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

Fifteenth Annual Meeting
June 19-21, 1974
Millbrae, California, U.S.A.

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DATE: June 19-21, 1974

PLACE: Millbrae, California

PARTICIPANTS:

CANADA

Fisheries and Marine Service Department of the Environment	C. R. Forrester, Chairman R. J. Beamish R. G. McIndoe (observer)

UNITED STATES

California Department of Fish & Game	T. Jow J. L. Baxter (observer) J. E. Hardwick (observer) R. J. Nitsos (observer) L. F. Quirollo (observer) D. H. Thomas (observer)
Fish Commission of Oregon	J. M. Meehan
Washington Department of Fisheries	G. S. DiDonato D. R. Gunderson
Alaska Department of Fish & Game	J. Lechner
National Marine Fisheries Service	T. A. Dark
Pacific Marine Fisheries Commission	J. P. Harville
International Pacific Halibut Commission	S. H. Hoag (observer)

I. CALL TO ORDER

The fifteenth annual meeting of the Technical Sub-Committee was called to order at 9:00 AM on June 19 by Chairman C. R. Forrester under instructions set forth by the Parent Committee in 1959. The business of the meeting was guided according to a prepared agenda (Appendix A).

II. APPOINTMENT OF SECRETARY

Tom Jow of California (U.S.A.) was appointed to act as recording secretary for the meeting.

III. APPROVAL OF AGENDA

The agenda circulated by Chairman C. R. Forrester prior to the meeting was approved.

IV. STATUS OF STOCKS

As status reports of California and Washington were circulated to other agencies at the onset of the meeting, Chairman Forrester called a recess until 10:30 AM so that species status reports assigned to TSC members could be compiled.

A. DOVER SOLE

Pacific coast dover sole landings in 1973 totalled 30.0 million lb, down 5% from the 31.6 million lb landed in 1972 but 52% above the mean for the past 10 years (1963-1972) of 19.7 million lb.

1. Canada 6%

Dover sole landings in 1973 were 1.8 million lb, 25% less than in 1972 but 57% above the 10-year mean. Dover sole catch per unit of effort (CPUE) based on vessel catches and landings in Area 5D was above the mean of the past 3 years and no changes occurred in the size distributions during the period of a purposeful fishery. These factors suggest that the stock is in good condition.

2. United States

a. Washington 4%

Trawl landings of dover sole in 1973 were 1.1 million lb, down slightly from the 1.2 million lb landed in 1972. Sixty-four percent of the total landings were from Areas 5B and 3B; CPUE increased slightly in 1973.

b. Oregon 15 %

Landings in 1973 of 4.4 million lb were down 25.7% from the 5.9 million lb of 1972. A 13.3% decrease in CPUE and the 25.7% decline in landings suggest a substantial decrease in the exploitable biomass of dover sole off Oregon (north of Cape Blanco) and southern Washington. This apparent reduction in biomass is due to three main factors: 1) the passage of the strong 1961 year-class out of the fishery; 2) the removal of older fish from a virgin stock off Coos Bay; and 3) unknown effects of catches by foreign fleets.

c. California 75 %

Landings in 1973 of 22.5 million lb were the highest on record. They exceeded the 1972 landings of 22.1 million lb by 2% and the 10-year mean of 12 million lb by 87%. Area 1B landings were 10.2 million lb and Area 1C landings were 8.9 million lb. CPUE values were up slightly in these areas.

B. ENGLISH SOLE

Canadian and U.S. English sole landings in 1973 were 9.9 million lb, a 14% increase over the 8.1 million lb landed in 1972. This landing, however, remained 9.2% below the 10-year average catch of 10.9 million lb. Catches exceeded 1 million lb in Areas 1B, 1C, 4A, and 5D in 1973.

1. Canada

Canadian landings of 1.6 million lb were 50% greater than those of 1972. The bulk of the landings (72%) were taken from grounds in northern Hecate Strait (Area 5D). CPUE for 1973 was 905 lb/hr, an increase of 71% over 1972.

2. United States

a. Washington

Washington English sole landings continued to increase during 1973. The total landing was 2.7 million lb, a 66% increase over the 10-year mean and

125% over the 1972 landing. Most of the increase occurred from "inside" foodfish landings (1.6 million lb) in Area 4A. Landings from offshore coastal areas were 1.1 million lb, the same level as in 1972. The northern Washington coast (Area 3B) provided 75% of the offshore landings.

b. Oregon

English sole landings in 1973 were 2.4 million lb, up 8% over 1972 and 13% above the 10-year mean. CPUE for Areas 2B-3A were 240 lb/hr in 1973, 15.2% below that of 283 lb/hr of 1972. Areas 2B-3A were the major English sole catch areas with landings of over a half million lb.

c. California

In 1973, English sole landings were 3.2 million lb, an increase of 7% over the 1972 landing of 3 million lb. This catch remained 26% below the 10-year mean of 4.3 million lb. Slight catch increases occurred in all areas off California.

C. PETRALE SOLE

The Canadian and United States petrale sole landings in 1973 were 8.3 million lb, a decrease of 6% from the 1972 catch of 8.8 million lb. This catch was 4% above the 10-year mean of 8 million lb. Catches exceeded 1 million lb in Areas 1B, 3A, and 3C.

1. Canada

Catch/Effort

i) Southern stock. The 1973 Canadian catch from the stock off the southwest coast of Vancouver Island was 868,000 lb, a 15% decrease from 1972 but still more than twice the 10-year mean. Average CPUE by double-gear vessels from May-August was 303 lb/hr, a 27% increase over that of 1972. Petrale sole of the 1966 and

1967 year-classes, recruited to the fishery in 1971, continued to dominate in the fishery.

ii) Northern stock. Canadian landings from the northern stock (Areas 3D, 5A-5D) were 174,000 lb, 25% lower than the previous year and less than one-third of the 10-year mean. The most recent CPUE of 1972 was 52 lb/hr which was equal to that of 1971 and one-half that of the 10-year 1963-72 period. Petrale sole from the northern stock continue to be an incidental species.

Winter Fishery

No distinct winter fishery by Canadian vessels occurred in 1973-74. Winter catches were less than 5,000 lb.

2. United States

a. Washington

The Washington trawl catch of petrale sole in 1973 was 2.2 million lb, a 29% increase from 1972 and 16% above the 10-year mean of 1.9 million lb.

Catch/Effort

i) Southern stock. Washington landings from "southern stock" (Areas 3A, 3B, and 3C) were 1.4 million lb in 1973. A slight increase occurred over 1972 landings and a 33% increase occurred over the 10-year mean catch. Substantial increases in CPUE reflect improved abundance and/or availability of petrale sole from southern stocks, especially in Area 3A.

Market sampling data indicate a decline in mean lengths in 1971 and 1972. Age data suggest this size decline may be due to the predominance of the 1966-1968 year-classes during these years.

Increased mean lengths in 1973 may indicate that no strong year-classes followed the 1968 year-class.

ii) Northern stock. Washington landings of petrale from northern stocks were 776,000 lb in 1973. This represents a substantial increase (164%) over that of 1972 and is only slightly below the 10-year mean. Catches from Areas 3D and 5A accounted for the majority of the current increase. CPUE for Areas 3D and 5A was up 241% and 74%, respectively.

Winter Fishery

The 1973-74 winter spawning ground fishery produced 580,000 lb[1], a 22% decrease from the 1972-73 fishery, although still 5% above the mean production of the past 10 years. Decreases of 29% and 14%, respectively, occurred in production from the Cape Flattery Spit Deep and the Estevan Deep. CPUE was up 8.8% and 17.4%, respectively, for the two deeps. Effort in the Cape Flattery Deep this past season was the lowest in 11 years.

b. Oregon

The 1973 landings of 2.2 million lb equalled those of 1972 and were 8.5% above the 10-year mean. CPUE for Areas 2B-3A was 344 lb/hr, 29.3% above the 1972 level of 266 lb/hr.

c. California

Catch/Effort

California petrale sole landings in 1973 were 2.9 million lb, a 20% decline from 1972 landings of 3.6 million lb and 7% lower than the 10-year mean of 3.1 million lb. Catch declines occurred in all PMFC areas fished; Area 1B was the most productive area where 1.6 million lb of petrale were caught.

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[1] Preliminary estimate based on landed weights of interviewed fishermen.

Winter Fishery

The November 1972-January 1973 winter fishery totalled 693,000 lb, the lowest winter fishery in the past 5 years. The estimated 1973-74 winter fishery catch was 1.3 million lb, a significant increase above that of the previous season.

D. PACIFIC COD

Canadian and United States landings of Pacific cod in 1973 were 24.6 million lb, down 16% from landings in 1972 but slightly above the mean for 1963-72. The landings reflected a decrease in strength of year-classes entering the fishery.

1. Canada

Pacific cod continued to be the dominant species in Canadian trawl landings. Total landings of 16.5 million lb in 1973 were 13% lower than in 1972 but still represented 43% of total trawl landings. The bulk of the landings came from grounds off southwest Vancouver Island and in Hecate Strait. Landings for Area 3C were 5.4 million lb, or just over half the level taken in 1972. Landings from Areas 5C and 5D at 8.8 million lb were about 30% higher than in 1972 and more than 2.5 times the 1971 level.

2. United States

a. Washington

Washington trawl landings of Pacific cod totalled 7.7 million lb in 1973. This was a decline of 17% from 1972 levels but 15% above the mean for the previous 10 years.

b. Oregon

Oregon landings of Pacific cod in 1973 at 0.5 million lb were less than half the level of 1972 and reflected a general decrease in strengths of year-classes and abundance in this fringe-area of Pacific cod distribution.

E. LINGCOD

Trawl-caught Canadian and United States landings of lingcod totalled 9.5 million lb in 1973, about 23% higher than the 1972 landings of 7.7 million lb and slightly above the 10-year mean level. Trends continued downward in Washington, recovered slightly in Canada, and continued upwards in Oregon and California.

1. Canada

Total Canadian trawl landings of lingcod in 1973 at 2.7 million lb were up 16% from 1972 but still 25% below the mean for the preceding 10 years. Approximately 65% of the trawl catch was taken from Area 3C and landings of 1.7 million lb were 50% greater than in 1972 and 25% greater than the mean for 1963-72. CPUE of lingcod in Area 3C at 841 lb/hr was 36% greater than in 1972. Length-frequency distribution of landed catches suggests that recruitment was not a factor causing changes in catch and CPUE in Area 3C in 1973. In addition to Canada's trawl production of lingcod, a line fishery in various areas contributed to an almost equal amount of production.

2. United States

a. Washington

Total trawl-caught lingcod landings of 1.7 million lb in 1973 were 17% higher than in 1972 but 53% lower than the mean for 1963-72. Catch and CPUE of lingcod in Area 3C continued to decline (17% and 23%, respectively, from 1972 levels).

b. Oregon

Oregon landings of lingcod at 2.0 million lb in 1973 were 48% above 1972 levels and almost double the mean levels during 1963-72.

c. California

Trawl catches of lingcod at 3.1 million lb in 1973 were 19% above 1972 levels and almost 3 times the level of 1963-72 landings. Landings increased from all California areas with more than half the total landings coming from Area 1B.

F. SABLEFISH

Canadian and United States trawl landings of sablefish were 8.2 million lb, 16% greater than the 7.1 million lb landed in 1972 and 158% greater than the 10-year mean landings of 3.2 million lb. All agencies reported substantially greater landings in 1973 than in 1972. Only in Washington did landings fall below the 10-year mean. Over 90% of the 1973 landings was caught in Areas 1B, 1C, 2A, 3D, and 5E.

In addition to trawl landings, Canada and Oregon reported sablefish landings caught by other gear of 1.9 and 0.5 million lb, respectively.

1. Canada

Sablefish landings in 1973 were 2.1 million lb; 183,000 lb taken by trawling. While the 1973 trawl landings were 88% less than 1972 landings and 63% less than the 10-year mean, landings by other gear increased two-fold over recent years. Increased landings were the result of increased effort with trap gear which accounted for 1.6 million lb of the 1.9 million lb taken by gear other than trawl.

2. United States

a. Washington

Washington trawl landings of 94,000 lb of sablefish in 1973 were 55% below the 10-year mean but 11% higher than 1972 landings.

b. Oregon

Landings of sablefish by trawlers in 1973 of 838,000 lb were 108% greater than those of 1972 and 430% above the 10-year mean. Sablefish landed from other gear catches were 482,000 lb in 1973.

c. California

A record trawl landing of 7.1 million lb was made in 1973. This catch exceeds the previous record of 5.1 million lb in 1972 by 39% and exceeds the 10-year mean by more than 300%. Increases in catch occurred in all areas. Increased landings may be attributed to a continued high demand and increased effort.

G. PACIFIC OCEAN PERCH

Canadian and United States landings of Pacific ocean perch in 1973 were 9.5 million lb, a decline of 35% from 1972 landings of 14.5 million lb and also 52% down from the 10-year mean.

1. Canada

Landings by British Columbia trawlers in 1973 were 3.1 million lb, 40% less than in 1972. Ninety-seven percent of the catch was from Queen Charlotte Sound (Areas 5A and 5B). CPUE in 1973 was 2,767 lb/hr, an increase of 33% from 1972.

2. United States

a. Washington

The 1973 Pacific ocean perch catch was only 5.8 million lb, a decline of 53% from the 10-year mean and 34% from the 1972 catch. Declines in production and in CPUE from Areas 3B-3D occurred despite the hope that conservation measures and recruitment of a strong 1961 year-class might reduce the declining trend of previous years. Catch in this area was 32% below the 1972 catch and 77% below the 10-year mean.

The catch from Queen Charlotte Sound declined 33% from 1972 while CPUE increased 14%. Included in the reported catch of Pacific ocean perch from Queen Charlotte Sound were landings of "slope" rockfish of 667,000 lb which consisted of S. reedi, S. diploproa, S. aleutianus, and S. rubrivinctus.

b. Oregon

Landings of Pacific ocean perch were 540,000 lb, the lowest annual landing since 1948. The landings were 10% below the 1972 level and 98% below the 10-year mean. CPUE for Areas 2B-3A was 359 lb/hr in 1973 compared to 290 lb/hr in 1972.

c. California

In 1973 Pacific ocean perch landings increased to 125,000 lb. This catch was well above average but Pacific ocean perch is a minor species in California landings.

H. OTHER ROCKFISH

Canadian and United States landings of other rockfish were 36 million lb in 1973, up 15% from the 31.3 million lb of 1972 and 52% over the 10-year mean of 23.7 million lb.

1. Canada

Landings of other rockfish by Canadian trawlers decreased 20% to 2.7 million lb but were still 3 times the mean 1963-72 level. The bulk of the other rockfish catch was taken in Queen Charlotte Sound and consisted mainly of S. flavidus.

2. United States

a. Washington

Washington trawlers landed 11.6 million lb of other rockfish in 1973, up 8% over 1972 and 20% over the mean of 1963-72. The major areas of production were Queen Charlotte Sound and Cape Scott.

b. Oregon

Landings of other rockfish totalled 3.6 million lb, down 12% from 1972 and 16% below the 1963-72 mean. The southern Washington - northern Oregon coast (Area 3A) was the principal rockfish producing area for Oregon trawl fishermen.

c. California

Record high rockfish landings of 17.5 million lb occurred in 1973. This amount is 33% above 1972 and 100% above the 1963-72 mean. Bocaccio (S. paucispinis) and chilipepper (S. goodei) rockfish were the major species contributing to the catch with canary rockfish (S. pinniger) a distant third.

V. REVIEW OF THE FISHERY

The 1973 trawl landings from the northeastern Pacific by Canadian and United States vessels were 159.5 million lb (Table 1). This catch was an increase of 0.7 million lb (0.4%) over the 158.8 million lb landed in 1972 and 4% above the 10-year (1963-72) average of 152 million lb. Total effort was 166,113 hr; down 0.4% from 1972 and 4% greater than the mean effort for the previous 10 years. Overall CPUE in 1973 at 960 lb/hr was close to the mean for preceding years.

In addition to trawl landings of groundfish, Canada and United States total landings of groundfish by gear other than trawl were 20 million lb.

The leading species in the 1973 trawl fishery was dover sole. Contributing chiefly to total dover sole landings of 30.0 million lb was the continued high volume landed in California. The other rockfish species groups contributed landings of 36.0 million lb, up 15% from 1972 and 52% above the 1963-72 mean level of landings. Landings of Pacific ocean perch at 9.5 million lb were down sharply from the 1972 level of 14.5 million lb and the 1963-72 mean level of 20.0 million lb. Landings of Pacific ocean perch reported by all agencies

Table 1. Otter trawl landings (1000's of lb) from the northeastern Pacific by Canadian and United States vessels in 1972, 1973, and mean for 1963-72.

Species	1972					1973					Mean 1963-72
	B.C.	Wash.	Ore.	Calif.	Total	B.C.	Wash.	Ore.	Calif.	Total	
English sole	1,084	1,826	2,196	3,002	8,108	1,630	2,683	2,371	3,209	9,893	10,894
Rock sole	2,110	555	2	5	2,672	1,789	844	tr	8	2,641	5,504
Petrale sole	1,275	1,726	2,185	3,574	8,760	1,044	2,222	2,191	2,876	8,333	7,942
Dover sole	2,424	1,192	5,942	22,080	31,638	1,830	1,254	4,416	22,485	29,985	19,708
Rex sole	359	101	1,314	1,662	3,436	317	168	1,256	1,583	3,324	3,002
Starry flounder	457	780	439	599	2,275	136	836	339	638	1,949	1,942
Other flatfish	562	291	600	1,576	3,029	1,221	527	657	1,498	3,903	2,247
Pacific cod	19,013	9,304	1,069		29,386	16,453	7,740	453		24,646	22,189
Lingcod	2,288	1,482	1,349	2,618	7,737	2,655	1,736	1,999	3,111	9,501	9,398
Sablefish	1,517	85	403	5,067	7,072	183	94	838	7,058	8,173	3,181
Pacific ocean perch	5,130	8,685	602	94	14,511	3,082	5,756	540	125	9,503	19,977
Other rockfish	3,393	10,678	4,057	13,160	31,288	2,681	12,246	3,558	17,544	36,029	23,723
Misc. species	610	216	36	292	1,154	421	184	63	604	1,272	689
Dogfish	181		tr	2	183	4,332		tr	2	4,334	205
Animal food	1,131	1,076	730	370	3,307	655	1,061	603	323	2,642	12,546
Reduction	157	4,072			4,229	153	3,215			3,368	8,992
Total	41,691	42,069	20,924	54,101	158,785	38,582	40,566	19,284	61,064	159,496	152,796
Percent of total	26.2	26.5	13.2	34.1	100.0	24.2	25.4	12.1	38.3	100.0	
Total hours	27,958	39,600	29,206	69,988	166,752	23,699	37,431	28,243	76,740	166,113	159,076
Catch/effort (lb/hr)	1,491	1,062	716	773	952	1,445	1,084	683	796	960	961

decreased; the sharpest drop was evident in Washington landings which were 5.7 million lb in 1973 as compared to 8.7 million lb in 1972.

Pacific cod landings in 1973 of 24.6 million lb by Canadian and U.S. trawlers were down 16% from 1972 landings but were slightly above the 10-year mean.

British Columbia fishermen landed 49.9 million lb of groundfish (excluding halibut) in 1973, of which 38.6 million lb (77%) were trawl-caught. This was a decrease of 7% from 1972 but 4% greater than the 1963-72 mean. Total effort expended was 23,699 hr. Pacific cod continued to be the dominant species caught (16.5 million lb or 43% of the total landings). Total B.C. rockfish landings at 5.8 million lb while slightly below those of 1972 were 45% greater than the mean for 1963-72. Landings of trawl-caught dogfish, at 4.3 million lb increased greatly over previous years because of a subsidized fishery. For the same reason landings of dogfish taken with gear other than trawl also increased sharply in 1973 (6.7 million lb in 1973 as compared to 72,000 lb in 1972).

No substantive trawl fishery is carried out by Alaskan fishermen. A freezer-trawler operation in the Unalaska area got off to a slow start when the vessel developed mechanical problems and returned to Seattle for repairs. Some interest has been expressed by firms in groundfish in the Kodiak area. A sizeable sablefish fishery exists in southeastern Alaska. No 1973 data are yet available.

Washington trawlers landed 40.6 million lb of groundfish in 1973, a 4% decrease from 1972 and a 25% decrease from the 10-year mean. Foodfish landings were the same as in 1972 while reduction landings (for fish meal) were down 21%. Other rockfish, Pacific cod, and Pacific ocean perch comprised 69% of foodfish landings. Pacific ocean perch landings declined sharply to 5.8 million lb and were 2.9 million lb (34%) below 1972 landings. Trawl effort totalled 37,431 hr, 5% below 1972 effort and 22% less than the 10-year mean effort. Queen Charlotte

Sound was the major area of production for Washington trawlers. Of the total effort, 36% occurred in Puget Sound (PMFC Area 4A).

Oregon landings of groundfish in 1973 totalled 21.7 million lb, of which 19.3 million lb (89%) were trawl-caught. The trawl catch declined 8% from that of 1972 and was 21% below the 1963-72 mean. Flatfish were the most important food species group (11.2 million lb) and the most important of these was dover sole (4.4 million lb). Estimated total fishing effort expended by the Oregon trawl fleet in 1973 was 28,243 hr, slightly below that of 1972 but above the 1963-72 mean.

California trawl landings in 1973 were 61.1 million lb, a new record catch. It exceeded the previous high in 1972 of 54.1 million lb by 13% and the 10-year mean of 37.2 million lb by 64%. Increased landings came from Areas 1A, 1B, and 2A while the catch from Area 1C declined. The California trawling fleet increased to 102 vessels in 1973. Trawl effort totalled 76,740 hr and catch effort was 796 lb an hour. Dover sole was the leading species in 1973 landings (22.5 million lb). Rockfish and sablefish followed in order of pounds landed. Record catches of dover sole, rockfish, sablefish, and lingcod were made in 1973.

VI. REVIEW OF DATA EXCHANGE PROCEDURES

Data exchange among agencies for the past two years was discussed. Status reports by all agencies have not been distributed in a timely manner. The chairman expressed disappointment that status reports from all agencies have not been exchanged at least one month before the meeting as has been the objective. He deplored the necessity for delaying meeting procedures, the result of lateness of some reports. A recommendation concerning timeliness of reporting was adopted and appears under Agenda Item XIV.

Mr. Dark distributed updated U.S.S.R. 1972 groundfish data to the TSC. He also informed the group of the fall 1973 U.S.-Republic of Korea preliminary fishery talks. No exchanges of data occurred but R.O.K. statistics may be available in the future.

Chairman Forrester reported on the INPFC historical bulletin on groundfish he and others have in preparation. He noted in preparation of this bulletin the lack of uniformity in fish weights (round and dressed) and in conversion factors. The TSC considered that round weight statistics were desirable and adopted a recommendation regarding weights that appears under Agenda Item XIV.

The increasing use of groundfish by sports fishermen was noted. For example, in 1973 California party boat fishermen alone caught over 3.5 million rockfish and 81,000 lingcod.

VII. REVIEW OF AGENCY PROGRESS

A. CURRENT AND PROPOSED RESEARCH

1. Canada

Groundfish staff of the Pacific Biological Station at Nanaimo in 1973 was reduced through transfer of one scientist to aquaculture programs. Staff consisted of one scientist, 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 (informally) between two projects, the Near Seas Investigation and the Rockfish Investigation.

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 provided 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). Reports were published dealing with catch statistics of the domestic fishery in 1973, length and age composition of English sole from northern Hecate Strait, laboratory observations on halibut eggs, and observations taken during commercial fishing operations.

b. Rockfish Investigation

Rockfish studies were continued to investigate taxonomy, growth, reproduction, stock size and population dynamics. A substantial portion (1600 sq miles) of Queen Charlotte Sound and southern Hecate Strait was surveyed during 1973 and sizeable quantities of rockfish species identified. Principal species were Pacific ocean perch over trawlable bottom and redstripe rockfish (S. proriger) over untrawlable bottom. During September 1973 a cruise was completed in Queen Charlotte Sound to assess the status of two important stocks of Pacific ocean perch. Reports were published on the various cruises and a comprehensive report on the survey work is in preparation.

c. Future Activities

The Groundfish Investigation staff was augmented by addition of a new scientific position which was filled in March 1974. The incumbent Dr. R. Beamish has accepted a wide range of responsibility and will be conducting research on Pacific cod, lingcod, Pacific hake and Pacific pollock. It is anticipated that the monitoring program will be continued on species contributing to the commercial fishery. There will probably be some reduction in research on Pacific ocean perch but similar studies will be initiated for other important rockfish species such as S. flavidus, S. proriger, and S. reedi. There will be cruises and research directed towards latent resources in the Strait of Georgia (hake and pollock).

2. United States

a. Alaska

At the present time the state of Alaska has no biological staff assigned solely to a groundfish research or management program. Current activities consist of compiling statistical records of minor harvest of groundfish for bait use by the commercial crab fisheries and sablefish foodfish fishery in southeast Alaska. Little other utilization of groundfish has occurred in Alaska except use of certain species in minor amounts by processing plants for marketing samples and through the recent entry of the catcher-processor vessel ROYAL SEA (SEA FREEZE PACIFIC), owned by Pan Alaska Fisheries, into the Alaska Peninsula-Bering Sea area. The ROYAL SEA activity was hampered by mechanical problems which required return to Seattle before any serious fishing or processing activities occurred, but she was expected to return to the Alaska fishing grounds in the near future. Although Alaska has no biological staff assigned completely to groundfish work, there has been reassignment of areas of responsibility in the westward region of Alaska to allow more concentrated effort on groundfish fishery problems and basic biological sampling programs. Reorganization of the westward region of Alaska to separate management and research responsibilities of shellfish and finfish activities has allowed the assignment of groundfish activities to the finfish section. Since it is anticipated that the major thrust of groundfish activity in Alaska will be in the westward region of Alaska, the reorganization will allow groundfish work to be accomplished jointly with the personnel working on salmon, herring, and environmental responsibilities. Planned activities as the fishery develops will be statistical catch tabulation, introduction of a compatible logbook program with other coastal states, and basic biological sampling of commercial harvests.

A specific management problem is anticipated as the groundfish fishery is expected to occur from April through July, the off-season for existing fisheries (shrimp, king and Tanner crab). This period coincides with the soft shell season of king and Tanner crab, and high incidental trawl catches of these species may result when they are concentrated and highly susceptible to mortality.

During 1974, as in 1973, Alaska has participated with the NMFS in the Bering Sea observer program aboard Japanese groundfish trawlers. Personnel have been assigned for 6-8 week periods to participate in this program under the direction and funding by NMFS.

The Department is currently evaluating the possibility of reclassifying an existing king crab biologist position to establish a full time groundfish biologist position in the westward region of Alaska, which would be located in the Kodiak westward region office.

b. Washington

Groundfish studies during the past year were carried out under three project's investigations. All groundfish work went on state funding July 1, 1973 terminating the heavy dependence on federal matching monies support since 1966 under PL 88-309. One scientific aide position employed by PMFC is located at the Seattle office and is concerned with groundfish age-reading work.

i) Trawl fishery monitoring (3 scientific aides). Daily coverage of the major Puget Sound landing ports is accomplished by two port samplers. During 1973 significant trawl landings occurred at Blaine, Bellingham, Anacortes, Everett, Seattle, LaConner and Westport on Grays Harbor. Biological samples collected during 1973 totalled 136 compared to 206 in 1972.

A computer-oriented data storage and retrieval system is handling the fishermen interview, biological samples and tagging data with improvements being made to facilitate retrieval and storage of large blocks of data.

ii) Coastal groundfish studies (3 biologists). Major emphasis this year was on Pacific ocean perch and petrale sole data analysis. All biological data on these species were incorporated into the new storage and retrieval system.

A tremendous amount of age and length data have been collected for Pacific ocean perch in Queen Charlotte Sound, and these data have been summarized by appropriate time periods so that estimates of age composition could be made. Work is currently underway to complete this analysis and estimate mortality rates for 1967-73. Ovary samples were collected from landings from Queen Charlotte Sound and off Washington-Oregon during 1973 and are currently being processed.

Petrale sole studies have centered around analysis of 1967-68 tagging experiments. A report is currently being prepared on the results of this work and should be completed soon.

iii) Puget Sound Groundfish (1 biologist full time). A new biologist was hired for this project during November 1973. Work activities are centered on analysis of "inside" waters tagging of Pacific cod. Other study areas included assembly of a set of historical groundfish statistics for inside waters, examination of the feasibility of controlling the abundance of dogfish in Puget Sound and monitoring a fishery specifically designed to capture dogfish. These dogfish were later used as a fish meal component of the Oregon Moist Pellet used in state salmon hatcheries.

c. Oregon

i) Tagging. Two tagging trips were completed between May 1973 and April 1974. A total of 975 sablefish were tagged between September 5 and October 5, 1973. Tagging occurred in Areas 3A and 2C during the resource assessment cruise of the chartered trawler R/V COMMANDO. On March 8-9, 1974, a total of 164 dover sole were tagged off Port Orford in 400-450 fms of water. The tagging was conducted during a regular fishing trip of the commercial trawler M/V HARMONY.

ii) Biological studies. The resource surveys conducted from 1971 to 1973 will be continued. The September 1974 cruise will be a replicate of the 1972 cruise and will cover the area between Yaquina Head and Cape Blanco in depths from 10 to 250 fms.

iii) Sampling program. Landings of dover sole, English sole, petrale sole, rockfish, and animal food were sampled at Brookings, Charleston, Winchester Bay, Newport, and Astoria.

d) California

Activities of the California Bottomfish Program include surveillance, monitoring, and assessments of groundfish stocks. A May 1, 1974 reorganization of the Marine Resources Region divided management and research functions of the region. Groundfish work will be carried out by geographically situated management units of the region.

i) Tagging. In July 1973, during a cruise of the N.B. SCOFIELD, 248 dover sole and 48 sablefish were tagged and released on the Punta Gorda ground in the northern part of Area 1B.

ii) Biological studies. It was planned to use the N.B. SCOFIELD to assess groundfish populations in fall of 1973 but the vessel was unavailable due to other commitments. This study, in the Monterey-Point Sur area (Area 1B), entailed the use of gillnets in areas heavily and lightly fished. Supplemental data were obtained from the commercial gillnet fishery and data analyses are in progress.

iii) Groundfish sampling program. Age and size composition samples of flatfish obtained at major ports in 1973 included 82 dover sole, 60 English sole, and 58 petrale sole samples. Rockfish species composition samples with some length measurements totalled 103. Twenty lingcod size samples and 15 animal food species composition samples were also obtained.

e. National Marine Fisheries Service

The Groundfish Assessment staff in the past year was composed of 10 biologists, two fishery technicians, one secretary, and two clerk typists, and a varying number of temporary fishery aides. The Groundfish Assessment Task is organized into three subtasks; Bering Sea Resources, Gulf of Alaska Resources, and Pacific Northwest Resources.

i) Bering Sea Resources. Groundfish surveys initiated in the eastern Bering Sea in 1971 continued in 1974. The objectives of the work are: 1) estimate distribution and abundance of groundfish species, 2) obtain data for recruitment, growth and mortality studies, 3) measure oceanographic features which may affect distribution and abundance of groundfish, and 4) examine the feasibility of applying underwater photography as an assessment technique. Crabs will be surveyed concurrently. The NOAA vessel OREGON and the charter vessel ANNA MARIE will operate jointly during June and July. Plans also call for cooperative work with the U.S.S.R. The Soviets are scheduled to survey the area north of the Pribilof Islands while NMFS operates to the south of the islands. Several days are scheduled for comparative fishing calibrations and exchange of data.

U.S. vessels will occupy approximately 110 predetermined stations spaced at 20-mile intervals in depths of 20-250 fms. Hauls will be 1 hour in duration and will be made with a 400-mesh Eastern otter trawl.

ii) Gulf of Alaska Resources. The NOAA vessel JOHN N. COBB will continue to assess the distribution of pollock and other groundfish in the western Gulf of Alaska during July and August, 1974. This will be the fourth cruise of a program initiated in 1972 to: determine the geographical and seasonal availability of pollock and other groundfish, estimate the vital rates of the pollock

population and to estimate potential yield. The 1974 survey area extends from Unimak Pass to the Shumagin Islands. A stratified-random sampling design will be employed and midwater and bottom trawls will be utilized.

iii) Pacific Northwest Resources. Pacific hake and sablefish continue to be the species of major interest, though studies of other groundfish species may be in the offing. The charter vessel TORDENSKJOLD was utilized in September 1973 off Oregon and Washington to gather biological data and to observe the general distribution and abundance of Pacific hake. During April-May 1974, the NOAA vessel JOHN N. COBB surveyed off California from Santa Barbara to Crescent City to determine the feasibility of indexing the abundance of juvenile Pacific hake for the purpose of forecasting the magnitude of recruitment to the commercial portion of the population. Hydroacoustic and trawling techniques were used to estimate abundance. This work will continue at least through 1975. In September-October, 1974 the JOHN N. COBB will participate in a cooperative U.S.-U.S.S.R. survey of the distribution and abundance of adult hake off Oregon and Washington. An important aspect of this work will be evaluation and calibration of U.S. and U.S.S.R. acoustic systems.

The sablefish tagging project was necessarily de-emphasized and additional effort was directed to hake studies. Since the last tagging cruise in April 1973, tagging has been conducted on an opportunistic basis. During the 1974 spring hake survey, 649 sablefish were tagged and released off California. The program will continue to furnish tagging equipment and act as a clearinghouse for tagging data.

iv) Other activities. The fishing vessel ANNA MARIE has been chartered for the summer of 1974 in a joint NMFS-industry venture to explore the potential for a U.S. groundfish fishery in the Bering Sea and the western Gulf of

Alaska. The vessel will operate in the Unimak-eastern Bering Sea area in May-June and in the Kodiak to Seward area in July-August on a production basis. Pollock is the primary target species.

The deployment of U.S. observers aboard Japanese groundfish fleets in the eastern Bering Sea in 1973 is continuing through 1974. Six observers are on groundfish vessels for 1-month periods in each calendar quarter. Observers collect biological data, determine the magnitude of incidental halibut and crab catches, compile fishery statistics and observe fishing techniques and strategies.

f. IPHC

Mr. Hoag described the major emphasis of IPHC in reassessment of halibut stocks. IPHC is also engaged in the observer program on Japanese commercial vessels. Studies of growth and recruitment of halibut are continuing.

B. REPORTS COMPLETED OR IN PROGRESS

Each agency distributed, with status reports, a list of reports completed or in progress.

VIII. 1973 RECOMMENDATIONS OF THE TECHNICAL SUB-COMMITTEE

1. PACIFIC OCEAN PERCH MANAGEMENT PROGRAM

The Pacific ocean perch working group has updated the previous 1970 report On the status of Pacific ocean perch (Sebastes alutus) stocks off British Columbia, Washington, and Oregon. Mr. Gunderson summarized the report that was distributed prior to the meeting.

Pacific ocean perch stock assessments 1970-72

The Pacific ocean perch stock in Queen Charlotte Sound remains in good condition and CPUE data suggest that the stock has remained at a fairly constant level during 1970-72. Current annual yield remains below 11% of the estimated

biomass of marketable fish; the exploitation rate thought to provide maximum sustainable yield. Furthermore, recent explorations by the G.B. REED have revealed that only about 37% of the known perch habitat in the Queen Charlotte Sound subarea is presently exploited.

Total catch in the Vancouver Area has declined significantly from the 1970 level. The 1972 catch of 2,605 m.t. represented a 40% decline from 1970, but still exceeds the estimated sustainable yield (2,000 m.t.) for the area. CPUE data indicate that biomass did not change appreciably during 1970-72, so that the working group still recommends adoption of a catch ceiling of 2,000 m.t.

Total catch in the Columbia Area has remained fairly stable since 1970. The 1972 catch of 2,849 m.t. is only a 3% decline from 1970, and still exceeds the sustainable yield of 1,500 m.t. estimated for this area. The decline in CPUE indicates that exploitable biomass decreased during 1971-72. As a result, estimated sustainable yield in the Columbia Area was recalculated, and the group again recommended a 1,500 m.t. catch ceiling.

The working group also considered further needs for Pacific ocean perch management. A discussion of these needs are contained in Appendix B.

The Technical Sub-Committee discussed the current status of Pacific ocean perch stocks and fisheries in the various areas. The problems of gilling of Pacific ocean perch, other rockfish, and dogfish in 3- to 3½-inch meshes were discussed. No studies have been made on these mesh sizes and catches of these species. The continued need exists for Canadian-U.S. assessment of Pacific ocean perch stocks. A time-series of catch and catch/effort data when available would comprise an appropriate document for submission to INPFC. It was noted that catches in Queen Charlotte Sound are going down and a continued monitoring effort is needed there to assess the stock.

The Technical Sub-Committee accepted the updated Pacific ocean perch status report of the working group. Recommendations for Pacific ocean perch management needs and for Parent Committee acceptance and approval for submission to INPFC of the status report are contained under Agenda Item XIV.

2. COOPERATIVE SABLEFISH TAGGING PROGRAM

Mr. Dark distributed a NMFS report "Sablefish investigations by the U.S. National Marine Fisheries Service and cooperating agencies, 1971-73" and reported on progress from June 1973-June 1974. Since 1971, 27,174 sablefish have been tagged by the NMFS, TINRO, Fish Commission of Oregon, and California Department of Fish and Game in the area from southern California to southeastern Alaska. The major objective of the tagging has been the investigation of stock inter-relationships. Recaptures of juveniles have exhibited movements of up to 250 miles while the adults have shown a lesser tendency to move with most recaptures in tagging areas with average movements of about 60 miles.

The sablefish program has been de-emphasized by NMFS and tagging continues to be on an opportunistic basis by all agencies. NMFS continues as a coordinating agency for tagging data and for supplying tagging materials.

3. MANAGEMENT OF PACIFIC COD IN PMFC AREA 3C

Chairman Forrester summarized recent events in the fishery in Area 3C. In 1973 this stock was exposed to high fishing mortality during the January-March period. Trends in catch and catch/effort concerned Canada and the U.S. and it was agreed that cooperative monitoring was advisable. Catch during the 1974 January-March fishery was 33% less than that of 1973. Catches peaked on February 21 and decreased thereafter. CPUE was variable throughout the period and was without trend, a situation similar to years prior to 1973. CPUE levels in 1974 were considerably less than those of 1973. Length frequencies and age

determinations of fish taken in 1974 show that fish were slightly larger and older than usual. Some reduction in recruitment occurred in 1974 as forecast. Despite some indications that the 1973 spawning ground fishery may have been anomalous, it was considered important to continue close monitoring because of the large proportion of Pacific cod catch removed from Area 3C during the spawning season.

4. RESEARCH NEEDS AND PRIORITIES

Mr. DiDonato provided the background in the definition of research needs and priorities and the formulation of two project proposals. The two proposals are: (1) Pacific cod, lingcod, and shelf-rockfish stock assessment studies; and (2) Washington coast groundfish biomass survey.

Mr. DiDonato described proposal (1) in detail and Mr. Meehan described proposal (2). The Technical Sub-Committee accorded priorities to the two proposals in the order listed and accepted them for submission to the Parent Committee. The two proposals are appended (Appendix C) and a recommendation to the Parent Committee is listed under Agenda Item XIV.

5. OTHER ROCKFISH

Canada and Washington presented reports of species composition of the "other rockfish" category at the 1973 meeting of the Technical Sub-Committee and it was recommended that other agencies develop similar reports. Mr. Meehan reported that Oregon has a report in the editorial process that hopefully would be available for the Parent Committee fall meeting. Mr. Nitsos described California rockfish species composition of trawl landings and is compiling a report based on sampling in 1973. Sebastes paucispinis and S. goodei are the predominant species in California landings with S. pinniger a distant third. The increasing importance of Sebastalobus alascanus in California landings was also noted.

6. LINGCOD

A draft report on the status of California lingcod stocks was circulated by Mr. Hardwick. California lingcod landings have increased since 1969 and are attributed to increases in abundance. Dr. Harville discussed the recreational fisheries for lingcod and noted the general paucity of data on recreational fisheries along the coast.

IX. 1973 RECOMMENDATIONS OF THE INTERNATIONAL GROUNDFISH COMMITTEE

A. RESEARCH NEEDS AND PRIORITIES

Chairmanship of the working group on research needs and priorities was changed from R. D. Humphreys, Canada, to G. S. DiDonato, U.S., because of Mr. Humphreys' change in assignment. Messrs. DiDonato, Forrester, Dark, Meehan, Jow, and J. McCrary (for J. Lechner, Alaska) of the working group met on April 16-17, 1974 in Seattle to consider research needs and priorities. Thirteen research study areas were considered and two project proposals were made. These were considered under Agenda Item VIII-4 and are appended (Appendix C).

B. MESH SIZE RATIONALE

Chairman Forrester circulated a report on Canadian research on mesh selection prior to the meeting. Mr. Jow reviewed mesh size regulations of California. Mr. DiDonato discussed mesh studies by PMFC and Washington's mesh changes from 4 $^{1}/_{2}$-inch mesh to smaller mesh sizes due to the development of the Pacific ocean perch fishery. Chairman Forrester considered it useful to incorporate in the report of the Technical Sub-Committee a list of references on mesh size. That list is Appendix D.

C. ROSTER OF LEAD PEOPLE IN GROUNDFISH WORK IN EACH ORGANIZATION

1. Canada

Westrheim, S. J. - Rockfish; International Fisheries

Forrester, C. R. - Domestic; International Fisheries

Ketchen, K. S. - Dogfish; International Fisheries

Beamish, R. J. - Pacific cod, lingcod, Pacific hake, Pacific pollock

2. United States

a. National Marine Fisheries Service

Alton, M. - Task leader, Groundfish Assessment

Dark, T. - Sub-task leader, Pacific Northwest Groundfish Resources

Hughes, S. - Sub-task leader, Gulf of Alaska Groundfish Resources

LaLanne, J. - Leader, Age Determination Unit

Larkins, H. - Leader, International Fisheries, Marine Fisheries Management Research

Nelson, M. - Task Leader, Hydroacoustic Survey Development

Shippen, H. - Pacific Northwest Groundfish (Pacific ocean perch and sablefish)

Thorson, K. - Pacific Northwest Groundfish (sablefish)

Wolotira, R. - Sub-task leader, Bering Sea Groundfish Resources

Traynor, J. - Staff, Hydroacoustic Survey Development

b. Alaska

Leckner, J.

c. Washington

DiDonato, G. S.	- Trawl fishery; International Fisheries
Gunderson, D. R.	- Rockfish; International Fisheries
Gosho, M.	- "Inside" trawl fishery
Petersen, M.	- Petrale sole

d. Oregon

Demory, R. L.	- Flounders
Robinson, J. G.	- Domestic Fisheries
Meehan, J. M.	- International Fisheries
Forsburg, B. O.	- Estuarine life history

e. California

Jow, T.	- Trawl fishery
Hardwick, J. E.	- Roundfish
Nitsos, R. J.	- Flounders, rockfish
Quirollo, L. F.	- Flounders
Thomas, D. H.	- Flounders

X. INTERNATIONAL MATTERS

A. STATUS OF FOREIGN TRAWL FISHERIES OFF THE WEST COAST OF CANADA AND THE UNITED STATES

1. Canada

Soviet fishing began off British Columbia again in June 1973 with the appearance of two trawlers off the lower west coast. No large-scale effort developed; the low maximum of 13 vessels of 1972 was not reached. In mid-August seven trawlers fished during a 3- to 5-day period off the southwest coast of Vancouver Island. Despite the low effort and new pilotage costs, 58 Soviet trawlers and support vessels entered Tasu Sound compared to 35 in 1972 and 84 in

1971. The primary Soviet fishery was on hake and although some herring were taken in 1972, this fishery was not repeated in 1973. In 1974 to date, there was no Soviet fishery off British Columbia.

Little change in Japanese fishing off British Columbia occurred in 1973. Limited numbers (4 trawlers and 3 longliners) fished throughout the year for blackcod, Pacific ocean perch, and various rockfish off the west coast of Queen Charlotte Islands, off Queen Charlotte Sound, and off the upper west coast of Vancouver Island. In 1974, a Japanese longliner fished off the upper west coast of Vancouver Island and the upper Queen Charlottes. Activities peaked at three trawlers and one longliner in April, following the pattern of previous years. In February, the Japanese trawler KOGO MARU was seized for fishing within Canadian waters in Queen Charlotte Sound. Catches of the trawler consisted of 700 metric tons (m.t.) of frozen processed rockfish of which Sebastes reedi, S. proriger, and S. crameri were reported to be the predominant species.

A new development in 1973 was the arrival of one German Democratic Republic (East Germany) and one Polish trawler on the west coast. The former vessel did not fish but the Polish vessel fished 2 or 3 days on La Perouse Bank in October causing concern for herring stocks which school there in fall months. In 1974, it is expected that six Polish trawlers will fish off the west coast.

Two South Korean longliners appeared off the Queen Charlotte Islands in 1974. The first arrived in February and departed immediately while the second began fishing in May and continues to do so off the upper west coast of the Queen Charlotte Islands for blackcod.

2. United States

a. Soviet Fishery

i) Gulf of Alaska (Oct. 1972-Sept. 1973)

A fleet of 2-10 trawlers conducted a small fishery for Pacific ocean perch in the Gulf and along the Aleutian Islands. Their estimated catch was 10,000 m.t. in the Gulf and 7,000 m.t. from the Aleutian Islands.

A new fishery was started in 1973 in the Kodiak area when as many as 19 side trawlers and 9 stern trawlers fished for flounder and pollock. The estimated catch of flounder and pollock from January to September was 25,000-30,000 m.t. Pacific halibut were observed on several vessels, particularly during March-April.

ii) Washington, Oregon, California (April 1973-May 1974)

The Soviet hake fleet appeared off California in late April 1973. Fleet size peaked at 68 fishing and support vessels in May off Oregon and southwest Washington. Fishing was most intense on Hecata and Stonewall Banks where good hake catches were observed throughout the summer. The fleet did not fish La Perouse Bank as it did in previous years. Fishing terminated in October, several weeks earlier than in 1972.

In 1974, about 20 stern trawlers were first observed off Santa Cruz, California in April, this fleet increased to 35 vessels in late April. As of May, 61 fishing and support vessels were operating off central Oregon and northward to Grays Harbor, Washington.

b. Japanese Fishery

i) Gulf of Alaska (1972-1973)

In 1972, 42 trawlers and 22 longliners were licensed to fish. The 1972 catch was 128,652 m.t. an increase of 30,051 m.t. over 1971. In 1973 the

same numbers of vessels were licensed. Preliminary data show catches in 1973 of 35,580 m.t. of Pacific ocean perch and 19,195 m.t. of blackcod.

ii) Washington, Oregon, California

As in 1972, little Japanese fishing effort was observed in 1973. Three stern trawlers operated for periods off Washington and red rockfish were observed in their catches. In fall 1973, a Japanese stern trawlers was observed off Pt. Reyes, California. Through May 1974, one longliner and one trawler have been sighted off Washington and one trawler noted off California.

iii) Other foreign fishing

Republic of Korea independent stern trawlers and a longliner fished in the Gulf of Alaska and along the eastern Aleutians in 1973 for Pacific ocean perch, pollock, and blackcod. Catches were estimated at about 6,000 m.t. of perch and pollock. The longliner probably took about 400 m.t. of blackcod.

The German Democratic Republic and Poland each had a stern trawler fishing for hake off Washington and Oregon in 1973. Both operated independent of the Soviets and off-loaded fishery products to a British transport off Washington in September 1973.

In May 1974 an East German trawler was observed off the Pacific Northwest.

B. RECENT DEVELOPMENTS IN FISHERIES AGREEMENTS

Current Canada and U.S. fisheries agreements with the U.S.S.R. and with Japan are for 1973 and 1974.

Mr. Dark reported that Japan has agreed to discontinue winter fishing in certain areas of the eastern Bering Sea to reduce (so stated) the incidental catch of halibut in trawls.

Chairman Forrester reported on the results of the Canada-U.S.S.R. scientific meeting in January. Recommendations included cooperative research, exchanges of scientists, and commercial vessel observations.

Mr. Dark discussed results of the U.S.-U.S.S.R. scientific meeting. Hake and a variety of other species were considered. Recommended cooperative work includes calibrating of acoustic methods and changes in format of exchange of biological data.

XI. RECOMMENDATIONS FOR COOPERATIVE PROGRAMS

No specific recommendations were made for cooperative programs. Chairman Forrester called attention to the problem of discards of undesirable species and sizes at sea discussed at the 1973 Technical Sub-Committee meeting. The Canadian status report contains August 1972-March 1974 observations on discards of a trawler. Mr. Jow distributed to the Technical Sub-Committee results of a March-November 1960 study on discards from trawling in the Monterey Area (1B). Mr. Meehan reported previous Oregon studies of discards in 1959-60 that were published by PMFC, and current work to obtain biological and discard information from the commercial flounder fishery. The latter study began in May 1974 and will continue through the summer.

XII. GROUNDFISH REGULATIONS

1. RECENT CHANGES IN TRAWL REGULATIONS

Washington has changed methods of measurement of mesh size to the distance between knots; i.e., now consistent with method of measurement by other coastal agencies. No other changes were reported. Oregon has scheduled a hearing on regulations to legalize gillnets for groundfish.

2. EFFECTIVENESS OF REGULATIONS

The use of $7\ ^{1}/_{2}$-inch mesh codends in the California halibut area (Area 1A) was discussed. It appears to be an effective regulation that allows the release of undersized halibut, the only groundfish that has a minimum size in California.

3. NON-TRAWL REGULATIONS

It has been recommended in Canada that the commercial take of lingcod with the aid of scuba gear be banned.

Washington has legalized the use of beam trawls with $4\frac{1}{2}$-inch webbing in inside waters.

XIII. OTHER BUSINESS

The use of a uniform trawl logbook along the coast was discussed. No action was taken. Chairman Forrester reported a new Canadian trawler logbook that he will distribute.

XIV. RECOMMENDATIONS

A. FUTURE WORK

1. Statistics on groundfish line and trap fisheries

The Technical Sub-Committee recommends that each agency take the necessary action to obtain detailed catch and effort statistics on groundfish line and trap fisheries.

2. Standardization of statistics on round weight units

The Technical Sub-Committee recommends that agencies standardize reporting of groundfish landing statistics in round weight units.

3. Species composition of other rockfish

The Technical Sub-Committee recommends that agencies endeavor to provide more detailed information on the species composition of their "other rockfish" landings.

4. Pacific ocean perch management program

a. The Technical Sub-Committee recommends that agencies intensify efforts to determine the extent of discards in their Pacific ocean perch fishery and in fisheries for that species by other nations.

b. The Technical Sub-Committee recommends that a joint comparison be undertaken to determine the validity of the various techniques of the U.S.S.R., Canada, and the U.S. for estimating rockfish biomass. Southern Queen Charlotte Sound is the recommended site for this study suggested to be undertaken in the late summer or early fall of 1975.

5. Trawl mesh size studies

The Technical Sub-Committee recommends that trawl net mesh size studies on Pacific ocean perch be conducted to determine if discards can be minimized by increasing mesh size without creating a substantial gilling problem.

B. PARENT COMMITTEE

1. Research proposals

The Technical Sub-Committee recommends that the Parent Committee approve the two appended research proposals. These in priority order are:

(1) Pacific cod, lingcod, and shelf-rockfish assessment studies off British Columbia, Washington, Oregon and California;

(2) Washington coast groundfish study.

2. Pacific ocean perch status report

The Technical Sub-Committee recommends Parent Committee acceptance and approval for submission to INPFC of the status report on Pacific ocean perch stocks off British Columbia, Washington, and Oregon, 1972.

NOTE: Parent Committee approval of the first two recommendations was given on June 20, 1974 (see Appendix E).

3. Groundfish statistics

The Technical Sub-Committee expressed concern regarding the problems encountered in obtaining timely groundfish statistics and the lack of

compatibility in methods of reporting groundfish landings (landings reported should be expressed as round weights).

The Technical Sub-Committee recommends that the Parent Committee assist in exploring means of improving the timeliness of statistics and ensuring their standardization.

XV. SCHEDULE OF MEETINGS

1. INTERNATIONAL GROUNDFISH COMMITTEE MEETING

Dr. Harville reported that he has scheduled the Committee meeting for Friday morning, October 11, 1974, in conjunction with the PMFC annual meeting, October 8-10 in Anchorage, Alaska.

2. SIXTEENTH ANNUAL MEETING OF THE TECHNICAL SUB-COMMITTEE

The 16th annual meeting is tentatively scheduled for June 25-27, 1975 (alternative dates June 18-20) in Vancouver, B.C.

XVI. ELECTION OF CHAIRMAN

Mr. G. S. DiDonato was elected chairman for 1975-76.

XVII. ADJOURNMENT

Chairman Forrester and members of the Technical Sub-Committee expressed appreciation to Mr. Meehan for his contribution as a member and chairman during the past several years. Mr. Meehan has accepted a post with NMFS in Washington, D.C.

The meeting was adjourned at 10:00 A.M., June 21, 1974.

AGENDA

TECHNICAL SUB-COMMITTEE OF THE INTERNATIONAL GROUNDFISH COMMITTEE MILLBRAE, CALIFORNIA, JUNE 1974 15TH ANNUAL MEETING

I. CALL TO ORDER

II. APPOINTMENT OF SECRETARY

III. APPROVAL OF AGENDA

IV. STATUS OF STOCKS

1. Dover sole	(FCO)	5. Lingcod	(CDE)
2. English sole	(CDF&G)	6. Sablefish	(NMFS)
3. Petrale sole	(CDF&G)	7. Pacific ocean perch	(WDF)
4. Pacific cod	(CDE)	8. Other rockfish	(WDF)

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. 1973 RECOMMENDATIONS OF THE TECHNICAL SUB-COMMITTEE

1. Pacific ocean perch management program (Gunderson)
2. Cooperative sablefish tagging program (Dark)
3. Management of Pacific cod in PMFC Area 3C (Forrester)
4. Research needs and priorities (DiDonato)
5. Other rockfish (FCO and CDF&G)
6. Lingcod (FCO and CDF&G)

IX. 1973 RECOMMENDATIONS OF THE INTERNATIONAL GROUNDFISH COMMITTEE

1. Research needs and priorities
2. Mesh size rationale
3. Roster of lead people in groundfish work in each organization

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 regulations

XIII. OTHER BUSINESS

XIV. RECOMMENDATIONS

1. Future work
2. Parent Committee

XV. SCHEDULE OF MEETINGS

1. International Groundfish Committee meeting
2. Sixteenth annual meeting of Technical Sub-Committee

XVI. ELECTION OF CHAIRMAN

XVII. ADJOURNMENT

PACIFIC OCEAN PERCH MANAGEMENT PROGRAM

In addition to reviewing the status of Pacific ocean perch stocks by management area and reviewing the need for catch ceilings, the working group also discussed the short- and long-term needs for Pacific ocean perch management (p. 27, 1972 Sub-Committee Report). The significant points covered in these discussions were as follows:

A. Short Term

Still to be determined was the extent of discards by the domestic and foreign fleets. All agencies are urged to expedite collection of such information.

B. Long Term

1. There was lack of agreement as to what age of entry would be optimal for Pacific ocean perch. Further examination of growth, mortality, and the pattern of recruitment to the fishery should resolve those differences.

2. The group agreed that three methods may be used to control age of entry of Pacific ocean perch; they are:

(a) minimum mesh size,

(b) restricting depth and/or time of fishing,

(c) limiting type of gear.

Further exploration of this matter was deferred until an optimum age of entry could be agreed upon.

3. Steps are being taken to examine the relationship between stock size and recruitment, but it was noted that a long time-series of data is required. In the meantime, spawner-recruit relationships should be examined with simulation modeling techniques to study the possible effects of fishing on recruitment.

4. Two special studies were recommended. These were:

   (a) Determination of the species composition of the U.S.S.R. "rockfish" catch.

   (b) A joint comparison of currently used techniques for estimating rockfish biomass of U.S.S.R., Canada, and U.S. to assess their validity. South Queen Charlotte Sound is the recommended site for this study because:

      1) there is a substantial stock of Pacific ocean perch there;

      2) several biomass estimates have already been made;

      3) there is a significant, well-monitored Pacific ocean perch fishery in this area;

      4) a large proportion of the bottom in this area is trawlable.

Soviet scientists have already agreed to study the species composition of their commercial catches, and if this is done properly no further action need be taken on recommendation (a). However, no firm plans have been formulated in response to the second recommendation. The group agreed that a survey of this nature should take place in late summer or early fall of 1975 before Pacific ocean perch begin their spawning migration out of Queen Charlotte Sound.

ATTACHMENT 1

PROJECT TITLE

Pacific cod, lingcod and shelf-rockfish stock assessment studies.

PROJECT DURATION (July 1, 1975-June 30, 1979)

Four-year period with evaluation and proposal for future work at the end of two years.

OBJECTIVE

Assess the status of these commercially important species to both United States and Canadian trawl fisheries, with the intent to recommend harvesting strategies to opimize yield. Specific objectives are to:

1. Evaluate the need and make appropriate regulatory recommendations (if needed) for restricting Canada and United States trawl fishing effort on winter spawning stocks of Pacific cod off the lower west coast of Vancouver Island.
2. Evaluate the need for a minimum size limit on commercial-caught lingcod in order to increase existing yields. British Columbia presently has a 23-inch minimum size limit on this species while the United States has none.
3. Determine the major species comprising the shelf-rockfish catch and set preliminary estimates of harvest levels for these species or species-groups by coastal regions.
4. Develop a uniform trawl fishery data base for Pacific coast state agencies in order to facilitate analysis on species status.

JUSTIFICATION

In Pacific cod recent increased fishing activity on major spawning aggregations and subsequent events in the fishery have raised questions concerning the extent of utilization and possible overutilization of the species. In lingcod virtually nothing is known of life history information of offshore populations. There are unresolved questions concerning growth, mortality, migration, recruitment patterns and, in particular, degree of susceptibility to exploitation of the species which has a rather unique spawning behavior. Shelf-rockfish have recently become of great importance to both the Canadian and United States trawl fisheries. The contribution of individual species to commercial catches in the rockfish category are only now being determined and there remains a paucity of information on their individual life histories. These species are major components of the Canadian and United States trawl fisheries on the Pacific coast. They have contributed an annual average of 35% to total trawl production by Canada and the United States on the Pacific coast during 1962-71 and in 1972 represented 43% of total trawl landings.

Since the groundfish fisheries of British Columbia, Washington, Oregon and California are long-established and relatively mature, these needs and problems are most critical along their long contiguous coastlines. The ground-fisheries of Alaska are in early stages of development and very possibly eventually will concentrate on other species. In the interests of their orderly development, and in order to be able to transfer stock assessment methods and techniques to those fisheries where applicable this project is designed to include Alaska and complete the potential coverage of the eastern North Pacific shelf.

METHODS

Detailed information on commercial exploitation and biological samples of the above species will be collected through fleet contact, i.e., through fishermen interviews and log records and through sampling of commercial landings for purposes of obtaining length and sex information and biological materials for later age determination studies. In order to facilitate coastwide interchange and collation of data, development of a common logbook will be considered and other steps taken to assure coastwide compatibility of data and to facilitate its EDP processing on a timely basis. Research operation would include those necessary for determination of stock or substock interrelationships, patterns of recruitment, migration, exploitation rates, etc., through tagging and other studies and other operations designed to determine stock abundance, spawning and post spawning behavior and associated environmental conditions. A consulting programmer will work with biologists in each state to set up compatible trawl fishery data processing systems.

BUDGET (July 1, 1975-June 30, 1977)

	FISCAL 1976	1977
PERSONNEL		
4 biologists - project leader level - ea. $14,000/yr (one in each state)	$ 56,000	$ 61,600*
16% employer contribution	8,400	9,240*
Overhead charges for reimbursable contracts (22% of above)	14,200	15,560
TAGGING SUPPLIES		
Tag releases (5,000 in Wash., Oreg., & Calif. at .10/tag)	1,500	1,500
Tag recovery rewards (30% of total released at $1.00 per tag)	4,500	4,500
VESSEL CHARTERS		
45 days at $500/day off Wash., Oreg. & Calif.	22,500	22,500
TRAVEL		
Per diem, automobile & plane expenses, $2,000/biologist	8,000	8,000
SUPPLIES		
Sampling equipment, nets, office supplies & equipment - $1,500 per biologist	6,000	6,000
CONSULTING PROGRAMMER AND ASSOCIATED COSTS		
Programmer fees (20 hr/wk at $12.50/hr)	13,000	14,300*
Computer costs ($150/month)	1,800	1,800
Travel: Per diem (2 days/month at $25/day)	600	600
Airfare, automobile expenses	1,500	1,500
	$138,000	$147,100

*10% increase made.

ATTACHMENT 2

PROJECT TITLE

Washington coast groundfish biomass survey.

PROJECT DURATION (July 1, 1975-June 30, 1977)

OBJECTIVE

The objective of this proposal is to develop a comprehensive method to determine the standing stock and potential yeild of groundfish species. It is recommended that a pilot project be conducted on the continental shelf and upper slope off Washington. Ongoing bottom trawl surveys conducted by the Fish Commission of Oregon are considered an adequate technique for flatfish stock assessment. However, hydroacoustic and midwater trawling techniques are required to assess roundfish species which are not fully available to bottom trawls. The proposed pilot project is aimed at combining bottom trawl and hydroacoustic-midwater trawl techniques being developed by the National Marine Fisheries Service to provide a comprehensive assessment of all groundfish species. This combination of methods will also provide a means of checking roundfish biomass estimates based solely on one technique or the other.

JUSTIFICATION

Knowledge of the standing stock of groundfish off the Pacific Northwest is vital to the rational management of that resource. Accumulation of information about these stocks is increasingly important as foreign fishing effort has expanded and as we anticipate an increasing U.S. responsibility for overseeing the rational use of groundfish resources on the shelf and upper continental slope. While some groundfish species of the region are underutilized or not utilized at all, with ever-greater world demand for fish protein we expect that

very soon all such resources will be fully or overexploited. The proposed survey will not only provide the data base for inhibiting overexploitation through proper management, but will also define the potential for groundfish species not presently utilized.

It is expected that the results of this cooperative survey will provide information that can be used to: 1) delineate those species of importance to the coastal state for which there are no surpluses; 2) set harvest levels for species of importance to foreign fleet, only; 3) set catch allocations for species of importance to more than one country.

METHODS

This study will be conducted on the continental shelf and upper slope off Washington and will consist of two basic methods: (1) a bottom trawl survey and (2) a hydroacoustic-midwater trawl survey.

Bottom trawl survey (Fish Commission of Oregon). The continental shelf will be sampled systematically and the weight and number of fish caught recorded by species. Estimates of total fish available will be made by relating area covered and fish caught to the total area available. Fishing will be done over as short a period as possible during the summer to reduce the possible effects of fish movement on the estimates of abundance. Laboratory time will be spent preparing equipment and processing the specimens and data collected.

Hydroacoustic-midwater trawl survey (National Marine Fisheries Service). The hydroacoustic-midwater trawl survey will be conducted along a systematic grid covering the continental shelf and upper continental slope. Echo-sounder signals will be continuously recorded on magnetic tape. Midwater and near-bottom aggregations of fishlike echo signs will be sampled to identify species and to obtain biological data. Estimates of the relative and absolute

abundance of important roundfish stocks will be derived using quantitative computer signal processing methods.

Survey tracklines and timing will overlap those of the bottom trawl survey to the maximum extent possible.

PROJECTED BUDGET (July 1, 1975-June 30, 1977)

Bottom Trawl Survey	FISCAL 1976	1977
PERSONNEL (1 project leader, 1 biologist, 2 technicians)	$ 45,250	$ 45,250
16.7% employer contribution	7,500	7,500
SERVICES AND SUPPLIES		
Supplies and equipment	9,375	9,375
Travel	1,075	1,075
ADMINISTRATIVE OVERHEAD	12,640	12,640
VESSEL OPERATIONS - 120 days at $550/day	44,000	22,000
CONTRACT FOR GRADUATE STUDENT (aging studies)	3,640	3,640
	$123,480	$101,480

Hydroacoustic-midwater Trawl Survey

Funds for this work have already been requested under a separate proposal within the National Marine Fisheries Service.

MESH SIZE REFERENCES

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The International Groundfish Committee has received its Technical Sub-Committee Report "The status of Pacific ocean perch (Sebastes alutus) stocks off British Columbia, Washington, and Oregon in 1972" by D. R. Gunderson, J. M. Meehan, and S. J. Westrheim. On the advice of its Technical Sub-Committee, the International Groundfish Committee authorizes submission to INPFC of this report (p. 1-14 of the draft) as a joint Canadian-United States document.

IGC commends the efforts of the TSC task force in developing research needs and priorities of two research proposals with first priority for a 4-year investigation of Pacific cod, lingcod, and shelf-rockfish stocks, and second priority for coastal resource biomass pilot surveys off the Washington coast. The IGC accepts and approves those proposals, and pending their formal submission will investigate ways and means of supporting them.

DISTRIBUTION OF THE REPORT OF THE TECHNICAL SUB-COMMITTEE

TECHNICAL SUB-COMMITTEE		TOTAL
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