ALASKA LEGISLATURE COMMITTEE FILES 1981-1982 3672

1851 HRES HJR 78 - SB 25

1851

(b) preparation of summaries of new information on distribution and origin and on the relationship of salmon distribution to oceanographic conditions

In connection with item (b) above, it is noted that in preparation for the annual meeting, each national section will submit a statement of what new information is contained in its reports.

(2) To review and report on results of scientific studies to determine the continent of origin of anadromous salmonids in the Convention area including those anadromous salmonids migrating in the waters south of 46° north latitude, as per Article III 1(a) and III 1(d)

(3) To review and report on progress in exchange of statistical data in accordance with the Memorandum of Understanding by the Contracting Parties concerning furtherance of research studies on anadromous Salmonidae in the Convention area and specifically concerning exchange of fishery statistics, age, and maturity data, scale and fish samples, and data collected by research vessels on catch, tagging, oceanographic conditions and biological parameters

(4) To review the exchange of statistical material on salmon among the three countries and the presentation of such material in documents, in the Statistical Yearbook, and in the Commission's Bulletin. The sub-committee's report shall contain an account of actions taken and recommendations regarding exchange and presentation of statistical material

(5) To review the plans of the three national sections on salmonid research and oceanography within the Convention area to effect the best possible coordination of these plans, and to arrange for exchanges of samples and of personnel. The sub-committee's report shall contain a statement of progress made and agreed measures regarding coordination and exchanges in accordance with Article X and statements by each country indicating their plans for the ensuing year, including requests for exchanges of samples and personnel

(6) To recommend publication of reports with regard to anadromous salmonids

4. REVIEW OF RESULTS OF SALMONID AND OCEANOGRAPHIC RESEARCH

(1) Documents

The sub-committee reviewed the documents presented to the Commission since the 1979 Annual Meeting (titles of all such documents are listed in INPFC Doc. 2349) and agreed that the following documents were relevant to the work of the sub-committee:

Canada	2328
Japan	2262, 2270, 2272, 2305, 2306, 2316, 2317, 2318, 2319, 2320, 2350
United States	2332, 2333, 2336, 2342, 2343, 2344, 2345, 2346, 2348, 2351, 2369
Secretariat	2259, 2261, 2281, 2311, 2321

(2) Outline of research conducted by each country in 1980

(a) Canada

(i) Salmon

High seas tagging (Doc. 2328): Recoveries of salmon tagged offshore in the North Pacific Ocean by Japan and the United States in 1977, 1978, and 1979, and additional recoveries from earlier Canadian, Japanese, and United States taggings were listed.

Other studies: The incidental catch of salmon (almost entirely chinook) by foreign vessels while trawling for hake in waters off the west coast of Vancouver Island, British Columbia, was recorded by Canadian observers during 1980.

(ii) Oceanography

Oceanographic programs and research were conducted by several Canadian agencies in the eastern Subarctic Pacific during 1980. These included:

- Cruises and moored current meter arrays to obtain physical, chemical, and biological data were used to study the spatial and temporal variability of currents, water properties, and plankton distributions in continental shelf and slope waters off the west coast of Vancouver Island
- Development of remote sensing techniques, including a sensor to determine chlorophyll distributions from aircraft
- Physical and chemical observations at Ocean Station P and along line P. Systems to replace Ocean Station P are being examined

- Daily observations of sea surface temperatures and salinity at coastal light stations and the collection of oceanographic data during fisheries research surveys were continued

- Publication of temperature charts for the eastern Subarctic Pacific

(b) Japan

(i) Salmon

Research on board research vessels (Docs. 2316 and 2317): The Japanese investigations were conducted by nine research vessels in 1980. One vessel simultaneously carried out investigations on Dall's porpoise as a U.S.-Japan joint research vessel in its first cruise. The research period commenced in April, about two weeks earlier than in the previous year, and ended in August. The research areas were mainly located in the northwestern Pacific Ocean and the Bering Sea (Fig. 1) with additional sampling by one vessel in the Gulf of Alaska. Surveys were not implemented in the Sea of Okhotsk nor within the 200-mile fishery zone of the U.S.S.R.

Fishing gears used were gillnets and/or longlines, the type and number of which varied slightly according to purposes of the survey.

The vessels Hokushin maru, Iwaki maru, and Kumamoto maru were engaged in research activities to obtain information on distribution and abundance of and biological data on salmon and steelhead trout, and used research gillnets with ten mesh sizes (48, 55, 63, 72, 82, 93, 106, 121, 138, and 157 mm) and the common gillnets with mesh sizes and structure similar to the gillnets used by the commercial vessels.

Another three vessels, Hokuho maru, Riasu maru No. 2, and Hokko maru were engaged in tagging experiments conducted to clarify continental origin of salmonids distributed in waters south of 46°N. The first two vessels used longlines in addition to the gillnets while the third used only longlines.

Hoyo maru No. 81 was dedicated to research on marine mammals, particularly Dall's porpoise, caught incidentally by salmon gillnets. These activities were carried out during the first cruise as one of the catcher boats grouped under a mothership fleet and using approximately the same number of common gillnets as a commercial fishing vessel. Gillnet and longline research was conducted in its second cruise to clarify the continental origin of salmon migrating in the central Bering Sea.

Oshoro maru and Hokusei maru used common gillnets, the research gillnets with 10 mesh sizes, gillnets with special mesh sizes (such as 30, 33, 42, 130, 179, 204, and 233 mm) and longlines (in case of Oshoro maru) in order to collect biological data on pelagic species such as salmon and squids in the subarctic zone of the North Pacific Ocean.

The research vessel personnel fished with gillnets and longlines, collected biological measurements of the catch, and tagged fish still viable out of those caught with longlines. All the vessels executed oceanographic surveys and carried out research on animals (fishes, squids, birds, and marine mammals) which were incidentally caught by these gears.

One Japanese scientist participated in a cruise of a U.S. research vessel dedicated to investigations to clarify the continental origin of salmonids in the area south of 46°N. The purposes were (1) to facilitate communication at sea to obtain data from Japanese research vessels for use in choosing stations for offshore purse seine operation in the area, (2) to provide advisory service about the operation of Japanese longlines, and (3) to observe the U.S. purse seine research operation.

Gillnet research: The gillnet research in 1980 commenced on May 1, about two weeks earlier than in the previous year, and was completed on August 7. A total of 276 gillnet operations were conducted during this period of time. In the northwestern Pacific Ocean, the research by gillnet was basically conducted at 5° intervals of longitude. In addition, operations were carried out to implement research to collect biological data, to conduct tagging experiments, and to execute the Dall's porpoise/salmon surveys in the fishing ground of the mothership fleets.

In May, 84 gillnet operations were conducted by six research vessels in the northwestern Pacific Ocean west of 175°W. In June, seven research vessels conducted a total of 65 gillnet operations almost in the same area. In July, the gillnet research was carried out by eight vessels in three areas. In the northwestern Pacific Ocean west of 175°W, six research vessels conducted 90 gillnet operations. In the central Bering Sea, one vessel conducted 19 gillnet operations. An additional six stations were fished along 145°W between 48°-57°N in the Gulf of Alaska. In August, three research vessels conducted 11 gillnet operations in the northwestern Pacific Ocean and one in the Bering Sea.

Longline research: The longline operation commenced from May 2, two weeks earlier than the year before, and ended on August 3, 1980. During the period, a total of 114 longline operations including 93 tagging operations were conducted. Efforts of the longline research operation were mainly exerted to clarify the

continental origin of salmonids distributed in the areas south of 46°N and were carried out in waters of latitudinal range 2-3 degree, south to north, centering around 45°N and between 161°E-175°W in the northwestern Pacific Ocean. Tagging experiments were also conducted in the Bering Sea and the Gulf of Alaska.

In May, two research vessels made 36 sets in a broad area between 41°-46°N and 161°E-175°W. The main target species then was sockeye salmon. In June, four research vessels made 25 sets mainly in waters 41°-47°N and 161°E-175°W, with primary target species of sockeye and coho salmon. In July, the longline research was carried out in three areas by four research vessels. Forty sets were conducted by two research vessels in the northwestern Pacific Ocean between 42°-49°N and between 162°E-175°W with primary target species for tagging being coho salmon. One research vessel made six longline sets in the central Bering Sea. The main target species were chinook and chum salmon. One research vessel conducted four longline operations along 145°W. In August, two research vessels conducted two longline operations in the northwestern Pacific Ocean and one in the Bering Sea.

Research on board motherships (Doc. 2316): The mothership salmon fishery in 1980 was conducted by four motherships and 172 catcher boats (each of the motherships was accompanied by 43 catcher boats). The mothership fleets left Hakodate on May 26 and returned between August 4 and 6. The landings to the motherships by catcher boats commenced on June 2 and completed on July 29-31 for a total of 222 landings. In June, there were 106 operations within a narrow area, south to north, between 170°-175°E in the North Pacific Ocean and one operation in the Bering Sea. In July, the operation was conducted 68 times in the Pacific Ocean and 47 times in the Bering Sea.

Daily catch statistics were collected on board the four salmon motherships. Records of fork length, body weight, gonad weight, and collections of scales were made for up to 60 sockeye salmon and up to 30 of each other salmon species on each mothership every landing day. The numbers of salmon measured on motherships in 1980 were 32,269 in all, consisting of 12,570 sockeye, 6,630 chum, 6,600 pink, 1,930 coho, and 4,539 chinook. Motherships made oceanographic observations every day at noon.

Investigation by U.S. observers (Doc. 2316): In 1980 eight U.S. scientific observers were on board four motherships, including one salmon observer and one marine mammal observer on board each mothership. The former was engaged in monitoring of the salmon fishing operation and collection of biological data within the U.S. Fishery Conservation Zone (USFCZ), while the latter was dedicated to investigation of marine mammals, particularly Dall's porpoise, incidentally caught by salmon gillnets. The observers worked on board motherships for 163 days in all, 40-42 days each for four motherships.

In 1980 a total of six U.S. scientists embarked the Japanese salmon research vessels with a split of 1, 2, and 3, respectively, on board Hokushin maru, Oshoro maru, and Hoyo maru No. 81. The purpose of the embarkation was to investigate marine mammals incidentally caught by salmon gillnets.

(ii) Oceanography (Doc. 2318)

Oceanographic studies of the northwestern North Pacific Ocean were carried out. Analyses of data for the period April to July 1980 were conducted with respect to the location of Western Subarctic Water and the Alaskan Stream.

(c) United States

(i) Salmon

Research on board research vessels and motherships (Docs. 2342, 2345, and 2348): Two research vessels fished with 732 m purse seines and a limited amount of longline gear in the North Pacific Ocean from mid-June to early August. Most sampling was done south of 46°N latitude and between 167°E-177°W longitude, although some sampling also occurred within 100 nautical miles of the central Aleutian Islands in early August. The principal objective of this work was to tag and release salmon and steelhead trout to determine the migrations and continent of origin of anadromous salmonids in waters south of 46°N latitude. Total sampling effort was 77 seine sets and 4 longline sets south of 46°N and 25 seine sets north of 46°N latitude.

In 1980, four U.S. salmon observers were trained; each was placed on board one of four Japanese motherships. Between June 10 and July 31, the observers reported fishing operations and collected biological data when the vessels were within the USFCZ. Data from four tagging experiments on board catcher vessels were analyzed to test the randomness of the catch sampling procedures used on board the motherships.

A chartered fishing vessel systematically fished across the migratory route of the Bristol Bay sockeye salmon run from June 7 through July 15. Sampling was conducted at 13 predetermined stations from 30 to 80 nautical miles offshore along the historic transect between Port Moller and Cape Newenham. Fishing was conducted with 200 fathoms of 137 mm mesh gillnet, 62 meshes deep. The primary objectives of the project were to estimate both daily and seasonal abundance and to monitor the age composition of the Bristol Bay run. Secondary objectives were to monitor timing of the run and to collect scale samples for post-seasonal racial analyses.

Other studies (Docs. 2332, 2333, 2336, 2344, 2346, 2348, 2351, and 2369): Catches of immature and maturing sockeye salmon of Bristol Bay origin by the Japanese mothership salmon fishery were estimated for 1978 and 1979 and were reported as in 1956-1977. Annual catches of western Alaska and Canadian Yukon chinook salmon by the Japanese mothership salmon fishery were estimated for 1956-1979.

Estimates were made of the incidental catches of salmon and steelhead trout by foreign and U.S.-U.S.S.R. and U.S.-Korean joint venture groundfish fisheries in 1979 off the coast of Washington, Oregon, and California, and in the Gulf of Alaska and Bering Sea.

Data were compiled on inshore catch, escapement, and age composition of chinook salmon returning to western Alaskan rivers.

United States scientists continued study of a relationship between indices of prevailing springtime ocean temperatures in the eastern Aleutian area and the timing of the sockeye salmon run to Bristol Bay, Alaska. Correlation between the Adak-Cold Bay mean air temperature in May and the median date of the run was slightly improved with the addition of the 1979 point. This relationship was used to forecast the timing of the large 1980 run.

Information on the distribution of salmon obtained from U.S. high seas tagging experiments was updated with the return of 19 tags in 1980.

Research continued to determine the continental origins of sockeye salmon in and around the area of the pre-1978 Japanese landbased driftnet fishery using scale pattern analysis. Numerous samples of maturing and immature sockeye salmon collected in the period 1972-1976 by Japanese research vessels and motherships were analyzed with a direct density classification procedure. The potential usefulness of scale pattern analysis in determining continental origins of coho salmon was explored in a preliminary analysis of 1979 coho scale samples collected from 19 river systems on the Kamchatka Peninsula and in Alaska.

Considerable effort was expended to identify the origin of salmon harvested in various inshore, mixed-stock fisheries of Alaska. The primary technique used was scale pattern recognition, although extensive tag recovery studies have also been undertaken, primarily for pink and chum salmon. Specific studies have included: sockeye salmon in Bristol Bay, Chignik, Kodiak, Prince William Sound, Cook Inlet, and Lynn Canal; chum salmon in Kotzebue Sound, Norton Sound, and the Yukon River; coho salmon in Cook Inlet and southeast Alaska; chinook salmon in Cook Inlet, southeast Alaska, and the Yukon River; and pink salmon in Prince William Sound and southeast Alaska.

A forecast of the 1980 Bristol Bay sockeye salmon run was generated. It represented the sum of forecasts for each of the eight major river systems of the bay. These were developed using one or more relationships each between the parent escapement and total return, between the smolt outmigration estimates and subsequent returns, and between the number of mature fish in the preceding year and the number of mature fish from the same brood year and freshwater age returning the next year. Each method used was weighted by its relative historic accuracy to yield the final forecast.

(3) Review of results of studies on continent of origin

(a) Coordination of research plans (Docs. 2244 Appendix 1, 2259, and 2261)

The precursor of the Ad Hoc Salmon Research Coordinating Group of the Sub-Committee on Salmon was formed at the 1977 Annual Meeting, and because of its importance in coordinating and facilitating research on continent of origin of salmon, the group was formalized and given special terms of reference at the 1979 Annual Meeting. Following the recommendation of the sub-committee, the group, including the spokesman-members of the sub-committee and their advisers, met for the fifth time in late February 1980, immediately prior to the meeting of the Ad Hoc Committee on Marine Mammals.

A major item of discussion was the 1980 research plans of Japan and the United States. Japan presented plans which included three longline vessels dedicated to conduct continent of origin research in waters around 46°N. Proposed transects and sampling stations were reviewed, and a southward shift of longline effort in the second cruise of two vessels was recommended. The U.S. member encouraged Japan to increase gillnet sampling in the area between 50°N and the central Aleutian Islands for the purpose of studying a relationship between the abundance of Bristol Bay sockeye on the high seas and inshore returns. The United States presented plans for a two-vessel tagging operation in waters near 46°N, which would employ purse seine and longline gear. Frequent radio exchange of catch data between U.S. and Japanese research vessels was proposed to provide information on areas of greatest abundance of target species. To facilitate this radio communication, a Japanese scientist was invited to work on board the U.S. vessels, and it was agreed that the details of this coordination would be settled through correspondence and through a meeting of Japanese and U.S. scientists in Seattle just prior to the field season. Neither the United States nor Canada intended to place salmon scientist/observers on board Japanese research vessels in 1980.

The status of exchanges of salmon scale samples and of catch statistics and other data was discussed at length. The United States informed Japan that earlier requests for 1972-1976 sockeye salmon scales had been fulfilled, and outlined 1980 plans for scale pattern analysis of sockeye salmon. The United States requested scale samples of coho salmon sampled on the high seas in 1979, and 1978 and 1979 sockeye and coho scales received by Japan from the U.S.S.R. Japan requested Alaskan chum salmon scales for years 1975 to present.

Japan presented recompiled (according to catcher vessel location) 1978 mothership catch and effort statistics and 1979 high seas catch statistics. The exchange of salmon research data was discussed. Since more and more data were being exchanged on computer tape, it was agreed that the Secretariat would maintain a record of and document the content, medium, and format of such exchanges.

The United States presented plans for the 1980 salmon mothership observer program, which were basically similar to those of 1979. The United States requested cooperation to repeat a tagging experiment to study randomness of samples of mothership catches, suggested two new sampling procedures, and requested the cooperation of mothership masters in logistical matters relating to observers' performance of assigned duties.

The February meeting ended with a short discussion of possible improvements of the sub-committee's report to the Commission, and of the need to clarify the period of cooperative research referred to in the revised Convention.

In preparation for field operations, considerable correspondence between Japan and the United States took place, which culminated with a meeting between a Japanese scientist and United States scientists in Seattle in early April. The detailed plans for radio communication between Japanese and U.S. vessels were made, and travel arrangements for the Japanese observer were discussed.

Radio exchange of research catch data took place every other day once the U.S. vessels reached the study area. Communication was often difficult on busy public frequencies, but enough data were accurately transmitted for the U.S. biologists to learn from the more extensive Japanese survey the areas of highest abundance of salmon. Several areas of possible improvement of such communication were identified.

(b) Review of results

(i) Results of studies by Japan (Doc. 2317 and additional information)

Japanese research vessels conducted salmon tagging operations during seven separate cruises from May through August 1980 in the North Pacific Ocean, Bering Sea, and Gulf of Alaska. Salmon were captured by longline, tagged and released in the waters lying between 41°28'-48°57'N and between 161°26'E-175°59'W in the North Pacific Ocean, between 55°48'-58°00'N and between 174°24'E-176°30'W in the Bering Sea, and between 49°52'-56°06'N and between 145°03'-144°50'W in the Gulf of Alaska. In total, 6,576 salmon were caught and of this number 2,822 were tagged and released. The number of fish tagged by species was 422 sockeye, 1,654 chum, 570 pink, 143 coho, 16 chinook, and 17 steelhead trout.

As much as possible, tagging effort was directed to those locations in which sockeye and coho were most abundant in the waters south of 46°N. The original survey plan was to make six survey cruises by three research vessels. However, the second cruise of Hokko maru was not conducted because of the rise in fuel oil price. Examination of gillnet CPUE data indicated that sockeye salmon were mainly distributed in waters close to 45°N in the western area and waters north of 45°N in the eastern area in May. The tagging stations were widely distributed from east to west in waters of 41°N to 46°N and were equivalent to the southern half of the distribution area of sockeye salmon. In the west longitudinal area, the density of sockeye was particularly low around the tagging stations. In June, relatively high density of coho salmon was observed in waters of 42°N to 46°N in the west longitudinal area and the tagging locations corresponded with this group of fish. In July the center of distribution of coho salmon was observed in the area of 47°N to 48°N and a few coho were tagged in waters south of 46°N in both the eastern and western areas.

Twenty-six recoveries of salmon tagged in the North Pacific, Bering Sea, and Gulf of Alaska in the period 1978 to 1980, and a recovery from the 1976 tagging were reported in 1980. The results of new recoveries are as follows:

Sockeye salmon: One immature sockeye salmon, released at 49°29'N, 179°23'E on July 27, 1979, was recovered at Nushagak in Bristol Bay on July 13, 1980, which supports previous data on offshore distribution of immature Bristol Bay sockeye salmon in July. Four additional sockeye salmon were recovered on the high seas.

Chum salmon: Five chum salmon were recaptured in coastal areas. Two notable recoveries among those were: one chum released at 45°30'N, 173°26'E on May 25, 1979 was recovered off Odanosawa, Aomori Prefecture on October 10, 1979, and another, released at 47°36'N, 161°29'E on June 19, 1979, was recovered at Wakkanai, Hokkaido on September 28, 1979. Japanese coastal recoveries of chum salmon have in the past been mainly from releases in the Bering Sea during June-August, and only one recovery of a chum released in waters south of 46°N, west of 175°E in May and June has been made along the Japanese coast. The two new recoveries support this single recovery in demonstrating a distribution and migration of Japanese chum salmon which differ from the typical distribution and return migration from the Gulf of Alaska through the Bering Sea (INPFC Bulletin 35).

Three other recoveries of chum salmon (one released in the Bering Sea on July 25, 1979 and captured at Shizunai, Hokkaido; another released at 44°31'N, 166°28'E and recovered in the Amur River on September 14, 1978; and the other released at 50°00'N, 162° 57'E and also recovered in the Amur River on October 14, 1979) support previous findings. Three other chum salmon were recovered on the high seas.

Pink salmon: One pink salmon, released at 56°03'N, 176°30'W on July 18, 1980 and recovered at Nushagak in Bristol Bay on August 11, 1980, extended the northwestern limit of Kuskokwim and Bristol Bay pink salmon (previously known to be 55°07'N, 175°40'W). A pink salmon released in the Gulf of Alaska on July 12, 1980 was recovered in Cook Inlet on July 30, 1980. Another pink released in the area around the central Kuril Islands on July 22, 1976 was recovered in Terpeniya Bay of Sakhalin. These two recoveries substantiate previous findings. Four other pink salmon were recovered on the high seas.

Coho salmon: A coho salmon released in the Gulf of Alaska on July 12, 1980 and recovered in Cook Inlet on July 25, 1980, and another coho, released at 48°31'N, 178°28'W, on July 31, 1979 and recovered in the Levaya Kotelnaya River, east Kamchatka in the same year, support previous findings for coho salmon of central Alaska and the east Kamchatka origin, respectively. Four other coho salmon, released in the waters of 44°-48°N, 179°E-176°W in late June, were recovered by mothership fleet operations in the areas of 49°-50°N, 173°-175°E in late July. They further support findings of northwestward migration of coho salmon in the above waters.

Steelhead trout: A steelhead trout, released at 45°31'N, 179°28'E on June 25, 1979, was caught in the Sandy River, a tributary of the Columbia River on January 19, 1980. This is a southward extension of the known ocean distribution of North American steelhead trout in the central North Pacific Ocean (previous distribution limit 51°00'N, 177°17'E).

Additional information regarding distributions, origins, and oceanographic conditions (Doc. 2318, 2319, and 2320): The catch data obtained in 1980 through operations by research gillnets with 10 mesh sizes were examined (Doc. 2320). The results obtained from the preliminary research data were:

Sockeye salmon: In May, three locations with CPUE over 1.0 fish/tan were observed. They were the area near 45°N, 162°E, the area south of the central Aleutian Islands north of 50°N, and the area near 44°N, 172°-178°E. Based on the past findings, the fish in the first and the second areas would be maturing fish and those in the third area would be immature fish. In June, CPUE over 1.0 was observed south of the central Aleutians. However, the range of this high CPUE did not extend to the waters south of Attu Island (north of 50°N west of 174°E). Areas with CPUE over 0.5 were observed in waters between 43°-49°N west of 175°E, but the center of this distribution was not well defined. In July, the area of main distribution of sockeye salmon was in waters north of 47°N. CPUE over 1.0 was observed near 48°-52°N and widely spread from east to west. According to past findings, this concentration was considered to consist of immature fish. A wide distribution of CPUE over 0.5 was observed in the central area of the Bering Sea. These fish were also considered to be immature.

Chum salmon: Except for the waters east of 175°E near 43°-45°N where CPUE over 0.4 was observed, CPUE in May was generally low, particularly north of 47°N. In June, CPUE over 0.4 was observed frequently in waters near the Kuril Islands and east of 175°E, but in the waters around 170°E the CPUE was still low. In July, CPUE over 0.4 was observed over a wide area north of 45°N, and in the central Bering Sea CPUE over 5.0 was widely observed.. Based on past findings it was considered that both maturing and immature fish occurred in this area.

Pink salmon: In May, CPUE was generally low, except for the waters near 42°N, 160°E and the waters south of 47°N near 177°E where CPUE over 1.0 was observed. In June, CPUE was generally low in the waters east of 160°E, but in the waters west of 160°E, very high CPUE (up to 16.0) was observed. In July, CPUE over 2.0 was observed in a wide area from south to north in the waters west of 165°E. However, CPUE in the Bering Sea and the waters east of 165°E was very low.

Coho salmon: In May, CPUE over 0.2 was observed only in the waters south of 44°N east of 175°E. In June, CPUE over 0.4 was occasionally observed in waters south of 46°N. In July, CPUE over 0.4 was widely observed south of 49°N but CPUE was generally low.

Chinook salmon: In May, chinook salmon were infrequently caught. In June the areas with CPUE over 0.02 were widely distributed and CPUE over 0.1 was observed. In July, areas with CPUE over 0.05 were observed in the waters near Kamchatka west of 165°E, the waters south of the Aleutians east of 180°, and the central Bering Sea.

Data obtained from immature sockeye salmon caught by the research gillnets with 10 different meshes south of the Aleutian Islands in July and August of each year from 1972 to 1980 were examined (Doc. 2319). It is known that immature sockeye in the area at that time of season are primarily of western Alaska origin. Sockeye salmon caught by research gillnets did not differ in fork length from fish sampled by purse seine but there was a possibility of underestimating relative abundance of age .1 sockeye. It was, therefore, concluded that age .1 and age .2 fish should be treated separately. In these waters, the sampling was conducted during July 1 to July 14 in 1980 and the average CPUEs were 1.18 fish/tan for age .1 fish and 0.77 for age .2 fish.

Observations on oceanographic conditions of the northwest Pacific Ocean were made during the summer of 1980 (Doc. 2318). The Western Subarctic Water did not show a marked deviation from the usual year to year pattern in waters west of 165°E, but the southerly extension of the Komandorski Cold Tongue was notable. The Okhotsk high pressure area developed in July and extended to the south, resulting in low temperature phenomena in some offshore areas between Hokkaido and Sanriku. However, on the salmon fishing grounds, the unusual low temperature phenomena were not observed.

(ii) Results of studies by the United States (Docs. 2332, 2333, 2336, 2342, 2344, 2346, 2348, 2351, and 2369)

New recoveries of salmon tagged by the United States were reported in the usual manner (Docs. 2348 and 2369). Two of these signified significant range extensions for North American stocks of pink and sockeye salmon. The recovery in Makushin Bay, Unalaska Island, of a pink salmon tagged at 45°42'N and 178°35'W marks the first North American tag recovery of a salmon released in the area of the pre-1978 landbased fishery area, and extends the known southwestern range of North American pink salmon. The 1979 recovery at Hissin Point on the west coast of Vancouver Island of a sockeye released south of Adak in 1977 extends the known range of southern British Columbia sockeye from 172°03'W to 176°24'W. A sockeye salmon released just south of Adak Island in 1978 was recovered by a landbased driftnet vessel, purportedly at 43°N, 167°E on July 9, 1980.

A study of the continent of origin of sockeye salmon in the pre-1978 Japanese landbased driftnet fishery area by means of scale pattern recognition involved a separate analysis for each of 14 groups of maturing and immature sockeye, viz., immature age 1.2 sockeye sampled in 1972 and 1975, immature age 2.2 fish in 1972 and 1973, maturing age 2.2 fish in 1972-1974 and 1976, maturing age 1.3 fish in 1973 and 1976, and maturing age 2.3 fish in 1972-1974 and 1976 (Doc. 2346). For several of these groups, sampling coverage was too sparse or sporadic to reveal spatial or temporal trends in mixing proportions of Kamchatkan and Alaskan stocks. Among the groups sampled sufficiently to demonstrate trends in distribution of continental stocks, statistically significant estimates of the proportion of Alaskan fish in the pre-1978 landbased area and west of 175°E were obtained for immature age 2.2 sockeye in 1972 and 1973, maturing age 2.2 fish in 1973, and maturing age 2.3 fish in 1972. For most sample groups the estimated proportions of Alaskan sockeye decreased to the west and south, as would be expected. Most of the Alaskan sockeye detected were of Bristol Bay origin, although some statistically significant estimates were obtained for Gulf of Alaska stocks as far west as area E6048. Because misclassification error rates were relatively high between Kamchatka and Gulf of Alaska fish and because many of the "unknown" sample sizes were quite small, some of the estimates for Gulf of Alaska may be spurious. Areas of intermingling of maturing and immature Asian and Alaskan sockeye were found to be more extensive than depicted in INPFC Bulletins 30 and 34. Few samples of either maturing or immature sockeye were available for the southeast part of the study area, south of 46°N and east of 175°E, so no firm conclusions could be drawn regarding continent of origin of sockeye in that sector.

A preliminary study to determine the potential usefulness of scale pattern analysis in continent of origin studies of coho salmon provided encouraging results (Doc. 2348). Scale samples of age 2.1 coho collected from 19 Kamchatkan and Alaskan river systems in 1979 were grouped according to four geographical regions: Kamchatka, and western, central, and southeastern Alaska. Classification of 735 fish of known origin in a 4-category analysis resulted in an overall classificatory accuracy of 65%, and the classificatory accuracy of the single Asian category was 73.6%.

Analyses of tagging data from experiments on board Japanese catcher vessels revealed that handling of the fish between the time the fish are removed from the net on board the catcher vessel and the time the fish are sampled on board the mothership do not randomize the sequence fish are sampled (Doc. 2342). However, this nonrandom sample still produced a random sample of weight. The effects of nonrandom sequence in the sample on age-composition estimation would have to be evaluated in a similar experiment. Any nonrandom ordering of ages or weights in the net would result in increased variability between samples.

Using procedures reported in INPFC Bulletin 30, the United States estimated that 360,000 Bristol Bay sockeye salmon were caught by the Japanese mothership salmon fishery in 1978--124,000 were maturing; 236,000 were immature (Doc. 2344). The estimates for 1979 were 68,000 for maturing fish and 410,000 immature fish, for a total of 478,000. From 1956 through 1979, average annual catch by the Japanese mothership salmon fishery of chinook salmon originating in western Alaska and in the Canadian portion of the Yukon River was estimated at 123,000. Statistical areas 8056 and 8058 in the central Bering Sea yielded 31% of the total catch of chinook salmon of western Alaska and Canadian Yukon origin.

Additional information regarding the incidence of salmonids in 1979 groundfish fishery catches was obtained by United States observers on board foreign and U.S.-U.S.S.R. and U.S.-Korea joint venture vessels off the Pacific coast of North America and in the Bering Sea (Docs. 2332, 2333, and 2336). The estimated incidental catch of salmonids by joint venture vessels was 2,674 fish. Of this total, 1,623 fish were caught off Washington, Oregon, and California, and 1,051 were caught in the Gulf of Alaska. The estimated total incidental salmon catch by foreign groundfish vessels was 135,160 fish (7,044 off Washington, Oregon, and California, 20,410 from the Gulf of Alaska, and 107,706 from the Bering Sea). The estimated species composition of the total foreign incidental take was 91.6% chinook, 6.7% chum, and 1.7% coho, sockeye, and pink salmon. The catches of chinook salmon by area were estimated to be 100,382 in the Bering Sea (as compared to 39,113 in 1978), 16,879 in the Gulf of Alaska (42,456 in 1978), and 6,551 off Washington, Oregon, and California (5,586 in 1978). The higher catches in the Bering Sea in 1979 were attributed to higher incidence rates on large surimi and freezer trawlers from Japan, Republic of Korea, and the U.S.S.R.

Because of U.S. concern regarding the impact of high seas driftnet and groundfish fisheries on stocks and inshore harvest of chinooks returning to western Alaska rivers, data were also compiled on inshore catches (Doc. 2351). Table 1 summarizes available estimates of catches by the driftnet, groundfish, and inshore fisheries by year of catch. Estimates in groundfish fisheries were not available for years prior to 1977. The sub-committee noted that Canada has a similar concern regarding salmon originating in the Canadian portion of the Yukon River.

(c) Summary of information on continent of origin

Three sampling seasons have passed since renegotiation of the INPFC treaty. Members of the Sub-Committee on Salmon agreed, therefore, that a summarization of information concerning continent of origin of salmonids in waters south of 46°N and west of 175°W is needed. It was considered appropriate to summarize this information with respect to the periods before and after the beginning of coordinated and intensified research on this matter which immediately followed the renegotiation early in 1978.

Before 1978 virtually all information on continent of origin of salmonids south of 46°N had come from Japanese high seas tagging experiments, although some additional information regarding sockeye salmon origins was available from studies of the incidence of parasite "tags" (Doc. 1795), age composition (Docs. 1796 and 1932), distribution of sockeye of various maturity stages (Docs. 2029 and 2030), and yearly fluctuations of CPUE (Doc. 2031). Most of the salmon released south of 46°N by Japanese tagging vessels before 1978 were pink and chum salmon, and the great majority of these were released west of 175°E (Doc. 2237 summarizes tagging information through 1978, and 1978 releases are reported in Doc. 2089). All coastal recoveries of pink and chum salmon were from Asia. Kamchatka pink salmon south of 46°N were known to occur as far east as 176°31'W (Doc. 2089). The nearest release locations of pink and chum salmon recovered in North American coastal areas were in the region of the central Aleutian Islands. Sockeye salmon were tagged south of 46°N at a much lower rate than were pink and chum and the great majority of these releases also occurred west of 175°E. Only one coastal recovery (from the Ozernaya River of the U.S.S.R.) resulted from these releases. Six additional Kamchatkan coastal recoveries of sockeye were from releases between 46°N-48°N and 160°-170°E. Information from other studies mentioned above provided no firm conclusions on continent of origin of sockeye in waters south of 46°N. Chinook and coho salmon and steelhead trout were also tagged southwest of 46°N, 175°W, albeit in much smaller numbers, and from these releases only one Asian coastal recovery of a coho salmon (released in area E6544) was recorded. A coho released at 44°28'N, 173°31'W in late June 1977, however, was recovered in early September in Bristol Bay, Alaska, which indicated occurrence of North American stocks in the vicinity of the area encompassed by this summary. Another coho released in the same longline set as this North American coho was recovered in the Kamchatka River in November 1977. These two recoveries signified intermingling of North American and Asian stocks much further to the southeast than previously known. The nearest release areas of chinook salmon and steelhead trout recovered in North American coastal areas were 8050 and W7550, respectively.

Research in the period 1978-80 that has provided additional information on continent of origin of salmonids south of 46°N has consisted of expanded tagging efforts by Japan (Docs. 2089, 2237, and 2317), a tagging effort by the United States in 1980 (Docs. 2348 and 2369), and scale pattern analysis of sockeye by the United States (Docs. 2136, 2222, and 2346). The recently increased rate of tag releases of all species (except for pink salmon southwest of 46°N, 175°E) is evident in Table 2. Recently acquired information on continent of origin of each salmonid species follows:

(i) Sockeye salmon

There have been three significant tag recoveries of sockeye in the post-1977 period. A maturing sockeye released in early June 1978 at 43°29'N, 168°38'E was recovered in the Ozernaya River of the U.S.S.R. This recovery significantly extended the known limit of the southern range of west Kamchatka sockeye. A maturing sockeye released in late May 1979 at 46°27'N, 171°38'E was recovered in Bristol Bay, Alaska. Although this recovery was not from a release south of 46°N, it significantly extended the known southwestern limit of maturing Bristol Bay sockeye and demonstrated the occurrence of this stock in the immediate vicinity of the landbased fishery area. Third, an early July 1980 recovery by a landbased driftnet vessel of a sockeye at 43°N, 167°E was from an August 1978 release just south of Adak Island. Intensive tagging studies have shown that virtually all immature sockeye in the Adak area in mid-summer are of North American (primarily Bristol Bay) origin (INPFC Bulletin 34). There is some reservation, however, regarding the accuracy of recovery location for this sockeye.

Scale pattern analysis of maturing and immature sockeye sampled on the high seas by Japanese research vessels in 1972-1976 has provided the greatest degree of resolution of information on sockeye origins south of 46°N. These studies have provided estimates of stock mixing proportion within maturity group, age group, 10-day period, and INPFC statistical area strata. Proportions of maturing Alaskan sockeye were estimated for 35 such strata. These estimates (most of which were not statistically significant) ranged from 0% to 35.6% and averaged 7.0% (unweighted mean). All samples of sufficient size were collected west of 175°E. For immature Alaskan sockeye, 25 samples of sufficient size provided estimates ranging from 0% to 53.7% and averaging 11.0%. Only 2 of these 25 samples were collected east of 175°E. It was concluded from these on-going studies that North American sockeye occur in the pre-1978 landbased fishery area, but that the great majority of sockeye there are of Asian origin. No firm conclusions were possible for the area east of 175°E due to lack of sufficient samples.

In summary, recent tagging experiments and scale pattern studies have provided evidence of the occurrence of North American sockeye in the area south of 46°N and west of 175°E. The scale pattern studies suggest that Asian and Alaskan sockeye intermingle over a broader area than depicted in Bulletins 30 and 34. There is little information on sockeye origins east of 175°E, owing to the markedly lower tagging and sampling of sockeye in that area (Table 2).

(ii) Chum salmon

The additional information from fish tagged in waters south of 46°N includes three chum salmon recaptured in coastal areas. Two notable recoveries were: one chum salmon released at 45°30'N, 173°26'E on May 25, 1979 and recovered off Odanosawa, Aomori on October 10, 1979; another released at 44°29'N, 161°31'E on June 16, 1979 and recovered at Mineoka in Soya Strait of Hokkaido on October 2, 1979. Japanese coastal recoveries of chum salmon have been mainly from releases in the Bering Sea during June-August, while a Japanese coastal recovery of chum salmon released southwest of 46°N, 175°E in May and June has been made only once before. These two new recoveries and the earlier one suggest a broader distribution of Japanese chum salmon than previously acknowledged, i.e., that maturing Japanese chum salmon are typically distributed through the Gulf of Alaska in April and May and migrate through the Bering Sea between June and August (INPFC Bulletin 35). A chum salmon released at 44°31'N, 166°28'E on May 24, 1978 was recovered on September 14, 1978 in the Amur River. There are still no coastal tag recoveries of chum released south of 46°N and between 175°E-175°W.

(iii) Pink salmon

Additional information from fish tagged in waters southwest of 46°N, 175°W includes one pink salmon recaptured in a coastal area. A pink salmon tagged at 45°42'N, 178°35'W on June 29, 1980 was recovered in Makushin Bay, Unalaska Island between July 15 and August 20. The previously known southern extent of North American pink salmon in waters west of 175°W was 50°56'N, which makes the present recovery a significant range extension.

(iv) Coho salmon

Catch per unit effort data from Japanese research vessels (INPFC Annual Report 1978, 1979, and Doc. 2320) indicate that coho salmon south of 46°N latitude annually increase in abundance between May and July in northeasterly and northwesterly directions from 175°E. Peak concentrations of coho occur north of 46°N in July. New information concerning the origin of coho migrating in the Pacific south of 46°N is very limited and indicates intermingling of stocks over a broad area. Three ocean and two coastal recoveries have been reported from the 1978-80 tagging by Japan and the United States. Tagged coho released west of 175°E at latitudes 46°35'N, 45°30'N, and 45°33'N were recovered within the same year at 49°17'N, 173°22'E; 49°52'N, 174°11'E; and 43°N, 167°E, respectively (Docs. 2317 and 2348). No coastal recoveries of coho tagged southwest of 46°N, 175°E have been reported; however, a coho tagged in 1978 at 49°59'N, 164°30'E was recovered in southeast Kamchatka in the same year.

There have been no coastal recoveries of coho tagged south of 46°N and between 175°E-175°W since 1977. However, a coho tagged at 48°31'N, 178°28'W in 1979 was recovered in the same year in the Levaya Kotelnaya River of the U.S.S.R. (Doc. 2317).

(v) Chinook salmon

Catch per unit effort data from Japanese research vessels (INPFC Annual Report 1978, 1979; Doc. 2320) indicate that chinook salmon are widely distributed and occur in low abundance south of 46°N latitude. Chinook abundance generally increases north of 46°N throughout the summer but remains low in relation to the other salmon species. Very few chinook salmon have been tagged southeast or southwest of 46°N, 175°E in the period 1978-1980 (Table 2). There have been no recoveries from these releases.

(vi) Steelhead trout

The distribution and abundance of steelhead are poorly documented south of 46°N latitude. Japanese tagging documents (Docs. 2089, 2236, and 2317) suggest steelhead are widely distributed and are similar to chinook salmon in relative abundance. No tags have been recovered from steelhead released southwest of 46°N, 175°E in the period 1978-1980 (Table 2). In 1980, however, a steelhead tagged at 45°31'N, 179°28'E in 1979 was recovered in a tributary of the Columbia River (Doc. 2317). This recovery significantly extended the known southwestern limit of North American steelhead in the central North Pacific Ocean, although Japan reports that a Washington State steelhead was previously tagged further west (51°00'N, 177°17'E; Doc. 2317). The latter steelhead was tagged in 1970 and recovered in 1971, but was first recorded in INPFC literature in 1980 (Doc. 2317).

(4) Summary of new information

(a) A pink salmon tagged by U.S. biologists at 45°42'N, 178°35'W on June 29, 1980 was recovered in Makushin Bay, Unalaska Island between July 15 and August 20. The previously known southern extent of North American pink salmon in waters west of 175°W was 50°56'N, which makes the present recovery a significant range extension. This recovery is also the first North American coastal recovery of a salmon released in the area of the pre-1978 Japanese landbased driftnet fishery.

(b) A pink salmon released by Japan at 56°03'N, 176°30'W on July 18, 1980 and recovered at Nushagak in the Bristol Bay on August 11, 1980 extended the known ocean distribution of pink salmon of Kuskokwim and Bristol Bay origin to the northwest (previously 55°07'N, 175°40'W).

(c) A sockeye tagged by U.S. biologists at 50°59'N, 176°24'W on July 7, 1977 was recovered at Hissin Point on the west coast of Vancouver Island on June 27, 1979. This recovery extends the known western limit of southern British Columbia sockeye from 172°03'W.

(d) Scale pattern analysis of numerous sample groups of maturing and immature sockeye salmon collected in the period 1972-1976 provided several statistically significant estimates of Alaskan (principally Bristol Bay) sockeye in the pre-1978 landbased fishery area that ranged between 6.5% and 36.9%. The area of intermingling of Asian and Alaskan maturing and immature sockeye was found to be more extensive than depicted in INPFC Bulletin 30.

(e) A steelhead trout released by Japan at 45°31'N, 179°28'E on June 25, 1979 was caught in the Sandy River, an Oregon tributary of the Columbia River on January 19, 1980, extending the known ocean distribution of steelhead trout of North American origin to the south in the central North Pacific (previously 51°00'N, 177°17'E).

(f) The first recoveries of coded-wire tagged salmonids outside of the U.S. and Canadian 200-mile fishery zones were made by a Japanese research vessel in the Gulf of Alaska in 1980. Two coded-wire tagged steelhead trout were recovered in July along longitude 145°W in the central gulf during the cruise of the Oshoro maru. One steelhead was released from the Niagara Springs Hatchery, Idaho, in April 1980 (Doc. 2317), and the second steelhead was released from the Cowlitz Hatchery (Columbia River), Washington, in April 1978 (K. Johnson, Pacific Marine Fisheries Commission, pers. comm.). Further, the former recovery is the only marine recovery of a tagged Idaho steelhead.

5. NEW JOINT COMPREHENSIVE REPORTS

The Sub-Committee on Salmon has reviewed the progress toward publication of the new joint comprehensive reports proposed by the Standing Committee on Biology and Research in 1970. The reports on chum salmon, sockeye salmon, coho salmon, and oceanography have been published and distributed in both English and Japanese versions. The English version of the report on chinook salmon has been distributed and the Japanese version is in the process of translation. The English version of the report on pink salmon should be distributed in early 1981; the Japanese translation has been started. The draft of the report on masu salmon will be submitted in Japanese to the Secretariat by the summer of 1981.

6. EXCHANGE OF DATA (Agenda items 8, 9, and 10)

The sub-committee notes that the exchange of basic tagging, catch, effort, biological, and oceanographic data from research operations is up to date generally, and that it should be continued at least at the same level as in the past. The United States indicated that detailed biological data collected by its biologists on U.S. purse seine vessels in 1980 would be provided on computer tape and tabular form, and detailed sockeye and coho scale measurement data would be provided on computer tape by late 1980. Japan indicated that detailed catch and oceanographic data from salmon research vessels for 1980 would be available by mid-1981.

The sub-committee notes that Japan has provided mothership salmon fishery statistics for 1978 and 1979 consisting of catch by species (in numbers and weight) and effort by $1^{o}x1^{o}$ area and 10-day period, tabulated according to catcher boat position. The 1980 statistics will be tabulated in the same manner and submitted by late January 1981 in accordance with the Memorandum of Understanding. The U.S. member requested that the voluminous 1980 statistics be submitted on a computer tape instead of in typed format, and Japan indicated that submission of data in the same computer-readable format as used for the 1979 data would be possible.

Japan has provided 1979 catch (in numbers and weight) and effort data for the landbased driftnet fishery, tabulated by $2^{o}x5^{o}$ statistical area and 10-day period. The Japanese member indicated that the 1980 statistics for this fishery would be provided in the same level of detail by late January 1981. The United States requested that the 1980 statistics for the landbased driftnet fishery be submitted on a computer tape in a suitable format similar to the one used for the mothership salmon fishery statistics except that $2^{o}x5^{o}$ statistical area will be used for the landbased driftnet fishery statistics.

A list of material and data exchanged during 1979-80 was documented by the Secretariat (Doc. 2311). This list included in part 1978 and 1979 scale samples and associated biological data for sockeye and coho salmon and 1972-1979 tagging data on sockeye and coho salmon requested by the United States and provided by Japan. Japan requested and the United States provided Alaskan chum salmon scales and associated biological data from 1975 through 1979.

7. STATISTICAL YEARBOOK

At recent annual meetings the status of the Statistical Yearbook has been reviewed and recommendations have been made regarding the format of the Yearbook and regarding inclusion of salmon statistics from non-member countries. The actions taken to date are as follows:

(1) 1977 Statistical Yearbook

The 1977 Statistical Yearbook has gone to press. The Yearbook will be distributed in mid-1981.

(2) 1978 Statistical Yearbook

Completion of the 1978 Statistical Yearbook has been delayed because of lack of a substantial portion of the salmon catch data from the states of Alaska, Washington, and Oregon. The U.S. member indicated that the states will be urged to provide the data promptly. The 1978 Yearbook will follow the format changes recommended by the sub-committee documented in the 1979 Proceedings.

(3) Inclusion of statistics from the U.S.S.R.

Coastal catches by species for 1978 and 1979 were provided through the United States and will be incorporated into the Yearbook. The sub-committee urges the Secretariat to continue its efforts to obtain catch data for 1975 through 1977.

(4) Inclusion of statistics from other non-member countries

The Secretariat has received the Republic of Korea 1979 Yearbook of Fisheries Statistics which contains information on the catch of salmonids in 1978. The 1978 catch statistics from the Republic of Korea will be published in the 1978 Statistical Yearbook with a footnote that the species composition of the catch is uncertain.

(5) 1979 and future Yearbooks

The sub-committee agreed that the format of the 1979 and future Statistical Yearbooks should follow that adopted for the 1978 Yearbook.

8. PUBLICATIONS (Agenda item 12)

The sub-committee reviewed the status of publications other than the comprehensive reports on salmon and oceanography, and the Statistical Yearbooks. The status of other publications is as follows:

(1) Historical Salmon Statistics Bulletin

The English version of the Historical Salmon Statistics Bulletin has been published and distributed as Bulletin Number 39 and the Japanese translation has been completed.

(2) 1972 Salmon Symposium Proceedings

The Japanese and English versions of the 1972 Salmon Symposium Proceedings (INPFC Bulletin 32) have been published and distributed.

(3) Bulletin

The U.S. Section intends to submit a manuscript entitled "Early oceanic migration and growth of juvenile Pacific salmon and steelhead trout" to the Secretariat for publication as a Bulletin.

9. RESEARCH PLANS FOR 1981

Tentative research plans for each national section for 1981 were exchanged. Requests for samples and data associated with these plans are listed in Appendix 1(A). The three national sections agreed to meet the requests insofar as possible, to consider making special effort for the collection of samples, and to expedite sample exchange.

The 1980 recovery by a Japanese research vessel in the Gulf of Alaska of a coded-wire tagged steelhead trout led to a request to the INPFC from the Pacific Marine Fisheries Commission for Japanese research vessels to examine salmonid catches routinely for adipose fin clips that may indicate the presence of such tags, and to return snouts of such fish along with recovery data. This request was referred to the Sub-Committee on Salmon. The sub-committee members agreed that high seas recoveries of coded-wire tagged salmonids would contribute significantly to information on ocean migrations and distribution, and that cooperation in recovery effort facilitated through the INPFC should involve U.S. and Canadian research and observer programs as well as the Japanese research program. The sub-committee therefore RECOMMENDS that the research and observer programs of the national sections include efforts, insofar as possible, to examine research or observed commercial catches for salmonids missing the adipose fin. Heads collected from these fish and accompanying recovery data will be processed in accordance with procedures to be decided at the next meeting of the Ad Hoc Salmon Research Coordinating Group. Specific participants in this cooperative effort will be Japanese and U.S. salmon research vessels, U.S. and Canadian observers on groundfish vessels, and U.S. observers on Japanese salmon motherships.

Following the 1980 recoveries of three tagged steelhead trout (two with coded wire tags, one with a Japanese disc tag), there was considerable discussion in the sub-committee about steelhead ocean migrations and distributions. Since information on this subject is scant, the Canadian member requested Japan to provide research and perhaps commercial (landbased driftnet and mothership) catch data for steelhead. The Japanese member responded that steelhead catches by

research vessels have not been reported (except in tagging documents that report only longline catches), but that they would be provided. Regarding the possibility of future commercial catch data on steelhead, Japan mentioned that a change in reporting procedures would require changes in domestic regulations and, although the possibility of such changes would be explored, no assurances could be presently made that these data would become available.

As a consequence of the review on continent of origin studies included in this year's sub-committee report, the sub-committee RECOMMENDS that in 1981:

(1) increased emphasis be given to tagging and collection of scales from sockeye salmon south of 46°N and between 175°E-175°W because of the much lower level of past tagging and sampling in this area

(2) increased emphasis also be given to tagging of pink salmon southeast of 46°N, 175°E due to the disproportionately lower level of past tagging in this area

(3) scales be collected, if possible, from all coho and chinook salmon sampled by research vessels south of 46°N since the potential for identification of the continent of origin of coho and chinook salmon by scale pattern appears favourable

(4) the Ad Hoc Salmon Research Coordinating Group review ways to improve the amount of information obtained from efforts to determine the continent of origin of salmonids south of 46°N.

The sub-committee notes that the efforts of the Ad Hoc Salmon Research Coordinating Group, reported under Review of results of studies on continent of origin, have resulted in a greater level of cooperation in planning of research vessel operations, execution of research, exchange of data, and analyses. The sub-committee notes with satisfaction the recent increase in tagging effort by Japanese research vessels and the initiation of U.S. tagging. However, the sub-committee considers that our present knowledge and the level of research planned cannot provide sufficient information on continent of origin of salmonids within the next year to enable the Commission to make recommendations under Article III 1(d) of the Convention. The sub-committee RECOMMENDS that the Standing Committee on Biology and Research call this problem to the attention of the Commission.

The sub-committee also RECOMMENDS that the Ad Hoc Salmon Research Coordinating Group continue its work through correspondence, and that the group meet in Tokyo, Japan in February 1981. If possible, the meeting should be held immediately prior to the meeting of the Scientific Sub-Committee of the Ad Hoc Committee on Marine Mammals. This will facilitate coordination of salmon and marine mammal research on vessels and simplify arrangements by the Secretariat for meeting rooms, interpreters, and typing services.

Tentative research plans for each country follow.

(1) Canada

(a) Salmonid research

Salmonids occurring incidentally in catches of marine species will be examined for incidence of adipose fin-clips. Heads of salmonids missing the adipose fin and all recovery information will be forwarded to the Pacific Marine Fisheries Commission. Information from high seas tagging will continue to be updated.

(b) Oceanographic research

In November 1980, a joint U.S.-Canada project in the vicinity of Ocean Station P will include the deployment of 25 drifting buoys and 4 moored buoys, and CTD and bathythermograph observations.

The observational program at coastal lighthouses, from fisheries vessels and at Ocean Station P (until July 1981) and the publication of temperature charts will be continued. Moored current meters off the west coast of Vancouver Island will be maintained. Development of remote sensing techniques and alternative systems for Station P will also be continued.

(2) Japan

Research plans for 1981 are still tentative but it is expected that research will continue in the North Pacific Ocean and Bering Sea.

(a) Salmon

(i) Research on board motherships

As in previous years, daily catch statistics will be collected. Body length and weight, gonad weight, and sex will be recorded for samples of each species. Scale samples will be taken.

(ii) Research by research vessels

The number of research vessels engaged in 1981 may be nine vessels. They will operate from May to August, a period similar to that in previous years. One or two of these vessels will operate in the Bering Sea.

The main objective is to collect biological data and samples for studies on distribution and abundance of salmon and steelhead trout in the North Pacific Ocean and Bering Sea in relation to stock identification of salmonids in offshore waters and to assess the status of the salmonid stocks.

Two or more of the research vessels mentioned above will be engaged in tagging of salmon under the research coordination plan of the three countries for studying continental origin of salmon distributed and migrating in the waters south of 46°N.

Head snouts and biological data for adipose-clipped salmonids will be collected from catches by the salmon research vessels.

(b) Oceanography

Oceanographic observations will be made by the research vessels and motherships carrying out the above.

(3) United States

(a) Continent of origin studies (Fisheries Research Institute)

The United States will continue studies of the continent of origin of salmon, particularly in the area of the pre-1978 Japanese landbased driftnet fishery. The main objective will be to tag salmon from possibly two research vessels which will fish with purse seine and longline gear in the period May through July. Because of the relatively low level of tag releases of the target species likely to be realized in far offshore tagging experiments, an intensive effort will be made to encourage the return of tags seen in Asian and North American coastal fisheries. Another major objective will be to continue scale pattern analyses of sockeye and coho. Scale samples already received from Japan and expected to be received from the U.S.S.R. will be used in continent of origin studies of immature and maturing sockeye salmon, and of coho salmon. Attempts will be made to obtain from the U.S.S.R. scales from past and 1981 sampling which will be used in future analyses.

(b) U.S. salmon observer program (National Marine Fisheries Service)

In 1981 the United States plans to place a salmon observer on board each of the motherships so that catches of salmon can be observed during all fishing operations within the USFCZ. Weighing of daily landings from catcher boats will be directly observed while the weight of daily catches of scout boats within the USFCZ will be obtained from a copy of the catch log furnished by the appropriate ship's officer. Daily effort and location, to the nearest minute of latitude and longitude, for each catcher and scout boat within the USFCZ, will also be recorded from the catch log. The U.S. salmon observers may collect biological data such as scales, body length and weight, gonad weight, and sex from samples of each species of salmon. Catches of salmon will be routinely monitored by U.S. salmon observers for any salmon missing adipose fins. Fish without adipose fins will be sampled for biological data and to recover potential coded wire tags implanted in the snout. The U.S. salmon observers will not monitor salmon catches beyond the USFCZ.

(c) Other studies

A research vessel will fish with gillnets along a transect offshore from Port Moller. Daily abundance estimates of mature Bristol Bay sockeye will be generated. Size characteristics of the fish will be investigated as a means for assessing total run strength. Inshore stock separation activities based on scale pattern analysis, age class composition differences, and tagging will continue on a comparable level as in 1980. A forecast of the total run of sockeye salmon to Bristol Bay by age class and river system will be made. These studies will be conducted by the Alaska Department of Fish and Game.

In response to a request from the Pacific Marine Fisheries Commission and subsequent recommendation by this sub-committee to accommodate that request, the United States will greatly increase efforts to examine salmonids sampled on the high seas for missing adipose fins which may indicate the presence of coded wire tags. U.S. observers on board motherships, foreign trawl and longline vessels, as well as on U.S. salmon research vessels will insofar as possible examine salmonids caught purposely or incidentally for missing adipose fins, and return snouts of these fish and accompanying recovery information in accordance with procedures to be determined at the upcoming meeting of the Ad Hoc Salmon Research Coordinating Group.

10. RECOMMENDED PROCEDURE FOR FUTURE MEETINGS

It is RECOMMENDED that the rapporteur system in use by the other sub-committees be tried by the Sub-Committee on Salmon for preparation of its 1981 report. The sub-committee nominated C. Harris (U.S.) as rapporteur for the 1981 meeting. The sub-committee noted that because of the short time between completion of field sampling and the annual meeting date, preparation of documents must be expedited insofar as possible. To be considered by the rapporteur the documents (in English) will need to be received two weeks prior to the sub-committee meeting date.

Suggested panel topic: Changes in recent years in operations of Japan's salmon mothership and landbased driftnet fisheries:

(1) Changes in seasonal and area distribution of effort and of catch by species

(2) Effect of these changes in terms of probable continent of origin of catch

---

TABLES 1 AND 2, FIG. 1, AND APPENDIX 1(A) FOLLOW

Table 1. Estimated total catch in thousands of western Alaska and Canadian Yukon chinook salmon by the Japanese mothership fishery, foreign groundfish fisheries, and U.S. commercial and subsistence fisheries.

Year	Mothership[a]	Groundfish[b]	Sub-total	Western Alaska[c]			Total
				Commercial	Subsistence	Sub-total	
1956	55.1	-	-	132.7	-	-	-
1957	35.2	-	-	158.4	-	-	-
1958	5.4	-	-	181.9	-	-	-
1959	27.8	-	-	195.1	-	-	-
1960	135.0	-	-	195.7	-	-	-
1961	13.9	-	-	243.1	-	-	-
1962	29.7	-	-	213.1	-	-	-
1963	40.8	-	-	208.1	66.2	274.3	315.1
1964	252.9	-	-	260.0	50.5	310.5	563.4
1965	105.5	-	-	263.0	52.9	315.8	421.3
1966	111.5	-	-	207.5	69.5	277.0	388.5
1967	69.8	-	-	284.0	81.9	365.9	435.7
1968	226.3	-	-	259.0	54.2	313.2	539.5
1969	435.2	-	-	287.6	65.2	352.9	788.1
1970	344.8	-	-	290.8	95.1	386.0	730.8
1971	143.6	-	-	283.2	73.8	357.1	500.7
1972	169.5	-	-	224.1	66.7	290.8	460.3
1973	47.0	-	-	177.4	69.7	247.1	294.1
1974	286.8	-	-	180.2	57.3	237.6	524.4
1975	109.2	-	-	126.2	77.2	203.3	312.5
1976	167.7	-	-	241.5	84.0	325.6	493.3
1977[d]	64.5	43.5	108.0	296.1	84.1	380.2	488.2
1978[d]	31.3	39.1	70.4	380.0	74.6	454.6	525.0
1979[d]	65.0	100.4	165.4	412.0	99.3	511.3	676.7
1980[d]	143.7	-[e]	-	312.0	90.0	402.0	-

...continued

Table 1. Continued.

[a]Doc. 2344; estimates do not include dropouts.

[b]Docs. 2121, 2210, and 2336 (assuming 100% of the catch is of western Alaska and Canadian Yukon origin).

[c]Doc. 2351.

[d]Preliminary estimates for western Alaska inshore catch and the 1980 mothership catch.

[e]Unknown, but first quarter catches were comparable to those in the first quarter of 1979.

Table 2. Numbers of salmonids tagged and released by Japan and the United States[a] in waters south of 46°N and west of 175°W before and after renegotiation of the INPFC treaty early in 1978. Percentages of 1956-1980 total tag releases of each species by period are shown in parentheses.

Period and area	Species						
	Sockeye	Chum	Pink	Coho	Chinook	Steelhead[b]	Total
1956-1977							
West of 175°E	843	7,923	43,401	137	48	-	52,352
East of 175°E	60	605	454	202	1	-	1,322
Sub-total	903	8,528	43,855	339	49	-	53,674
	(52.2)	(72.9)	(95.8)	(43.5)	(57.0)	-	(89.3)
1978-1980							
West of 175°E	695	2,097	1,460	126	14	3	4,395
East of 175°E	109	1,070	476	314	23	40	2,032
Sub-total	804	3,167	1,936	440	37	43	6,427
	(47.1)	(27.1)	(4.2)	(56.5)	(43.0)	-	(10.7)
Sub-total by area, 1956-1980							
West of 175°E	1,538	10,020	44,861	263	62	-	56,747
East of 175°E	169	1,675	930	516	24	-	3,354
Grand total	1,707	11,695	45,791	779	86	-	60,101

[a]The United States tagged salmonids in this region only in 1980.
[b]Data are not presently available for the 1956-57 period.

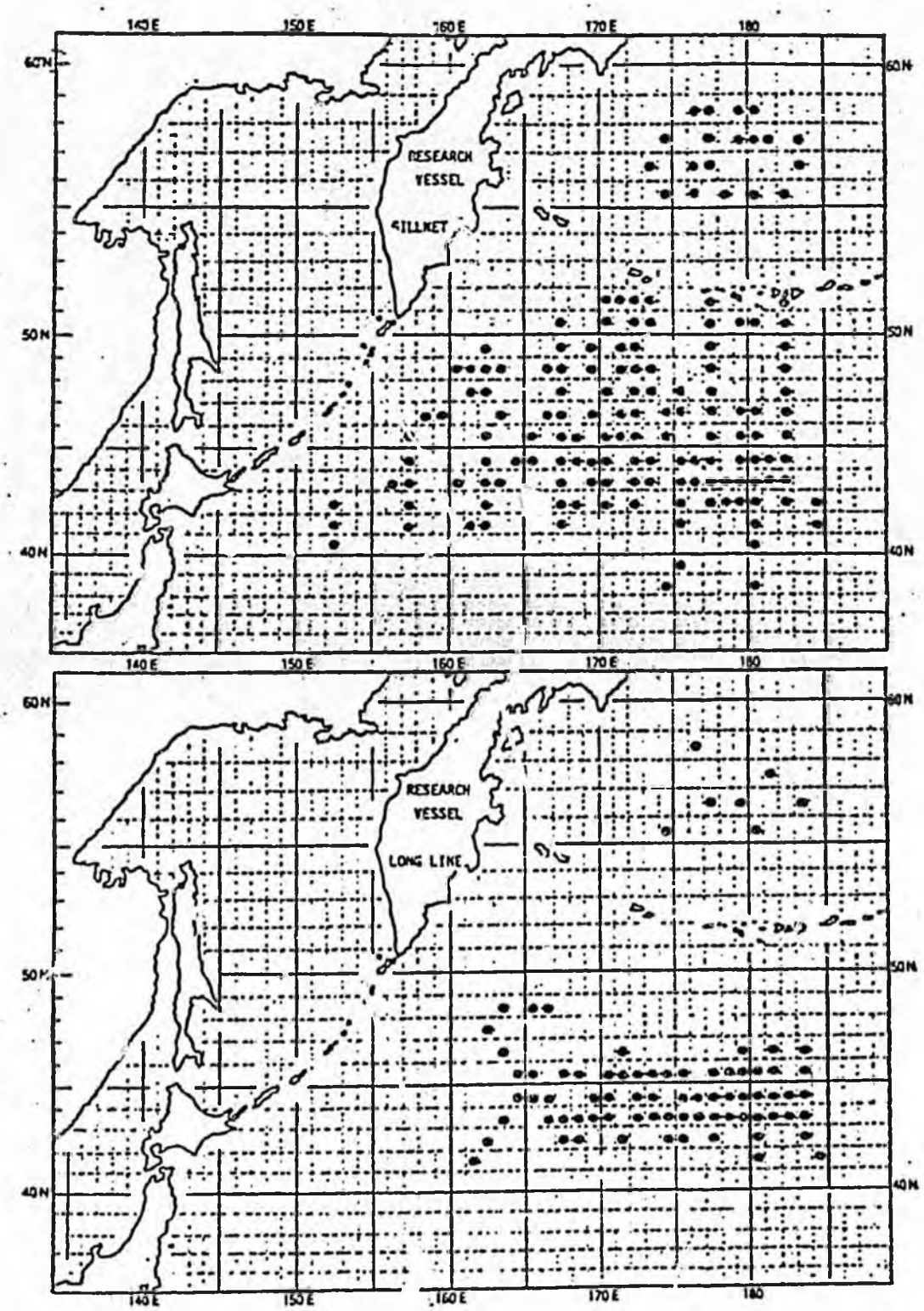

Figure 1. Fishing locations of Japanese research vessels west of 175° W, 1980 (Doc. 231ó).

APPENDIX 1(A)
(Doc. 2352)

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

27th Annual Meeting--1980

Anchorage, Alaska, 1980 November 4

SAMPLE AND DATA REQUESTS FOR 1981

1. REQUESTS BY CANADA

Samples of fish or scales from various U.S. and Japanese fisheries and rivers may be required. Requests will be forwarded by Canada when specific requirements are known.

2. REQUESTS BY JAPAN

Samples of fish or scales from various U.S. and Canadian fisheries and rivers may be requested. Requests will be forwarded by Japan when specific sample requirements are determined. Associated biological and sample information data will be required.

3. REQUESTS BY THE UNITED STATES

Samples of scales or plastic scale impressions from Japanese research vessel and mothership collections and from Asian rivers may be requested of Japan to aid analyses by U.S. scientists of the area of origin of salmon taken on the high seas. Samples of scales or scale impressions from Canadian fisheries and rivers may also be requested. Requests will be forwarded by the U.S. member when specific sample requirements are determined. Associated biological and sample information will be requested.

In order to study the operations of the high seas salmon fisheries of Japan, the United States requests an English language copy of the 1980 fishing regulations and charts showing the regulatory areas and sub-units of the landbased driftnet and mothership salmon fisheries which depict any quota, time, area, or effort regulations affecting the operation of the fisheries. The United States wishes to obtain one tan of drift gillnet of each mesh size used in the landbased and mothership salmon fisheries.

In recent years Japan has provided sockeye CPUE data to the United States obtained by research vessels fishing driftnet stations in July and August south of the central Aleutians between 175°E and 175°W north of 50°N. These data show a useful run forecast relationship between CPUE by ocean age group and return runs to Bristol Bay the following year. The United States, therefore, encourages Japan to continue this sampling in 1981 if feasible and to again provide the CPUE data by age group by the time of the 1981 INPFC annual meeting.

(c) International Pacific Halibut Commision (Doc. 2330)

The International Pacific Halibut Commission will continue in 1981 its long-term series of annual surveys of juvenile halibut in the southeast Bering Sea.

6. REVIEW OF THE PROPOSED U.S. ECOSYSTEM MANAGEMENT CONCEPT

Japanese scientists reviewed the basis for the concept of managing the multi-species resources of an area as an ecosystem complex. This review is directed to the management of the eastern Bering Sea area but contains elements of a general review of this type of management. In particular, they presented some constraints to the application of this technique, namely: the lack of quantitative data on energy flow and productivity of ecosystems; the assumptions made about the constancy of ecosystem functions; the dangers of extracting segments of the ecosystem and treating them in isolation; and the inter-relationships of assumed state and driving variables.

They also have reviewed the procedure of this management and concluded that (1) ABC of the groundfish complex should be the sum of ABCs calculated for individual species and (2) when MSY is estimated for the groundfish complex, allocation of the overall MSY to species should be based on ratios of estimates of EY for individual species (Doc. 2313).

7. SUMMARY

(1) This report was prepared by the Rapporteur for the Bering Sea Panel and summarizes documents submitted for the 1980 Annual Meeting pertaining to commercial fisheries, biology and assessment of stocks, management procedures, and field research activities on Bering Sea groundfish. The report was reviewed, revised, and adopted by the panel during its meetings of October 23-25.

(2) In 1977 the United States extended its fishery jurisdiction and assumed responsibility for management of fishery resources within a 200-mile fishery conservation zone bordering its coastline. Under terms of extended jurisdiction, all fisheries in the Bering Sea operate under a number of area-time restrictions and catch limitations. Total allowable catch limitations (optimum yield) were approximately 1.4 million mt annually in 1977-79, and about 1.6 million mt in 1980.

(3) Total estimated catches of groundfish, squid, and herring taken by all fisheries other than the United States in 1979 was 1,288,300 mt, about 95,000 mt less than in 1978. As in past years, Japan accounted for the majority of the catch (79.1%) and pollock was the major species (73.3%) in catches.

(4) In 1979 Japan operated 6 motherships with 90 catcher boats, 56 independent stern trawlers, and 22 longline-gillnet vessels in the mothership, North Pacific trawl, North Pacific longline-gillnet fisheries and 70 trawlers in the landbased dragnet fishery. Efforts by these fisheries in 1979 was similar to that in 1978 except that 24,200 tans of gillnet were fished in 1979, but none in 1978, and landbased trawl effort increased by 33.4% from 1978 to 1979. Total catches by these fisheries were 995,019 mt, a 5.7% decrease from 1978. Pollock accounted for 82.3% and yellowfin sole 6.4% of the total catch by the mothership, North Pacific trawl, and North Pacific longline fisheries, while "other flatfish" accounted for 24.2% and pollock 22.0% of the landbased dragnet catch.

(5) Preliminary data for January-July, 1980 indicate that the catch by all Japanese fisheries was 466,587 mt, 7,300 mt less than for the same period in 1979. Catches of pollock (which accounted for 79% of the total catch) and yellowfin sole (6% of the total catch) increased while the catch of all other species decreased.

(6) Estimated catches by other fisheries in 1979 were 150,776 mt by the U.S.S.R., 98,066 mt by the R.O.K., 18,283 mt by Poland, and 2,013 mt by Taiwan. Pollock was the major target species for all of these nations but the U.S.S.R. also had a target fishery for yellowfin sole (41,259 mt) and Atka mackerel (20,277 mt).

(7) Incidental catches of halibut in 1979 were estimated to be 580,000 fish, or 2,800 mt, which was similar to the estimate of 600,000 fish in 1978, but substantially greater than the estimate of 340,000 fish taken in 1977.

(8) United States groundfish fisheries in the Bering Sea were limited to a setline fishery for halibut and a purse seine-gillnet fishery for herring in 1979. The halibut catch was 574 mt and the herring catch 12,000 mt.

(9) Catch-effort data for halibut from the commercial fishery in the eastern Bering Sea are too meager to assess the abundance of the adult stock. The mean CPUE of juvenile halibut in 1980 was 27.7 fish per 60-minute haul, representing a substantial increase from the value in 1979 and the highest value since the mid 1960s. The high CPUE in 1980 was attributed to the abundance of age 2 and age 3 fish of the 1977 and 1978 year-classes. Equilibrium yield of halibut in the eastern Bering Sea was estimated to range between 1 and 2 million pounds (454-907 mt).

(10) Pollock catches have declined from a peak of 1.9 million mt in 1972 to 979,000-914,000 mt in 1977-79 due to restrictions placed on the fishery because of evidence of declines in stock abundance. CPUE analysis by both U.S. and Japanese scientists indicate that abundance of pollock was relatively stable from 1975 to 1977 and increased moderately (8-12%) from 1977 to 1979. All sources of data show that the 1977 and 1978 year-classes of pollock are relatively strong and

Cambria Bay → Bering Sea

(1) King salmon recovery
US Trawl.

(2) pinks inside Hawk Inlet
recover Prince William Sound

(4) ~~King~~ pinks PWS. recovered
N.S.E. stream.

(2) Steelhead recovered Jap trawls
in Gulf of Alaska. from S.E.

Substantiated Recovery

Any emergency regulation which changes any existing fishery management plan shall be treated as an amendment to such plan for the period in which such regulation is in effect. Any emergency regulation promulgated under this subsection (A) shall be published in the Federal Register together with the reasons therefor; (B) shall remain in effect for not more than 45 days after the date of such publication, except that any such regulation may be repromulgated for one additional period of not more than 45 days; and (C) may be terminated by the Secretary at any earlier date by publication in the Federal Register of a notice of termination.

Publication in Federal Register.

Publication in Federal Register.

(f) ANNUAL REPORT.—The Secretary shall report to the Congress and the President, not later than March 1 of each year, on all activities of the Councils and the Secretary with respect to fishery management plans, regulations to implement such plans, and all other activities relating to the conservation and management of fishery resources that were undertaken under this Act during the preceding calendar year.

Report to Congress and President.

(g) RESPONSIBILITY OF THE SECRETARY.—The Secretary shall have general responsibility to carry out any fishery management plan or amendment approved or prepared by him, in accordance with the provisions of this Act. The Secretary may promulgate such regulations, in accordance with section 553 of title 5, United States Code, as may be necessary to discharge such responsibility or to carry out any other provision of this Act.

Regulations.

SEC. 306. STATE JURISDICTION.

16 USC 1856.

(a) IN GENERAL.—Except as provided in subsection (b), nothing in this Act shall be construed as extending or diminishing the jurisdiction or authority of any State within its boundaries. No State may directly or indirectly regulate any fishing which is engaged in by any fishing vessel outside its boundaries, unless such vessel is registered under the laws of such State.

(b) EXCEPTION.—(1) If the Secretary finds, after notice and an opportunity for a hearing in accordance with section 554 of title 5, United States Code, that—

Notice, hearing.

(A) the fishing in a fishery, which is covered by a fishery management plan implemented under this Act, is engaged in predominately within the fishery conservation zone and beyond such zone; and

(B) any State has taken any action, or omitted to take any action, the results of which will substantially and adversely affect the carrying out of such fishery management plan;

the Secretary shall promptly notify such State and the appropriate Council of such finding and of his intention to regulate the applicable fishery within the boundaries of such State (other than its internal waters), pursuant to such fishery management plan and the regulations promulgated to implement such plan.

(2) If the Secretary, pursuant to this subsection, assumes responsibility for the regulation of any fishery, the State involved may at any time thereafter apply to the Secretary for reinstatement of its authority over such fishery. If the Secretary finds that the reasons for which he assumed such regulation no longer prevail, he shall promptly terminate such regulation.

SEC. 307. PROHIBITED ACTS.

16 USC 1857.

It is unlawful—

(1) for any person—

(A) to violate any provision of this Act or any regulation or permit issued pursuant to this Act;

HJR

81

STATE OF ALASKA
DEPARTMENT OF REVENUE
OFFICE OF THE COMMISSIONER

JAY S. HAMMOND, GOVERNOR

POUCH S
JUNEAU, ALASKA 99811
PHONE: (907) 465-2300

March 2, 1982

The Honorable Eric G. Sutcliffe
The Honorable Kenneth J. Fanning
Co-Chairmen
House Resources Committee
Room 120 - Capitol Building
Juneau, Alaska

Dear Mr. Sutcliffe and Mr. Fanning:

Re: House Joint Resolution No. 81

House Joint Resolution No. 81, proposing amendments to the constitution of the State of Alaska relating to the creation of a natural resou trust, was introduced in the House on February 8, 1982 and was rei to the House Resources and Judiciary Committees.

For the consideration of the House Resources Committee, I am enclosing copies of Fiscal Notes prepared by Mr. Anselm Staack, Comptroller, Treasury Division, Department of Revenue concerning the House Joint Resolution.

Sincerely,

R. D. Stevenson

R. D. Stevenson

Enclosures

cc: The Honorable Ramona L. Barnes
Chairwoman
House Judiciary Committee

Joseph K. Donohue
Deputy Commissioner
Department of Revenue

Anselm Staack, Comptroller
Treasury Division
Department of Revenue

THE LEGISLATURE OF THE STATE OF ALASKA
TWELFTH LEGISLATURE

HJR 81

(REVENUE REDUCTION TO GENERAL FUND UNRESTRICTED)

FISCAL NOTE (1 of 2)

I. REQUEST
Bill/Resolution No. HJR 81 (2/8/82)
Title Establish Alaska Natural Resources Trust
Requested by House Resources Committee Date 3/1/82

II. FISCAL DETAIL
Agency Affected General Fund Unrestricted
Program Category Affected Revenue Collection and Management
BRU, Program, Or Subprogram(s) Affected Treasury Management
(Note: If more than one budget component is affected, separate line-item amounts and funding for each component in the analysis section.)

EXPENDITURES (Thousands of Dollars)

	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
100 PERSONAL SERVICES						
200 TRAVEL						
300 CONTRACTUAL						
400 COMMODITIES						
500 EQUIPMENT						
600 LAND & STRUCTURES						
700 GRANTS,CLAIMS,ETC.						
TOTAL						

MILLIONS
FUNDING (~~Thousands~~ of Dollars)

GENERAL FUND			(1,608.8)	(1,906.9)	(2,159.9)	(2,511.1)
FEDERAL FUNDS						
OTHER (Specify Source)						

POSITIONS

FULL TIME						
PART TIME						
TEMPORARY						

III. ANALYSIS (See Fiscal Note Preparation Instruction, Section III)

Legislation would dedicate revenues to a natural resources trust which is to receive the state's interest in income from natural resources, including royalties, etc., subject to prior amounts dedicated to permanent fund and other previously established claims.

Since the consititutional amendment is necessary to effect transfer of funds to the trust FY 84 is the first year of transfer after election takes place.

SEE OTHER FISCAL NOTES FOR ADMINISTRATIVE COSTS.

Anselm C. Staack

IV. DATE March 1, 1982 PREPARED BY Anselm C. Staack, Treasury Comptroller
AGENCY Dept. of Revenue, Treasury Division
PHONE 465-2350

Original: Legislative Finance
cc: Budget and Management
Prime Sponsor (First Legislator Named)

33-001 (Rev. 12/81)

THE LEGISLATURE OF THE STATE OF ALASKA
TWELFTH LEGISLATURE

HJR 81
(FUND INVESTMENT
ADMINISTRATIVE COST)

FISCAL NOTE (2 of 2)

I. REQUEST
Bill/Resolution No. HJR 81 (2/8/82)
Title Establish Alaska Natural Resources Trust
Requested by House Resources Committee Date 3/1/82

II. FISCAL DETAIL
Agency Affected Department of Revenue
Program Category Affected Revenue Collection and Management
BRU, Program, Or Subprogram(s) Affected Treasury Management
(Note: If more than one budget component is affected, separate line-item amounts and funding for each component in the analysis section.)

EXPENDITURES (Thousands of Dollars)

	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
100 PERSONAL SERVICES			92.6	101.9	112.1	123.3
200 TRAVEL			10.0	11.0	12.1	13.3
300 CONTRACTUAL			255.0	280.5	308.6	339.4
400 COMMODITIES			3.0	3.3	3.6	4.0
500 EQUIPMENT			6.0			
600 LAND & STRUCTURES						
700 GRANTS,CLAIMS,ETC.						
TOTAL			366.6	396.7	436.4	480.0

FUNDING (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER (Specify Source)						
Trust Income			366.6	396.7	436.4	480.0

POSITIONS

FULL TIME						
PART TIME						
TEMPORARY						

III. ANALYSIS (See Fiscal Note Preparation Instruction, Section III)
Legislation dedicates revenues to a natural resources trust. THIS FISCAL NOTE ACCOUNTS FOR ADMINISTRATIVE COSTS RELATED TO THE INVESTMENT OF FUND ASSETS ONLY. THIS IS A COMPANION MEASURE NECESSARY TO HB 642. Administrative costs are to implement HB 642.
Personal Services is for Investment Officer II (R22,X) to invest and manage assets; Accounting Tech. II (R14,G) for associated trust investment accounting and reporting. Contractual Services: Comm. $15.0; Print & Adv. $10.0; Safekeeping and related reporting/accounting $200.0; Audit $25.0; Misc. $5.0 Equipment is for new positions.

IV. DATE March 1, 1982 PREPARED BY Anselm C. Staack, Treasury Comptroll
AGENCY Dept. of Revenue, Treasury Division
PHONE 465-2350

Original: Legislative Finance
cc: Budget and Management
Prime Sponsor (First Legislator Named)
33-001 (Rev. 12/81)

SB

25

COMMITTEE REPORT

HOUSE

3/12/81

FURTHER: FINANCE

(11)

Date: MAY 19 1981

Mr. Speaker:

The Committee on RESOURCES has had CSSSSB 25(Fin)am

"An Act establishing a power project development fund in the Alaska Power Authority and amending the Alaska Power Authority Act; and providing for an effective date."

under consideration and reports it back as follows:

[ ] do pass [ ] do not pass

[ ] do pass with attached amendments(s)

[ ] replace with CS for CSSSSB 25 [ ] same title [X] new title

and recommends _____

[ ] AND attaches a "Letter of Intent" [ ] New Fiscal Note

[X] reports it back without recommendation INDIVIDUAL

[ ] referred to the _____ Committee

MEMBERS SIGNING
DO PASS

Tony Gardiner

Ted Stevens "No Nuk Zone"

MEMBERS HAVING
OTHER RECOMMENDATIONS:

Pete Peterson No Rec

Rick Halford do pass if amended

Dan Sumner — Do not pass unless amended

Jim Sutcliffe no rec

J. Smith No Rec

Tony Gardiner
CO-CHAIRMAN

Ted Stevens

H 60 (Rev. 3/81)

Alaska State Legislature

Speaker of the House of Representatives

Official Business

Pouch V
State Capitol
Juneau, Alaska 99811

MEMORANDUM

TO: Representative Terry Gardiner, Co-Chairman
House Committee on Resources

FROM: Representative Jim Duncan
Speaker of the House

DATE: April 13, 1981

RE: Equity Return Financing for Hydro-Electric Projects

One of the most critical issues facing this and subsequent legislatures is the need to provide reliable, low-cost power to citizens of the state, for this and future generations. Development of our renewable hydro-electric resources can give us the opportunity to do this. I think it is important that the benefits derived from hydro-electric power be equitably distributed to provide parity in power costs on a statewide basis. Therefore, at my request, Eric Yould and Terry McGuire have developed a financing proposal for hydro-electric projects based on a fixed rate of return on equity. It appears to be a sound, viable alternative to both grant and loan financing, as it provides not only a return on our investment but, when fully operational in 1989, equity in power costs for all Alaskans as well.

As envisioned, projects built with state capital and owned by the state (APA), would be required to return a percentage of the project value annually to APA over the useful life of the project. At a 5% rate of return, for example, local utilities operating the facilities could cover operation and maintenance expenses and forward the remainder to APA. The Authority estimates that if all the projects listed on page two of the attached summary were operational, wholesale power could be produced for 3.8¢ per kilowatt-hour (without Susitna), while still allowing a 5% return on equity, less an average of 1.5% for annual operating and maintenance expenses.

This figure (3.8¢) would be the wholesale power rate charged for Green Lake and Solomon Gulch when they come on line in 1982, with money from the equity return used to bring the wholesale cost of power from these projects down to this amount. When Swan Lake and Lake Tyee come on line in 1984, followed by Terror Lake in 1985 and Bradley Lake in 1986, sufficient power will be produced to allow a 3.8¢ wholesale charge per kilowatt-hour, with the additional revenue produced by a 5% return on equity then being available to subsidize power production costs and other energy-related projects (i.e., conservation, weatherization, etc.) on a statewide basis. The basis of this is the fact that the larger projects will produce much larger amounts of power at a cheaper wholesale rate than the initial (Solomon Gulch and Green Lake) projects. In this sense, the program is dependent on a few large power producers which have readily available markets.

It should be emphasized that the 3.8¢ per kilowatt-hour rate is for wholesale costs. Only power production is subsidized, with the retail rate to consumers being adjusted upward to account for the varying distribution and administrative costs incurred by the different local utilities to whom the wholesale power is sold. It would then be in the interest of the local utilities to encourage and promote conservation, efficient management practices and distribution to control their retail rates. Susitna start-up in the 1990's would both increase the amount of return on investment and lower wholesale power costs from 3.8¢ to 3¢ per kilowatt-hour. Susitna is the long-term anchor in this program.

The funds generated by an equity return would be available by legislative appropriation for essential and related energy programs such power production assistance, weatherization, development of other renewable energy resources, enforcement of building codes and other projects which promote the efficient use of energy while subsidizing the rates of those who must continue using expensive energy such as diesel. This program would create the mechanism to not only reduce energy costs statewide but also create p city in energy costs on a statewide basis when the projects on page 2 are fully operational in 1989.

Success of an equity return scheme depends on state ownership of projects, a strong commitment to energy conservation, development only of feasible projects, and in all likelihood, a separate rate structure for industrial users.

I strongly support an equity return method of hydro-electric financing in concept, realizing that many details are yet to be worked out. I would strongly recommend that this method of financing be worked into a committee substitute for SB 25. I think it will answer the Senate's desire for direct investment, while at the same time provide the state with a return on investment over the life (not just 30 - 50 years) of a project. All of the projects listed on page 2 of the attached summary are feasible under an equity return scheme, indicating that the feasibility of future projects would be protected as well.

I have asked Legislative Attorney Billy Berrier to draft the appropriate language for inclusion in SB 25 establishing the program at a 5% return on equity.

I urge consideration of this concept by the Resources Committee and would be willing to appear before the Committee in support of the concept.

JD:jp

Attachment

ENERGY PROGRAM FOR ALASKA (EPA)

The following pages are an attempt to address diverse energy issues, concerns, and strategies with a comprehensive program. It has the potential of being supported by all Alaskans, eliminate regional differences, provide reasonable cost energy statewide, and ensure financing of energy development. The potential benefits to Alaskans could exceed the benefits provided by other distribution programs of the state's non-renewable income.

The institutional framework exists to establish this program, as do the revenues to finance the program. It would require legislation to empower the Public Utilities Commission and the Alaska Power Authority to implement some aspects of the program.

The program should be evaluated today while major decisions on state investmen in, or subsidy of, capital intensive renewable energy projects are being debated. The program should be comprehensive and rational, provide equitable benefits to all Alaskans and regions of Alaska, and provide a basis for sound decisions and future development. The program would not produce results overnight. The projects which may be developed would require years to construct, and the benefits of the program could only be distributed as the return on state investments increase. In the mean time, financial resources are available and means can be found to meet near-term needs until such time as the program is fully functioning.

This paper analyzes some implications of a comprehensive state subsidy of power development. A major impact of the program would be to lower energy costs statewide to benefit all Alaskan consumers. The program would also levelize the power production cost of energy statewide. This analysis would not have been performed in previous years when limited state assistance in financing of power project was considered. Today, there is considerable support for state investment in, and subsidy of, renewable energy projects in the form of low interest loans or grants. program of tate investment can provide reasonable cost energy for all areas of Ala It can promote economic development and provide a benefit that directly impacts the disposable income of Alaskans without being subject to taxation. A program of this nature would be unique in that it has never been, to our knowledge, attempted on a statewide basis anywhere else in the United States. The question is, how can the distribution of the benefits from state investment in renewable energy projects be equitably distributed to all Alaskans?

The Power Production Cost Assistance Program was created to address the curren high cost of energy in predominantly rural areas of Alaska. This program, no matte what its ultimate form may be, was established in the Power Authority since there was some consideration that operating subsidies provided through the program could be, eventually, offset by capital investment in renewable energy development. Although, the concept is commendable, the fact must be recognized that for many areas of rural Alaska, the most ecomomic solution may be limited to weatherization, increased efficiency in diesel generation, and waste heat utilization. This situatio will make termination of the Power Production Cost Assistance Program extremely dif ficult, particularly since Alaskans in these areas would not receive the benefits o state investment in renewable energy projects.

In past years, the concept of raising the cost per kilowatt hour of energy sol from power projects owned by the state by a amount necessary to subsidize rural en gy costs was not supported since state assistance in development of the projects wa not significant. However, if state assistance increases significantly, a policy to equitably distribute the benefits of state investment could be established. The renewable energy projects represent a state resource in most cases, and they do not necessarily exist for the benefit of a single community or region. State investments in energy should to the extent possible equitably benefit all Alaskans. But this investment has implications beyond the ability to equitably distribute the benefits. It will encourage economic development which must be controlled, and industrial energy demand should not necessarily be provided the same benefits from state investment in power projects as other classes of Alaskan consumers, except when it will create an industry that would otherwise not materialize and has an overall positive state benefit. It will also provide less incentive for conservation, when conservation through increased efficiency and weatherization may be in many cases the most economically feasible area for state investment or subsidy. Therefore, any policy which artifically lowers the price of energy must support an effective program of energy conservation.

A policy of state investments must be directed only toward projects which are economically feasible, to include both renewable energy generation projects and conservation. The potential size and impact of transfer payments for rural operating subsidies and conservation measures from a return on state investments could be substantial. The following analysis is based upon current dollar estimates and is intended to illustrate the program and issues surrounding it.

proximately $4.5 million as it is presently established. The program is funded with general fund appropriations. Assistance could be expanded in various ways by broadening the base of eligible customers, by increasing the percentage of assistance beyond 85% of the portion of power production costs eligible for assistance, or by lowering the base power production cost escalator from 7¢ to 6¢. Any one measure or a combination of these measures could increase the FY 82 cost of the program to $10, $20, or even $30 million per year. Assuming the latter figure, there is also potential for price induced increases in demand, which could be assumed over time to cause the cost of the program to increase significantly to, perhaps, $90 million per year. General fund appropriations for this program would be extremely difficult to continue.

If the State invested in renewable energy projects, it would be possible to establish an equity return on that investment. The advantage of an equity return is that it can be established to minimize the cost of energy impact on the consumers of energy from the project, and provide a constant source of revenue to fund other programs, like the Power Production Cost Assistance Program and conservation. Whereas a grant provides no return and a low interest loan provides a limited return for the 30 to 50 year repayment period, an equity return continues for the useful life of the project. The amount of this return in current dollars based upon a 5, 7, and 9% equity return on the construction cost of various projects is shown below. The equity rates of return approximate the principal and interest payments respectively on 3.0%, 5.7%, and 8.0% loans for a 30 year term to finance construction. The table is in millions of 1981 dollars.

Project(s)	Capital Construction Cost (1981 $)	Annual Equity Return 5%	7%	9%
Black Bear Lake	$ 28.0	$ 1.40*	$ 1.96	$ 2.52
Tazimina	123.0	6.15*	8.61	11.07
Bradley Lake	170.0	8.50	11.90	15.30*
Green Lake	55.0	2.75	3.85	4.95*
[illegible]ions	1.4	.07*	.10	.14
Solomon Gulch	68.0	3.40*	4.86*	6.12
Chester Lake	9.0	.45	.63*	.81
Terror Lake	85.0	4.25	5.95*	7.65
Lake Tyee	60.0	3.00	4.20*	5.40
Swan Lake	87.0	4.35	6.09*	7.83
SUB-TOTAL	$ 686.4	$ 34.12	$ 48.15	$ 61.79
Susitna	3,500.0	175.00	245.00	315.00*
TOTAL	$4,186.4	$209.12	$293.15	$376.79

The above table does not reflect all the potential projects which may be found feasible and subsequently developed. The table does not reflect that from 1% to 2% of the capital construction cost will represent the annual Operation and Maintenance costs for each project. In addition, the cost of energy from individual projects, due to varying project costs per kilowatt or the amount of excess capacity in the early years of operation, may not permit the same rate of return for each project initial operation. The asterisks in the table for each project represent an estimate of the return that would be possible without adversely impacting the cost of energy in each project area in the early years of operation. Clearly, the potential exists to more equitably distribute the benefits of state investment in energy projects. Without Susitna, an expanded Power Production Cost Assistance Program could be funded with the equity return on feasible energy projects. Including Susitna, power costs could be considerably reduced or stabilized statewide with a potential for a return to the general fund.

have to recover the annual operation, maintenance and administrative costs of the projects, or approximately 1.5% of the capital costs of construction. The grant funding alternative would require $10.24 million in revenue from the projects excluding Susitna, and $70.54 million including Susitna. The wholesale cost of energy in cent per kilowatt hour for this situation (which is equivalent to an equity return rate of 1.5%) is depicted below along with the cost of energy for various other rates of return.

	1.5%	5%	7%	9%
Without Susitna	1.3	3.8	5.4	6.9
With Susitna	1.1	3.0	4.2	5.4

Under the 5% return situation, $34.12 million is recovered excluding Susitna, and $209.12 million is recovered with Susitna. Of the return with Susitna, $70.54 million would again pay for O&M and administration, and $138.58 million would be available for power production cost assistance, conservation, new project construction, or a return to the general fund.

The various rates of return are illustrated to demonstrate the approximate wholesale cost of energy from the system, and the amount of the generated return which could be made available for alternative purposes. The overall rate of return could be adjusted to provide statewide benefits through other projects and programs and still result in a low cost of energy. Again, the rate of return associated with individual projects could be established in direct relation to the economic feasibility of the project and the relative power production costs in the project market area.

Many actions would be necessary to implement this statewide program.

1. State investment should only be made in those projects that are economically feasible. If a community or region can be provided electric power in a least cost manner only through more efficient diesel generation and conservation, then state assistance should be provided to stabilize the cost. The assistance would be through a power production cost assistance program and a conservation program funded with the return on equity from projects which were feasi for development.

2. The projects developed through state investment must be owned by the state as capital projects of the state. Individual projects can be leased for operation and maintenance to utilities in the market area served by the projects. It is necessary to establish the project owner as the state since the renewable resource projects would be constructed with state funds (non-renewable income), the renewable resources should benefit all Alaskans, and a common wholesale power cost for the energy produced from all projects could only be established for those projects owned by the State.

3. With lower energy costs, the demand for energy could increase in areas of the state currently experiencing the highest cost of energy production. It is likely that conservation efforts would be diminished unless energy efficiency standards for building construction are adopted, diesel generation efficiency standards are adopted, and energy conservation programs are strongly supporte Examples may include inefficient use of electric heat in poorly weatherized

ctric heat could be restricted to buildings that meet certain standards and when it is a more efficient use for heating purposes. A minimium of 8 kwh's per gallon of fuel could be established as a standard for diesel generation, and efficiency that is attainable for even small diesel generators. Individual consumers who fail to meet the weatherization standards for electric heat could be charged a premium, and communities which fail to maintain and efficiently operate their diesel generation could be provided assistance based solely on the minimium efficiency standards.

4. Separate rate structures for industrial uses could be established to either encourage or discourage industrial consumption dependent upon state policy. However, this policy would have to be consistently applied and studied further before it is established.

Both the Power Production Cost Assistance Program and the Energy Conservation Program could be continuously funded from the return on the economically feasible renewable resource projects. The opportunity exists today to establish Alaska's renewable energy future. State investment in renewable energy could prove to be a valuable State asset for the future. The program could equitably distribute benefits in the form of reasonable cost energy to all Alaskans. The capital energy projects of the State are an infrastructure investment which can provide a measurable return to the State and its residents while assisting in economic development.

This conceptual program would not impact the existing generation, transmission and distribution systems of the retail utilities. Local control would be maintaine wherever possible. The project selection and development process would be controll as currently provided in A.S. 44.83 and in Power Authority regulations. Only the feasible projects based upon technical, economic, and environmental evaluation parameters would be proposed for State investment.

The following analysis estimates the 1981 dollar value of equity return on state investments in power projects which could be state financed and constructed in the remainder of the 20th century. The estimate is based upon a wholesale 1981 dollar cost of energy at 3¢/kwh. The return would have to pay for operation and maintenance of the projects and administration of the program. It would also provide funding for an Energy Conservation Program and a Power Production Assistance Program. The cost of power generation statewide could be equalized, whether the generation is from state funded renewable energy projects, or diesel generation. The cost of energy to consumers would vary among communities and utilities only to the extent that administration and distribution system costs vary among utilities.

TABLE I

Projects	Capital Construction Cost (1981 $)	First Year of Operation	Average Annual Energy Sales (Gwh
Black Bear Lake	$ 28.0	1985	23.0
Tazimina	123.0	1988	80.0
Bradley Lake	170.0	1986	300.0
Green Lake	55.0	1982	55.0
Port Lions	1.4	1982	1.0
Solomon Gulch	68.0	1982	52.0
Chester Lake	9.0	1983	9.0
Terror Lake	85.0	1985	120.0
Lake Tyee	60.0	1984	125.0
Swan Lake	87.0	1984	80.0
Susitna (Stage 1)	2300.0	1993	3000.0
Susitna (Stage 2)	1200.0	1997	3000.0
	$4186.4		6855.0

In Table II, the "Available" column indicates the return on state investment in renewable energy projects which could fund diesel generation costs in areas not served by projects, the energy conservation program, and new construction of renewable energy projects. All revenue from wholesale power sales from state projects would return to an energy account in the general fund and subject to the Executive Budget Act, be available for appropriation to fund programs.

TABLE II

Year	Gwh Sales	Annual Expenditures	Equity Return (Million $)	Project O&M & Administration	Available
1982	108	$ 224.4	$ 3.2	$ 1.2	$ 2.0
1983	117	100.0	3.5	1.3	2.1
1984	217	150.0	6.5	3.3	3.1
1985	334	150.0	10.0	4.7	5.3
1986	659	275.6	19.7	6.1	13.6
1987	687	300.0	20.6	6.1	14.5
1988	745	300.0	22.3	7.1	15.2
1989	760	300.0	22.8	7.1	15.7
1990	775	300.0	23.2	7.1	16.1
1991	795	300.0	23.8	7.1	16.7
1992	815	300.0	24.4	7.1	17.3
1993	3,835	300.0	115.0	30.0	85.0
1994	3,855	300.0	115.6	30.0	85.6
1995	3,855	300.0	115.6	30.0	85.6
1996	3,855	300.0	115.6	30.0	85.6
1997	6,855	286.4	205.6	42.0	163.6
1998	6,855	-	205.6	42.0	163.6
1999	6,855	-	205.6	42.0	163.6
2000	6,855	-	205.6	42.0	163.6
Year 2000 TOTAL		$4186.4	$1464.2	$ 346.2	$1118.0
Year 2010 TOTAL		4186.4	3520.2	766.2	2754.0
Year 2020 TOTAL		4186.4	5576.2	1186.2	4390.0
Year 2030 TOTAL		4186.4	7632.2	1606.2	6026.0

The tables indicate that the equity return on projects could not pay the estimated costs of the existing power production assistance program until 1985. The FY 82 cost estimate for the current program is $4.5 million. The level of assistance could be increased in relation to a greater return from projects which begin operation in succeeding years. If Susitna is constructed, the return based upon a 1981 wholesale cost of [illegible]/kwh from all projects would far exceed the needs of a large power production assistance program in those areas not served by the projects. Each year the return from the sale of energy from the power projects owned by the state could significantly lower diesel generation costs in other areas, assist in financing new projects, and fund energy conservation programs. Or alternatively, the wholesale cost of energy could be decreased to a level sufficient to fund program needs.

Note that this was an inflation free analysis which did not consider a discount of benefits to reflect an opportunity cost of alternative state expenditures or investments.

TABLE II

Year	Gwh Sales	Annual Expenditures	Equity Return (Million $)	Project O&M & Administration	Available
1982	108	$ 224.4	$ 3.2	$ 1.2	$ 2.0
1983	117	100.0	3.5	1.3	2.1
1984	217	150.0	6.5	3.3	3.1
1985	334	150.0	10.0	4.7	5.3
1986	659	275.6	19.7	6.1	13.6
1987	687	300.0	20.6	6.1	14.5
1988	745	300.0	22.3	7.1	15.2
1989	760	300.0	22.8	7.1	15.7
1990	775	300.0	23.2	7.1	16.1
1991	795	300.0	23.8	7.1	16.7
1992	815	300.0	24.4	7.1	17.3
1993	3,835	300.0	115.0	30.0	85.0
1994	3,855	300.0	115.6	30.0	85.6
1995	3,855	300.0	115.6	30.0	85.6
1996	3,855	300.0	115.6	30.0	85.6
1997	6,855	286.4	205.6	42.0	163.6
1998	6,855	-	205.6	42.0	163.6
1999	6,855	-	205.6	42.0	163.6
2000	6,855	-	205.6	42.0	163.6
Year 2000 TOTAL		$4186.4	$1464.2	$ 346.2	$1118.0
Year 2010 TOTAL		4186.4	3520.2	766.2	2754.0
Year 2020 TOTAL		4186.4	5576.2	1186.2	4390.0
Year 2030 TOTAL		4186.4	7632.2	1606.2	6026.0

The tables indicate that the equity return on projects could not pay the estimated costs of the existing power production assistance program until 1985. The FY 82 cost estimate for the current program is $4.5 million. The level of assistance could be increased in relation to a greater return from projects which begin operation in succeeding years. If Susitna is constructed, the return based upon a 1981 wholesale cost of 3¢/kwh from all projects would far exceed the needs of a large power production assistance program in those areas not served by the projects. Each year the return from the sale of energy from the power projects owned by the state could significantly lower diesel generation costs in other areas, assist in financing new projects, and fund energy conservation programs. Or alternatively, the wholesale cost of energy could be decreased to a level sufficient to fund program needs.

Note that this was an inflation free analysis which did not consider a discount of benefits to reflect an opportunity cost of alternative state expenditures or investments.

NUSHAGAK ELECTRIC CO-OPERATIVE, INC.

P. O. BOX 197 . DILLINGHAM, ALASKA 99576 . AREA CODE (907) 842-5251

April 3, 1981

Representative Joe Chuckwuk
Alaska State Legislature
Pouch V (MS 3100)
Juneau, AK 99811

Dear Joe:

We just received the following letter from Dave Hutchens, Executive Director, of ARECA and I would like to share it with you.

FROM: David Hutchens
Executive Director

DATE: March 31, 1981

HYDRO BILLS STALLED IN HOUSE RESOURCES COMMITTEE

After three days of hearings on all energy legislation lumped together I have still not been permitted to testify. There has been some good testimony along with a lot of misinformation presented to the Committee, but there has not been an explanation of what S.B. 25 and S.B. 26 will do. Co-Chairman Terry Gardiner is operating on the assumption that this approach is not acceptable to the Committee without the Committee ever having the opportunity to get a straight explanation of this important legislation.

Gardiner apparently is preparing to completely rewrite this legislation more to his own liking. Based on his questions and comments during the hearings Gardiner's direction appears to be emerging. He apparently intends to use the existing (but dormant) Power Project Loan Fund as the vehicle for financing projects on a loan basis rather than as direct investments by the State as S.B. 25 provides.

It also appears Gardiner is headed toward providing only those funds each year which can actually be spent in that fiscal year, without any mechanism to stay even with inflation. This means the anticipated projects will cost at least $8.25 billion rather than the $5 billion provided for in S.B. 25. It also means that the early projects will be completed before funding would start on later projects like

Rep. Joe Chuckwuk April 3, 1981

Tazimina, Bradley Lake and Susitna. These later projects would then be more expensive because of inflation, and it will be virtually impossible to finance them standing alone after everybody else has his project already built.

The situation is critical! Please contact the members of the Resources Committee you know and ask for their help."

This matter has particular concern to us here in the Bay Area because the Tazimina Project has the potential to utilize a renewable resource to provide fixed cost long term power supply to all the villages in the Illiamna, Kvichak, Naknek and Nushagak drainages. It would also include the Dillingham - Aleknagik Area as well as the base at King Salmon.

If fully developed, there would be power to spare. The advantage to this concept is that conceivably it could be cheaper to heat with electric heat than it would be with stove oil.

Not too many years ago when the pro's and con's of Snettisham were being kicked around, one statement made was, "If the price of stove oil ever reached $0.86 per gallon in the Juneau Area, it would be cheaper to heat with electric heat because of the excess power capacity available."

I do not know what the price of stove oil is today in Juneau but I do note that there are a great number of homes installing electric heat units.

Besides the basic advantage of electric heat units providing substantially more BTU's than stove oil per dollar invested, there is another economic phenomenum involved where excess capacity is available; that is, the more KWH that are consumed, the cheaper each KWH becomes. I guess you could term this concept maximizing the return on the initial investment.

At Nushagak Electric we believe that we need both Lake Elva and Tazimina for the best long range benefit for the entire Bay Area.

Please give this matter your careful consideration.

Thank you.

Yours very truly,

David F. Bouker

DAVID F. BOUKER
Manager

DFB:ka

P.S. Our March fuel bill was over $76,000 which averages out to $133 per consumer.

NUSHAGAK ELECTRIC CO-OPERATIVE, INC.

P. O. BOX 197 . DILLINGHAM, ALASKA 99576 . AREA CODE (907) 842-5251

April 1, 1981

Representative Joe Chuckwuk
Pouch V
State Capitol
Juneau, AK 99811

Dear Joe:

We appreciate your taking the time to discuss Elva and hydro financing this morning.

Another area that we neglected to comment on is the proposed changes in 3 AAC 94.010 to 3 AAC 94.900 which affects the Alaska Power Authority.

There are two specific areas which we believe are worthy of comment:

1. 3 AAC 94.060 paragraph (b) 2 states that, "in conducting a feasibility study the authority will use various techniques and methods to insure that information about the proposed project will include all project construction costs . . . (including) . . . the estimated cost of power based on hypothetical financing conditions . . ."

We note this proposed policy change is inconsistent with the APA's direction to R. W. Beck relevant to the Lake Elva Study.

2. 3 AAC 94.100 paragraph (2) c states that "the term of loans for feasibility studies, preconstruction engineering and project design, constructing, equipping, modifying, improving and expanding of hydroelectric generation facilities designed to produce more than 1.5 megawatts of power will be 50 years."

We believe that this is another attempt to establish criterea which can only have an adverse affect on rural communities which have the greatest need for reasonable cost stable power supply. It would never apply to an urban area because they already enjoy the benefits of low cost power and density

Rep. Chuckwuk
Juneau, AK

April 1, 1981

would obviously support much larger power projects.

John Pearson believes that the Legislative Oversight Committee has control of these proposed changes but, as of this writing, I am unable to determine just who is involved on this committee.

Anything you can do in this area would be of great assistance.

Thanks.

Yours very truly,

Dave

DAVID F. BOUKER
Manager

DFB:ka

K Reistrom

MAY 4 1981

Bristol Bay Native Corporation

445 E. 5TH AVENUE / P. O. BOX 220 / ANCHORAGE / ALASKA 99510 / PH. (907) 278-3602

April 30, 1981

The Honorable Fred F. Zharoff
Alaska State House of Representatives
Pouch V, State Capitol Building
Juneau, Alaska 99811

Dear Mr Zharoff:

In response to Representative Sutcliffe's letter of April 22, 1981 and Representative Gardiner's letter of April 23, 1981, the BBNC herein takes the following position on the Lake Elva Project.

If the Lake Elva Project had been constructed in 1960, it would have provided adequate power to the Dillingham area for the past 20 years. Now it is too little and too late. Both the power plant and a major portion of the transmission line would be located within the Wood River-Tikchik State Park. The BBNC and the villages of Aleknagik, Ekwok, Koliganek and New Stuyahok have gone on record supporting fish first in the management of the park. The original management proposal was recreation oriented and provided for extensive development.

The BBNC supports the Tazimina Lake Project over the Lake Elva Project because it has the potential of providing power to at least 15 villages in the Bristol Bay area. The Lake Elva Project would only supply power to the Dillingham area (Aleknagik, Dillingham and Kanakanak).

The BBNC supports the Lake Elva Project only as a potential additon in an intertied system. If feasible, it would be constructed some time in the future. The Tazimina Lake Project would be constructed first. A feasibility investigation of the Lake Elva Project at this time is premature. The feasibility investigation more properly belongs at Tazimina, now.

We are working closely with the Alaska Power Authority, the Bureau of Land Management, the State of Alaska, Nondalton Native Corporation and Iliamna Natives Limited in the effort to move this project forward.

We thank you for your support and the opportunity of stating our position once again.

Sincerely,

Donald F. Nielsen
Vice President

cc: Nushagak Electric Cooperative, Inc.
Alaska Power Authority

A M E N D M E N T

Offered in the HOUSE RESOURCES COMMITTEE By

TO: HCS CSSS SB 25 Resources

Amendment 1

Page 3, line 1:

After "invest" insert "money in", delete "the balance of", and delete "fund which exceeds the amount the"

Page 3, line 2 and 3:

Delete all material

Page 3, line 4:

Delete "revenue under this subsection shall be made"

Page 3, line 5:

After "37.10.075." insert the following new material:

"The Department of Revenue shall provide money in the fund to the authority after a cost for a project is incurred."

Amendment 2

Page 3, line 14:

After "be" insert the following new material:

"deposited in the general fund and may be annually appropriated to the fund by the legislature."

Page 3, line 14:

After "be" delete remainder of line

Page 3, lines 15 - 22:

Delete all material

Amendment 3

Page 4, line 8:

After "unless" insert ", after making a feasibility study under AS 44.83.181,"

Page 4, line 10:

After "cover" insert "the requirements set out in AS 44.83.490."

Page 4, lines 11 -16:

Delete all material

Amendment 4

Page 5, line 29:

After "pay" insert "the greater of: (A) an annual return to the state of not less than five percent of the amount which the authority has spent from the fund for all projects; or (B) an amount equal to the sum of:"

Page 6, lines 1, 3, 4, and 6:

Change the subparagraph designations to sub-subparagraphs (i)-(iv)

Amendment 5

Page 8, line 19:

After "heads of the" delete "principal departments" and insert "<u>state agencies</u>"

CS HB 359 (Resources)

A M E N D M E N T

A new section is added to the bill, to the intent:

*Sec.___. The Alaska Power Authority is authorized to continue accepting and making payment on claims from eligible utilities under the power production cost assistance program until it determines that

(a) the utility has had sufficient time to apply for assistance under this Act;

(b) the Alaska Public Utilities Commission has had sufficient time to act upon such applications; and

(c) the utility is not eligible for assistance under this Act.

###

AMENDMENT

XV

OFFERED IN THE HOUSE: BY: Rep. Eric Sutcliffe

TO: House Resources HOUSE BILL No. _____

SENATE BILL No. HCS CSSSSB 25

PAGE: 4 LINE: 29

Add before if:

When money is appropriated to the Alaska Power Authority for a power project, the Alaska Power Authority shall enter into a contract with the utilities which will purchase the power. The contract shall include the responsibility of the utilities to return annually the the Alaska Power Authority 10% (if Section 1. below applies) or 5% (if section 2. below applies) of the amount appropriated for the project. This return shall be assessed commencing on the date that the contract is in effect.

(AMENDMENT # 4, continued)....

Page 5, line 27:

Delete all of subsection (D), and add in its place:

"(D) a rate of return on all amounts invested in the power projects by the authority of three percent."

Line 29:

change (c) to (b)

Page 6, line 3:

Delete all of (d) and insert in its place:

"(c) The authority shall annually adjust the rate of return specified in (a)(1)(D) and (a) (2)(D) of this section, according to changes in the consumer price index for the state as compiled by the Bureau of Labor Statistics, United States Department of Labor. The index for November, 1980, is the reference base index."

Lines 14-18:

Delete all of subsection (e):

Lines 19:

Change (f) to (d),

Line 12:

add a new section (e), to read:

AMENDMENT # 4, continued:

Page 6, line 22:

add a new subsection (e), to read:

"(e) The authority shall estimate the appropriations necessary for the purposes specified in (a)(1)(A)-(C) and (a)(2)(A)-(C) of this section. The estimates required by this subsection shall be provided to the governor in the budget submitted under AS 37.07."

Line 27 to page 7, line 7:

delete all of subsection (3) and renumber following subsection.

###

HCS CSSSSB 25 (Res)

A M E N D M E N T

Page 2, line 13:

add "on loans or" before "on an issue"

Page 5, line 2:

change "(d)" to "(e)"

Page 7, line 22 - 23:

delete "per month"

####

A M E N D M E N T

AS 44.83.177 (a) and (b) are amended to read:

Sec. 44.83.177. Reconnaissance study. (a) To identify power project alternatives and energy needs and consumption patterns for a community, the authority shall, after consultation with other state agencies and after review of information on alternative sources of power, complete a reconnaissance study for each proposed new power project.

(b) A reconnaissance study shall

(1) survey all energy [power] sources available to the community and adjacent area and evaluate the relative economic merits of alternative sources of energy, including energy conservation and capture and utilization of waste energy as provided for in Sec. 170 (1)(B).

(A) for potential hydroelectric sites, the study shall include one-year data collection on water flow

(B) the study shall include one-year evaluation collection of data on wind speed, direction and other information valuable to development of wind generation.

(2) include an assessment of the total energy needs of the community, including but not limited to, electricity, space heating, and transportation fuels based on end use of the energy;

(3) include an assessment of the effect of the development of alternative sources of energy [power] on the environment so as to assure that there is no adverse effect to the environment which would make the project inadvisable;

(4) include public comment from residents of the community and adjacent areas.

(c) Remains the same as existing law.

(d) the authority shall consult with the division of energy and power development in the department of Commerce and Economic Development, and with the Alaska Energy Center of the Department of Administration to determine the information needed for their respective

purposes for energy planning and technology development, as part of the reconnaissance study.

(e) the reconnaissance study shall be part of the energy planning process leading to development of a comprehensive energy plan as provided for under AS 44.83.224.

AMENDMENT I

Page 2, lines 14-~~25~~ 23:

Delete all language, and insert in its place:

(2) will provide the lowest power cost to utility customers in the market area over the estimated life of the power project, or mix of power projects, which operate$or will operate on one or more of the following:

(A) renewable energy resources, including but not limited to hydroelectric, wind, biomass, solar, tidal or geothermal, or energy derived from temperature differentials air, water or earth, or other physical properties which can be used to produce energy, conserve fuel or provide for more effiecient utilization, transfer or storage

(B) waste energy and energy conservation technology

(C) fossil fuels including oil, natural gas or coal;

(D) peat.

AMENDMENT II

Page 5, lines ~~14-21~~ 6-12:

(1) ~~(A)~~ until June 30 of the fiscal year in which the production capacity of all power projects acquired or constructed by the authority under the energy program for Alaska exceeds 500 megawatts, the authority shall establish and maintain a wholesale power rate for each power project which rate will return to the authority, on an annual basis, not less than five percent of the amount which the authority has invested in the power project from the fund;