored the the ship's name back to the Wigwam. Operating as a tug, she was sold by 1922 to the Foss Launch and Tug Company. Foss rebuilt the vessel into a more seaworthy tug renamed the Foss 19. After her steam plant was finally replaced with a 180-horsepower Fairbanks-Morse diesel engine, she began many years of tug duties and general towing in Puget Sound and Southeast Alaska out of Ketchikan. She became the first Foss tug to work in Alaska (Skalley).
- At the end of the 1930s, the *Foss 19* began hauling oil each year to communities in Southeast Alaska. Around 1940, her engine was upgraded to a 200-horsepower Enterprise full-diesel and additional overhauling and modernizing of the boat's deck house and cabins was done. With this engine the *Foss 19* often won tugboat races she competed in during the 1950s (Newell).

The *Foss 19* continued her service with Foss until she was sold on 14 May 1965 to Pat Stoppleman who renamed her the *Kiowa* and installed a replacement D-343 Caterpillar engine. Two years later in 1967, Samson Tug & Barge purchased the boat and operated her out of Sitka, Alaska.

On 30 October 1978, the tug found herself in heavy weather while pulling logs in Herring Bay (Frederick Sound, near Ketchikan). The vessel floundered and sank after logs, which had broken loose from the load, tore open her stern in the rough sea. Fortunately, the crew was rescued by another Samson tug before the *Kiowa* was lost (Skalley).

- Newell, G. 1957. Pacific Tugboats, p.140. (Photographs from the Joe Williamson marine collection). Bonanza Books, New York, NY.

- M. R. Skalley, M. R., 1981. Foss 90 Years of Towboating. Superior Publishing, Seattle.

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"Scuttle Butt Pete". 1947. Scutt Reviews the Foss 19 – from Yacht to Modern Tugboat. Pacific Motor Boat, Dec. 1947. p. 53 (photo on p.51)

Kiffer, D. 2005. The Grounding of the *Princess Sophia*. SitNews (Ketchikan)

A Poor Evaluation

The *Osprey* was considered to be well constructed, however, after the Bureau's Deputy Director, E. Lester Jones, lived aboard her for 60 days during his 1914 inspection of the Alaska fisheries, his opinion of the vessel was unfavorable. In his Report of Alaska Investigations, 1914 Jones expressed the following:

"In reference to the unseaworthiness of the *Osprey*, I feel well qualified to pass judgment, for in my investigations and research this season I lived aboard her for 60 days and found conditions far from satisfactory. Her freeboard amidships is just 12 inches. From the deck to the top of the pilot house the distance is over 14 feet, and with the greater part of her machinery above the water line the vessel is so topheavy that a good breeze renders it dangerous to leave the dock. In an unusual blow last fall, the *Osprey* without warning turned completely on her side, lying flat on the water long enough for the engine room to be flooded. The officers and crew were penned up in this treacherous boat, and only by an act of Providence did a counter flurry right her in the next few seconds.

This is the vessel that is offered to our men to patrol 26,000 miles of coast line in boisterous seas to protect the great fishing industry of Alaska. The decks, pilot house, and many of the beams are rotten, and the boat must be handled with unusual care. The boiler is also defective, having been installed 19 years ago, when the boat was built.

However, I talked with men of experience who are familiar with vessels and their construction, and all admit that her hull is strong and sound and agree that this boat if properly refitted and provided with more efficient machinery would prove suitable for certain requirements of the Alaska patrol service...

The *Osprey* has been used only part of the time during the last two years in southeastern Alaska, due primarily to two reasons first, lack of appropriations; and second, because she is unseaworthy and many days unable to leave her dock."

◁ Vessels: Early Bureau of Fisheries Patrol Boats

Auklet and *Murre*, 1917 Sister Patrol Vessels

Auklet and *Murre* Details (Both Boats)			
Year built	1917	Tonnage	25 gross, 17 net
Location built	Seattle, WA	Original power(with BOF)	25 hp, 3-cylinder Frisco Standard gas engine. Small sails were carried aboard for emergency use. Lights were powered by electricity.
Builder	Elliott Bay Yacht & Engine Co.	Average speed:	8.5 knots
Designer	Martin C. Erismann	Cruising range	3,000 miles (600 gal. fuel tanks)
Length	48'	Primary area	Southeast Alaska
Breadth	12.5'	Disposition:	*Auklet* sold in 1950, *Murre* unknown
Draft	5.25'		

The *Auklet* at Little Port Walter, Alaska. Auke Bay Laboratories photo.

A Congressional bill in 1916 appropriated $10,000 for the building of two vessels for fisheries enforcement in southeastern Alaska. Construction bids were then opened in Seattle, Washington, on 5 December 1916. After receiving seven bids, a contract was signed with Elliott Bay Yacht and Engine Company, a local firm who immediately began building the two boats. Both were patterned after the seaworthy salmon purse-seine design and built using Douglas fir. The work was completed, inspections made, and on 10 May 1917, the Bureau of Fisheries (BOF) accepted the boats, which were named *Aukl*et and *Murre*. The total cost including plans and inspections was $9,702.70. Following their 1917 summer commissioning, the two boats left Seattle on 7 July for

Auklet and Murre

Wrangell, Alaska, to begin the many years of patrol duties and other work in the southeast region.

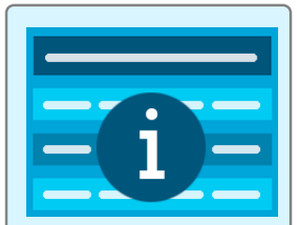
The identical design of both vessels featured a raised deck forward of the pilot house that dropped moving aft. The deck was covered by the overhanging roof of the raised deck house amidships. The sides of each boat extended upwards to create the walls of the after cabin. A small afterdeck was situated at the stern. The interior of each vessel provided comfortable accommodations for two fishery agents and a crew of three.

As was common with the BOF Alaska boats, the *Auklet* and *Murre* had their share of repairs and renovations. In February 1928, both were outfitted with a hot water heating plant in Juneau, Alaska. Later that year, each vessel had its galley enlarged, which increased the comfort of those aboard. Within their first 5 years of service, both vessels had their engines replaced with heavier 40-horsepower Frisco-Standard models that enabled them to better withstand Alaska's heavy wind and sea conditions.

On 25 October 1918, tragedy occurred when the steamship *Princess Sophia* hit Vanderbilt Reef, near Juneau, resulting in the loss of all 343 persons aboard. Through November, the *Auklet* and *Murre* both joined with the Bureau's vessel *Osprey* in the unsuccessful search for survivors from the incident.

During their service, the *Auklet* and *Murre* were used primarily for fishing patrols in Southeast Alaska, however, they often performed other important work: stream-marking in September 1920; annual springtime patrolling of sealing grounds near Sitka, Alaska, during fur seal migrations beginning in 1921; assisting the War Department to inspect active and abandoned fish traps for being possible navigational obstructions; and routine stream improvements, which involved removal of impediments, such as log jams and beaver dams, that could obstruct the ascent of salmon to their spawning grounds.

The *Auklet*, 1917 - 1950



Known *Auklet* Skippers (click to expand)

During her initial 2 years of service, the *Auklet* experienced a couple of significant events. A few days before departing on her initial trip to Alaska in 1917, she participated in the 4th of July celebration of the formal opening of Seattle's Lake Washington Canal that connected Puget Sound with Lake Washington. During the event she followed the Bureau's new Pribilof Islands tender *Roosevelt*, which served as the flagship leading a flotilla of hundreds through the canal.

Then, in the following year on 12 September 1918, while docked at Juneau, an accident occurred when the *Auklet's* house sustained extensive damage after she was hit by the ill-fated Canadian Pacific steamship *Princess Sophia*.

In addition to her normal fishery patrol work, the *Auklet* was used to provide transportation for several Bureau employees and supplies, such as foodstuffs from Prince Rupert, B.C. to the Alaska merchants in Wrangell and Ketchikan who were experiencing shortages during the 1920 steamship strikes. In 1934, the *Auklet* worked on the Civil Works Administration's project for clearing log jams and other obstructions in salmon streams that were blocking the fish from reaching their spawning grounds. Two years later, she participated in the construction of a 70-foot concrete fish ladder at the falls of the Pavlof Harbor headwaters on Chichagof Island in Southeast Alaska.

At times the *Auklet* would sail to Seattle for repairs and overhauling and, when needed, she would make these trips with other Bureau vessels in tow. This was the case in 1921 when she towed the *Osprey* to Seattle for auctioning, then returned to Alaska pulling the newly acquired BOF patrol boat *Petrel*.

Auklet and Murre

The *Auklet* and *Murre*. Photo from Pacific Motor Boat, June 1917.

In the late 1940s, the Auklet was part of the Fish and Wildlife Service's Alaska fleet engaged in salmon hunting and trapping winter patrol work. She was scheduled to conduct first-time downstream fish migration research in early 1949. Her long federal service came to an end when she was sold in the fall of 1950.

The *Murre*, 1917 - 1942*

(* last known service)

Throughout her long service with both the Bureau of Fisheries (BOF) and Fish and Wildlife Service, the *Murre* was assigned primarily to enforce fishing regulations in Southeast Alaska, although the boat occasionally patrolled other parts of Alaska, as in the mid-1930s when she was sent to Seward, Katalla, and Prince William Sound areas.

Known *Murre* Skippers (click to expand)

The vessel was used in Alaska by other agencies as well. In 1919-20, she was on loan to the Bureau of Census, and in the next winter to the Bureau of Education and the Department of Justice. The War Department used the *Murre* briefly during the spring of 1924 to inspect for improper lighting on unattended fish traps and structures that could pose as hazards in navigable waters.

Some of the non-patrol work done by the vessel and her crew included:

- Rendering help in 1930 and 1936 with the pink salmon tagging operations and the studies of salmon migration routes being conducted in Alaska by Dr. Willis H. Rich.
- Assisting B. E. Smith, of Ketchikan in March 1932, who was transporting and planting approximately 300,000 Japanese seed oysters to Southeast Alaska in the hopes of establishing an additional food source.

As far as significant mishaps to the *Murre*, they began early in her federal service.

- Considerable damage and loss of the crew's property occurred when fire broke out in her galley on 3 December 1919, at Hoonah, Alaska. The captain and crew were aboard at the time and fortunately awoke in time to extinguish the fire. Repairs amounted to $600.
- On 1 April 1920, while conducting census work for the Bureau of Education, the vessel struck a rock and was beached in Keku Strait, Alaska. She was towed by the *Auklet* to Wrangell where repairs costing over $1,600 were made. The ensuing investigations determined that both incidents were not preventable and no blame was assessed.

- In April 1937 the *Murre* suffered a broken crankshaft while en route from Seattle to Alaska, and required a tow by the BOF vessel *Teal*.

The *Murre* was used into the 1940s, with the last known reference to the boat being from the 1942 "Merchant Vessels of the United States" (p. 530), which lists her as a FWS boat transferred to the U.S. Navy Department for service during World War II.

Additional Reading

Anonymous. 1917. Patrol Boats For U.S. Fishery Service. Pacific Motor Boat, January 1917. p. 22.

Anonymous. 1917. Two New Vessels For Alaska Fishery Service. Pacific Motor Boat, June 1917. p. 31.

Murre account: Stan Bishop - A True Sourdough, Coming to Alaska and the Yes Bay Hatchery. Interview with Stan Bishop transcribed by L. Harrington, 1997.

Anonymous. 1917. Marine Pageantry Marks Opening of the Famous Lake Washington Canal. Pacific Motor Boat, Aug. 1917. p. 5-10.

* Kiffer, D. 2005. The Grounding of the *Princess Sophia*. SitNews (Ketchikan)

◁ Vessels: Early Bureau of Fisheries Patrol Boats

Swan, *Tern*, and *Coot*, Yukon River Patrol Boats

The *Swan*, 1918 - 1924

Swan Details	
Year built	1917-18
Location built	Fairbanks, AK
Length	36'
Breadth	6'
Power	20 hp engine
River speed	6-13 mph
Disposition	sold in 1924

The *Swan* was added to the Bureau of Fisheries' (BOF) Alaska fisheries fleet for a brief time when she was commissioned in July 1918 for field work and transportation duties along the Yukon River.

The *Swan* was built for the Bureau during the winter of 1917-18 in Fairbanks, Alaska. She was specifically designed for river use, with sleeping accommodations for two. In a 4.5 mph river current she achieved 6 mph upstream, 13 mph downstream, and consumed an average 2.5 gallons of fuel per hour.

In addition to her eventual patrol work, the *Swan* offered valuable transportation along the Yukon to various BOF agents, as private boats had been relied upon prior to this. During his extensive 1919 salmon investigations of the river, Bureau of Fisheries inspector

The *Tern*. Bureau of Fisheries photo, 1926.

Calvin F. Townsend traveled over 4,000 miles aboard the *Swan*. (see "Commercial Salmon Fishing..." box above).

The Bureau soon realized that the 36-foot *Swan* lacked the size to patrol in the exposed waters at the river's mouth. She was consequently limited to service in the upper Yukon and its tributaries. For the winter months she was hauled out at Nenana, located about 50 miles downriver from Fairbanks. After only 3 years of service, the *Swan* was held in reserve on the Yukon and not used. In 1924 she was finally condemned. Her engine was removed to replace the one in the BOF launch *Puffin*. The *Swan's* hull was then sold for $75.

Swan, Tern, and Coot

The *Tern*, 1920 - 1929

Tern Details	
Year built:	**1920**
Location built:	**Fairbanks, AK**
Length:	**38'-40'**
Breadth:	**7'**
Draft:	**2'**
Engine:	**self-starting 35-50 hp gas**
Disposition:	**sold in 1929**

The *Tern* was built in April of 1920, costing an estimated $3,100. The well-used boat patrolled on the Yukon from Fairbanks to the lower river and delta waters. In 1922 alone, she covered 5,015 total miles.

Following each fishing season, the *Tern* was usually dry docked for winter storage. She was condemned and sold in 1929.

The *Coot*, 1929 - 1946 (known service)

Coot Details			
Year built	**1929**	**Draft**	**3'**
Location built	**Bellingham, WA**	**Tonnage**	**21 tons gross**
Builder	**George Wrang**	**Engine (gas):**	**100 hp HSR-6 Hall-Scott gas**
Designer	**H. L. Coolidge**	**Known skipper:**	**Cal Townsend (1929)**
Length	**50'**	**Disposition:**	**unknown**
Breadth	**11'**		

The *Coot*. Bureau of Fisheries photo, 1930.

The 50-foot *Coot*, having a shallow 3-foot draft, was longer than both of the Bureau's preceding Yukon patrol boats, *Swan* and *Tern*. Powered by a 100-horsepower Hall-Scott gas engine, the vessel's design accommodated seven persons and included a transom stern and a 'skeg' aft (stabilizer keel extension).

Construction of the draft cruiser for the BOF was contracted early in 1929 with George Wrang of Bellingham, Washington, and by the end of spring the *Coot* was ready for duty.

In June, she was transported north to St. Michael, Alaska, aboard the commercial steamer *Derblay* and placed into service for the 1929 summer fishing season. The *Coot* replaced the *Tern* for the Yukon patrol. In August that same year, the *Coot* transported Dr. Ales Hrdlicka, a Czech anthropologist and Smithsonian curator, down the Yukon River. Dr. Hrdlicka was in Alaska at the time making investigations in connection with his study of the American Indian.

The last year of known federal service for the *Coot* was 1946, with the Fish and Wildlife Service.

(Merchant Vessels of the United States 1946, p.794., U.S. G.P.O., Washington: 1946)

Swan, Tern, and Coot

Commercial Salmon Fishing and Enforcement on the Yukon River

Commercial fishing on the Yukon River emerged in 1918 with the experimental operation of the Carlisle Packing Company's cannery located near the river's mouth. The company quickly learned that the large supply of river salmon supported the continuation of their canning business; however, the region's inhabitants strongly objected, fearing the fish population was being threatened. At the time, nearly 11,000 persons and over 6,000 of their dogs along the Yukon were dependent on the river's salmon.

A public hearing was thus held in Seattle, Washington, in November 1918 to decide what restrictions, if any, should be imposed on the taking of the river's salmon for export purposes. The hearing resulted in the prohibiting of commercial fishing above the Clear River junction with the Yukon and limitations on the yearly canning production to 30,000 cases of packed salmon, 1,000 barrels of pickled salmon, and 200 tierces (barrels) of mild-cured salmon.

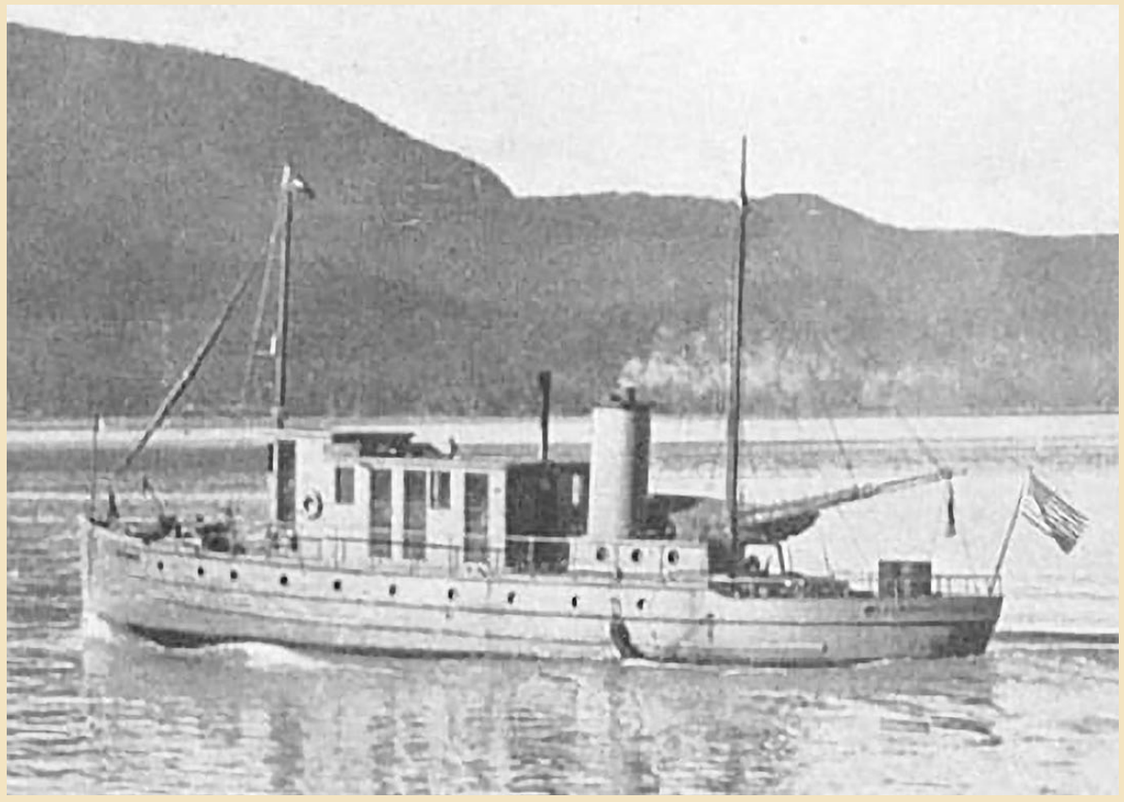
In 1919, four salteries were also operating on the lower river. That year, the commercial take of salmon on the Yukon was 469,949 – about 62 per cent in excess of the established regulations. Residents along the river continued their protests that the salmon runs were being depleted.

The Bureau of Fisheries wanted to understand what impact commercial fishing would have on the Yukon salmon populations. In 1919, they sent one of their agents, Inspector Calvin F. Townsend, to the region to investigate the situation. In his travels along the river, Townsend assessed the salmon runs and interviewed local residences and traders about their relationship to the salmon. Another thorough study was made in 1920, this time including Dr. Charles H. Gilbert (Stanford University) and Henry O'Malley (BOF field assistant). As a result of these investigations and another public hearing, the Secretary of Commerce issued an order on 18 December 1920 restricting fishing on the river, and within 500 yards of the mouth, to non-commercial local use only.

To enforce these restrictions, the Bureau began utilizing its own vessels, specifically for monitoring the fishing grounds of the district each year during the few summer months of active salmon fishing. The BOF patrol vessels *Swan*, *Tern*, and *Coot* served successively, except in 1920, when both the *Swan* and *Tern* patrolled the Yukon River and tributaries together. During the non-fishing seasons, these two boats were usually hauled out of water for winter storage. Military posts for obtaining fuel were provided in agreement with the U.S. War Department.

Kittiwake, World War I Boat Over 100 Years Old

Kittiwake Details			
Year built	1908	Draft	5'
Location built	City Island, NY	Tonnage	46 gross, 17 net
Builder	Kyle & Purdy	Original engine:	60-65 hp Union diesel
Designer	Gielow & Orr		Roy L. Cole (1923-26)
Other names/ id:	Raeo (1908-18, 1948-56)	Known skipper:	John J. O'Donnell (1927)
	USS Raeo, SP-588 (Navy, WWI)		James C. Crawford (1928-31)
	Harbor Queen (1957-97)		James C. Crawford (1928-31)
	Entiat Princess (1998)		Leo J. Collins (1940)
	#204966 (USCG ID)	Known service	1923-41, 1944-45 (fisheries)
Length	70'-73'	Disposition:	sold by 1948
Breadth	15'		

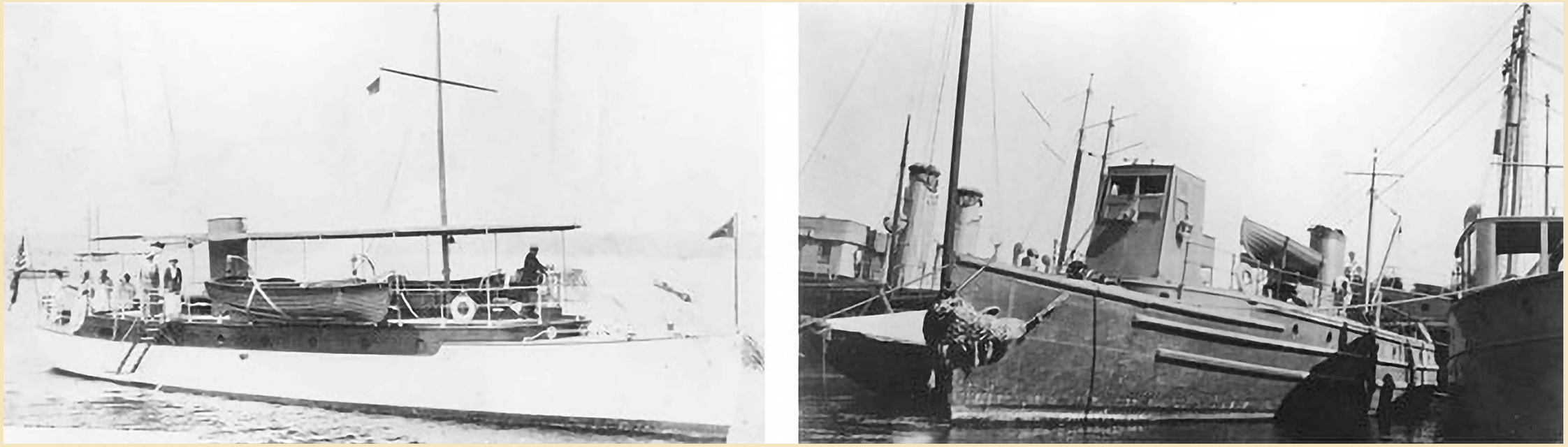


The *Kittiwake*. Bureau of Fisheries photo, 1924.

Following World War I, the U.S. Navy transferred several surplus vessels to the Bureau of Fisheries (BOF). One of the four boats received by the BOF in 1919 for Alaska fisheries enforcement was the 73-foot *Raeo*. The other three were the *Cobra*, *Calypso* and *Edithena* which the BOF renamed *Petrel*, *Merganser* and *Widgeon*, respectively.

The *Raeo* was designed by naval architects, Gielow & Orr and built in 1908 at City Island Shipbuilding Co. in New York. She was operated locally as a passenger day boat owned by Ralph S. Townsend, and later

Kittiwake



The *Raeo*, (left) as a pre-war pleasure boat (American Motor Boat, 1908), and (right) as the U.S.S. *Raeo* (SP-588), ca. 1917-19. U.S. Naval Historical Center photos. Original prints in National Archives' Record Group 19-LCM.

by W. Schall. The Navy then purchased the vessel for $10,500 to be used as a scout patrol boat during the war. The yacht was commissioned in May 1917 as the U.S.S. *Raeo* (SP-588) and, after modifications were made, patrolled off the East Coast stationed out of Newport, Rhode Island.

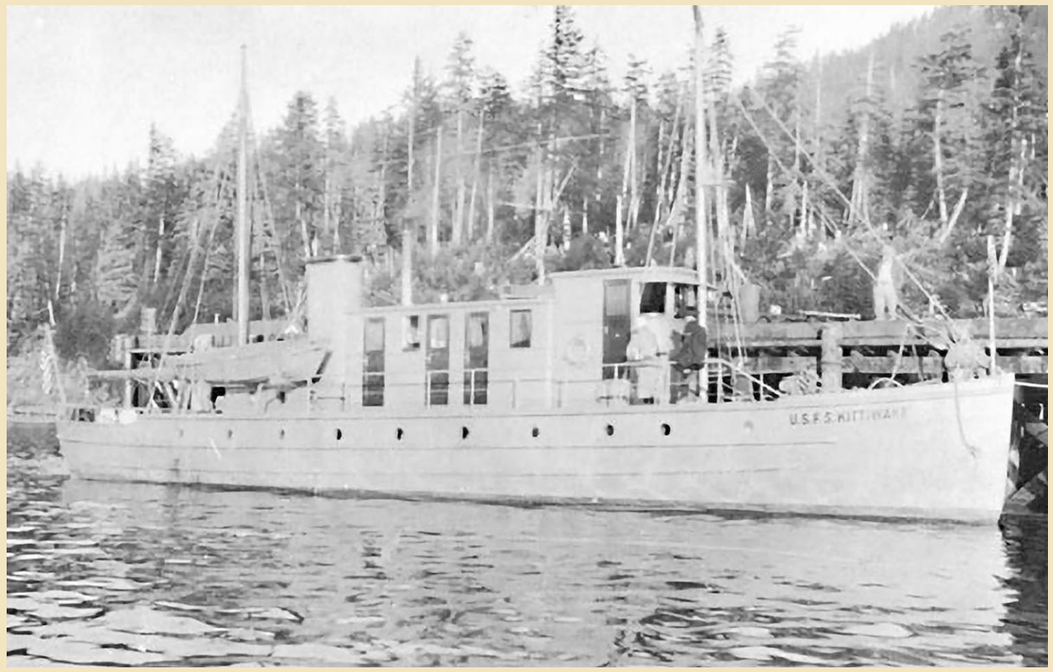
A 1919 Executive order addressed the disposition of Navy vessels no longer needed after the war, resulting in the *Raeo's* transfer to the Bureau of Fisheries on 17 October 1919. She was rechristened the *Kittiwake* and assigned to the Bureau's station at Gloucester, Massachusetts, doing fish culture work.

After repairs and extensive overhauling, the *Kittiwake* motored south from Woods Hole, Massachusetts, to Norfolk, Virginia, arriving on 3 November 1922. She eventually reached Seattle, Washington, in the following spring aboard a Navy transport vessel. Her recorded length at this time was about 70 feet.

Following the installation of a new 65-horsepower Union diesel engine, the *Kittiwake* began her lengthy Alaska service with the Bureau of Fisheries in the summer of 1922. At first, she performed fisheries enforcement and transported passengers in the Cook Inlet and Prince William Sound districts. An example of the *Kittiwake's* usefulness to the Bureau is the roughly 11,000 miles she logged for patrol work in 1926. Sometime around 1930, the vessel was assigned to patrol the Alaska waters of the Seward/Katalla district during summer seasons, moving afterward to the southeastern region in the fall.

The *Kittiwake* had additional patrol duties in Alaska. Beginning in 1923, she was used to enforce the fur seal and sea otter protection

Kittiwake



The U.S. Fisheries Service vessel *Kittiwake* at Prince William Sound in the 1920s. Photo in Pacific Motor Boat, June 1929. Digital copy provided by Mark McCallum, Heritage Program Manager, Tongass National Forest.

laws. Near the end of the 1920s, the *Kittiwake*, along with several other BOF vessels, was used to patrol the northern Pacific halibut fishery. As part of other work, she assisted in the herring and pink salmon tagging operations conducted in Alaska during the mid-1930s. The vessel also transported materials for a new 38-foot weir being built in 1927 at Chinik Creek in Kamishak Bay, Alaska.

The *Kittiwake* was one of several Bureau boats that received extensive overhauling in the winter of 1933-34 as part of a $20,000 allotment made by the Public Works Administration. Additional repairs were required in Ketchikan, Alaska, after the vessel struck an uncharted rock in Moria Sound on 30 July 1938.

By 1942, the *Kittiwake* had been transferred back to the U.S. Navy for use during World War II. She served as a utility and general dispatch boat around Puget Sound until her return to the (now) Fish and Wildlife Service in May 1944. Throughout the remainder of the year, she underwent renovations in preparations for resuming her Alaska fisheries service in 1945.

By 1948, the vessel was owned by Duwamish Shipyard, Inc. in Seattle. With her name having been restored to the original *Raeo*, she was reclassified as a fishing boat. The *Raeo* was then renamed the *Harbor Queen* after her 1957 acquisition by Tacoma Boat Mart, a Washington State boat service company operating since 1938. For the next 40 years or so, five different owners operated the old vessel in Puget Sound as a passenger, charter, and tour boat out of Tacoma, Seattle, and La Conner.

The latest known sale took place at Seattle in 1998. The new owners removed her upper decks for transport to Wenatchee, Washington, where she was converted to a sternwheeler and renamed the *Entiat Princess*. As of 2009, the century-old vessel was being used for dinner cruises, tours and charters on the Columbia River nearby.

Additional Reading

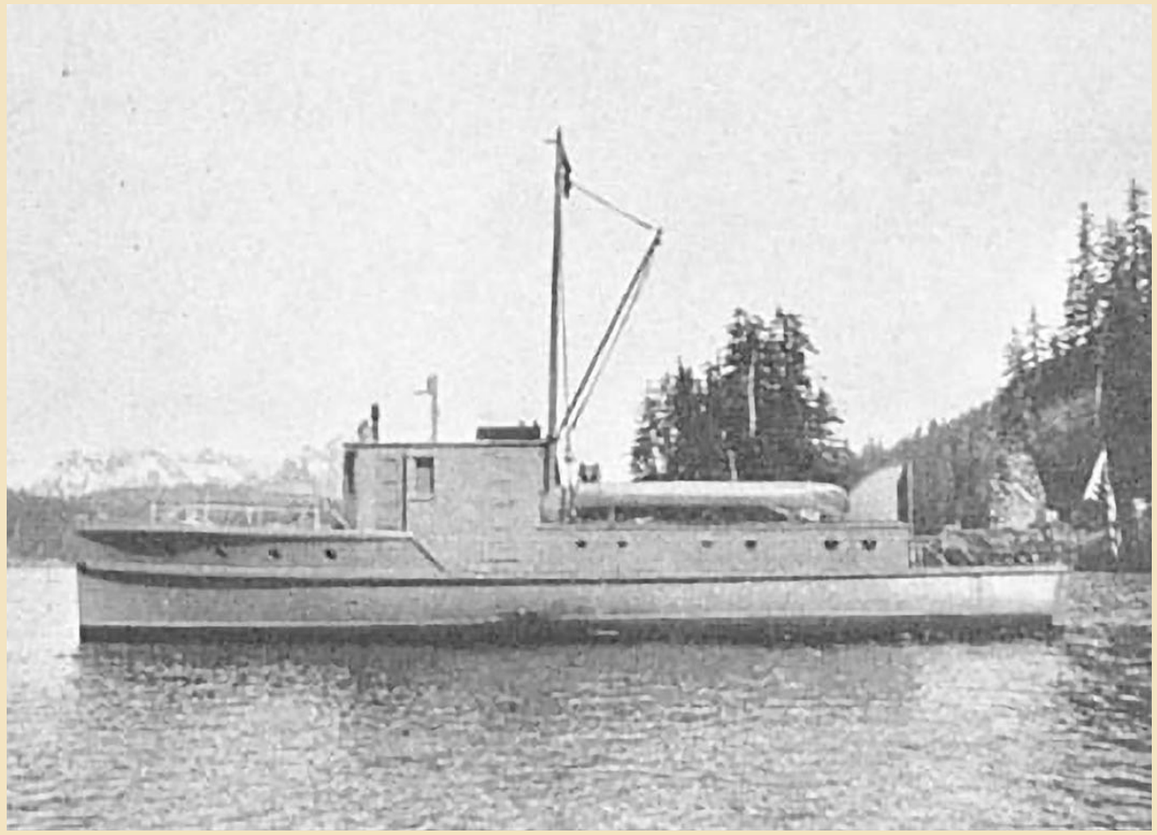
Raeo -- A Notable Motor Yacht. MotorBoating, Vol. 11-12, p.17-20.

Petrel and *Merganser*, World War I Boats

During World War I, several vessels were used by the U.S. Navy Department as scout patrols off the U.S. East Coast. After the war, a 24 May 1919 Executive Order addressed the disposition of vessels no longer needed by the Navy and, subsequently, several boats were transferred to the Bureau of Fisheries (BOF) in 1919.

Two of these vessels, the *Cobra* (S.P.626) and *Calypso* (S.P.632) were obtained by the Bureau at Quincy, Massachusetts, in July 1919. The boats were towed to the Bureau's Woods Hole station in Massachusetts by the BOF vessel *Phalarope*, renamed the *Petrel* and *Merganser*, respectively, then towed by the Phalarope on to the Norfolk Navy Yard in Virginia.

At Norfolk, both boats were loaded aboard the U.S.S. *Neptune* on 3 October for transport to the Pacific Northwest. They arrived at the Puget Sound Navy Yard in early 1920 and were taken to Seattle, Washington, where inspections were made.



The *Petrel*. Bureau of Fisheries photo, 1924.

They were then hauled to King Cove, Alaska, aboard the Pacific American Fisheries steamer *Redwood*, arriving on 18 June 1920. For the next 2 years, both boats were held from active fisheries service in Alaska. During this time, the *Petrel* and *Merganser* were returned to Seattle where they were repaired and outfitted for fishery patrol work as funds became available.

Two other excessed Navy boats were obtained by the BOF in 1919 and also joined the Alaska fleet; the *Widgeon* and the *Kittiwake*.

The pleasure craft *Cobra* was built in 1917 during World War I at Lynn, Massachusetts, at a cost of $14,000. She was originally equipped with a single mast and room for a complement of seven. For war use she was soon acquired by the U.S. Navy in September 1917 and commissioned the U.S.S. *Cobra* (SP-626). In November she began shore patrol off New England operated by the First Naval District. After the war she was transferred to the Bureau of Fisheries (BOF) in September 1919 and renamed the *Petrel*.

Petrel and Merganser

The *Petrel*, 1919 - ? (Alaska service)

Petrel Details			
Year built	1917	Fuel capacity:	600 gallons
Location built	Lynn, MA	Speed:	26 knots (avg.)
Builder	Britt Brothers	Range:	8,400 miles
Names/id (other):	Cobra (1917-18)	Known skippers:	C. E. Tibbits (1922)
	USS Cobra, SP-626 (WWI)		Iver N. Stanisland (1923-25)
Length	54'		Henry E. Thorpe (1929)
Breadth	11'		Clyde I. Dell (1931)
Draft	2.5'	Known service:	1919-34 (in Alaska)
Tonnage	23 tons gross, 15 tons net	Disposition:	unknown
Power (with BOF):	350-400 hp Dusenberg (original) engine		

After arriving in the Pacific Northwest from Norfolk, Virginia, the BOF vessel *Petrel* was prepared in early 1922 for work in Alaska. The renovations involved general remodeling and redecking. In addition, her engine was replaced with a more economical 25-horsepower Standard motor taken from the Bureau's vessel *Auklet*, which just had its engine upgraded. Early that summer, the *Petrel* was towed by the *Auklet* from Seattle, Washington, to Wrangell, Alaska, to begin her annual fisheries patrol duty in southeastern Alaska.

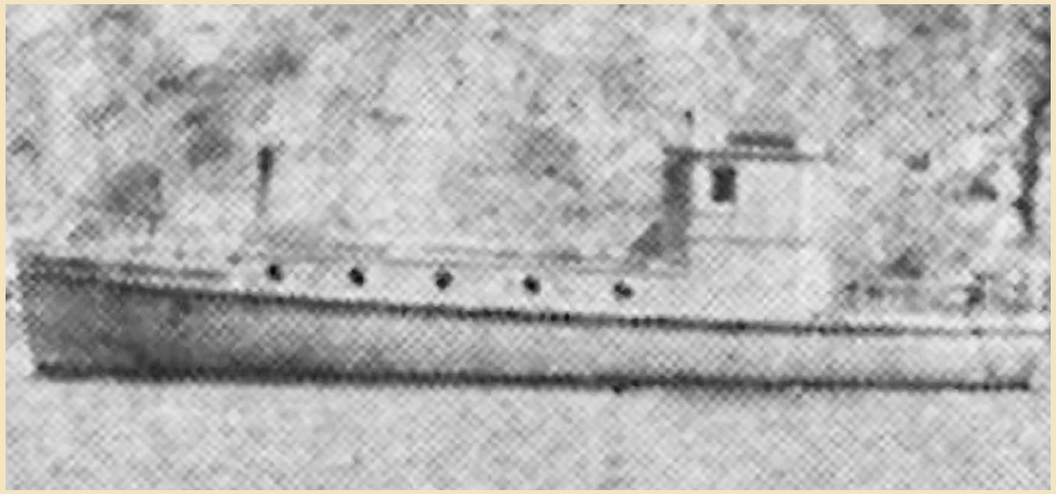
The secondhand engine later become defective, causing the *Petrel* to be laid up during the 1926 fishing season. Her patrol work resumed on 20 September 1927 after a new 50-horsepower, 4-cylinder Cummins engine was installed. In 1930, she spent some time enforcing the fur seal protection laws in the vicinity of Sitka, Alaska. The last known mention of the *Petrel* is that she was placed out of commission in Seattle after the 1934 season.

The *Merganser*, 1919 - ? (Alaska service)

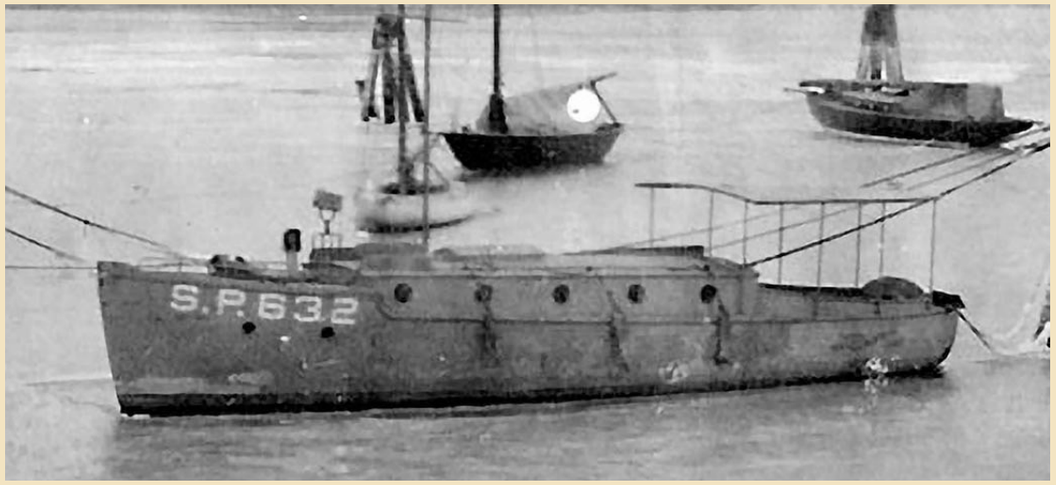
Merganser Details			
Year built	1909	Draft	3' 8"
Location built	Morris Heights, NY	Tonnage	16 tons gross, 13 tons net
Builder	New York Yacht, Launch & Engine Co.	Engine:	20 hp Alco gas (original)
Names/id (other):	*Calypso* (1909-18)	Fuel capacity:	100 gallons
	USS Calypso, SP-632 (WWI)	Speed:	9 mph (avg.)
	#206289 (USCG ID)	Known service:	1919-42 (in Alaska)
Length	54'	Disposition:	unknown
Breadth	10.5'		

Prior to World War I, the 45-foot *Calypso* was originally a civilian pleasure craft. She was acquired from her owner, A.L. Mason (Westfield, N.J.), by the U.S. Navy, who then modified her into a motor launch for use during the war. She was commissioned in July

Petrel and Merganser



***Merganser* in Chignik River, Alaska.** Photo from Pacific Motor Boat, June 1929.



The U.S.S.*Calypso* (SP-632), ca. 1917-19. U.S. Naval Historical Center photo.

1917 as the U.S.S.*Calypso* (SP-632 and patrolled in the northeastern waters of the U.S.

Two years later, the vessel was transferred to the Bureau of Fisheries (BOF), renamed the *Merganser*, and sent to Seattle, arriving in early 1920. For the remainder of the year, she received over $3,000 in repairs in preparation for Alaska service.

The *Merganser* made a few trips between Seattle and Alaska before she actually engaged in much enforcement work. The launch was first towed to Ketchikan in March 1921 by the U.S. Forest Service vessel *Hiawatha*, then nearly a year later, was towed by the BOF boat *Auklet* from Wrangell back to Seattle for additional repairs and the installation of a new 16-horsepower engine. Two months later, the *Merganser* was heading back north again, this time transported aboard the Northwestern Fisheries Company ship *St Paul*. She arrived at Chignik, Alaska, on 25 April 1922 where she was finally ready to begin her regular summer fisheries patrol duty.

This marked the start of the *Merganser's* service enforcing the laws which protected the salmon, halibut, sea otter and fur seal fisheries.

During the mid-1920s, she was stationed at Ikatan where she patrolled the Alaska Peninsula region during the active fishing season. She was usually hauled out of the water for the remainder of each year.

An incident occurred in 1925, when the *Merganser* went missing. The U.S. Coast Guard cutter *Haida* was dispatched and located the *Merganser* 10 days after she had run aground at Unimak Island, Alaska. The *Merganser* was pulled off the shore by the *Haida's* crew and fortunately suffered only minimal damage.

In 1931, the vessel became the new Alaska Yes Bay hatchery tender, replacing the Bureau's launch *Puffin*. When the hatchery closed 2 years later, the *Merganser* returned to Alaska fisheries patrol duties, operating in the southwestern district. The last known reference to the *Merganser* is on a 1942 Fish and Wildlife Service vessel list *.

* Merchant Vessels of the United States (MVUS) 1942, p.530. U.S. G.P.O., Washington: 1941 (the Merganser is not listed on the FWS list in 1943 MVUS)

Widgeon, World War I Boat

Widgeon Details			
Year built	1914	Tonnage	15 tons gross
Location built	Morris Heights, New York	Original power	twin 60 hp, 570 rpm; Speedway gas engines
Builder	Charles L. Seabury & Co.	Average speed	9-12 knots
Names/id (other):	*Edithena* (1914-17)	Known skippers:	Earle L. Hunter (1922-25)
	USS Edithena, SP-624 (WWI)		Greg W. Mangan (1928, 1931)
	Ila Mae (1986)		Carl Christensen (1926-27, 29)
	#212122 (USCG ID)		Albert N. Van Slyke (1937-40)
Length	68'? (sources vary)		Frank See (FWS, ?)
Breadth	15′	Known service:	1921-41, 1944 (fisheries)
Draft	3.75'	Disposition:	unknown

The *Widgeon* pictured with men brailing salmon from a floating trap in Southeast Alaska, ca. 1938. Archival photograph (F&WL C-1195) by Mr. Sean Linehan, NOS, NGS. NOAA Photo Library image.

Before serving with the U.S. Bureau of Fisheries (BOF), the *Widgeon* was originally named the *Edithena*, built in 1914 by Charles L. Seabury & Co. (Morris Heights, N.Y.) for Loring Q. White and homeported in New Bedford, Massachusetts. As with the other BOF Alaska patrol boats *Merganser*, *Petrel*, and *Kittiwake*, the *Edithena* was a privately owned pleasure vessel that became victim to World War I when she was purchased for $17,000 by the U.S. Navy in (June) 1917 and then drastically modified for war use. Commissioned in August as the U.S.S.*Edithena* (SP-624), the vessel was stationed at Boston, Massachusetts, during the war, and operated by the First Naval District to patrol the waters off the U.S. East Coast.

Widgeon

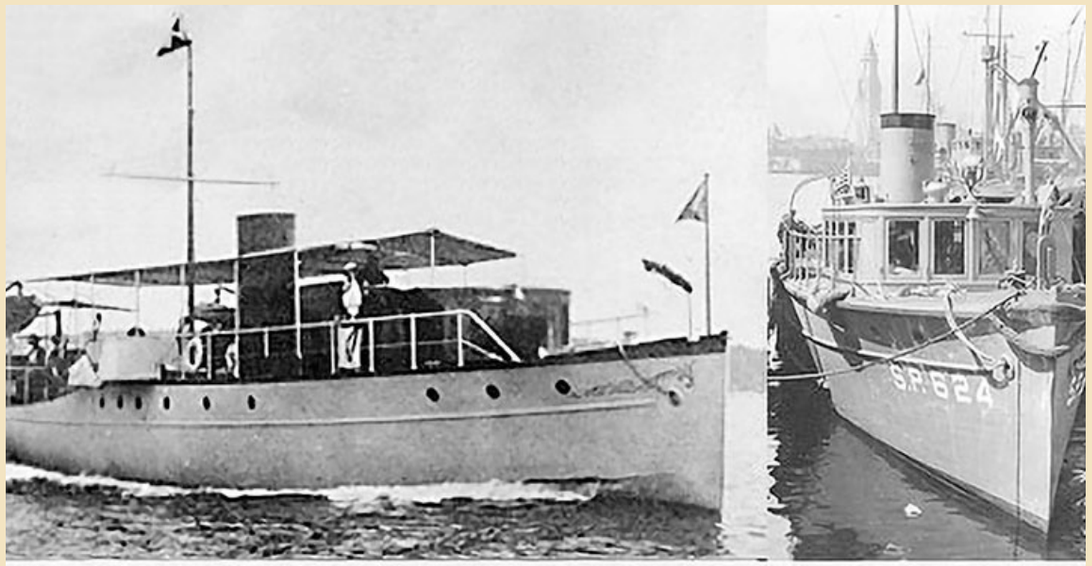
After her removal from naval service on 21 October 1919, the U.S.S. *Edithena* was transferred to the BOF and renamed the *Widgeon*. The BOF vessel *Halcyon* towed the Widgeon from Woods Hole, Massachusetts, to Hampton Roads/Norfolk, Virginia, where she arrived on 25 November 1921. The *Widgeon* then left for the Pacific Northwest on 22 April 1922 carried aboard the Navy transport U.S.S. *Gold Star*.

Upon her arrival in Seattle, Washington, the *Widgeon* was modified for fisheries enforcement service. In August 1922, she sailed north to begin her annual duties of patrolling the waters around Southeast Alaska. In 1928, the *Widgeon* expanded her patrol by participating with other Bureau vessels in the protection of the migrating northern fur seal herds in southeastern Alaska and at the Pribilof Islands in the Bering Sea.

From time to time, repairs and regular maintenance work was done to the Widgeon throughout her service. For instance, prior to the installation of a water-lubricated rubber Goodrich "Cutless" bearing, her bearings required rebabbitting every two months (see box below). In 1924 her twin engines were rebuilt. That same year, Secretary of Commerce Herbert Hoover took a trip aboard the *Widgeon* as part of President Harding's party visiting Alaska.

In the summer of 1929, the *Widgeon* required engine work and was out of commission during the month of July while awaiting replacement parts. During this time, her patrol work was done by the Highway, a vessel on loan from the U.S. Bureau of Public Roads.

A few months later, additional repairs were made, this time to the *Widgeon's* propeller and rudder. The damage occurred on 12 October 1929 when she ran aground on Russian Reef off Whitewater Bay in Alaska. Fortunately, after waiting for the tide to rise, the vessel was able to slide free of the reef into deeper water. She managed to return to town for repairs under her own power. A 1930 BOF report states; "A troller and the Indians on the boat *Merrimac* reported her wrecked completely which later proved untrue...". "Two power boats came to



Over a 10-year period the ship underwent considerable transformations: (top-left) as the *Edithena* in 1914 before the war; (top-right) the U.S.S. *Edithena* (SP-624) at Boston, Massachusetts, ca. 1918; and (bottom) the *Widgeon* with the Bureau of Fisheries, 1924. Top photos from Naval History & Heritage website. Bottom: Bureau of Fisheries photo.

the vessel's assistance, and subsequently their owners entered salvage claims against the Government."

The *Widgeon* then suffered significant damage to her engine room in May 1930 when an explosion and fire occurred on board while she was docked in Juneau. Fortunately, the vessel was saved by the Juneau Fire Department.

After an extensive 1931-32 winter overhaul in Seattle, the vessel continued her federal fisheries duties into the 1940s when the BOF was reorganized as the Fish and Wildlife Service (FWS). In 1942, the *Widgeon* was with the U.S. Navy again, this time during World War II serving as a radar-equipped "picket boat", used to increase the radar detection range around a given area. The last known record of the *Widgeon* as a FWS boat is in 1944*. As of 1947, she was once again in private ownership, registered with her original name *Edithena* out of Seattle. Her last known registration was for 1970-86, under the name *Ila Mae*, a fishing boat homeported at Anacortes, Washington.

Merchant Vessels of the United States (MVUS) 1944, p.745. U.S. G.P.O., Wash.: 1914. *Widgeon* is not listed on the FWS list in the 1945 MVUS.

Additional Reading

Edithena --- A Twin Screw 75-Footer. In New Boats of the 1914 Season. Power Boating, Vol. 11-12, p.37-38.

B. F. Goodrich "Cutless" Bearings

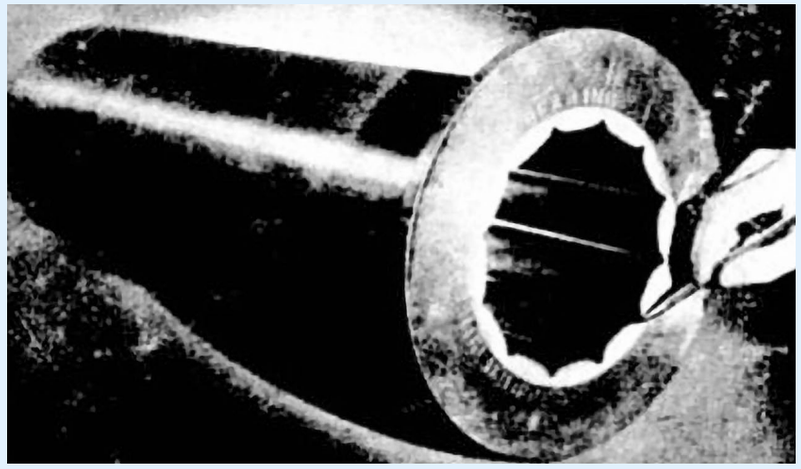
Used in both the *Teal* and *Widgeon*, these water-lubricated bearings greatly reduced maintenance costs. As the following text taken from a 1930 advertisement states: the *Widgeon's* old bearings required rebabbitting every two months, while the new Cutless bearing gave "five whole years of completely satisfactory and uninterrupted service"

The bearing "Outwears Old Bearings 30 Times...

Boat owners, operators, engineers, have been repeatedly astonished by this B. F. Goodrich development – a bearing made of soft rubber and lubricated with water."

"Goodrich engineers had developed a rubber with amazing resistance to abrasive wear. So they designed the Goodrich 'Cutless' Bearing, now used on craft of every type where oil lubrication is difficult, or where sand and grit cut the ordinary bearing."

From Pacific Fisherman, 1930. 28[11]:57



"The pencil points to rubber lining of a Goodrich Cutless bearing. Note the grooves through which sand and grit are ejected by lubricating water stream." From Pacific Fisherman, 1931. 29[13]:8

◁ Vessels: Early Bureau of Fisheries Patrol Boats

Scoter, the Agency's Bristol Bay Boat

Scoter Details			
Year built	1920	Original power	50 hp, 3-cylinder Frisco
Location built	Tacoma, WA	Average speed	8 mph
Builder	unknown	Known skippers:	Hector McAlister (1922)
Designer	unknown		Joseph Paulsean (1923-27)
Names/id (other):	*Clatsop* (1920-21)		? Herre (1928)
	#219922 (USCG ID)		Lin Jorgensen (1931)
	#219922 (USCG ID)		Ole H. Elveness (1940)
Length	57'-65' (sources vary)		Nels Christiansen (1944)
Breadth	15′		Milton Harenden (1949)
Draft	6.8'	Federal service	1922-49
Tonnage	41 gross, 28 net	Disposition:	sold ca. 1950?

FWS vessel *Scoter* after major renovations. Auke Bay Laboratories photo.

Built in 1920, the 65-foot purse seiner *Clatsop* was property of the Bristol Bay Packers when the Bureau of Fisheries (BOF) purchased her in April 1922 for $5000. Following the sale, she was renamed the *Scoter* by the BOF and towed from her location in Portland, Oregon, to Bristol Bay, Alaska, by the steamer *Akutan*. The *Scoter* arrived the following month on 16 May to begin her lengthy service in fisheries enforcement work.

Scoter

During the fishing seasons, the *Scoter* was used primarily by the BOF agent in charge and wardens of the district. The vessel soon became a valuable addition to the Bureau's Alaska fleet, as federal officials could now contact and direct the various boats, crews, and fisheries patrol operations in the entire Bristol Bay area, including the Kvichak, Naknek, Nushagak, Igushik, and Ugashik districts.

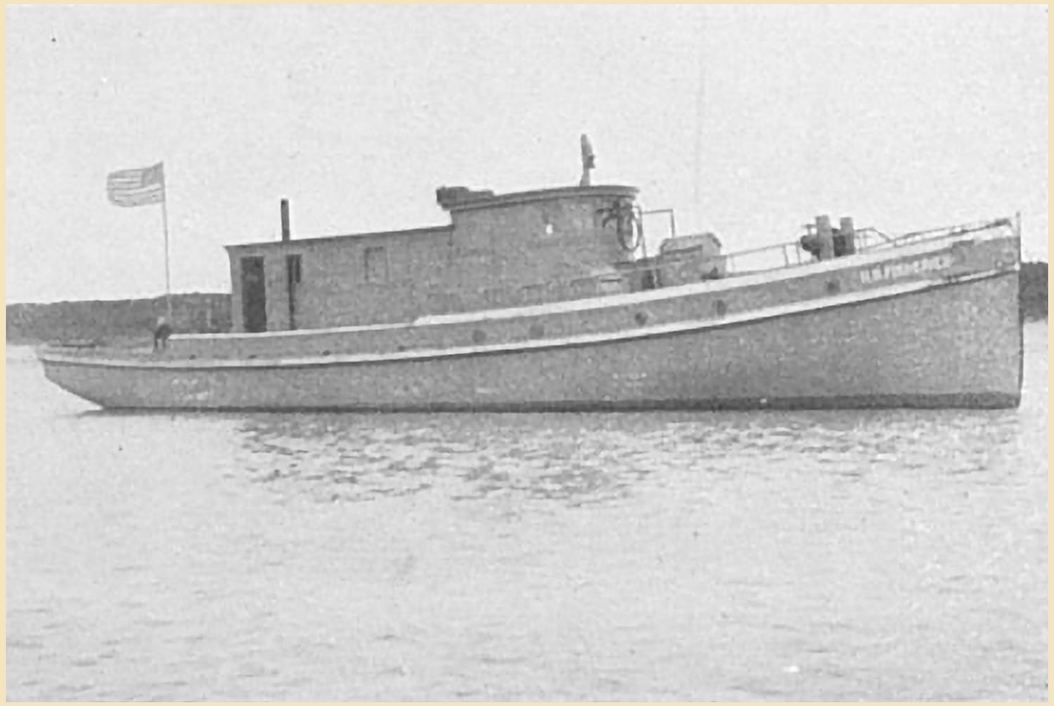
Supporting the *Scoter* were several low-draft power launches used for predatory trout work, weir support and fishing patrol. This fleet made it possible for the first time to act efficiently against fishing violators over the entire region.

The *Scoter* frequently patrolled Southeast Alaska during fall fishing seasons and was usually out of water during the off-season months at the Bureau's marine ways on Naknek River. This was done each year until 1928, when the boat began bringing fishery workers down to Seattle, Washington, each winter. In addition to the workers, passengers on the return trips north each spring would include BOF employees and occasional dignitaries.

While visiting Seattle, repairs and the occasional extensive remodeling was done to the *Scoter*. In the winter of 1928-29 she was completely overhauled with a new pilothouse and extended aft trunk. In winter 1930-31 she received a new 66-horsepower Washington diesel engine, which allowed the old 50-horsepower gas engine to be installed in the BOF boat *Blue Wing*. Significant renovations were done again to the *Scoter* during winter 1932-33.

The *Scoter's* continued service during the 1930s also involved participation in Alaska activities in addition to fisheries enforcement:

- a 1933-1934 Civil Works Administration winter project clearing log jams and other obstructions to spawning salmon from the streams in southeastern Alaska
- a 1935 salmon-tagging experiment in Southeast Alaska (along with the BOF vessel *Kittiwake*) in which 1,900 pink salmon were tagged. Over 33% of tags were returned by the public along with information concerning the time and place of each capture. Each returned tag amounted to a 25-cent reward
- stream inspections and surveys around the Alaska Peninsula, Prince of Wales Island, Kodiak, and Craig in the late 1930s



The *Scoter*. Bureau of Fisheries photo, 1925.

As a Fish and Wildlife Service (FWS) boat in 1941, the *Scoter* hauled framing lumber from Seattle to Naknek, Alaska, for the construction of the Agency's Field Laboratory on Brooks Lake, an important location for over 30 years of successful salmon research and management.

Sparse information provides only a brief hint as to the vessel's history entering the 1950s:

Scoter

- according to the Alaska Shipwrecks website, the FWS vessel *Scoter* "went on the rocks and was lost September 19, 1949 in Slocum Arm [Alaska]".
- the Juneau Empire (Alaska) newspaper (2-9-51) stated the vessel "was disposed of" in 1950 and that the FWS had plans to replace her.
- the Daily Sitka Sentinel newspaper (5-10-51) wrote that "Mr. and Mrs. Don Martin had the Sitka Marine Railway install a new bug shoe* on his 65 foot vessel, the *Clatsop*. The craft is known in Sitka as the *Scoter*. *Clatsop* was her original name...built in 1920 at Astoria, Oregon. Mr. Martin has installed an automatic pilot, direction finder and...radio telephone. He plans to leave Sitka Friday to fish for tuna off Guadalupe on the Mexican coast, working up as far as Monterey."

  * a "bug shoe" is a length of hardened material, such as ironbark, placed on the sternward keel extension (skeg) to protect from shipworm damage.

Additional Reading

Eicher, E. J. 1967. History of the Bristol Bay Investigation, 1938-1956. Bureau of Commercial Fisheries manuscript.

◁ Vessels: Early Bureau of Fisheries Patrol Boats

Blue Wing and *Red Wing*, Kodiak-Afognak Patrol Boats

The *Blue Wing*, 1924 - ?

Blue Wing Details			
Year built	1918		F. R. Lucas (1925)
Names/id (other):	*August* (pre-BOF)		Dan H. McNeil (1926-27)
	El-Don (post-FWS)		Spencer L. West (1929)
	#216855 (USCG ID)	Known skippers:	Victor Hilberg (1931)
Length	49.6'		M. T. Morris (1944)
Breadth	12.5'		Nels Christiansen (1944)
Draft	5.7'		Milton Harenden (1949)
Tonnage	22 gross, 18 net	Known service	1924-51
Original engine	50 hp Union	Disposition:	unknown

The FWS vessel *Blue Wing* in 1947 after major renovations. E. P. Haddon, photographer. Auke Bay Laboratories photo.

The 49-foot purse-seiner *August* was purchased by the Bureau of Fisheries in 1924. The vessel was then renamed the *Blue Wing* after the blue-winged teal.

On 29 July, she set off from Seattle, Washington, for Southeast Alaska, where she began enforcing the fishing laws and regulations until moving over to Cook Inlet in early September.

During the next 10 years, the seaworthy vessel patrolled regularly in Alaska around Kodiak and Afognak islands. She also served as local

Blue Wing and Red Wing

The *Blue Wing*. Bureau of Fisheries photo, 1925.

tender to the Afognak hatchery, where she was headquartered. The *Blue Wing* was usually sent to the southeastern district each autumn following the summer fishing seasons.

In the winter of 1929-30, the *Blue Wing* underwent extensive renovations. Part of this work included the reboring and installation of the 50-horsepower gas engine taken from the Bureau's patrol vessel *Scoter*.

Throughout the mid-1930s, the *Blue Wing's* Alaska service included patrolling Bristol Bay. In June of 1936, she moved from her summer duty in the Kodiak area to patrolling annually in Prince William Sound. Non-enforcement work included the assisting of stream marker replacement in the Ketchikan district during the spring of 1937.

While she was a Fish and Wildlife Service (FWS) boat in 1941, the *Blue Wing* went missing for several days after being caught in a severe gale off British Columbia. She had developed engine trouble and narrowly avoided running aground. Fortunately, the Canadian police eventually located the vessel safely anchored while her crew was working to repair the engine.

The *Blue Wing* was with the FWS as late as February 1951, stationed at Craig, Alaska. U.S. Coast Guard records show she was later named the *El-Don*.

The *Red Wing*, 1926 - 1939

Red Wing Details	
Length	**40'**
Breadth	**11'**
Draft	**3.5'**
Tonnage	**10 gross**
Original engine	**3-cylinder Standard**
Disposition:	**condemned in 1939**

The *Red Wing* was transferred to the Bureau of Fisheries from the Department of Agriculture in 1926 but was kept out of commission at the Afognak hatchery in Alaska pending the installation of a replacement engine. The 40-foot *Red Wing* was equipped with sleeping accommodations for a crew of five.

In 1928, with a 3-cylinder standard gas engine and new fuel tanks installed, the vessel finally began enforcement duty. The *Red Wing* patrolled throughout the Kodiak-Afognak district and extended her duties to the Alaska Peninsula beginning in 1935. She was also used to provide transportation of supplies and personnel to the federal salmon hatchery at Afognak Lake.

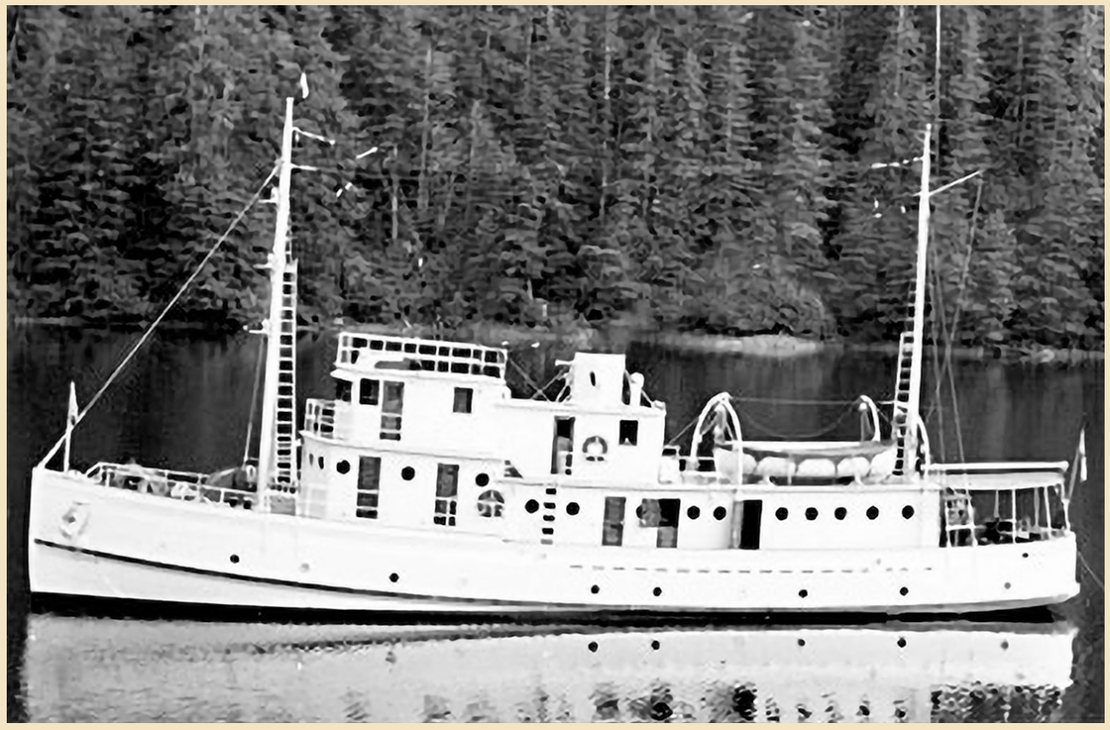
Blue Wing and Red Wing

***Red Wing* during a 1919 National Geographic Society expedition to the Katmai area.** National Geographic Society, Katmai Expedition, 1913-19 photo, UAA-HMC-0186. Archives and Special Collections, Consortium Library, University of Alaska Anchorage.

The *Red Wing's* fisheries service came to an end in 1939. While awaiting her launch in the spring, the vessel was damaged from an earthquake. Her ensuing service was consequently shortened and proved disappointing. Local assessments made by the Bureau of Marine Inspection and Navigation revealed that the boat's poor condition did not warrant further investments for repairs. As a result the BOF decided to condemned and dismantle the *Red Wing* in August.

Brant, Flagship of the Alaska Patrol Fleet

Brant Details			
Year built	1926	Original engine	225 hp, 6-cylinder direct-reversible, Union full diesel
Location built	North Bend, OR	Speed	9-10.5 knots
Builder	Kruse & Banks	Cruising range	1,500 miles (3,600 gal. cap.)
Designer	unknown	Known skippers:	Earle L. Hunter (1926-31)
Other names/id	FWS 523		William M. Olson (1937)
	#266702 (USCG ID)		William M. Olson (1937)
Length	100'		James R. Crawford (1940)
Breadth	21'		L. G. Collins (1944)
Draft	10'	Fisheries service	1926-53
Tonnage	166 gross, 67 net	Disposition	sold in 1953



The Fish and Wildlife Service vessel *Brant*. Auke Bay Laboratories photo.

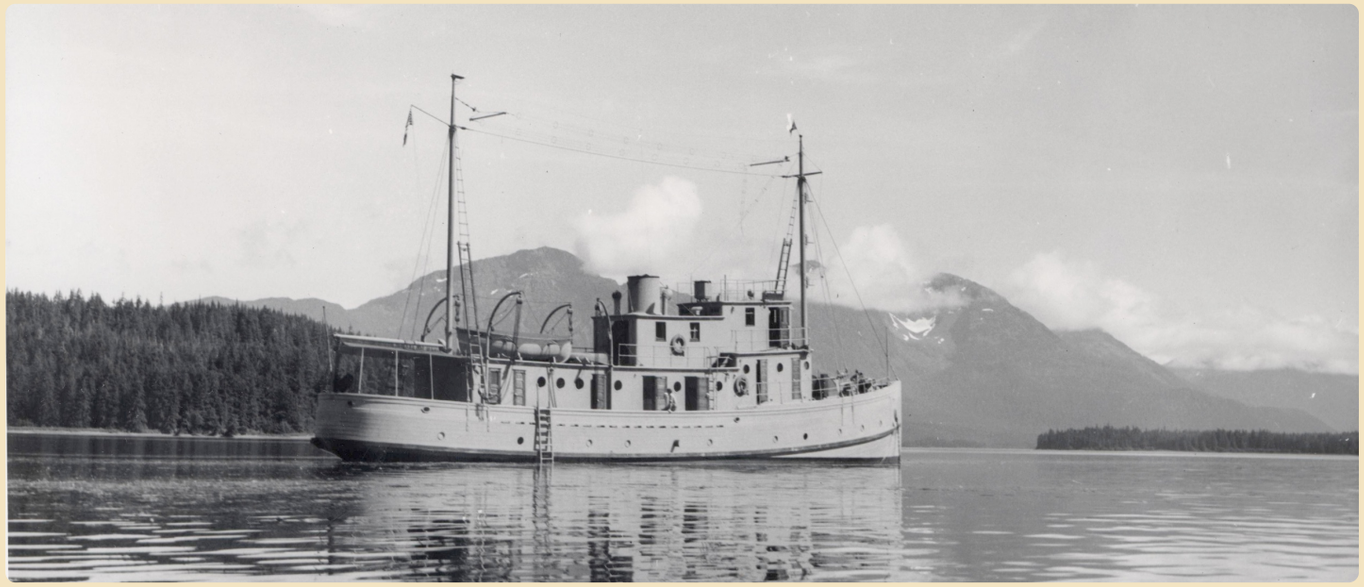
In 1926, the *Brant* became the Bureau of Fisheries' (BOF) largest Alaska vessel when it was launched on 3 June in North Bend, Oregon. A month later she was sailing north to Alaska from Seattle, Washington. Several years later, the vessel was referred to as the "flagship of the patrol fleet" by BOF Chief, Ward T. Bower, in his 1939 Alaska fishery report.

The *Brant* was heavily constructed of fir and old-growth Port Orford (Oregon) cedar. She proved quite seaworthy and well adapted for use in Alaska's exposed coastal waters. A 14-horsepower Union gas engine ran the air compressor, generator and bilge pump. She was modernly equipped with complete electrical, including a 110-volt, type A4H, 150

ampere-hour Edison nickel-iron-alkaline storage battery, wireless radio, and a new Allan Cunningham anchor windlass. The *Brant* could accommodate six passengers and nine crewmen. By 1928, her pilot house had been significantly modified.

On board the 1926 maiden voyage were BOF Commissioner Henry O'Malley and Congressman Milton W. Shreve, who spent several weeks inspecting the local Alaska fisheries. Following her summer work that year, the *Brant* left for a journey to San Pedro, California, to patrol during the winter off the coasts of California and Mexico. Upon returning to Alaska in March, her captain, Earl Hunter, recounted the broken propeller blade and severe storms encountered during their recent trip south.

Initially the *Brant* was assigned to patrol regularly in Alaska's southeast and central districts. At times she was used to investigate conditions of the fisheries as far west as Kodiak Island. During spring months in the late 1920s and early 1930s, she could be found off the Washington coast near Neah Bay and Cape Flattery engaged in enforcing the laws protecting sea otters and fur seal herds migrating northward. During part of the 1926-27 winter, she was performing duties off the California coast. In 1926, the vessel found herself disabled 5 miles off the Columbia River bar and was towed to safety by a U.S. Coast Guard cutter after sending out a distress call.



***Brant*, Flagship of the Alaska Patrol Fleet**

The *Brant* was used for fishery patrol work in Alaska"s southeast and central districts, and also enforced laws protecting the migrating sea otters and fur seals off Washington State"s northwest coast. The *Brant* was sold to the Foss Launch and Tug Company in 1953 and again to a Los Angeles couple in 1959. While being used for oil exploration off the California coast in 1960, the *Brant* caught fire and sank. Captain Lloyd H. "Kinky" Bayers collection, 1898-1967: MS10-4-1-65. Alaska State Library Historical Collections. May not be reproduced without permission.

On 30 June 1929, Commissioner O'Malley again left Seattle aboard the *Brant* for a 2-month inspection of the fisheries around Alaska and fur sealing operations at the Pribilof Islands in the Bering Sea. The vessel often transported other BOF agents and employees from Seattle to, and throughout, Alaska and was assigned the regular duty of general fisheries supervisory work. Throughout the mid- to late 1930s, she assisted

Brant

during fall months with the patrol of fishing grounds and the survey of salmon spawning streams in southeastern Alaska.

Following the closure of fall fishery activities, the vessel was usually in Seattle, at which time she received any necessary repairs and renovations. Extensive work was made to the *Brant* and other BOF boats during the 1933-34 winter under a $20,000 Public Works Administration allotment for this purpose.

In the latter half of 1938, the *Brant* found herself out of commission after running aground on 15 July in Alaska, eight miles from Kodiak on Williams Reef. This accident required her to be refloated by the U.S. plane tender *Wright* and U.S. Navy minesweeper *Teal*. She then had to be towed south, first by the *Teal*, then to Ketchikan, Alaska, by the Coast Guard patrol boat *Alert*, and eventually on to Seattle by the BOF vessel *Crane* for repairs to the extensive damage.

After repairs were made, the *Brant* departed from Seattle on 4 January 1939 for Juneau, Alaska, where she offered 3 months of service to the Territorial Legislature's biennial session. During this time the vessel was used for two weeks in February assisting in the search for survivors from a lost Marine Airways passenger plane flying between Ketchikan and Juneau with six persons aboard. In March, the *Brant* offered transportation to several Civilian Conservation Corps workers traveling in Alaska from Juneau to Little Port Walter.

Throughout the 1940s, the *Brant* continued her Alaska service for the Agency, now known as the Fish and Wildlife Service (FWS). In 1944, her skipper, Captain James R. Crawford, a long-time Arctic sea captain and explorer, retired on 31 January. As late as May 1947, the *Brant* served as a base of FWS operations in Alaska for stream surveying. The work involved small outboard-powered skiffs used in shallow waters for ship-to-shore travel and for identifying obstructions to migrating adult salmon.

During the 1950s, she received a 240-horsepower Union diesel engine – built in 1951 at Oakland, California – which provided a full speed of about 9 mph. At this time, the controls for the main engine and single-shaft propeller were located in the engine room. The vessel also had two auxiliary diesel engines, fire and bilge pumps, and a battery bank contained within the machinery space. She consumed 800 gallons of oil a day from 4,000-gallon capacity tanks.

In 1953, the Foss Launch and Tug Company purchased the (USS) *Brant* from the FWS

A new look after extensive renovations. Auke Bay Laboratories photo.

Brant

and stationed her out of Los Angeles, California. She was registered for "towing and miscellaneous" tug work, though the extent of her actual use is uncertain. One source mentions that in August 1955 the boat was in a "lay-up" status at the Craig shipyards in Long Beach, California.

The *Brant* was then sold by Foss to Joseph and Bernedee Rose of Los Angeles in 1959. On the morning of 8 May 1960, the vessel was en route to an oil exploration survey location off Point Conception, California (near Santa Barbara), when a fire broke out in the engine room which could not be extinguished. She eventually sank around 2:00 pm that afternoon in about 25 fathoms (150 feet) of water. A remotely operated underwater vehicle later identified the *Brant's* debris field.

***Brant* photos in the AFSC Multimedia Gallery**

Fate of the *Brant*

The "engineer on watch, who had been in the machinery space at about 0630 and noted everything to be normal, received permission from the master to shave. Soon thereafter, while shaving in his stateroom, he heard the alarm, 'Fire in the engine room'. He entered the engine room and observed flames between the floorboards inboard of the port auxiliary engine which was in operation. Flames were next observed outboard of the port auxiliary...fire hose was led to the machinery space from the main deck and directed on the fire for several minutes. The fire appeared under control, then sea water from the fire hose caused the electric motor driving the fire pump to stop.

The cowl ventilators serving the machinery space remained open and trimmed forward. The flames increased and it was then decided to abandon ship. All hands donned life preservers and the outboard skiff was launched and towed astern. Since the crew could not enter the machinery space because of the flames, the vessel continued underway. Course was altered to beach the vessel. The vessel was later stopped by plugging the main engine air intake." (Schwemmer, 2000)

"Fearing the boat would explode, the crew of eight abandoned the ship hurriedly, jumping into the water. As if angry at its maltreatment, the *Brant* continued to run under power, in circles, with no one at the helm, for several miles until it sank. The eight men were rescued, fortunate not to have been run over by the burning boat." (Wheeler & Kallman, 1984)

"When CGC-95334 [Coast Guard cutter], which had been dispatched to assist, arrived at the scene at 0833, the *Brant* had been abandoned and was burning furiously. All persons from the *Brant* had been rescued by small vessels in the area. The CGC-95334 used four steams of sea water on the fire and used all available mechanical foam. They were able to contain the fire, but were unable to extinguish it. Several explosions occurred in the after hold where the oxygen was stowed.

The loss of the vessel was estimated at $40,000 and the oil exploration equipment at $45,000...No lives were lost and no persons were injured. (Schwemmer, 2000)

Schwemmer, R. 2000. *Brant*. In Shipwreck Database Summary. U.S. Dep. Commer., NOAA Office of National Marine Sanctuaries: West Coast Region. (not paginated).

Wheeler, E. D., and R. E. Kallman. 1984. Shipwrecks, Smugglers, and Maritime Mysteries of the Santa Barbara Channel. Pathfinder Publishing, Ventura, CA. 122 p.

◁ Vessels: Early Bureau of Fisheries Patrol Boats

Teal, New Life for a Grand Old Vessel

Teal Details			
Year built	1927	Original engine	150 hp, 6-cylinder, Washington-Estep diesel
Location built	North Bend, OR	Average speed	9.5 knots
Builder	Kruse & Banks		
Designer	Coolidge & H. C. Hanson	Known skippers:	J. J. O'Donnell (1929-30)
Other names/id	#504538 (USCG ID)		Roy L. Cole (1927-28, 30-44)
Length	78'		Clyde I. Dell (1934?)
Breadth	18'		Howard Marks (1952, FWS)
Draft	6.5'	Fisheries service	1927-59
Tonnage	91 gross, 62 net	Disposition	transferred to ADFG

H. C. Hanson Survivors

Surprisingly, three Bureau of Fisheries boats, built from 1927-1930 of similar H. C. Hanson design, were still in use as of 2010. The sister boats *Teal* and *Pelican* were nearly identical, built for deep-water oceanographic work; while the *Crane*, about 10 feet longer, was designed as a fish packer vessel.

Teal, served 1927-1959; *Crane*, served 1928-1959; *Pelican*, served 1930-1957.

The *Teal*. Bureau of Fisheries photo, 1928

The *Teal* was built in 1927 at North Bend, Oregon, specifically for the Bureau of Fisheries (BOF). Her 2-inch thick hull was constructed with old-growth Port Orford (Oregon) cedar. She was outfitted with modern auxiliary equipment. Like the Bureau's patrol boat *Widgeon*, the *Teal* had an efficient 340 rpm water-lubricated B.F. Goodrich bearing.

Located in the deckhouse was the captain's room, wireless radio room, crew's mess, galley, dining saloon, and a head. These areas were mostly separated with self-sealing doors and high thresholds leading out onto the side decks. Accommodations aboard the vessel were superb. In addition to the master's stateroom just aft of the wheel-house, the crew made use of a large forecastle forward with two double

Teal

The *Teal* in 1958 with the Fish & Wildlife Service. Auke Bay Laboratories photo.

The *Teal* fully restored, ca. 2010. Photo provided by Kit Pingree.

staterooms, while passengers were quartered below the aft area in two 3-berth staterooms.

Though construction of the *Teal* was completed in 1927, she was not ready for Alaska service until May of the following year when she sailed north to Cook Inlet, in the Gulf of Alaska. Here, she began her annual fisheries patrol during summer salmon fishing seasons. Each fall, she initially patrolled around Southeast Alaska, eventually moving to Prince William Sound in the latter 1930s. In a typical year the vessel logged approximately 11,000 miles.

Winters were spent at Seattle, Washington, where she received any needed repairs or renovations. Significant work was done to the *Teal* during the winter of 1932-33 and again in the following year, when she received overhauling through a $20,000 Public Works Administration allotment.

Towards the end of the 1920s, the *Teal* was part of the Bureau's northern Pacific halibut patrol fleet in which the skippers, wardens and officials aboard were granted search and seizure powers as designated by the President of the United States.

In the mid-1930s, the vessel also assisted in the spring herring-tagging work and fall salmon-spawning grounds inspection conducted in Southeast Alaska. During most of September 1938, she was used in Prince William Sound for surveying streams – and again

Teal

The neglected *Teal* prior to her 1997-99 restoration. Photo credit: Jean E. Jones. Photos provided by M. Burwell, Minerals Management Service, Dept. Interior

for 7 weeks in the fall of 1939, working jointly with the Alaska Game Commission under the supervision of Wildlife Agent Clarence Rhode.

Now a Fish & Wildlife Services (FWS) patrol boat (as of 1940), the *Teal* was stationed at Juneau, Alaska, during the late 1950s. In March 1957, she was on temporary loan to the Alaska Department of Fish and Game (ADFG). She was then used, along with the FWS boat MV *Brown Bear*, in oceanographic surveys as part of a five-vessel operation conducted in 1956-57.

As a result of Alaska's statehood in 1959, the Nation's newest state assumed management control over its own fisheries from the U.S. government. As was the case with several other Bureau of Commercial Fisheries boats (under the USFWS), the *Teal* was transferred to the ADFG in 1960. Appointed in January that year to take charge of the vessel was ADF&G Protection Boat Officer, Henry Museth – the title of Protection Boat Engineer went to Philip C. Johnson.

In the mid-1960s the *Teal* was sold into private ownership. In a 1966 auction, K. Erickson purchased the boat for $25,513, then sold her in 1977 for $20,000 to B. Callahan of Juneau. Subsequent owners included: B. Perka (1982, Port Townsend, WA); R. Newell (1984, Westport, WA); and R. & G. Jones (1997, Port Hadlock, WA). When the Joneses acquired the *Teal*, she was on blocks, badly deteriorated and nearly beyond saving. Restoration work began, and after 2 years and roughly $750,000, her resurrective launch was announced for 13 July 1999. She received a 350 hp Cummins 855 engine around 2000. In 2004, the boat was sold to D. & S. Mahoney, then again in 2008 to Kit Pingree. Since then, the *Teal* had $250,000 in additional improvements. As of 2012, the *Teal* had won several awards and was being moored and cared for by Ms. Pingree at Friday Harbor, Washington.

***Teal* photos in the AFSC Multimedia Gallery**

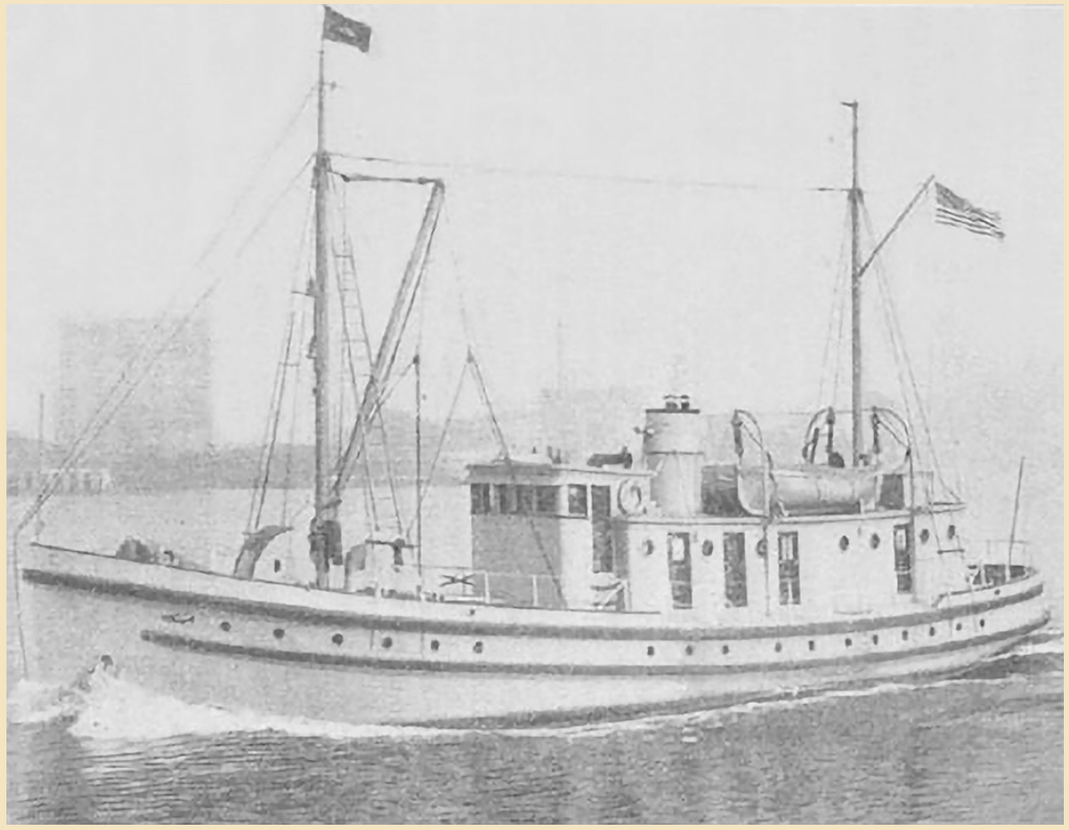
Additional reading

Lane, R. M. 2010. Sister Act - Still Classy After 80 Years. PassageMaker, October 2010. p. 88-96.

◁ Vessels: Early Bureau of Fisheries Patrol Boats

Crane, a Long History of Extensive Use

Crane Details			
Year built	1928	Tonnage	134 gross, 91 net
Location built	Port Blakely, WA	Original engine	200 hp, 6-cyl. Washington, direct-reversing Estep diesel
Builder	J. C. Johnson Bros.	Average speed	9.5 mph
Designer	Coolidge & H. C. Hanson	Known skippers:	J. J. O'Donnell (1929-30)
Other names/id	*Patricia* (1960s & 1970s)		Ole H. Elveness (1939)
	Brapo, Fishing 5, Belle		James R. Crawford (1939)
	Crane (1978-present)		Lin Jorgensen (1940)
	#284723 (USCG ID)		Daniel Draining (1944-45)
Length	92'		Henry C. Museth (1957)
Breadth	20'	Fisheries service	1928-59
Draft	11.7'	Disposition	transferred to ADFG



The *Crane*. Bureau of Fisheries photo, 1929.

In early 1928, the *Crane* was added to the Bureau of Fisheries' (BOF) Alaska fisheries enforcement fleet. The Bureau assigned R. L. Cole as inspector to manage the $60,000 construction project. Washington Iron Works of Seattle, Washington, provided the 200-horsepower Washington-Estep full diesel engine that would power the *Crane*.

The massive 131-ton vessel, was launched on 19 April 1928 from the J. C. Johnson Shipbuilding yard at Port Blakely on Bainbridge Island – located just across Puget Sound from Seattle.

Crane

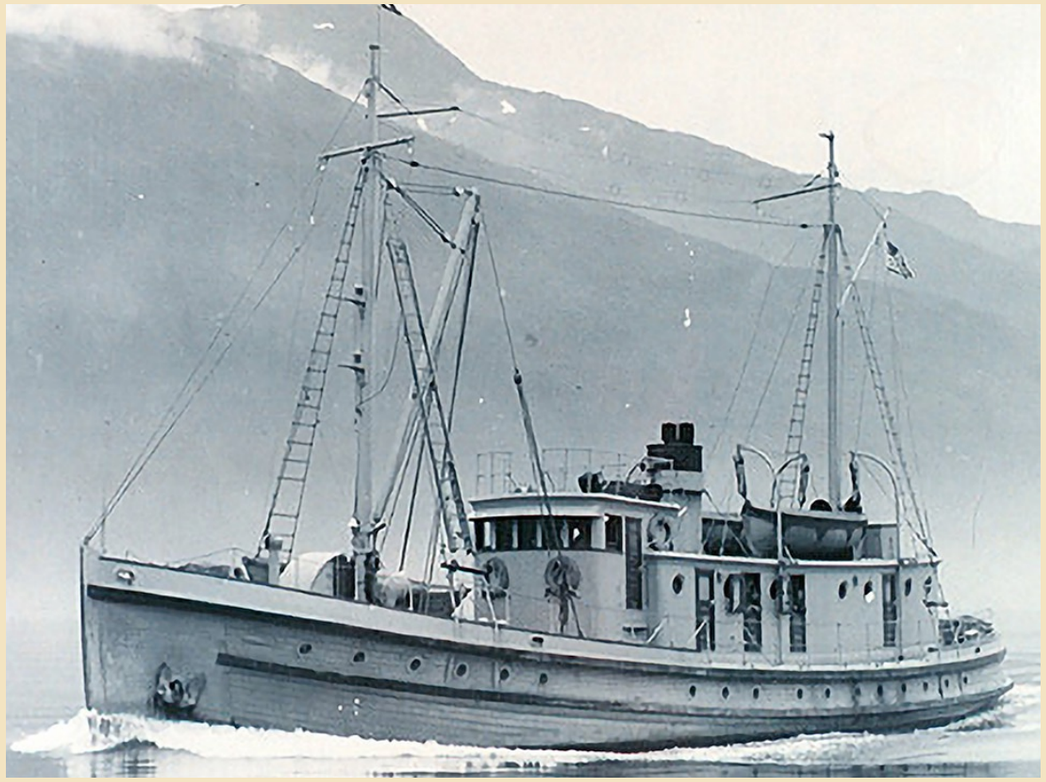
The *Crane* was framed entirely in Port Orford (Oregon) cedar: 12" by 12" sawn-frames on 18" centers (6" between frames). Her deck beams were 8.5" by 9.5", a hefty 5" by 27" shelf timber and the triple keelson was 30" of solid wood. The *Crane* had 3" fir planking and a 4" skin (Hughes, 1982). Her sturdy hull was sheathed with ironbark. As a more recent owner put it, she was "built to push icebergs around". An advertisement in a 1933 Pacific Fisherman magazine proclaimed that the vessel was "equipped with a 110 volt, type B6H, 112.5 ampere-hour Edison Nickel-Iron-Alkaline Storage Battery".

After being outfitted, the BOF vessels *Crane* and *Teal* both left Seattle in May 1928 on their initial voyages to Alaska. The *Crane* began her regular annual salmon fisheries patrol of the Alaska Peninsula region.

By the end of the 1920s, the *Crane's* service extended to her participation in the Northern Pacific halibut patrol of Alaska waters and the Bering Sea. This was done in combination with certain U.S. Navy ships and most of the BOF's current territorial fleet. As part of this effort, search and seizure powers were granted to the skippers and officials aboard each vessel. Other conjunctive work entailed the *Crane* and several other BOF boats being assigned to conduct seasonal patrols for the protection of sea otters and migrating fur seal herds from Washington to Alaska.

Throughout her BOF service, the *Crane* also spent time in the fall seasons conducting inspections of the salmon-spawning waterways in southeastern Alaska. Following this, the vessel was usually brought back to Seattle for repairs and overhauling.

Significant renovations were made during winter 1933-34 to both the *Crane* and BOF boat *Scoter* through an allotment by the Public Works Administration. This occurred just prior to a Bureau-supervised Civil Works Administration project in which both vessels helped clear and improve salmon-spawning streams in Southeast Alaska. It was reported that as of 22 February 1934, log jams and



The Fish and Wildlife Service vessel *Crane* entering Gastineau Channel, Alaska.
Auke Bay Laboratories photo.

other obstructions were cleared in 325 streams (totaling 802 miles) by the work done by approximately 200 temporary employees.

The 90-foot *Crane* was regularly used as a transport vessel. Seasonal employees and supplies were carried between Seattle and Naknek/Bristol Bay in Alaska. With her size she occasionally served as the Bureau's tender to the Pribilof Islands. This was the case in July and August of 1931, when she took over for the *Penguin*, which was reassigned to transport the Commissioner of Fisheries and other officials on an inspection tour of the fisheries in Alaska. It is known that the *Crane* acted as Pribilof tender as late as 1953, when she filled in for the *Penguin II*.

Crane

Other transport work was done when the *Crane* was in service to the U.S. Post Office Department during a Pacific Coast maritime strike (mid-November 1936 to 4 February 1937) to convey mail between Seattle and Juneau, Alaska. On one of her voyages north, she carried 750 sacks of mail from Seattle. In the spring of 1939, the vessel hauled cement and towed a barge of building materials to Southeast Alaska for the Division of Scientific Inquiry's Little Port Walter construction project. This was followed by a mishap on 21 May, when the *Crane* suffered damage to her keel from hitting a rock in Grenville Channel, B.C. The incident required her to be dry docked for a few days of repair work at the Ketchikan, Alaska, marine ways.

Very little is known of the *Crane* between 1940 and 1959 when she was with the Fish and Wildlife Service (formed from the BOF in 1940). During the late 1950s, the vessel was used for management purposes out of Seattle when she was transferred to the Alaska Department of Fish and Game (ADFG) on 11 April 1960, as a result of Alaska's statehood.

That same year, the ADFG sold the *Crane* in November to O. H. "Doc" Freeman of Seattle for $12,000. In April 1961 the boat was again sold, this time to the Pohley and Bratton families of California who sailed her southward from Seattle, leaving on 16 April. While en route, they experienced trouble and were towed by the U.S. Coast Guard into Coos Bay, Oregon. As a result, the families decided to have a paid crew deliver the *Crane* to her eventual destination.

Over the next several years the Crane had several reported owners and name changes, which included *Brapo, Fishing 5,* and *Belle*. A University of Washington professor, W. Burns, acquired the vessel for $25,000 in 1971 and, over the next couple years, spent nearly $300,000 restoring her from essentially just the hull. At first he rigged her to troll for tuna, then later used her for 6 years packing for a Friday Harbor, Washington, cannery.

While named the *Patricia*, the vessel was acquired in 1978 by "Snapper" Carson, of Ketchikan, for $190,000. Mr. Carson restored

The *Crane* in 2005. Photo provided by Chris Beaudin.

her original name and used the *Crane*,which he called "the best boat on the West Coast", for 25 years to fish and pack for salmon and herring. In November 2003, the *Crane* was purchased for $159,000 by Chris Beaudin (Crane Adventures)

After receiving a major restoration, the vessel was used during summers as a gillnet tender in Southeast Alaska. In addition, the *Crane* has been chartered for tours and customized outings.

***Crane* photos in the AFSC Multimedia Gallery.**

Crane Accounts

Regarding the removal of a BOF field crew from Bristol Bay in 1939 (Eicher, 1967): "Most of the men walked over the ten-mile portage to Iliamna Bay where the U.S.F.S.* Crane met the group. A heated controversy took place when the Crane made its appearance on departure day, inasmuch as the skipper Ole Elveness, refused to come inside the bay, claiming it was too shallow. Eventually, all of the men were ferried by speedboat in rough water to the open ocean anchorage, and put aboard the Crane. All were seasick in a stormy night trip to Seward. Two or three men were put ashore there to take Alaska Steamship passage to Seattle, inasmuch as the Crane was overloaded. Captain Crawford took command of the Crane from Juneau to Seattle." * Note: the BOF was also known as the U.S.F.S. – "U.S. Fisheries Service".

Mark Freeman (son of 1960-61 Crane owner "Doc" Freeman) shares his memory of the vessel in a 2009 email: "We then took her to Fremont Boat Company [Seattle] which I owned and I put her up for sale for Dad. For power, she had the original Washington Estep direct Reversible 200 hp diesel. When I would bring her into Fremont Boat I would shut her off over by Bergs Fuel dock and she would coast for 1/4 mile up thru the hole and into the yacht dock. I would ring for slow astern and the engineer, Ed Anderson, would hit the air start lever. Woff, woff, woff - she would start slow astern and bring the Crane to a halt and we would tie her up. It looked easy but she was so heavy if I missed she would have ended up in the middle of North Northlake Way. She almost sunk once - we had been somewhere and came back to the yard about 2200 [10:00 pm] and looked at the Crane and she was down by the bow with no waterline in sight. We started a couple of scow pumps and got the water down far enough to find the problem - had turned one valve off - and we had saved the day again."

And, a couple "Snapper" Carson stories (Hughes, 1982): "the Crane was running north through Canada for the Alaskan salmon season when, in the middle of a dark night, a pair of seiners cut directly in front of her. The Crane struck the second aluminum seiner (which was under tow, as it turned out) broadside, slicing her practically in half. Damage to the Crane? 'Well, we replaced a chunk of the bowstem,' says Snapper. The rest of the story is that there was a bottle of shampoo sitting on a shelf in the fo'c's'le, less than a foot from the bow. 'When we hit, the shampoo moved about an inch. It didn't even tip over,' he says, incredulous himself"

"Another story has it that last spring after the herring season, Snapper wanted to haul the Crane out for the yearly bottom paint and zincs ritual. The Sea Ward Shipyard in Ketchikan had hauled out a 100' steel boat just the week before, but when they tried to lift the 87' Crane, they couldn't. Snapper's only choice then was to put her on the grid. He did, and that night as he stood on deck looking across the water, he saw what he thought was a huge oil slick spreading out from his boat. His mind raced; bilge, fuel tanks, stove tanks, oil drums, but no, everything was in order. Then he realized what he was seeing was not oil, but creosote. The sheer weight of the Crane was squeezing the creosote right out of the supporting grid timbers."

Sources:

Eicher, G. J. 1967. History of the Bristol Bay Investigation, 1938-1956. 13 p.

Hughes, H. 1982. The *Crane*: Sturdy as the Stories About Her. Alaska Fisherman's Journal, May 1982. p. 60-61.

Pelican, Impressive Service Coast to Coast

Pelican Details			
Year built	1930	Tonnage	94 gross, 39 net
Location built	Newport News, VA	Original engine	150 hp, 6-cylinder direct reversible Winton diesel
Builder	Boat Harbor Marine Railway	Known skippers:	Edgar L. Raymond (1937-40)
Designer	H. C. Hanson		"Whispering" Jim ? (1957)
Other names/id	#537911 (USCG ID)		Art Phillips (WDF)
Length	78'	Fisheries service	1930-40 (East Coast, Gulf); 1941-57 (Alaska)
Breadth	10.25'	Disposition	transferred to WDF
Draft	5'		

1930 marked the last year in which vessels were acquired by the Bureau of Fisheries (BOF) for fisheries enforcement work in Alaska. The Bureau's largest boat to date, the 130-fo0ot *Penguin*, was being launched to serve as the latest transport tender to the Pribilof Islands. She replaced the aging *Eider* which, along with the newly built *Pelican*, joined the regular fisheries fleet. With the exception of the small research launch *Heron* (1931-35), it would be another 10 years before the Agency

The *Pelican* in 1938. Photo courtesy of the Louisiana Universities Marine Consortium.

– as the Fish and Wildlife Service (FWS) in 1940 – would gain additional boats for Alaska.

The 78-foot *Pelican* was built specifically for the Bureau, launching in the summer of 1930 from the Boat Harbor Marine Railway yard at Newport News, Virginia. She immediately replaced the Bureau of Fisheries boat *Gannet* which had been used for the year-long fish cultural work based at the Bureau's Boothbay Harbor station on the coast of Maine.

Leading naval architect, Harold Cornelius Hanson (Seattle, Washington), designed about a dozen of the various vessels used during much of the century by the Agency for fisheries service in Alaska. The plans he drew for the *Pelican* satisfied the BOF's requirement for a boat capable of doing the offshore

Pelican

work of the U.S. eastern seaboard continental shelf at depths up to 100 fathoms.

The *Pelican's* design was nearly identical to the one he created for her BOF "sister" boat *Teal*, built 3 years earlier. A major exception was the 6-foot addition to the *Pelican's* aft deckhouse for a fisheries research laboratory. Some of her deckhouse cabins, such as the crew's mess, radio room and captain's room (with chart table) were separated and accessed by a series of self-sealing exterior doors located along the vessel's side decks.

The *Pelican* was heavily planked, built with east coast longleaf yellow pine on white oak with Douglas fir decking. Atop four huge 12- by 20-inch wood timbers sat her 150-horsepower direct-reversing Winton diesel engine, which was started from an air compressor.

Through most of 1932 (until 17 October), the *Pelican* was used by the International Passamaquoddy Fisheries Commission for a special study to investigate the potential harm to local food fishes as a result of the proposed building of power dams in Cobscook and Passamaquoddy Bays, Maine. The following year, the vessel assisted in ocean fishery studies off the coast of Maine.

Operations here continued until 1933, at which time she was placed out of service for 4 years. While idle, she received a major overhauling of her engine at Portland, Maine. The *Pelican* was then sent to Fairhaven, Massachusetts, in 1936, where repairs and alterations began. The work included installation of deck fittings, a 25-kilowatt generator and a hydrographic winch having 5,000 feet of steel cable for oceanographic work.

With renovations complete, the vessel left Fairhaven on 10 January 1937 and traveled south along the Atlantic coast towards her eventual destination in the Gulf of Mexico. The skipper at this time was Edgar L. Raymond, with Edward W. Turner as chief engineer.

The *Pelican* with the Fish and Wildlife Service, 1949-50. Auke Bay Laboratories photo.

Upon reaching the U.S. Coast Guard station at Curtis Bay, Maryland, the *Pelican* obtained a radio and its generator. These were provided and installed by Coast Guard personnel. The vessel continued south, arriving on 22 January at Brunswick, Georgia, where she acquired fishing gear and hydrographic equipment, and received additional minor work.

On 30 January, the *Pelican* departed for New Orleans, Louisiana. She was now well equipped for doing offshore deep-water hydrographic

Pelican

and biological surveys in the Gulf of Mexico. Because she lacked the size, however, she had to remain within 100 miles from shore and avoid prolonged stays at sea.

The Gulf work took place from Florida to Texas for the BOF's shrimp investigations program – led by Milton J. Linder, with the oceanic biological and hydrographic work under the direction of Dr. Lionel A. Walford. The goal of the effort was to gain knowledge of shrimp biology and to establish a commercial fishery in the area. Attempts were made to record the fish taken during the hundreds of trawls conducted.

Through 1938-40, the shrimp investigations done by the *Pelican* continued. This work included exploratory offshore trawling, plankton hauls, and water salinity and geological bottom core analyses. In 1938 large populations of brown shrimp were discovered in the deeper areas off the Louisiana coast. This confirmed the theory that shrimp move to deeper waters in the winter after disappearing in the fall from fishing grounds closer to shore. The discovery also resulted in the commercial harvesting of shrimp in the Gulf of Mexico, which served as an important reserve supply to the depleting South Atlantic stock.

When the Fish and Wildlife Service (FWS) emerged from the BOF in 1940, the *Pelican* was conducting shrimp surveys during the first part of the year off the southern Atlantic coast, from Florida to North Carolina. In 1941, she was hauled to the Pacific Northwest from Newport News on board the U.S. Navy transport *Vega*. She arrived in Puget Sound at the end of April where she was overhauled before being placed into service. Later that year, she towed the FWS vessel *Eider* – damaged after running aground on 24 October – from Prince Rupert, B.C., to Seattle for repairs. Much of the *Pelican's* work for the FWS throughout the 1940s is unclear; however, it is known that she often serviced the trap and stream watchmen in Alaska with supplies.

***Pelican* in the Strait of Juan de Fuca between U.S. and Canada, 1991.** Photo courtesy of Mr. Walt Masland.

During World War II, the U.S. Army took control of the *Pelican*. While stationed at Seward, Alaska, she was used by the Army in 1943-44 to service the outer coast lookout stations on Montague Island (Gulf of Alaska) with personnel and supplies. The vessel's poor condition at this time required frequent repairs and maintenance.

After the war, the *Pelican* was back with the FWS. Sometime around 1947-48, she received a 200-horsepower, 6-cylinder, direct-reversing Joshua Hendy Iron Works (Sunnydale, California) diesel engine, which was installed at Seattle. The new engine required a discharge of compressed air to start and burned about one gallon of fuel per mile. It provided a cruising speed of 8.5 knots (700 rpm) and a maximum speed of 10 knots (900 rpm). By 1957, the vessel was based at Juneau, Alaska, and used for management operations.

Pelican

For 12 years (1958-70), she was on loan to the Washington Department of Fisheries (WDF) and was used for fisheries patrol off the Washington coast. The *Pelican* became the WDF's largest patrol vessel and the first to be equipped with radar, which proved useful for navigation, surface searches and tracking locations of commercial fishing boats. With the WDF she also received a new replacement Hendy engine of the same model, her third main engine since being built.

In 1970-71 the *Pelican* was returned to the Agency – now called the National Marine Fisheries Service (NMFS) as part of NOAA. By 1972 she was removed from federal service and, with only 800 operating hours on her engine, was purchased for about $16,000 through a sealed-bid auction in Seattle by Mr. & Mrs. Walt Masland. The Maslands then spent thousands of hours over almost 40 years working to restore and maintain nearly all of the vessel's originality. As of 2010, the Pelican was at Port Angeles, Washington, still operated by her only private owners, the Maslands – powered by the 60-year-old Hendy engine.

***Teal* and *Pelican*, ca. 1990.** Photo by Kit Pingree

***Pelican* photos in the AFSC Multimedia Gallery**

Additional reading

Lane, R. M. 2010. Sister Act - Still Classy After 80 Years. PassageMaker, October 2010. p. 88-96.

Eider, Pribilof Tender and Patrol Vessel

Eider Details			
Year built	1913	Tonnage	76 gross, 52 net
Location built	Seattle, WA	Original engine	110 hp, 3-cylinder
Builder	Nilson & Kelez	Known skippers	Arthur L. Mellick (1919-22)
Designer	Lee & Brinton, Wayward Inc.		Gilbert G. Gunderson(1923)
Other names/id	*Idaho* (1913-18)		Johannes A. Beck (1925)
	YP-198 (USCG, WWII)		Amund Andersen (1926-29)
	#210842 (USCG ID)		Spencer L. West (1931-32)
Length	88'		George Skarbo (1939-41)
Breadth	19'	Fisheries service	1919-48
Draft	9.2'	Disposition:	sold in 1949

The *Eider*, 1920. National Archives and Records Administration - Pacific Alaska Region photo, record group 22, U.S. Fish and Wildlife Service. NOAA web page.

On 1 July 1918, a Congressional appropriation of $20,000 became available to the Bureau of Fisheries (BOF) for the construction or purchase of a wooden power-vessel capable of serving the Pribilof Island facilities in the rough open waters of the Bering Sea.

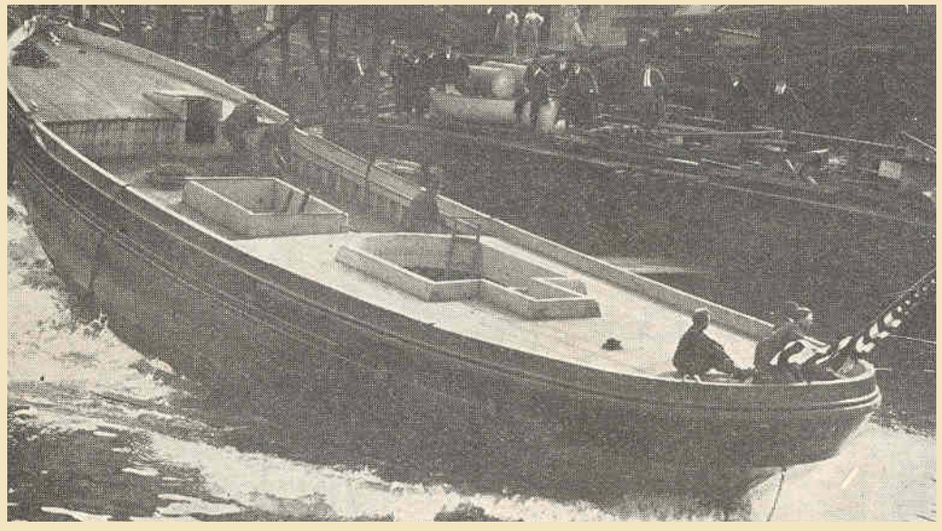
Building plans were drawn up by naval architects, Lee and Brinton of Seattle, Washington, detailing a suitable vessel, 70 feet long, with a heavy-duty 80-hp engine, 30-ton cargo capacity, sleeping accommodations for 16 men, and fuel tanks sufficient for a cruising radius of over 2,000 miles. The original plan was to christen her the *Tern*, as it was customary for the BOF to name its Alaska boats after marine birds common to the region.

Eider

Round-the-World Flight *

In 1924, under the command of J. A. Beck, the *Eider* played a key role in a historic event. U.S. Army Air Service pilots in four airplanes took off from the Sand Point Naval Station in Seattle on 6 April, attempting to become the first ever to circumnavigate the globe by air. On 28 September, 175 days after departing, two of the original planes completed the attempt, arriving successfully back to Seattle.

For part of the journey, the *Eider* was able to transport the advance officers, supplies, gasoline and oil for this endeavor to several key locations throughout Alaska and the Bering Sea. At these stations the vessel provided the pilots with accommodations, meals, meteorological information, and at times plane moorings, as the planes were not permitted to land on Russian soil.



Launching halibut schooner Idaho, designed by Lee & Brinton. Freshwater and Marine Image Bank photo.

On three separate occasions, the bidding for construction of the vessel was advertised and opened at Seattle. Each time the low bid was well over the appropriated amount: $27,500 on 3 December 1918, $26,900 on 8 January 1919, and $28,800 on 12 May 1919. Since more money was needed, Congress subsequently approved an additional $7,500 in a deficiency act on 11 July 1919.

With $27,500 of available funds, the BOF eventually decided to purchase the well-known power schooner *Idaho* from her designers, Lee & Brinton, for $26,000, which occurred in the summer of 1919. The 88-foot *Idaho*, launched 6 years earlier in Seattle on 16 November 1913, had since been operating as a deep-sea Pacific halibut fishing vessel. The seaworthy craft was powered by a 110-hp, 3-cylinder Frisco Standard engine, with a fuel capacity for a cruising radius of 5,500 miles.

After her acquisition she was renamed the *Eider* by the Bureau and immediately underwent several modifications. Alterations included additional staterooms and a communications room with a modern 1/2-kilowatt wireless system installed by the U.S. Navy. The Navy also mounted a light one-pound gun on deck to be used for guarding the fur seal rookeries. Much of the movable equipment on the decommissioned former tender *Roosevelt* was transferred to the *Eider*.

This began the tender's 10 years of federal service transporting goods and personnel between Seattle, Unalaska, the Pribilofs, and other island communities local to the Aleutian chain and Bering Sea. Since the Pribilof Islands offered no harbor, wharf or suitable anchorage, the *Eider* was stationed 250 miles away at Unalaska, the nearest port.

Eider

The *Eider's* first full year of service in 1920 was quite eventful. Starting in January she made the first of many impressive journeys to St. Paul and St. George Islands (Pribilofs), a trip seldom attempted before during the hazardous winter months. In April, the ship brought 1,312 seal skins and 938 fox skins from the Pribilofs to Unalaska where they were transferred to the Victoria, a commercial steamer bound for Seattle. That fall, outbreaks of smallpox put the *Eider* under quarantine at Unalaska on 18 October and again on 10 November.

By this time the vessel had traveled nearly 8,000 miles including 11 roundtrips between Unalaska and the Pribilof Islands, and two trips to King Cove on the tip of the Alaska Peninsula. On 28 November, it was necessary for the Eider to depart for Kodiak, Alaska, for important repairs. On her return trip to Unalaska at the end of the year, the *Eider* responded to a report that the mailboat *Pulitzer* disappeared near Chignik, Alaska. After locating the disabled vessel the *Eider* transported the crew, passengers, and mail through winter seas southwest to Unga and Unalaska. Over the years, the *Eider* and her crew would be used to assist other ships in distress. These vessels included the *Lister*, beached at Cape Makushin (40 miles from Unalaska) in December 1922, and the *Viking*, missing in winter of 1923-24

For 6 weeks in the fall of 1921, the *Eider* was again at Kodiak, this time undergoing major restorations and repairs. As part of this work, her hull was sheathed with ironbark, deckrailing was modified, the forecastle floor was raised, the rudder was reriveted, the main engine overhauled, and a new bilge pump installed. Other renovations involved adding and redesigning interior areas (staterooms, companionway, bulkheads, toilets, new lockers, etc.). A year and a half later on 24 March 1923, the *Eider* arrived in Seattle to have her old gas engine replaced with a more efficient 140-hp, 6-cylinder Atlas-Imperial diesel, of solid injection and reverse gear type. That summer, the vessel averaged 8.75 knots with the new engine that would provide years of satisfying performance for the Agency. Two years later, a 12-hp Cummins diesel auxiliary was added.

The *Eider* performed her tender duties and other assignments during the decade, logging as many as 17,000 nautical miles in a year. Following a 1923 Executive Order, she began guarding the sea otters and migratory fur

The *Eider* after a cold journey. Archival photo by Mr. Steve Nicklas, NGS/RSD. NOAA Photo Library.

Eider

seal herds in Alaska, and later aided with the annual seal census in July 1929. Beginning in 1923, Bureau employees traveled on the *Eider* for a few weeks each summer inspecting the Alaska salmon fisheries at various canneries and spawning streams. These BOF agents included Dr. Charles H. Gilbert, Willis H. Rich, and Dennis Winn. By the mid-1920s, the *Eider's* Alaska patrol duties extended to salmon patrol in southwestern region and, in 1929, protecting the northern Pacific halibut.

Near the end of the 1920s, the *Eider* continued receiving major overhauls and repairs. Her hull had suffered damage in 1925 when it struck a rock in Wrangell Narrows in Southeast Alaska. Another mishap occurred during a foggy storm in September 1929, when the *Eider* lost her rudder and skeg (the sternward keel extension) after hitting a rocky reef off St. George Island, Alaska, and had to be towed to Juneau.

The years of exposure to ice and harsh weather in the open sea had also taken its toll on the vessel's condition. Consequently, in 1928, the BOF suggested that a new and larger ship with more power was needed to replace the aging *Eider* for the open-water trips in the Bering Sea. When the new Pribilof tender *Penguin* was commissioned and began service in 1930, the *Eider* was reassigned to annual fisheries patrol duty in the more protected waters around Kodiak.

Throughout the 1930s, the *Eider* continued providing valuable transportation of passengers and supplies to various Alaska stations whenever required. In the spring of 1934, she was protecting the fur seal herds migrating northward along the Washington Coast near Neah Bay. Between February and April 1936, she was part of the stream improvement project being conducted by the Works Progress Administration in the Juneau and Wrangell districts of the Alaska territory. Then in 1938, biologists were using the vessel to conduct a tagging experiment to measure the travel times of fish.

During World War II, the ship was requisitioned by the U.S. Navy, which then transferred her to the U.S. Coast Guard on 29 May 1942. She was designated the YP-198 and converted into a harbor fireboat. It is believed she was reacquired by the Navy on 26 October 1945 before being returned to the FWS.

In 1940, the BOF reorganized into the Fish and Wildlife Service (FWS) and the *Eider* continued to sail Alaska waters. That year, her hull sustained 14 feet of damage from hitting a reef on 24 October off Prince Rupert, B.C. The last known account of the *Eider* while with the FWS took place in October 1946, when she carried a search party to Shuyak Island, Alaska, in an unsuccessful attempt to locate a missing enlisted Navy man.

Declared surplus property by the FWS, the *Eider* was acquired in January 1949 by G. D. Robinson, a U.S. Geological Survey (USGS) geologist, to study volcanos and geology around the Aleutian Islands. Since 1946, the USGS geologists doing this research had been without dedicated transportation to and from the islands.

The *Eider* upgraded to a 500-hp GM diesel engine in 1951 and continued supporting the USGS's research until October 1954, at which time she was surplussed. The following year, the vessel was obtained by the U.S. Trust Territories of the Pacific Islands (Marshall Islands) to provide support for medical and dental personnel. Sometime after her acquisition it appears she became crippled and sank while under tow for repairs.

Eider photos in the AFSC Multimedia Gallery

Additional Reading on the "Round-the-World" Flight

- Glines, C. V., and S. B. Cohen. 2000. The First Flight Around the World, April 6-September 28, 1924. Pictorial Histories Publishing Company. Missoula, MT. 170 p.
- Crotty, R. 2010. Magellans of the Sky. Prologue Magazine 42(2). National Archives website

Stream Watchmen

The following material is excerpted.

For the fishing season of 1918 the Bureau inaugurated an additional feature for securing a more adequate enforcement of the fishery laws. A number of temporary employees, designated as stream watchmen, were detailed to important fishing grounds in southeastern and central Alaska. Each watchman was assigned a limited area to patrol, which he was expected to keep under continuous observation.

In certain regions where fishing is carried on by means of gill nets, haul and purse seines, or other movable apparatus, these watchmen will be much more effective than patrol boats. Patrol boats can enforce the law in respect to movable apparatus only while actually present at the fishing grounds where it is used. The appropriation necessarily limited the number of men who could be advantageously employed in this way. However, by selecting certain strategic points for operations and by shifting watchmen from one stream to another in response to changing conditions in respect to fishery operations it is thought that a very considerable amount of protection may be afforded the fisheries at comparatively small cost.

Ten men were employed to undertake this work. Seven of them were secured through the dean of the University of Washington, five of the seven being students at the university and two being professors, while an eighth was a graduate of the university. One man was secured in the State of Washington, and the tenth man was engaged in southeastern Alaska. Five of the men were assigned to work in southeastern Alaska and five in central Alaska under the immediate direction of the Bureau's regular officers. A number of small boats were hired for the use of these men."

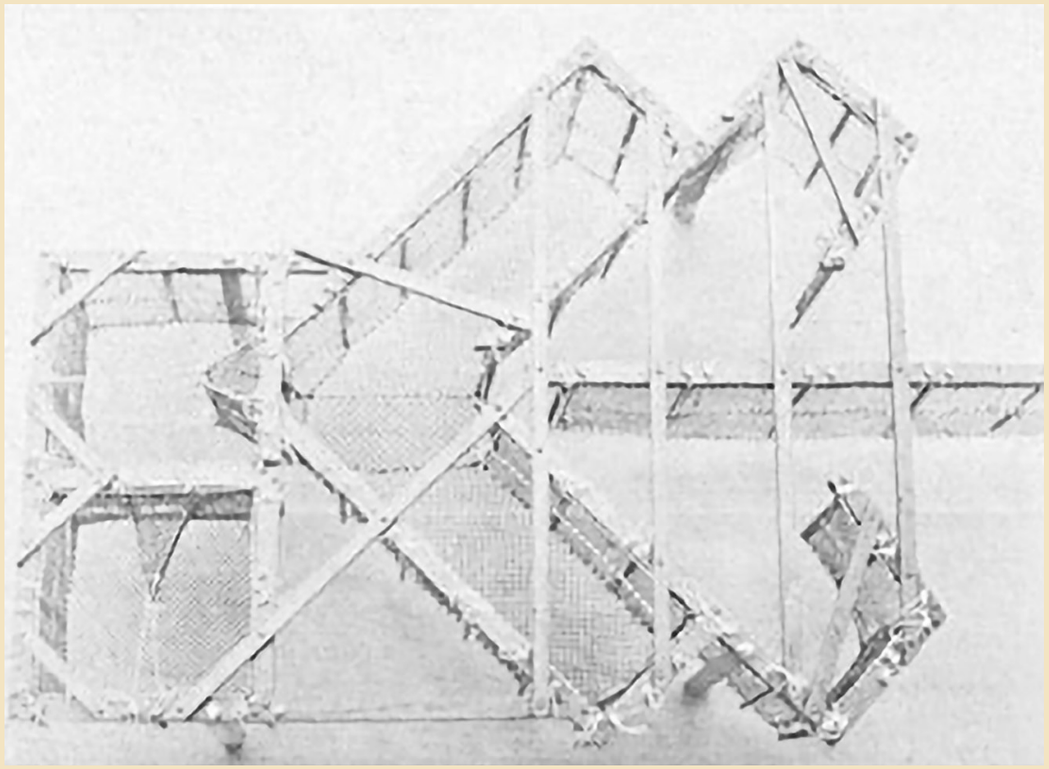
From: Smith, H. M. 1920. Report of the Commissioner of Fisheries for the fiscal year ended June 30, 1918. U.S. Dep. Commer., BOF Doc. 862:84.

A temporary stream guard camp in the Copper River district. Bureau of Fisheries photo, 1923.

During the next several years the number of stream watchmen (or "stream guards") increased dramatically. In 1922 they numbered 59 men, growing to 220 in 1931. These men were selected for this work based on their familiarity with the country and interest in the Alaska fisheries. The length of annual employment ranged from 2 to 5 months.

To cover larger areas and more streams, some of these men provided their own power boats. Occasionally they were used to maintain lights and free floating fish traps from drift. In addition to these

Stream Watchmen



A floating trap. Bureau of Fisheries photo, 1916.

guards, special wardens and operators of chartered boats were employed.

There was no doubt that the presence of the stream watchmen on the mouths of spawning streams successfully deterred illegal fishing, facilitated prosecutions of violators, and was of great benefit to the conservation of Alaska salmon runs.

A Significant Trial

In 1926, complaints continued of fish trap robberies in southeastern Alaska. A number of the larger canning companies had established a patrol of 17 launches, while a few other companies took similar action individually to protect their traps. Numerous cases of this so-called piracy were reported; however, few arrests were actually made.

On 16-17 September 1926, a trial of "United States v. Val Klemm et al." took place in Ketchikan, Alaska, where the defendants, Val Klemm and Walt McCall, were accused of robbing fish traps. It was believed that this extensive practice would be greatly curtailed by holding the trial. It was also reported that the general impression prior to this case was that trap operators had no legal rights to the fish alive in the traps until they were actually removed from the water.

The two defendants were found guilty and sentenced to three years in the Federal penitentiary at McNeil Island in Puget Sound, Washington. The Ketchikan Chronicle newspaper headline read, "Verdict is First Ever in Alaska for Fish Piracy."

The following is extracted from the charge by Judge Reed to the jury in this case: "When fish are impounded - that is, enclosed - in a trap and separated from the sea by said trap, so that they are in the actual personal or constructive possession of a person, they become subject to larceny, and any person who takes, steals, and carries away fish that have been impounded in a trap belonging to any person, he has a special property in them by reason of having the fish impounded in the trap."

Additional reading: Harrington, L. B. 2007. Val Klemm: Miner, Fish Pirate. Part of "Pioneers of Southeast Alaska" series. Stories in the News (SitNews), Ketchikan website

Fish and Wildlife Service Vessels

◁ Vessels

FWS Boats Acquired 1940-1958 (length, year built)

1940 ***Heron (II)***** (58 ft, 1940)

1941 ***Brown Bear**** (115 ft, 1934)

1941 ***Black Douglas*** (140 ft, 1930)

1942 ***Swan II (Seal)*** (66 ft, 1926)

1942 ***Grizzly Bear**** (58 ft, 1934)

1944 ***Black Bear*** 33 ft, 1934)

1948 ***Washington*** (100 ft, 1946-47)

1949 ***Alaska*** (100 ft, 1947)

1949 ***King**** (42 ft, 1944-46)

1950 ***Kittiwake II**** (73 ft, 1944)

1951 ***Sablefish**** (38 ft, 1949)

1951 ***Auklet II*** (57 ft, 1951)

1951 ***Ibis II*** (24 ft, 1951)

1956 ***Skipjack**** (43 ft, 1943)

1957 ***Capelin**** (40 ft, 1939)

1957 ***Albacore**** (40 ft, 1938)

1957 ***Mackinaw**** (52 ft, 1927)

1958 ***Shad*** (44 ft, 1958)

*Earliest known year of service

***Heron* is listed here due to the extent of FWS Alaska service, despite qualifying also as a BCF "newer research ship".

Note: This list does not include the 1950s FWS Pribilof Islands tenders, *Penguin II* and *Dennis Winn*.

Fish and Wildlife Service Vessels Since 1940

Effective 30 June 1940, the Bureau of Fisheries (BOF) and Bureau of Biological Survey merged as part of the Interior Department's new Fish and Wildlife Service (FWS).

As a result, the existing BOF Alaska vessels were transferred to the FWS. By 1944, the FWS had also added the newly built *Heron*, the three-masted schooner *Black Douglas*, and the Alaska Game Commission's *Seal* and the three "bear" boats.

Shortly thereafter, the U.S. involvement in World War II required the military use of many FWS vessels for patrol and transportation duties.

At the end of the 1940s, several boats were added to the FWS's Alaska fleet, many fresh from shipbuilding yards, such as the *Auklet II*, *Sablefish*, *John R. Manning* and *John N. Cobb*.

(Note: The *Manning* and *Cobb* are presented in the Newer Research Ships section.)

With the beginning of the 1950s came the disposal of some long-used BOF boats, like the *Auklet*, *Scoter*, and *Penguin*.

Fish and Wildlife Service Vessels

Another significant occurrence at this time was the federal approval in 1951 for the transfer of the fleet maintenance operations base from its location at the north end of Lake Union (Seattle, Washington) to Juneau, Alaska, where the new port facility would accommodate maintenance division offices and the 37 FWS vessels included in the move.

In 1956, the FWS reorganized into the United States Fish and Wildlife Service (USFWS), and under it was created the Bureau of Commercial Fisheries (BCF) – a descendant from the original U.S. Fish Commission. The Alaska FWS boats were now controlled by the BCF for marine research. While a few remained with the USFWS, most were turned over to the Alaska Department of Fish and Game (ADFG) after Alaska's 1959 statehood. Some survived into the 2000s.

The vessels featured in this section were initially obtained by the Fish and Wildlife Service primarily from 1940 through the 1950s; however, for some of them, the actual year of their acquisition is unfortunately unknown. These boats spent the bulk of their federal service with either the FWS/USFWS or the Alaska Department of Fish and Game.

The other boats that were acquired around 1950 and thereafter were owned and retained past Statehood by the Bureau of Commercial Fisheries for use in Alaska – some lasting into the more recent years of the National Marine Fisheries Service (since 1970 under NOAA). These vessels are described on the Newer Research Ships section pages.

Unfortunately, the available history for several of these old vessels is sparse. Though a few boats are known to have been restored, and still exist as of 2013, the fate of many others, especially after 1940, is unknown.

Unknown Patrol Boats for the FWS Vessels

Heron (II)

Heron (II), Research Boat for Little Port Walter

Heron (II) Details			
Year built	1940	Draft	3.6'
Location built	Seattle, WA	Original engine	135 hp, 6-cylinder Murphy diesel
Builder	Sunde & Olsen	Known skippers	Curt Jenson (FWS)
Designer	Edwin Monk		Dean Frame (1960s)
Other names/id	#526163 (USCG ID)		Robert Budke (1960s)
Length	58', 4"	Known service	1940-69
Breadth	13.5’	Disposition:	sold

In 1940, the Bureau of Fisheries transitioned into the new Fish and Wildlife Service (FWS) and, after nearly a decade, another boat was acquired by the Agency for the purpose of fisheries work in Alaska – this vessel being the newly built *Heron*.

The construction, which had started in March at Seattle, Washington, was completed during the summer at a cost of $19,000. The boat was a modified purse-seiner type having a double-ended hull designed by Seattle marine architect, Edwin Monk. The *Heron* had a galley, laboratory, and sleeping accommodations for six men.

On 5 August 1940, the boat left Seattle for the FWS Little Port Walter (LPW) field station in Alaska. Aboard was the Fisheries Biological

Laboratory (Seattle) director, Dr. Frederick A. Davidson, who reported he was completely satisfied with the *Heron's* performance.

Monk's Design

"The performance of the double-ender *Heron*, a new 58-foot service vessel for the [Little] Port Walter biological station of the Fish and Wildlife Service, aroused much comment in 1940.

'The requirement was a double-end hull that would show some speed,' explained Monk. 'The orthodox double-ender is a good sea shape but to drive it at anything but a very moderate speed is almost impossible. At moderate speeds it drives very easily; but an attempt to push it beyond a given point results in a pronounced ‘squat’ as the hull tends to bury itself aft. This is where the long straight bottom lines of the transom stern begin to show to advantage. The objection to the transom stern for the *Heron* was that it is a poor performer in a following sea, and it has, to some eyes, a ‘sawed-off’ appearance. Exhaust gases have a tendency to flow into the cockpit, whereas the flow of air around a double-ender eliminates this.'

The *Heron's* stern was lengthened at the waterline, and the buttocks were also extended and straightened, by superimposing a short chine or knuckle, resulting in ‘a clean running boat with no deep hollow in the waterline amidships.’ Construction costs for this new type of stern were higher, but offset by an increase in speed – which Monk figured would be particularly applicable to trollers and to motor sailers. Powered by a 6-cylinder Murphy diesel, *Heron* cruised easily at 14 mph."

From: Oliver, Bet. 1998. Ed Monk and the Tradition of Classic Boats, p. 32. Horsdal & Schubart Publs. Ltd. Victoria, B.C., Canada. 160 p.

In 1962, the Heron's double-ended design (and crew) were put to the test during a severe storm in the Gulf of Alaska. With the skipper rendered unconscious, a crewman took over the wheel and realized the only way of surviving the turbulent swells was to keep the stern facing each wave.

More: 2011 Interview with Jack Helle (AFSC, retired)

Heron (II)

The *Heron* at the time of her launch in 1940. John Dassow (FWS), photographer.

Upon her arrival at her new LPW headquarters, the *Heron* became the Agency's first research vessel in the area since the small motor launch *Heron*, which retired from service 5 years earlier. The new *Heron* no doubt got her name from the launch and she was known by some as the *Heron* II.

Throughout the 1940s, the *Heron* was used primarily for transportation in support of field camps and for research, such as juvenile salmon surveys and herring studies taking place in Southeast Alaska. As with other FWS vessels, the *Heron* would be in Seattle during winters for reconditioning–as in 1946-47, when she received significant repairs and renovations in preparation for the upcoming season in Alaska.

On 16 February 1942, the *Heron* left Seattle and returned to Little Port Walter to participate in the counting of pink salmon fry resulting from the eggs spawned in Sashin Creek during the previous fall–a project headed by FWS biologist, Samuel J. Hutchinson. Late in the decade, the vessel was used in 1948-49 by Stream Improvement Project staff in their ongoing stream survey work being conducted on the east coast of Prince of Wales Island in Alaska.

During the 1950s, the *Heron* continued to be used for the annual pink salmon fingerlings census. Following the 24 June opening of the 1955 fishing season, the *Heron* and the FWS vessel *Sablefish* were both inspecting all commercial fish traps in the western and eastern districts of Icy Strait in Alaska. In 1956, the operation of the *Heron* was assumed by the new Bureau of Commercial Fisheries (BCF, part of U.S. FWS). Throughout the end of the decade, the *Heron* was headquartered at Juneau, Alaska, and was used primarily for biological research.

As a BCF boat, the *Heron* remained working in Alaska, servicing the Bureau's Olsen Bay station in the early 1960s. At the end of June 1963, she was sent to Juneau for repairs after

Heron (II)

her duties were taken over by the USFWS amphibious Grumman Goose aircraft. During the ensuing winter, the *Heron* once again received extensive maintenance and restoration. This work included a complete engine overhaul, repair of the dry rot in the deck and superstructure, major replacement of the plumbing and wiring, and the installation of an aft laboratory. She was also outfitted for the upcoming 1964 estuarine field program.

Late that spring, the vessel filled in at Traitors Cove, Alaska, for the BCF boat *Murre II,* which was undergoing repairs. Through May and June, hydrographic work was being done at Traitors Cove by the BCF Biological Laboratory's Oceanographic Investigation Program. During part of the 1964 summer, the *Heron*, along with the 20-foot craft *Blue Boat*, completed a series of several successful cruises to determine the juvenile salmon seaward migrations through summer nursery areas to the Gulf of Alaska.

In 1965, early life studies of salmon were conducted during outings aboard the *Heron* in Alaskan and British Columbia waters. In the following year, plans were made that would use voice radio from aboard the *Heron* and *Murre II* to report weather conditions to the Juneau U.S. Weather Bureau station.

The *Heron* visited Traitors Cove again in 1967 with the camp scow in tow from Ketchikan, Alaska, which allowed the chum salmon studies field program to begin on 19 May. From here the Heron was used during the summer months to release over 17,000 international plastic orange drift cards throughout Southeast Alaska and British Columbia to study surface currents and salmon migrations. For two days in the early fall of 1968, scientists were aboard the vessel trying to determine the cause of intense *Brachyphallus crenatus* infections found in juvenile herring migrating into Auke Bay, Alaska.

The early 1970s marked the end of the *Heron's* time with the Agency as she was sold at auction to a private party. The vessel was reported to have been seen in the late 1990s in Southeast Alaska while she was being operated by a hunting guide. A 2008 online nautical forum member's profile indicated their ownership of the *Heron* in Tacoma, Washington, with plans to restore the vessel for a trip to "Mexico and points south."

Heron photos in the AFSC Multimedia Gallery

Additional Reading

Piloting the Heron through a storm in 1962. Taken from an interview conducted with retired AFSC biologist Jack Helle on 4 November 2011.

Anonymous. 1940. A New Type of Stern Speeds the "*Heron*". Pacific Motor Boat, Nov. 1940. p.29.

Oliver, B. 1998. Ed Monk and the Tradition of Classic Boats. Horsdal & Schubart Publs. Ltd. Victoria, B.C., Canada. 160 p.

"An Amazing Boat"

The following account was taken from a November 2011 interview with retired Auke Bay Laboratories (AFSC) biologist Jack Helle, who gained great admiration for the Heron after piloting her through a heavy storm back in 1962.

"...four of us were going to bring the *Heron* back down from Prince William Sound to Juneau [Alaska]... Dean Frame was the skipper... So we left Prince William Sound, and the weather was decent. We got off...Cape Hinchinbrook [in] the open ocean, and...swells [were] big and all that, but...we weren't in any storms or anything. And I think it was the second of September, so, you know, it shouldn't have been really nasty weather...no storms forecast at all. We got fairly close to Yakutat, and all of a sudden it started to get stormy. And it started really fast. And it got really stormy...Dave Bolton and I were on the wheel. I was driving and Bolton handled the radio and this kind of stuff. And we knew that the storm was...really picking up. It wasn't just going away. And we weren't sure that we could even get into Yakutat, because, you know, the water gets shallow as you approach the coast over there.

I had Dave go down and wake up the skipper and Woody Spence. And he went down there, and he came running back up, and he said, 'I'm not sure if they're...okay'. He said, 'It just smells terrible'. They were down in the bunk – in the lower bunk underneath. The wheelhouse was up here and then it went down here to a bunkhouse down in back. And he said, 'When I opened the door, the fumes in there...were just terrible, and these guys are both out.' And we were getting involved in, I mean, heavy seas. We were getting broached around and the boat was getting hit sideways, and the waves were over the top of us. And so, I said, 'Well, geez, you got to get them out of that room.'

So he got them – he drug them out of bed and got them up the stairs...to the wheelhouse. And they were literally out. I mean, they were just barely conscious... What had happened was, when we first hit the rough water, a can of engine cleaning solvent was in the engine room and fell over, and it wasn't capped... It's really strong stuff...like ether...and they were...just green looking. They were terrible. And so we got them up and they couldn't do a thing... They were starting to recover a little bit when he got them up out of the room...

"An Amazing Boat"

We concentrated on making sure they were going to be okay and comfortable and trying to get them something, but the weather was so rough that we could hardly even navigate and move around in the boat. And between all of that, we kind of weren't sure where we were, even at that point. And then the winds got stronger and stronger and stronger. And it just got to be an awful storm. It was just horrible. And the winds were out of the northeast, and we checked the weather service. The check later on [indicated] that [it] was [an] unpredicted storm, and the winds at Yakutat were over eighty knots. And we got into this thing, and we got blown away from Yakutat... We were trying to do a compass bearing to stay between Yakutat and Icy Strait – someplace so we could make it back, and maybe it wouldn't be so bad down there, closer to land. You know, get a little bit closer to southeast where it's not so big [with] long shallow areas and stuff. And it was so bad that we couldn't do it at all...

Jack Helle retired in 2008 after 49 years of service.

Finally, the only thing I could do...[was] try to quarter into these waves. And then a big wave would come up and it would just broach us right over to the side, go way underneath...just sort of rocking... It was just a mess. It was horrible. And so, I finally realized that...I could not go against the waves. And not only that, but the waves weren't all coming from one direction. It would be coming like this and like this and like this, you know, just humongous swells, and not only that, they had this breaking sea all over the top of them, of course. So every time we got broached over in the trough...the sea would break over the top of us, and we'd just be water everywhere.

And I finally realized the only way that I could keep that boat alive, keep it from sinking, was to have the stern – it was a double-ender – ...facing into the wave. That's the only way that I could do it. So I'd...have to look out the back window, which I could see out, and then steer it so that I'd have the stern...perpendicular to the wave that was coming, but they were coming this way, this way, and this way. And it was huge things, and then the water would break over the top. And so you'd go down, and often, even at that, when you went down, the motor would race... You're going downhill like this into the trough, and...I thought the motor was going to blow up, just racing and whining away. And then you get down to the top and you cut right into the next wave, and it just broaches you over and up you go on. The water's pouring everywhere.

Oh, it was just...nightmarish. And I realized that I was pretty sure that we...were having a lot of trouble, and I realized that we needed to get a mayday out of some sort. So I had Dave get the radio. And we didn't have contact with anybody, and Dave was doing the radio. Finally, I said, 'Well, send out a mayday, just call a mayday out,' and he sent out a mayday, and then we got broached by this huge wave, and it took us down into the...bottom [of the trough], and Dave had the mic[rophone] in his hand, and when he got tossed over on the other side of the wheelhouse,...it broke the mic off of the radio. So, here he had a mic that wasn't attached. Not just the plug out, I mean, it was broken. So he figured out how to short out the wire in the radio with a screwdriver. So he...then put a screwdriver into the wire and he could short it out and he could talk...

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Coast Guard...cutter Balsam was down off of Ketchikan, and they heard the signal. So they talked to us, and I told them our radio is busted and we're having a lot of trouble. I said we were near Yakutat and now we're going with the seas. I have no idea. I told them the direction we were going, which was...mainly west, but southwest. And I said we're headed in this direction and we can't go any other way... I tried to turn around a couple of times and you can't do it, it's too dangerous. And we were barely making it anyway... I had Dave put life jackets on Woody and Dean Frame...and we tied cans of food onto their life jackets and this sort of thing.

And the problem was, we had a life raft on this boat, one of these ones that will, if the boat sinks, it'll pop up, okay? It's a great idea, but the life boat was on the back cabin – on the roof of the cabin behind us... You didn't dare go outside of the wheelhouse, the waves were just pouring over the top. You...[would have] just gotten washed away. There was no way we could get to that lifeboat to get in it... If you got sunk and you're out at sea in the open...you'd never get to the life raft. It was hopeless.

And just when I was looking back – and this one time, the hatch was in the back part of the boat there – ...I noticed...we had just took this huge wave, and it had hit the hatch... It had broke the hatch in the back, and...this square...was wide open to the bilge and the engine room and everything, and it was about ready to go over the deck on the side. We were done if it did that. So I...told Dave, 'we got to get this.' I grabbed a rope, and I tied the rope around my waist, and I said, 'Tie this fast onto something and then hold it, as you can,' and I ran out through...the back door, and got out on the back deck with this rope attached to me. And I had just reached out and it [the hatch] was just about to go over the side, and I got the hatch there – got it in my hand – and I slammed it on the top, and I...told Dave, 'Go down underneath and see if you can make this fast someplace real quick.'

Well, meanwhile, nobody was doing anything in the boat. Those two guys were passed out up on the deck, and we were just being slammed every which way. But I barely got that thing, and we would have been done in the water right then if I hadn't gotten that hatch. And he [Dave] got under there and he was able to fix the hatch. It still had some pieces there you could attach it underneath, and they hadn't broken off totally, so we got the hatch secure.

So then we...started trying to go stern into the waves again...and re-establish contact with the Balsam down there. And they said, 'Don't do anything drastic...just do what you're doing, keep the boat afloat.' He said, 'It sounds to me like that's all you can do right now is to keep the boat from going under.' He said, 'and we've sent an aircraft out'... It's a double-prop...seaplane...an amphibious floatplane.

'We've sent one out to locate you.' And he said, 'We've got you located - on your radio beam, we've got you located on your direction. We know where you are from us. But we've having trouble getting a triangulation from anybody, because nobody from shore has been able to hear your call, and so we can't get a triangle, we don't know where you're at exactly. We know you're on this line, and we've got this airplane going out on this line toward you...'

We had to be really cautious...because we were afraid we would lose [the] radio altogether... They called us back real quick and they said, 'We got a triangulation on you from a tuna clipper that's in Yakutat, and they heard you on their radio, so we know exactly there you are. We got the plane out – headed out towards you.' And he said, 'Don't stay on the radio, just keep in contact once in awhile.' We could receive, but transmitting was the problem. So we could hear them. Finally, the plane [pilot] said...'We're close to you now.' And he said, 'What's the ceiling look like where you're at right now?' And I said, 'It's less than 500 feet, I mean, it's pretty much down here.' And I said, 'The wind has maybe slacked off some, but,' I said, 'it's still chaos out here, it's really something.' And he said, 'Okay...in five minutes you're going to see us break out from under the clouds. We'll be under the clouds and you'll see us.'

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And sure enough, 5 minutes exactly, this big, two-engine plane pops out of the clouds, and it's less than 500 feet out there. And they circle around like this, and as they circle, they're going out of sight into the clouds...and they're talking to us. And they said, '...the tuna clipper that was in Yakutat decided to come out and help you.' And he said, '...they didn't want to navigate it because it was too rough, so they turned around and tried to go back to Yakutat.' He said, 'They couldn't go to Yakutat because it was too rough, so now they're out coming toward you.' And he said, 'We've got you on a collision course with this big tuna clipper.' I think it was a 180-foot vessel or some sort...

And, of course, then it was dark, pitch dark there... And he said, 'They'll have lights on the top of their masts.' We had lights, but our mast didn't go up very [high]. It wasn't much to speak of... He said, '...you'll be having radio contact with them shortly...because they're coming out to you...' 'It's getting too dark now,' he said. 'We need to head back, because we need to have visual contact with you...and we're not going to have it any more.' So they left us. And what they didn't tell us – and I found [out] later...in Yakutat, because the crew of that plane was there – was that they had a huge life raft in there [the plane] that they could have dumped out the door to us and had it inflate when it hit the water. Now that might have done some good. But he said, 'I didn't tell you that, because,' he said, 'at that time, it looked like you had the boat somewhat stabilized.' And he said, 'I didn't want you jumping off the boat into a life raft...and who knows if that would have worked or not.' So he said, 'I didn't tell you that we had that onboard. Plus we had the tuna clipper coming toward you...'

So...in the pitch night...the tuna clipper said, 'We got you on our radar and we can see you now... You'll probably be able to see our mast occasionally.' And, of course, the waves were, well, I don't know, they [the swells] were probably...30, 40, 50 feet, you know – huge things. And...we saw this little light way off in the distance and then it would disappear. And then it would come up a little bit and disappear. So that had to be it [the tuna clipper], of course.

And so they came up to us and they circled around us... And the wind had died down some, but it was still tough winds – huge seas still. He said, 'We think the best thing to do is to try to go back to Yakutat.' And I said, 'Where the hell are we, anyway?' He said, 'You are 80 miles from Yakutat. You guys got blown 80 miles off shore.' And he said, '...I want you to turn around. I'm going to give you the compass course for Yakutat, and I'm going to go ahead of you.'... We had an 'iron mic', what they call the automatic steering. That didn't work as soon as you left the inside waters. That never worked, so we

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didn't [have automatic steering]. It [the boat] had to be hand steered all the time.

So he said, 'I'll give you the compass course... Also, you'll be able to see my back light when we go above the swells.' He said, 'You'll be able to see that light to make sure you're on course.' And he said, 'We'll stay at a speed just to make sure that we're ahead of you aways so we don't collide or anything like that.' You don't dare, I mean, you didn't dare get close to each other out there – the violence of the waves... And, of course, they knew that. They stayed their distance, you know, never got too close. So anyway, by then I realized that we could make it if we got turned around. And actually, the plane did stay above... That's right. He said, 'I'll stay with you until you get turned around – make sure you're stable.' And so...we got turned around when the plane was there, before the tuna clipper showed up... He got us turned around and on the compass course to go collision with the tuna clipper... Then he said, 'You have the lead.' He made sure that we were able to negotiate going back again...but it was still tremendous. Just still awful out there... It was just terrible... It was just was nightmarish...

You know...it's amazing what happens to you when you have a near-death experience. You know, people think that you...just sort of lose it, and, you know, you just sort of go all 'bazoo', and it's actually the opposite of that. It's completely opposite. Both Dave and I were the same. We knew that we weren't going to make this. We knew that that was it. And all I could think about was...I was never going to see...my wife and daughter any more. And, Dave was talking about his parents... Very, very calm [attitude]... We weren't, you know, we weren't – it wasn't – it was very, very calm. In fact, abnormally calm.

And so...we finally...followed that tuna clipper. We got stabilized and everything, and after what – I don't remember – 38 hours or something like that, I never left the wheel except to go back with the rope and get on the hatch. I was on the wheel all that time. And we got close to Yakutat and then finally got into Yakutat. And the aircraft crew was there, along with the tuna clipper crew, and they were telling us...that they...just tried to turn around. They couldn't get turned around. So...the Coast Guard guy, the captain, he said, 'Who was I talking to to start with out there on the radio?'... And I said, 'Well, I started talking to you when you came on,' and then I said, 'Dave handled most of it when [he] had to short out the mic with a screwdriver.' And he said, 'The thing that unnerved us up in the airplane was that how calm that you and Dave were.' He said, 'My God...for what you guys were going through...what in the world?" And I said, 'Well, I can't explain it, either.' I said, 'We didn't think we were going to make it, you know, so we were pretty sure it was over with.' And, in fact, I had my camera – that Canon 16 range-finder camera sitting up there on the thing. I never took one picture, because what's the point? It's going to go down with the ship. What's the point of taking any pictures?... But, I didn't have time anyway, because I had my hands full with the boat...

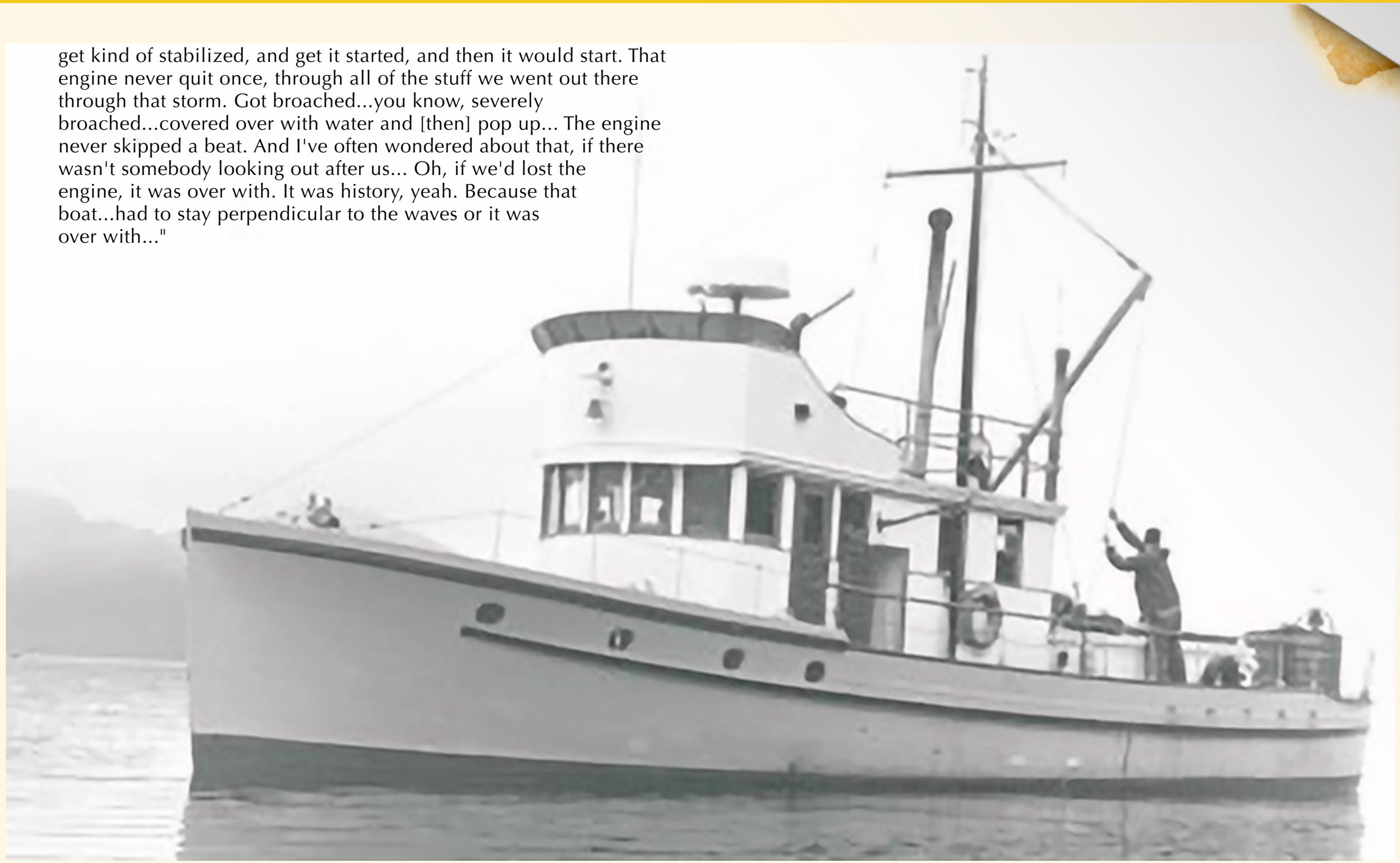
I've had a couple of other experiences like that with airplane stuff that was nothing like this. This was unbelievable...

The other thing on this *Heron* episode... They made me...write it up [an incident report]... And they also gave me a nice award. A Special Act Award for taking command of the ship...and bringing it to safety, and etc., and all of that... Let's see, I think I've got it written up here... A Special Act Award [May 3, 1963] from the Department of Interior, Fish and Wildlife Service, for [Assuming command of the R/V *Heron* and manning the wheel for 30 hours and assisted by seasonal biologist David Bolton navigated the vessel to Yakutat when the vessel's Master and a crewman were incapacitated in an accident during an unpredicted very severe storm in the Gulf of Alaska, September 5-8, 1962.]...

It was really something..but, boy, that boat was an amazing boat. And sometimes you wonder if something else isn't going on, because when we took that boat from Juneau up there, we were having trouble with the engine... When we'd get out in the swells, it would move the oil over to one side of the engine, kinda, and it [the engine] would quit. And then you'd have to get back. You'd have to

"An Amazing Boat"

get kind of stabilized, and get it started, and then it would start. That engine never quit once, through all of the stuff we went out there through that storm. Got broached...you know, severely broached...covered over with water and [then] pop up... The engine never skipped a beat. And I've often wondered about that, if there wasn't somebody looking out after us... Oh, if we'd lost the engine, it was over with. It was history, yeah. Because that boat...had to stay perpendicular to the waves or it was over with..."



Brown Bear, Grizzly Bear, and Black Bear Boats

Brown Bear, *Grizzly Bear* and *Black Bear* - "Bear" Boats

Several boats designed by the noted naval architect Harold Cornelius Hanson (Seattle, Washington) were constructed initially for the federal Alaska Game Commission in 1934. These vessels included the *Red Fox, White Fox, Black Fox* and the 30-foot *Cross Fox*. In addition were the three "bear" boats described here, which eventually went to the Fish and Wildlife Service (FWS).

The *Brown Bear*, 1941-49, 1965-?

Brown Bear Details			
Year built	1934	Cruising range	4,000-5,400 miles
Location built	Winslow, WA	Average speed	8.5 knots
Builder	Winslow Marine Railway& Shipbuilding Co.	Original engine	twin 200 hp Washington diesels (Wash. Iron Works)
Designer	H. C. Hanson	Disposition	unknown
Other names/id	YP-197 (USCG, WWII), *Baja Explorador* (post-NOAA), #980667 (USCG ID)	Fisheries service	1941-49 (FWS) 1965-72 (BCF, NMFS)
Length	114'	Known skippers	John O. Sellevold (1937-41)
Breadth	27'		Ian ? (1951)
Draft	13'		? Princehouse (1960s)
Tonnage	300 tons gross		

Situated at Eagle Harbor on Bainbridge Island, just across Puget Sound from Seattle, was the Winslow Marine Railway & Shipbuilding yard. It had been established in 1903 as part of the Hall brothers' boat building business originally located on the island nearby at Port Blakely. Since shipbuilding jobs were a vital source of employment and economic benefit to the small island community, any new boat building contracts were well received. This was especially true for the construction of the 114-foot *Brown Bear* in 1934, at the time when the U.S. was recovering from the Great Depression.

The $125,000 cost for building the wooden-hulled *Brown Bear* was funded by the U.S. Government's Works Progress Administration. The vessel, which took 6 months to build, was designed specifically for biological research work.

The *Brown Bear* was constructed for both the Alaska Game Commission (AGC) and the U.S. Bureau of Biological Survey (BBS). The launching of the vessel on 7 November 1934 was witnessed by a large number of guests who had traveled across the Sound from Seattle aboard the Kitsap County Transportation Company's steamer *Manitou*.

The vessel's heavy sawn-fir-frame type hull was sheathed in ironbark. She was designed with a flush deck, with a long forward deck suitable for working in Arctic ice. A hatch in the aft deck led to a 100-ton cargo storage hold. Spacious living space with sleeping accommodations for 16 men was provided from her three separate deck levels. Aft of the upper deckhouse was an 18-foot tender powered with a 10-horsepower Kermath engine.

In 1936, sea otters were surveyed for the first time around the Aleutian Islands using the *Brown Bear*. It was discovered that the valuable herd, which was feared to be going extinct, was in fact increasing in numbers and expanding their range. Cruises such as

Brown Bear, Grizzly Bear, and Black Bear Boats

this also provided the opportunity to report any sightings of foreign fishing activities being conducted in Alaska waters.

The BBS biologist Olaus Murie made use of the *Brown Bear* from 1936-38 during his investigations of resources native to all the Aleutian Islands and other areas around the Alaska Peninsula and Bering Sea. During these expeditions he was accompanied by other scientists form the AGC and BBS. The vessel was skippered by John Sellevold, a veteran seaman.

During his intensive study of Alaska's fisheries and marine mammals in connection with the BBS, Dr. Carl L. Hubbs (Curator of Fishes at the University of Michigan) was transported in 1939 aboard the *Brown Bear* to the Pribilof Islands, Unalaska, and later in September to Seattle. In 1940, after the Aleutian Islands Reservation was renamed the Aleutian Islands National Wildlife Refuge, the *Brown Bear* was assigned to protect game at the refuge and patrolled the Aleutians throughout the year.

By 1941, the vessel had been transferred to the recently formed Fish and Wildlife Service (FWS). At this time the U.S. government was exploring the means of propagating the sea otter in Alaska, which involved the *Brown Bear* making trips to the Aleutian chain as far as Attu Island.

Shortly thereafter, she was turned over to the U.S. Navy for use during World War II. She was then acquired by the U.S. Coast Guard on 5 January 1942, and designated as the yard patrol boat YP-197. At this time she was equipped with a T-106 radio transmitter, RC receiver, and a boom and derrick. The YP-197 was used by the Coast Guard as a transport ship to carry personnel and freight in Puget Sound and the San Juan Islands to the north. On 2 November 1945, the vessel rejoined the Navy briefly before returning to the FWS.

In 1946, the *Brown Bear* narrowly escaped destruction while docked at the north end of Lake Union in Seattle scorched by a large fire that gutted the FWS warehouse at the pier, resulting in nearly $100,000 in damage and loss of contents within.

The *Brown Bear* at Lake Union, Seattle, Washington, ca. 1941. Photo print provided by V. Lundquist (AFSC). Photographer unknown.

Frankie and Normie

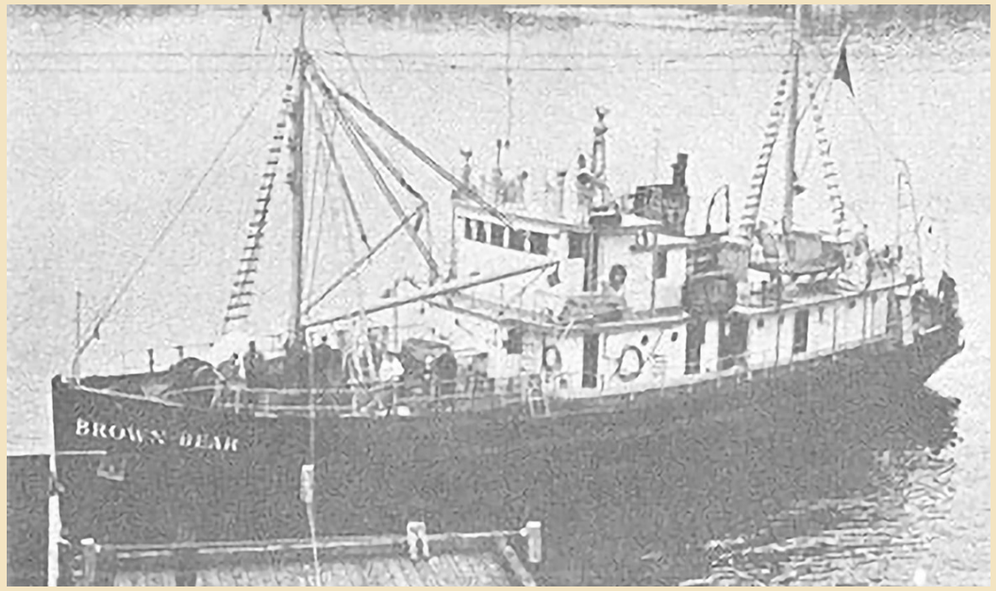
The 18 December 1936 edition of the "Schenectady Gazette" reported on the *Brown Bear's* unlikely mascots: Frankie, a 4-month-old bald eagle purchased in the Aleutians by U.S. Bureau of Biological Survey crew members from an Eskimo boy for a dollar, and Normie, a 3-month-old seagull who would only bathe in fresh water. The birds were close friends and became quite the tourist attraction while the ship was docked in Seattle – Normie perching proudly atop Frankie's back.

Brown Bear, Grizzly Bear, and Black Bear Boats

The following year, the *Brown Bear* left Seattle on 3 April for southeastern Alaska with passengers who worked the downstream pink salmon fry counting weir at the FWS Little Port Walter field station. The vessel then served as a base of operations for the spring stream surveys headed by FWS biologist Samuel J. Hutchinson. During this work, outboard-powered skiffs were used for ship-to-shore transport. In early May 1947 the survey ended and the staff were transferred to the FWS vessel *Brant* to conduct additional surveys in the Ketchikan, Alaska, district, while the *Brown Bear* returned to Seattle with Mr. Hutchinson. By the end of the decade, the *Brown Bear* was making regular runs to and from Bristol Bay with supplies before being relieved around 1950 by the FWS's newly acquired transport vessel *Dennis Winn*.

For 6 months in 1950-51, the *Brown Bear* was sailing in severe weather at the Aleutian Islands while her crew were investigating an intestinal parasite that was killing infected sea otters. Upon her return to Juneau, Alaska, in May 1951, the vessel was again requisitioned by the U.S. Navy and by the summer of 1952 she had been acquired by the University of Washington's (UW) Department of Oceanography. For the next several years, the converted coastal freighter was used by the UW for various research projects in Alaska, off the coasts of Washington and Oregon, and in parts of the Columbia River – often in cooperation with boats from other agencies:

- An oceanographic reconnaissance to study the estuarine circulation of the deep-water Silver Bay fjord estuary near Sitka, Alaska – conducted with four other vessels including the USFWS *Skipjack* and *Teal* (1956, 1957)
- A longitudinal profile survey (bathymetry, bottom sampling, chemical/physical studies of the water, etc.) as far north as the Bering Strait, with ships from both the Scripps Institution of Oceanography (U.S.) and Canada (summer 1958)
- An oceanographic exploration as part of an international project to study the Pacific Ocean including the Aleutian Trench – equipped with 31,000 feet of wire rope and various sampling gear to make soundings as deep as 20,000 feet (summer 1957)



The *Brown Bear*. 1963 U.S. Naval Oceanographic Office publication photo.*

The *Brown Bear* in front of Taku Glacier, Alaska, August 1935. Archival photo by Steve Nicklas, NGS/RSD. NOAA Photo Library.

Brown Bear, Grizzly Bear, and Black Bear Boats

- A comprehensive study of the Chukchi Sea conducted jointly with the USFWS Bureau of Commercial Fisheries (BCF) vessel, *John N. Cobb* (1959, 1960). Sea bird observations were also made aboard the *Brown Bear* during the 1960 cruise
- Four cruises made off the Washington and Oregon coasts to collect physical, biological and chemical data in connection with studying the properties of the Columbia River effluent water (January to August 1965)

Operation of the vessel was eventually returned to the Agency (USFWS/BCF) sometime in the later 1960s. She became a "house boat" and was used for saltwater salmon rearing experiments while stationed at the NOAA Manchester Biological Field Station in in Puget Sound near Bremerton. The *Brown Bear* served as a floating laboratory and hatchery, equipped with tanks and trays for marine sampling. The boat had superb facilities for studying water chemistry, which allowed fresh and salt water to be circulated and modified by temperature, filtration, aeration, and ultraviolet sterilization. In 1972, a portable floating laboratory was obtained to replace the *Brown Bear*.

In a 2014 email, maritime hobby-historian George Schneider (California) shared his knowledge of the vessel's post-NOAA history:

"I next saw her in 1990, and she had been sold for excursion work [and dive chartering] in the waters around Baja California and named Baja Explorador. When that project was over, she returned to Los Angeles and was sold to American owners and renamed Brown Bear, documented with the Official Number 980667 in 1992. I don't believe she ever sailed again, with her various owners being Michael Brittain of Seward, AK, then Alaska Oceanographic Society, Anderson Tug & Barge Co., and eventually R/V Brown Bear Inc. of Seward. By 1994 she had been moved to San Diego Harbor's free anchorage, where she sank from neglect in August. In 1995 I noted that she appeared to be broken in half, but in January 1998 The San Diego Log reported she had been raised, towed to sea, and scuttled off San Diego."

The *Brown Bear* Auke Bay Laboratories photo.

***Brown Bear* photos in the AFSC Multimedia Gallery**

Additional Information

Anonymous. 1934. Queen of New Alaska Game Dept. Fleet. Pacific Motor Boat, Feb. 1934. p.12.

Jones, N. 1935. New Alaska Game Commission Fleet. Pacific Motor Boat, Jan. 1935. p.17-20. (details of furnishings, with interior photos).

Anonymous. 1934. The Launching of the "Bears". Pacific Motor Boat, Dec. 1934.

Capurro, R. A., A. M. Bargeski, and W. H. Myers (compilers). Oceanographic Vessels of the World; a Joint Publication of IGY World Data Center A for Oceanography and the National Oceanographic Data Center. Publication info Wash., D.C. Printed by U.S. Navy Hydrographic Office, 1961-1966. Physical descrip. 3 v. (loose-leaf) illus. 29 cm. General Note Vol. 2-3 printed by the Hydrographic Office under its later name: U.S. Naval Oceanographic Office.

The *Grizzly Bear*, 1942 - 1965

Grizzly Bear Details			
Year built	1934	Engines	90 hp Washington diesel, 1960: 160 bhp Gray Marine, G.M. diesel 671
Location built	Seattle WA	Speed	9 knots (avg.)
Builder	Schertzer Boat & Mach. Wks	Range	700 nautical miles
Designer	H. C. Hanson	Fisheries service	1942-54 (FWS), 1956-64 (USFWS)
Other names/id	FWS 1900, #583647 (USCG ID)	Known skippers	Sandy Matson (ca. 1948-53)
Length	58'		Cletus Groves (1955)
Breadth	14'		Arthur H. Kassner (1950s)
Draft	6.2'-9.6'		Karl Alstead (until 1967)
Tonnage	45 gross, 31 net	Disposition	transferred to ADFG

The 58-foot wooden cabin cruiser *Grizzly Bear* provided many years of valuable service for both the Alaska Game Commission and, beginning in 1944, with the Fish and Wildlife Service, where she was also identified as the FWS 1900.

The *Grizzly Bear* was launched on 10 November 1934. Other than the oak beams and ironbark sheathing, she was built with fir

The FWS vessel *Grizzly Bear*, FWS 1900. Auke Bay Laboratories photo.

throughout. Her engine was a 4-cycle 90-horsepower Washington diesel, which was later replaced in 1960 with a new 160 bhp Gray Marine, G.M. diesel 671.

Located in the AGC vessel's deckhouse were the pilothouse, captain's stateroom, galley and messroom. Accommodations for four men were below deck. The wireless radio room and combined warden's stateroom/office were aft of the engine room. A York ice machine was situated in the engine room which contained an oil-burning heater, providing piped hot water to all crew quarters. On the aft deck was carried a Tregoning tender.

In July 1941, the *Grizzly Bear* was used to transport naturalist and author, Stanley G. Jewett, during his trip through Southeast Alaska in which he studied birds and collected specimens. Around 1942-43

the boat was transferred to the Fish and Wildlife Service and given the added "FWS 1900" designation.

Note: Known sources conflict as to when the FWS actually acquired the *Grizzly Bear*. "Merchant Vessels of the U.S. 1943" (U.S. Bureau of Customs) lists the boat being with the AGC, however, a FWS "Official Log (St. Paul) Funter, Alaska, 1942" makes reference to the "FWS 1900 (*Grizzly Bear)* for 19 October 1942.

Several years later the *Grizzly Bear* and three search planes were dispatched to Admiralty Island in Southeast Alaska to rescue FWS biologist, Robert Meeks, who was the lone survivor of a twin-engine Grumman Goose plane crash on 1 September 1954. The incident claimed the lives of five FWS employees, including the Assistant Fisheries Administrator for Alaska, George B. Kelez.

The *Grizzly Bear* at the Little Port Walter facility in Alaska. Auke Bay Laboratories photo.

In 1965, the Alaska Department of Fish and Game (ADFG) acquired the *Grizzly Bear* from the U.S. Fish and Wildlife Service. The ADFG noted that the boat performed well in the inside waters of Alaska, however, sailing in heavy seas created wet and unsafe conditions on deck and difficulty in securing loads from washing overboard.

The *Grizzly Bear* was stationed at Ketchikan, Alaska, in 1973, when the ADFG believed her deteriorated condition warranted a newer and larger replacement. In June 1976, she was auctioned by the State of Alaska at Juneau. The most recent reference to the *Grizzly Bear* is a U.S. Coast Guard vessel documentation issued in December 2006.

The *Black Bear*, 1944 - ?

Black Bear Details			
Year built	1934	Draft	5'
Location built	unknown	Engines	125 hp diesel
Builder	unknown	Speed	10 knots
Designer	H. C. Hanson	Known skippers	Doyle Cissney (1952)
Other names/id	FWS 7501 ?	Known service	1944-57
Length	48'	Disposition	unknown
Breadth	12.6'		

Brown Bear, Grizzly Bear, and Black Bear Boats

Little is known about the *Black Bear* (FWS-7501?). Launched in the fall of 1934, it appears she was acquired by the FWS around 1944.

The double-ender was the smallest of the three "bear" boats, measuring 48 feet in length. She was designed with a flush deck with the pilot house sinking into the deck about one foot aft. Her backbone was built of fir while the stem and stern were of hardwood.

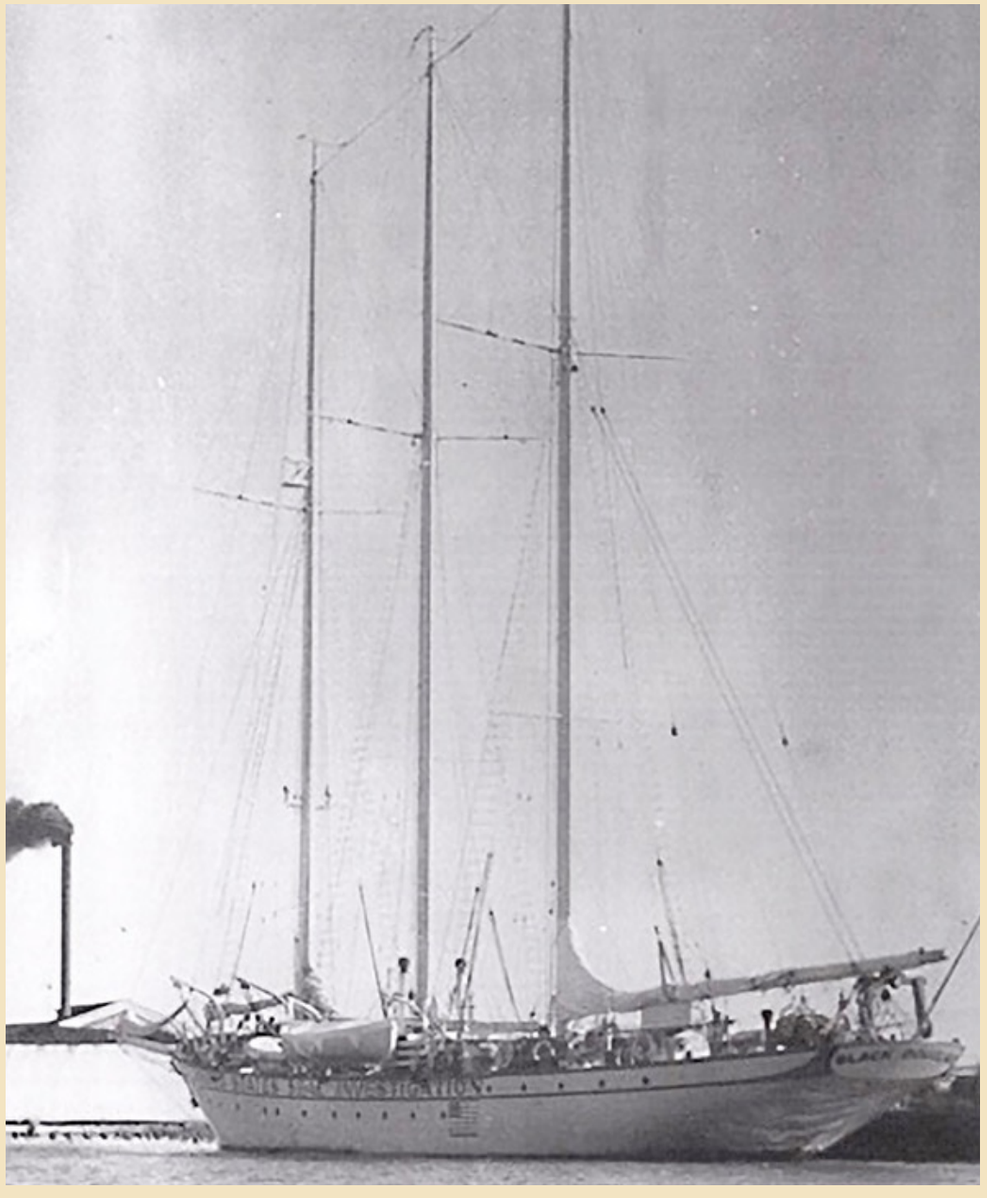
In the spring of 1957, the operation of the *Black Bear* was turned over to FWS staff biologist Dr. Norman Wilimovsky, of the Alaska Commercial Fisheries Research Group, for use with his program. In preparation the boat underwent major renovating and remodeling, which included the installation of a new engine, winches, and electronic gear.

The *Black Bear*. Photo provided by Auke Bay Laboratories (AFSC)

Black Douglas, Fur Seal Research Vessel

Black Douglas Details			
Year built	1930	Length	116'-170' (sources vary)
Location built	Bath, ME	Breadth	32'
Builder	Bath Iron Works	Draft	12'
Designer	H. J. Gielow & Co.	Tonnage	360-371 tons
Other names/id	IX-55(Navy, 1942)	Original Engines	twin 325 hp Cooper Bessemer auxiliary diesels
	FWS-1105 (1941-42)	Average Speed	9.5 knots
	PYc-45 (Navy, 1943)	Cruising Range	5,000 miles
	te Quest (1972-82)	Fisheries service	1944-49 (Alaska)
	Aquarius, Aquarius W (1982-)	Disposition	sold in 1966
	El Boughaz I(2005-)		

On 9 June 1930, the *Black Douglas* was launched in Bath, Maine, as one of the largest steel-hulled schooners ever built. She was constructed by the Bath Iron Works (est. 1826) as a private 3-masted schooner yacht for Mr. & Mrs. Robert C. Roebling – Robert being the grandson of John A. Roebling, famed builder of the New York Brooklyn Bridge, Niagara Suspension Bridge, and the Cincinnati-Covington Bridge.



The *Black Douglas* leaving Savannah for Seattle on 29 October 1941.
Photo from Skidaway Institute of Oceanography website, courtesy of W.R. Roebling.

Black Douglas

The ship's 120-foot Douglas fir masts supported 9,111 square feet of sails that propelled the vessel. Auxiliary power was provided by twin 325-horsepower Cooper Bessemer diesel engines. These were later replaced with a 400-horsepower Enterprise diesel and then again with two Volvo diesel engines with twin shafts. The vessel was originally to be named *Grenadier*, but Mr. Roebling was persuaded by the Bath boatyard foreman to go with *Black Douglas*, after the famous Scottish knight. On her bow was placed a carved wooden figurehead of the knight.

The Roeblings and their friends sailed the *Black Douglas* on a maiden voyage through the Straits of Magellan at the southern tip of South America. In 1936, the family purchased the Modena Plantation on the north end of Skidaway Island, off the coast of Georgia. They then moved there from Trenton, New Jersey, and lived aboard the *Black Douglas* while the farm and living structures were being built onshore.

In September 1941, the Fish and Wildlife Service (FWS) purchased the ship following a special 30 June Congressional appropriation of $290,000 to begin the North Pacific fur seal investigation work. The *Black Douglas* was reconditioned in preparation for the work at Mingledorff's shipyard in Savannah, Georgia.

The vessel, having been converted into a floating biological laboratory for seal research, set sail on 29 October 1941 for Seattle, Washington. Some sources suggest that the large lettering "UNITED STATES SEAL INVESTIGATION" was painted on her sides to help deter submarine attacks in the Atlantic and Caribbean waters during World War II. Two months later, the 7 December bombing of Pearl Harbor brought the U.S. into the war. It is reported that while en route to Seattle, the *Black Douglas* was fired upon by an enemy submarine off the Oregon coast and manage to escape by cutting her engine and blacking out.

Upon reaching Seattle, the ship requisitioned by the U.S. Navy, who then removed her figurehead and sailing gear (masts, spar, tackle, rigging, etc.). Four .50 caliber machine guns and sonar equipment were installed for military duty and on 18 April 1942, the U.S.S. *Black Douglas* was placed into service classified as the Miscellaneous Unclassified Auxiliary, IX-55. On 8 April 1943 she was reclassified as the coastal patrol yacht PYc-45 and commissioned on 19 April. That year, her engine was replaced with twin 450-horsepower Volvos connected to a single shaft. During the war, she patrolled the waters near Neah Bay off the Washington coast. After the war, the vessel was decommissioned at the Puget Sound Navy Yard on 20 September 1944.

As the *Aquarius* after her restoration in Germany, ca. 1990. Photo courtesy of W.R. Roebling, photographer.

Black Douglas

She was removed from the Navy Register and returned to the Fish and Wildlife Service on 4 October 1944. At last the FWS had the *Black Douglas* available for its North Pacific fur seal project, however, two and a half years passed before the cruises actually began. During this time, the renovations and refitting were being made in Seattle to once again outfit the ship for the task at hand.

On 16 May 1947, the *Black Douglas* finally sailed northbound to begin the long-awaited studies of the Alaska fur seal herd. Headed by Dr. Victor Scheffer of the FWS, the work entailed tagging the seals and studying their feeding habits at the Pribilof Islands breeding grounds in the Bering Sea.

The *Black Douglas* followed the fur seal herd to ascertain alleged poaching threats and the seals' migratory routes both to and from the Pribilof Islands. During the cruises, the crew also had the opportunity to study other marine mammals that potentially prey upon the young fur seals. That first year of the project, mechanical troubles prevented the vessel from trailing the seal herd further west than Attu Island at the end of the Aleutian chain. On 12 August, she returned to Seattle.

On 2 November 1948, the *Black Douglas* again sailed from Seattle north to the Pribilofs and Aleutian Islands to continue the fur seal study. The ship pursued the herd south as far as southern California to locate the wintering grounds before returning to port in late December. During the several 1947-49 cruises made from Alaska to California, almost 4 million seals were followed. These voyages also provided the opportunity to collect information by observing albatrosses at sea.

The captain and crew of the *Black Douglas* received commendations from the Secretary of the Interior as a result of their night rescue of 18 survivors from the Panamanian lumber ship *Salina Cruz*, which burned on 17 October 1949, about 100 miles off the coast of Oregon. Fortunately, the survivors, suffering from exposure, had been spotted in two lifeboats by Coast Guard planes.

The *Black Douglas* in San Diego with her masts and sailing gear removed, 1962. Archival photo by Mr. Steve Nicklas, NGS/RSD. NOAA Photo Library.

The *Black Douglas*' service in Alaska turned out to be short, however. Following the fur seal cruises in 1949, the vessel was moored at Treasure Island (San Francisco, California), used by the FWS to collect oceanographic data concerning currents and chemical/biological water characteristics. Late in 1949, the *Black Douglas* was reconditioned for oceanographic work and was relocated at La Jolla, California, near San Diego. Renovations included the installation of bathythermograph and plankton winches, and an overboard work platform. A wet laboratory was created from a portion of the galley.

From 1949-65, the *Black Douglas* was assigned to the Scripps Institution of Oceanography and Southwest Fisheries, and the California Department of Fish and Game for use in oceanographic cruises made between Oregon and Mexico. In 1949, the vessel and

three other ships were involved in a coast-wide ocean pilchard research program. Other studies involved:

- sardine spawning patterns off southern California and Baja California (Jan.-Feb. 1951)
- vertical distribution of southern California jack mackerel fish larvae (Apr. 1955)
- detailed physical and chemical hydrographic observations, and southern California egg and larval collections of sardine and other ecologically associated species, such as mackerel and anchovy (1956)
- nightly plankton and temperature collections from areas frequented by the sardine fleet out of San Pedro, California (Oct.-Dec. 1957)

In 1965 the FWS descendant fisheries agency, Bureau of Commercial Fisheries (est. 1956), replaced the *Black Douglas* at La Jolla with the newly built research vessel *David Starr Jordan*. Bidding opened on 18 July 1966, for the auctioning of the *Black Douglas*. She was sold to Louis Black, a treasure hunter who used her to search for the sunken Spanish galleon *Atocha*.

The vessel was then sold in 1972 to the George Stoll family, owners of the Flint preparatory school in Sarasota, Florida. Since the ship was now showing severe wear from the many years of intensive use, she was fully remodeled, given new masts and renamed the *teQuest*. The revived vessel partnered with another Flint boat, the *TeVega*, to visit various locations throughout Europe and the Mediterranean as a training ship for students learning to sail.

The Flint school was eventually disbanded in 1982 and the *teQuest* was sold to an investment group. The ship was brought to Germany, where, at a cost of $4 million, she was extensively restored as a luxury schooner at the Abeking and Rasmussen shipyard, and renamed *Aquarius*. During the 9 June 1996 weekend, the *Aquarius* (*Black Douglas*) returned to Skidaway Island for the first time in 55 years to celebrate her homecoming and 66th birthday. She also attended the Centennial Olympic Games which was being held at that time in Georgia.

In May 2003, the *Aquarius* was in Nice, France, under British registry, carrying a $1-2 million "historical" premium, and being offered for sale at a price of $6-7 million. She had additional maintenance and refitting work done in 2005 as a sailing yacht under the name *El Boughaz I*. Photos and references of the vessel found on the Internet dated as recently as 2009 showed her based out of France, apparently owned by King Mohammed VI of Morocco.

***Black Douglas* photos in the AFSC Multimedia Gallery**

Additional Reading

- *Black Douglas* photos. Skidaway Institute of Oceanography.
- History of the Flint School's Ships: *TeVega* & *teQuest* (photos). Flint School e-Museum website
- Skidaway's Documentation (photos). Flint School e-Museum website
- Roebling (family) History. Skidaway Institute of Oceanography.

Swan II, Fish and Wildlife Service Boat - Originally the Alaska Game Commission vessel *Seal*

Swan II Details			
Year built	1926	Length	66' (sources vary)
Location built	Seattle, WA	Breadth	15.5'
Builder	H.C. Hanson & Coolidge	Draft	8.8'
Designer	H.C. Hanson & Coolidge	Original power	135 hp, Eastern Standard diesel engine
Other names/id	*Seal* (1926-38 AGC, 1971-)	Known skippers	K.C. Talmadge (AGC)
	Bear (1939-41 AGC)		Roy Lindsley (FWS)
	Nunatak II (1955-68)		Leon Vincent (NPS)
	#535277 (USCG ID)	Known FWS service	1942-46

Constructed in Seattle, WA, in 1926 as the MV *Seal*, this 66-foot seaworthy vessel of H.C. Hanson & Coolidge design was most likely the first boat built for the newly formed Alaska Game Commission (AGC). She was powered by a 135-horsepower Eastern Standard diesel engine and carried a typical compliment of five crewmen and a game warden. Captained by Tom Smith, the *Seal* first arrived in Southeast Alaska in March 1927.

The National Park Service boat *Nunatak II* shown in 1967. Glacier Bay National Park and Reserve Collection photo (cropped).

Swan II

Her seasonal duties included patrolling for the illegal taking of fur-bearing land animals around the Aleutian Islands, Alaska Peninsula, Kodiak region, Bristol Bay, lower Cook Inlet and, at times, Prince William Sound. She was normally stationed in southeastern Alaska during winter months.

Two interesting events involving the *Seal* occurred in 1937. First, in September she won an unofficial race from Seward to Valdez against another AGC boat, the *Brown Bear*. Then, 2 months later, the *Seal's* crew rescued four survivors from the stranded vessel *Caroline*. The crew had managed to escape to shore 4 days prior to the rescue.

The National Park Service boat *Nunatak II* -- formerly the FWS boat *Swan II*, and AGC boat *Seal*. Glacier Bay National Park and Reserve Collection photo (cropped).

The *Seal* underwent a brief name change in February 1939, when she became the *Bear*. By 1942 the vessel had moved to the Fish and Wildlife Service (FWS) and was renamed the *Swan II*. The original *Swan* had served the Bureau of Fisheries in Alaska from 1918-24. Skippered by Roy Lindsley, the *Swan II* is known to have been part of the FWS fleet up to 1946.

Under FWS ownership, the *Swan II* served as a mother ship, and was involved in the transplanting of deer and marten to areas such as Yakutat and Kodiak Islands. The process entailed using small dogs to chase the deer off the islands where speedboats with outboard motors would then capture them while they swam and put them in crates for the sailing. The marten transported by the *Swan II* had originally been captured by native inhabitants along the Southeast Alaska mainland coast.

By 1949, the *Swan II* had been transferred to the Bureau of Mines (BOM), who used her as a project supply boat. A photograph record description indicates she was at Juneau, Alaska, in December of 1952. Earlier that year the *Swan II* had served as a base for a BOM field party conducting studies of radioactive deposits in Southeast Alaska.

Yet another move took place in 1955, when the *Swan II* was acquired from the BOM by the National Park Service (NPS) and renamed the MV *Nunatak II* to replace their smaller 50-foot boat, the MV *Nunatak*. Based in Bartlett Cove just west of Juneau, the *Nunatak II* served as a combination NPS patrol boat and ranger station and was instrumental in the development of the installation there. In 1962, the NPS moved the vessel's base to their administrative site at Indian Point 15 miles north of Juneau, where she was used less for patrol and more for resupply and logistical support of science at Glacier Bay National Monument. One research source indicates the *Nunutak II* had once served as a "territorial mail and supply ship serving Juneau to Glacier Bay and all the little villages and towns along the way." In 1968, the NPS replaced the *Nunutak II* with the MV *Nunatak III*.

Swan II

The *Nunutak II* was at Glacier Bay National Park in 1971 when she was sold by auction to her first private owners, Tom and Dorothy Osborne. The Osbornes restored the boat's name to the original *Seal*. They lived and fished aboard the *Seal* until 1995, when the boat was sold.

Having been abandoned and in poor shape (motor stripped and no wiring or running water) the *Seal* was acquired in 2004 by R. J. Peterson. In a 2008 Wooden Boat magazine article, Mr. Peterson indicated his approach to restoring the boat emphasized the use of traditional materials and methods, such as "caulked decks, oakum, cotton, pine pitch, and tar". Since 2004, the wheelhouse has been completely rebuilt, with teak and African mahogany used to restore the curved pocket windows. The 2013-updated WoodenBoat.com register lists the *Seal* powered by a 400-horsepower Cummins DA 220 engine. As of 2016, Mr. Peterson was passionately continuing the restoration work.

Additional Reading and Photos

- MV *SEAL* website - restoration photos

FWS boat *Swan II*. Glacier Bay National Park and Reserve Collection photo.

Reconstruction Finance Corporation (RFC) Exploratory Fishing Fleet Vessel

In response to a 1945 suggestion by the War Food Administration, four exploratory fishing vessels were constructed to help determine the potential for harvesting new marine resources. The goal was to overcome the wartime shortage of meat protein and expand the knowledge of the crab and fish resources identified by the 1940-41 Fish and Wildlife Service's (FWS) Alaska king crab explorations conducted with chartered boats.

The new 100-foot steel-seiners, *Washington, Oregon, Alaska,* and *California* were designed by naval architect H. C. Hanson and built – averaging $250,000 each – for the RFC, an independent government corporation. In addition, conversions were made to the 410-foot *Pacific Explorer* to serve as a cargo/factory mother ship. All work ($4,750,000) was funded by the RFC and managed by the Pacific Exploration Company (PEC). After completion, the PEC leased and operated the fleet from the RFC for $50,000 per year and 55% of the profit. As part of the agreement, FWS agents were accommodated aboard the boats during cruises to observe operations and conduct research.

The *Washington*. Northwest Fisheries Science Center photo.

It wasn't long before the *Washington, Oregon*, and *Alaska* were acquired by the FWS. Little is known about the *California*, other than hearing that she was used in the early 1970s as a tuna seiner out of San Pedro, California -- then later towed to Seattle in the early 1990s and resold.

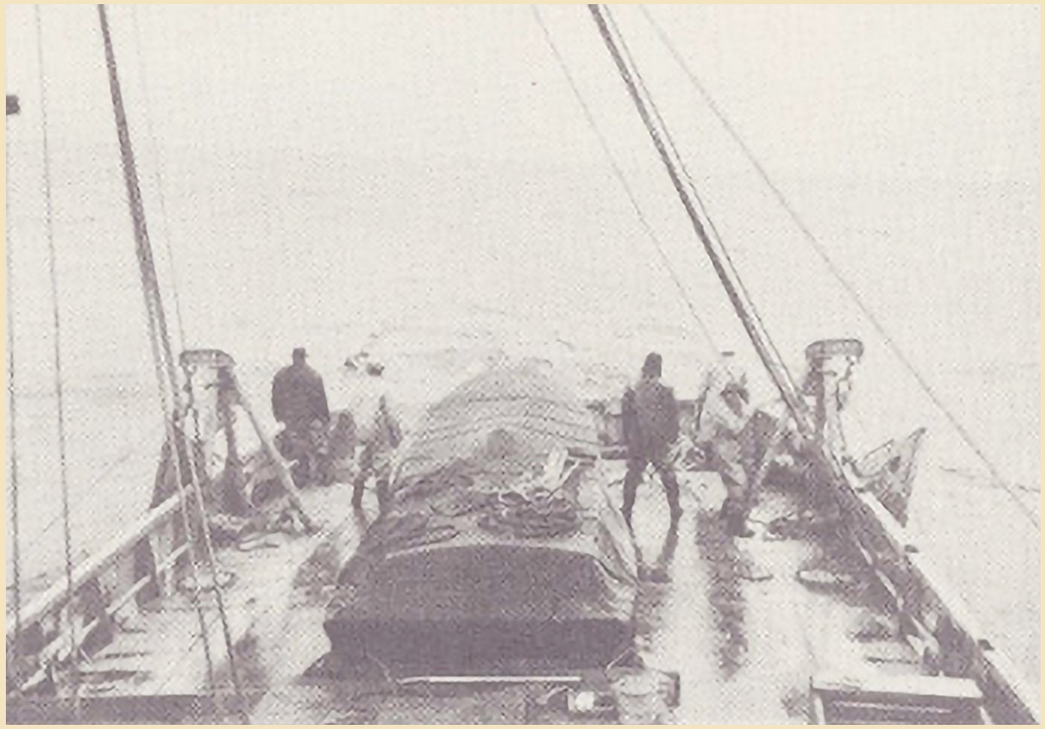
The *Washington*, 1948

Washington Details			
Year built	1946-47	Draft	13.75′
Location built	Portland, OR (hull), then Astoria, OR	Tonnage	158 tons net
Builder	Gunderson Bros. (hull) and Astoria Marine Construction Co.	Original engine	600 hp super-charged diesel
Designer	H. C. Hanson	Known skippers	Edwin Hansen
Length	100′		Leon Vincent (NPS)
Breadth	26′	Disposition	Sold in 1949

The *Washington's* brief service with the FWS began in July 1948 when she was transferred from the PEC to the Montlake Laboratory in Seattle, Washington, as a result of special congressional funding for a new exploratory fishing project in the Bering Sea.

The 100-foot catcher vessel was constructed with a double-bottomed steel hull, wooden deckhouses, and accommodations for 14 men. On deck was a large trawling winch mounted amidships. The *Washington* was equipped with a 3,655 cubic foot insulated dual-compressor refrigerated cargo hold and six unsulated steel-lined brine wells supporting a combined capacity of 5,875 cubic feet. Her tanks held 16,800 gallons of diesel fuel, 1,200 gallons of lubricating oil and 2,600 gallons of fresh water. In addition to the 600-horsepower supercharged main engine were two 50kW auxiliary diesel generators.

After a lengthy preparation for duty, the *Washington* left Seattle near the end of August 1948 on her first trip to Alaska, designated "Exploratory Cruise No. 1, North Pacific Fisheries Exploration and Gear Research". Part of the crew under Captain Edwin Hansen consisted of fishery engineers and a chemist from the FWS Seattle Technological Laboratory.



The *Washington's* low gunwales allowed rough seas to easily wash over the aft deck. 1949 FWS Fishery Leaflet photo.

To continue the research done in previous, the vessel spent two months in the Nome region of the Bering Sea exploring Norton Sound and St. Lawrence Island for potential far-north seafood resources. Experimental technological work was done to determine efficient methods for gear operation, catching, handling, and transporting frozen fish at sea. The untried vessel was also assessed as to her seaworthiness and suitability for work in deplorable weather common to some areas of the northern Bering Sea where

port facilities were lacking and navigational conditions were somewhat unknown.

During the trip, the *Washington* often encountered severe seas and unusually poor weather, such as snow squalls and gale force winds, while off St. Lawrence Island. On these occasions her low gunwales allowed the decks to become awash with seawater, which created dangerous working conditions and often caused most of the catch and collected biological samples to be lost overboard. Throughout the cruise, the Washington was constantly trying to avoid the weather. Unfortunately, the vessel's performance proved unsatisfactory and it was decided not to retain the vessel. Consequently, the *Washington* was sold late in 1948 for $150,000, which helped fund the construction of the *John N. Cobb*. A receipt dated 4 August 1949 shows custody of the vessel being transferred to an agent on behalf of the Republic of Korea.

Washington photos in the Pacific Fishery History Project Gallery

The *Washington*. Bureau of Commercial Fisheries photo, from Carmel Finley website.

Additional reading

Ellson, J. G., B. Knake, and J. Dassow. 1949. Report of Alaska Exploratory Fishing Expedition, Fall of 1948, to Northern Bering Sea. U.S. Dep. Int. FWS Fishery Leaflet 342, June 1949. 25 p.

Ellson, J. G., D. E. Powell, and H. H. Hildebrand. 1950. Exploratory Fishing Expedition to the Northern to Bering Sea in June and July, 1949. U.S. Dep. Inter. FWS Fishery Leaflet 369, March 1950. 56 p.

R/V *Washington* - First Exploratory Cruise (posted 7-14-14). Carmel Finley website.

1948 Logbook for the Washington.

The 1948 Alaska Cruise

The *Washington* returned on October 23 from its first cruise, which took it to the Nome region in the Bering Sea in an effort to solve several local fisheries problems. Nome residents, who are more likely to eat Norwegian sardines, Columbia River salmon and Iceland fillets than seafoods from their own waters, wanted to know what resources they have available there. With reindeer herds diminished, the Natives desire another food source, while the whites, besides hoping to develop the local market, would like to ship by air such commodities as shrimps, clams and king crab meat, all of which being luxury items would merit transportation costs, especially so with a favorable air freight rate on return trips from Nome.

It was the purpose of the Washington to discover what could be done in the way of establishing Far North fisheries in the face of the odds presented by physical conditions in Bering Sea. Much of the water is extremely shallow, only 15 to 17 fathoms in depth, with a sloping coast line and no anchorages and harbors. This calls for the operation of fairly large boats, which must be self-sufficient. Winds build up heavy seas rapidly and weather conditions make fishing impossible except for a short season, at most from June to October. During the brief two months the *Washington* was in the north, she spent much of the time 'hiding out' from the weather, finally being obliged to move south.

'We never were able to land on St. Lawrence Island.' said Joseph G. Elson, who was in charge of the field trip for the Fish & Wildlife Service, 'so finally we stood about 5 miles out and the school teacher at Gambell called together the Natives and interviewed them for us in the schoolhouse while we put our questions by radio.'

Part of the fisheries exploration work, he explained, involves finding out from the people of any region where they have seen or heard that certain fisheries may exist. ('The best of our drags for quality were at St. Lawrence Island,' Elson said.)

This is an unexplored area insofar as the United States is concerned, but prior to the war the Japanese operated cannery vessels in sight of Gambell village, presumably packing king crab. The Russians also have fished in Bering Sea from the Pribilofs north.

John Dassow, [FWS] chemist who went on the *Washington* as observer, told of the hauls of starfish brought up in Norton Sound. 'They wouldn't look productive at first glance, but among them we found a scattering of small fish of different species.'

The *Washington*, rigged as an otter trawler, brought up quantities of sole and flounder, some of which were frozen and carried back to Seattle for experimental work in methods of thawing and refreezing fish.

The *Washington* set out to find feeding banks of fish, but owing to starting late and encountering the worst summer weather in 15 years, found none, though there were indications of their existence. Having an untried vessel to work with hampered the expedition. The *Washington* now is in drydock undergoing some structural changes to make it more suited for its next season in Northern waters.

The above account was taken from an unknown newspaper article – believed to be the Seattle Times, dated 12 December 1948.

The *Oregon*, 1949, 1969-80 (Alaska service)

Oregon Details			
Year built	1946	Draft	14'
Location built	Portland, OR (hull), then moved to Astoria, OR	Tonnage	219 tons gross
Builder	Gunderson Bros. (hull) and Astoria Marine Construction Co.	Original engine	600 hp Enterprise
Designer	H. C. Hanson	Average speed	9 knots
Other names/id	FWS 1600 (FWS)	Cruising range	4,800 miles
	FRV 51 (NOAA)	Known skipper	Wendell Schneider (1969-73)
	R 551 (NOAA)	Fisheries service	1949 (AK, Pac. NW coast)
	#251138 (USCG ID)		1950-68 (Gulf of Mexico)
Length	100'		1969-80 (Alaska)
Breadth	26'	Disposition	Decommissioned in 1980

As one of the four RFC exploratory fishing boats, the *Oregon* was constructed in Oregon in 1946. The hulls for both her and the *Washington* were built by Gunderson Brothers at Portland. The boats then moved to Astoria to have the work finished by the Astoria Marine Construction Company. Both were designed as single-masted West Coast combination seiner-draggers, each with a raised deck and full-molded, round bottom hull with bilge keels.

Outfitted for live-bait fishing, the *Oregon* set out in 1948 to search for untouched resources of (albacore) tuna in the north, central and south Pacific Ocean.

This cruise also provided the opportunity to test new gear types. She was joined by her sister ship, the RFC's purse-seiner *Alaska*.

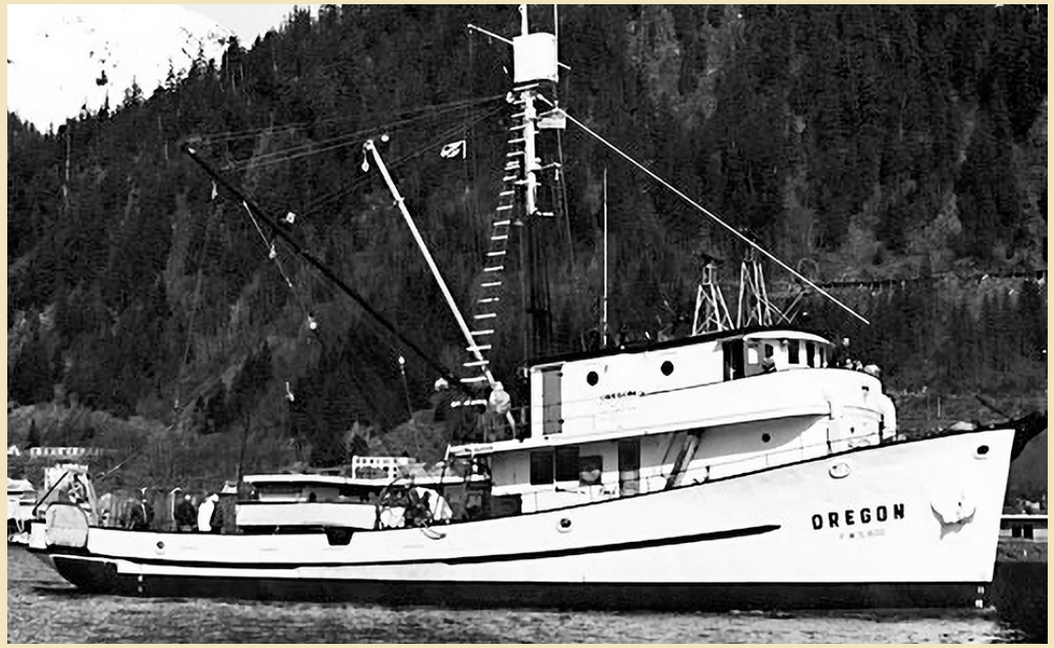
Reports from the initial trips made off the Washington/Oregon coasts were outstanding. From August to October the *Oregon* was at the Hawaiian Islands before sailing south to the Line Islands, then west to the Marshall Islands and other U.S. Pacific Trust Territory islands.

Through special legislation and appropriations, the *Oregon* was obtained by the Fish and Wildlife Service in 1949 – for a reported $300,000. On 8 August, she sailed from Seattle, Washington, to continue prospecting for albacore tuna off the coasts of Washington, Oregon, and British Columbia. Experimental trawls were made both to study tuna distribution and range and to possibly identify a commercial tuna fishery. The extensive use of LORAN on the trip marked the first time a FWS vessel used the long-range navigational aid for assessing fishing conditions. Whenever a sizable school of tuna was located, the *Oregon* would alert the local fishing fleet by radio as to their location. Later that year, the vessel moved to Southeast Alaska to perform the same work of locating tuna and reporting to fishermen in the area.

In 1950, the *Oregon* was relocated to the FWS's new Exploratory Fishing and Gear Research (EF&GR) base at Pascagoula, Mississippi, arriving at her new home port on 5 January after 27 days of sailing from Seattle.

Based on a recommendation by the Gulf States Marine Fisheries Commission, she began explorations that April focusing on shrimp, red snapper, tuna, menhaden, and shark. The *Oregon* would spend the next 16 years in the region supporting the Agency's EF&GR program by searching for various commercial marine populations, to include bottom fish and other potential species. These activities took the vessel on numerous cruises in the Gulf of Mexico, western

NOAA research vessel *Oregon*, FRV 51, at Seattle. NOAA Photo Library.



The research vessel *Oregon*, FWS 1600. Auke Bay Laboratories photo.

Atlantic Ocean and off the coast of South America as far south as French Guiana, in shallow waters north of the Amazon River.

In 1964, as part of the International Cooperative Investigations of the Tropical Atlantic (ICITA) program, the *Oregon* was used to collect hydrographic and biological data and to study surface schooling fish while at South America. From the fall of 1964 to 1966, the vessel made four important exploratory fishing trips in the Lesser Antilles area of the Caribbean Sea in connection with the United Nations (UN) Special Fund Caribbean project. During the cruises, longline, trolling, trawls, and dredges were made which resulted in catches of tuna, swordfish, dwarf herring, silversides, several varieties of shark, shrimp, scarlet prawns, and lobsterettes. The UN observers and trainees who accompanied the *Oregon* gained knowledge of the offshore marine resources and fishing gear/techniques which would influence any future commercial fisheries established in the Caribbean.

A contract to begin construction of the *Oregon's* replacement was made in 1965. As a result, The new 170-foot *Oregon II* was built at Pascagoula at a cost of $1,990,000 and launched in February 1967. She took over the fishery and living marine resource studies in the area, continuing the work for over 40 years with the Agency. The original *Oregon* remained in the Gulf for the next 2 years, continuing her operations, based at St. Simons Island, Georgia.

In 1969, the *Oregon* returned to Seattle where extensive renovations were made. She then went to her temporary base at Juneau, Alaska, replacing the BCF's research vessel *John R. Manning*. The *Oregon* resumed the familiar gear research work and exploratory fishing –

NOAA research vessel *Oregon*, R 551, at Seattle. NOAA Photo Library.

this time for bottom fish, shrimp and crabs in the eastern Bering Sea and lower Bristol Bay.

When the Juneau EF&GR laboratory moved to Kodiak, Alaska, in 1970, the *Oregon* followed. For 5 years she performed annual offshore surveys of the Alaska continental shelf for the Groundfish Assessment Program, under the National Marine Fisheries Service (NMFS). In 1973, the vessel was officially incorporated into the NOAA fleet. Three years later, she began operating in the Bering Sea and Gulf of Alaska for NMFS' Resource Assessment Program.

After a long service with the Agency, the *Oregon* was decommissioned in 1980 and soon transferred to the state of South Carolina on 20 October. She was sold by the state wildlife department in the late 1980s for $6,000.

In April 1991, Jon Franklin purchased the *Oregon* and spent nearly a year completely overhauling the boat to her original configuration. He left South Carolina in February 1992 with the vessel, arriving about 6 weeks later in the Pacific Northwest. Mr. Franklin (Oregon Seafoods, Lopez Island, WA.) has used the *Oregon* for bait-fishing and trolling for herring and salmon in Alaska, 1997-98 winter tuna fishing at Fiji in the South Pacific, and albacore fishing off the Washington coast in the fall of 2001. He still owned and operated the boat as of early 2014.

Oregon photos in the AFSC Multimedia Gallery

Additional Reading

Exploratory fishing (posted 6-27-14), with photos of the *Oregon* at the Government Locks in Seattle. Carmel Finley

Springer, S., and H. R. Bullis. 1954. Exploratory Shrimp Fishing in the Gulf of Mexico, Summary Report for 1952-54, p.1-16, 26-28. In Commercial Fisheries Review, 16:10 [Oct. 1954]. FWS, U.S. Dep. Int., Wash. D.C., 95 p.

The *Alaska*, 1949 - 1962 (FWS/Bureau of Commercial Fisheries ownership)

Note: While the *Alaska* was apparently not used in Alaska as a FWS vessel, she is featured here as being both a significant part of the RFC Alaska exploratory fishing fleet and a research boat frequently chartered by the Alaska Fisheries Science Center later in the 1980s and 1990s for survey use in Alaska and the Bering Sea.

Alaska Details			
Year built	1947	Breadth	25′
Location built	United Concrete Pipe Co.	Draft	13.5′
Builder	United Concrete Pipe Co.	Original engine	600 hp super-charged diesel
Designer	H. C. Hanson	Cruising range	7,500 miles
Other names/id	#252331 (USCG ID)	Disposition	Transferred to CDFG
Length	100′		

The *Alaska* at San Diego, 2007. Allen Shimada (NMFS), photographer.

The *Alaska* was built in 1947 at a cost of nearly $300,000. Both she and the *California* were constructed by the United Concrete Pipe Company in Long Beach, California. The *Alaska* was a combination-type motor trawler which could easily be modified for purse-seining or live-bait tuna fishing. The vessel was equipped with a trawling winch having two main spools (each with a capacity of 500 fathoms of 5/8-inch cable); three large bait wells; a large freezing compartment; fishing platforms; a blanket net; a sea scanner used to locate schools of fish and aid in navigation; a ship-to-shore radiotelephone; radar; and two fathometers for determining depths. In addition to her main engine, she was powered by two auxiliary 75-horsepower diesel engines, each driving a 220-volt generator. The fuel capacity was 17,700 gallons, lubricating oil capacity 1,200 gallons, and fresh water capacity 2,240 gallons. The Alaska could accommodate ten crewmen and seven scientists.

Washington, Oregon, and Alaska

In 1947 the International Fisheries Commission (IFC) desired to research halibut in the Bering Sea and formed an agreement with the Pacific Exploration Company – contracted to operate the *Alaska* – about how to conduct the investigation. The Fish and Wildlife Service (FWS) hoped to gain added information on king crab and bottom fish from this private venture. All three groups were also interested in determining whether or not a vessel of the *Alaska's* type and size could operate satisfactorily and with profit in the Bering Sea. On 21 July 1947, the vessel left Astoria, Oregon, northbound with a crew of 13, which included an IFC representative to tag halibut and a FWS observer. The *Alaska* proved to be quite seaworthy, performing well in heavy seas.

In the first half of 1948, the Reconstruction Finance Corporation again contracted with the PEC to operate the Alaska. The boat was now outfitted out as a tuna-seiner for tuna fishery exploration in the western Pacific – mostly from the Hawaiian Islands southward through the Line Islands and west as far as the U.S. Trust Islands north of New Guinea. The contract provided that FWS observers again be included aboard the boat.

The FWS obtained the *Alaska* in 1949 through special legislations and appropriations and stationed her at Brunswick, Georgia, where she was used for the next several years for the collection of oceanographic, biological, and meteorological data. The boat was later modified and appropriately equipped for work in the Gulf of Mexico and Caribbean Sea.

In 1951, the *Alaska* was used in connection with a comprehensive oceanographic survey of the Gulf, collecting samples of water and plankton along with other physical data for the Gulf Fishery Investigations, Texas A&M College, and the Geological Survey's Department of Oceanography (Trace Elements Section). This work continued until the FWS decommissioned the *Alaska* in 1953 at Brunswick.

Her activity thereafter is unknown until the summer of 1957, at which time a 10-year lease agreement was negotiated between the FWS and the California Department of Fish and Game (CDFG). After being reconditioned and outfitted in Miami, Florida, the *Alaska* arrived on 12 February 1958 at San Pedro, California, her new home port. From 1958 to 1960 she was used by the University of California Scripps Institution which conducted cruises off Southern California to study pelagic fish and investigate the migration route of albacore approaching the Pacific Coast prior to the commercial fishing seasons.

In 1961, the Alaska was again under the control of the CDFG. Two years later, the CDFG assumed ownership of the vessel as a result of a 9 August 1962 congressional act that transferred all interest of the boat to the State of California.

In 1963, the vessel possessed a recently installed underwater viewing chamber with a starboard-side midship observation window to aid in offshore fish sampling (see inset figure). At this time the *Alaska* was also equipped with 320 square feet of laboratory space on and below the main deck and accommodated a normal complement of four scientists, nine students and a crew of two.

That summer while the *Alaska* was off the coast of Baja California conducting sea bass investigations, scientists on board the vessel documented catching the largest snowy grouper (fish) they had ever seen in the area.

During the 1970s, as part of the CDFG's continued work at sea, the boat was used off southern California and Baja to investigate jack mackerel in 1974 and California market squid in 1976.

The vessel returned again to the Pacific Northwest in 1980 when she was acquired by the University of Washington (UW) to replace its research ship, *Commando*. The *Alaska*, often chartered by the UW, was used by the Alaska Fisheries Science Center numerous times for various research cruises until 1995. These trips including the trawl

surveys conducted in 1981 and from 1983 to 1992 in the Bering Sea.

The *Alaska* was sold by the UW in the late 1990s. She was last spotted in 2007 at San Diego, California.

***Alaska* photos in the AFSC Multimedia Gallery**

Additional reading

King, J. E. 1949. Experimental Fishing Trip to Bering Sea. U.S. Dep. Int. FWS Fishery Leaflet 330, March 1949. 13 p.

Ellson, J. G., B. Knake, and J. Dassow. 1949. Report of Alaska Exploratory Fishing Expedition, Fall of 1948, to Northern Bering Sea. U.S. Dep. Inter. FWS Fishery Leaflet 342, June 1949. 25 p.

Ellson, J. G., D. E. Powell, and H. H. Hildebrand. 1950. Exploratory Fishing Expedition to the Northern to Bering Sea in June and July, 1949. U.S. Dep. Int. FWS Fishery Leaflet 369, March 1950. 56 p.

◁ Vessels: Fish and Wildlife Service Vessels

Other Fish and Wildlife Service (FWS) Boats

The *King*, 1949*-1959

Scant information collected on the vessel suggests she was built sometime in the mid-1940s. The Bureau of Commercial Fisheries (BCF) fleet tables for 1957-59 indicate the 40-foot *King* was built in 1946 at a cost of $16,168 and was powered by a 175-hp engine.

The earliest account of the vessel's use by the FWS was that in 1949 she performed fisheries patrol work while stationed at the FWS King Salmon base on the Naknek River in Alaska. By 1957, she was being used for biological research and management work. The boat continued operating out of King Salmon until her transfer to the Alaska Department of Fish and Game (ADFG) in 1960 as a result of Alaska's recent statehood.

Note: Two other sources refer to an unnamed 42- to 50-foot patrol boat built in 1944 for the FWS by students of the Edison Vocational School in Seattle, Washington. This vessel, possibly the *King* or *Sockeye* (below), was designed by naval architect Edwin Monk, with plans for a 200-hp gas engine. (Pacific Motor Boat, June 1943 - and - GloryBe Restoration website)

The *Sockeye*, 1949*-1970

Not much is known about the *Sockeye*. Built in 1946, The 40-foot boat was powered by a 175-horsepower engine.

Around 1949, both she and the *King* (see above) were at Bristol Bay hauling building materials for a weir cabin project at the head of the Ugashik River. From 1949 to 1971, the *Sockeye* appeared on annual vessel fleet rosters for the BCF and National Marine Fisheries Service (NOAA) – headquartered out of King Salmon, used primarily for salmon research work around Bristol Bay and the upper Alaska

The *Sockeye*. Auke Bay Laboratory photo.

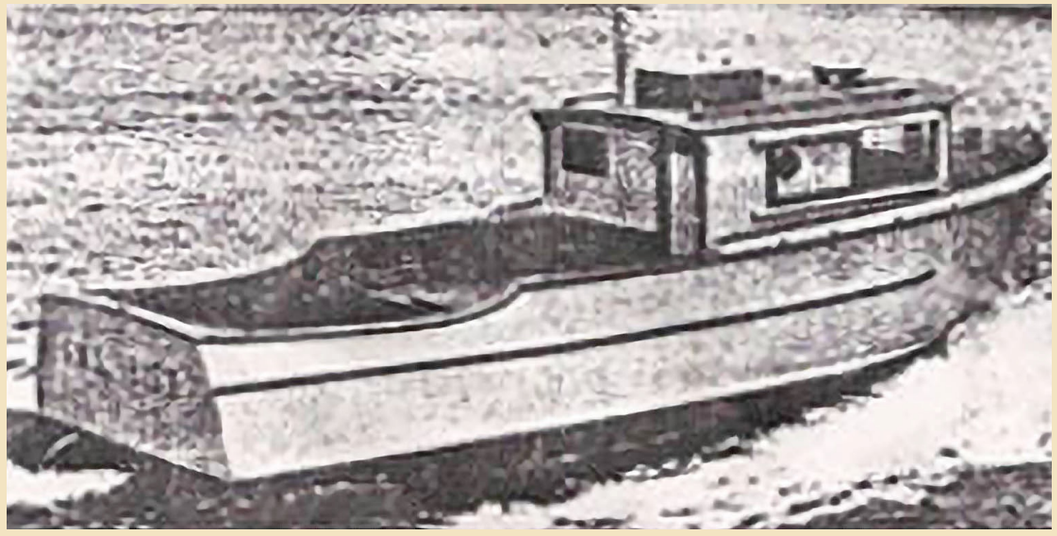
Peninsula. Unlike the other FWS boats on this page, the *Sockeye* remained with the BCF throughout the 1960s.

The *Ibis II*, 1951-1959

In 1951, the FWS received two additions to their Alaska fisheries fleet; the *Ibis II* and *Auklet II*. Both boats were built in Seattle, Washington, under the supervision of FWS vessel superintendent, Earl Bright. The design plans were drawn and submitted by local naval architect, William Garden.

Construction of the 24-foot long, 8-foot breadth, *Ibis II* was done in 1951 by "Chamber & Franck" boat builders. She was designed for use in the creeks, rivers and shallow coastal waters of Alaska. This was made possible by her semi-tunnel stern design which helped

Other Boats



Ibis II. Photo from Pacific Motor Boat, Oct. 1951.

maintain a shallow 16-inch draft. The 12-13 mph cruising speed was provided by a 95 hp Chris-Craft gas engine of 230 cubic inches piston displacement.

Over the next 10 years the *Ibis II* was in Alaska used for fisheries patrol, salmon tagging and other research work based out of Chignik. As with many other FWS vessels, she was turned over to the State of Alaska (ADFG) in 1960 following Statehood.

The *Skipjack*, 1956*-1959

Built in 1944, the *Skipjack* was a 42-foot wooden cruiser with a 175 hp engine. The earliest account of the *Skipjack's* FWS fisheries use was in 1956, when she joined four other research vessels on a reconnaissance oceanographic survey to study estuary systems found in fjords and deep inlets along the Alaska and British Columbia coasts. That year the *Skipjack* was assigned to the Bureau of Commercial Fisheries, a newly created division of the U.S. Fish and Wildlife Service (USFWS). One of her known FWS skippers was Robert Budke.

Based out of Cordova, Alaska, the boat was used for biological research and management activities until her transfer to the ADFG on 9 February 1960. At some time between 1965 and 1974, she was excessed by the ADFG. According to U.S. Coast Guard vessel documentation renewed in 2013 for the *Skipjack* (ID# 506566), she was at one time named the *Cathy Jean* and is recorded having a hull breadth of 10.6 feet, depth 4.6 feet, net tonnage 10, and her owner as residing in Tacoma, Washington.

The *Capelin*, 1957*-1959

In 1956, new BCF division took control of the 40-foot *Capelin*. Though it is unclear when the boat originally became the property of the FWS, it is known that she was built in 1939 and was powered by a 145 hp engine in the mid-1950s. As a BCF vessel from 1957 to 1959, the *Capelin* was used mainly for management duty out of Ketchikan, Alaska. She went to the ADFG in February 1960.

The *Albacore*, 1957*-1959

As with the *Capelin* (above), all that is known about the *Albacore* is from the 1957-59 BCF fleet lists. The 40-foot boat was built in 1938 and had a 122-horsepower motor. Her known skippers included Les Meyers, who worked seasonally, and Jack Boone, a well-known artist in Seattle and Cordova. Prior to her 1960 move to the ADFG, the *Albacore* was based in Cordova and used by the Bureau of Commercial Fisheries for biological research. The auctioning of the 40-foot ADFG boat "M-V *Albacore*" (along with three others) was advertised in a September 1965 Petersburg, Alaska, newspaper -- minimum bids being $3,000 to $5,000 each.

The *Mackinaw*, 1957* - 1960

Another BCF boat first mentioned in 1957 was the *Mackinaw*. She was built in 1929, at 52 feet in length, and having a 150-horsepower

Other Boats

The *Mackinaw* in 1959. Bill Heard, photographer.

engine (while with the BCF). Prior to 1960, she was headquartered at Juneau, Alaska, operating in coastal waters primarily for management purposes. At the end of the 1950s the vessel also participated in some of the first oceanographic surveys of Auke Bay as part of the marine fish investigations in Southeast Alaska. Around 3:00 am on 20 June, 1960, the *Mackinaw* met her fate when she sank in Taku Inlet, approximately 10 miles southeast of Juneau. The vessel had run into rocks in waters 50-60 fathoms deep after the master-engineer fell asleep at the wheel.

The *Shad*, 1958 - 1959

The 44-foot steel (boiler plate) power barge *Shad* was built in 1958 at the Duwamish Shipyard in Seattle and immediately began service with the BCF stationed at Juneau. Her flat-bottom scow design, which allowed her to be beached for loading and unloading, made her a valuable transport vessel for carrying freight, mobile equipment and passengers. Other specifications include: breadth, 16 feet; depth, 4.5 feet; displacement, 11.7 tons gross fully loaded; workload, 20 tons; and 577 cubic feet of working deck space.

The BCF used the *Shad* for both management work and biological research. At one point in time she was headquartered at Cordova, Alaska, skippered by Hugh Hosek. The ADFG acquired the barge in March 1960 and swapped out her gas engine with a 85 bhp G.M. diesel in 1964. She was equipped with gear for pulling Dungeness crab pots and radar for conducting nighttime surveillance of closed fishing areas.

The *Shad* remained with the ADFG working out of Juneau through the early 1970s, and perhaps longer. A 1973 ADFG report

The power barge *Shad*. ADFG photo, 1974.

Other Boats

recommended she be replaced, since the necessary work to increase the crew accommodations and storage areas, add new winches and perform needed hull repairs was estimated to cost between $25,000 and $35,000. A Petersburg newspaper announced the intended auctioning of the *Shad* by the ADFG slated for 2 October 1982. The current (2014) U.S. Coast Guard vessel documentation shows the *Shad's* owner residing in Juneau.

Other known FWS boats

Each of the following were transferred to the State of Alaska (ADFG) on 9 February 1960:

- *Shearwater*
- The *Shearwater* (II ?) (FWS 156)
- The *Mackerel*
- The *Baby Winn*
- The *Grayling*
- The *Humpy*
- The *Steelhead*

* Earliest known year of government service in Alaska

More photos in the AFSC Multimedia Gallery.

The *Shearwater II*. Auke Bay Laboratory photo.

Kittiwake II

Kittiwake II, Sad Ending to a Long History

Kittiwake II Details			
Year built	1944	Draft	10′
Location built	Stockton, CA	Original engine	240 hp Fairbanks-Morris
Builder	Stephens Brothers, Inc.	Average speed	10 knots
Designer	unknown	Cruising range	1,800 nmi
Other names/id	*Jessie R. Nelson*, ST-415 (Army)	Known skipper	Hank Museth (1950s)
	Kittiwake? (ADFG)		Oivind T. Ivarson (1957)
	#930867 (USCG ID)	Federal service	1950-59
Length	73′	Disposition	transferred to ADFG

The *Kittiwake II* was a wooden fishing vessel constructed in 1944 by Stephens Brothers Company (1902-87) in Stockton, California. Her seaworthy design greatly allowed for the heavy work of conveying cargo, passengers and barges around the waters of Alaska. The 73-foot harbor tug style hull was built of 2.5" fir planking on 4" by 5" oak frames and featured a high bow, shapely horseshoe stern and provided a deep displacement.

The ST 415 in Alaska in 1946 prior to her becoming the *Kittiwake II*. O. H. "Doc" Freeman, photographer. Photo courtesy of Mark Freeman, Fremont Tugboat Co.

Kittiwake II

Originally named the *Jessie R. Nelson* (ST-415), the vessel was built for the U.S. Army who used her during World War II at the Aleutian Islands for military patrol. According to one of her last owners, she originally had a 50-caliber machine gun mounted on the roof. Over 40 years later, ammunition rounds were found in the bilge that were thought to have been left there as added ballast. An extensive battery bank provided an adequate 110v DC electrical system for running everything while the boat was anchored.

After the war, the Federal Aviation Administration acquired the vessel and employed her to maintain the numerous Pacific coast radar stations. Sometime around 1950, the boat was obtained by the Fish and Wildlife Service (FWS) and renamed *Kittiwake II,* no doubt after the earlier Bureau of Fisheries/FWS Alaska patrol vessel *Kittiwake*, built in 1908. During the 1950s the *Kittiwake II* was used by the Agency in connection with its salmon management and biological work in Alaska. By 1957, the vessel was headquartered at Juneau, Alaska, and owned by the Bureau of Commercial Fisheries (BCF), a new division formed under the reorganized U.S. Fish and Wildlife Service (USFWS) in 1956.

With Alaska's statehood came the *Kittiwake II's* transfer in March 1960 to the Alaska Department of Fish and Game (ADFG), who made good use of her for several years. An ADFG vessel survey report stated that she could fish gillnets and crab pots, could be equipped to drag or seine, able to perform general fishery surveillance and freight work, and with regards to her seaworthiness; "Motion in heavy seas - rolls in trough, vessel is equipped with stabilizers which are effective. Good in following sea."

Based on the photo to the right and several references to "*Kittiwake*", it appears the the ADFG may have dropped the "II" from her name after the acquisition. A "Vessels Section" was soon created in 1962 under the ADFG's Division of Engineering and Services to maintain and operate the fleet's larger boats. In addition to the *Kittiwake II*, these vessels included the *Crane*, *Auklet II*, *Dennis Winn*, *Teal*, and others which had been transferred from the USFWS.

As part of her long service with the ADFG, the *Kittiwake II* was used in 1962 and 1963 to transport elk and moose calves during game transplants to Gravina Island in Alaska. The boat received a new 325 bhp Caterpillar engine in 1967.

The vessel was then purchased in 1986 from the ADFG through auction by Michael Yourkowski along with three other partners. Mr Yourkowski used the boat in Alaska for fishing, tours and various chartering contracts. Following the spring 1989 *Exxon Valdez* oil spill, the *Kittiwake II* provided transportation to the affected areas for many spill-related research groups.

In October 2003, she was sold to Daniel W. Strickland, who used her to work his oyster farm at Bear Cove, Alaska. During the early morning of 21 February 2005, fire broke out aboard the vessel in the Homer Harbor, Alaska. It took firefighters 10 hours to extinguish the "difficult fire to fight". Afterwards, Mr. Strickland stated that the boat was considered a total loss by the insurance company. What remained of the *Kittiwake II* was towed to Seward, Alaska, and put on land, where she still rested as of 2011.

Sablefish, Kasitsna Bay Research Vessel

Sablefish Details			
Year built	1949	Cruising range	600 nmi
Location built	Seattle, WA	Known skipper	Eugene Stubb (early 1950s)
Builder	Grandy Boat Co.		Dean Frame
Designer	Edwin Monk - Lorne Garden		Robert Budke
Other names/id	#943858 (USCG ID)		Jack McBride (Kasitsna Bay)
Length	38′	Known service	1950-59
Breadth	12′		1956-69 (USFWS)
Draft	4.5′		1970-71 (NMFS)
Original engine	175 hp Lathrop Mystic gas	Disposition	sold in 1971
Average speed	8 knots		

The *Sablefish* at Kasitsna Bay in July 1965. Auke Bay Laboratories photo.

The 38-foot fish boat *Sablefish* was designed by Edwin Monk and built in Seattle, Washington, by the Grandy Boat Company in 1949. She was constructed for the Fish and Wildlife Service (FWS) having a fir keel, hardwood stem, frames of white oak, with sleeping accommodations for six.

Sparse accounts confirm her FWS service beginning around 1950. In 1951, the boat was used in a salmon escapement project. During the upcoming winter, she was wintered at Ketchikan, Alaska, then in the following winter at Seattle. Starting on the 24 June opening of the 1955

Sablefish

fishing season, the *Sablefish* and FWS research vessel Heron were used to commence the annual pink salmon fingerling census, in which they visited all commercial fish traps in the eastern and western Icy Strait districts. In July and August of 1956, pink salmon samples were collected aboard the *Sablefish* from Herman Creek, located northeast of Ketchikan.

A potential disaster occurred in January 1960 when a fire broke out aboard the *Sablefish* as a result of an over-heated smoke stack. Fortunately, the flames were extinguished before any significant damage was done.

The vessel had a complete engine overhaul in 1963 and was converted for shellfish work, enabling her to handle crab pots and shrimp trawls. In May 1964, she was sent to the Agency's Kasitsna Bay field station in Alaska to take over the activities of the MV *Chinook*, which had been declared unsafe and suspended from duties pending the necessary overhauling and repairs.

The *Sablefish* remained at Kasitsna until she was sold in 1971, at which time she was powered with a 165-bhp GM engine. Subsequent owners include the U.S. Air Force, who used her for R & R at Seward, Alaska, and the University of Alaska School of Ocean and Fisheries Science, who used her as a research boat out of Juneau, Alaska. In a 2011 interview, a retired fisheries director recalled that the vessel was later used to fish Dungeness crab for several years at Tenakee Springs, Alaska – and that "finally it got just too old and decrepit, and they put it up on the beach and burned it. So that was the end of the *Sablefish*."

The research vessel *Sablefish*. Auke Bay Laboratories photo.

◁ Vessels: Fish and Wildlife Service Vessels

Auklet II, Built for Alaska Fisheries Service

Auklet II Details			
Year built	1951	Average speed	10-12 knots
Location built	Seattle, WA	Cruising range	1,500 nmi
Builder	Blanchard Boat Co.	Known skipper	Clyde "Pop" Dell (1951)
Designer	William Garden		? Cooper (1950s)
Other names/id	*Auklet* (mid-1990s)		John M. Thornton, Jr. (1957)
	#262422 (USCG ID)	Fisheries service	1951-59
Length	57′	Known service	1950-59
Breadth	14.7′		1956-69 (USFWS)
Draft	4′		1970-71 (NMFS)
Original engine	twin 200 hp G.M. Series 6-71 diesels	Disposition	transferred to ADFG

The *Auklet II*. Auke Bay Laboratories photo.

At a cost of $60,000, the 57-foot *Auket II* was built for the Fish and Wildlife Service (FWS) and launched at Seattle, Washington, during the summer of 1951. She was no doubt named after the *Auklet* that had served many years for the Bureau of Fisheries (1917-39) and the FWS (1940s). The vessel was capable of performing passenger and freight transport, general fishery surveillance, limited fishing, and various tug work.

The *Auklet II*, designed by Seattle naval architect William Garden, featured a (Edwin) Monk style wooden hull with a distinct cruiser stern, a large galley for her size and sleeping accommodations for six. The boat was equipped with an Ocean electric plant, a Photo-Electric Pilot, Mathers clutch and throttle controls, a one-mile Ray Portable Light Company searchlight, a windlass forward, an aft-mounted hydraulic mast-

Auklet II

mounted winch and two Grandy plywood boats topside . She was powered by twin Series 6-71 G.M. diesels furnished by Evans Engine & Equipment Company, which drove a 3" Monel shaft through a 2-to-1 reduction gear and turned a 36" by 27" Coolidge propeller. Like with other federal fisheries boats, the *Auklet II* had water-lubricated Goodrich "Cutless" bearings.

That year, she set out on her initial trip to her new headquarters at Juneau, Alaska. On board was FWS vessel supervisor, Earl Bright, who had overseen the construction. Thus began a decade of fisheries research and patrol work for the new boat. In 1954, she was helping to furnish the various weir camps and stream guards in the Ketchikan, Alaska, area.

The *Auklet II* fell under control of the new Bureau of Commercial Fisheries (BCF) in 1956 when it became a division of the reorganized U.S. Fish and Wildlife Service (USFWS). Through the remainder of the 1950s, the boat was used for management and biological research while being stationed at Seldovia, Alaska.

The renamed charter vessel *Auklet*, ca. 2010. Photo courtesy of David Janka, Auklet Charter Services.

As a result of Alaska attaining its statehood, many of the USFWS boats were transferred from 1960 to 1965 to the Alaska Department of Fish and Game (ADFG). These boats included the *Crane*, *Dennis Winn*, *Kittiwake II*, *Teal*, and many others. In March 1960, the ADFG received the *Auklet II* and afterwards referred to her simply as the "*Auklet*" – the name seemed to stick. During the previous year, a new 185 bph Caterpillar D33 T.A. engine had been installed. In 1964, a new 32v, 300w Onan diesel auxiliary was added. By 1973, the need was expressed for at least $25,000 in vessel maintenance which included repairs to the hull and bulwarks and replacement of the engine, furnace, radiators, and anchor/cargo winches.

The *Auklet (II)* provided over two decades of valuable service to the ADFG until she was sold in the early 1980s. During the ensuing years, ownership of the vessel changed a couple of times. One of her owners was Dean Rand, who made several upgrades and renovations to the boat around 1989-90.

In March 1995, the boat was purchased by David Janka, who had operated her for Mr. Rand from 1992-94. Mr. Janka officially renamed the vessel "*Auklet*", since as he put it: "that is the name so many have gotten to know her by in recent decades". In 1995, he started his business, Auklet Charter Services (http://www.auklet.com/ – in operation as of 2012), which has provided the boat for multi-day research work, filming crew support, and natural history tours throughout Prince William Sound and south central Alaska.

***Auklet II* photos in the AFSC Multimedia Gallery**

Newer Research Ships

Newer Research Vessels Since 1949

Research Vessels Acquired 1949-71 (length, yr built)

1949	***Murre II***	(86 ft, 1943)
1949	***Sockeye****	(40 ft, 1946)
1950	***John N. Cobb***	(93 ft, 1950)
1950	***John R. Manning***	(86 ft, 1950)
1962	***George B. Kelez***	177 ft, 1944)
1967	***Miller Freeman***	(215 ft, 1967)
1968	***Fairweather***	(231 ft, 1968)
1969	***Oregon*** **	(100 ft, 1946)
1971	***Cripple Creek***	(65 ft, 1953)

*Earliest known year of service

**The *Oregon* was also used for one year of Alaska service with the FWS in 1949

Explorations for evaluating new commercial fishing sites, along with the studies of new fishing methods and equipment, were formally established as a separate activity of the United States in 1949. The objective was to provide information to a fishing industry interested in expanding or diversifying to new species and locations.

Several regional exploratory fishing and gear (development) research (EF&GR) groups were created within the Fish and Wildlife Service (FWS) to help provide information on potential fisheries: the North Pacific Fisheries Exploration and Gear Research Program within the Seattle (Washington) Technological Laboratory (1948); the Gulf Exploratory Fishery Program at Pascagoula, Mississippi (1950); a short-lived Exploratory Fishing Unit at the new Honolulu, Hawaii, laboratory (1950); and an EF&GR base in Juneau, Alaska (1960).

To obtain practical and commercially significant catch-rate and catch-composition data, commercial scale fishing surveys were conducted using chartered commercial fishing vessels or research vessels built especially for this unique purpose.

By 1949, the need for a dedicated EF&GR vessel in Alaska waters, and other areas, was recognized and construction planning for the *John N. Cobb* and *John R. Manning* was underway. In the interim, research cruises continued aboard the other FWS boats and chartered commercial fishing vessels – a practice still in use as of 2011.

Newer Research Ships

Throughout the 1950s and 60s, the exploratory fishing expeditions focused on searching for sizable populations of species such as tuna, salmon, halibut, shrimp, and scallops. While the FWS boats were used in Alaska waters, some cruised farther south along areas of the West Coast and even into the central and South Pacific Ocean. The 1956 reorganization of the FWS into the U.S. Fish and Wildlife Service (USFWS) led to the creation of the Bureau of Sport Fisheries and Wildlife, and the Bureau of Commercial Fisheries (BCF). The BCF immediately assumed control of the FWS Alaska boats and continued using them primarily for marine research. The BCF then evolved into the National Marine Fisheries Service (NMFS) in 1970 as a result of the reorganization that created NOAA in the Department of Commerce.

Described in this section are a handful of the more modern vessels found on our roster of federal Alaska fisheries boats. In addition to the *Cobb* and *Manning* mentioned above, the Agency acquired two ships from the U.S. Army; the *Murre II* and *George B. Kelez*. During the late 1960s, the BCF also received the newly built *Miller Freeman* and the USFWS research vessel *Oregon*, an original Reconstruction Finance Corporation exploratory fishing boat from the late 1940s.

Unlike many of the other FWS/USFWS vessels of the 1950s, these research ships remained with (or joined) the fisheries Agency after Alaska's 1959 statehood – rather than transferring to the Alaska Department of Fish and Game as most had done.

With time most of the NMFS boats were no longer needed and were disposed of. In 2008, the *John N. Cobb's* decommissioning left the *Miller Freeman* as the last operating vessel of those honored on these historic pages. The NOAA ship *Oscar Dyson*, launched in 2003, is representative of a new generation of state-of-the-art vessels used for fisheries research in Alaska.

Murre II

Newer Research Ships

Additional reading

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Capurro, R. A., A. M. Bargeski, and W. H. Myers (compilers). Oceanographic Vessels of the World; a Joint Publication of IGY World Data Center A for Oceanography and the National Oceanographic Data Center. Publication info Washington, D.C. Printed by U.S. Navy Hydrographic Office, 1961-1966. Physical descrip. 3 v. (loose-leaf) illus. 29 cm. General Note Vol. 2-3 printed by the Hydrographic Office under its later name: U.S. Naval Oceanographic Office.

Greenwood, M. R. 1950. Exploratory Fishing and Gear Development, p.107-128. In R.R. Mitsuoka, R.E. Pearson, L.J. Rutledge, and S. Waterman (editors), Fifty Years of Cooperation and Commitment: 1931-81, the Northwest and Alaska Fisheries Center. U.S. Dep. Commer., NOAA Tech. Memo. NMFS F/NWC-34. 294 p.

Murre II

Murre II, Supply & Research Power Barge

Murre II Details			
Year built	1943	Cruising range	2,500 miles
Location built	Seattle, WA	Known skipper	Pat Britt (1949)
Builder	Maritime Shipyards		Louis McDonald (1954)
Designer	unknown		Gwilyn Hopkins (1957)
Other names/id	BSP 1915 (WWII)		Mark Myer (substitute)
	FRV 63 (NOAA)		Herbert Hakula (1960)
	R 663 (NOAA)		James Brown (1963)
	#592984 (USCG ID)		Henry Museth (1965, '75)
Length	86′		James Whistler (1986)
Breadth	24′		John C. Bortniak (1989)
Draft	7.5′	Fisheries service	1949-89
Original engine	twin 115 hp Caterpiller D-13,000 diesel	Disposition	Sold in 1991
Average speed	8 knots		

The NOAA power barge *Murre II*, R 663. Auke Bay Laboratories photo.

The research vessel *Murre II* experienced a long and distinguished service supporting fisheries research in Southeast Alaska – most of which was with the Agency's Auke Bay Laboratory (ABL).

This 86-foot self-propelled wooden barge was built in Seattle, Washington, by the Maritime Shipyards for the U.S. Army Corps of Engineers to haul mail, fuel, passengers, and various freight throughout the Aleutian Islands during World War II. She launched in 1943 as the BSP 1915.

Murre II

On 14 May 1949, a power barge was assigned to the Fish and Wildlife Service (FWS) at Kodiak, Alaska, and rechristened the *Murre II* before being stationed at her home port in Juneau, Alaska.

From 1949 to 1963, the vessel hauled much needed cargo and personnel to stream guard camps and the Little Port Walter field station. The *Murre II* also acted as a base for FWS surveillance aircraft and crew. A significant incident occurred on 11 November 1956 when a blow-back in the engine room furnace resulted in an explosion and fire that caused minor damage to the vessel.

The *Murre II's* shallow draft allowed for operations close to shore. In 1963, the U.S. Fish and Wildlife Service installed research equipment on the vessel and after that she became an integral part in the Agency's fisheries and oceanographic research throughout Southeast Alaska.

Until research work began on the vessel in 1963, only cursory oceanographic studies of southeastern Alaska waters had been made. After an initial survey in Auke Bay, comprehensive programs were developed to gather data on a wide variety of marine topics. It has been estimated that about 80% of southeastern Alaska's first recorded identifications of marine zooplankton have come from samples taken while on the vessel. These and other 'firsts' were commonplace for the multipurpose *Murre II*.

A cold day on the NOAA vessel *Murre* II, FRV 63. Auke Bay Laboratories photo.

In May 1964, the regular monthly oceanography cruise to survey Traitors Cove and conduct various mid-water trawling operations had to be cut short when the *Murre II* broke a crank shaft on a main engine forcing her to return to port. For several months, until engine repairs were made, most of her scheduled work was covered by the *Heron*.

The *Murre II* was operated by the Auke Bay Laboratory until 1987. During this time, the vessel made the first cruise in August 1975 for the purpose of acquiring distribution/abundance information on humpback whales in Southeast Alaska. Other assignments included supporting regional research activities as diverse as the NMFS' Marine Resources Monitoring, Assessment, and Prediction (MARMAP) program (1972); the

Murre II

Porcupine Creek impacts of logging study (1977, 1981); Steamer Bay benthic population investigations as part of a long-term ecosystem study of undisturbed estuarine systems (1977-78); trawl surveys on the distribution of walleye pollock in nursery areas in Stephens Pass and Tenakee Inlet (1978, 1981); and numerous surveys for pink and chum salmon plus oceanographic and plankton sampling in many locations in Southeast Alaska (1970s and 1980s).

In addition, the *Murre II* was also the base of operations for other research activities, such as the fall collections of Pacific ocean perch in southeastern Alaska (1980s); weekly monitoring in Auke Bay for "Plankton Watch-1982" – a cooperative program of the Alaska Department of Fish and Game, Juneau-area nonprofit private hatcheries and ABL; and the U.S./Canada transboundary Pacific salmon studies in the Boca de Quadra area of Southeast Alaska (mid-1980s).

Many of the ABL scientists have described the *Murre II* as the ideal vessel for Southeast Alaska coastal operations – supporting research efforts and moving people and supplies when and where needed. Over the years, the vessel managed to withstand its share of severe weather. On returning from one research project the vessel encountered a nasty storm in the Gulf Alaska. Upon docking in Juneau, divers found that some of its wood sheathing had been ripped off the hull but the nails had been left intact. Above water, only a few of the cargo bulkheads were damaged.

In 1987, the operation and maintenance of the *Murre II* was transferred to the NOAA Corps fleet. After 35 years of distinguished service supporting fisheries research in Southeast Alaska waters the vessel was decommissioned in 1989. Two years later the vessel was sold. She eventually went to the Poulsbo Community College on Puget Sound (Washington) as a training vessel for scallop draggers.

***Murre II* photos in the AFSC Multimedia Gallery**

The *Murre II* loaded with lumber and a bulldozer. Auke Bay Laboratories photo.

John N. Cobb, Establishing a Rich Legacy

Cobb Details			
Location built	Tacoma, WA	Cruising range	4,800 miles
Builder	Western Boatbuilding Co.	Known skippers	Sheldon W Johnson (1945-55)
Designer	W. C. Nickum & Sons		Jose Franco (1958)
Length	93.5′		Robert P. (Pete) Larsen (′60, ′63, ′67, ′72)
Breadth	26′		John C. Bortniak (1990)
Draft	11′	Fisheries service	1950-2008
Tonnage	185-250 gross tons	Disposition	Decommissioned on 13 August 2008
Average speed	9 knots	Disposition	Decommissioned on 13 August 2008

Masters and Commanding Officers of the *Cobb* 1950-1999
(click icon to expand)

The *Cobb* in Alaska. D. Withrow (AFSC), photographer.

John N. Cobb

Built in 1950, the *John N. Cobb* provided valuable service in Alaska waters for over half a century until her career came to an end in 2008. Based on a West Coast purse-seiner design by W. C. Nickum and sons, she was constructed for the Fish and Wildlife Service (FWS) at Tacoma, Washington. Funding was made available from the $150,000 sale of the *Washington*, a FWS boat which failed to prove herself suitable for an exploratory fishing project in 1948.

The 93-foot vessel was named after *John Nathan Cobb* (1868-1930), an author, stenographer, clerk, magazine editor, conservationist, naturalist, canneryman, and founding director (1919-30) and later dean of the University of Washington's College of Fisheries. From 1895 to 1912, he had worked primarily as a field agent for both the Fish Commission and Bureau of Fisheries.

After her launch on a snowy 16 January 1950 and commissioning a month later on 18 February, the *Cobb* was ready for duty. Specifically designed for exploratory fishing and gear development, the vessel was capable of trawling, longlining, gillnetting, and oceanographic sampling. On board was modern navigational equipment, which included radar, a LORAN navigation system, depth-finders, and an electro-mechanical steering system. The ship was initially assigned to her new home port at the FWS Exploratory Fishing & Gear Research (EF&GR) unit's Seattle base at the Montlake Laboratory.

The *Cobb's* first cruise in March and April of 1950 was to Alaska looking for commercial shellfish (shrimp) populations. During that summer, from June to September, the vessel was cruising in the ocean waters off Washington, Oregon, and Alaska during a search for albacore tuna. In August she was approximately 270 miles off Washington's coast when her crew discovered the Cobb Seamount — an underwater mountain rising nearly 9,600 feet from the ocean floor to within 132 feet of the surface.

During the 1950s, the FWS took full advantage of their new boat. In 1953, the *Cobb* was at the Aleutian Islands being used for

The NOAA ship *John N. Cobb*, R 552. Dave Withrow (AFSC), photographer.

preliminary salmon explorations, primarily to develop fishing techniques with gill nets on the high seas. Later that year, exploratory herring fishing was conducted aboard the boat in Prince William Sound, Alaska, to determine the availability of the species.

In the spring of 1955, the vessel was in the eastern North Pacific Ocean conducting the first surveys of salmon distribution in that area. This work, involving the *Cobb* and other chartered halibut schooners, continued through 1961, at which time the general distribution of salmon in the North Pacific and Bering Sea was substantially established. Also that year, the boat was used to tag petrale sole in the submarine canyon "Esteban Deep" off the west coast of Vancouver Island, B.C.

John N. Cobb

In 1956, the new Bureau of Commercial Fisheries (BCF) was formed under the reorganized U.S. Fish and Wildlife Service (USFWS). The *Cobb* then became a part of the BCF fleet and at the end of her first decade she was being used by the EF&GR in 1959 when it obtained its first SCUBA dive team. "In August 1959, the *Cobb* was involved in 'Chariot Project' with the U.S. Atomic Energy Commission to assess the feasibility of using nuclear explosives off the northwest coast of Alaska to excavate harbors or canals. Fortunately this project never materialized." (Orsi & Heard, 2008 *).

Some examples of her work in the 1960s include refining exploratory techniques in combination with a high-resolution research model echo sounder used to locate dragging areas off Washington that contained commercial quantities of desired fish (1960); cooperation with the Atomic Energy Commission to study deepwater marine resources off Washington and Oregon (1961); and experimental trawling for salmon in Alaska with the BCF ship, *George B. Kelez* (1963).

"These accounts of the *Cobb's* service in the 1950s help to illustrate her value to the Bureau. Of her first 41 trips, 11 focused on experimenting with fishing methods and equipment, 7 involved midwater trawling, 2 for bottom and shrimp trawling, and 2 were for testing a fish pump device.

While the BCF became the National Marine Fisheries Service (under NOAA) in 1970 the 20-year old boat endured. "In the early 1980s, the *Cobb* collaborated on a coast-wide research project sampling juvenile salmon with small-mesh purse seines off the coasts of Oregon, Washington, British Columbia, and Alaska.

With the renewed focus on marine ecology of juvenile salmon and other epipelagic fishes, the *Cobb* helped pioneer using surface rope trawls from 1997 to 2007. Use of these trawls led to the Southeast Coastal Monitoring (SECM) Project and

The *Cobb* ready for launching in 1950. FWS photo.

John N. Cobb

Vessel *John N. Cobb* embarking to Alaska

development of an important long-term data set on biophysical factors affecting fluctuations in interannual year-class strength of salmon populations." (Orsi & Heard, 2008 *).

"The vessel primarily supported research projects in southeastern Alaska for the AFSC's Auke Bay and National Marine Mammal laboratories. Research projects have included: juvenile salmon marine ecology and factors affecting year-class strength, marine mammal surveys (cetacean ecology, humpback whale prey investigations, harbor seal ecology near tidewater glaciers), coral and sponge benthic habitat studies, habitat mapping of near-shore estuaries, sablefish tagging and telemetry studies, juvenile rockfish habitat assessment, oceanographic sampling and long-term coastal monitoring, and support to various remote field camps and the Little Port Walter Marine Station." (Orsi & Heard, 2008 *).

Slated to sail until August 2008, the *John N. Cobb* was forced to become idle 2 months earlier when she broke the main crankshaft in her original 1931 Fairbanks-Morse locomotive engine. Considering the 4-6 months of repairs estimated at $245,000, it was decided to end her lengthy service. She was decommissioned on 13 August 2008 at the Sand Point facility in Seattle as the oldest existing wooden boat in the (NOAA) fleet. She was then listed on the National Register of Historic Places and moved to Salmon Bay in Seattle. As of 2013, the Cobb was owned by the Seattle Maritime Academy, a branch of Seattle Central Community College.

Other Significant Events

One of the most memorable times of the Cobb's remarkable career as a research vessel was after the *Exxon Valdez* oil spill in Prince William Sound on 29 March 1989.

Before the spill the *Cobb* was in an inactive status but was quickly mobilized to play a key role in this major research response. In subsequent years the *Cobb* supported numerous studies evaluating lingering effects of this damaging oil spill to the Prince William Sound ecosystem.

The *Cobb's* career also included at least two high-profile rescue operations and one burial at sea. She came to the assistance of the purse seine vessel *Karen Rae* in Icy Strait in the mid-1990s and the Alaska State ferry Le Conte in 2004 which had run aground on 10 May about 30 miles north of Sitka. (Orsi & Heard, 2008).

John N. Cobb

Printable Facts Sheet

***John N. Cobb* photos in the AFSC Multimedia Gallery**

Audio YouTube video of the 1950 Fairbanks-Morse diesel engine

See Also

- * Orsi, J., and B. Heard. 2008. The NOAA Ship *John N. Cobb* Leaves a Rich Legacy. AFSC Quarterly Report, Apr-June 2008.
- *John N. Cobb* Sails Past Half Century Mark (AFSC Quarterly Report, Oct-Dec 1999)
- A Visit to the R/V *John N. Cobb*, 2013 (posted 6-20-14). Carmel Finley website.
- NOAA's Oldest Ship, *John N. Cobb*, to be Retired. August 13, 2008. (NOAA website)
- National Register of Historic Places designation request for the RV *John N. Cobb*. Registration form, 2008/2009. Source: U.S. National Park Service website)
- McNeely, Richard L. 1963. Development of the *John N. Cobb* Pelagic Trawl -- a Progress Report, p.17-27. In Commercial Fisheries Review, July 1963, 25(7).
- NOAA Marine Operations website

The *John N. Cobb*, FWS 1601. Auke Bay Laboratories photo.

John R. Manning, 20 Years of Exploratory Fishing

John R. Manning Details			
Year built	1950	Draft	8.5′
Location built	Tacoma, WA	Original engine	6-cylinder 320 hp diesel
Builder	Pacific Boatbuilding Co.	Average speed	9 knots
Designer	Pillsbury & Martignoni	Cruising range	8,000 miles
Other names/id	FWS 1002	Known skipper	Joseph Vilicich (1951)
	R. B. Hendrickson		Jewell Pinyon (1963)
	#524645 (USCG ID)		W. Schneider (1963-69)
Length	86.5′	Known service	1950-69
Breadth	24.5′		

The fisheries vessel *John R. Manning* was a wooden West Coast purse seiner built for the Fish and Wildlife Service's (FWS) Pacific Oceanic Fishery Investigations to support experimental commercial-scale purse seine tuna fishing between Hawaii and Palau (about 500 miles east of the Philippines).

The construction was done by the Pacific Boatbuilding Company (Tacoma, Washington), which was in business from 1926-92 and

Purse-seining in the tropical Pacific Ocean, ca. 1950. K. Yee, photographer. NOAA Photo Library.

John R. Manning

built many high-performance vessels during World War II. In early 1950, both the 86-foot *Manning* and another newly built research boat, the *John N. Cobb*, were launched in Tacoma, and soon delivered to the FWS.

The *Manning* was named after John Ruel Manning, a Bureau of Fisheries chief technologist and a pioneer in utilization research whose work demonstrated the nutritive value of fish oils, protein, minerals, and growth factors in menhaden (and other species) fish meals used as ingredients in animal feeds.

In addition to her 320-horsepower Washington Iron Works diesel engine, the *Manning* ran two diesel generators for auxiliary power. She was designed with live bait tanks and gear to support deep trolling and longline fishing operations. The boat was outfitted with modern navigational equipment such as Loran, a radio direction finder, a 250-watt radio telephone and telegraph transmitter, and an automatic steering pilot. Her fuel capacity for an 8,000-mile cruising range was necessary for supporting explorations in the Pacific Ocean where refueling points were scarce.

On 21 February 1950, the vessel left Seattle, Washington, for San Pedro, California, then continued on to her new headquarters at Pearl Harbor (Honolulu, Hawaii). In cooperation with the U.S. West Coast tuna fishing industry, she was used for exploratory tuna fishing around Hawaii and beyond into the Philippine Sea and South Pacific. Because of the scarcity of live bait in the ocean, the *Manning* was also experimenting with alternate capture methods. While the results of purse-seining (for skipjack) and gill-netting around the Hawaiian, Line, and Phoenix islands were generally disappointing, the crew found a 40% improvement in the take of yellowfin tuna using modified longline gear. In addition, during these cruises stomach contents were sampled from albacore, yellowfin, and big-eyed tuna to determine their diets.

The *Manning* was used to support the Fish and Wildlife's Pacific Oceanic Fishery Investigations, and later for exploratory fishing operations in Alaska.
Bureau of Commercial Fisheries (U.S. Fish and Wildlife Service)

By 1954, the boat was traveling between Hawaii and Alaska searching for commercial quantities of Pacific albacore. In 1956, she became part of the Bureau of Commercial Fisheries (BCF) fleet under the reorganized USFWS and was stationed at Juneau, Alaska. The next year she began investigating the occurrence and movement of tuna along the West Coast in connection with the Northeastern Pacific Albacore Survey.

During renovations at Seattle in early 1963, considerable areas of dry rot were uncovered in the vessel's hull, requiring the replacement of entire planks and timbers. Following her repairs, the *Manning* was used for exploratory scallop fishing in the Gulf of Alaska. Later that year, scientists aboard the *Manning* tagged king crabs around Kodiak Island.

In 1963, the *Manning* was also involved in five search and rescue missions – four of which resulted in the successful rescue of about 20 persons total aboard six different endangered vessels.

John R. Manning

Throughout most the 1960s, The *Manning* was used for halibut and other bottom fish surveys, patrol work, and observations on foreign fishing activities in the Bering Sea. In 1967 the vessel was again in the area, assigned to the BCF's Exploratory Fishing and Gear Research Program (EF&GR) for midwater availability studies of Alaska pink shrimp – in which schools of pink shrimp were located at night well above the sea floor in inshore waters by making echo-sounding transects coupled with test drags using a *Cobb* pelagic trawl. In 1968-69 the EF&GR made use of the vessel in Southeast Alaska for exploratory surveys of scallop populations.

No longer needed after 20 years of service, the *John R. Manning* was replaced in 1969 by the newly refurbished FV *Oregon*.

At some later time the *Manning* was sold and renamed the *R. B. Hendrickson* after Ralph Hendrickson, Superintendent of Columbia River Packers Association's (CRPA) Naknek Cannery in Alaska. A 1982 Transportation Research Board "Marine Accidents Reports" abstract mentions the "fishing vessel *R. B. Hendrickson*, grounding and sinking on May 13, 1979".

***Manning* photos in the AFSC Multimedia Gallery.**

The research vessel *John R. Manning*, FWS 1002. Auke Bay Laboratories photo.

George B. Kelez, Oceanographic High-seas Vessel

George B. Kalez Details			
Year built	1944	Length	177.5′
Location built	Decatur, AL	Breadth	32′
Builder	Ingalls Shipbuilding	Draft	10′
Designer	Sturgeon Bay Shipbuilding & Drydock Co. (Wisconsin)	Original engine	900 bhp GM
Other names/id	FS-400 (Army, WWII)	Average speed	10.5 knots
	T-AKL-30 (Navy)	Cruising range	7,300 miles
	CRS 41 & R 441 (NOAA)	Known skipper	Trygve Mathisen (1960s)
	Earl "Bull" Shepard		Roy L. Robeck (1972)
	Rest Express, Mon Repos	Federal service	1962 - 1972 (fisheries)
	Monrepos Express		1972 - 1980 (cont. w/NOAA)
	MV *Croyance*	Disposition	unknown
	Smuggler's Point (post-NOAA)		

The NOAA ship *George B. Kelez*. Captain Robert A. Pawlowski, NOAA Corps, photographer. NOAA Photo Library.

Built by Ingalls Shipbuilding (Decatur, Alabama) in 1944 for the U.S. Army, this AKL-type steel-hull cargo ship was designed by the Sturgeon Bay Shipbuilding & Drydock Co. (Wisconsin), with Nickum & Sons Consultants (Seattle, Washington). This coastal freighter was originally designated the FS-400 by the Army; then used during World War II in the Central Pacific under the control of the U.S. Coast Guard; then transferred from the U.S. Army Transportation to the U.S. Navy's Military Sea Transportation Service on 1 July 1950 and designated the

George B. Kelez

AKL-30. She was then struck from the Naval Register in 1961 and declared excess property at Mare Island, California, that summer.

Following a thorough inspection in late 1961, the surplus AKL-30 was acquired by the Bureau of Commercial Fisheries (BCF). She was renamed the *George B. Kelez* after George Bothwell Kelez (born 1908), one of the agency's pioneering fisheries researchers in Alaska who, while on duty along with four other wildlife employees, died in a plane crash on 1 September 1954.

Bureau of Commercial Fisheries vessel *George B. Kelez*. Auke Bay Laboratories photo.

In February 1962, the *Kelez* was towed from California to Seattle where she underwent 4.5 months of activation and conversion for fisheries research use, costing about $100,000. Most of the work was done by the ship's crew, which entailed the purchase and installation of new equipment, such as fishing/oceanographic devices, and specialized electrical and refrigeration systems. Modifications were also made to the captain and crew quarters.

The vessel's dedication cememony took place on 20 July 1962 in Seattle. Among the participants were George Kelez's mother and brother. A dedication plaque aboard the vessel (see below) read: "Wherever this living ship goes, there goes also the spirit and faith of George B. Kelez, who dedicated and gave his life to conservation of our fishery resources". Mt. Kelez, in the Brooks Range, Alaska, was also named after him earlier in 1954.

The *Kelez's* 6-week shakedown cruise in late July 1962 took her to the Gulf of Alaska and Aleutian Islands for experimental salmon gillnetting. Based out of Seattle, the converted vessel now allowed the BCF, for the first time, to conduct oceanographic and high seas salmon studies during the winter season. Previously, chartered vessels were used for spring and summer work, but they were too small for safe winter operations far offshore and lacked the adequate space for laboratory studies and for gear storage and repair that was available with the *Kelez*.

Throughout the decade, several salmon fishing cruises were made by the Bureau's Biological Laboratory with the *Kelez* around Bristol Bay and other Alaska waters. In addition, the ship took part in several experiments during the mid-1960s for determining ocean current flows by making use of both drift bottles in the subarctic Pacific region and radio-transmitting, oceanographic data-gathering buoys released 300 miles off Washington's coast. In early 1966, the vessel participated in the first winter oceanographic measurement of the Alaskan Stream – a current which closely relates with the formation of the salmon fishing ground – in the western subarctic region of the North Pacific.

George B. Kelez

During the early 1970s some of the cruise activities conducted by the *Kelez* included:

- A summer 1971 cruise in the North Pacific to collect salmon and trout samples which were later analyzed for genetic and maturity studies
- A 21-day cruise in fall 1971 off the coasts of Washington and British Columbia to sample ichthyoplankton and zooplankton populations and field test certain gear (net systems, on-board larvae holding facilities, a seawater chemical concentration autoanalyzer, and a method of computer processing salinity and water temperature data)
- A 39-day cruise in early 1972 in which 2,400 sablefish were tagged in southeastern Alaska
- A 22-day cruise in spring 1972 in the Kodiak region to examine oceanographic and environmental conditions, and to test the operation of shipboard data acquisition devices
- A spring 1972 cruise in Puget Sound and off the Washington coast in to determine suitable structure, towing speeds, and trajectories for zooplankton sampling gear (paired "Bongo" nets)
- A 1972 summer cruise in the Gulf of Alaska to study the distribution and abundance of Pacific salmon

Limited funding during the first three years of the new NOAA reorganization (1970-72) led to reductions in vessel operations and oceanographic studies. Cutbacks near the end of 1972 resulted in the R/V *George B. Kelez* being decommissioned and taken out of fisheries service, though she remained a NOAA ship into the 1980s. In March 1973, she was reactivated and sent to southern California on temporary loan to the Geological Survey. Late the next year, the *Kelez* moved to the East Coast and was based at NOAA's Atlantic Marine Center at Norfolk, Virginia. Bids for repair work to the vessel opened on 6 December.

The "MV *Croyance* - San Lorenzo" (right) at Moss Point, Mississippi, in 2005. Officer Kirk Pellegrin (Pascagoula, Mississippi, Police Dept.), photographer. NOAA Photo Library.

Following the work she was used from 1976-1980 primarily in connection with the Marine Ecosystems Analysis (MESA) New York Bight Project, in which benthic sampling was done to monitor and research the short-term ecological effects of ocean dumping. During this time the *Kelez* was listed with NOAA's Environmental Research Laboratories (1976-77) and Office of Marine Pollution Assessment (1978-79). In January 1980, 35 scientists from 13 countries took part in open-ocean sampling aboard the *Kelez* in Bermuda as part of an

George B. Kelez

intergovernmental project to gather oceanographic data on the effects of common pollutants.

The ship was apparently purchased in April 1982 by the the Seafarers Harry Lundeberg School of Seamanship and renamed the *Earl "Bull" Shepard*. She was used by the school until being sold in February 1994 and over the next 10 years likely had other names such as the *Rest Express, Mon Repos*, and *Monrepos Express*. In 2005, the same vessel was spotted rusting away at Moss Point, Mississippi, under the name MV *Croyance,* out of San Lorenzo, Honduras (see photo). Within a year she was acquired by the Omega Protein Corporation and then renovated into a menhaden fishing vessel named the *Smuggler's Point*.

George B. Kelez photo in the AFSC Multimedia Gallery

Additional Reading

*French, Robert, R. 1963. Activation of U.S. Bureau of Commercial Fisheries Research Vessel *George B. Kelez,* p. 6-13. In Commercial Fisheries Review, August 1963, 25(8).

The Dedication Plaque

In 1962 the inscription on the plaque placed aboard the *Kelez* was read aloud during the dedication ceremony:

"United States Bureau of Commercial Fisheries Motor Ship *George B. Kelez*"

"To inspire those who man her and those who follow her course in the great international seas, this research ship is hereby dedicated to the honor of George B. Kelez, Fishery Research Biologist and Alaska Fishery Administrator of the U. S. Bureau of Fisheries and Fish and Wildlife Service from 1930 to 1954. This ship and her scientists will further the research ideals and objectives on the high seas and in Alaskan waters which motivated his entire career. Wherever this living ship goes, there goes also the spirit and faith of George B. Kelez, who dedicated his life to conservation of our fishery resources. We are proud of the name, proud of the vessel and proud of the crew. May our Lord protect and guide you."

Signed by Samuel J. Hutchinson, Regional Director, 20 July 1962.

Miller Freeman

Miller Freeman, Research Trawler from 1967 to 2013

Miller Freeman Details			
Year built	1967	Breadth	42′
Location built	Lorain, OH	Draft	20′
Builder	American Shipbuilding Co.	Original engine	2,200 hp GM diesel, with 3 auxiliaries
Designer	Philip F. Spaulding	Average speed	12.5 knots
Other names/id	R 223, FRS 21 (both NOAA)	Cruising range	13,000 miles
	#508932 (USCG ID)	Fisheries service	1967-2013
Length	215′	Disposition	decommissioned 2013

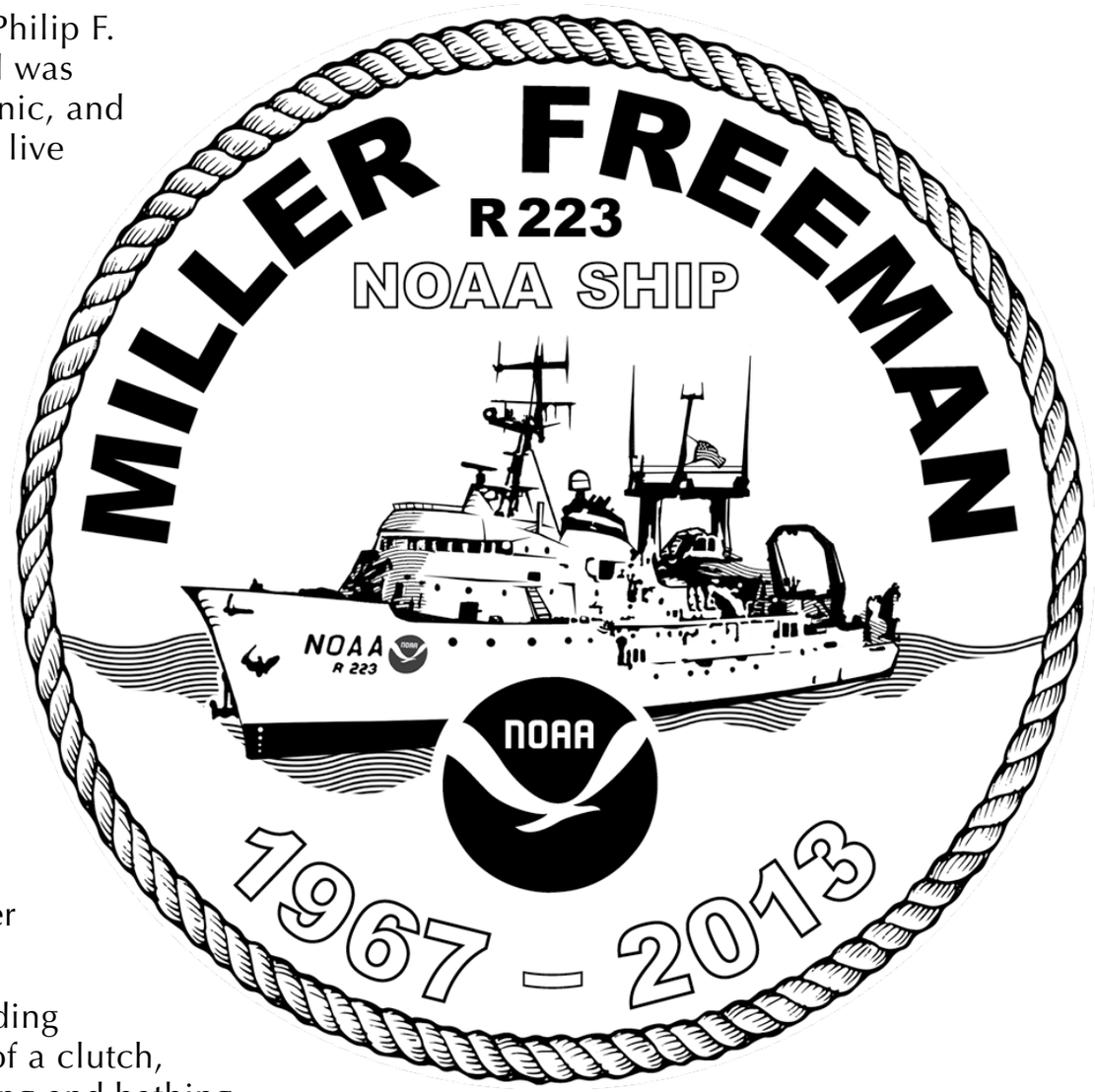
NOAA ship *Miller Freeman*

In the mid-1960s the Bureau of Commercial Fisheries (BCF) required a large vessel for its Biological Laboratory in Seattle, Washington, for oceanographic research and high-seas fishery investigations. Costing nearly $3.4 million, the 215-foot *Miller Freeman* became the newest and largest BCF research ship to date when her hull was launched at Lorain, Ohio, on 2 April 1966.

The vessel was named after Miller Freeman (1875-1955), a publisher/editor who, among other publications, founded the trade magazine "Pacific Fisherman" in 1903. He went on to become president of Miller Freeman Publications, Inc. and served on the Pacific Fisheries Conference, North Pacific Fisheries Treaty, and International Halibut Commission. Freeman became a long-time advocate for fishermen and the development and preservation of U.S. fisheries.

Miller Freeman

The Pacific stern trawler *Freeman* was designed in 1965 by naval architect, Philip F. Spaulding. The ship could accommodate 10 scientists and a crew of 26; and was equipped with laboratories for oceanographic, biological, chemical, electronic, and physical process studies. A large living-room-sized live-tank system allowed live sea specimens to be sustained under pressure.



The *Freeman's* stern-ramp configuration allowed for trawling operation in deep-sea waters. She had a 2-ton capacity articulated crane (13' horizontal reach) mounted on the port-side forecastle, but lacked any lifting capability on the after deck. Among the installed equipment were a Triton fish counting echo sounder, Loran, a 48-mile-range Decca radar and Apelco automatic radio direction finder. With a large fuel capacity of 150,155 gallons, which provided a 13,000-mile cruising range, and water tanks for holding 7,350 gallons of fresh water, the *Freeman* was able to remain at sea for long periods of time.

"A major and unique asset is the 12-foot retractable centerboard and its contribution to the quality of the hydroacoustic surveys and other acoustic data collection. The ability to move the ship's hydroacoustic fish survey, acoustic doppler current profiler, and other transducers on the bottom of the centerboard, away from the acoustic noise created by the hull, significantly enhances the quality of the data collected and the scientific products based on that data." (NOAA Office of Marine & Aviation Operations flyer). This stabilizing device also helped reduce roll whenever the vessel was stationary while fishing or gathering oceanographic data.

Other special features include a hydraulic variable-pitch propeller for providing precision control from the wheelhouse over engine speeds without the use of a clutch, two evaporation distillers capable of producing 3,600 gallons of fresh cooking and bathing water from sea water, and an intake probe on the bow which filters salt-water for use in chemical analyses and the aquariums aboard ship.

In 1967 after the remaining construction was complete, the *Freeman's* shakedown cruise took her from Ohio, down through the Panama Canal, and on to arrive at her new home port in Seattle late in the year. It would not be until 1969, however, before the ship sailed to the southern Bering Sea for the Auke Bay Laboratory's oceanographic and crab surveys.

Her early service was again suspended when she was temporarily deactivated on 1 July 1970, due to lack of funding. At the end of 1972, further cutbacks put a stop to the ongoing work which was being done to prepare the vessel for her eventual reactivation. It would be 5 years before the

Miller Freeman

Ice creates difficult conditions aboard the *Freeman*. Photo credit: NOAA OMAO Pacific Marine Center. NOAA Photo Library.

ship was reactivated and fully rigged in 1975. At this time she was finally equipped with the much needed 5-ton lift crawler crane for her after deck.

When the *Freeman* returned to action in 1975 she worked in the Gulf of Alaska and Bering Sea for energy-related biological baseline studies. Much of her duties that year were with the NOAA Offshore Continental Shelf Survey and Assessment Program primarily doing resource surveys for MARMAP (Marine Resources Monitoring, Assessment, & Prediction Program).

On 22 October 1975, she received a request from the U.S. Coast Guard to assist in the rescue of the crab vessel *Aquarian*, which had lost her steering in the Aleutian Island chain. Despite the rough seas in 40- to 60-knot winds, the *Freeman's* crew was able to toss a line to the distressed boat and safely tow her to Akutan Island -- ending the 2-day ordeal. The following year, mastodon (or mammoth) tusk, tooth and mandible fragments were discovered during trawl hauls done by the *Freeman* in the Chukchi Sea (and Kotzebue Sound), of interest to the research concerning the Bering Land Bridge.

Over the years the *Miller Freeman* continued to be a valuable asset to NOAA and the Alaska Fisheries Science Center, serving as a working support platform for the study of the ocean's living resources. Through the early 2000s, the ship remained one of the largest research trawlers in the United States, until October 2010, when she was placed in inactive status. The *Freeman* was decommissioned on 29 March 2013 in Seattle and sold at auction later that year on 5 December for $337,550.

***Miller Freeman* photos and a video in the AFSC Multimedia Gallery.**

See Also

- NOAA Marine Operations website

◁ Vessels: Newer Research Ships

Fairweather, Survey Vessel

NOAA ship *Fairweather* is a hydrographic survey vessel whose primary mission is to map coastal waters to update nautical charts. In addition to supporting marine navigation, *Fairweather's* data is also used for marine ecosystem studies, fisheries habitat mapping and ocean research.

The ship's side scan sonar collects imagery of the sea floor, which can identify obstructions or wrecks that could be navigational hazards, and identify characteristics of interest to biologists and geologists. The sonar emits sounds waves in a swath, which generates a detailed image of objects on the sea floor.

To obtain accurate depth measurements (within 10 centimeters), the ship uses multibeam echo sounders. The bathymetric data can be converted into three-dimensional models to provide extremely accurate depths and detailed images of the sea floor and objects. The ship also has hydrographic survey launches that conduct surveys in shallower water depths the ship cannot access. The launches are fitted with sonar similar to those used by the ship.

NOAA ship *Fairweather*, commissioned in 1968. NOAA Photo Library

Commissioned in 1968, the 231-ft. ship is named after Mount Fairweather, the tallest peak in the Fairweather Range at 15,300 feet above sea level, located in Alaska's Glacier Bay National Park and Preserve. Captain Cook named Mount Fairweather in 1778. This hydrographic survey vessel primarily operates in Alaska coastal waters and is homeported in Ketchikan, Alaska.

To learn more about *Fairweather's* nautical charting mission, visit www.nauticalcharts.noaa.gov.

See Also

- Office of Coast Survey website

Cripple Creek, Very Brief Service With The National Marine Fisheries Service

Crripple Creek Details			
Year built	1953	Length	65'
Location built	San Diego, CA	Original engine	D-375 Caterpillar
Builder	National Steel & Shipbuilding (?)	Known skipper	Augustine Barcott (1972)
Designer	unknown	NMFS service	1971-73
Other names/id	T-446 (Army, 1953-?)	Disposition	excessed in 1973
	Curlew (USFWS, since 1970s)		

This steel-hulled vessel was built in 1953 for use in the Korean War by the U.S. Army. Designated the T-446, she was originally designed for running rivers, harbor tug work, and transporting passengers and cargo.

Information about the boat's ownership and activities after her construction is lacking until the latter 1960s. At this time she was the property of the Bureau of Mines Marine Technology Center (BMMTC), stationed at Tiburon on San Francisco Bay in California. Extensive modifications were made to the vessel by the BMMTC for conducting ocean undersea seismic mineral exploration surveys.

By 1967, the vessel was being used significantly for testing various equipment on open sea cruises off the U.S. West Coast. Because of her design, however, the BMMTC felt that the boat was too unstable of a platform to continue using her for this work.

In 1969, the *Cripple Creek* – named after a famous mining camp – was acquired from the BMMTC by the U.S. Fish and Wildlife Service (USFWS) for use by its Bureau of

The *Cripple Creek* threatened by ice after a severe storm hit Kodiak, Alaska, in January 1972. Doyne W. Kessler (NMFS), photographer. NOAA Photo Library.

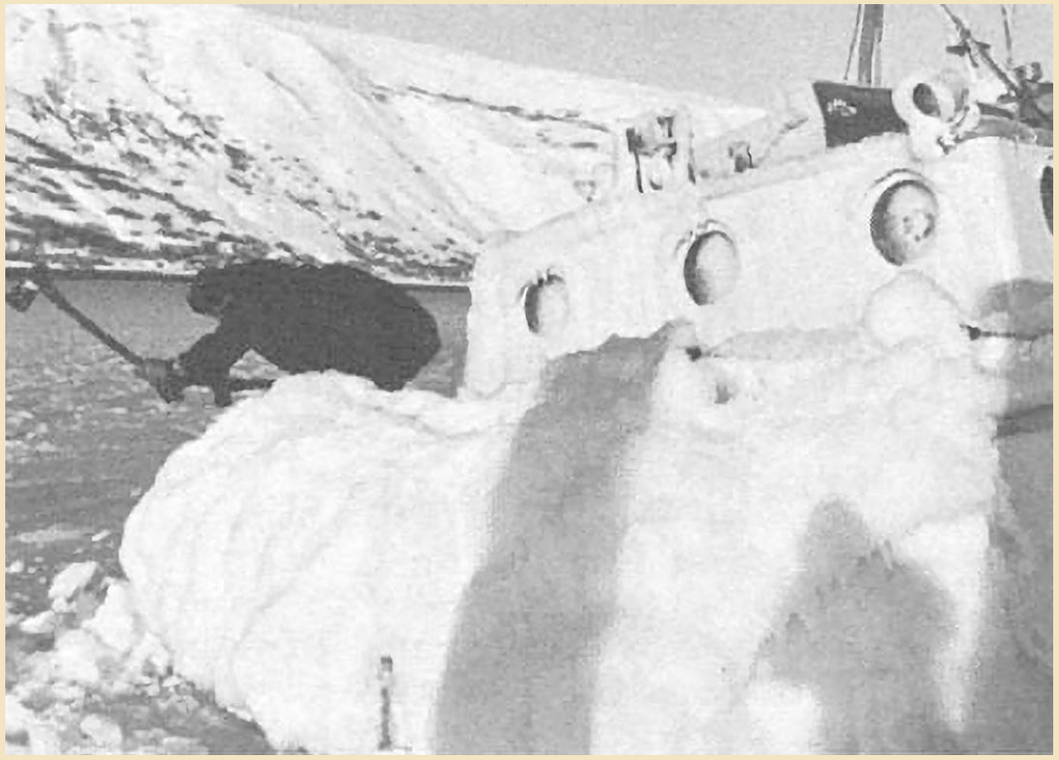
The USFWS vessel MV *Curlew*. Charity Haring, creator. USFWS National Digital Library photo.

Cripple Creek

Sport Fisheries and Wildlife (BSFW). After obtaining the boat, the BSFW put her to use in Alaska for an eagle survey project. Following this work, she was sent to Seattle, Washington, where extensive renovations were made. The *Cripple Creek* then returned to Alaska to be based out of Juneau where she was used considerably as a base for bird work in Southeast Alaska, under the Raptor Management Program.

The National Marine Fisheries Service (NMFS) acquired the 65-foot vessel around April 1971. She was brought to Seattle where most likely the stabilizers (or rolling shocks) she had were installed to minimize the rolling problem she experienced. The boat then returned to Alaska, arriving at her Kodiak headquarters on 11 August. She was used briefly in Prince William Sound before being deemed too unstable for open ocean work and consequently docked where she remained unused for well over a year.

On 17 January 1972, while being moored at the Kodiak Naval Station pier, the *Cripple Creek* found herself severely listing from ice – built up over 2 feet in places – after exposure to a violent storm of sustained 70-mph winds (see photos on this page). Staff at the Kodiak laboratory had to brave the cold and spent several hours chipping away the ice to prevent the vessel from keeling over.



An axe is used to remove ice from the stern of the *Cripple Creek*. NOAA photo.

The *Cripple Creek* was excessed by NMFS in 1973 and the USFWS reacquired her only to find she had badly deteriorated while being idle. Extensive icing had caused damage. The engine, generators, bathroom and other systems no longer worked. Garbage and filth had accumulated from the transients who had been living aboard. The vessel saw new life when she was completely retrofitted inside and out. She also received a new name, the *Curlew*, after the endangered shorebird, Eskimo curlew.

Since the early 1970s the USFWS Ecological Services Division has operated the research boat. Some of the work done with the *Curlew* over this time has included transporting game, studying shipwrecks to understand coldwater deterioration and effects of wrecks on marine environments, sampling marine sediment for mining contaminants, and conducting numerous bird surveys.

The *Curlew* was in use by the USFWS until 10 October 2012, when she was sold at auction in Juneau for $92,015.

The Pribilof Islands Tender Vessels

The Pribilof Islands Tender Vessels

A "tender" is a dedicated supply vessel used to transport passengers and cargo to and from the Pribilof Islands.

Pribilof Tenders Acquired 1915-64

		(length, year built)
1915	Roosevelt	(182 ft, 1905)
1919	Eider	(88 ft, 1913)
1930	Penguin	(130 ft, 1930)
1948	Dennis Winn	(148 ft, 1944)
1950	Penguin II	(148 ft, 1944)
1964	Pribilof	(223 ft, 1954)

Following the 1867 U.S. purchase of Alaska from Russia, the northern fur seal populations on the Pribilof Islands (St. Paul and St. George) were the first natural resource to be harvested in the new territory. In just over 30 years following the acquisition of Alaska, the U.S. Treasury received net revenues from the fur seal industry which more than covered the $7.2 million purchase price.

From 1870 to 1909, reckless commercial harvesting was significantly impacting the seal population on the Pribilofs. Such harvests were carried out, in part, by private companies who leased the islands during this time from the U.S. Government. On 21 April 1910, the U.S. Congress directed the U.S. Secretary of Commerce and Labor to assume immediate total responsibility for the management and harvest of northern fur seals, foxes and other minor fur-bearing animals. As for the previous lessees, this responsibility also extended to the care, education and welfare of the Aleut communities of the isolated Pribilof Islands. Under the Secretary's direction, the Bureau of Fisheries (BOF) was assigned administration of the Pribilofs and on 9 May 1910, annual instructions were finalized the Bureau's agent in charge of seal fisheries, Walter I. Lempkey.

The new duties of BOF included the coordination of transporting cargo and personnel to the Pribilofs and nearby island communities from the supply sources at San Francisco, California; Seattle, Washington; Dutch Harbor and Unalaska (both in Alaska). Initially,

The Pribilof Islands Tender Vessels

Lembkey was tasked with the matter of providing a suitable vessel to serve as a tender for the Pribilofs.

On 17 May 1910, Lembkey left Washington D.C. for San Francisco where, on 26 May, he chartered for $142.50 per day the steamer *Homer*– a vessel which had hauled seal skins from St. Paul Island in the previous year. Food, clothing, and other supplies for the island inhabitants and workers were purchased and loaded aboard the *Homer*, which left for the Pribilofs on 11 June 1910.

The *Homer* would be the first of several dedicated Pribilof Islands tenders to regularly make the long and often rough voyage between the U.S. West Coast and the Bering Sea. During these 5 years, the *Homer* was also used at times to enforce the North Pacific Fur Seal Convention Act of 1911, which prohibited the pelagic harvest of marine mammals near the Pribilof Islands. In 1914 the base of purchasing annual supplies for the Pribilofs was moved from San Francisco to Seattle and the private steamer *Melville Dollar* was chartered by the BOF to transport the $40,000 of annual supplies, and passengers, to the islands. In addition to their regular patrol duties, U.S. Coast Guard and Treasury Department ships, and occasionally U.S. Navy vessels, continued to also share in this role of providing supplies for the islands.

By 1914 the cost of charters reached $250 or more per day, and since 1910 over $100,000 had been spent on trips to the Pribilofs. Over one-third of this cost was estimated to have been incurred from the inefficient manner of transporting supplies between the islands and the ship, anchored offshore due to the lack of adequate landings. To haul the cargo, an expensive rowboat (skin-covered "bidarrah" or

USS Roosevelt

The Pribilof Islands Tender Vessels

"baidar") was used to go back and forth between the ship and shore. Since weather and water conditions were always a factor, this was often a slow and costly process which sometimes required several weeks to complete just the unloading at both islands. Owing to costs, the BOF sought to acquire its own ship dedicated to the service, knowing that the various activities required a large seaworthy vessel for operation in the open and often stormy waters of the Bering Sea. In 1917, the Bureau assigned its own vessel, the *Roosevelt*, to this duty for the first time.

The Pribilof tenders routinely carried various cargo (e.g., lumber, machinery, tractors, building materials, mail, salt, coal, food, general supplies, etc.) and passengers (doctors, dentists, teachers, employees, dignitaries, workers, store keepers, etc.) to and from the Pribilof Islands and other nearby Alaskan communities. Their arrivals were highly anticipated and met with enthusiasm by the local residents – any delays resulted in much anxiety. On each return trip south from the islands, the vessels would haul valuable seal skins and the byproducts from the harvests such as seal oil, meal, and bones (for conversion into fertilizer).

The *Eider* on a winter trip to the Pribilofs. Bureau of Fisheries photo, 1927.

Eventually, the U.S. Government's control over operations on the Pribilof Islands began to decline, and in 1975 the Agency's last tender, the *Pribilof*, was sold. As one facet of the Fur Seal Act of 1966, all Native people on the islands were to become self-sufficient and locally self-governed – processes already in motion on St. Paul Island. During the 1970s, the Agency – now the National Marine Fisheries Service (NMFS) – began transferring the fur seal operations along with federal land and buildings to the local communities.

Featured in this section are the six federal vessels which served as Pribilof tenders for 60 years, owned by the U.S. Fisheries Service under its various names – Bureau of Fisheries (1903-39), Fish and Wildlife Service (1940-55), Bureau of Commercial Fisheries (1956-69, USFWS) and National Marine Fisheries Service (1970-, NOAA).

The Pribilof Islands Tender Vessels

Restoring Control

As a result of the 1971 Alaska Native Claims Settlement Act, thirteen Native corporations were formed to represent the various tribes through land ownership and management, employment, resource development, business ventures, etc. In addition, certain government lands were transferred to Native Alaskans.

On 13 October 1983, the entire control of the commercial fur seal industry and management of the Pribilof Islands was relinquished by NMFS. With the exception of federal facilities and lands (such as seal and bird rookeries), the administration of the islands was then assumed by the local Native communities. After the expiration of the 1957 Interim Convention on Conservation of the North Pacific Fur Seals in 1984, the fur seal industry collapsed and the Pribilovians struggled with what to do next. After 14 October 1984, fur seals (and sea lions) were harvested only for Native subsistence. The Aleuts soon learned to profit from the highly productive local crab and fish resources.

Through cooperation with tribal governments, NMFS continued the scientific study of fur seals and their harvest on the islands. NMFS also retained ownership of some land and historical structures. Near the end of the 1990s and into the 2000s, NOAA took responsibility for the environmental restoration of the Pribilof Islands. Nearly 8,000 tons of debris which had accumulated over the years were removed. Other work entailed contaminated soil clean-up, ground reseeding, development of new solid waste landfills, and the restoration of some historical buildings.

Roosevelt, Bureau's First Pribilof Tender

Roosevelt Details			
Year built	1905	Draft	16'
Location built	Bucksport, ME	Tonnage (tons)	654 gross
Builder	McKay & Dix	Original engine	1,000 hp compound
Designer	unknown	Known skipper	Hans Bierd (1918-19)
Other names/id	SP-2397 (Navy, WWI)	Pribilof service	1917-19
Breadth	35.5'	Disposition	sold in 1919

Peary's 3-masted steamer *Roosevelt* at Newburgh, New York, in 1909. Detroit Publishing Co. photo collection. Library of Congress.

In 1915, the Bureau of Fisheries (BOF) purchased its first dedicated Pribilof Islands tender for $40,000 in New York. Before the *Roosevelt* could be used, however, she required extensive overhauling and wasn't actually ready for Alaska service until 1917. In the meantime, the U.S. Navy collier *Saturn* was used by the Bureau to service the Pribilofs in 1915, and in 1916 the steamer *Elihu Thomson* was chartered from the Pacific Cold Storage Company of Tacoma, Washington.

At a cost of $150,000 provided by the Peary Arctic Club, the steamship *Roosevelt* was built specifically for Robert Peary's 1905 and 1908 Arctic explorations. The ship was named after President Theodore Roosevelt, who had been openly supportive of Peary's expeditions. McKay and Dix Shipyard in Bucksport, Maine, constructed the 1,600-ton, 184-foot schooner. Launched on 23 March 1905, the *Roosevelt* was christened by Peary's wife, Josephine. The ship's thick flexible wooden and steel-sheathed hull was uniquely braced by struts, providing ample protection while traveling through, or being held in, frozen ice. The egg-shaped hull design allowed her to ride above the ice, rather than being crushed by it. The vessel had sails on three masts, a high-powered steam engine, and a large propeller on a 1-foot diameter shaft designed to push her through thick ice.

Roosevelt

Following her historic journeys to the Arctic, the *Roosevelt* was purchased in 1910 by John Arbuckle, "the great tea, coffee, and sugar merchant of Brooklyn" according to Peary. Arbuckle's personal interest was salvaging wrecked ships. He significantly modified the *Roosevelt* into an ocean-worthy wrecking tug that successfully recovered several large steamships, such as the *Yankee*, and other shipwrecks. After Arbuckle's death in 1912, the *Roosevelt* remained inactive with the rest of his salvage fleet near the Brooklyn Bridge in New York until she was purchased by the BOF in 1915. The Bureau felt a vessel of this type was necessary for the long open supply runs in the Bering Sea between the two main Pribilof Islands (St. Paul and St. George – some 40 miles apart) and Unalaska, which was 250 miles away from the Pribilofs in the Aleutian Islands chain.

The *Roosevelt* experienced a considerable delay in getting to the Pacific Northwest. In July 1915 – while sailing from New York to Norfolk, Virginia, to pick up coal for the Pribilofs – the Bureau's new tender experienced significant mechanical failure requiring repairs at the Norfolk Navy Yard. A thorough inspection revealed that additional work was needed, including a general overhaul. A significant part of this work required replacing the coal-fired engine with an oil-burning one, and restoring the foremast, which Arbuckle had removed. Another improvement included the installation of a more efficient 3-blade propeller. At the end of summer 1916, the overriding demands for steel during World War I created a delay for forging the new tail shaft, which further prevented the vessel from sailing for several months.

By this time the total cost of the ship and its repairs had reached $72,000 – still a bargain compared to the minimum $100,000 cost of building a new vessel that would meet the Bureau's requirements.

While the *Roosevelt* was lying idle, the 8th annual Convention of the Southern Commercial Congress was being held in Norfolk during the month of December 1916. Both the *Roosevelt* and the Bureau's steamer *Fish Hawk* participated in the event by exhibiting several fishery-related items and devices.

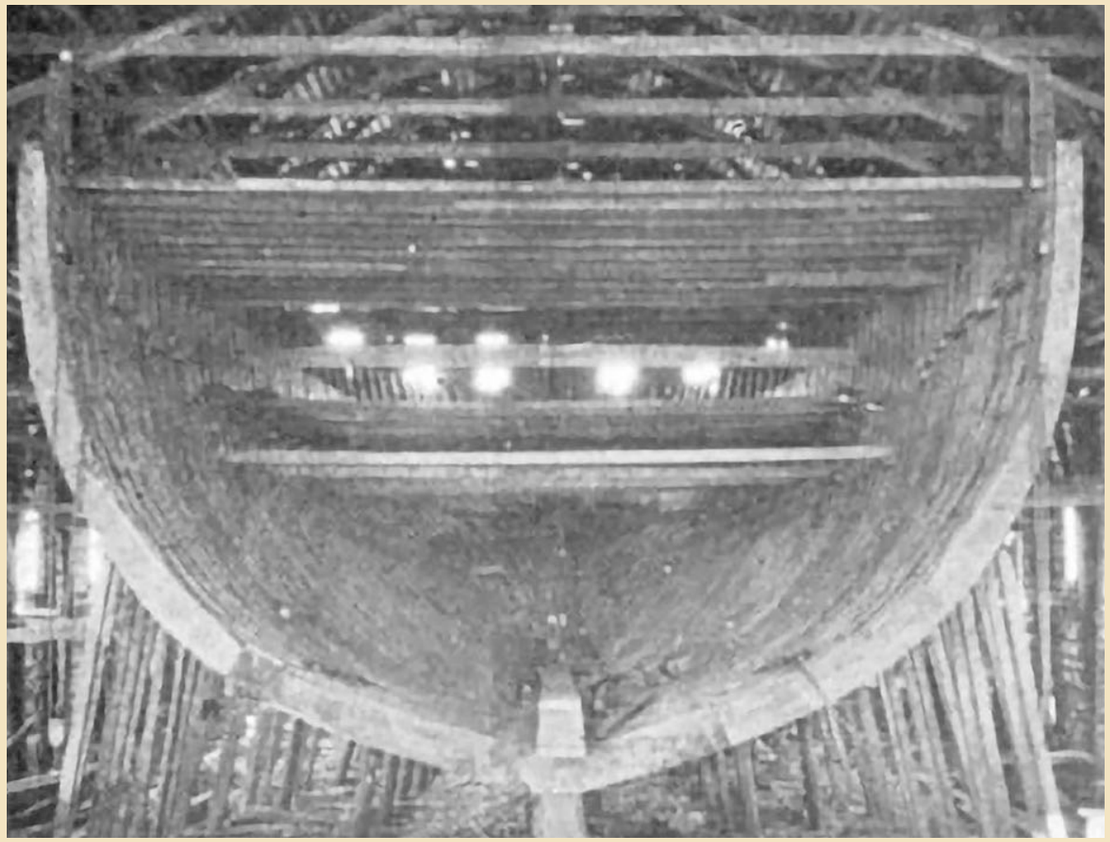
Soon afterwards, on 23 January 1917, the *Roosevelt* finally sailed for Seattle, Washington, but was impeded by an international incident which detained the vessel for over a month at Guantanamo, Cuba. This event was followed by yet another delay of 3 weeks for necessary repairs at Balboa, Panama.

At last on 23 April 1917, the *Roosevelt* arrived in Seattle bringing with her supplies for the U.S. Navy and the Bureau of Lighthouses. That summer, a dedication took place on 4 July to mark the opening of Seattle's new Government Locks, connecting Puget Sound with the Ship Canal and Lake Washington. The *Roosevelt* became the first large ocean-going vessel to enter the canal when she led a flotilla of hundreds of boats – including the Bureau's newly built Alaska boat, *Auklet*.

By year's end, the *Roosevelt* had made two trips to the Pribilofs with personnel, building materials and various supplies. On her return trip in August, she hauled 4,882 fur seal skins and 606 fox skins to Seattle for rail shipment to St. Louis, Missouri, where they were prepared for auction. For her first year of service, it was estimated that the work done by the *Roosevelt* versus using hired or chartered vessels, as previously done, had more than the covered the cost of purchasing the ship. Perry Moore, of the Foss Company, was aboard the *Roosevelt* in 1917 and later recalled that his trip was "plagued with severe storms, engine breakdowns and a mad man...loose with a fire axe".

In 1918, the *Roosevelt*'s January voyage marked the first time that it was possible to sail reliably to the Pribilof Islands in the winter. That spring the vessel became involved in a dramatic sequence of events. First, on 27 April, the *Roosevelt* debarked Seattle for the Pribilofs filled with cargo, including three 1-ton trucks. The ship was unloading supplies at the Pribilofs when diphtheria broke out among her crew. After the St. Paul Island physician administered the antitoxin, the *Roosevelt* steamed to Unalaska for quarantine. Fortunately for the island inhabitants, the disease was confined to the ship.

Roosevelt



The *Roosevelt*'s hull during construction, 1904-05; (right) midship cross section looking aft, (left) massive trusses strengthen the sides against ice pressure (horizontal timber pictured is 14" x 16"). Photos from R. E. Peary. 1917. "Secrets of Polar Travel".

Then while quarantined at Unalaska, disaster struck in Bristol Bay. Several cannery vessels filled with workers became stuck in pack ice, facing destruction and death. The quarantine delayed the *Roosevelt*'s rescue attempt for 3 days until 27 May. Her hull design allowed her to cut through the heavy ice – 16 feet thick in places – and save 21 people from the sunken vessel Tacoma who had sought refuge on an ice floe. The remaining 115 passengers had managed to board another endangered ship, the *St. Nicholas*, which at the time was within an estimated 12 hours of sinking.

Fortunately, the *Roosevelt* had arrived on the scene in time. For the next few weeks her captain, Hans Bierd, and crew safely towed five vessels out of danger. Three of these ships were the *St. Nicholas* with over 300 onboard, the *Centennial* with 161 persons, and the *Star of Chile* with 220. Remarkably, the *Roosevelt* received only minimal damage during the ordeal. As a result, the cannery associations sent letters of appreciation and commendation to the *Roosevelt*'s captain and crew.

During World War I, suitable seagoing BOF vessels, including the *Roosevelt*, were transferred to the U.S. Navy for military use. From 18 March 1918 to 11 June 1919, the *Roosevelt* was available to the Navy, which installed three 3-pound guns onboard and identified the ship as SP 2397. The vessel was based at Seattle and patrolled the U.S. West Coast and Alaska waters, while continuing the transportation of general cargo and skins to and from the Pribilofs for the BOF.

Roosevelt

The *Roosevelt* leads a parade of hundreds of vessels during the formal opening of the Lake Washington Ship Canal in Seattle on 4 July 1917.
Photo from the PEMCO Webster & Stevens Collection, MOHAI.

On 17 January 1919, it was reported – and later confirmed by Steamboat-Inspection Service surveyors – that the *Roosevelt* was once again in need of extensive repairs and overhauling. The ship was taken to the Puget Sound Naval Shipyard at Bremerton, Washington, on 21 April. Dry rot had set in and after additional inspections it was decided that the $186,000 cost for the necessary work was too high. Consequently on 4 June, the *Roosevelt* was condemned and moved to Seattle for auction. Captain Bierd resigned his commission on 18 June and the crew remained long enough to transfer equipment from the *Roosevelt* to her replacement, the newly purchased tender, *Eider*. On 15 July 1919, the *Roosevelt* was sold for $28,000 to the high bidder, Capt. M. E. Tallakson.

After her brief period with the BOF, the *Roosevelt* continued to operate in the Pacific Northwest as a 700-ton-capacity freighter. In April 1923, the West Coast Tug Company acquired the ship and modified her into a powerful ocean towing tug, considered the largest commercial tug on the West Coast. For 18 months she made outstanding tows in all weather and in record times. The largest tow ever recorded at the time for a single tug occurred in June 1924, when the *Roosevelt* pulled the 16,000-ton battleship *Connecticut* from Seattle to Oakland, California.

On Christmas Eve in 1929, the *Roosevelt* was towing the ex-mail vessel *Starr* in a heavy gale, when she became disabled after the tow line parted and tangled in her propeller – the *Starr* managed to set anchor during the ordeal. While drifting dangerously close to Wessels Reef, near Middleton Island, Alaska, the *Roosevelt* was rescued by the persistent efforts of Captain Peter Wold and his crew of the halibut schooner *Attu*, who were able to pass over a tow line.

Late December 1931, the ship was nearly lost at sea in a horrendous gale off Vancouver Island while towing the racing schooner *Commodore*. The *Roosevelt*'s towline apparently parted. Her radio room became flooded and before the radio failed, the broken distress calls from the seven-man crew included "For God's sake hurry" and "...does not appear to have much chance to survive." Fortunately, the *Roosevelt* managed to seek shelter at Neah Bay, off the northwest coast of Washington and rode out the storm.

The aging tug had her final known inspection in 1936 and was purchased shortly thereafter by the California Towing Company of San Francisco. On 31 October 1936, the *Roosevelt* left Seattle with the *Jason*, a former U.S. Navy collier, in tow to New York City for scrapping. The heavy tow and rough seas, however, proved too much for the *Roosevelt*. About 250 miles after passing through the Panama Canal with a leaking hull, she

experienced serious engine and boiler problems and was forced to turn around. She limped back to Cristobal, Balboa (Panama), and was salvaged by her crew to compensate for long overdue wages. To keep her from sinking, the *Roosevelt* was beached and abandoned in mid-January 1937 on a mud bank in the Old French Canal – a vessel graveyard where the worn out historic ship was left to slowly rot away with time.

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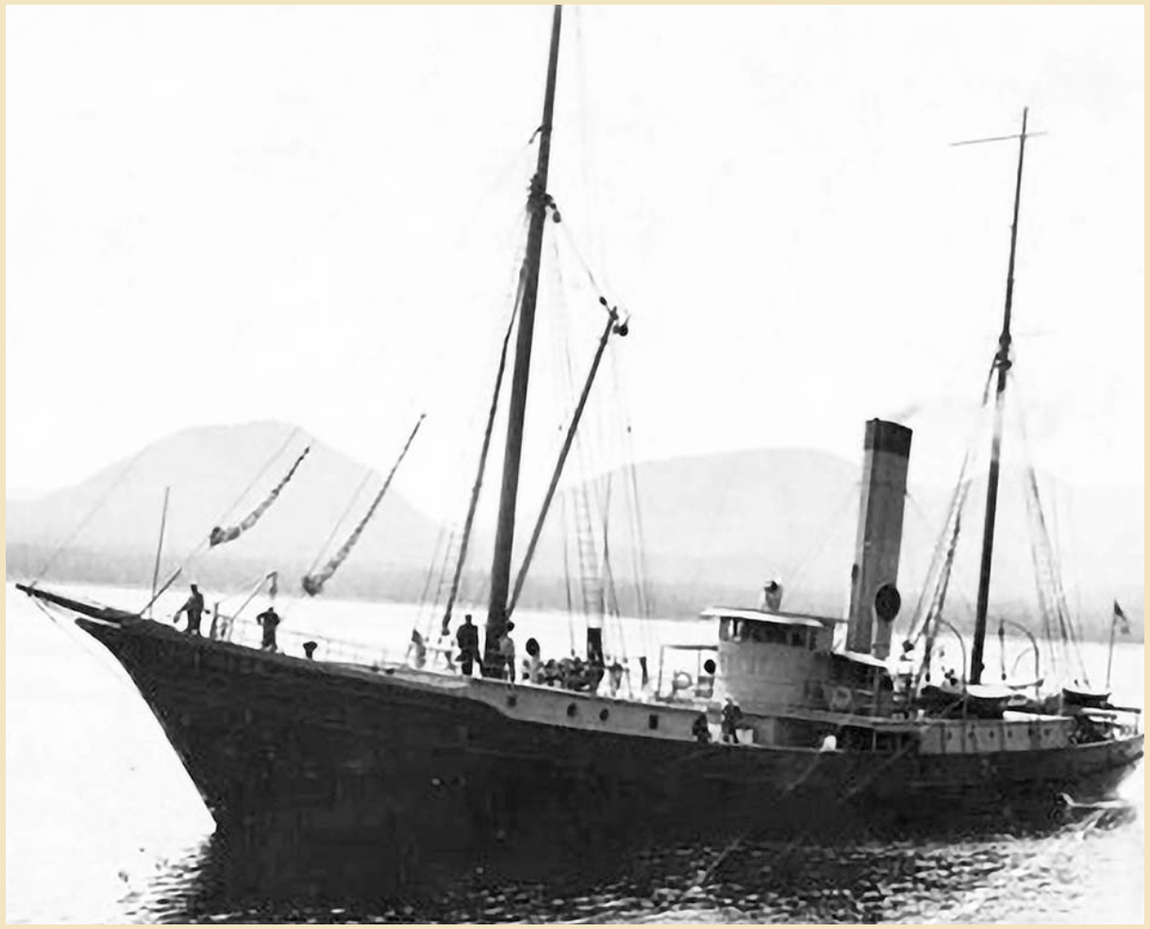

The 2-masted *Roosevelt* near Ketchikan, Alaska. Sadlier-Olsen Family Collection photo, ca. 1898-2001, ASL-P289-126. Alaska State Library.

"For Sale"

A publication announcement in 1919 for the selling of the *Roosevelt* read:

"FOR SALE – The U. S. Fisheries steamer *Roosevelt* will be sold at public auction to the highest bidder on July 15, 1919, at 10 a.m., at Salmon Bay Wharf, Seattle, Wash., at which place the vessel may be examined by interested persons prior to time of sale.

The *Roosevelt* is a wooden, single-screw, oil-burning steamer built in 1905, length, 182 feet; breadth,

35 ft. 5 in.; and depth, 16 ft. 2 in. The vessel is of 654 gross tons. It has two Scotch boilers, built in 1907, and compound engine of 1,000 h.p. Fuel capacity is 859 barrels. Equipped with wireless. Vessel will be sold without boats or movable equipment."

The *Roosevelt* was acquired by the Washington Tug and Barge Company of Seattle in November 1924 and towed lumber barges between Puget Sound and California. Her delivery schedule again proved impressive, averaging two round trip runs per month. On a 6-day trip in August 1925 to San Pedro, California, she averaged 8 knots while towing the ocean-going barge *Decula* loaded with 2.4 million feet of lumber. That winter while towing two barges from Seattle to Florida, the *Roosevelt* lost her rudder and drifted for days in the Pacific before help arrived.

Penguin, Pribilof Tender for 20 Years (1930-50)

Penguin Details			
Year built	1930	Average speed	10 knots
Location built	Seattle, WA	Cruising range	4,000 miles
Builder	Ballard Marine Railway Co.	Known skippers	Amund Anderson (1930)
Designer	H. C. Hanson		Elias Boe (1931)
Other names/id	Carib Queen		Harold P. Knutsen (1940-46)
Breadth	27'		Giovanni Knudsen (1946)
Draft	17' 10"	Pribilof service	1930-50
Tonnage (tons)	394 gross	Disposition	Damaged by fire in 1950
Original engine	twin 400 hp, 6 cyl., direct reversible Union full diesels		

The *Penguin*. Auke Bay Laboratories photo.

To satisfy the Bureau of Fisheries' (BOF) need for a new Pribilof tender to replace the *Eider*, Congress appropriated $125,000 to construct the BOF's largest Alaska vessel to date, the *Penguin*. The contract to build the wooden ship was awarded to the Ballard Marine Railroad Company of Seattle, Washington, with their low bid of $89,589. This shipyard also built the British minesweeper that would become the famous *Calypso* used by Jacques-Yves Cousteau for his noted international field research.

Designed by the acclaimed Seattle naval architect, H. C. Hanson, the *Penguin* had a sturdy sheathed ironbark hull that allowed for sailing in heavy weather and drifting ice. Below deck, her comfortable and adequate quarters would be used over the years by numerous BOF employees

Penguin

and various officials while traveling to and from Alaska. Her hold could accommodate 160 tons of cargo.

Powering the vessel were two 400-horsepower, 6-cylinder Union full diesel engines driving twin screws. Her fuel capacity provided a 4,000-mile cruising radius. Six years after her construction, a fathometer for measuring water depths was installed during an overhaul in Seattle, which greatly aided in navigation, particularly while sailing in the hazardous Aleutian waters.

On 8 January 1930, the 130-foot *Penguin* was launched at Salmon Bay in Seattle. The event had actually been scheduled for the previous day, but following the traditional bottle-christening ceremony, the ship refused to slide down the skids into the water – the cold winter temperatures had frozen the skid grease, holding the *Penguin* securely on the ways. Even the efforts of two boats in the water pulling on the *Penguin* failed to free her. Fortunately, by the next day, the grease was thawed and, in front of a large enthusiastic crowd, another bottle was broken and the ship was successfully launched.

Without sufficient landings at the Pribilofs, a baidar (or "bidarrah") is towed out to unload the *Penguin* II which must anchor offshore – a slow and long-standing process which was still being used (pictured here) in 1961. National Archives and Records Administration - Pacific Alaska Region photo, record group 22, U.S. Fish and Wildlife Service. NOAA website.

Immediately following her commissioning, the *Penguin* left Seattle on 5 May 1930, arriving at the Pribilof Islands (St. Paul and St. George) 11 days later. She brought with her 17 BOF employees and 175 tons of general cargo. In September, the ship also provided 2 weeks of service in connection with salmon escapement studies in the Ketchikan district, Southeast Alaska. Late in the year, the vessel proved her capabilities while performing successfully during extreme weather conditions. The *Penguin* logged over 20,600 nautical miles during the 8 months of her busy maiden year.

In 1933, the *Penguin* was involved in a winter rescue operation. On 24 January, the 59-foot wooden Unangan trading boat *Umnak Native* found herself in a violent storm while moored in Inanudak Bay on Umnak Island. Consequently, her anchor chain snapped and her engine failed to start. The foundering vessel broke apart and 11 lives were lost to drowning or exposure. One of the four survivors was Bishop Antonin Pokrovsky, of the Russian Orthodox Church, who had managed to reach shore. He was discovered by local inhabitants, who were unable to transport him either by land or small boat. The steamer *Starr* was in the vicinity, but her captain lacked the charts needed to enter the bay safely. The BOF was contacted and dispatched the

Penguin

Penguin, which, on 14 February, was able to rescue the bishop who was suffering from severe illness and frozen legs.

The *Penguin* also encountered a few mishaps of her own while serving in Alaska. On 8 August 1933, strong tidal currents in Seymour Narrows endangered the ship after her steering gear broke. As fortune would have it, the nearby halibut fishing boat *Bernice* was able to tow the *Penguin* to safety where repairs could be made.

Then several weeks later on 21 September, the *Penguin* was about 12 miles southeast of Ketchikan when she struck the vessel *Tuscan*, which was hauling mail. Following the incident, the *Penguin* towed the damaged *Tuscan* to Ketchikan. A $6,800 claim was filed by the *Tuscan* owners. Six months later the case was tried and dismissed due to an inability of the claimants to show negligence on the part of the *Penguin*. The *Penguin* also underwent a 2-week quarantine while at St. Paul Island after a case of measles was discovered aboard the vessel on 1 July 1939.

Throughout her service life to the BOF, the *Penguin* was used for other purposes other than just supplying the Pribilofs. The Commissioner of Fisheries, Henry O'Malley, and his party used the ship for several weeks in July and August of 1931 to inspect fisheries throughout parts of Alaska. During this time the BOF vessel *Crane* substituted as Pribilof tender. In September 1932, the *Penguin* transported three live fur seals and 19 rosy finches from the Pribilof Islands to Seattle. The fauna continued their journey by train to the National Zoological Park at Washington D.C. – one male seal and three of the birds died en route. In 1934, the vessel provided transportation to various places along coastal Alaska for U.S. Navy, U.S. Post Office, and Steamboat Inspection Service personnel.

In 1937, a remote field station consisting of several buildings was established in the western Aleutian Chain on Amchitka Island for the purpose of expanding the study and protection of sea otters. In this and future years, the *Penguin* provided vital transportation of cargo, supplies, building materials, and workmen from other island communities for the construction and maintenance of the facility. In 1940, the *Penguin*'s crew also assisted at the Amchitka facility with electrical repairs, power plant servicing, and the installation of a radio-telephone transmitter and antennae.

Throughout the 1930s, the annual take of seal skins at the Pribilofs increased significantly. By the end of the decade, they numbered over 60,000 skins (64,864 in 1940), the most taken in 50 years. Based on 1939 sales their value averaged just over $19 per skin. In the 1938-39 trapping season (December to January) 1,029 fox pelts were also taken from the Pribilof Islands, with values averaging $14 to $15 per skin. As usual, the *Penguin* and various military ships transported the seal and fox skins to Seattle where they were then sent by rail to St. Louis for processing and public auction by the Fouke Fur Company.

As the threat of war in the Pacific grew, the Penguin was transferred to the U.S. Navy in 1941.

In addition to the fur seal skins, byproducts from sealing operations were also hauled from the St. Paul Island plant to Seattle. In 1939, these commodities, which sold for over $15,500, consisted of nearly 28,000 gallons (514 barrels) of seal blubber oil ($8,704 at just over 31 cents per gallon), 4,789 gallons of seal carcass oil; and 338,421 pounds ($6,863) of seal meal. The Division of Fish Culture acquired 75 tons of the meal for use across the country as hatchery fish food, while the remainder was sold to high bidders.

As the threat of war in the Pacific grew, the *Penguin* was transferred to the U.S. Navy in 1941, and returned to Dutch Harbor, Alaska, in early 1942 to resume her Pribilof cruises for the (now) Fish and Wildlife Service (FWS). During 1942, supplies, provisions and equipment were transported to the Funter Bay, Alaska, camp in preparation for the evacuation of the Pribilof Islands.

Penguin

By 1948, the heavily used *Penguin* was logging nearly 29,000 nautical miles each year. Some of her cruises involved the study of albatrosses in 1947-49 – voyages that led her to the tip of the Aleutian Chain, across the North Pacific Ocean, and as far south as San Francisco.

The *Penguin*'s federal service came to an abrupt end when fire destroyed her superstructure and cabins on the night of 3 June 1950, while she was moored at the FWS dock in Lake Union at Seattle. Fortunately, her hull was saved. The damage, originally estimated between $15,000 and $20,000, forced the FWS to retire her from service and seek an immediate replacement – the *Penguin* II. The burned *Penguin* was sold for $25,778 at auction to Tom Farrell and Russ Gibson of Seattle on 21 March 1951.

Her designer, H. C. Hanson, then obtained the vessel he fondly referred to as the "best wooden boat ever built". Hanson felt the ship could be saved and went about completely rebuilding her along with new wiring and equipment. In 1957, the *Penguin* was sold to the H. O. Merren Company of the Cayman Islands. Renamed the *Carib Queen* under the British flag, and based out of Georgetown, Cayman Islands, the vessel's last known use was transporting tourists from Florida to the company's Cayman resort in the Caribbean.

Damage to the *Penguin*'s pilot house and upper cabins from the 1950 fire. Photo print provided by V. Lundquist (AFSC). Photographer unknown.

***Penguin* photos in the AFSC Multimedia Gallery**

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- Anonymous. 1930. *Penguin* Takes to the Water. Pacific Motor Boat, June 1930. p. 55.
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Some Insight on the *Penguin*

Actual accounts from passengers on the *Penguin* are very limited, however, Fredericka Martin offers a few vivid details concerning the ship and life aboard the northbound cruise to the Pribilof Islands in the summer of 1941 (Martin 2010*):

On first seeing the *Penguin* at dock on Lake Union, Seattle, she notes that "the outlines of the *Penguin*...belied the claim of a four-hundred-ton displacement. Even the mountains of crates and boxes hiding the deck failed to add bulk to its size."

Her fellow passengers included 20 young college students employed to blubber seal skins for the Fouke Fur Company (St. Louis, Missouri). As Martin recounts they wandered restlessly from one spot to another or sprawled out uncomfortably for sun baths. She notes that the northbound ship with limited deck space had many passengers and everyone "sought out a crevice in the freight and maintained squatter's rights determinedly" seeking some fresh air to help avoid seasickness.

Martin also recounts how life on St. Paul Island in the Pribilofs centered around each arrival and departure of the *Penguin* during the two years when she and her husband were on the island. Each arrival was eagerly awaited especially when everyday supplies were in short supply. Any delay caused anxiety among the islands residents and there was further frustration when the *Penguin* would arrive but had to wait for unloading because of poor weather conditions. Lacking natural or man-made harbors on the islands, the supplies and passengers had to be transported between ship and shore in the open water using baidars (small canvas covered boats). This transfer was neither safe nor fast with the unpredictable seas that surrounded these islands.

Martin notes how the sacks of mail were one the first things to be offloaded at each stop as this was the major connection between the island communities and the outside world.

Martin, F. L. 2010. Before the Storm Broke: A Year in the Pribilof Islands, 1941-1942. University of Alaska Press, Fairbanks, 385 p.

Dennis Winn, Auxiliary Pribilof Tender in the 1950s

Dennis Winn Details			
Year built	1944	Length	148'
Location built	Bellingham, WA	Tonnage (tons)	540 gross
Builder	Northwestern Shipbuilding Co.	Original engine	875 hp Fairbanks Morse diesel
Designer	H. C. Hanson	Known skippers	Clyde "Pop" Dell
Other names/id	*Lt. Walter J. Will*	Fisheries service	1951-59
	FS-244 (Army,WWII)	Disposition	sent to ADFG
	Expansion (post ADFG)		
	Temehani (post ADFG)		

During World War II, over 300 coastal freighters were constructed for the U.S. Army. Some of these were 148-foot wooden transports designed by the noted architect H. C. Hanson of Seattle, Washington. They proved valuable, especially in Aleutian waters, towing barges/vessels, and hauling troops and cargo to remote outposts. One of these ships was the *Lt. Walter J. Will* (FS-244), named after a Congressional Medal of Honor recipient who, while serving as a first lieutenant in the U.S. Army, had died courageously in 1945 from wounds he sustained in combat.

Like the Agency's 1950-64 Pribilof Island tender *Penguin II* the FS-244 was built in 1944 at Bellingham, Washington, by the

The *Dennis Winn*, Auke Bay Laboratories photo

Northwestern Shipbuilding Company, a short-lived business (1942-45) established by regional investors from Seattle to construct boats during wartime. In November 1948, the surplus FS-244 was obtained by the Fish and Wildlife Service (FWS, formed from the Bureau of Fisheries, BOF, in 1940). Shortly after her acquisition, the FS-244 was renamed the *Dennis Winn*, commemorating the BOF Bristol Bay management agent whose accomplishments included the first extensive aerial salmon spawning ground surveys conducted in western Alaska in 1931.

The Fish and Wildlife Service made immediate use of the *Dennis Winn*. She was put into service in Alaska waters replacing the FWS vessel *Brown Bear's* assigned work of making the regular trips to and from Bristol Bay with supplies and personnel. One of the *Winn's*

Dennis Winn

skippers (possibly the first) was Captain Clyde C. "Pop" Dell, who was known to have been with the Agency around 1949.

Part of the ship's assignments in the 1950s were to frequently support the FWS tender *Penguin II* duties by transporting cargo and passengers to and from the Pribilof Islands. In the summer of 1955, the Winn hauled 200 tons of building material from Seattle to St. Paul Island (Pribilofs); cargo that greatly aided in the construction program to further the development of the islands. While stationed out of Juneau, Alaska, during the latter 1950s, the vessel was used for management and biological research activities by the Bureau of Commercial Fisheries (part of the USFWS).

As a condition of Alaska's recent statehood, the *Dennis Winn* was transferred to the Alaska Department of Fish and Game in 1960. She was then put up for auction in the spring of 1961. After her sale the vessel was renamed the *Expansion* and "served as a mail boat for the Alaska Peninsula and Aleutian Islands and stopped monthly at False Pass to bring the mail and passengers, sailing out of Seward [Alaska]. She also had on board a small store where one could buy fresh produce, ice cream and other perishables." *

* From False Pass City Government web site, which features a 1968 photo of the mail boat MV *Expansion* in False Pass. Last accessed 7-1-13.

In November 1965, the vessel was sold in Seattle to French interests and operated as a transport ship in the South Pacific under the name *Temehani*. It is believed she sank near Bora Bora around 1981.

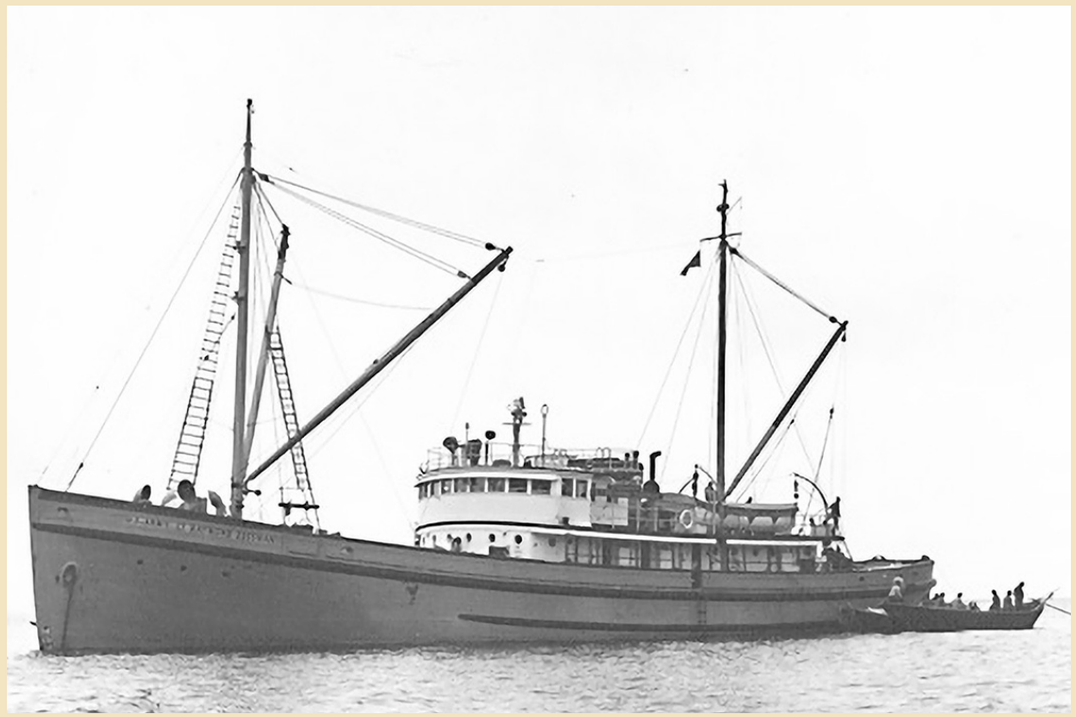
(From Shipbuilding History website).

The Army ship FS-244 before her FWS renaming. Kodiak Military History Museum photo.

Penguin II

Penguin II, Pribilof Islands Tender (1950-64)

Penguin II Details			
Year built	1944	Length	148'
Location built	Bellingham, WA	Tonnage (tons)	540 gross
Builder	Northwestern Shipbuilding Co.	Original engine	875 hp Fairbanks Morse diesel
Designer	H. C. Hanson	Pribilof service	1950-63
Other names/id	*Lt. Raymond Zussman*	Disposition	Retired in 1963
	FS-246 (Army, WWII)		



The Army ship *Lt. Raymond Zussman* (FS-246) prior to FWS service as the *Penguin II*. National Archives and Records Administration - Pacific Alaska Region photo, record group 22, U.S. Fish and Wildlife Service. NOAA website.

In the days following the fire on the Pribilof Islands tender *Penguin*, it was decided that the cost to convert a replacement vessel would be less expensive than the estimated $75,000 cost for repairing the damaged *Penguin*. On 9 June 1950, within a week of the fire, the Fish and Wildlife Service (FWS) acquired a surplus World War II freighter from the U.S. Army Transportation Corps, the *Lt. Raymond Zussman* (FS-246).

The vessel was named posthumously after Raymond Zussman, a U.S. Army second lieutenant who received the Congressional Medal of Honor for his heroism during World War II – his command and courageous single-handed actions resulting in the capture of nearly 100 prisoners.

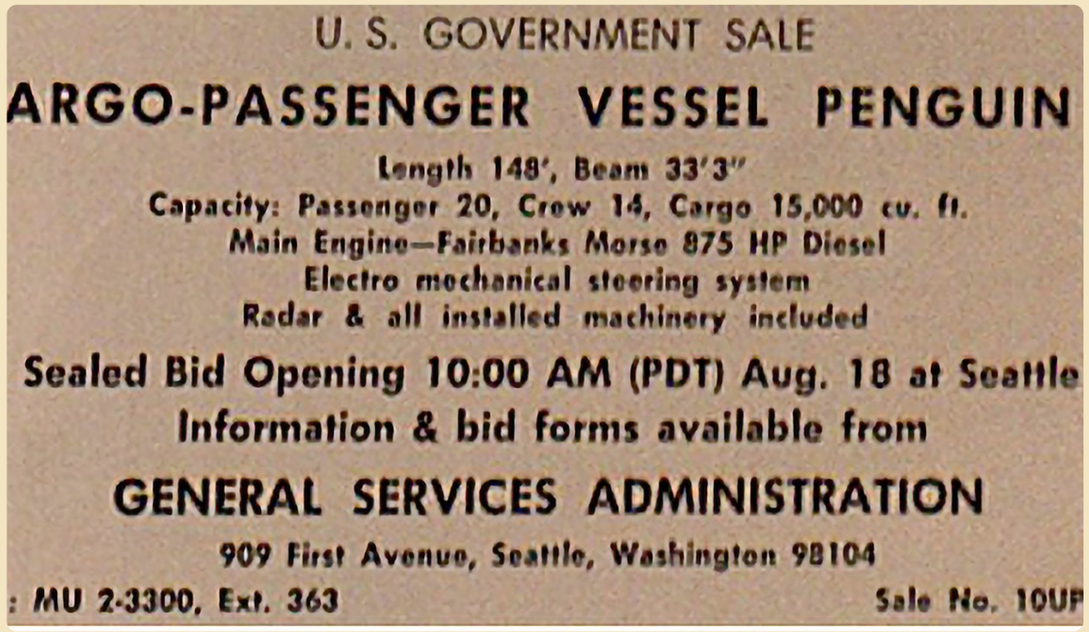
Along with the FWS vessel Dennis Winn, the *Lt. Raymond Zussman* was one of the several 148-foot wooden transports designed by H. C. Hanson and built during the war. The ship was constructed by the Northwestern Shipbuilding Company in Bellingham, Washington, for the U.S. Army, which took delivery of the vessel in June 1944.

Penguin II

The *Zussman* was considered a significant improvement over the *Penguin*. In comparison, her 875-horsepower Fairbanks Morse diesel engine provided more speed. The *Zussman*, at 540 gross tons, was also larger than the 394-ton *Penguin* and, after renovations in February 1951, had more cabin area, twice the cargo capacity, and 10 times the refrigeration storage compared to her predecessor. An electro-mechanical steering system was later added.

Immediately after her acquisition by the FWS, the *Zussman*, loaded with passengers and supplies, left Seattle for the Pribilofs on 17 June; only four days later than the *Penguin*'s originally planned departure. That summer, Secretary of the Interior, Oscar L. Chapman, announced; "The goodwill built up for 20 years in the name of the *Penguin* will not be lost...the vessel's successor has been named *Penguin II*". On 21 September 1950, the ship's name was officially changed.

Three round-trips between Seattle and the Pribilof Islands were made during her maiden year with the FWS. This number increased to five trips in 1952 (26,387 miles) and to six in 1953 (32,351 miles) – hauling 612 passengers, 3,450 tons of general cargo and 146,484 gallons of fuel oil. Many of the 66,378 seal skins harvested in 1953 at the Pribilofs were also transported by the *Penguin II*. In addition to supplying the islands, the vessel provided inter-island transportation and delivered much needed goods to small Aleut communities scattered throughout the Alaska Peninsula and Aleutian Islands. Each fall, a supply of Christmas trees was also brought along.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Capacity: Passenger 20, Crew 14, Cargo 15,000 cu. ft.
Main Engine—Fairbanks Morse 875 HP Diesel
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: MU 2-3300, Ext. 363 Sale No. 10UP

Announcement for the selling of the *Penguin* II. From Pacific Fisherman, Aug. 1964.

By the early 1960s, the *Penguin II* was considered too small and inadequate for continuing the Pribilof runs that were requiring an ever-increasing amount of supplies. The ship was consequently retired from service in 1963 and offered for sale the next year. A magazine announcement (pictured below) declared she was to be auctioned on 18 August 1964 in Seattle.

A maritime hobbyist-historian, George Schneider, reported that he spotted the vessel in 1976 in Los Angeles Harbor (California) and, after talking with a crew member, learned that the vessel had been renamed the *Aurora,* homeported at the San Andres Islands and sailing under the Columbian flag.

***Penguin II* photos in the AFSC Multimedia Gallery**

Pribilof, Bureau's Last Pribilof Tender (1964-75)

***Pribilof* photos in the AFSC Multimedia Gallery**

Pribilof Details			
Year built	1953-54	Tonnage (tons)	1,187 gross
Location built	New Orleans, LA	Original engine	700 hp White-Superior National twin-diesels
Builder	Higgins Industries	Average speed	11 knots
Designer	Alden	Cruising range	8,400 miles
Other names/id	FSR-791 (Army)	Known skipper	Fred Langbehn (1965-72)
	#293151 (USCG ID)	Pribilof service	1963-75
Length	223'		(BCF took ownership in 1964)
Breadth	38.5'	Disposition	sold in 1975
Draft	16'		

The freight and supply Army vessel FSR-791 prior to becoming the *Pribilof*. Higgins Industries Collection photo. Earl K. Long Library. University of New Orleans.

In the early 1960s, the Bureau of Commercial Fisheries (BCF) considered acquiring a larger replacement for the aging *Penguin II*, which had become too small and inadequate for use as the BCF's Pribilof Islands tender. In October 1962, the U.S. Army agreed to lend the BCF a 223-foot freighter, the FSR-791, from its mothball fleet. The next year, the BCF put the vessel to use on the important transport runs to and from the Pribilof Islands.

The steel freight and supply (FS class) ship was built around 1953-54 for the Army by Higgins, Inc. in New Orleans, Louisiana. The shipyard would be purchased in 1987 by Halter Marine, which built the NOAA ship *Oscar Dyson* (in 2003) among other fisheries research vessels. The

Pribilof

FSR-791 was powered by National twin-diesel (Superior model) 700-horsepower engines (with three auxiliaries) and was equipped with refrigeration capabilities.

The Bureau took ownership of the FSR-791 in 1964 and aptly renamed her the *Pribilof*. This resulted in the permanent removal of the *Penguin II* from the BCF fleet. The *Pribilof* proved well suited for transporting passengers and cargo between Seattle, Washington, and Alaska.

After her acquisition by the BCF, the *Pribilof* was assigned by the Marine Mammal Resources group, based out of Seattle, to support Agency activities in the Pribilof Islands. In addition, like her predecessors, the *Pribilof* was soon pressed into search and rescue duties. In November 1965, she assisted in the rescue of 37 survivors from the 10,000-ton freighter *Oduna*, which ran aground on Unimak Island, Alaska.

The extended use of the *Pribilof* was evaluated around 1968 when the opinion was raised that roughly $100,000 could be saved annually if the vessel's tender duty was taken over by chartered commercial transportation. In response, several essential services were identified that would be "lost to the Program by discontinuance of the *Pribilof*" – and that during her three to four annual voyages to the Pribilofs the ship also conducted offshore pelagic fur seal research cruises and was relied upon to make numerous important inter-island shuttle trips as necessary to transport:

- mail that couldn't be delivered by airdrop (i.e., breakables and outgoing items)
- emergency repair equipment and services
- perishable goods
- teachers and students
- doctors (with medicines) and patients to/from PHS hospital in Anchorage

The MV *Pribilof*, a converted Navy oiler owned by the Aleut Corporation, hauls general cargo throughout the Aleutian Chain and Pribilofs. National Archives and Records Administration - Pacific Alaska Region photo, record group 22, U.S. Fish and Wildlife Service. NOAA website.

- federal officials
- cultural and recreational exchange

The response was no doubt effective since the *Pribilof* remained in service for several more years. In the 1970s, the National Marine Fisheries Service (NMFS, under NOAA) continued using the vessel, homeported in Seattle. In one year (1973), the ship was scheduled for five trips between Seattle and the Bering Sea to supply the

Pribilof

Pribilof communities with vital provisions. At this time, the *Pribilof*'s crew and captain consisted of 19 men. On the return trips, the *Pribilof* hauled sealskins, blubber, frozen seal meat (for food on mink farms), and heavy equipment in need of repair. Note: at this time weekly commercial flights from Anchorage, Alaska, were also transporting mail, medicine and perishable goods to and from St. Paul Island.

In 1975, the NMFS sold the *Pribilof* to the Aleut Corporation (see "Restoring Control"). The Aleut Corporation then signed a long-term agreement with NMFS to maintain the transportation service between Seattle and Alaska, and continue supplying the government base at Adak in the Aleutians.

Sometime later, the *Pribilof* underwent conversions and became a fish-processing vessel. She was purchased by Lafayette Fisheries in 1983, and in 2004 was acquired by Trident Seafoods, who (as of 2013) owned and operated the vessel as a fish processor in the Bering Sea.

"Aleuts Know Santa is Seagoing Man on *Pribilof* Trip"

"Seattle, Wash. (UPI) - Generations of kids have known Santa Claus as an air traveler but youngsters on the lonely Pribilof Islands, Santa's own backyard, would scoff at that. They know he comes by boat.

And it's no easy journey for a man of his years. The trip actually starts here in late November when the MV (motor vessel) *Pribilof* loads up with goods and gifts, bought by catalog.

It's a mean trip in the winter, according to Capt. Fred Langbehm, skipper of the vessel which makes four trips a year to the islands of St. George and St. Paul.

The *Pribilof* left here for the islands late in November and was expected back by Christmas.

Among the items aboard this trip were fireworks. The inhabitants of the desolate islands set off their fireworks on New Year's Eve since the Fourth of July falls during the long Arctic 'day' when the sun never really sets for months on end."

From Wilmington Morning Star, Wilmington, N.C. Dec. 9, 1965. p. Four-D.(Google Newspaper Archive).

BOF Launches & Small Craft

Bureau of Fisheries Launches & Small Craft

Beginning in the early 1920s, the Bureau of Fisheries (BOF) was employing a growing number of shallow-draft launches and other small craft – in addition to their fleet of larger saltwater vessels – for Alaska fisheries enforcement and other work. These small boats, and those that were frequently chartered, patrolled primarily on the more protected waters of rivers, streams and bays – often by the wardens and stream guards (or "watchmen") assigned to each district. In the vast Bristol Bay region, several numbered launches were used to canvass the area (see below).

Unknown U.S. Bureau of Fisheries launch. Auke Bay Laboratories photo.

For the protection of spawning salmon, the boats also frequently ran on streams and rivers to abolish predatory trout and remove debris and other obstructions to salmon spawning (and marine navigation). Their shallow draft and smaller size made them quite suitable for these tasks.

Originally, several of the smaller craft used in Alaska were chartered from the local commercial canneries and hatcheries in each region. In 1922, as many as 18 small boats were chartered in the Southeast district alone. During the 1930s, the Bureau increased its fleet of small vessels with outboard motors, such as skiffs and dories, and chartered fewer.

BOF Launches & Small Craft

The *Puffin*, 1919 - ?

One of the earliest known launches owned by the Bureau was the 25-foot *Puffin*. She was carried onboard the BOF steamship *Roosevelt* as the ship's launch. When the *Roosevelt* was sold in 1919, the *Puffin* began working independently in Alaska.

In July of 1919, the *Puffin* set off from Seattle, Washington, to Ketchikan, Alaska, under her own power, but broke down along the way due to engine failure. She was loaded on a freight steamer in Canada and arrived at Ketchikan nearly a month later. When repairs and alterations were made, the *Puffin* began her stream protection work in various parts of Alaska, including Juneau, the Taku River, and Prince of Wales Island. She logged approximately 1,500 total miles in 1922.

During 1923, the *Puffin* was not in service for the fishing season. Determined as being too small for patrol work, she was transferred later that year to the Bureau's Division of Fish Culture for use at the McDonald Lake-Yes Bay hatchery. For 10 years she served as tender to the hatchery, making the necessary shuttle trips to and from Ketchikan with supplies and personnel.

The *Puffin* was replaced by the Bureau's vessel *Ibis* in 1932 and spent the remainder of the year reassigned to fisheries patrol around Ketchikan. The *Puffin* was laid up in Seattle throughout 1933. Her history beyond then is unknown.

The *Ibis*, 1923 - ?

The Columbia River model *Ibis* was purchased in spring 1923 by the BOF and brought to Chignik, Alaska, aboard the Columbia River Packers' Association (CRPA) ship *Tonawanda* for fisheries patrol work. That year she was also used by Warden Charles E. Petry to oversee the building of a salmon counting rack on Chignik River.

In September 1928, the 30-foot *Ibis* left Alaska aboard the CRPA steamer *Memnon* bound for Astoria, Oregon, where her hull was renovated, her 12-horsepower Atlas heavy duty engine was overhauled, and general repairs were made. She returned to Chignik in April 1929.

The *Ibis* at Chignik on southern side of the Alaska Peninsula. Bureau of Fisheries photo, 1926.

BOF Launches & Small Craft

The small gas boat only patrolled for a few months each year during the active salmon fishing season and was otherwise stored out of the water. It is known that her BOF service lasted until the formation of the Fish and Wildlife Service (FWS) in 1940 – and possibly beyond, since a 30-ft. "*Ibis*" is listed as a FWS boat through 1946 in the annual "Mechant Vessels of the U.S.".

The *Sea Gull*, 1924 - 1926

Purchased in 1924, the 31-foot *Sea Gull* was the BOF's second smallest named vessel – after the *Ibis* (above) – in Alaska at the time. She performed fisheries patrol on the Copper River flats until being destroyed by an accidental fire on 18 June 1926.

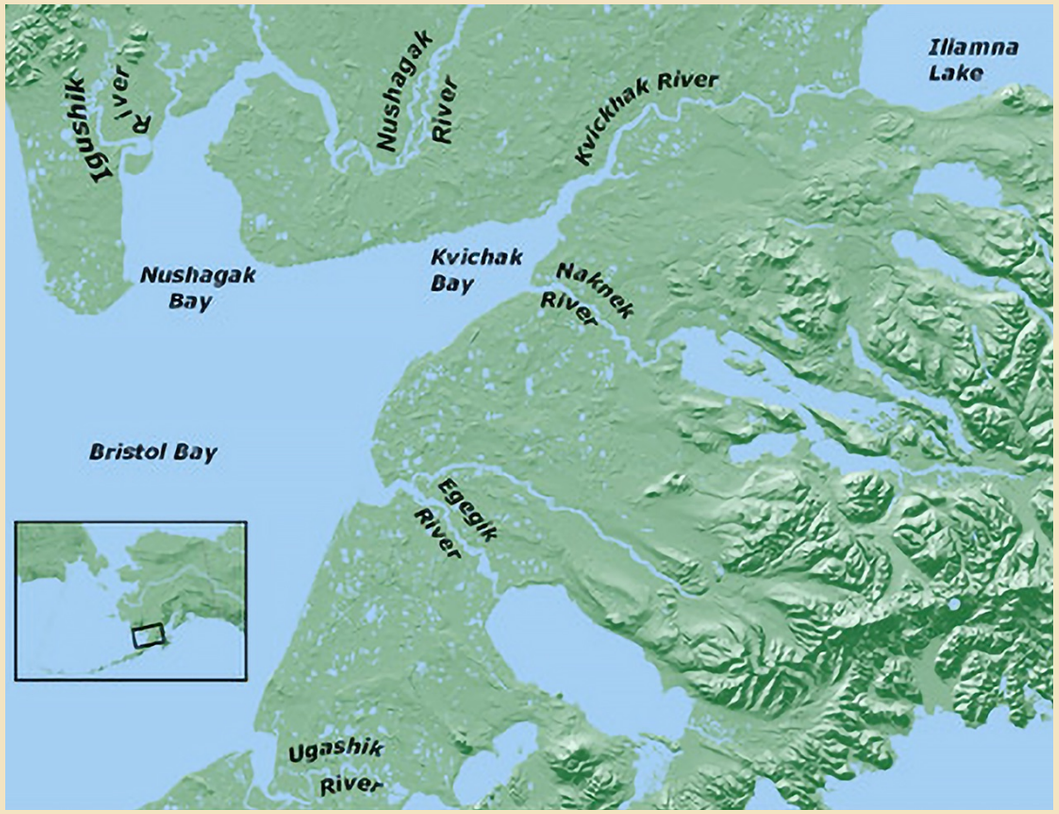
Bristol Bay Launches, since 1924

(Note: years in parentheses below are known periods of Alaska service)

Launch No. 2 was used for enforcement duty on the Naknek River in eastern Kvichak Bay, (1926-31) and lower Kvichak Bay (1927). On 27 July 1935, she was decimated by an explosion. Her 80-horsepower engine was salvaged and overhauled for use in Launch No. 4.

Launch No. 3 patrolled Nushagak Bay and River in northeast Bristol Bay (1926-31), the Wrangell district (1938) and on Olga Bay in the Kodiak area (1939).

Launch No. 4 operated on the Ugashik River in southeast Bristol Bay until after the close of the commercial fishing season in 1924 when it was completely destroyed by an accidental fire. She was replaced the following year by Launch No. 5. It appears that a new Launch No. 4 could have been put to use in the 1930s, since there is mention of her receiving the reconditioned engine from the destroyed Launch No.2 in 1935. It is also reported that Launch No. 4 patrolled in Prince William Sound (1938-39) and was enhanced by a new 160-horsepower engine installed in August 1938.

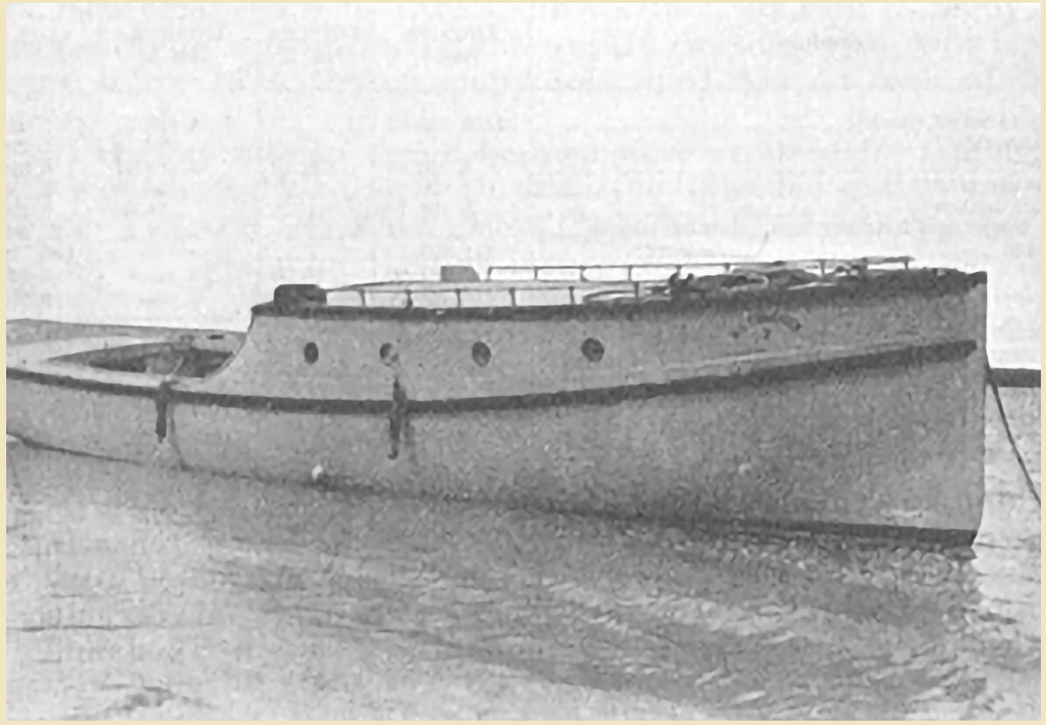


Major bays and rivers patrolled by launches in the Bristol Bay area.

Launch No. 5 was of a Columbia River type design, powered by an 8-horsepower Frisco Standard engine. She was initially assigned to the Bristol Bay district in 1925 to replace Launch No. 4, which was lost to fire. During the next 15 years she patrolled in Ugashik River and Bay (1925-26), Igushik River in Nushagak Bay (1927), Egegik River in eastern Bristol Bay (1929-31), and the Ketchikan district (1938-39).

Launch No. 6 ran on the Ugashik River/Bay (1926-31) and later in the Juneau and Wrangell districts (1938-39).

BOF Launches & Small Craft



Launch No. 7 patrolled on the Kvichak and Naknek rivers. Bureau of Fisheries photo, 1926.

Launch No. 7 was a 36-foot cruiser model semi-tunnel type boat powered by a 40- to 60- horsepower Red Wing engine. Her shallow draft, power, and speed allowed the boat to easily ascend streams and access flats. She was able to patrol large areas of Bristol Bay during closed fishing periods, parts of which had previously been unreachable. From 1925 to 1931 she patrolled around Kvichak Bay/River and Naknek areas and was used in connection with the Kvichak weir operations.

Launch No.8 operated in the Ugashik River and Bay (1926-31), also serving as tender to the Ugashik weir.

Launch No. 9 ran in the Kvichak Bay and River (1931).

Launch No. 43 was assigned to the Afognak hatchery (1924-26). She was also used in the Kodiak-Afognak district during part of each year for fisheries patrol work.

See Also

- *Scoter*, the Agency's Bristol Bay boat and Naknek River marine ways.
- The *Heron* - flagship research launch, 1931 - 1935.
- Related topic: Stream watchmen.

Launches, small patrol craft, and others

Charters and Other Non-Agency Vessels

To supplement the Bureau of Fisheries' growing Alaska fleet in the 1920s and 1930s, vessels were frequently chartered from private parties or occasionally borrowed from other government agencies. These boats were usually acquired temporarily each year, primarily for fisheries enforcement. The U.S. Coast Guard cutters continued providing open-water patrol in the North Pacific and Bering Sea, protecting the fur seal herds and other marine mammals as it had done since 1867. As the Bureau gained more vessels, and the use of aircraft, the need for charters diminished by the late 1930s.

Chapman **(NOAA, in service 1980-98) worked primarily for the Resource Assessment and Conservation Engineering (RACE) Division in the Bering Sea and western Gulf of Alaska. Made an Auke Bay Laboratory sablefish project cruise in late 1984. Later sent to the Gulf of Mexico. Decommissioned in 1998.**

Launches, small patrol craft, and others

Known boats chartered or borrowed by the Bureau from 1913-39 for Alaska fisheries patrol. (by region of operation)

Southeast

America First	1926	**Kitty (launch)**	1918
Anona	1925, 1927-28	**Lady Luck**	1929-32, 1934
Anthonette	1920, Juneau	**Lily**	1921
Baranoff (17 ton)	1913-14, Wrangell	**Lovera (7 ton)**	1913-14, Ketchikan
Bear	1928-31	**Lue (launch)**	1913, Juneau and Icy
Bee (launch)	1918	**Mars**	1935-36, Ketchikan
Chirikov	1931	**May (launch)**	1918
Daring	1925	**Murrelet (6 ton)**	1916, 1924-26
Diamond T	1925	**My Fancy (launch)**	1918
Diana	1925-26	**Pheasant**	1927
Dixie (launch)	1920, Juneau	**Rainbow**	1924
Emma	1921	**Santa Rita (8 ton)**	1913-14, 1928,
Gazelle	1932	**Standard (15 ton)**	1913, 1915-16, 1921
Gloria	1926-27	**Sterling**	1933-34, Ketchikan
Gordon D	1932	**T-433**	1927, troll-caught
Helen F	1930	**Truth**	1913, Ketchikan
Helen Hinton	1929-31	**Try It**	1920, Juneau
Highway (from	1929	**Typhoon**	1928
Igloo	1924, 1926	**Valkyrie**	1926-31
Janie K	1929	**Yakobi**	1927
Jazz	1924	**Yukon**	1929

Central (Gulf of Alaska)

Angelus (launch)	1917, Prince William Sound
Auger	1924, Cook Inlet
Blue Ointment	1924, Cook Inlet
Buzzard	1924, PWS
Coyote	1921, 1929-31
Ellona	1918, PWS and Copper River
Emma	1924, PWS
Fog	1924, Cook Inlet
Harlequin	1932, Port Valdez
Katherine L	1931-33, PWS and Copper
King U-109	1925-26, PWS
Lily	1925, PWS
Nimrod (8 ton auxiliary	1916-17, Cook Inlet
Pilot	1926-30, PWS and Copper
Prospector (7 ton launch)	1916, 1918, 1920-21, 1924-32
Shamrock (7 ton)	1916, PWS
Stanley	1930, PWS and Copper River
Wingham	1934-39, Seward-Katalla

Area unknown

Iowa	1915

Launches, small patrol craft, and others

Alaska Peninsula / Bering Sea

Alasco II	1937, Orzenoi to Pavlof Bay
Auk	1925-32, 1936, Ikatan-Shumagin and Port Moller
Marie S (launch)	1933-36, 1938, Kuskokwim River
Popof	1936
Robin	1924-27, Yukon and Kuskokwim Rivers
T-433	1925-26, Kuskokwim River

After the Bureau of Fisheries reorganized into the Fish and Wildlife Service (FWS) in 1940, the vessel focus turned more towards research. This was evident with the building of several boats after World War II for exploratory fishing and gear testing in the Pacific and Alaska waters. The use of private and non-Agency vessels – by the FWS, Bureau of Commercial Fisheries (BCF, 1956-69), and National Marine Fisheries Service (since 1970, under NOAA) – continued through to the present time (2011).

The following exemplifies a few of these vessels (scroll through image gallery in the beginning of this section to view):

- *Mitkof* 1955: Gulf of Alaska (GOA) salmon distribution surveys.
- *Paragon* 1955: GOA salmon distribution surveys.
- 1960-61: red king crab bottom trawl surveys in the Bering Sea.
- 1964: trawl drags at over 200 stations throughout the GOA and in selected sections of the Bering Sea.
- Mist 1960: crab tagging operations at Kachemak Bay, Alaska – 2,800 crabs were taken in June.
- *Tordenskjold* 1955-61 (known): exploratory Alaska red king crab cruises.
- *Little Lady* 1966: shrimp gear testing and exploratory fishing survey off Prince of Wales Island.
- *Northwest Explorer* 2002: Bering Sea bottom trawl surveys.
- 2003: GOA bottom trawl surveys.
- *Sea Storm* 2002: Bering Sea bottom trawl surveys.
- 2003: GOA bottom trawl surveys.
- 2009: GOA bottom trawl surveys.
- *Gladiator* 2003: GOA bottom trawl surveys.
- *Pacific Explorer* 2009: GOA bottom trawl surveys.

Photo credits:

- *Bertha Ann*: August 1961. Archival Photograph by Mr. Steve Nicklas, NGS/RSD. NOAA Photo Library
- *California Rose*: Auke Bay Laboratories (AFSC).
- *Chapman*: NOAA Photo Library

Launches, small patrol craft, and others

- *Townsend Cromwell*: NOAA Photo Library
- *Researcher*: Auke Bay Laboratories. E. P. Haddon, photographer (bottom enlargement).
- *Vesteraalen*: Jay Orr (AFSC)
- *Yaquina*: NOAA Photo Library
- *Sonny Boy*: Auke Bay Laboratories.
- *Commander*: Auke Bay Laboratories.
- *Aldebaran and Arcturus*: 1999 AFSC website photo, photographer unknown.
- *North Star*: Auke Bay Laboratories.
- *Cruiser*: Auke Bay Laboratories.
- *American Star*: 1941. Coast & Geodetic Survey Season's Report Patterson 1941-73.
- *Ronquil*: sketch, Auke Bay Laboratories.
- *Chum*: sketch, Auke Bay Laboratories.

Related topics:

- Stream watchmen.
- Launches / small craft.

Supplemental

Additional reading, resources, and acknowledgments.

Supplemental

Learn More

Much of the historical information presented on these pages was found within the "U.S. Fish Commission Annual Reports" (1871-1940 and 1947-1979) – NOAA Central Library website

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- 1970s Conservation and Stewardship Legislation. ("NOAA Celebrates 200 Years of Science, Service, and Stewardship" website)
- 1850-1900 - U.S. Fish Commission. Spencer Baird and Ichthyology at the Smithsonian. Smithsonian website
- Developing and Delivering the Promise of U.S. Fishery Management. ("NOAA Celebrates 200 Years of Science, Service, and Stewardship" website)
- History of the National Marine Fisheries. ("NOAA History - A Science Odyssey" website)
- Stories and Tales of the Fisheries Service. ("NOAA History - A Science Odyssey" website)
- Fisheries Historical Page. (NOAA Northeast Fisheries Science Center website)
- Illustrations of the Fisheries and Fisheries Industries of the United States. (NOAA Photo Library website)

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The material provided on these historical web pages has been distilled from information and personal accounts published in many sources (e.g., recurrent federal reports, progress reports, press releases, books, newsletters, newspaper articles, websites, etc.) as well as from interviews with boat owners, retired skippers/crew, fisheries biologists, and other staff. This historical information is a natural complement to our ongoing research activities and efforts to archive research collections, and it is intended to present brief introductory summaries and snapshots versus a complete picture of fisheries research in Alaska. These accounts are subject to interpretation and no guarantee of accuracy is implied or assumed, particularly for source links over which we have no control. Reference to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.