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

Thirteenth Annual Meeting
June 28-30, 1972
Newport, Oregon

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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 28-30, 1972

PLACE: Newport, Oregon, U.S.A.

PARTICIPANTS:	CANADA	-C.R. Forrester R.D. Humphreys R.G. McIndoe (observer)
	UNITED STATES	
	California	-T. Jow
	Oregon	-J.M. Meehan - Chairman R.L. Demory J.G. Robinson M.J. Hosie (observer) B.O. Forsberg (observer) R.E. Loeffel (observer)
	Washington	-G.S. DiDonato D. Gunderson
	Alaska	-J. McMullen
	NMFS	-T.A. Dark
	PMFC	-J.P. Harville (observer)
	INTERNATIONAL PACIFIC HALIBUT COMMISSION	-S.H. Hoag (observer)

I. CALL TO ORDER

The thirteenth annual meeting of the Technical Sub-Committee was called to order at 10:30 AM on June 28 by Chairman J.M. Meehan 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

J.G. Robinson of Oregon (U.S.A.) was appointed to act as recording secretary for the meeting.

III. APPROVAL OF AGENDA

The agenda was approved essentially as presented with the wording "trawl" fisheries, "trawl" regulations amended to "groundfish" fisheries, "groundfish" regulations.

IV. STATUS OF STOCKS

A. Petrale sole

The United States and Canadian petrale sole catch in 1971 was 8.2 million pounds, an increase of 20% over the 1970 catch of 6.8 million pounds and only 8,000 pounds less than the 1961-70 ten-year average of 8.2 million pounds.

Area 1B, central California coast, was the most productive area with a catch of 2.2 million pounds of petrale sole. Area 3C, lower west coast of Vancouver Island, had a catch of 1.3 million pounds; Area 3A, lower Washington coast, and Area 1C, upper California coast, had respective 1971 petrale sole catches of 1.3 million and 1.1 million pounds. Petrale catches from other areas between Area 1A and 5D ranged from 3,000 to 530,000 pounds.

1. Catch/Effort

a. Canada

The 1971 Canadian catch of petrale sole was 1.1 million pounds.

The petrale sole catch from the stock off the lower west coast of Vancouver Island (Area 3C) in 1971 was 846,000 pounds, about 2.5 times that taken in 1970 and 3 times the mean for the 1961-70 period. Average CPUE, based on the performance of double gear vessels during the period May to August, was 269 lb/hr, about 2.5 times that in 1970 and twice the mean for the preceding

10 years. The improved CPUE in 1971 was due to the abundance of small fish of the 1966 and 1967 year classes in the catch. Above average year classes of petrale sole appear to be associated with relative high sea surface temperatures and greater than usual onshore water transport during the January to March period. During this period in 1966 and 1967, water temperatures were above average as was water level for 1966. In 1967, water level was about average for the period 1940-70.

In 1968 and 1970, sea temperatures were also higher than average during the January to March period. This suggests that there may be four good year classes appear in a period of five years which should result in some resurgence of the petrale sole fishery. However, incoming year classes are being exploited at much younger ages than in early years of the petrale sole fishery. Under these circumstances, even strong year classes may not survive long.

Canadian petrale sole landings from the northern stock (Areas 3D, 5A-5D) by Canadian vessels were 274,000 pounds, slightly higher than the 139,000 pound catch of 1970 but substantially below the mean for the preceding 10 years of 637,000 pounds. The most recent CPUE for the northern stock was 24 lb/hr in 1970, a reflection of a low level of abundance.

b. United States

1) Washington. The 1971 Washington trawl catch of petrale sole totaled 1.1 million pounds. This catch level represents a 37% increase from the very low 1970 landings; however, it remains well below (52%) the past ten-year mean of 2.3 million pounds.

Landings of "southern stock" petrale sole in 1971 totaled 428,000 pounds. This catch is up 62% over the very low 1970 landings of 264,000 pounds but it is still 59% below the past ten-year mean. An upsurge in catches during July and August off Ucluelet accounted for the major part of the increase in the

southern stock landings.

Some increase in Area 3B landings over 1970 occurred; however, the total catch of 223,000 pounds still remains 17% below the past ten-year mean. A total of 97,000 pounds of petrale sole was also landed from Area 3A. Petrale sole catches off the Washington coast occurred throughout the year with individual landings being of small magnitude.

Landings of "northern stock" petrale totaled 344,000 pounds in 1971. This amount is of the same magnitude as in 1970 and remains substantially below the past ten-year mean of 894,000 pounds. Catches and CPUE remained depressed throughout the entire range of the northern stock, i.e., Esteban Deep into Queen Charlotte Sound.

2.) Oregon. The 1971 catch of 2.3 million pounds was 6.7% above the 1970 catch of 2.1 million pounds and 16% above the 10-year mean catch of 2.0 million pounds.

Slightly more than half of the total Oregon catch (1.2 million pounds) came from Area 3A, lower Washington coast.

3.) California. Petrale landings in 1971 of 3.7 million pounds were 8% and 23%, respectively, greater than the 1970 catch of 3.4 million pounds and the 10-year average catch of 3.0 million pounds. Petrale catches were highest in Area 1B, central California coast, where 2.2 million pounds were taken. The catch in Area 1C, upper California coast, totaled 1.1 million pounds. Areas 1B and 1C landings were virtually the same as 1970 landings. The 1971 petrale catch in Area 1A, lower California coast, of 412,000 pounds increased 58% over the 1970 catch of 261,000 pounds. Petrale catches from Oregon waters, Area 2A, by California fishermen decreased to 30,000 pounds from 74,000 pounds taken there in 1970.

The 1971 petrale catch was the best annual catch since the 4.2 million pound catch of 1954. The 1972 catch appears destined to equal or exceed that of 1971.

2. Winter Fishery

There was no distinct winter fishery for petrale sole by Canadian vessels in 1971-72. Catches were less than 70,000 pounds and only one catch of about 1,000 pounds was taken in water deeper than 100 fathoms.

The Washington 1971-72 winter fishery for deep-water spawning petrale sole amounted to 601,000 pounds. Landings from northern stock petrale sole were at a very low level with only 73,000 pounds reported. The "southern stock" petrale, however, supported a significant fishery on the Cape Flattery "Spit" where 528,000 pounds were taken this past winter and an upsurge in landings occurred for this stock as a result.

Winter 1971-72 catches (November-January) of petrale sole in California were 1.4 million pounds. Upward catch trends continue in all areas. The respective catches from Areas 1A, 1B, and 1C were 498,000, 761,000, and 482,000 pounds.

B. Lingcod

Trawl-caught Canadian and United States landings of lingcod totaled 8.3 million pounds in 1971, about the same as in 1970, but 13% below the 1961-70 mean of 9.5 million pounds. Trends in lingcod catch during the 1961 to 1971 period have been generally upward in California and Oregon. In Washington and British Columbia, trends were upward to 1968 and have been downwards since that time. In the latter regions, it is known that some discrete stocks of lingcod are highly susceptible to fishing. The relationship between fishing, stock size, and recruitment has not yet been established for various lingcod stocks off the coast.

1. Canada

Total Canadian trawl catch of lingcod in 1971 was 3.4 million pounds, slightly above that of 1970 and about the same as the mean for the 1961-70 period. A major area of production was Area 3C where catch increased one-third over 1970 and was 25% above the mean for the 1961-70 period. Length-frequency distributions of lingcod for the years 1968-71 from Area 3C suggests that current production is largely dependent on one or more strong year classes and that no new strong year classes have appeared since 1968. Catch per unit of effort of lingcod in Area 3C in 1971 was close to the mean for the preceding 10 years.

In addition to the trawl fishery, there was a Canadian line fishery which landed approximately 2.8 million pounds of lingcod mainly from inshore grounds.

2. United States

a. Washington. Total Washington trawl catch of lingcod in 1971 was 2.0 million pounds, down 22% from 1970 and 52% from the preceding 10 years. Catches from Areas 3C and 5A still comprised the majority of the landings, but catches from those areas were only 30% and 11%, respectively, of the levels in 1961-70.

b. Oregon. Total Oregon trawl catch of lingcod in 1971 was 1.3 million pounds. This was close to a record and was up 35% from 1971 and 41% from catches of 1961-70. The bulk of the catch came from Areas 2B and 3A.

c. California. Total California trawl catch of lingcod in 1971 was 1.7 million pounds which was 27% and 94%, respectively, above the 1970 and 1961-70 average catches and the highest in the history of the fishery. Catches were made primarily in Areas 1B and 1C.

C. Pacific cod

Landings of Pacific cod by Canadian and United States trawlers in 1971 totaled 17.1 million pounds, up 89% from 1970 but 12% less than the 1961-70 mean of 19.5 million pounds. Fluctuations in Pacific cod catch appeared to be caused by fluctuations in strength of incoming year classes. These in turn appear to be the effect of changes in environmental factors rather than the effect of fishing.

1. Canada

A total of 11.0 million pounds of Pacific cod was landed by Canadian trawlers in 1971 and the species was again the dominant feature of British Columbia landings. The Canadian catch was almost twice that of 1970, but 17% less than the 1961-70 mean. Production in 1971 was aided by appearance of a relatively strong 1969 year class which was most evident on grounds off the lower west coast of Vancouver Island. In northern Hecate Strait, both catch and catch/effort have declined in recent years with declining strength of incoming year classes. However, there are indications of improved recruitment in 1972. Suitability of environmental conditions for cod production off British Columbia are estimated from surface seawater temperatures during February. In northern Hecate Strait, water temperatures were lower than usual in four of the past five years (1968-72). Such conditions should result in production of better than average year classes of Pacific cod in those years. It is noteworthy that markets for bait grey cod in Alaska are reported slow because cod are abundantly available to halibut fishermen.

2. United States

a. Washington. Washington trawl catch of Pacific cod totaled 5.6 million pounds in 1971--about twice that of 1970, but close to the mean for 1961-70. Most notable increase in catch and catch/effort occurred on grounds

off the lower west coast of Vancouver Island (Area 3C) where catch in 1971 was 50% greater than the mean for 1961-70. Catch in other Areas (4A, 5A, and 5B) remained relatively close to the 1961-70 mean.

b. Oregon. Pacific cod landings increased to 483,000 pounds from 78,000 pounds in 1970. Oregon is a fringe area for cod distribution and landings generally fluctuate with the passage of strong and weak year classes in more northern areas.

D. Pacific ocean perch

Pacific ocean perch landings in Canada and the United States at 12.8 million pounds in 1971 declined 34% from the 19.5 million pounds landed in 1970.

1. Canada

Total Canadian landings of Pacific ocean perch declined 37% in 1971 from 1970 (3.0 million pounds from 4.6 million pounds in 1971 and 1970, respectively). The 1971 catch was still 30% greater than the 10-year average, however. The decline in Canadian landings was attributed to depressed 1971 market conditions with resultant decline in effort (40% drop between 1969 and 1971). Most Canadian landings came from PMFC Areas 5A-5B (INPFC Queen Charlotte Sound sub-area), 2.4 million pounds; the rest (505,000 pounds) from Areas 3B-3D (Vancouver area).

2. United States

a. Washington. Total landings of Pacific ocean perch in 1971 declined 39% in Washington from 1970 (8.1 million pounds from 13.2 million pounds in 1971 and 1970, respectively). The 1971 catch was 37% below the 10-year average. This decline was attributed to lessened effort due to lower availability of stocks and a shift in effort to other rockfishes and Pacific cod, for which a ready market existed. Washington perch landings came from PMFC Areas 5A-5B (Queen Charlotte Sound sub-area), Areas 3B-3D (Vancouver area)

with 6.4 million and 1.6 million pounds in the first two areas, respectively. Only 41,000 pounds were taken in the Columbia sub-area.

b. Oregon. Oregon landings of Pacific ocean perch in 1971 were nearly identical to the 1970 total (1.6 million pounds), but 68% less than the 10-year average. Oregon catches remained low because of the low availability of perch in areas generally fished by Oregon vessels. No market problems existed in Oregon in 1971. Oregon catches came from all three INPFC areas - 308,000; 459,000; and, 852,000 pounds, respectively, in the Queen Charlotte Sound sub-area and the Vancouver and Columbia areas.

c. California. California Pacific ocean perch landings increased nearly 100% in 1971 over 1970--from 57,000 to 112,000 pounds, and represented an increase of 300% over the 10-year average.

E. Other rockfish

Total Pacific coast landings of rockfishes other than Pacific ocean perch decreased 7% from 1970. The catch in 1971 was 24.5 million pounds; in 1970 it was 26.3 million pounds. Most important species in this group which includes many species of *Sebastes* were *S. flavidus*, *S. pinniger*, *S. brevispinis*, *S. paucispinis*, *S. goodei*, and *Sebastolobus alascanus*.

1. Canada

Catches of other rockfishes in Canada increased 11% in 1971 over 1970 (1.7 million and 1.5 million pounds, respectively), continuing an upward trend in catches of this group sincd 1967 when only .5 million pounds were landed. This trend was caused by increased market acceptance. *S. flavidus* is the most important species and was taken in Queen Charlotte Sound.

During 1971, 49% of other rockfish landings came from PMFC Areas 5A-5B, 26% from Areas 5C-5D, and 21% from Areas 3B-3D. Four per cent of landings came from Area 4A.

2. United States

a. Washington. Washington landings of other rockfish in 1971 declined 13% from 1970 (10.5 from 12.2 million pounds), but were up 15% from the 10-year mean. Recent increases from the 10-year mean have been due, at least in part, to declining Pacific ocean perch catches with resultant shift in effort.

The estimated 1966-70 other rockfish catch species composition was 46% *Sebastes flavidus*, 32% *S.pinniger*, 15% *S. brevispinis*. 5% *S. paucispinis*, and 2% miscellaneous species. Species composition varied between grounds and with depth within grounds.

During 1966-70, 56% of the catch came from PMFC Areas 5A-5B and 43% from Areas 3B-3D. During 1971, these percentages were 59% and 37%, respectively.

b. Oregon. Landings of other rockfish totaled 3.4 million pounds, down 3% from 1970 catch of 3.5 million pounds and 27% below the 10-year mean. This was the lowest landing since 1957. The drastic reduction in landings, which started in 1970, may be due to the impact of the Soviet fleet on other species of rockfish.

Sebastes flavidus and *S. pinniger* were most important in landings.

During 1971, 72% of the rockfish landings came from PMFC Areas 2B-3A, 12% from 3B-3D, 8% from 5A-5B, and 8% from 1C-2A.

c. California. California landings of other rockfish decreased 2% in 1971 from 1970 (8.9 million from 9.1 million pounds), but were 8% greater than the 10-year mean. Leading species in 1962 and 1963 were *Sebastes paucispinis, S. goodei, S. pinniger,* and *Sebastolobus alascanus*. No recent sampling for species composition has been made but these are probably still the predominant species. *S. alascanus* has become increasingly important in landings, comprising about 15% of the total rockfish catch in 1970 and 1971.

During 1971, most (46%) of the landings came from PMFC Area 1B, 38% from Areas 1C-2A, and 16% from Area 1A.

F. English sole

Canadian and United States landings of English sole in 1971 totaled 7.5 million pounds. This total was 21% below the 1970 catch of 9.5 million pounds and 35% below the 11.6 million pound average for 1961-70. PMFC statistical Areas 1B, 5D, 1C, and 4A were the leading English sole catch areas where respective catches of 1.6 million pounds, 1.1 million pounds, 1.0 million pounds, and 984,000 pounds were made.

1. Canada

Landings of English sole in 1971 were 1.4 million pounds. This was a drop of almost 50% from 1970 and 15% less than the mean for the preceding 10 years. The bulk of the landings (74%) was taken as usual from grounds in northern Hecate Strait. CPUE in this fishery is based on performance of vessels which had 20% or more of English sole in their landing for a trip during February-June. Based on these criteria, the CPUE for 1971 was 466 lb/hr, i.e., 35% lower than the mean for the preceding six years. The English sole fishery in northern Hecate Strait is strongly dependent on newly recruited fish, primarily 4 and 5-year-olds. Production of good English sole year classes appears to require relatively low water temperature (or some factor associated with low water temperature) and there is a decline in strengths with water temperatures above 6^0C. (This, despite the potential of the egg for better survival at higher temperatures. High water temperatures are apparently associated with transport of eggs or larvae to unfavorable rearing areas; Ketchen, 1956, Alderdice and Forrester, 1968.) The principal year classes expected in 1971 were 1967 and 1966. However, the sea surface temperature in February in northern Hecate Strait (the index for temperature) in both those years was above average and some

reduction in year class strengths appeared to have occurred (age determinations have not yet been completed for 1970-71). The principal incoming year class in 1972 is expected to be 1968. Whether the temperature was sufficiently below normal in 1968 to influence year class strength remains to be seen; however, 1969 temperatures appear to be so. In February 1969, the sea surface temperature was below normal, an amount equivalent to that in 1962 when there was production of a strong English sole year class and also a very strong year class of Pacific cod in north Hecate Strait.

2. United States

a. Washington. Trawl food fish landings of English sole in 1971 were 1.3 million pounds, down 30% from 1970 and 59.2% from the past 10-year mean. In addition to the food fish landings, some 0.7 million pounds of English sole was landed for animal feed.

The northern Washington coast (Area 3B) is the principal English sole coastal area fished by Washington trawlers. Landings in this area declined to 241,000 pounds in 1971 which is at a very low level - down approximately 84% from the past 10-year mean. The 1971 CPUE value of 65 pounds per hour is also down substantially (71%) from the past 10-year mean.

Production of English sole from inside waters of Puget Sound also declined from 1970. The 1971 catch totaled 1.7 million pounds, of which 984,000 pounds were landed for food and 755,000 pounds for animal feed.

b. Oregon. English sole landings were 1.8 million pounds in 1971, down 4.5% from the 1970 total and 14.4% below the 10-year mean. Catch/effort for Areas 2A through 3A of 220 pounds/hour in 1971 was 6.8% below the 1970 figure of 236 pounds/hour.

c. California. The downward trend in English sole landings which began after 5.8 million pounds were landed in 1968 has continued. Last year

the total catch of 3.0 million pounds was 10% less than the 1970 catch of 3.3 million pounds and 34% below the 10-year mean catch of 4.5 million pounds.

The catch in Area 1B of 1.6 million pounds was only 1% below that of 1970 and the 408,000 pounds caught in Area 1A was 5% greater than the 1970 1A catch. However, the 943,000 pounds of English sole taken in Area 1C was 24% below the 1970 catch of 1.2 million pounds.

The 1972 English sole fishery appears thus far to be slightly improved over that of 1971.

Annual age compositions of the 1959-69 landings at San Francisco (Area 1B) have been compiled. The Area 1B fishery from 1959-69 has varied between 1.1 million pounds in 1960 and 3.0 million pounds in 1967. During the lowest years, 1959 and 1960, three year classes (ages 5, 6, and 7) comprised the large part of landings while in years of highest catch, 1962 to 1968, four or more year classes contributed heavily to the annual landings. Sampling in 1963 indicated a large 1959 year class. The 1960 year class was the strongest of the year classes of the early sixties. The 1961 and 1962 year classes also appeared above average during 1965 through 1968. These four year classes doubtlessly influenced the annual English sole landings during the years they occurred in the fishery.

G. Dover sole

The United States and Canada landed 24.1 million pounds of Dover sole in 1971, a decrease of 7.3% from the 1970 landings of 26 million pounds, and 39.5% above the 1961-70 mean of 17.2 million pounds.

1. Canada

Dover sole landings of 3.0 million pounds in 1971 were only slightly under the 1970 total of 3.1 million pounds and more than three times the 1961-70 average of 0.7 million pounds. Area 5D contributed 67% of the total, almost identical to the per cent in 1970 (68%). CPUE at 915 pounds per hour in 1971

was slightly lower than in 1970 (976 lb/hr).

2. United States

a. Washington. Trawl landings of Dover sole in 1971 (1.4 million pounds) were down 38.4% from those of 1970 (2.2 million pounds) at 1.4 million pounds, and 28.7% lower than the 10-year average of 1.9 million pounds. Area 3B (Goose Island ground) contributed 45% of the total. CPUE in Area 3B in 1971 at 295 pounds per hour was down substantially from 1970 (541 lb/hr), but above the mean for 1961-70 (235 lb/hr). Area 5B CPUE in 1971 at 110 pounds per hour was below both 1970 (142 lb/hr) and the 10-year average (197 lb/hr).

b. Oregon. Dover sole landings in 1971 were identical to the 1970 total, 5.5 million pounds; up 22% above the 10-year average of 4.5 million pounds. Area 2B catches comprised 64% of the total, Area 3A, 22%. CPUE in Areas 2A through 3A was up from 1970, 444 compared to 375 pounds per hour tow. Continued strength of the strong 1961 year class supported the good 1971 Dover sole fishery.

c. California. The 1971 Dover sole catch of 14.2 million pounds was 6.0% less than the record 1970 catch of 15.1 million pounds. It was 42.0% more than the 1961-70 mean of 10.0 million pounds. Most of the catch came from Areas 1C and 1B (7.8 and 5.6 million pounds, respectively). The Area 2A catch was 781,000 pounds. Production in Area 1C that was down 19% from 1970 partly offset by an increase of 28% in Area 1B. The Dover sole fishery in California will continue at high levels in 1972 with Area 1C production about the same as recent years, while there will be an increased production in Area 1B.

V. REVIEW OF THE FISHERY

The 1971 trawl landings from the northeastern Pacific by Canadian and United States vessels were 134.3 million pounds. This catch was a decrease of

5.1 million pounds (3.7%) from the 139.4 million pounds landed in 1970 and 10.5% below the 10-year (1961-70) average of 150.0 million pounds. Total effort was 154.9 thousand hours. This was about the same as the 154.3 thousand hours expended in 1970 and 2.8% below the mean effort for the previous 10 years. The overall CPUE in 1971 was 867 lb/hr, 8.0% below the mean for the past 10 years.

The leading species group in the 1971 trawl fishery continued to be other rockfish with landings of 24.5 million pounds. This catch was a decrease of 6.7% below that of 1970, but still 7.8% above the 1961-70 mean. A 1.6 million pound drop in the Washington landings was responsible for most of the rockfish decline. Pacific cod was the roundfish next in importance with a total landing of 17.1 million pounds. This is an increase of 88.3% above the 9.1 million landed in 1970; however, it is still 11.0% below the 10-year mean. Main catches of Pacific cod were from grounds off the lower west coast of Vancouver Island (Area 3C), Hecate Strait (Areas 5C and 5D), and Queen Charlotte Sound (Areas 5A and 5B). British Columbia and Washington account for most of the landings with 11.0 and 5.7 million pounds, respectively. Landings of Pacific ocean perch at 12.8 million pounds were down sharply (34.5%) from the 19.5 million pounds landed in 1970. A part of the decline can be attributed to the removal of the factory stern trawler Seafreeze Pacific from the fleet. Total flatfish landings in 1971 were 51.5 million pounds, 5.3% less than in 1970. Dover sole (24.1 million pounds) continued as the predominant species, followed by petrale sole (8.2 million pounds). California was the major area of landings for both Dover and petrale soles with Oregon in second spot for both species. Animals food landings amounted to 7.5 million pounds, a decrease of 2.0% from 1970. Animal food landings for mink food continue to drop sharply and are now at their lowest level in 20 years. Poor market conditions for fur pelts apparently

has resulted in reduced stocks of mink which in turn reduced demand for fish as food. The large drop in mink food landings in 1971, however, was almost balanced by an increase in animal food landings used as pet food. Fish landed for reduction purposes (fish meal) declined 20.7% from 10.3 million pounds in 1970 to 8.1 million pounds in 1971. This decline reflected the closure of a fish meal plant in Blaine, Washington and the absence of fish meal produced on the factory stern trawler Seafreeze Pacific.

VI. REVIEW OF TERMS OF REFERENCE

Mr. Meehan read the terms of reference of the International Groundfish Committee and Technical Sub-Committee as described in the minutes of the first meeting of the Technical Sub-Committee (1960) and amended at the thirteenth annual meeting of the International Groundfish Committee (1971). The terms of reference are as follows:

(A) To review proposed changes in groundfish regulations affecting fisheries of common interest before they are implemented.

(B) To review the effectiveness of existing regulations.

(C) To exchange information on the status of groundfish stocks of mutual concern and to coordinate, wherever possible, programs of research.

(D) To recommend the continuance and further development of research programs in order to provide a basis for future management of the groundfish fishery.

There was no comment on the Terms of Reference.

VII. REVIEW OF DATA EXCHANGE PROCEDURES

The possibility of adding species to the PMFC Data Series was discussed. Dr. Harville commented that minor changes had been made in the data series, with some pages added. He further noted that statistics for the longline fishery and pot fishery are being added.

A desire for distribution of copies of completed tag experiments was expressed by several persons. Mr. Dark (NMFS) asked for tag experiment reporting forms, and expressed a desire for NMFS to participate in reporting in future. NORFISH might collate and distribute monthly tag experiment data. It was agreed one copy of each completed tag experiment will be sent to each agency.

Mr. Forrester commented on the desirability for each reporting agency to define the basis for catch per unit of effort data in status reports. As it is, various agencies use different levels of effort in CPUE.

Some discussion took place on procedures for reporting or distributing Soviet and Japanese fishery statistics obtained through various means by member states. Mr. Forrester (and others) thought this information would be useful to have available for Sub-Committee meetings. Mr. Dark will obtain clarification on the availability of Japanese fishery data aquired through INPFC.

VIII. REVIEW OF AGENCY PROGRESS

A. Current and Proposed Research

1. Canada

a. Near Seas Investigation

The collection and analyses of catch and effort statistics for purposes of measuring changes in abundance of the important trawl-caught groundfish species continued to be an important function of the Near Seas group. 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), rock, English, and petrale sole (otoliths), and a start was made on interpretation of lingcod scales for purposes of determining growth.

b. Rockfish Investigation

During 1971, three G.B. Reed groundfish cruises were completed which dealt with rockfishes and their environment. GBR 71-1 (June) included an echo-sounder survey for bottom-type in south Queen Charlotte Sound, and calibration of the BCF Mark II Universal Trawl (as an off-bottom trawl) with the standard on-bottom trawl used on the G.B. Reed.

GBR 71-2 (August) included collection of length-weight and length-girth data for Pacific ocean perch off southeastern Alaska, and exploration of an uncharted bank off Dixon Entrance and a little-known gully in Queen Charlotte Sound. GBR 71-3 (October) included a collection of *Sebastes proriger*, *S. reedi*, and *S. alutus* (control) for technological tests of fillet storage, and a trawl survey of the Pacific ocean perch stock in south Queen Charlotte Sound.

Laboratory activities consisted of otolith reading and report writing.

c. Tagging studies

No new tagging operations were conducted by the groundfish group.

2. United States

a. Alaska. Groundfish research in Alaska has been incidental to general management activities on salmon, king crab, and shrimp. About 600,000 pounds of sablefish were landed, mostly caught by longline in southeastern Alaska.

There is a groundfish catch incidentally caught by the shrimp fishery. No sampling of this catch has been done to date; no species breakdown is available. Much of it is sold to crab fishermen for bait.

b. Washington. A very substantial part of the department's groundfish program continues to be supported by a PL 88-309 contract "Washington Trawl Fishery Monitoring and Data Analyses Studies".

1.) Groundfish Data Collection and Processing Systems. Daily coverage of the major Puget Sound landings is accomplished by two port samplers. These individuals collect catch and fishing effort data utilizing a fishermen interview system established in 1953. During 1971, interview coverage was obtained for 94% of the coastal landings and 78.5% of the "inside" landings for an overall average of 92% (excludes Pacific hake fishery).

Biological samples are also collected by the port samplers. Major species are sampled for length, sex, age for the flatfishes, weight and maturity for Pacific ocean perch and Pacific hake. Rockfish species catch composition estimates (both visual and by direct count) are also made. Market samples collected during 1971 totaled 206, down somewhat from the 233 obtained in 1970.

Tagged fish are recovered from the vessel's catches by the port samplers and are processed and readied for keypunching at the Seattle office.

One biologist is stationed at the federal-state groundfish age reading unit located at the National Marine Fisheries Service Laboratory in Seattle,. Routine production age readings are being obtained for Pacific ocean perch and Pacific hake utilizing otoliths. English sole interopercles have also been aged from special samples collected during monthly cruises in the Gulf of Georgia. Age reading work on starry flounder interopercles from the Gulf of Georgia cruises and petrale sole otoliths from market samples have just begun.

A computer-oriented data storage and retrieval system has been developed for the catch-effort data, biological samples and tagging records.

2.) Groundfish Data Analyses Studies. These studies include estimations of survival, mortality, recruitment and yield, interpretation of

catch and effort data for trends in abundance, analyses of tag recoveries for distribution and migration patterns, and standing stock estimates from acoustic survey.

Age and length samples from commercial landings of Pacific ocean perch were used to show that this species tends to form aggregations with differing growth rates. A report on this subject will appear in the July issue of the Fisheries Research Board of Canada Journal. The Technical Sub-Committee report on the status of Pacific ocean perch stocks off British Columbia, Washington, and Oregon prepared in conjunction with the Fisheries Research Board of Canada and the Fish Commission, was completed in March 1972. Preliminary analysis of the 1967-71 northern Washington Pacific ocean perch cruises has been completed. A draft of the results is currently being prepared. It is hoped that a 1972 cruise can be made in July or August. Analysis of the 1953-70 Pacific ocean perch catch and effort data is well underway. It is hoped that this work, utilizing the long series of fleet logbook data, will provide some insight into potential yields and the effects of foreign and domestic trawling in absolute rather than relative terms. The Schaefer logistic model, or some modification of it, is being applied to this end.

Liaison work with personnel of the University of Washington Sea Grant program NORFISH has been a significant activity. The NORFISH project, which is basically a systems analysis approach to North Pacific Fisheries, has materially aided the Groundfish Investigations section through advances in groundfish data retrieval and analysis capabilities and stock assessment work.

Recoveries from a 1964 central Puget Sound tagging study are being analyzed to evaluate the possible occurrence of "homing instincts" for English sole to specific localized areas.

Acoustic assessment of Puget Sound hake populations have been conducted each spring since 1969. A report discussing the methods, instrumentation, and results of the first two season was published in the September issue of the Fisheries Research Board of Canada Journal.

A final report on the problem of a sport-commercial conflict in Discovery Bay, Washington has been published in the department's Technical Report series. The conclusion of the study was that the bottomfish resource in Discovery Bay is not being overfished and that the present commercial trawl fishery is not significantly affecting the recreational fisheries for salmon or bottomfish in the area.

Three tagging cruises were conducted since those reported at the 1971 meeting. The commercial trawler Lemes was chartered to fish central Puget Sound for a period of five days beginning June 17, 1971. Fifteen tows were completed and 3,707 English sole were tagged and released. The commercial trawler Reliance was chartered to fish the Admiralty Inlet area of Puget Sound for five days beginning June 17, 1971. Twenty tows were completed and 1,422 English sole, 929 rock sole, 217 sand sole, and 8 petrale sole were tagged and released. In conjunction with Dr. G. Paulik's Fisheries class at the University of Washington, the research vessel Commando made seven drags in southern Puget Sound on November 21-22, resulting in a total of 1,492 dogfish shark tagged and released.

c. Oregon

1.) Tagging. Four tagging trips were completed from July 1971 to June 1972. All tagging was accomplished in Area 2B on Dover sole during regular trips of commercial vessels. On July 23-25, 1971 and August 3-4, 1971, one thousand sixteen fish were tagged off Coquille Point in 60 to 150 fathoms

of water. On February 3-4, 1972 and March 31 to April 1, 1972, four hundred forty-nine fish were tagged off Cape Arago in 180 - 280 fathoms of water. In addition to the above studies, 35 lingcod were tagged aboard the charter vessel R/V Commando during the September 1971 resource survey of flatfishes.

2.) Biological studies. The resource surveys started in 1971 will be continued in 1972. One study will determine the biomass of flatfish occupying the continental shelf of Oregon between Cape Blanco and Newport. A second study will determine the biomass of Oregon pink shrimp (*Pandalus jordani*) off Oregon between Cape Blanco and the Columbia River. Both phases will be funded with PL 88-309 funds.

3.) Sampling program. Landings of Dover sole, English sole, petrale sole, Pacific ocean perch, and rockfish were sampled at Brookings, Coos Bay, and Astoria. Animal food landings were sampled at Newport and Astoria.

d. California. The 88-309 Shellfish and Bottomfish Data Analysis Project has continued to work closely with the Bottomfish Program. Its normal staff is comprised of two biologists, a statistical methods analyst, a computer programmer, and a key punch operator. Staffing has continued to be a problem and this project remains understaffed. A systems analysis study of the Bottomfish Program is being conducted in cooperation with the Data Analysis Project. While progress has been slow, it is anticipated that the study will be completed in 1972.

1.) Tagging. In 1971, 2,519 sablefish were tagged during two cruises of the N.B. Scofield in conjunction with studies of distribution, abundance, ecological relationships, and population stocks of sablefish and other groundfish in southern and central California. A cruise with similar objectives was completed in May 1972 when 662 sablefish were tagged off northern California. No other groundfish were tagged since the 1971 meeting of the Technical Sub-Committee.

2.) Biological studies. Studies of sablefish and associated species were conducted during the aforementioned N.B. Scofield cruises. The sampling gear was 100-fathom groundline longlines with 220, 6/0 hooks on 18-inch gangens. Fishing operations were conducted in southern, central, and northern California during the three cruises. At fishing depths ranging from 100 to 600-fathoms, the gear selectively caught sablefish along with a few rockfish in the shallower sets and good numbers of rattails (*Coryphaenordes sp.*) in deeper sets. Best catches of sablefish were from the 400-fathom sets in central and northern California. Sets in 500-fathoms had the best catches in southern California. A south to north trend in sablefish abundance also was evident; sablefish were least abundant in southern California. Data from the most recent cruise are being compiled for analysis.

A series of N.B. Scofield cruises are scheduled to begin in early 1973 to study groundfish species in nearshore areas off central and northern California. The information generated will be valuable in resolving user conflicts in areas that, due to the proximity to land, are extremely sensitive to the activities of man.

3.) Sampling program. Landings of Dover, English, and petrale sole were sampled at Eureka, Fort Bragg, San Francisco, Monterey, Morro Bay, and Santa Barbara. In 1971, 61 English sole, 59 Dover sole, 48 petrale sole, and 17 animal food samples were obtained of fish caught from Areas 1A, 1B, 1C, and 2A.

Age interpretations of collected age structures of English, petrale, and Dover sole were continued. A backlog still exists; however, aging of samples collected through 1969 were completed.

e. National Marine Fisheries Service. The Seattle Biological Laboratory has been reorganized as the Northwest Fisheries Center of the

National Marine Fisheries Service under NOAA. The Center includes most of the facilities of the Montlake complex and the Kodiak Marine Fisheries Facility. The Marine Fish and Shellfish Division, one of 5 divisions comprising the Center, is responsible for all groundfish and shellfish research undertaken by NMFS throughout the Northeastern Pacific Ocean and Bering sea.

1.) Hake. With the completion of study on age and growth, the hake program has been reduced to monitoring the age and length composition of the population off Oregon and Washington and the distribution and abundance of eggs - larvae off California (La Jolla Laboratory). This information supplements foreign fishery statistics and foreign research data in evaluation of the status of the stocks. Future Studies - continued monitoring of age and length composition (July 1972) and distribution and abundance of eggs - larvae.

2.) Saury. Saury studies will be terminated with the completion of two reports now in progress. Although a promising harvesting technique was developed, it was concluded that eastern Pacific saury do not occur in commercial concentrations with adequate frequency. This observation has been generally substantiated by Japanese exploratory ventures. Considerable information was accumulated on distribution, abundance, age and length composition, growth and mortality, and life history.

3.) Sablefish. Increasingly intense foreigh fishing effort and renewed interest (after a transitory mercury "scare") on part of the domestic industry have emphasized the need for sablefish research. In 1971, pot strings were fished off Washington to assess distribution and abundance, but difficulties in estimating catchability coefficients precluded evaluation of abundance. A cooperative tagging program involving NMFS, the west coast states and the Soviet Union has been initiated to determine migration behavior

and to help define population components. During the winter of 1972, 2,400 tagged sablefish were released off southeast Alaska. No returns have yet been received. A cruise is scheduled for the summer 1972 off Oregon and Washington to examine the effects of various pot construction materials on the size of the catch and to tag and release as many sablefish as is possible. The Soviet research vessel, Ogon, is scheduled to begin tagging off Washington using NMFS tags and application equipment. Subsequent studies will include comprehensive analysis of foreign fishery statistics, early life history studies, and development of survey techniques.

4.) Pollock. The obvious great potential of the pollock resources in the Bering Sea and northeastern Pacific Ocean has stimulated the emergence of this new research activity. To date, a literature review has been completed, foreign fishery statistics and survey data have been evaluated and plans for a preliminary resources survey culminated. In the summer of 1972, we will study a small area south of Kodiak Island to develop suitable survey and sampling techniques and to collect biological data. This information will provide a basis for design of more comprehensive surveys to determine distribution and abundance, estimate vital population parameters, define life history aspects, determine vulnerability of pollock to existing harvesting methods, and predict the potential yield.

5.) Kodiak. The R/V Oregon, operating out of the Kodiak Marine Fisheries Facility, is currently in the eastern Bering Sea. The objectives of the cruise are to: assess the abundance, distribution, and species composition of the groundfish community, estimate standing stocks, gather biological data, measure environmental parameters which may effect distribution and abundance, and to accumulate background data for estimation of recruitment, growth mortality, and eventually maximum sustained yields.

6.) Other Activities. Considerable time and effort has been devoted to the program development plan for Phase II (demersal surveys) of the Marine Resources Monitoring Assessment and Prediction (MARMAP) program. It is anticipated that this program will become increasingly demanding on our research resources and will eventually be one of our more important activities. Spinoff information will serve to satisfy some of the objectives of future studies cited previously.

Work continues on commercial and research gear development. Examples are paired trawls, multietsonde, sablefish pot design, computerized acoustic survey system.

B. Reports Completed or in Progress.

Lists were circulated prior to the meeting and reviewed at the meeting for each participating agency.

IX. 1971 RECOMMENDATIONS OF THE TECHNICAL SUB-COMMITTEE

Review of the special status report on Pacific ocean perch. Chairman Meehan reviewed progress on this joint Canadian-United States project. A report has been prepared and accepted by both Canadian and United States sections of the International North Pacific Fisheries Commission, and is now an official INPFC Document. It was agreed that is be published by Canada as Technical Report No. 326.

The status report on Pacific ocean perch (Appendix B) off the Oregon-Washington and British Columbia coasts concludes that the stocks in Queen Charlotte Sound are in relatively good shape, whereas the stocks in the Vancouver and Columbia areas are in a depleted state. Based on these conclusions, the Technical Sub-Committee discussed a variety of management strategies that might be implemented in order to maintain the Pacific ocean perch stocks

in Queen Charlotte Sound and improve them in the Vancouver and Columbia areas. As a result of the discussions, the following management program was formulated:

Pacific Ocean Perch Management Recommendations

A. Immediate Needs

1. Establish catch ceilings in the Vancouver and Columbia management areas (Vancouver Area - 2,000 m.t.; Columbia Area - 1,500 m.t.).

2. Monitor changes in age composition and total mortality.

3. Obtain estimates of Pacific ocean perch catch by management area, including discards, for both domestic and foreign fleets.

B. Long Term Needs

1. Agree on a reasonable age at entry.

2. Explore methods of controlling age of entry into catch.

3. Examine relationship between stock size and recruitment.

4. Institute special studies within certain areas (i.e., relation between Soviet hake fishery in the Vancouver and Columbia areas and the Pacific ocean perch stocks).

5. Refine biomass estimates by management area.

6. Determine acceptable exploitation rates by management area.

7. Review the need for catch ceiling by management area.

8. Continue to obtain estimates of Pacific ocean perch catches, including discards, for both domestic and foreign fleets.

X. 1971 RECOMMENDATIONS OF THE INTERNATIONAL GROUNDFISH COMMITTEE

Discussion of agenda item X was short.

Chairman Meehan welcomed T. Dark as a fully accredited representative to the Technical Sub-Committee.

Messrs. J.G. Robinson and R.L. Demory were added as Oregon representatives to the Technical Sub-Committee. It was recommended that Dr. Alverson of NMFS

be placed on the list of advisors and others.

XI. INTERNATIONAL MATTERS

A. Status of foreign groundfish fisheries off the west coast of Canada and the United States.

1. Canada

As in past years, the Soviet hake fleet appeared off the southwest coast of Vancouver Island during June (36 trawlers and 2 transports). Also during June, 2 Soviet transports and 25 Soviet trawlers entered the port of Tasu on the southeast coast of the Queen Charlotte Islands. Soviet fishing activity off the southwest coast of Vancouver Island ranged from a minimum of 22 trawlers to a maximum of 63 trawlers plus 1 tug, 2 tankers, and 2 transports during July. During August and September, the Soviet fleet off the southwest coast of Vancouver Island began to decrease. By the end of September, the Soviet fleet had declined to about 21 trawlers and 1 tanker off the southwest coast of Vancouver Island. Thirty-three Soviet trawlers, 5 transports, and 1 tug entered the port of Tasu during September. On October 11, Soviet trawlers were sighted off the southwest coast of Vancouver Island and 6 trawlers and 2 transports were present in the port of Tasu. The last Soviet trawler left B.C. coastal waters by December 5, 1971.

One to 3 Japanese longliners fished coastal waters off Queen Charlotte Sound and the west coast of Vancouver Island throughout the year. Two Japanese trawlers appeared in May 1971 off the northwest coast of the Queen Charlotte Islands and 1 Japanese trawler fished the southwest coast of Vancouver Island during July-September. In August, a saury vessel was sighted off the southwest coast of Vancouver Island.

2. United States

a. Gulf of Alaska. (January-September 1971). The Soviets apparently began fishing for Pacific ocean perch in the Gulf of Alaska in March 1971 when 3-4 trawlers were observed off southeastern Alaska. In May, 2 BMRT factory trawlers and 2 SRTM freezer side trawlers fished for perch in the western Gulf. In late June, one trawler began fishing off Kodiak Island and was joined by additional trawlers during the next month. By the end of July, 11 BMRT's were fishing the western and central Gulf, mainly on Albatross and Portlock Banks. In August, the size of the fleet was reduced to about 6 trawlers in the central Gulf. In late September, the fleet swelled to 14 BMRT factory stern trawlers which fished from the Fairweather Ground in the eastern Gulf to Albatross Bank in the central Gulf.

The 1971 USSR shrimp fishery began in early January with 6 SRTM's fishing near the Shumagin Islands. By February, the fleet in that area had increased to 16 SRTM's. In mid-February, 8 SRTM's left the Shumagin area and began fishing the Portlock Bank east of Kodiak Island. In early April, fishing effort was again focused off the Shumagin Islands where 16 SRTM's were observed. By early May the fishery ended.

b. Oregon-Washington. (January-September 1971, January-June 1972). Soviet vessels appeared off Oregon in early April 1971. By July, there were 65 fishing vessels and 15 support vessels off Oregon-Washington. By mid-July, all but 3 trawlers had moved northward along the Washington coast to La Perouse Banks. In past years, the movement to La Perouse Banks normally did not occur until September. By September, the fleet was reduced to about 25 vessels. Observed catches were mostly hake. In general, fishing effort appeared to be somewhat greater than in 1970, but observations indicated that the catch of hake was smaller.

In May 1972, 28 trawlers and 2 reconnaissance side trawlers appeared off Oregon. As of June 22, there were 29 stern trawlers, 2 side trawlers and 4 support vessels operating from Cape Lookout to Heceta Bank, Oregon. A very few large catches (30-40 thousand pounds) of hake were observed.

c. Japanese Commercial Fisheries. (Northeastern Pacific, January-July 1971). In 1971, the Japanese groundfish fishery in the northeastern Pacific Ocean was conducted by 42 trawlers and 22 longline-gillnetters. A preliminary estimate of the catch by this fleet was 59,342 m.t., an increase of 5,905 m.t. for the same period in 1970. There was an increase in the pollock and Pacific ocean perch catch and decreases in blackcod and flounder catches.

Of the total catch, 25.3% was blackcod, 43.8% was Pacific ocean perch, 23.1% was pollock, and other species 7.8%.

Of the total catch, 25.7% was taken from the Shumagin Island area, 24.7% from the Kodiak area, 20.0% from the Yakutat area, 14.8% from the southeastern Alaska area, and 14.8% from other areas.

Off Washington-Oregon, there was again just a token groundfish effort by 2 stern trawlers and 1 longliner fishing off Destruction Island, Washington. In September, however, the number of vessels swelled to 18 when the saury fleet arrived for exploratory fishing primarily with "Boki-ami" gear, but possibly gillnetting and seining were also attempted.

d. California. Mr. Jow reported that foreign fishing off California is less than in previous years.

B. Recent developments in fisheries agreements.

No recent developments in fisheries agreements were reported.

C. International Commission for the exploration of the north Pacific.

Chairman Meehan opened discussion of this item. The body would be mainly for exchange of scientific information. The Technical Sub-Committee supported

the concept in principle.

XII. RECOMMENDATIONS FOR COOPERATIVE PROGRAMS

A. Aging Workshop. Mr. Meehan recommended that an aging technique workshop be held within the next one to two years, especially on flounders. After some discussion, it was agreed Oregon would initiate correspondence with the objective of canvassing members as to state of knowledge on aging and a tentative agenda for such a workshop. A liaison group was suggested by the Technical Sub-Committee as follows:

Canada	C. Forrester
United States	
NMFS	Richard Major
Alaska	J. McMullen
Washington	Ruth Mandapat
Oregon	R.L. Demory
California	T. Jow
IPHC	W. Hardman

A specific recommendation was drafted and appears under agenda item XV of this report.

B. Species reports on "other rockfishes".

Discussion on the necessity of this item developed into recommendation 2, agenda item XV (A).

C. Lingcod Report. Discussion of need for a special status report on lingcod stocks also developed and a working committee of C. Forrester, G. DiDonato, and J. Hardwick was to develop preliminary summary of available knowledge on this species.

D. Sablefish Tagging. Programs were discussed as a possible cooperative project, Canada has plans to do some tagging in August. No recommendation for cooperative tagging was made.

XIII. GROUNDFISH REGULATIONS

A. Recent or proposed changes.

1. Canada

Canada is considering taking action to rescind catch limits (winter) on petrale sole. Also, they are considering removing the minimum size limit on sablefish, provided other coastal agencies concur. No changes in regulations were reported.

2. United States

a. Washington. Washington reported no changes in regulations, although they might consider rescinding the sablefish minimum size limit.

b. Oregon. Oregon reported that the minimum size limit on sablefish had been rescinded in spring, 1972. Also, minor changes in wording of several regulations had been accomplished recently for clarification. A permit (experimental) had been issued for a set-gillnet permittee to take groundfish in the ocean, and a longline permit issued for the taking of groundfish in Yaquina Bay. No proposed changes are planned.

c. California. Legislation is in progress to extend for another year the regulations that: (1) permit trawling between Point Lobos and Point Sur in waters not less than one mile from shore (Area 1B), and, (2) trawling with nets with not less than 5½-inch meshes between Point Arguello and El Capitan Point (Area 1A) in waters not less than 25 fathoms and not less than one mile from shore. The current regulations will be in effect until the 61st day following adjournment of the 1972 regular session of the legislature.

California halibut trawl grounds were designated as adjacent to the mainland shore in waters not more than 25-fathoms deep and not less than one mile from shore between Point Arguello and Point Mugu (Area 1A).

Within the halibut trawl grounds:

1.) Open season shall be June 1 through January 30.

2.) No halibut less than 4 pounds round may be possessed aboard trawlers.

3.) Not more than 500 pounds of other fish may be possessed.

4.) Codend mesh of 7½".

The director may close the area or part of it if the resource or the fishing operations are in danger of irreparable injury. These regulations are to remain in effect until the 61st day following adjournment of the 1975 regular session of the legislature.

California has groundfish regulations (gillnetting) not historically considered under trawl regulations. These will be compiled and circulated at the next meeting.

d. Alaska. No changes, past or proposed, were reported for Alaska for groundfish. The Kodiak Island-area shrimp quota system has been changed, so that unfilled portions of quarterly quotas are not added to the following quarterly period's quota.

e. International Pacific Halibut Commission. Mr. Hoag foresaw no immediate changes in halibut regulations relating to trawling gear.

B. Effectiveness of regulations.

Discussion of this item was deferred until the next meeting.

XIV. OTHER BUSINESS

Dr. Harville advised the Technical Sub-Committee of two Acts now pending in the United States Congress which, if passed, would be significant to the United States, and possibly to Canada indirectly. They are:

A. High Seas Conservation Act. This would give the Federal Government management capability in the 3-12 mile contiguous fishery zone. Passage of the Act would mean some liaison between present state or multi-state managers and federal managers, and cooperative agreements would need to be worked out.

B. State-Federal Fisheries Management Act. This Act would provide 100% grants to state or federal jurisdictions for work on multistate fisheries. Plans are very tenuous at present, but a target date for 1973 enactment was hoped for and up to 3.5 million dollars to assist states in management problems. A stated or demonstrated need for cooperative research-mangement by the states would enhance chances for obtaining grants under this Act.

XV. RECOMMENDATIONS

A. Future Work

1. Groundfish aging techniques. The Technical Sub-Committee recommends that Oregon initiate correspondence with other west coast agencies on the status of aging methods and technology. Such correspondence will result in a collation of such knowledge with the objective or preparing an agenda for consideration of aging methodology at a workshop to be held in the next one to two years if such a meeting seems desirable and useful.

2. Other rockfish (*Sebastes spp.*). The Technical Sub-Committee recommends that each agency develop and present a special report at the 1973 meeting on the state of knowledge of other rockfish fisheries.

3. Lingcod. The Technical Sub-Committee (Lingcod Working Group) shall examine and prepare a summary on available data on west coast lingcod stocks.

4. Sablefish research programs. The Technical Sub-Committee recommends that each agency develop a sablefish research program at the maximum

feasible level and develop recommendations for a cooperative research program for discussion at the next Sub-Committee meeting.

B. Parent Committee

The Technical Sub-Committee recommends that the Parent Committee request of their respective governments that immediate action be taken to institute the specific system of Pacific ocean perch management as outlined under item IX of these minutes. The Sub-Committee further recommends that a catch ceiling of 2,000 metric tons be set for the Vancouver Area and a catch ceiling of 1,500 metric tons be set for the Columbia Area (see Appendix C).

XVI. SCHEDULE OF MEETING

A. International Groundfish Committee

The I.G.C. meeting will be held on November 14, 1972 at the Cosmo Airtel, Portland, Oregon in conjunction with the annual Pacific Marine Fisheries Commission meeting.

B. Technical Sub-Committee.

The fourteenth annual meeting was scheduled for mid-June, 1973 in the State of Washington. Exact dates and place will be scheduled later.

XVII. ELECTION OF CHAIRMAN FOR 1973

The Sub-Committee elected R.D. Humphreys, Canada, as Chairman for 1973. His term of office was set to begin January 1, 1973.

XVIII. ADJOURNMENT

The meeting was adjourned at 10:40 AM on June 30, 1972.

AGENDA AS ADOPTED

TECHNICAL SUB-COMMITTEE OF THE

INTERNATIONAL GROUNDFISH COMMITTEE

NEWPORT, JUNE 1972

13th ANNUAL MEETING

I. CALL TO ORDER

II. APPOINTMENT OF SECRETARY

III. APPROVAL OF AGENDA

IV. STATUS OF THE STOCKS

1. Petrale sole (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 TERMS OF REFERENCE

VII. REVIEW OF DATA EXCHANGE PROCEDURES

VIII. REVIEW OF AGENCY PROGRESS

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

IX. 1971 RECOMMENDATIONS OF THE TECHNICAL SUB-COMMITTEE

X. 1971 RECOMMENDATIONS OF THE INTERNATIONAL GROUNDFISH COMMITTEE

XI. INTERNATIONAL MATTERS

1. Status of foreign groundfish fisheries off the west coast of Canada and the United States
2. Recent developments in fisheries agreements
3. International commission for the exploration of the north Pacific

XII. RECOMMENDATIONS FOR COOPERATIVE PROGRAMS

XIII. GROUNDFISH REGULATIONS

1. Recent and proposed changes in groundfish regulations
2. Effectiveness of regulations

XIV. OTHER BUSINESS

XV. RECOMMENDATIONS

1. Future work
2. Parent Committee

XVI. SCHEDULE OF MEETINGS

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

XVII. ELECTIONS OF CHAIRMAN FOR 1973

XVIII. ADJOURNMENT

APPENDIX B

ON THE STATUS OF PACIFIC OCEAN PERCH (SEBASTES ALUTUS) STOCKS OFF BRITISH COLUMBIA, WASHINGTON, AND OREGON IN 1970

Note: Appendix pages B-1 through B-48 distributed under separate cover.

DETERMINATION OF CATCH CEILINGS

The Technical Sub-Committee reviewed the report entitled "On the Status of Pacific Ocean Perch (*Sebastes alutus*) stocks off British Columbia, Washington, and Oregon 1970" (Appendix B of the report of the 13th annual meeting). As a result of this review, the Technical Sub-Committee recommended catch ceilings for the INPFC Vancouver Area (2,000 metric tons) and Columbia Area (1,500 metric tons).

The following paragraphs give some of the methods and rational for arriving at the recommended catch ceilings.

Vancouver Area:

Mean 1966-1968 biomass of marketable fish in the Vancouver Area = 34,000 m.t.

Mean weighted 1966-1968 Washington CPUE = 0.538

Mean weighted 1969-1971 Washington CPUE = 0.296

$$\text{Mean 1969-1971 biomass} = \frac{0.296}{0.538} \quad (34{,}000) = 18{,}703$$

In view of the extremely low levels of stock density in the Vancouver and Columbia areas, it seems unwise to utilize only yield-per-recruit analyses and to ignore the possibility of future recruitment failure. As a result, it seems prudent to follow the guidelines set by Tyurin (1967) and limit annual fishing mortality to the level of annual losses from natural causes (μ=v). He suggested this because in the species he studied, population fecundity was sharply reduced at high levels of F. Following his procedure:

$$\frac{\mu}{a} = \frac{1}{2}, \frac{M}{Z} = \frac{1}{2}, F = M = 0.12, Z = 0.24, a = 0.213$$

The recommended exploitation rate would be $\frac{a}{2} = \frac{0.213}{2} = 0.106$, and the resulting 1973 catch ceiling for the Vancouver Area would be 18,703 (0.106) = 1,983 ≃ 2,000 m.t.

Columbia Area:

Mean 1966-1968 biomass of marketable fish in the Columbia Area = 35,000 m.t.

Mean weighted 1966-1968 Oregon CPUE = 0.375

Mean weighted 1969-1971 Oregon CPUE = 0.156

$$\text{Mean 1969-1971 biomass} = \frac{0.156}{0.375} \quad (35{,}000) = 14{,}560 \text{ m.t.}$$

Using the procedure from the Vancouver Area, the resulting catch ceiling for the Columbia Area would be 14,560 (0.106) = 1,543 ≃ 1,500 m.t.

Sources of Error:

Since the catch records of all nations contained an unknown quantity of rockfish other than Pacific ocean perch, the 1966-1968 biomass estimate was overestimated to some degree. This would make the proposed catch ceilings too high. On the other hand, the catch ceiling computations were quite sensitive to the estimate of M. Our data indicated 0.12 as the best estimate of M. The true value, however, could be anywhere between 0.10 and 0.20. If M was underestimated, the proposed catch ceilings would be too low. These two sources of error would tend to compensate each other.

Condition of Implementation:

Catch ceilings represent a maximum permissible fishing mortality. They should include not only catches landed, but also catches caught and discarded.

Literature Cited

Tyurin, P.V. 1967. Biological foundations for the optimum rate of fishing out and the permissible extent of by-catch of the young of valuable fish. In: Methods of assessing fish resources and forecasting catches, edited by T.F. Dement'eva and K.A. Zemskayo. All-Union Scientific Research Institute of Marine Fisheries and Oceanography (VNIRO), Proceedings 62:33-49. (Israel Program for Scientific Translations Ltd. Cat. No. 5479).

Distribution of Report
Technical Sub-Committee

		Total
Technical Sub-Committee		
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
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
I.P.H.C.	S. Hoag	1
Spare		4
	Total	39

State of Washington
DEPARTMENT OF FISHERIES
Fisheries Center, Univ. of Wash.
Seattle, Washington 98105

MEMO

TO: Technical Sub-Committee Members **DATE:** April 23, 1973

FROM: Gene DiDonato, WSDF

SUBJECT: Historical Trawl Fishery Statistics, 1950-1970

Please find attached WSDF trawl catch statistics for the 20-year period, 1950-1970. This information is distributed as a supplement to the historical catch statistics contained in appendix B-1 of the 1971 Technical Sub-Committee Annual Report.

GD:rh
cc: C. Forrester (FRBC)
R. Humphreys (CE)
T. Dark (NMFS)
J. McMullen (ADFG)
D. Gunderson (WSDF)
J. Meehan (OFC)
J. Robinson (OFC)
B. Demory (OFC)
T. Jow (CDFG)

WASHINGTON TRAWL LANDINGS
1950 through 1954 (1,000 Pounds)

SPECIES	1950	1951	1952	1953	1954	Mean 1950-54
English sole	4,097	4,680	4,534	2,510	4,850	4,134
Rock sole	119	490	1,420	388	520	587
Petrale sole	4,309	3,339	3,259	2,414	3,590	3,382
Dover sole	NA (1)	870	1,424	1,264	1,889	1,362 3/
Rex sole	NA (1)	3	18	6	8	9 3/
Starry flounder	1,352	1,274	1,157	793	815	1,078
Other flatfish	283	81	532	267	429	318
Total flatfish	10,160	10,737	12,344	7,642	12,101	10,597
Pacific cod	6,616	8,368	9,873	8,157	15,327	9,668
Lingcod	2,330	1,810	1,386	928	1,494	1,590
Sablefish	491	1,259	618	221	330	584
Pacific O. perch	NA (2)	NA (2)	1,383	2,939	6,662	3,661 4/
Other rockfish	11,948	9,652	8,896	3,713	6,010	8,044
Misc. species	26	33	34	51	73	43
Total food fish	31,571	31,859	34,534	23,651	41,997	32,722
Dogfish	117	380	514	827	793	526
Animal food	12	37	18	495	1,064	325
Reduction	1,096	1,677	2,846	3,230	3,132	2,396
Total catch	32,796	33,953	37,912	28,203	46,986	35,970
Total hours	NA	NA	NA	NA	NA	NA

(1) Included in other flatfish, (2) Included in other rockfish, 3/ 4-yr. aver.
4/ 3-yr. aver.

WASHINGTON TRAWL LANDINGS
1955 through 1959 (1,000 Pounds)

SPECIES	1955	1956	1957	1958	1959	Mean 1955-59
English sole	4,085	3,805	3,253	4,478	5,387	4,202
Rock sole	964	716	313	483	534	602
Petrale sole	2,992	2,896	4,701	2,154	3,066	3,162
Dover sole	3,322	3,722	1,522	2,031	2,365	2,592
Rex sole	27	38	7	30	19	24
Starry flounder	1,530	1,631	1,290	918	876	1,249
Other flatfish	92	175	112	70	22	94
Total flatfish	13,012	12,983	11,198	10,164	12,269	11,925
Pacific cod	12,608	9,561	11,280	12,243	12,930	11,724
Lingcod	3,428	2,809	2,560	2,877	4,500	3,235
Sablefish	443	3,269	564	370	940	1,117
Pacific O. perch	3,499	4,980	4,515	2,736	5,840	4,314
Other rockfish	5,583	5,695	4,254	5,499	6,201	5,446
Misc. species	67	59	38	65	66	59
Total food fish	38,640	39,356	34,409	33,954	42,746	37,821
Dogfish	726	407	368	1,338	1,399	848
Animal food	879	3,813	2,588	2,501	1,388	2,234
Reduction	2,720	4,243	4,757	5,054	5,055	4,366
Total catch	42,965	47,819	42,122	42,847	50,588	45,268
Total hours	NA	NA	NA	NA	NA	NA

Washington Trawl Landings, 1960 through 1970
(Thousands of Pounds)

Species	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	Mean 1960-69	1970
English sole	5,039	3,582	3,075	3,607	3,739	3,779	3,693	2,915	3,169	2,989	3,559	1,718
Rock sole	863	584	789	793	830	1,013	1,377	1,879	826	1,148	1,010	452
Petrale sole	2,472	3,507	2,964	2,944	2,162	2,737	2,547	1,830	1,575	1,608	2,435	797
Dover sole	3,466	2,655	3,083	2,785	1,714	1,373	1,072	998	1,526	1,850	2,052	2,235
Rex sole	14	22	32	41	66	105	89	129	19	12	529	26
Starry flounder	1,105	1,174	982	1,020	802	704	483	1,271	1,957	657	1,016	397
Other flatfish	57	97	70	44	66	86	216	166	48	77	93	114
Total flatfish	13,016	11,621	10,995	11,234	9,379	9,797	9,477	9,188	9,120	8,341	10,694	5,739
Pacific cod	5,134	2,955	3,154	6,298	6,211	9,942	9,466	8,365	5,526	3,767	6,082	2,660
Lingcod	4,702	4,732	3,418	2,468	2,953	4,569	5,737	5,778	5,940	3,465	4,376	2,540
Sablefish	962	523	2,361	545	271	182	245	182	155	138	556	183
Pacific ocean perch	6,064	7,871	11,447	15,616	11,244	14,388	17,416	13,579	11,715	12,269	12,161	13,249
Other rockfish	5,449	6,706	9,518	7,464	5,509	6,515	9,315	6,863	10,255	17,141	8,474	12,157
Miscellaneous species	24	25	100	76	76	81	155	86	80	91	79	55
Total food fish	35,351	34,433	40,933	43,701	35,643	45,747	51,791	44,041	42,791	45,212	42,422	36,583
Animal food	3,390	5,184	3,966	2,419	3,135	3,844	7,212	6,829	6,310	3,226	4,552	2,598
Reduction	3,025	2,213	2,330	2,286	3,628	4,247	9,867	26,819	6,865	9,672	7,095	10,132
Total landings	41,766	41,830	47,289	48,406	42,406	53,565	68,870	77,689	55,966	58,110	54,069	49,313
Total hours	57,900	50,700	54,600	52,900	53,800	49,600	51,800	49,700	46,100	51,800	51,900	45,036