REPORT OF THE TECHNICAL SUB-COMMITTEE OF THE INTERNATIONAL GROUNDFISH COMMITTEE Appointed By The Second Conference on Coordination Of Fisheries Regulations Between CANADA and the UNITED STATES

Fourteenth Annual Meeting
June 20-22, 1973
Seattle, Washington, USA

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Report of the Technical Sub-Committee of the International Groundfish Committee appointed by the Second Conference on Coordination of Fisheries Regulations between Canada and the United States

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DATE: June 20-22, 1973

PLACE: Seattle, Washington, USA

PARTICIPANTS: CANADA

Fisheries Research Board of Canada	-C.R. Forrester
Canada Department of Environment	R.D. Humphreys - Chairman
	R.G. McIndoe (observer)

UNITED STATES

California Department of Fish and Game	-T. Jow
Oregon Fish Commission	-J.M. Meehan
	R.L. Demory
	J.G. Robinson
Washington Department of Fisheries	-G.S. DiDonato
	D.R. Gunderson
National Marine Fisheries Service	-T.A. Dark
	H.A. Larkins (observer)
Pacific Marine Fisheries Commission	-J.P. Harville (observer)
International Pacific Halibut Commission	-S.H. Hoag (observer)

I. CALL TO ORDER

The fourteenth annual meeting of the Technical Sub-Committee was called to order at 10:30 AM on June 20 by Chairman R. D. Humphreys under instructions set forth by the parent committee in 1959. The business of the meeting was guided according to a prepared agenda which appears as Appendix A.

II. APPOINTMENT OF SECRETARY

T. A. Dark of NMFS (USA) was appointed to act as recording secretary for the meeting.

III. APPROVAL OF AGENDA

Minor amendments were made to the proposed agenda distributed to the members prior to the meeting. The approved agenda appears as Appendix A.

IV. STATUS OF STOCKS

There was some discussion about the propriety of the heading of this agenda item, with comment that perhaps "Trends in Fisheries" may provide a better description of the subject matter. Ultimately the Sub-Committee agreed that the primary interest is "Status of Stocks" and that the Sub-Committee should address that issue under this agenda item. It was agreed that henceforth, sablefish will be added to the list of species considered under "Status of Stocks" and that NMFS will be responsible for summarizing sablefish status reports for presentation at the next annual meeting of the Sub-Committee.

A. Petrale sole

The United States and Canadian petrale sole catch in 1972 was 8.8 million pounds, an increase of 7% over the 1971 catch of 8.2 million pounds and an increase of 9% above the 1962-71 average of 8.0 million pounds. Leading production areas were Areas 1B, 3C, 3A, and 1C where respective catches were 2.0, 1.7, 1.1, and 1.0 million pounds. The catches from other areas ranged from 1,000 to 892,000 pounds.

1. Catch/Effort

a. Canada

The 1972 Canadian catch of petrale sole was 1.3 million pounds, a slight increase over the 1.1 million pound catch of 1971.

The catch from the southern stock off the southwest coast of Vancouver Island (Area 3C) in 1972 was 1.0 million pounds, a 20% increase from 1971 and three times the mean catch for the past 10 years. Average catch per unit of effort (CPUE) based on performance of double-gear vessels during May to August

was 238 lb/hr, a 12% decrease from that of 1971. The increased catch was probably due to the continued strength of 1966 and 1967 year classes which first appeared in 1971. The dominance of these year classes are noted in length frequency distributions for 1971 and 1972.

Northern stock (Areas 3D, 5A-5D) catches by Canadian fishermen in 1972 were 232,000 pounds compared to 264,000 pounds for 1971. The 1972 catch was nearly a third less than the 10-year mean. The weighted CPUE available for the most recent year, 1971, was 49 lb/hr, well above the 1970 and 1969 CPUE of 24 lb/hr but still well below the 1962-71 mean of 124 lb/hr. Petrale sole in northern areas are considered to be in extremely low abundance. No increase in abundance is apparent in northern areas as occurred to the south with the entries of the 1966 and 1967 year classes. It is suspected that intensive 1966 and 1967 trawling by foreign fleets had a serious effect on northern petrale sole stocks.

b. United States

1.) Washington. The 1972 trawl catch of 1.7 million pounds was a 58% increase from 1971. However this catch remains 15% below the 10-year mean of 2.0 million pounds.

The 1972 catch from the southern stock of 1.3 million pounds by Washington fishermen was a threefold increase over the 428,000 pounds caught in 1971. It was also 50% greater than the past 10-year mean. The increase was due to good catches from the Cape Flattery Spit Deep in March-April and good inshore catches off Cape Flattery during the summer. In contrast, the 1971 improvement of summer catches for other Area 3C grounds off the lower west coast of Vancouver Island did not continue in 1972.

Northern catches totaled 294,000 pounds, a record low for northern stock production. Esteban Deep (Area 3D) catches were very poor at 80,000 pounds and CPUE of 69 lbs/hr was down 65% from the 10-year mean of 198 lbs/hr. Some improvement in Queen Charlotte Sound catches occurred but CPUE remained at a low level.

2.) Oregon. The 1972 catch of 2.2 million pounds was 4.3% below the 1971 catch and 8.5% above the 10-year mean. CPUE for Areas 2B through 3A was 266 lbs/hr or 3.9% above the 1971 CPUE of 256 lbs/hr.

3.) California. The 1972 catch by California fishermen was 3.6 million pounds, a 3.6% decrease from the 1971 catch of 3.7 million pounds and an 18% increase over the 10-year mean of 3.0 million pounds. In 1972, slight decreases occurred in catches from Area 1A, 1B, and 1C while a slight increase occurred in the Area 2A catch.

2. Winter Fishery

There was no distinct winter fishery for petrale sole by Canadian vessels in 1972-73. December 1972 to April 1973 catches totaled only 18,500 pounds.

The Washington winter fishery (December 1972 - April 1973) resulted in landings of 787,000 pounds (preliminary estimate). Northern stock and southern stock winter fisheries were 354,000 and 433,000 pounds, respectively.

The California winter fishery (November 1972 - January 1973) is estimated at 628,000 pounds, a reverse of the increasing trend in the winter fishery of recent years. The peak winter catch of 1,456,000 pounds for the past 10 years occurred in 1971-72.

B. Lingcod

Trawl-caught Canadian and United States landings of lingcod totaled 7.7 million pounds in 1972, about 10% below that for 1971 and 15% below the 1962-

71 mean. Trends continued downward off British Columbia and Washington, and upwards off Oregon, but were sharply upwards off California.

1. Canada

Total Canadian trawl catch of lingcod in 1972 was 2.3 million pounds, about 35% below the mean for the preceding 10 years. The major area of trawl production of lingcod was Area 3C and length frequencies of lingcod from this area suggest that recruitment to the stocks has not been substantial. In addition to Canada's trawl production of lingcod there is a line fishery in various areas of the coast which accounts for an almost equal amount of production.

2. United States

a. Washington. Total trawl-caught lingcod landings were 1.5 million pounds, down 25% from 1971 and 64% from the 1962-71 mean. The catch from Area 3C was reduced to only 17% of the mean annual catch taken during 1962-71. However, there was also some evidence of declining fishing effort in this area which undoubtedly accounted for some drop in production. Production of lingcod was below the 1962-71 mean for all important areas fished by Washington vessels. The Washington trawl fleet landed 86% of the total commercial lingcod catch in Washington in 1972.

b. Oregon. Trawl-caught lingcod landings were 1.3 million pounds in 1972, up 5% from 1971 and 40% above the 1962-71 mean.

c. California. Trawl catches of lingcod in California reached a record high of 2.6 million pounds in 1972. This was 60% over 1971 and almost twice the annual level taken during 1962-71. Catches increased in all areas. There was increased fishing effort in California in 1972 compared to 1971 and previous years but the increase was of the order of 30%, i.e., much less than would account for the increase in lingcod catch. Improved recruitment since

1970 is believed to be partly responsible for the increase in catch. In addition to the trawl catch, 1.6 million pounds were taken by the line fishery.

C. Pacific Cod

United States and Canadian landings of Pacific cod in 1972 reached 29.4 million pounds, up sharply from the 17.1 million pounds taken in 1971 and the 1962-71 mean of 20.2 million pounds. Catch and catch per unit of effort appeared to have increased in all regions north of Area 3A.

1. Canada

Pacific cod continued to be the dominant species in Canadian trawl landings and reached 19.0 million pounds in 1972 (up 75% from 1971). More than 50% of the catch came from grounds off the lower west coast of Vancouver Island where substantial contribution was made by the 1969 and 1970 year-classes as three and two year-olds respectively. The latter, when entering the fishery as two year-olds, appeared much stronger than any of its known predecessors. Age determinations show that about 60% of catches taken after the spawning season are two year-olds. There has been some recovery of Pacific cod stocks in the Hecate Strait area and Canadian catches in 1972 at 5.9 million pounds were 80% higher than in 1971. Pacific cod in landings from Hecate Strait are older than Pacific cod in landings from west coast grounds. Evidence was presented suggesting very high rates of fishing on spawning concentrations of Pacific cod in Area 3C in 1973.

2. United States

a. Washington. Washington trawl catch of Pacific cod totaled 9.3 million pounds in 1972, about 65 and 55% above that of 1971 and the 1962-71 mean respectively. Catches and catch/effort increased in all areas but particularly in Area 5B.

b. Oregon. Pacific cod landings increased to 1.1 million pounds from the 0.5 million pounds of 1971, and reflected the greater abundance in this fringe area of the cod's distribution.

D. Pacific ocean perch

1972 Pacific ocean perch landings in Canada and the United States were 14.5 million pounds; an increase of 14% over 1971 landings and a 29% increase from the 1962-71 mean.

1. Canada

Total Canadian landings were 5.1 million pounds in 1972 which represents a 75% increase from the 2.9 million pounds landed in 1971 and a 104% increase from the 10-year mean. Ninety-four percent of the total landings came from area 5A and 5B (INPFC Charlotte sub-area). The remainder, 258,000 pounds, was from Areas 3B-3D (INPFC Vancouver area). In Queen Charlotte Sound, Canadian CPUE values were up substantially (66% in terms of catch/hr) from 1971 values. Some of the increase in catches and CPUE may be attributed to changes in seasonal and areal fishing patterns. There was considerably more effort spent during August-November, 1972, than in the same period of previous years and there appeared to be relatively greater effort on grounds toward the seaward side of Queen Charlotte Sound than in 1969-71. However, substantial increases in CPUE were observed in all areas fished in Queen Charlotte Sound in 1972, possibly reflecting a recovery of the stocks from the intensive 1966-67 fisheries.

2. United States

a. Washington. Total landings were up 8% from 8.1 million pounds in 1971 to 8.7 million pounds in 1972, but were 33% below the 10-year mean. While the 1.1 million pound landing from off the northern Washington coast and the

west coast of Vancouver Island is less than the 1971 landing, the 7.4 million pound landing from Queen Charlotte Sound represents a one million pound increase from 1971.

b. Oregon. Landings were down 63% from 1971 and 88% from the 10-year mean. Ninety-eight percent of the landings were from Areas 2B-3A (Columbia Area) where the CPUE was down from 328 lbs/hr, in 1971 to 290 lbs/hr, in 1972.

c. California. California fishermen landed 94,000 pounds of Pacific ocean perch in 1972 which was a 16% decrease from the 112,000 pounds landed in 1971, but about twice the magnitude of the 10-year mean. Eighty-four percent of the landings (79,000 pounds) was from Area 1C.

E. Other rockfish

Canadian and U. S. landings of other rockfish were 31.3 million pounds in 1972, a 28% increase over 1971 landings and 35% above the past 10-year mean landing.

1. Canada

Landings of other rockfish in 1972 continued to increase. The 3.4 million pounds landed in 1972 was 100% greater than the 1971 landings of 1.7 million pounds and 298% greater than the 10-year mean. Most of the other rockfish landed was from Queen Charlotte Sound and consisted mainly of Sebastes flavidus.

2. United States

a. Washington. Washington's 1972 landings of 10.7 million pounds represents a 1% increase from the 1971 landings and a 12% increase from the 10-year mean. The bulk of the landings (83%) was from the northwest coast of Vancouver Island and Queen Charlotte Sound. Principal species were Sebastes flavidus, S. pinniger, and S. brevispinis.

b. Oregon. Landings of other rockfish totaled 4.1 million pounds in 1972, up 19.2% from the 3.4 million pounds landed in 1971 and 10.8% below the

10-year mean. Most of the other rockfish landed (82%) came from Areas 2B and 3A.

c. California. Other rockfish landings in 1972 were 13.2 million pounds as compared to 8.8 million pounds in 1971, a 49% increase. The 1972 landings were 61% greater than the 10-year mean. Landings were greatest from Areas 1B and 1C (51% and 27% of the total landing respectively). Predominant species in California landings are Sebastolobus alascanus, Sebastes paucispinus, S. gooclei and S. pinniger.

F. English sole

Canadian and Unites States landings of English sole in 1972 were 8.1 million pounds. This total was 8% greater than the 1971 catch of 7.5 million pounds but it was 28% below the past 10-year average of 11.1 million pounds. Areas 1B, 1C, and 4A, were leading catch areas where catches exceeded a million pounds in 1972.

1. Canada

Landings of English sole in 1972 were 1.1 million pounds, a decline of 25% from that of 1971 and 28% below the 1962-71 mean. The bulk of the landings (72%) was taken in northern Hecate Strait (Area 5D). CPUE in this fishery was 528 lbs/hr, slightly greater than that of 1971, but 23% below the 10-year mean.

2. United States

a. Washington. Washington trawl landings of English sole for foodfish use were 1.8 million pounds in 1972. This catch is up 39% from 1971, a reverse of the downward landing trend which began in 1970. An additonal 216,000 pounds of English sole was landed for animal food in 1972.

The northern Washington coast (Area 3B) is the main area fished for English sole by Washington trawlers; in 1972, 520,000 pounds caught in Area 3B. CPUE was 107 lbs/hr, an improvement over that of 1971. Both catch and CPUE remain below 10-year averages but they are the first signs of improvement since 1968.

English sole catches of 1.4 million pounds from inside waters of Puget Sound (Area 4A) represent a decrease from 1971. The decrease was due to the decline in animal food catch to 216,000 pounds in 1972 from the 755,000 pounds in 1971. The foodfish catch of English sole was 1.1 million pounds in 1972, a slight increase over the one million pounds of 1971.

b. Oregon. Oregon English sole landings in 1972 of 2.2 million pounds increased 22% over 1971 landings and were 4% above the 10-year mean. Areas 2B and 3A were the most productive areas where respective catches were 764,000 and 721,000 pounds. CPUE for Areas 2B-3A of 283 lbs/hr in 1972 was 20% above the 1971 figure of 236 lbs/hr.

c. California. The 1972 catch of 3.0 million pounds was only 1% greater than the 1971 catch. The 1972 English sole catch was well below average, 32% below the 10-year mean of 4.4 million pounds. In 1972, Areas 1B and 1C were the leading areas of catch with respective catches of 1.5 and 1.2 million pounds.

G. Dover sole

The U. S. and Canada landed 31.6 million pounds of Dover sole in 1972, an increase of 31.1% from the 1971 landings of 24.1 million pounds, and 74.6% above the 1962-1971 mean of 18.1 million pounds. International statistical Areas 1C, 1B, 2B, and 2A were the leading Dover sole production areas where respective catches of 9.9 million pounds, 9.2 million pounds, 3.6 million pounds, and 3.3 million pounds were made.

1. Canada

Canadian landings of Dover sole in 1972 at 2.4 million pounds were slightly lower than in 1971, but substantially above the mean for the preceding 10 years. CPUE of Dover sole (zero threshold) from Area 5D was 977 lb/hr, about the same as in 1970 and 1971. Recent increases in Dover sole catches are believed to

be directly due to increased effort directed toward that species because of decreased abundance of English sole and rock sole in northern Hecate Strait.

2. United States

a. Washington. Trawl landings of Dover sole amounted to 1.2 million pounds in 1972, down slightly from 1.4 million pounds landed in 1971. Areas 3B and 5B account for over one-half of the Washington trawl production. Landings from Area 5B in 1972 remained about equal to 1971 landings at 217,000 pounds. CPUE was at a very low 83 lb/hr. Both catch and catch/effort are substantially below the mean of the past 10 years. Landings from Area 3B amounted to 470,000 pounds, down 25% from 1971. CPUE was 243 pounds per hour, also down from 1971 but equal to the past 10-year mean.

b. Oregon. Landings of Dover sole increased to 5.9 million pounds in 1972. This was 7.3% above 1971 and 26.5% above the 10-year mean. Areas 2B and 3A continue to be the primary source of Oregon catches. Catches from Area 2B in 1972 at 3.6 million pounds remained about equal to the 1971 landings. CPUE (30% threshold), however, dropped from 538 lb/hr in 1971 to 479 lb/hr in 1972. Area 3A landings showed a substantial increase to 1.7 million pounds in 1972 from a low of 1.2 million pounds in 1971. CPUE also increased to 471 lb/hr in 1972 from 368 lb/hr in 1971.

c. California. A record catch of 22.1 million pounds of Dover sole was landed in 1972. This was 55% greater than the 1971 catch of 14.2 million pounds and more than double the 10-year mean catch of 10.7 million pounds. Substantial increases in catch occurred in all statistical areas. Areas 1C and 1B catches were over 9 million pounds each and 3 million pounds were taken in Area 2A.

V. REVIEW OF THE FISHERY

The 1972 trawl landings from the northeastern Pacific by Canadian and United States vessels were 158.8 million pounds (Table 1.). This catch was

Table 1. Otter trawl landings (1,000's of pounds) from the Northeastern Pacific by Canadian and United States Vessels in 1971, 1972 and mean for 1962-71.

Species	1971					1972					Mean 1962-71
	B.C.	Wash.	Ore.	Cal.	Total	B.C.	Wash.	Ore.	Cal.	Total	
English sole	1,438	1,316	1,799	2,964	7,517	1,084	1,826	2,196	3,002	8,108	11,053
Rock sole	4,309	568	122	--	4,999	2,110	555	2	5	2,672	5,643
Petrale sole	1,115	1,095	2,284	3,704	8,198	1,275	1,726	2,185	3,574	8,760	8,038
Dover sole	2,987	1,376	5,538	14,241	24,142	2,424	1,192	5,942	22,080	31,638	18,131
Rex sole	424	59	839	1,469	2,791	359	101	1,314	1,662	3,436	2,937
Starry flounder	293	496	485	248	1,522	457	780	439	599	2,275	1,934
Other flatfish	458	132	521	1,197	2,308	562	291	600	1,576	3,029	2,099
Pacific cod	10,996	5,615	483		17,094	19,013	9,304	1,069	0	29,386	20,161
Lingcod	3,427	1,984	1,281	1,651	8,343	2,288	1,482	1,349	2,618	7,737	9,332
Sablefish	418	123	240	2,971	3,752	1,517	85	403	5,067	7,072	2,920
Pacific ocean perch	2,947	8,074	1,649	112	12,782	5,130	8,685	602	94	14,511	20,367
Other rockfish	1,716	10,525	3,404	8,858	24,503	3,393	10,678	4,057	13,160	31,288	23,107
Misc. species	204	82	28	142	456	610	216	36	292	1,154	646
Dogfish	259	--	4	--	263	181	--	tr	2	183	255
Animal food	943	3,789	1,786	988	7,506	1,131	1,076	730	370	3,307	14,861
Reduction 1/	157	7,985	0	--	8,142	157	4,072	0		4,229	8,819
Total	32,089	43,219	20,463	38,545	134,318	41,691	42,069	20,924	54,101	158,785	150,303
% of total catch	23.9	32.2	15.2	28.7	100	26.2	26.5	13.2	34.1	100	
Total hours	28,235	41,400	28,644	53,837	152,116	27,958	39,600	29,206	69,988	166,752	159,077
Catch/Effort (16/hr)	1,028	1,044	714	716	882	1,491	1,062	716	773	952	945

1/ Reduction pounds include dogfish in Washington statistics.

an increase of 24.5 million pounds (18.2%) over the 134.3 million pounds landed in 1971 and 5.6% above the 10-year (1962-71) average of 150.3 million pounds. Total effort was 166.8 thousand hours; up 9.6% over 1971 and 4.8% greater than the mean effort for the previous in 10 years. The overall CPUE in 1972 was 952 lb/hr; 0.7% above the mean for the past 10 years.

In addition to trawl landings of groundfish, Canada, Washington, and Oregon reported total landings of groundfish by other than trawl gear of 7.2 million pounds.

The leading species in the 1972 trawl fishery was Dover sole with landings of 31.6 million pounds. This catch was an increase of 31.1% over that of 1971, and 74.6% above the 1962-71 mean. Most of this increase in Dover sole landings was due to the exceptionally high catch in California waters (22.1 million pounds). The other rockfish species group was next in importance with a total landing of 31.3 million pounds, an increase of 27.8% over the 1971 level and 35.5% over the 1962-71 mean.

British Columbia fishermen landed approximately 46.1 million pounds of groundfish (excluding halibut) in 1972, of which 41.7 million pounds (90%) were trawl-caught. This was an increase of 30% above that of 1971 and 18% greater than the 1962-71 mean. Total effort expended was 28.0 thousand hours. Pacific cod was the dominant species caught (19.0 million pounds or 46% of the total landings). Preliminary Canadian evidence indicates that spawning aggregations of the Pacific cod stock in Area 3C in 1973, were subjected to very high rates of fishing. An increase in B. C. rockfish landings was noticeable.

Washington landings of grounfish (excluding halibut) in 1972 amounted to 43.1 million pounds, of which 42.1 million pounds (97.7%) were trawl-caught. The principal fishing gears other than trawl were troll, set line and drag seine.

The trawl catch level represents a 3% decrease from 1971 and a 23% decrease from the 1962-71 mean. Foodfish landings were up 18% to 36.9 million pounds (primarily Pacific cod). The rockfishes (including Pacific Ocean perch) remain the major species group contributing to the Washington trawl fishery (52% of the total 1972 trawl foodfish landings). Total effort expended was 39.6 thousand hours; down 4.3% from 1971 and 20.3% below the past 10-years mean.

The 1972 Oregon groundfish landings totaled 22.7 million pounds, of which 20.9 million pounds (92.3%) were trawl-caught. The trawl catch represents an increase of 2.3% over the 1971 level but 18% below the mean for the 1962-71 period. Foodfish landings accounted for 20.2 million pounds (96.5%) of the 1972 catch, flatfish were the most important foodfish species group (12.7 million pounds), and Dover sole was the most important species (5.9 million pounds; 46.9% of the total flatfish catch). An estimated 29.2 thousand hours of fishing effort were expended by the Oregon trawl fleet in 1972; above the estimated 28.6 thousand hours in 1971 and 4.9% above the 10-year mean.

In 1972, California fishermen landed 61.5 million pounds of groundfish of that total, 88% was trawl-caught while 12% was taken in line and trap fisheries.

The California trawl fleet landed 54.1 million pounds of groundfish in 1972--the highest catch on record. This catch exceeds the previous high of 39.4 million pounds landed in 1970 by 37% and the 10-year mean of 34.9 million pounds by 55%. The trawl fleet increased to 95 vessels in 1972 and fished 70.0 thousand hours; an increase of 16.2 thousand hours (30%) over the 1971 level. Dover sole was by far the leading species in California landings, followed by the multi-species rockfish group, then sablefish (these three groups comprised

75% of the total 1972 landings). There were significant catch increases in 1972 for Dover sole, sablefish, rockfish, and lingcod.

VI. REVIEW OF DATA EXCHANGE PROCEDURES

There was considerable discussion on whether groundfish catches by gear other than trawl, not presently reported in the PMFC data series, should be included.

It was suggested that rather than hastily modify the data series the practicality of expanding the scope of the series should be examined. The Sub-Committee agreed that as a first step, the 1973 status reports should include catches by gear other than trawl (i.e., troll, handline, seine, and gillnet) and by PMFC area as is practical.

Mr. Dark submitted USSR groundfish statistics for 1967-71. The Sub-Committee concurred that Japanese groundfish statistics could be included in the Sub-Committee report if the words "Not to be Cited" occurred on the cover.

VII. REVIEW OF AGENCY PROGRESS

A. Current and Proposed Research

1. Canada

Groundfish staff of the Fisheries Research Board of Canada on the Pacific coast in 1972 remained as in 1971, i.e., two scientists, seven technicians, and one clerk. Two of the technical staff had as their primary responsibility the collection of samples from the commercial trawling operations. Other personnel were divided between three projects, the Near-Seas Investigation, the Rockfish Investigation, and Sablefish Culture.

a. Near-Seas Investigation. This segment of the Groundfish Investigation was concerned primarily with collection and analyses of catch and effort statistics for purposes of measuring changes in abundance of the important trawl-caught groundfish species. Size and age composition materials were also collected from commercial landings at major fishing ports and provide information on changes in recruitment, growth and mortality. Age and growth studies continued on Pacific cod (scales) and on English, rock, and petrale sole (otoliths). A report was published on ages of rock sole in 1964-71 commercial catches from northern Hecate Strait (Area 5D). Reports were also published on mercury content of dogfish in the Strait of Georgia and on catch and effort statistics in the Canadian groundfish fishery.

b. Rockfish Investigation. Pacific ocean perch stocks in south Queen Charlotte Sound and off southwest Vancouver Island are periodically investigated in situ with the research vessel G.B. Reed. Rockfish studies generally utilize conventional techniques to investigate taxonomy, growth, reproduction, stock size and population dynamics. Field studies included echo-sounder and trawl survey of north Queen Charlotte Sound, stock assessment of Pacific ocean perch off southwest Vancouver Island and joint calibration studies of echo-sounders and trawl nets with the

G.B. Reed and the Soviet research vessel Ogon. Continuing studies with Vancouver laboratory personnel are attempting to identify subpopulations of Pacific ocean perch using biochemical techniques. Reports were published dealing with rockfish synonymy, age determination and growth of Pacific ocean perch, G.B. Reed groundfish cruises and status of Pacific ocean perch stocks off British Columbia, Washington and Oregon (in cooperation with investigators from Washington and Oregon).

c. Sablefish Culture. Reports on sablefish culture activities have been disseminated. Also included in 1972 activities was supervision of a tagging program which saw 1,003 juvenile sablefish tagged on inside grounds near Queen Charlotte Strait at the north end of Vancouver Island.

d. Tagging Studies. Other than the blackcod operation, no new tagging experiments have been conducted by the groundfish group.

e. Future Activities. The Groundfish Investigation in 1973-74 will no longer be divided into a Near-Seas and Rockfish group. There is urgent need for a thorough stock assessment of all important demersal fish stock off Canada, particularly in Queen Charlotte Sound, Hecate Strait, and Dixon Entrance, the region decreed in 1971 to be a Canadian fishing zone. As a result the distinction between the Near-Seas and Rockfish projects will become increasingly indistinct. It is anticipated that stock monitoring will continue for all important species. Special attention will be given to those exhibiting some symptoms of overfishing (e.g., rock sole and lingcod). The initial 2-year exploration by echo sounder and trawl, of north Queen Charlotte Sound and Hecate Strait will be completed.

2. United States

a. Washington. The Groundfish Investigation staff during the past year was comprised of six biologists, three scientific aides and one clerk-typist. Two of the biologist positions are presently vacant and a third position is being in the process of/transferred to baitfish studies. The Groundfish Investigation program continued to be heavily supported by PL 88-309 funds during this past year.

1.) Groundfish Data Collection and Processing Systems.

Daily coverage of the major Puget Sound landing ports is accomplished by two port samplers. During 1972 significant trawl landings occurred at Blaine, Bellingham, Anacortes, Everett, Seattle, La Conner and Westport on Grays Harbor. Biological samples are also collected by the port samplers. Samples collected during 1972 totaled 206 which is the same as 1971. Groundfish tag recoveries processed during the period May 1, 1972 - April 30, 1973, totaled about 1,000.

One biologist is stationed at the Federal-State groundfish age reading unit located at the National Marine Fisheries Montlake Laboratory in Seattle. Final ages were assigned during May 1, 1972 - April 30, 1973, on a routine basis to Pacific hake and Pacific Ocean perch samples. Age readings of English sole interopercles, petrale sole otoliths, and starry flounder interopercles were also accomplished.

A computer-oriented data storage and retrieval system has been developed for the fishermen interview, biological samples and tagging data. A consulting programmer was contracted to handle the various data retrieval, manipulations and storage needs of the Groundfish staff on May 3, 1973.

2.) Groundfish Data Analysis Studies. Major emphasis has occurred on Pacific Ocean perch and other rockfish species during this past year. An analysis of the availability, size composition, age composition and growth characteristics of Pacific Ocean perch captured during the 1967-1972 biological cruises off the northern Washington coast has been completed. Significant effort was spent on Pacific Ocean perch stock assessment using simulation studies and other computer models. The write-up of these studies is underway. Extraction and compilation of Pacific Ocean perch catch and fishing effort data by ground from Queen Charlotte Sound is underway in preparation of a detailed and joint review of the fishery in this area with Canadian scientists. Much effort has been spent analyzing "other rockfish" catch statistics with rockfish species composition estimates taken by port samplers. This is being done pursuant to one of the 1972 Tech. Sub-Comm. recommendations.

A progress report is underway on various activities conducted during the past 1-4 years pertaining to the feasibility of controlling the abundance of dogfish in certain areas of Puget Sound. It will include results of questionnaires sent to commercial and recreational fishermen, sport fishery sampling checks, dogfish tagging studies, results of a pilot-scale tagging and subsequent removal operation and a review of the Puget Sound dogfish fishery during the 1940's.

The possibility of "homing interests" for English sole to specific localized areas in central Puget Sound continues to be investigated.

Results of Pacific hake investigations conducted in Puget Sound are in a report planned for completion this coming summer.

b. Oregon

1.) Tagging. One tagging trip was completed between July 1972 and April, 1973. Tagging was conducted during regular fishing trips of commercial vessel Pacific. All tagging occurred in Area 2B on Dover sole. On March 23-27, 1973, a total of 221 fish were tagged off Cape Arago in 120-300 fathoms of water.

2.) Biological Studies. The resource surveys conducted in 1971 and 1972, will be continued. The 1973 cruise will be a replicate of the 1971 cruise and will cover the area between the Columbia River and Yaquina Head in depths from 10 to 250 fathoms.

3.) Sampling Program. Landings of Dover sole, English sole, petrale sole, rockfish, and animal food were sampled at Brookings, Charleston, Winchester Bay, Newport, and Astoria.

c. California. The California Bottomfish Program staff of five biologists has remained at the level of past years. In addition to the permanent staff, ten man months of seasonal assistance have been available.

The 88-309 Shellfish and Bottomfish Data Analysis Project has continued to work closely with our group. This group has recently reached its full complement of two biologists, a biometrician, computer programmer, and a keypunch operator.

1.) Tagging. No groundfish tagging has been accomplished since the last meeting of the Technical Sub-Committee.

A cruise of the N. B. Scofield in July, 1973, is scheduled to assess resources on the Punta Gorda ground in the northern part of Area 1B. Tagging of Dover sole and sablefish will be undertaken.

2.) Biological Studies. Two cruises of the N. B. Scofield to assess groundfish resources in the Monterey-Point Sur area (Area 1B) have been completed; a third cruise is scheduled for fall 1973. Gill-nets of various mesh sizes are used to sample the fish populations in depth between 10 and 60 fathoms. Several species of rockfish and lingcod were the predominant species caught. Groundfish were more abundant in lightly commercially fished areas than at traditionally fished areas.

A cruise of the N. B. Scofield is scheduled for July 1973, as previously mentioned, to assess Dover sole and associated species on the Punta Gorda ground. This ground contains a slope area where fishing for Dover sole began in 1971 and from which high annual catches have been made since.

3.) Sampling Program. Age and size composition samples of landings of Dover, English, and petrale sole were obtained at major ports. In 1972, 81 Dover sole, 70 English sole, and 57 petrale sole samples were obtained. Only three samples of animal food were obtained in 1972.

A sampling program to determine the species composition of rockfish in landings was initiated early this year. Age interpretations of flatfish age structures were continued and a small backlog of samples remain.

d. National Marine Fisheries Service

1.) Tagging. Sablefish tagging continues primarily for the purpose of defining stock units, migration rates and patters, and growth rates. In February-March 1972, NMFS tagged 2,397 sablefish in three locations in southeast Alaska. To June, 1973, 68 tags had been returned and none from areas greater than 90 miles ($\bar{x}$=60 mi) from the release site. During August-September, 1972, an additional 3,426 sablefish were tagged off Oregon and while various trap types were compared for fishing efficiency. In the winter

and spring of 1973, 1,560 juvenile sablefish were tagged in Puget Sound. In April 6,992 adults were tagged in Chatham Strait, southeast Alaska.

This tagging program is being conducted in cooperation with the California Department of Fish and Game, which has released 3,208 tagged sablefish off California, and TINRO of the USSR, which has tagged about 5,000 sablefish off northern California, Oregon, Washington and British Columbia. A total of 22,647 tagged sablefish have been released to date.

2.) Biological Studies. Pacific hake - The La Jolla laboratory continues to participate in cooperative studies with the Soviets for the purpose of monitoring the distribution and abundance of hake eggs and larvae off California. These studies provide estimates of the spawning biomass. We continue to sample adult hake off Washington-Oregon for age and length composition. An unusually abundance of 2-year-old hake in 1972 samples suggests the 1970 year class may be extraordinarily large. Conformation must await additional sampling in 1973-74.

Pollock - In 1972, the Northwest Fisheries Center, initiated a program to: (1) determine the geographical and seasonal availability of pollock and other bottomfish in the western Gulf of Alaska, (2) estimate vital rates of the pollock population and, (3) estimate potential yield for pollock. The first trawl survey was conducted in July-August, 1972, in the Kodiak area. A second survey in the same general area has just been completed, while a third cruise will occur in the Kodiak-Unimak Pass area in August-September, 1973. Results of the first two surveys utilizing the area-swept approach are presently being analyzed. Program duration is projected for 3 years.

Bering Sea Groundfish Surveys - During June-July, 1973, the NMFS vessel Oregon and charter vessel Mark I continue the groundfish resource assessment work initiated in 1971, in the eastern Bering Sea. Primary objectives are to: (1) assess abundance, distribution, and species composition of the bottomfish community, (2) determine biological condition of the bottom fish resource by obtaining age, sex composition, and length frequency data, (3) measure oceanographic parameters which may affect distribution and abundance of more important species. Surveys will utilize the "area-swept" method and several days will be spent conducting comparative trawl experiments with the Oregon and Mark I to render the results of their work comparable.

B. Reports Completed or in Progress

Each agency had previously distributed a list of their reports and those lists were briefly reviewed during the meeting.

VIII. 1972 RECOMMENDATIONS OF THE TECHNICAL-SUBCOMMITTEE

A. Groundfish Ageing Workshop

Mr. Demory commented on his letter to Sub-Committee members summarizing the age determination activities of Pacific Coast fishery agencies and their evaluations of relative precision and accuracy. While common problems associated with age determination were difficult to define, most agencies indicated that their criteria and technique generally provided acceptable levels of precision for species of interest, but levels of accuracy were rarely established. Because there were differences in species of interest and in specific problem areas among agencies, the Sub-Committee agreed that rather than convening a coastwide workshop, agencies could best resolve age determination difficulties by arranging for cooperative studies on an individual basis.

B. Species Composition of "Other Rockfish" Catches

Canada (Fisheries Research Board of Canada) and the United States (Washington State Department of Fisheries) presented reports[1] on the species composition of the "Other Rockfish" category of their respective status reports. Sebastes flavidus, S. brevispinis, and S. pinniger were predominant species in the "Other Rockfish" landings of both Washington and British Columbia. It was noted that 1962-71 mean catch of S. flavidus by Washington's fleet was of the same magnitude as the mean true cod catch and the mean catch of S. pinniger rivals the mean lingcod catch for the same period. This becomes more significant when one observes that, in terms of pounds landed, truecod and lingcod have been considered Washington's second and third most important groundfish species.

The Oregon Fish Commission has a draft of a report on the species composition of Oregon rockfish catches and California will initiate a study in 1973 with a report due in 1974. A comprehensive joint report is planned for 1974.

1/ Species Composition of Rockfish in Catches by Canadian Commercial and Research Vessels in Queen Charlotte Sound,
by C. R. Forrester and M. S. Smith.

The WDF Rockfish Species Composition Study
Washington Department of Fisheries.

These reports can be obtained from any member of the Technical Sub-Committee.

C. The Status of Our Knowledge of the Lingcod Resources

The Lingcod Working Group did not convene during the past year, but Mr. Forrester submitted a working report, The Lingcod (Ophiodon elongatus) in Waters off Western Canada. 1/ The author reviews the history of the Canadian fishery, utilizes tagging results to examine migration, growth, and mortality rates, presents information on maturity and fecundity, compiles available length-weight relationships, and discusses yield estimates for the Strait of Georgia stock.

The working group will continue to compile available information with the hope of producing additional reports.

D. Cooperative Sablefish Research Programs

The National Marine Fisheries Service was the only agency to develop a plan for cooperative sablefish research. Mr. Dark submitted a proposal for such work in the form of a recommendation under Agenda Item XI.

IX. 1972 RECOMMENDATIONS OF THE INTERNATIONAL GROUNDFISH COMMITTEE

A. Minimum mesh-size regulation and underlying rationale

There was but brief discussion of this topic. It was noted that the Sub-Committee had thoroughly considered the matter during the Eleventh Annual Meeting in 1970, and that subsequent changes in minimum mesh sizes and associated rationale have not been substantive.

B. Resolution of differences in Canadian-U. S. minimum mesh-size regulations.

By way of review, the Sub-Committee observed that the basic problem is that Washington trawlers fishing in Canadian waters as a result of the US-Canadian Reciprocal Fishing Agreement may be in violation of Canadian minimum mesh-size regulations because, even though Washington and Canadian minimum mesh sizes are similar by regulation, a difference in

1/ This report may be obtained from any member of the Sub-Committee.

mesh definition results in acceptance of smaller mesh size by Washington. Washington measures 2 bars and 2 knots while Canada (also Oregon and California) measures 2 bars and 1 knot.

Mr. DiDonato stated that the matter of modifying Washington's method of mesh measurement had been under consideration and that it might be feasible to redefine criteria for measuring trawl meshes. The members of the Sub-Committee agreed that WSDF should continue to pursue the matter of seeking modification of mesh definition in accordance with that presently used by British Columbia.

X. INTERNATIONAL MATTERS

A. Status of Foreign Trawl fisheries off the west coast of Canada and the United States.

1. Canada. Soviet trawlers and their support vessels again appeared off the coast of British Columbia in June, 1972. However, fishing activity never reached the magnitude of past years. For example, in July, 1971, there were a maximum of 63 trawlers fishing off the southwest coast of Vancouver Island--in July, 1972, there were 13 sighted. This lowered activity was also apparent at Tasu Sound where a total of 84 Soviet vessels entered during 1971 but only 35 in 1972. The Soviets continued to fish primarily hake in 1972. However, during the week of October 25, both the F.P.C. Tanu and the R/V G. B. Reed reported that Soviet trawl fleet of up to ten vessels were fishing on herring stocks sourtherly of the Agreement Area. At a meeting held in Tasu Sound between the Soviet Fleet Commander and the Canadian Regional Director of Fisheries, the Canadian government was

advised that the Soviets had taken no more than 300 tons of herring during the two week period beginning October 25.

There was no change in the Japanese fishing pattern off the coast of British Columbia in 1972. Small numbers of vessels (about 3 longliners and 4 trawlers) worked along the coast throughout the year. The longliners fished primarily for blackcod off the west coast of the Queen Charlotte Islands off Queen Charlotte Sound, and off the upper west coast of Vancouver Island.

1. United States

a. Soviet Commercial Fishery

1.) Gulf of Alaska (October 1971-September 1972). The Soviets again trawled for Pacific ocean perch from Yakutat westward along the Aleutian Islands. In October-November there were 14-16 trawlers fishing the central and eastern Gulf of Alaska. The fleet size increased during April and peaked at 25 vessels in mid-May; a substantial increase in effort over the same period in 1971. Six to 12 vessels fished from June through September, mainly on Portlock and Albatross banks off Kodiak. On the basis of past catch and effort information, it was estimated that from October 1971 through September 1972, 75,000 metric tons of perch were taken in the central and eastern Gulf of Alaska.

Four Soviet trawlers fished along the Aleutian Islands in the western Gulf of Alaska in October-November, 1971. The fishery terminated in mid-December. Three trawlers resumed fishing in mid-April, 1972. Through most of May-August the fleet consisted of 5-6 trawlers. Fleet size decreased in late August and the fishery was terminated in September. It is estimated that Soviet catch along the Aleutian Islands was about 20,000 m.t. of perch. There was no Soviet shrimp fishery in October-December, 1971.

The 1972 fishery began in mid-January, about two weeks later than in 1971. Fishing was mainly east of the Shumagin Islands and in the Kodiak area. The initial fleet consisted of eight trawlers, but increased to 16 vessels from February-April. It is estimated the Soviets took about 3,000 m.t. of shrimp in this area in 1972.

2.) Washington-Oregon. (July 1972-June 1973). The pattern of Soviet hake fishing off Oregon and Washington remains much the same. In 1972, the fleet reached a maximum size in July when 39 BMRT factory stern trawlers, were observed. Fleet size decreased through October and in late November the fishery terminated. Observations suggest that the catch in 1972 was about what it was in 1971, roughly 150,000 m.t.

In 1973, Soviet trawlers first appeared in early May. During May 38 stern trawlers and 19 side trawlers operated in the area. Side trawlers have not been so prominent since 1966-67. During early June, however, the majority of the side trawlers left, and by mid-June there were about 45 stern trawlers and support vessels.

3.) California. (January-June, 1973). Soviet fishing vessels were sighted off California during late April. The fleet varied from 10 to 16 trawlers. In early May the fleet moved northward to Oregon.

b. Japanese Commercial Fisheries (Northeast Pacific, January-July, 1972). As in 1971, 42 trawlers and 22 longline-gillnetters were licensed to fish in the northeast Pacific. Preliminary data indicates that the total catch east of 170°W longitude was 78,870 metric tons which constitutes an increase of 19,528 m.t. from the catch made during the same period in 1971.

The species composition and areal distribution of the catches in the same period of 1971 and 1972 were very similar. Forty-six percent of the total catch was Pacific Ocean perch, 24% was blackcod, 17% was pollock and other species amounted to 12%. Shrimp were not caught.

Twenty-two percent of the total catch was taken from the INPFC Kodiak area, 22% from the Yakutat area, 20% from the Shumagin area, 19% from the Southeastern area, and 17% from other areas.

As in 1971, little Japanese fishing occurred off Washington and Oregon during 1972. A single stern trawler was present during the summer while five were sighted in the fall. One longliner appeared throughout the year and a saury research vessel scouted for saury during August and September.

B. Recent Developments in Fishery Agreements

1. International North Pacific Fisheries Commission - Sub-Committee on the Northeast Pacific Groundfish (Oct., 1972).

On the basis of rather limited data (mainly Japanese catch/effort data) the Sub-Committee generally agreed that Pacific ocean perch stocks in the Chirikof, Kodiak, Southeastern and Charlotte areas are at moderate levels of abundance. Perch stocks in Shumagin, Vancouver and Columbia areas are at low levels of abundance.

The U.S. recommended perch catch ceilings in the Vancouver (2,000 m.t.) and Columbia (1,500 m.t.) areas, but the Sub-Committee failed to reach agreement on the validity of computational procedures or values used therein.

Effects of current levels of exploitation on sablefish are uncertain, but the Sub-Committee noted that CPUE for the Japanese longline fishery in 1971 was down 12% from 1970 CPUE, for all areas combined. Decline in CPUE was noted in all areas. Sub-Committee recommended that the reaction of sablefish stocks to current and future levels of exploitation should be closely monitored.

Proposals for future analyses and recommendations to B&R Committee were to:

(a) monitor incidental catches of halibut by Japan,

(b) resolve Pacific Ocean perch age determination discrepancies among U. S., Canada, and Japan,

(c) conduct studies on recruitment, growth mortality and stock interrelationships for Gulf of Alaska Pacific ocean perch,

(d) improve collection of Pacific ocean perch age and length data from commercial catches and identification of such data by depth. Obtain USSR catch-effort statistics for Gulf of Alaska Pacific Ocean perch fishery, and that

(e) member nations should intensify sablefish research to gather data on age and size composition, growth and mortality rates, recruitment, and stock interrelationships.

2. U.S.-Japan Bilateral Agreement

In November 1972, the 1970 agreement with respect to certain fisheries off the coast of the Unites States, was renegotiated and extended for a period of two years.

There were several changes in loading zones available to Japanese fishing vessels in the Bering Sea and Aleutian Islands.

Japanese trawling within the U. S. contiguous fishery zone in the Aleutian Area was eliminated in some instances and their fishing seasons shortened in other instances.

There were adjustments in dates of closure to Japanese trawling in six areas around Kodiak Island used by U. S. crab fishermen and on halibut grounds fished by U. S. fishermen in the Bering Sea and Gulf of Alaska.

The Japanese harvest of Pacific Ocean perch in the northeast Pacific Ocean will not exceed 60,000 m.t. with special limitations to be placed on Japanese catch of this species in areas designated as "Vancouver" and "Columbia" in the INPFC statistical reporting system.

It was agreed that Japanese catch and effort for sablefish in the northeastern Pacific Ocean and pollock in the eastern Bering Sea will not exceed the 1971 levels.

Finally, there are provisions for improving enforcement and the reduction of pollutant discharge at sea.

3. US-USSR Bilateral Scientific Meeting (Moscow, Dec., 1972)

Soviet hydroacoustical surveys conducted in summer, 1971, off Washington, Oregon, and California suggest a substantial decrease in standing stock of Pacific hake. US and Soviet scientists agreed that the present relatively small size of the stock is due to an accumulation of small and medium size year classes. Analysis of age composition data by the US suggests that the 1970 year class may be unusually large and may contribute substantially to the exploitable population within 2-3 years. It was recommended that the hake fishery be closely monitored.

The Soviet hydroacoustic surveys in summer 1971 between 43° and 49°N. outside of 20 miles indicated about 150,000 tons of rockfish, about what was observed in 1970. It was agreed that Pacific Ocean perch stocks off Washington, Oregon, and parts of the Gulf of Alaska are in a depressed state and require continued control of the fishery. Other shelf rockfish species (Sebastes flavidus, S. jordani, S. entomelas) are regarded in satisfactory condition. Between 37°-52°N S. flavidus stocks were estimated at 19,600 m.t. in 1970 and 22,700 m.t. in 1971.

It was the view of Soviet scientists that the pollock stock in the eastern Bering Sea, 1970-71, was 4.5-5.0 million m.t., which should allow an annual catch of about 1.5-1.8 million m.t.; roughly what is currently harvested. The intensive fishery and the fact that 2-3 year classes comprise the exploited population led to the recommendation that the countries utilizing the resource, closely observe the fishery and if necessary establish proper controls.

Although there is no strong evidence that sablefish stocks off California, Oregon, Washington, and British Columbia have been over-exploited, both sides agreed that the status of these populations should be carefully monitored and again called for coordinated effort in the management of the resource.

The Soviets believe the eastern Bering Sea stock of yellowfin sole can produce 200,000 m.t. annually. The catch peaked in 1961, at 600,000 m.t. then declined steadily and the stock is now in a depressed state.

It was agreed that the US and USSR would:

(a) continue cooperative hake egg, larva and adult surveys,

(b) conduct joint studies to resolve Pacific ocean perch age determination discrepancies, and

(c) conduct cooperative studies of biology, distribution and abundance of shrimp stocks in the Gulf of Alaska.

4. Canada-USSR Bilateral Scientific Meeting (Moscow, December, 1972).

Essentially, the same material was discussed at the Canada-USSR scientific meeting as that discussed at the US-USSR scientific meeting. Mr. Forrester noted one inconsistency in that while the Soviets reported to the U. S. that their survey of 1971 revealed 22,700 m.t. of S. flavidus

between 37°-52°N latitudes, they used a figure of about 220,000 m.t. in discussions with Canada.

5. US-USSR Bilateral Agreement (Feb. 1973)

Primary aspects of the new agreement are:

(a) Some changes in fishing and loading zones in the Bering Sea and northeast Pacific,

(b) The USSR agreed to restrict it's catch of flatfish, including yellowfin sole, in the eastern Bering Sea to 100,000 m.t. during 1973-74,

(c) The USSR will limit its catch of Pacific hake to the 1971 level (150,000 m.t.),

(d) The USSR will not conduct a special fishery for rockfish south of 50°30'N. The boundary was formerly 48°10'N. latitude,

(e) The USSR will not conduct a specialized fishery for for flounders and soles south of 48°10'N. latitude,

(f) representatives of the fishing fleets of US and USSR will meet at least twice each season in the Alaska and California-Washington-Oregon areas for exchange of information, discussion of actual or potential problems and to consider matters relating to the operation of the fleets,

(g) The USSR will review U.S. proposal for improvement of USSR fishery statistics for exchange at scientific meetings,

(h) The U.S. west coast ports of Portland, Seattle, and Honolulu will accommodate Soviet fishing, fishery support and fishery research vessels, and

(i) two Fishery Claims Boards; one in Washington, D.C. and one in Moscow were established to consider and settle claims arising from conflicts resulting from fishing operations.

6. Canada-USSR Bilateral Agreement

1972 was the final year of a two-year agreement between Canada and the Soviet Union, signed in Moscow, January 22, pertaining to fisheries in the northeastern Pacific Ocean. The new agreement which extended the original agreement, came into effect February 19, 1973. Two additional provisions to the original agreement were agreed to: (a) that scientists assess the condition of stocks involved in the fishing operations of the two countries off British Columbia and, on the basis of this evidence, make joint recommendations to the two governments to insure the conservation of the stocks, and (b) that Canada will permit Soviet scientific research vessels, engaged in cooperative investigations, to use the facilities of ports at Prince Rupert, Vancouver and Nanaimo, B. C.

In addition, understandings were reached in which the Soviet authorities would provide more detailed statistics of their fishing operations in the British Columbia area, particularly with regard to their catches of blackcod, herring and halibut, including incidental catches. The Soviet authorities also undertook to cooperate with Canada in measures to permit the depleted stocks of Pacific herring to recover.

7. U.S.-Canada Reciprocal Fishing Agreement

No new formal agreement was yet available, but apparently the 1970 agreement has been extended for a period of one year. The provisions for reciprocal groundfish fisheries remain essentially unchanged, except that limited fisheries for sablefish in the reciprocal areas of both countries were accommodated in the new agreement.

XI. RECOMMENDATIONS FOR COOPERATIVE PROGRAMS

A. Pacific Ocean Perch Management Program

Mr. DiDonato reviewed the "immediate" and "long term" needs of the management program (p. 27, 1972, Report of the Technical Sub-Committee) and emphasized the importance of follow through by the perch management program working group. The sub-committee agreed that certain "immediate" needs had been satisfied (i.e., catch ceilings), but the working group must persevere in further refinement of the program.

Mr. Gunderson was elected Chairman of the Working Group. A specific recommendation was submitted under agenda Item XIV of this report.

B. Sablefish Tagging Program

Mr. Dark initiated discussion of the need for inter-agency cooperation in a comprehensive sablefish tagging program. He emphasized that sablefish resources in the Bering Sea and northeast Pacific Ocean are under multi-nation exploitation which was a matter of concern at recent INPFC and US-USSR scientific meetings.

While budgetary constraints precluded a comprehensive research program, NMFS mounted a limited tagging program in 1971, for the purpose of: (1) defining stock units, (2) determining migration rates and patterns, and (3) determining growth rates. Some measure of cooperation has existed among NMFS, the California Department of Fish and Game and TINRO of the USSR and to date, 1,560 juveniles and 21,087 adults have been tagged. It was the judgment of NMFS that the current program could be enhanced by a more comprehensive and coordinated cooperative effort and the following program was proposed:

1. Review of agency current and future research priorities, capabilities vis a vis objectives and needs of sablefish tagging study and development of an operational plan outlining such things as release sites, release seasons, release numbers (juvenile and adult), recovery systems, and publicity.

2. Participating agencies, when operationally and financially feasible, would initiate programs specifically for the tagging of sablefish in accordance with agreed upon operational plan. In lieu of such programs, agencies would be prepared to tag sablefish taken incidentally during field studies of a higher priority.

3. When operationally and financially feasible, NMFS would provide tags, application equipment, data forms and participating scientists.

4. NMFS would act as a depository for release and recovery information generated by the program and would compile such information to be included in regular (semi-annual) progress reports to all participants.

5. Periodic review of progress by participating agencies, analysis of results and at the appripriate time, joint reporting of findings.

Messrs. Meehan and DiDonato stated that it was not presently feasible for their agencies to initiate specific sablefish tagging programs, but they could conceiveably assist as tagging opportunities arise while engaged in other research activity. Mr. Forrester commented that Canada plans to continue as opportunity permits, sablefish tagging studies initiated independently several years ago.

A recommendation regarding the NMFS proposal was formulated and presented under agenda Item XIV of this report.

C. Management of Pacific Cod in PMFC Area 3C

Mr. Forrester presented preliminary data which suggests that spawning aggregations of Pacific cod in Area 3C are subject to very high levels of fishing mortality during January-March. He observed that the major spawning grounds occur within the Canadian contiguous fishery zone and therefore are subject to Canadian management, but was seeking U.S. assistance in further evaluation of the situation and in evolution of a management scheme.

A specific recommendation was made under agenda item XIV of this report.

D. Discard of Undesireable Species and Sizes at Sea

Mr. Demory outlined the prcblems of estimating the magnitude and character of the discard of undesireable or undersized fish at sea by commercial trawlers, evaluating the impact on the resource and defining management implications. Mr. Meehan suggested a cooperative program designed to determine the species composition, age composition and length frequency of the discarded portions of trawl catches.

The sub-committee agreed on the seriousness of the problem and importance of obtaining information on the nature of discards, but was of the opinion that most agencies are without adequate resources for generating the necessary studies.

Agencies will explore the problems associated with discards as allowed within current research priority structures, but no specific recommendation was made.

E. Research Needs and Priorities

Consideration of the previous item stimulated discussion of the matter of research priorities. The sub-committee noted the recent increased utilization of groundfish species and the increasing difficulties of adequately monitoring not only traditional commercial fisheries, but also developing fisheries with current levels of staff and funding.

The need for clearly identifying research priorities in order to assure effective allocation of rather scarce research resources was obvious to the sub-committee. Dr. Harville commented that in spite of present low funding levels, the sub-committee should freely recommend action programs of high priority, because there exists several sources of financial assistance for research of demonstrated need.

A specific recommendation was submitted under Agenda Item XIV. of this report.

XII. GROUNDFISH REGULATIONS

A. Recent changes in trawl regulations

1. Canada

Canada reported that the minimum size limit on sablefish, temporarily waived in 1972, has been reinstated. However, sub-legal sablefish may be harvested by special permit.

2. United States

a. Washington. The minimum size limit on sablefish was recinded in April, 1973. No other changes were reported.

b. Oregon. Oregon reported no changes in trawl regulations.

c. California. Legislation passed in 1972, created the following trawl regulations which were effective in March, 1973:

1.) The regulation that permits trawling between Point Lobos and Point Sur (Area 1B) in waters not less than one mile from the mainland shore was extended indefinitely.

2.) Within the California halibut trawl grounds from Point Arguello to Point Mugu (Area 1A) adjacent to the mainland shore not less than one mile and not more than 25 fathoms deep, open season shall be June 16 through March 14, for California halibut (a change from June 1 through January 1).

3.) It is unlawful to use trawl nets with codend mesh less than $7\frac{1}{2}$ inches in waters less than 25 fathoms deep adjacent to the mainland shore, between Point Arguello and Point Mugu.

4.) Between Point Arguello and Point Mugu (Area 1A) trawl nets with not less than $4\frac{1}{2}$ inch mesh may be used in waters not less than 25 fathoms deep but in no case in waters less than one mile from the mainland shore.

B. Effectiveness of Regulations

The sub-committee agreed that the full impact and effectiveness of regulations can only be evaluated after years of observation and considerably more analysis than has been possible. There was little discussion of the ramifications of specific regulations, but Mr. DiDonato observed that since the minimum size limit on sablefish was recinded in April, 1973, there has been no noticeable change in the size composition of sablefish landings.

C. Non-trawl Groundfish Regulations

1. Canada

No changes were reported in non-trawl groundfish regulations.

2. United States

a. Washington. With the exception of the rescinded minimum size limit on sablefish, no changes in non-trawl groundfish regulations were reported.

b. Oregon. No changes in non-trawl groundfish regulations were reported.

c. California. A summary of California's non-trawl groundfish regulations appears in Appendix B.

XIII. OTHER BUSINESS

A. Landing Weights as Reported by Buyers

Mr. Meehan commented that it has recently come to his attention that it is common practice among Oregon fish buyers to deduct 5% of the weight of groundfish landings for ice and slime. He emphasized the potential for bias in landed weights among States and Canada if all landings are not subject to similar deductions. Mr. Gunderson recalled that some Washington state buyers deduct 3% for slime and ice from landings that are predominantly Dover sole. No specific action was taken.

B. Exchange of Ex-vessel Price Lists

Mr. Gunderson stated that ex-vessel price lists from the states and Canada would be of interest and inquired about the feasibility of an exchange. Mr. Humphries noted that ex-vessel prices in Canada change throughout a year, but that annual mean prices might be exchanged. No specific action was taken.

XIV. RECOMMENDATIONS

A. Future Work

1. Pacific Ocean perch management program.

The technical sub-committee recommends that the perch working group pursue the management program outlined on pp. 27, of the 1972 Report

of the Technical Sub-Committee and that the working group convene by mid-September, 1973, to update the report, On the Status of Pacific ocean perch (Sebastes alutus) stocks off British Columbia, Washington, and Oregon in 1970. The updated version should be available prior to the 1974 Technical Sub-Committee Meeting. It was also recommended that the working group evaluate financial and personnel resources available for program implementation and advise the sub-committee if additional resources are required to insure program effectiveness.

2. Cooperative Sablefish Tagging Program

The Technical Sub-Committee recommends that the proposal for cooperative sablefish tagging be accepted as submitted by NMFS, but without specific agency committment for special sablefish tagging studies.

3. Management of Pacific Cod in PMFC Area 3C

The Technical Sub-Committee recommends that a working group consisting of scientists from the State of Washington and Canada (chaired by Mr. Forrester) attempt to determine rates of exploitation of spawning stocks of Pacific cod in Area 3C, and if conservation measures are considered necessary, to make such recommendations to the parent committee at the earliest opportunity and, at the latest, by the time of the Parent Committee meeting in November, 1973.

4. Research Needs and Priorities

The Technical Sub-Committee recommends that each agency provide a representative to form a working group (to be chaired by Mr. Humphreys) to identify species and areas of concern in addition to those presently under consideration, assign research priorities, and transmit such information to the Parent Committee at the earliest opportunity.

5. Other Rockfish. The Technical Sub-Committee recommends that each agency continues to develop special reports on the "other rockfish" fisheries for presentation at the 1974 meeting of the Technical Sub-Committee.

6. Lingcod. The Technical Sub-Committee recommends that the Lingcod Working Group continue to summarize all data available on lingcod stocks for presentation at the 1974 meeting of the Technical Sub-Committee.

B. Parent Committee

1. Additional funding

The Technical Sub-Committee recommends that the Parent Committee investigate means of obtaining additional funding for groundfish research demonstrated to be of high priority.

2. Additional meetings of the Parent Committee

The Technical Sub-Committee recognizes that the timing of the Parent Committee's annual meeting is such that important actions with respect to groundfish problems may not be completed in time to serve in the formulation of U.S. and Canadian policy or position presented at international fishery meetings. Therefore, the Technical Sub-Committee recommends that the Parent Committee explore means of convening additional meetings with Technical Sub-Committee members and advisors, when deemed necessary.

XV. SCHEDULE OF MEETINGS

A. International Groundfish Committee

The I.G.C. meeting will be held on November 13, 1973, at the Rodeway Inn in Boise, Idaho in conjunction with the annual Pacific Marine Fisheries Commission meeting. It was recommended that the Chairman of the

Technical Sub-Committee convene the Sub-Committee at 8 o'clock a.m. on the day of the Parent Committee annual meeting, if deemed necessary, to discuss reports and findings of working groups.

B. Technical Sub-Committee

The fifteenth annual meeting of the Technical Sub-Committee is scheduled for late June, 1974, in San Francisco, California. The exact dates will be announced at a later time.

XVI. ELECTION OF CHAIRMAN FOR 1974

The Sub-Committee re-elected R. D. Humphreys, Canada, as Chairman for 1974.

XVII. ADJOURNMENT

The meeting was adjourned at 11.15 a.m. on June 22, 1973.

AGENDA AS ADOPTED

TECHNICAL SUB-COMMITTEE OF THE

INTERNATIONAL GROUNDFISH COMMITTEE

SEATTLE, WASHINGTON, JUNE 20-22, 1973

14th ANNUAL MEETING

I. CALL TO ORDER

II. APPOINTMENT OF SECRETARY

III. APPROVAL OF AGENDA

IV. STATUS OF THE STOCKS

1. Petrale (CDF&G)
2. Lingcod (CDE)
3. Pacific cod (CDE)
4. Pacific Ocean perch (WDF)
5. Other rockfish (WDF)
6. English sole (CDF&G)
7. Dover sole (FCO)

V. REVIEW OF THE FISHERY (CHAIRMAN)

VI. REVIEW OF DATA EXCHANGE PROCEDURES

VII. REVIEW OF AGENCY PROGRESS

1. Current and proposed research
2. Reports completed or in progress

VIII. 1972 RECOMMENDATIONS OF THE TECHNICAL SUB-COMMITTEE

IX. 1972 RECOMMENDATIONS OF THE INTERNATIONAL GROUNDFISH COMMITTEE

X. INTERNATIONAL MATTERS

1. Status of foreign trawl fisheries off the west coast of Canada and the United States
2. Recent developments in fisheries agreements

XI. RECOMMENDATIONS FOR COOPERATIVE PROGRAMS

XII. GROUNDFISH REGULATIONS

1. Recent changes in trawl regulations
2. Effectiveness of regulations
3. Non-trawl groundfish regulations

XIII. OTHER BUSINESS

XIV. RECOMMENDATIONS

1. Future work
2. Parent committee

XV. SCHEDULE OF MEETINGS

1. International Groundfish Committee Meeting
2. Fifteenth Annual Meeting of Technical Sub-Committee

XVI. ELECTION OF CHAIRMAN FOR 1974

XVII. ADJOURNMENT

California Groundfish Regulations

Miscellaneous Gear

Gill Nets

It is unlawful to take salmon in gill nets.

Drift gill nets may be used between the Oregon-California border and the San Mateo-Santa Cruz County border (approximately at Ano Nuevo 37°N lat, PMFC areas 1C and part of 1B).

Set gill nets may be used between Point Reyes and the San Mateo-Santa Cruz County border (Area 1B).

In that part of Monterey Bay lying north and west of a line drawn from the light on the end of the Monterey Breakwater due east to the shoreline, drift and set gill nets may be used except to the rockfish or lingcod; however, loads or lots of fish taken in these areas may contain 200 pounds or less of rockfish and lingcod, in combination, but never more than 100 pounds of rockfish.

From San Mateo-Santa Cruz County border south to California-Mexico border (Areas 1B and 1A) drift and set gill nets may be used except in Santa Monica Bay, Los Angeles Harbor area, and the north, east, and south sides of Santa Catalina Island, and except for the taking of rockfish and lingcod between a line running due west magnetic from the south steamplant stack at Moss Landings (36°48'N lat)and a line running due west magnetic from the Point Pinos lighthouse in waters between 40 and 60 fathoms from sunset Thursday to sunset Sunday and except between a line running due west magnetic from the south steamplant stack at Moss Landing and a line due west from Hurricane Point (36°21.5'N lat) in waters less than 40 fathoms except that loads or lots of fish taken in these areas may contain 200 pounds or

less of rockfish and lingcod, in combination, but never more than 100 pounds of rockfish.

Trammel Nets

Trammel nets includes entangling nets constructed of more than one wall of mesh. Trammel nets may not be used for salmon. Between the Mendocino-Sonoma County line (38°46'N lat) and the California-Mexico border, trammel nets with at least 8-inch mesh may be used. They cannot be used between Yankee Point, Monterey County and the Santa Barbara-Ventura County line within 1 mile of a pier or jetty nor can they be used or possessed in Santa Monica Bay.

Traps

Traps may be used for taking groundfish under permit from the Fish and Game Commission.

DISTRIBUTION OF THE REPORT

OF THE TECHNICAL SUB-COMMITTEE

Technical Sub-Committee		total
California	T. Jow (2)	2
Oregon	J. Meehan, J. Robinson, B. Demory	3
Washington	G. DiDonato, D. Gunderson	2
Alaska	J. McMullen	1
NMFS	T. Dark	1
Canada	C. Forrester, R. Humphreys	2
International Groundfish Committee		
Canada	R. McIndoe (4, 2 for Ottawa)	4
U. S.	J. Harville (4, 2 for U. S. Government)	4
Advisors and others		
Canada	K. Ketchen (3, 2 for Ottawa) W. Hourston, S. Westrheim	5
U. S.	G. Arnett (2), D. Gates - California	3
	T. Kruse, W. Hublou - Oregon	2
	T. Tollefson (2), D. Kauffman - Washington	3
	D. Johnson, D. Alverson - NMFS	2
IPHC	S. Hoag	1
Spare		4
		39