

**REPORT OF THE
TECHNICAL SUBCOMMITTEE OF THE
INTERNATIONAL GROUND FISH COMMITTEE**

**APPOINTED BY
THE SECOND CONFERENCE ON COORDINATION
OF FISHERIES REGULATIONS BETWEEN
CANADA AND THE UNITED STATES**

**NINETEENTH ANNUAL MEETING
JUNE 14-15, 1978
MENLO PARK, CALIFORNIA**

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Report of the Technical Subcommittee of the International Groundfish
Committee Appointed by the Second Conference on Coordination of Fisheries
Regulations Between Canada and the United States

Date: June 14-15, 1978

Place: Menlo Park, California

Participants:

Canada

Fisheries and Oceans Canada

Mr. S. Westrheim, Chairman
Dr. R. Beamish
Mr. A. Cass
Mr. B. Leaman
Dr. F. Taylor

United States

California Department of Fish
and Game

Mr. T. Jow
Mr. J. Baxter (Observer)
Mr. J. Hardwick (Observer)
Mr. S. Schultz (Observer)
Mr. J. Spratt (Observer)
Mr. D. Thomas (Observer)

Oregon Department of Fish and
Wildlife

Mr. R. Demory
Mr. J. Robinson

Washington Department of Fisheries

Mr. M. Fraidenburg
Mr. M. Pedersen

Alaska Department of Fish and Game

Mr. P. Rigby

National Marine Fisheries Service

Mr. T. Dark
Dr. D. Gunderson (Observer)
Mr. T. Miyahara (Observer)

Pacific Marine Fisheries Commission

Dr. J. Harville (Observer)

International Pacific Halibut
Commission

Mr. S. Hoag (Observer)

I. Call to Order

The 19th annual meeting of the Technical Subcommittee was called to order at 0915, June 14, 1978, by Chairman Mr. S. Westrheim under instructions set forth by the Parent Committee in 1959.

II. Appointment of Secretary

Mr. T. Jow, CDFG, was appointed recording secretary.

III. Approval of the Agenda

Appraisals of petrale sole and shelf rockfish management measures in the Vancouver Area, and Pacific cod were added as agenda item VII, A, 3, 4 and 5 to the tentative agenda circulated by Chairman Mr. S. Westrheim prior to the meeting. The meeting was conducted according to the approved agenda (Appendix A).

IV. Terms of Reference of the Subcommittee

The U.S. Section presented language changes suggested by Mr. M. Pedersen for discussion purposes. Dr. R. Beamish commented on changes and questioned the propriety of changes by the TSC. Dr. Beamish also commented that there is a need to function as a scientific group despite extended jurisdictional zones of both countries.

It was noted that discussions on terms of reference occurred at the 1977 meeting of the IGC but approved minutes were not available for consideration.

Dr. J. Harville commented that the future of the IGC is unknown. It can serve as a bridge between consultative groups of both countries. The TSC should continue to operate, as in the past, as a scientific body with concentration on scientific questions and provide assessments and management strategies and their impacts.

A working group of the TSC could look at the Terms of Reference and changes in them. The current Terms of Reference are:

(1) to review proposed changes in groundfish regulations affecting fisheries of common interest before they are implemented;

(2) to review the effectiveness of existing regulations;

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

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

V. Review of Agency Groundfish Programs

A. Activities

1. Canada

The Groundfish Program staff of the Marine Fisheries Section increased in 1976-1977. A sub-program was also created to concentrate on major flatfish stocks and a new scientist will head this project.

Biological studies and stock assessments of sablefish, lingcod, pollock, and Pacific hake were conducted in 1977. Over 10,000 trap-caught sablefish were tagged off the west coast of Vancouver Island and the Queen Charlotte Island to delineate stocks and to study migrations and growth. Lingcod studies of size and age at maturity indicate later maturity for lingcod off the west coast of Vancouver Island than that of earlier studies. Assessment of the effects of dogfish predation on Dungeness crabs was carried out in Hecate Strait and Dixon Entrance.

The hydroacoustic unit continued to determine the distribution and

abundance of herring, hake pollock, dogfish, and "other rockfish" off the southwest coast of Vancouver Island. Acoustic surveys were part of a joint Canada-Poland survey of the west coast of Vancouver Island. Inter-calibration studies were carried out at the start of the survey in the Canada-US boundary area with Canada, Poland, and U.S. research vessels.

Diel differences in species composition and densities of fish schools were examined during a June acoustic survey between Juan de Fuca Trench and Amphitrite Point. In March, the Pacific cod spawning grounds off Amphitrite Point were surveyed.

Field studies of Pacific cod in 1977 consisted of a cruise to Amphitrite Bank (southwest Vancouver Island) to continue studies of surficial sediments and their relationship to cod spawning. Laboratory studies included: a) length-weight and length-girth relationships; b) studies of migration based on tagging experiments; c) stock assessment studies; and d) investigation of an age-determination problem.

Pacific ocean perch field studies included two cruises to Queen Charlotte Sound. Biomass was estimated in August-September and preliminary studies were made of the relationship between sweepline length and catch rate.

In October, exploratory trawling was conducted in western Queen Charlotte Sound. Laboratory projects included: a) updating to 1974 of joint Canada-U.S. stock assessment of Pacific ocean perch in the B.C. - Oregon region and a partial update of this document to 1976; b) recalculating Pacific ocean perch biomass estimates for Queen Charlotte Sound based on the results of the 1976 Canada-U.S. trawl intercalibration studies; and c) ageing of Pacific ocean perch. Sub-Program

personnel participated in the Industrial Development Program of explorations for Dover sole in Dixon Entrance and the west coast of the Queen Charlotte Islands.

The monitoring of the domestic fishery was continued and augmented in 1977 with an additional port sampler in Prince Rupert. Sampling was conducted more efficiently in 1977 and a 91% increase in samples resulted. The statistics group produced an annual summary of catch and effort statistics for the 1976 fishery. This group also completed the transfer and editing of historical biological sampling data to magnetic tape format. A "soft" data base, using hauled catch weight was also created and implemented.

A foreign fishing vessel observer program was initiated in May 1977. Emphasis of observer coverage was placed on rockfish.

A pilot tagging project on juvenile Pacific cod was conducted in Georgia Strait in January 1978.

2. United States

(a) National Marine Fisheries Service

Most of the groundfish research at the Northwest and Alaska Fisheries Center is conducted by the Resource Assessment and Conservation Engineering Division (RACE). The staff consists of a division leader and 25 scientists.

Bering Sea Groundfish Assessment

Annual surveys since 1971 in the southeastern Bering Sea to assess conditions of groundfish resources were continued in 1977-78. The 1978 survey areas will be expanded to include slope areas down to 457 m to provide more complete coverage of pollock, sablefish, Pacific ocean perch,

Greenland turbot, and arrowtooth flounder stocks.

Gulf of Alaska Groundfish Assessment

A winter resource assessment survey was conducted in the Kodiak Island area to locate and sample Atka mackerel stocks for age composition, growth, food habits, fecundity, and length-weight relationships. Biological, distribution, and abundance data were also collected for other principal groundfish species. A document on all groundfish and shellfish research conducted in the Gulf of Alaska since 1948 is in preparation by this group.

Rockfish Investigations

A cooperative synoptic rockfish survey from Port Hueneme, California to the U.S. - Canada boundary area was conducted during July-September 1977. Biomass estimates for rockfish and other major species such as hake are available and biological characteristics are under study. A similar survey will be conducted in the Gulf of Alaska from Dixon Entrance to Kodiak Island during June-September 1978.

Latent Resource Assessment

Bottom trawl survey of little known groundfish resources in inside and offshore waters of southeastern Alaska was completed in 1977. In early spring of 1978 a bottom trawl survey of resources of Prince William Sound, Alaska was completed. In progress is a program to index Alaska sablefish distribution and abundance by means of traps at 3 sites in southeastern Alaska. Tagging and the collection of biological data are part of the study.

Pelagic Resource Assessment

The hydroacoustic resource assessment system was used in the 1977 rockfish survey. The lack of rockfish aggregations in midwater and the

contagious distribution of the few schools observed limited the usefulness of the system in the survey. In winter of 1977, a hydroacoustic midwater trawl survey of the Bering Sea herring resource was conducted. Herring were scarce in the survey area. The hydroacoustic assessment system will be used during the 1978 Gulf of Alaska rockfish survey.

Other Activities

Considerable effort in 1977 was devoted to modification of Preliminary Management Plans and to the development of Fishery Management Plans.

Scientific observers were placed on Soviet and Polish vessels operating off Washington, Oregon, and California and on Japanese vessels in the Gulf of Alaska.

(b) Alaska

Groundfish management and research activities were coordinated by the groundfish scientist. He also performed in an advisory capacity on groundfish, and participated as a member of the North Pacific Fishery Management Council's Groundfish Plan Development Team and its Bering Sea Groundfish Plan Development Team.

A program initiated in 1978 is the observer program aboard domestic trawlers in Alaska waters.

(c) Washington

The Marine Fish Program staff conducts research, management, and enhancement of nonanadromous, marine finfish. In addition to the 3 units that deal with groundfish, an Extended Jurisdiction Affairs Analyst for marine fish was added in 1977.

Stock Assessment Unit

Highlights of the groundfish activities of the Stock Assessment Unit during the past year include: participation in the 1977 Synoptic Rockfish

Survey off the coast of Washington; completion of research papers dealing with stock assessment of Puget Sound hake, trawl mesh selectivity on English sole in the Gulf of Georgia, comparative otter trawl experiments in Queen Charlotte Sound, and the feeding habits of yellowtail rockfish off Washington and in Queen Charlotte Sound; analysis of catch and CPUE by ground for Pacific cod, lingcod and flatfish; work on the validity and variation in ageing yellowtail rockfish by otoliths; and participation in the design and implementation of a recreational fisheries sampling experiment in Puget Sound.

Groundfish Management Unit

Major tasks of the unit during the past year included participation in the development of the Pacific Regional Council Groundfish Management Plan and methodology of the National Recreational Fisheries Survey; and management of the commercial and recreational fisheries for groundfish via the public hearing process. Field activities were concerned mainly with monitoring of the trawl fisheries, set net fisheries for Pacific cod and spiny dogfish, line fisheries for lingcod, Pacific cod, and spiny dogfish, and the recreational fisheries.

Marine Fish Enhancement

This unit has been involved with implementing capital budget funds for the construction of artificial reefs, fishing piers, and acquisition of property to improve access to fishing areas. A new project has been implemented dealing with enhancement of Puget Sound lingcod populations. The feasibility of several strategies are being examined. These include capture and transfer of prespawning adults from high abundance areas to depleted areas; artificial rearing of young from eggs; and collection, pen rearing, and planting of juvenile lingcod.

(d) Oregon

Stock Assessment Project

A vacancy in the project occurred in 1977 that resulted in a re-classification of the position and plans for filling it in the next biennium. A scientist with a strong EDP background transferred into the project.

English sole and lingcod tagging was started in winter 1977-1978 in PMFC areas 2B and 2C.

Analysis of Pacific ocean perch data from the 1977 rockfish survey is nearly completed and results will be presented at the July 6-7, 1978 rockfish survey symposium.

Groundfish-Shrimp Management Project

Ongoing projects of fishery monitoring through logbooks, fish tickets, and sampling of landings continued. A major additional task during the year was participation in development of the Pacific Fishery Management Council's Groundfish Fishery Management Plan, and also the shrimp FMP. Also a start was made in May 1978 toward substantially augmenting the data base on marine recreational bottomfish use in the estuaries and coastal-nearshore zone.

Proposed Projects

The proposed PL 88-309 project for FY 1979 is to establish a series of index stations in the INPFC Columbia area to monitor the rebuilding of Pacific ocean perch stocks. Lingcod and rockfish tagging and tag recovery work will be continued. Other projects planned include an analysis of logbook and fish ticket data to establish criteria, at some specified level of precision, that will enable the Marine Region to improve substantially the timeliness of groundfish catch and effort statistics.

By mid-FY 1979 several computer programs will be operational that will handle all routine data processing needs.

(e) California

In 1978, a reorganization occurred that placed biometrical and biostatistical functions in the Department's Planning Branch. Groundfish research and management are performed by the Marine Resources Region, Operations Research Branch, and Planning Branch.

Monitoring and assessments of commercial and recreational fisheries for groundfish are accomplished by Regional personnel. Groundfish landings by commercial vessels were sampled at major ports. Commercial passenger fishing vessel and private vessel catches were also sampled at selected ports.

Logbook data for groundfish taken by trawls, pot, and recreational fisheries were collected in 1977. The NORFISH system for trawl data is under implementation.

Assessments of major stocks will be conducted in 1978-1979 for input to the Pacific Fishery Management Council's (PFMC) groundfish management plan.

3. International Pacific Halibut Commission (IPHC)

Activities of the IPHC include stock assessments, studies of migration in the Gulf of Alaska and in the Bering Sea, a study of the effectiveness of baits, determinations of stock size and mortalities, continuation of the annual trawl survey to assess juvenile halibut, and a survey of halibut in Hecate Strait.

B. List of Reports Published

The reports published were distributed by each agency in status reports.

VI. Review of Northeast Pacific Groundfish Fisheries

A. Canada-United States Fisheries in 1976

1. Total Landings

Trawl landings by Canadian and United States vessels on the Pacific coast in 1977 were 86,517 mt, a slight decrease from the 86,549 mt landings of 1976. Estimated total effort was 201,163 hours, a decrease of 15,839 from the 217,002 hours of 1976 (Table 1).

Canadian trawl landings were 24,770 mt, an increase of 3% over 1976 landings. Canadian trawling effort, at 34,407 hours, declined 5% from 1976. Non-trawl groundfish landings totaled 2,889 mt in 1977, 37% above those of 1976.

United States trawl landings in 1977 were 61,747 mt, a decrease of 1% from 1976. Trawl effort in 1977 of 166,766 hours was 8% below 1976 effort of 180,631 hours. Non-trawl landings of groundfish totaled 11,310 mt, an increase of 9% over those of 1976.

2. Dover Sole

Coastwide landings of Dover sole in 1977 totaled 13,864 mt, down 7.6% from the record 1976 total and 22% greater than the 1967-76 mean.

a. Canada

Landings in 1977 were 696 mt, a decrease of 40% from 1976 landings and 16% from the 1967-76 mean. The majority (82%) of these fish were caught in the northern Hecate Strait-Dixon Entrance region. The primary area of production was area 5D where the catch was 467 mt (a decrease of 53% from 1976); CPUE in area 5D, based on interviewed landings, was 0.141 mt per hour - a drop of 50% from 1976.

b. United States

Washington - Trawl landings of Dover sole in Washington were 1,051 mt

Table 1. Trawl landings, metric tons, from the northeastern Pacific by Canadian and United States vessels in 1976 and 1977 and means for 1967-1976.

Species	1976				1977				Mean 1967-76				
	B.C.	Wash.	Ore.	Calif.	AK	Total	B.C.	Wash.		Ore.	Calif.	AK	Total
English sole	1,307	1,618	1,643	1,945		6,513	1,469	1,172	1,001	1,950		5,592	4,832
Rock sole	2,154	182	7	7		2,350	1,249	191	10	5		1,455	2,280
Petrale sole	337	1,108	793	1,349		3,587	285	603	822	1,275		2,985	3,716
Dover sole	1,153	1,274	2,262	10,322		15,011	695	1,051	1,818	10,300		13,864	11,404
Rex sole	132	171	477	914		1,694	99	166	425	945		1,635	1,488
Starry flounder	48	311	773	472		1,604	89	577	283	505		1,454	1,028
Other flatfish	1,320	290	566	878	154	3,208	1,607	327	435	900		3,269	1,397
Pacific cod	10,067	5,229	277		106	15,679	7,627	4,032	364			12,023	10,679
Lingcod	1,368	1,470	439	1,246		4,523	1,175	1,223	381	1,180		3,959	4,640
Sablefish	382	291	442	2,746		3,861	787	479	326	2,530		4,122	2,367
Pacific ocean perch	1,746	1,375	1,019	40	2	4,182	2,716	2,027	681	50		5,474	5,689
Other rockfish	2,019	5,752	2,076	8,904		18,751	4,866	8,718	2,147	9,000		24,731	13,402
Misc. species	1,523	52	512	236	181	2,504	1,152	163	603	515		2,433	415
Dogfish	85	486	6	1		578	724	586	122	2		1,434	410
Animal food	100	997	56			1,153	49	842	83			974	3,776
Reduction	300	1,051				1,351	181	932				1,113	3,744
Total	24,041	21,657	11,348	29,060	443	86,549	24,770	23,089	9,501	29,157		86,517	71,267
Percent of total	27.8	25.0	13.1	33.6	0.5	100	28.7	26.7	10.9	33.7		100	
Total hours	36,371	53,400	33,259	93,974		217,004	34,407	52,073	26,683	88,000		201,163	
Catch/effort	0.66	0.40	0.34	0.31			0.699	0.432	0.351	0.331			
(excludes dogfish, mt/hr)													

(excludes dogfish, mt/hr)

in 1977, an 18% decrease from 1976 landings, but 47% above the 1967-76 mean. Areas 3B, 3C, and 3A were the main areas of production (87%). In 1977, landings from 3A increased 117% over 1976, while landings from 3C and 3B decreased 49% and 7%, respectively. Similarly, in 1977 CPUE was up 150% in Area 3A, but down 42% and 9% from 1976 in Areas 3C and 3B, respectively.

Oregon - Landings of Dover sole in Oregon totaled 1,818 mt, 20% less than in 1976, and 20% less than the 1967-76 mean of 2,279 mt. Areas 2B and 3A contributed most of the 1977 catch, 761 and 765 mt, respectively. Most of the decline in statewide landings occurred in Area 2B, due to conversion of vessels there to the 1977 shrimp fishery.

California - The 1977 landings of Dover sole in California was estimated at 10,300 mt, about the same as the record 1976 total, and greater than the 10-year mean. The most productive areas were Areas 1B and 1C (middle and upper California, respectively).

3. English Sole

The 1977 English sole catches by Canadian and United States trawlers were 5,592 mt, a decrease of 14% from 1976 catches but 16% above the 1967-1976 mean catch. Areas of highest production in 1977 were 1B, 1C, 4A, and 5D.

a. Canada

Canadian trawl landings of English sole in 1977 were 1,469 mt, 12% above 1976 landings and 70% above the 10-year mean. Northern Hecate Strait (5D) was the primary area of production. In Area 5D landings rose 3% from 1976 to 972 mt; CPUE declined 21% and was 28% below the 1967-1976 mean CPUE.

b. United States

Washington - Trawl landings of 1,172 mt of English sole was a decrease of 28% from 1976 but nearly equal to the 10-year mean. Landings from Area 4A for food fish of 792 mt were the highest in more than 10 years and comprised 68% of the total trawl production of English sole for food fish. The most productive coastal area was 3B where the 1977 catch was 266 mt. The 3B catch in 1977 was 61% and 39% below 1976 and 10-year mean respective catches. CPUE was also down 33%. This was a reversal in the 5-year increasing trend for the area and was probably due to less targeting on English sole on the Cape Flattery grounds.

Oregon - Landings of English sole in 1977 were 1,001 mt, 39% less than the 1976 landings of 1,643 mt but only 1% less than the 1967-1976 mean.

California - The 1977 English sole catch by California trawlers of 1,950 mt was slightly greater than the 1,945 mt 1976 catch but it was still 11% below the 10-year mean catch of 2,182 mt. Areas 1B and 1C were the most productive English sole areas for California trawlers.

4. Petrale Sole

Canada and United States petrale sole landings in 1977 were 2,985 mt, a 17% decrease from those of 1976 and 20% less than the 1967-1976 mean catch. Canada, Washington, and California reported decreases in catch, while Oregon's petrale catch increased by 28 mt in 1977.

a. Canada

Landings of petrale sole totaled 285 mt in 1977, a 15% decrease from 1976 and 33% below the 10-year mean. The majority of the catch (70%) were caught in Area 3C where the landings were about equal to those of 1976. CPUE in Area 3C, however, continued its decline to 0.049 mt per

hour, 21% below CPUE of 1976 and 41% below the 10-year mean. As in 1976, Canadian trawlers did not target on petrale sole.

b. United States

Washington - The 1977 trawl catch of petrale sole totaled 603 mt, a decrease of 46% from 1976 and 33% below the 10-year mean. Landings of petrale sole from Areas 3A, and 3C (southern stock) of 532 mt was the lowest in 6 years. This was a 42% decrease from 1976. Biological samples of size and age indicate that the fishery is no longer sustained by the strong 1966-68 year classes and that subsequent year classes may be relatively weak. Washington trawl landings from the northern stocks (Areas 3D and 5A-5D) were only 73 mt in 1977, the lowest in more than 20 years. Catch and CPUE declined in all areas. Most of the Washington winter petrale fishery (154 mt) occurred on the Cape Flattery Spit Deep in 1978.

Oregon - Landings of petrale sole in 1977 were 822 mt, about 5% greater than the 1976 landings, but 15% less than the 1967-76 mean landing of 959 mt.

California - Landings of 1,275 mt of petrale sole in 1977 were 5% below those of 1976 and 7% below the 10-year mean catch of 1,442 mt. Areas 1C and 1B were the most productive areas where 1977 catches were 800 and 400 mt, respectively.

5. Rock Sole

Total trawl landings of rock sole in 1977 were 1,455 mt a decrease of 38% from 1976 value, as well as a 36% decrease from the 1967-1976 mean.

a. Canada

Canadian landings totaled 1,249 mt in 1977, a decrease of 42% from the previous year and 34% from the 1967-1976 mean. Hecate Strait (Areas 5C-5D) continued to be the major area of production. CPUE in this area

fell 41% from the 1976 value, to 0.333 mt per hour.

b. United States

Rock sole continued to be a minor component of United States trawl landings. Washington State vessels landed 191 mt of rock sole in 1977, which was 5% greater than in 1976 but 48% below the 1967-1976 mean.

6. Lingcod

Canadian and United States trawl landings of lingcod in 1977 were 3,959 mt, a 12% decline from 1976 landings and 15% below the 1967-1976 mean.

a. Canada

Total lingcod landings in 1977 of 2,247 mt were 3% less than 1976 landings. Landings by trawlers in 1977 of 1,175 mt decreased 14% from those of 1976 and also decreased 29% from the 1967-1976 mean. Fifty-three percent of the trawl landings were from Area 3C where the downward trend in landings of recent years was continued.

b. United States

Washington - In 1977 Washington trawl landings of lingcod were 1,223 mt, down 17% from 1976 and the 10-year average (Table 12). The catch from Area 3B was the highest in 9 years and CPUE was above average. Catch in Area 3C, the major area of production (34% of total) was down 32% from 1976, but was slightly above the 10-year average. CPUE from Area 3C was down 21% from 1976 and 42% below the 10-year mean. Catch and CPUE from Areas 5A and 5B declined to extremely low levels in 1977, well below the 10-year means.

Oregon - Landings of lingcod in 1977 were 381 mt, down 13% from 1976 landings and 39% less than the 1967-1976 mean landings of 621 mt. In 1977, some Area 3A processors were combining Pacific cod

and lingcod into one category, thus landing statistics of either group are to be used with caution.

California - In 1977, California trawlers landed 1,180 mt of lingcod. This catch was 5% less than the 1976 catch but it was 32% above the 1967-1976 mean of 897 mt. Line catches in 1977 are estimated at 500 mt.

7. Pacific cod

In 1977, Canadian and United States trawlers landed 12,039 mt of Pacific cod, a decline of 23% from 1976 landings but 10% above the 10-year mean.

a. Canada

Pacific cod was the major species in British Columbia trawl landings and comprised 31% of the total. The 1977 trawl landings of 7,627 mt was a 24% decline from 1976 landings and were only slightly greater (8%) than the 1967-1976 mean. Principal production areas were Areas 5C-5D, Hecate Strait (3,510 mt) and Area 3C, southwest coast of Vancouver Island (2,045 mt). Catches in these areas in 1977 declined from those of 1976 and CPUE also decreased in 1977.

b. United States

Washington - Pacific cod continued to be the most important single species in trawl landings. Landings in 1977 were 4,032 mt, which was 30% less than last year's peak catch but it was still 19% above the 10-year mean. The most productive areas were 3C, 4A, and 3B. Catch and CPUE declined in Areas 4A and 3B. In Area 3C, catch and CPUE were nearly the same as those of 1976. While the 3C catch was 85% above the 10-year mean, CPUE was down 22% from the 10-year average.

8. Pacific ocean perch

United States and Canadian landings of Pacific ocean perch in 1977

were 5,474 mt, up 24% from 1976 and 4% from the 1967-1976 mean. Primary areas of catch were Areas 5B, 5E, 3C, and 2C.

a. Canada

Landings of Pacific ocean perch in 1977 were 2,716 mt, an increase of 56% over 1976 and 78% above the 1967-1976 mean. The majority of the catch was taken from Queen Charlotte Sound. A new and significant Canadian fishery developed off the west coast of the Queen Charlotte Islands.

b. United States

Washington - The 1977 trawl landings were 2,758 mt, a 13% increase from 1976 but 45% below the 1967-1976 mean. Areas 5A, 5B, and 3C accounted for most of Washington's landings.

Oregon - Oregon's 1977 landings were 681 mt, up 4% from 1976 and up 136% from the 1967-1976 mean. Continued contributions of a strong 1970 year class harvested mainly in Areas 2C and 3A accounted for a large portion of those increased landings in 1977.

California - The 1977 landings were 50 mt.

9. Other rockfish

Total 1977 Canadian and United States trawl landings were approximately 24,731 mt, up 32% over 1976.

a. Canada

The 1977 trawl catch was 4,866 mt, up 141% from 1976 and up 432% from the 1967-1976 mean. Queen Charlotte Sound and the west coast of the Queen Charlotte Islands were the major production areas, and Sebastes flavidus and S. reedi was the major species landed.

b. United States

Alaska - - no report

Washington - Washington trawlers landed 8,718 mt of rockfish (377 mt of slope rockfish and 8,341 mt of shelf rockfish) in 1977, up 33% from 1976 and up 41% from the 1967-1976 mean. Areas 3A and 3C were major production areas. Sebastes flavidus and S. pinniger were the principal species landed.

Oregon - Landings totaled 2,147 mt, down 12% from 1976 but up 8% from the 1967-1976 mean. Area 3A accounted for most of the production. Sebastes flavidus and S. pinniger were the principal species landed.

California - In 1977 the estimated landings were 9,000 mt, up 7% from 1976. Area 1B was the leading area and the leading species were Sebastes paucispinis and Sebastes goodei. Line and gillnet catches were substantial and approached 2,268 mt. Rockfish are the most numerous species in the ocean sport catch. Each year about 4,536 mt of rockfish are taken by sport fishermen.

10. Sablefish

Canadian and United States trawl landings of sablefish in 1977 were 4,122 mt, a 7% increase from the 3,836 mt in 1976 and a 74% increase from the 1967-1976 mean. Trap catches were in excess of 3,100 mt ^{1/} and line catches were approximately 295 mt. ^{1/} Total sablefish catches in 1977 were approximately 7,500 mt.

(a) Canada

Trawl landings of sablefish were 787 mt, a significant increase of 106% from the 1976 value and 232% above the 1967-1976 mean. The major trawl production was from Area 3C (684 mt).

Non-trawl landings of sablefish in 1977 totaled 301 mt., 71% of which was obtained by trap gear, primarily in Area 5E.

(b) United States

1 Includes only a preliminary estimate for California and does not include Alaska catches.

Alaska - The estimated 1977 sablefish catch was 780 mt, with 90% of catch by longline.

Washington - Trawl landings of sablefish in 1977 were the highest since 1962, totaling 479 mt. This was an increase of 65% over 1976 and 389% above the 10-year average. Area 3C was the major area of production (62% of the total). Improved markets resulted in some directed fishing for this species.

Set line landings of sablefish were 292 mt and the trap catch was 355 mt. The majority of the line catch was from Areas 3A and 3B and most of the trap catch was from Area 3A. Both line and trap catches increased from 1976 levels.

Oregon - Trawl landings were 326 mt, a 26% reduction from the 1976 level, but a 178% increase over the 10-year mean. The reduction of 1977 catches may be partly a reflection of an approximate 20% reduction in trawl effort from 1976. Over 50% of the catch came from Area 2B.

California - Trawl landings of sablefish in 1977 are estimated at 2,530 mt. The trap catch is expected to exceed the trawl catch for the first time. Line catches are minor and most fishermen who previously fished longlines have switched to traps.

11. Dogfish

Dogfish stocks appear to have almost completely recovered from the peak exploitation years of the 1940's. An active fishery developed in Puget Sound in 1976 and 1977 and in the Canadian portion of the Strait of Georgia in 1977. Dogfish landings in 1977 totaled 1,312 mt; U.S. landings were 588 mt and Canadian landings were 726 mt. The market appears strong for dogfish and it is anticipated that dogfish landings will increase dramatically in the next few years. Canada has estimated that the sustainable yield of dogfish in all Canadian waters is 8,000 mt, thus it

appears that the species is considerably underexploited at present.

B. Other Nations' Commercial Fisheries in 1977

In 1977, other nations conducted fisheries for groundfish under conditions established by Canada and the United States as a result of extended jurisdiction of both countries. Time-area closures, gear-vessel limitations, species prohibitions, and catch quotas were imposed on non-North American fishermen.

1. Japan

(a) Gulf of Alaska

Japan licensed 42 trawlers and 22 longline-gillnetters to fish in the northeast Pacific ocean. Japan was allocated 106,822 mt of groundfish and caught 96,928 mt. This catch included 41,174 mt of pollock, 17,943 mt of Pacific ocean perch, 15,462 mt of flounders, and 14,356 mt of sablefish.

(b) British Columbia

There were 3 Japanese fisheries conducted off British Columbia during 1977; hake, rockfish, and sablefish employing 4, 9, and 21 vessels, respectively. Rockfish fishing was concentrated off Langara Island (April-October) and Triangle Island (June 15-August 20). Fishing for sablefish occurred throughout the year although effort was low from April-September. Some concentration of effort occurred around Langara Island-Dixon Entrance but there was a more general application of effort south of Cape St. James. The hake fishery was conducted in Sub-zone 5-2, off southwest Vancouver Island, during August-September. Hake catches were low and fishing ceased before the quota was reached.

(c) Washington-California

No fishing by Japan occurred in this area.

2. Polish People's Republic

(a) Gulf of Alaska

Two trawlers ventured into the Gulf of Alaska on an exploratory fishing mission and caught 1,256 mt of pollock and 209 mt of Atka mackerel from respective allocations of 6,000 and 1,000 mt.

(b) British Columbia

Poland conducted 2 fisheries in Canadian waters during 1977. Six trawlers fished hake in Sub-zone 5-2, primarily during September. The final Polish hake catch was considerably below the Polish quota of 7,500 mt.

An experimental fishery for dogfish was undertaken by 3 Polish trawlers in Sub-zone 5-2 and Zone 3 during 1977. The fishery operated under special permit arrangement under direct Canadian supervision and with the assistance of Canadian trawler masters as advisors. The feasibility of both a directed dogfish fishery in these areas and mechanized processing equipment was examined during the fishery.

(c) Washington-California

Six Polish stern trawlers fished from June to October, primarily for hake. Poland was allocated 18,000 mt of hake, 2,000 mt of jack mackerel, and 131 mt of other species.

3. Republic of Korea (ROK)

(a) Gulf of Alaska

ROK fishing in the Gulf of Alaska included a trawl fishery for groundfish and a longline fishery for sablefish.

As many as 4 trawlers fished in the fall of 1977 in the Unimak Pass to Shumagin Island region of the western Gulf of Alaska. This represents a slight reduction from the 5 vessels present in 1976.

The longline fishery for sablefish was conducted off southeastern Alaska and off the Shumagin Islands by as many as 5 vessels.

(b) British Columbia

A single South Korean longliner operated in Canadian waters in 1977. Targeting on sablefish, the vessel fished off the coast of Vancouver Island during October and November and caught 168 mt.

(c) Washington-California

No ROK fishing occurred in this area.

4. U.S.S.R.

(a) Gulf of Alaska

The USSR fishery in the Gulf of Alaska was conducted primarily by 11 to 24 stern trawlers fishing off Albatross Bank near Kodiak Island and off the Shumagin Islands. Fishing was discontinued in April and did not resume until August. The fishery was terminated in October after the USSR Pacific cod allocation had been reached.

(b) British Columbia

Four Soviet trawlers fished for hake in Sub-zone 5-2 during September and October. Soviet vessels left the Canadian zone after this period although substantially below their hake quota. Seasonal shifts in the availability of fish were thought to be responsible for the poor Soviet hake catch in 1977.

(c) Washington-California

The USSR hake fishery began in June and employed an average of 35

stern trawlers, a reduction from recent years. Fishing again was centered off Oregon. By October, the allocation had been reached and fishing was discontinued.

C. All-Nation Catch of Major Species

1. Pacific hake

Total removals of Pacific hake were approximately 132,805 mt. The USSR took an estimated 110,760 mt, Poland caught an estimated 19,514 mt, Japan caught 1,941 mt, and the U.S. harvested approximately 600 mt. The major part of the catch was from the Oregon and northern California region.

2. Rockfish

Total all-nation landings were approximately 58,881 mt. Directed rockfish fishing occurred reciprocally by Canadian and United States vessels in their coastal waters. Directed fishing for rockfish by Japan off Canada yielded 3,039 mt. No other foreign nation fished for rockfish in Canadian waters; remaining landings in Canadian waters were incidental to either hake, sablefish or dogfish fisheries.

Directed rockfish fishing by non-north American vessels off the United States was confined to the Gulf of Alaska and was conducted by the USSR, Japan and the Republic of Korea (23,590 mt). The incidental catch of rockfish in the Soviet and Polish hake fisheries off the Washington-California region was 520 mt.

3. Sablefish

The all-nation catch of sablefish in the northeastern Pacific ocean is estimated to be 26,656 mt.^{1/} Japan, the largest producer, took 17,290 mt. Poland caught 17 mt, the USSR took 81 mt, Republic of Korea took 1,768 mt, and the United States caught 6,411 mt.^{1/} Approximately 72% of the total

1 A preliminary value - does not include Alaska data and only an estimate of California line and trap catches.

catch was taken from the Gulf of Alaska.

D. Canada-United States Recreational Fisheries

Recreational fisheries for groundfish in the northeastern Pacific are becoming increasingly important and substantial poundages are taken by sport fishers. Agencies have various methods of collecting recreational catch data. Washington and Oregon sample the catches. California has logbooks for commercial passenger fishery vessels and also sample catches. Alaska has no established recreational program.

Canadian recreational fishermen caught an estimated 183 mt of groundfish in 1976. Lingcod (Est. 82 mt) and rockfish (Est. 65 mt) were the most important species. Washington recreational fishermen caught 700 mt of groundfish in 1976. The most important species were Pacific cod (261 mt), rockfish (220 mt) and lingcod (81 mt). The estimated numbers of groundfish caught by Oregon recreational fishermen (mostly by salmon anglers) during June 15 to September 15, 1976 totaled 118,929 fish, perhaps 125 mt. Rockfish (89,546), and lingcod (12,569) were the most important species. These are minimal estimates of the total marine recreational catch of bottomfish, even during the period cited.

The largest part of the recreational groundfish catch in California is taken by commercial passenger fishing vessels (CPFV) fishermen. In 1977, CPFV fishermen caught 3.3 million groundfish. Rockfish comprised 3.2 million of this total. A conservative weight estimate of the California recreational catch of groundfish is 4,500 mt.

Mr. S. Hoag reported that Canadian and United States recreational fishermen catch about 136 mt of Pacific halibut annually.

Inclusion of recreational catch data in the Data Series was discussed. It was considered inappropriate to include data of unknown accuracy in

the Data Series. The importance of recreational groundfish data is such that the TSC agencies will look into current methods of compiling recreational data and the methods of checking their accuracy. For 1979, recreational data will be reported in the Report of the TSC. Inclusion in the Data Series with identification of the provisional nature of the data was considered. Dr. J. Harville described the United States national marine sportfish survey that involves telephone and fishermen-intercept interviews. The survey will not be carried out on the Pacific coast this year.

E. Canada-United States Groundfish Regulations

1. Changes since the 1977 TSC Meeting

(a) Alaska

Sablefish regulations were changed so that there are no restrictions on domestic sablefish fisheries in outside waters.

(b) British Columbia

The winter closure for petrale sole in Area 3C was removed. A one-month closure for Pacific cod in Area 3C was implemented.

(c) Washington

Coastal commercial gear and seasons were defined and specified. Modifications of legal gear were made for otter trawl, set net, drag seine, and line fisheries. A moratorium for inner Puget Sound on sport and commercial lingcod fishing was enacted. In northern Puget Sound, commercial and sport lingcod fishing was closed during December 1 to March 31 and the sport bag limit for lingcod was reduced from 3 to 2. The recreational aggregate limit of 15 rockfish, Pacific cod, and sablefish was changed to 15 in the aggregate of rockfish, cod, pollock, and greenling; no more than 10 may be rockfish in Puget Sound.

(d) Oregon

The Oregon recreational catch limit was 25 for marine species, except

salmon. It was changed to a 25 aggregate limit with a 15 fish aggregate limit for rockfish, cabezon, or greenling. Bag limits for lingcod and Pacific halibut remained at 3 and 2, respectively, within the 25 fish total limit.

(e) California

No significant regulation changes occurred for California.

2. Changes under consideration

(a) Alaska

Regulations are incorporated in the North Pacific Fishery Management Council's groundfish management plan. The plan was submitted to the Secretary of Commerce in March 1978 and it was returned with proposed regulations by NOAA which were unacceptable to the NPFMC. The primary objectives of the plan are to conserve Pacific halibut and to promote growth of a domestic groundfish fishery. The plan specifies allowable biological catch (ABC) for foreign and domestic fishers by species by INPFC area with a 20% reserve by species. A 2-year observer program is part of the plan. Incidental catch of Pacific halibut is set at 0.0025% of the total allowable catch (TAC) of all species. Three sanctuary areas are also described.

(b) British Columbia

Canada will develop ABC and TAC for all species by late summer 1978. Projects are underway to look at limited entry for the Strait of Georgia trawl fishery.

No regulation changes are under consideration at this time.

(c) Washington

No outside groundfish regulation changes are under consideration. Trawl mesh size changes from 3 to 4-1/2-in, definition for mid-water trawls, pollock regulations, and set net seasons for inside waters are under consideration.

(d) Oregon

No regulation changes are under consideration.

(e) California

Effective on July 1, 1978 in Areas 1B and 1A from Monterey Bay southward the minimum gillnet mesh size is 4 1/8-inches; no material larger than number 6 nylon except for bottom 15 meshes can be used. No other regulation changes are under consideration.

(f) IPHFC

No regulation changes are under consideration.

F. International Fishery Agreements

1. Canada-U.S. Agreement

The 1977 Reciprocal Fisheries Agreement between the United States and Canada (general provisions presented in the 1977 TSC report) was extended into 1978. Fishing was conducted under the terms of the agreement as negotiations on 1978 interim and long-term agreements proceeded. The 1977 Reciprocal Fisheries Agreement was suspended on June 2, 1978 when the two countries failed to reach agreement on a new interim agreement. Negotiations on the long-term agreement will continue on June 19, 1978.

2. Other Canadian Agreements

Proposals for agreements are under consideration but no agreements have been reached. Among the proposals is one by Poland to harvest 7,500 mt of dogfish. An agreement was made with Japan to harvest 1,500 mt of sablefish off Canada.

3. Other USA Agreements

Under the terms of the Fisheries Conservation and Management Act of 1976, countries wishing to fish in waters under United States fishery jurisdiction must enter into a Governing International Fishery Agreement

(GIFA) with the United States. In 1977, Japan, USSR, Poland, the Republic of Korea, and the Republic of China entered such agreements and requested permits to fish within the U.S. fishery zone in 1977 and 1978. More recently, Mexico has signed a GIFA and has received permits to fish for Pacific hake and a variety of groundfish in the Gulf of Alaska during 1978.

Current foreign fisheries are conducted under terms of preliminary management plan (PMP). The 1978 PMP allows foreign catches of 89,000 mt of hake, 4,000 mt of jack mackerel and relative low incidental catches of certain groundfish species. It also allows for reallocation to foreign fleets any unutilized portion of the U.S. hake quota (41,000 mt on or after July 31).

VII. Groundfish Research

A. Stock Assessment

1. Reports of Working Groups

(a) Pacific cod-lingcod-petrale sole in Area 3C.

(b) Pacific cod and lingcod-rock sole in Areas 5A and 5B.

Mr. M. Fraidenburg described efforts of the working group which began 2 years ago. As a result, Washington has compiled data on catch, catch effort by area, ground and month. Mr. S. Westrheim added that Canada, due to the need for stock assessments for extended jurisdiction, has made little progress on the original intent of the proposal which was to look at the inter-relationships of these species. Canada has a data report in the proof stage for 1956-1977 on the 3 species in 3C that has catch, catch effort by annual quarter and ground. Mr. A. Cass reported recent decreasing catch effort for lingcod in Area 3C and that lingcod in Area 5A were caught incidental to other species. Catch effort for lingcod has fluctuated and there is evidence that some stocks are fully exploited and others are

over-exploited. A Manuscript Report is in the draft stage that reviews biology of lingcod and contains 1977 and 1978 catch effort trends.

It was agreed that the work of the Working Groups were completed, but each agency will perform stock assessment after data exchange. Respective analyses will be offered for review and meetings will take place as necessary to consenses on assessments.

(c) Pacific ocean perch in Areas 2B-5B

Dr. Gunderson reported that the 1974 status of stock report has been updated through 1976. This was provided last November to the TSC. Since that meeting, age data through 1976 and catch data to 1977 are available to add to the preliminary report which would complete it.

The Working Group met in May 1978 to appraise alternate management strategies. The final report has not been completed as some differences exist within the Working Group respecting the quality of data and age composition. The Working Group will continue its assessments of Pacific ocean perch.

(d) Shelf rockfish in Areas 1A-5D

Mr. M. Fraidenburg reported that the Working Group had been unable to work on the problem due to other commitments. Mr. M. Pedersen suggested a recommendation for continued work on the assessments on an independent basis rather than as a working group.

2. Pacific hake

Mr. T. Dark reported that the results of the 1977 rockfish survey provided an estimated hake biomass of 1,188,748 mt in the area from Port Hueneme to 50° N latitude. Seven percent of the estimate was derived from the area-swept method of the bottom survey while the rest was estimated hydroacoustically. A difference in the 1978 estimate from the 1975

estimate was that in 1975, 50% of the hake biomass was found adjacent to the bottom. In the 1977 trawl survey, 80% of the hake biomass occurred off bottom in depths of 50-100 fms, 7% in 100-150 fms, 4% in 150-200 fms, and 2% in 200-250% fms. Two strong year classes, 1970 and 1973, were present in the 1977 survey. The 1976 egg and larval survey indicated that the 1976 year class was very weak and these observations were supported by the scarcity of 1 year old hake in the 1977 trawl survey samples. A report on hake assessment is not complete at this time but it will be by mid-summer.

3. Petrale sole

A decreasing trend in Canadian and U.S. petrale catches from 4,600 mt in 1975, 3,576 mt in 1976, to 2,985 mt in 1977 has occurred. Strong 1966 to 1968 year classes have passed through the fishery and no exceptional later year classes are evident. Petrale sole in the Cape Flattery Spit to Esteban area are at a low level of abundance.

4. Appraisal of shelf rockfish management in the INPFC Vancouver Area

The management events to date and their rationale for shelf rockfish in the Vancouver Area were reviewed at Mr. M. Fraidenburg's suggestion. Mr. B. Leaman reported that in 1977 the TSC reaffirmed its recommendation of a 287 mt catch ceiling for Pacific ocean perch for the Vancouver Area, and the 1977 Canada-U.S. bilateral specified that the other rockfish catch be kept at the 1974 level in the Vancouver Area. The 1977 perch catch in the 3C-3D areas was 267 mt and the other rockfish catch was 1,144 mt. For 1978 in the Canadian zone, Canada recommends no directed catch of Pacific ocean perch, 500 mt of other rockfish in Area 3D, and 400 mt of rockfish in Area 3C with 200 mt to be taken in the northern part of Area 3C.

The status of stocks of other rockfish in the Vancouver Area were discussed. On delineation of stocks, TSC members agreed on separate stocks for Areas 3C and 3D. Washington members, because of species composition, suggest a single stock is present within Areas 3C and 3B. Results of the 1977 U.S. rockfish survey indicate the stocks could support a larger catch than that recommended by Canada. Mr. S. Westrheim's explanation for the ceiling was that Canada has taken a conservative approach due to the long response time required for rehabilitation. The TSC discussed assessment of available information, gaps in knowledge, and recommended future work. Mr. M. Fraidenburg and Mr. B. Leaman were appointed to draft the recommendation which is Recommendation 1 to the TSC.

5. Pacific cod

Mr. S. Westrheim described Pacific cod fisheries in Hecate Strait, Queen Charlotte Sound, Strait of Georgia, and off the Southwest coast of Vancouver Island (Area 3C). In the first 3 areas annual catches have fluctuated and there is no evidence that the fisheries have impacted the stocks. In Area 3C, recent climatic changes have been favorable for cod and catch fluctuations have appeared similar to those of other areas. Age composition, however, differs from that of Hecate Strait stocks. In Area 3C, ages 2 are predominant in the spring fishery while age 3 are predominant in the winter fishery. Hecate Strait spring and winter fisheries are comprised respectively of ages 2-3 and 3-4. The fishery in Area 3C was originally a spring fishery. Beginning in 1965, a U.S. winter fishery developed on Amphitrite Bank, where cod aggregate to spawn. Originally, the winter fishery occurred around the rim of the bank, and intercepted cod moving to and from the spawning area. With improvement of gear the fishery now takes place on the bank when the cod are spawning

and is a possible threat to reproduction.

B. Special Studies

1. Reports on:

(a) Age Determination Workshop

The TSC in 1977 recommended that a working group meet to examine age determination techniques of important groundfish species in order to promote standardization. Mr. M. Pedersen coordinated initial arrangements and Ms. D. Chilton (FOC) coordinated the workshop held at the Pacific Biological Station, Nanaimo on April 3-6, 1978. Mr. M. Pedersen reported that Pacific cod, lingcod, rockfish, sablefish and Dover sole ageing techniques were considered. The workshop was considered successful by all participants and it met all the objectives set forth by the TSC. The TSC commends Ms. D. Chilton for her contributions in the conduct of the workshop. Comprehensive workshop reports by Ms. D. Chilton and Messrs. W. Barss and J. Golden (ODFW) were circulated to participants and TSC members.

(b) Hydroacoustic workshop

The TSC in 1977 recommended that a workshop be held to consider:

(1) The progress and potential of hydroacoustic techniques to assess biomass of groundfish stocks; (2) The compatibility of the various agencies' hydroacoustic techniques to assess biomass; and (3) A specific evaluation of the techniques for the assessment of rockfish, Pacific hake, and Pacific cod. Dr. F. Taylor coordinated the workshop held at the Northwest and Alaska Fisheries Center in Seattle on April 11-12, 1978 and reported the results to the TSC. Equipment in use is reaching a level of standardization. The techniques are appropriate for biomass estimations of pelagic and semi-pelagic species such as hake, herring, and pollock. For semi-demersal species, such as most rockfish, hydroacoustics has proved less

successful, largely because of the effort required to sample the patchy distribution of these forms. For species with small off-bottom components hydroacoustics would not be useful in biomass estimations. Dr. Taylor circulated a report of the meeting to TSC members.

(c) Sablefish workshop

In 1977, the TSC recommended that a working group be convened to review and analyze existing information, to establish a standardized system for the collection of biological and fishery data, to examine age determination techniques and consider further refinements, and to recommend any necessary coordination of sablefish management by Canada and the U.S. Mr. T. Dark coordinated the workshop which was held on February 15-16, 1978 at the Northwest and Alaska Fisheries Center in Seattle. The working group considered all the above items and made 3 recommendations which are: 1) Standardized logbook data; 2) Fishery sampling to determine maturity composition of the catch; and 3) Canada and the U.S. representatives meet to achieve standardization of foreign fleet observer data. Mr. T. Dark circulated a meeting report prior to the TSC meeting.

The TSC reviewed the recommendations of the sablefish working group and concur with them.

2. Pacific cod tagging by Canada

Mr. Bruce Leaman reported on a January 1978 pilot tagging study of juvenile cod in the Strait of Georgia preparatory to tagging to determine recruitment of juveniles into the fishery. The pilot study had objectives of determining the relationship of tow duration and survival and tagging mortality. Floy anchor tags were used and every 10th fish was double tagged with a sutured tag. Scale samples from half the fish revealed age composition of 57% age 1, 28% age 2 and 2% over age 2. There was a

12.1% mortality shortly after tagging and 17% mortality occurred after holding the tagged fish overnight. Of 970 cod released, 17% were recovered by May 1978. Almost equal numbers of single tagged and double tagged cod were recovered.

3. Pacific cod tagging in Agate Pass, Washington

Mr. M. Pedersen reported on cod tagging in Puget Sound and circulated a report. The objectives of the study were to investigate movement and exploitation of cod in central Puget Sound. A total of 641 cod were tagged in February and March 1977. Recoveries indicate that cod move rapidly through the area with a high turnover rate of fish during the fishery. Tagging results indicate that the current fishery should not endanger the resource.

4. Sablefish tagging by Canada

Dr. R. Beamish reported on sablefish tagging completed during December 1977 and an early 1978 cruise with a second cruise now in progress. To date 20,000 fish have been tagged of which 75% were injected with oxy-tetracycline to aid in age determination. Recoveries totaled 76 tagged sablefish of which most were caught in the tagging area.

5. English sole tagging by Oregon Department of Fish and Wildlife

Mr. R. Demory reported on English sole tagged in Areas 2B and 2C during December 1977 and March 1978 to determine movement during the spawning period. Of a total of 4,345 fish tagged, 71 or 2% were recovered. December releases made the longest movements, some as far as to Vancouver Island, while April releases were taken mainly in the tagging area. Most of the tag recoveries were from processors which indicate that fishermen are not seeing the tagged fish.

6. Lingcod tagging

(a) Oregon Department of Fish and Wildlife

Mr. R. Demory summarized lingcod tagging off Yaquina Bay to determine inshore-offshore movement. Inshore tagging over a reef was accomplished in November 1977 and offshore tagging is planned for August 1978. Returns total 12 lingcod at liberty 2 to 73 days; all were caught in the release area.

(b) Canada

Mr. A. Cass reported plans for tagging juvenile lingcod in the Strait of Georgia and the west coast of Vancouver Island in July 1978.

7. Dogfish tagged in the Strait of Georgia

Dr. R. Beamish reported that a high school group tagged 2,000 dogfish in 1978. A total of 7,000 have been tagged. Petersen disc tags with tritonium or tantalum pins were used. This group plans to continue tagging and work on tag development.

8. Other tagging

Mr. T. Dark reported that a processed report on past cooperative sablefish tagging will be completed this summer. About 34,000 sablefish were tagged of which about 3% (1,000) were recovered. Eighty percent of the tagged sablefish were caught in release areas. The average movement was 73 miles.

Mr. Pedersen reported movement of a yellowtail rockfish and a black rockfish to outside waters from tagging in the San Juan Islands.

Mssrs. R. Demory and J. Robinson reported an Oregon State University study that involved lingcod and rockfish tagging off Depoe Bay over in-shore reefs.

The TSC tag inventory needs to be updated. Agencies will poll

universities and others engaged in tagging so that the tag inventory can be updated.

9. Other studies

Mr. M. Fraidenburg reported on a feeding habits study of yellowtail rockfish in Queen Charlotte Sound and off Washington. A draft report was distributed.

Mr. S. Westrheim reported on results of rockfish age analyses by 2 readers. Differences in modal ages and sizes by the readers suggested that the same criteria were not used. Examination of samples, however, revealed that the differences were real and the same criteria were used.

C. Cooperative Research Programs with Other Nations

1. Canada - proposal for Pacific cod tagging experiment in Areas 3B-3C by Canada-U.S.

A proposal for joint tagging of Pacific cod on spawning areas in Areas 3B and 3C during February-March 1979 was presented by Canada. Washington could participate with personnel only and not ship time. Discussions culminated in a recommendation to conduct the cooperative tagging.

2. United States - report on Canada-Poland-U.S. hydroacoustic intercalibration

Mr. T. Dark reported that the intercalibration by the vessels G. B. Reed, Miller Freeman and Profesor Seidlecki was conducted in September 1977. Mr. M. Nelson of NWAFC is compiling a report.

3. Research vessel observer programs U.S.-Japan and U.S.-U.S.S.R.

Mr. T. Dark reported that observers will be aboard Japanese and U.S.S.R. research vessels when conducting research in the U.S. zone.

VIII. Progress on 1977 Recommendations

A. Technical Sub-Committee

1. Sablefish-specification of biological and fishery data base and standardization of format for data collection. Mr. T. Dark coordinated the workshop, compiled and distributed its report. The objectives of the TSC recommendation were fulfilled.

2. Petrale sole - intensification of acquisition and analyses of biological and fishery data to assess condition of stocks, and determine if management measures need to be considered.

All agencies are continuing to devote attention to petrale sole. Petrale samples were difficult to obtain at some ports due to the small landings. Mr. R. Demory reported that ODFW had begun an analysis of historic petrale sole data.

3. Hydroacoustic workshop

The hydroacoustic workshop was held in Seattle on April 11-12, 1978. Dr. F. Taylor coordinated the workshop and distributed a workshop report. The objectives of the TSC recommendation were fulfilled.

4. Age determination workshop

This workshop was held in Nanaimo on April 3-6, 1978. Mr. M. Pedersen and Ms. D. Chilton acted as coordinators. The workshop served to fulfill the 1977 recommendation of the TSC.

5. Pacific ocean perch working group

The Working Group met in May 1978. The 1974 status of stock report was updated through 1976 and presented at the 1977 November interim meeting of the TSC. The matter of alternative management strategies was considered, but no concensus was reached. The working group agreed to continue to complete tasks outlined by the 1977 recommendation.

6. Shelf Rockfish Working Group

Mr. M. Fraidenburg reported that due to other commitments, particularly those associated with extended jurisdiction, this working group did not make progress on the TSC recommendation during the past year.

7. Reporting in metric units

Metric units will be used in TSC reports.

B. Parent Committee

The TSC noted that the Minutes of the 1977 meeting of the IGC are as yet unavailable for guidance and consideration at this meeting.

1. Control of Pacific ocean perch harvest.

At an extraordinary session of the IGC on June 17, 1977 the IGC subscribed to and endorsed the TSC recommendation and recommended to respective governments to take appropriate action to assure that the seriously depleted stocks of Pacific ocean perch in the Vancouver and Columbia INPFC areas are not subjected to further significant harvests beyond the limits recommended for 1977 (Vancouver 287 mt, Columbia 111 mt). Dr. J. P. Harville transmitted this recommendation to U.S. management agencies on July 20, 1977.

2. Coordinated rockfish survey

The IGC approved and transmitted to respective governments a recommendation for support of a coordinated survey of rockfish resources off the United States and Canada.

IX. 1978 Technical Subcommittee Recommendations

A. Future Work

1. Pacific hake

The TSC reviewed and adopted the proposal of inclusion of Pacific hake in statistical tables of the Groundfish Data Series. The TSC

recommends that in the future Pacific hake be included in the Groundfish Data Series and in status reports of member agencies.

2. Other rockfish stock assessment and management in Area 3C.

The TSC recommends that a working group be formed to address the problems of other rockfish stock assessment and management in Area 3C, with particular attention directed to the Vancouver Area. This group shall prepare a summary document of the current state of knowledge about these species, and in so doing generate a list of priority projects which should be undertaken to aid in the resolution of assessment and management problems of these species. The working group will report to the TSC at the October 1978 Interim Meeting. Mr. M. Fraidenburg will act as coordinator.

B. Parent Committee

1. Coordinated rockfish survey

The Technical Sub-committee reaffirms its support of a coordinated rockfish survey as a means of obtaining a better understanding of rockfish stocks, and urges both countries to seek adequate ship time and other support required to carry out such a survey during 1978.

2. The Technical Sub-committee requests support to expedite arrangements for a joint Canada-U.S.A. tagging experiment in early 1979 to delineate stocks of Pacific cod in Area 3B-3C.

3. IGC meeting minutes

The Technical Sub-committee noted that minutes of the November IGC 1977 meeting were not circulated prior to the June 1978 TSC meeting. The TSC recommends to the International Groundfish Committee that such minutes be made available so that instructions and advice of the IGC can be incorporated in the conduct of TSC meetings.

4. The TSC reviewed the Report of the Sablefish Workshop and concurs with its recommendations which concern:

1. Uniform logbook data
2. The study of reproductive biology, reproductive distribution, and biology, distribution, and movement of pre-recruits.
3. Uniform U.S.-Canada foreign fishery observer data.

Recommendation 3 of the working group has been carried out.

The TSC recommends that the IGC support the TSC in implementing the recommendations of workshop.

X. Other Business

A. Activities of the Pacific Fishery Management Council's Groundfish Management Plan Development Team

Mr. R. Demory reported on the progress of the groundfish plan. Several drafts have been completed and discussions were held with the advisory panel. The plan will be presented to the PFMC's Scientific and Statistical Committee at Monterey in July 1978 and to the Council in August. Portions of the Plan concerning social-economic factors are being contracted. The Plan is scheduled for implementation on January 1, 1980.

XI. Schedule of Future Meetings

An interim meeting of the TSC is scheduled for October 16, 1978. The IGC meeting is scheduled for October 17, 1978; both meetings will be held in Coeur D'Alene, Idaho. The 20th Annual Meeting of the TSC is scheduled for June 1979 in British Columbia.

XII. Election of Chairman

Mr. T. Dark, NMFS, was unanimously elected chairman for 1979-1980.

XIII. Adjournment

The meeting was adjourned at 1800 on June 15, 1978.

Appendix A
AGENDA
for the
19th Annual Meeting
of the
Technical Sub-Committee of the International Groundfish Committee
California, June 14-16, 1978

- I. CALL TO ORDER
- II. APPOINTMENT OF SECRETARY
- III. APPROVAL OF AGENDA
- IV. TERMS OF REFERENCE OF THE SUB-COMMITTEE
- V. REVIEW OF AGENCY GROUND FISH PROGRAMS
 - A. Activities
 - B. List of reports published
- VI. REVIEW OF NORTHEAST PACIFIC GROUND FISH FISHERIES
 - A. Canada-United States Commercial Fisheries in 1977
 - 1. Total landings (Chairman)
 - 2. Dover sole (ODFW)
 - 3. English-sole (CDEG)
 - 4. Petrale sole (CDEG)
 - 5. Rock sole (FOC)
 - 6. Lingcod (FOC)
 - 7. Pacific cod (FOC)
 - 8. Pacific ocean perch (WDF)
 - 9. Other rockfish (WDF)
 - 10. Sablefish (NMFS)
 - 11. Dogfish (FOC)
 - B. Other Nations' Commercial Fisheries in 1977 (FOC and NMFS)
 - 1. Japan
 - 2. Polish Peoples Republic
 - 3. Republic of Korea
 - 4. USSR
 - 5. Others
 - C. All-Nation Commercial Catch of Major Species
 - 1. Pacific hake (NMFS)
 - 2. Rockfish (FOC)

Agenda (continued)

3. Sablefish (NMFS)

- D. Canada-United States Recreational Fisheries (Commitment made at the November 1977 Interim Meeting)
- E. Canada-United States (Domestic) Groundfish Regulations
 - 1. Changes since the 1977 TSC Meeting
 - 2. Changes currently under consideration
- F. International Fisheries Agreements
 - 1. Canada-USA Agreement
 - 2. Other Canadian Agreements
 - 3. Other USA Agreements

VII. GROUND FISH RESEARCH

A. Stock Assessment

- 1. Reports from Working Groups on:
 - (a) Pacific cod-lingcod-petrale sole in Area 3C
 - (b) Pacific cod-lingcod-rock sole in Areas 5A & 5B
 - (c) Pacific ocean perch in Area 2B-5B (Gunderson - NMFS)
 - (d) Shelf rockfish in Area 1A-5B (Fraidenburg - WSF)
- 2. Pacific hake (Dark - NMFS)
- 3. Petrale sole
- 4. Shelf Rockfish - Appraisal of management measures in the INPFC Vancouver Area
- 5. Pacific cod - general review (RECOMMENDATION)

B. Special Studies

- 1. Reports on:
 - (a) Age-determination Workshop (Pedersen - WDF)
 - (b) Hydroacoustic Workshop (Taylor - FOC)
 - (c) Sablefish Workshop (Dark - NMFS)
- 2. Pacific cod (juveniles) tagging by Canada (Leaman - FOC)
- 3. Pacific cod tagging in Washington inside waters (Pedersen - WDF)
- 4. Sablefish (adults) tagging by Canada (Beamish - FOC)
- 5. English sole tagging by ODFW (Demory)
- 6. Lingcod tagging
 - (a) ODFW (Demory)
 - (b) Canada (Cass)
- 7. Dogfish Tagging in the Strait of Georgia (Beamish)

8. Other tagging
9. Other studies

C. Cooperative Research Programs with Other Nations

1. Canada - proposal for joint Pacific cod tagging experiments in Areas 3B-3C by Canada-USA
2. United States - report on Canada-Poland-USA hydroacoustic intercalibration

VIII. PROGRESS ON 1977 RECOMMENDATIONS

A. Technical Sub-Committee

1. Sablefish - specifications of biological and fishery data base and standardization of format for data collection. (Dark - NMFS)
2. Petrale sole - intensification of acquisition and analysis of biological and fishery data to assess condition of stocks, and determine if management measures need to be considered.
3. Hydroacoustic Workshop - April 1978 (Taylor - FOC)
4. Age Determination Workshop - April 1978 (Pedersen - WDF)
5. Pacific Ocean Perch Working Group - (Gunderson - NMFS)
6. Shelf Rockfish Working Group - (Fraidenburg - WDF)
7. Reporting in metric units - to begin in 1978

B. Parent Committee

1. Control of Pacific ocean perch harvest
2. Coordinated rockfish survey

IX. 1978 TECHNICAL SUB-COMMITTEE RECOMMENDATIONS

A. Future Work

1. Include Pacific hake in statistical tables
2. Other rockfish stock assessment and management in Area 3C

B. Parent Committee

1. Coordinated Rockfish Survey
2. Joint Canada-U.S. Pacific cod tagging in Areas 3B-3C
3. IGC 1977 Meeting Minutes
4. Sablefish Workshop Recommendations

X. Other Business

- A. Activities of the Pacific Fishery Management Council's Groundfish Management Plan Development Team

XI. Schedule of Future Meetings

XII. Election of Chairman

XIII. Adjournment

Appendix B

Distribution of the Report of the Technical Sub-Committee

Technical Sub-Committee

Canada:	J. Westrheim, B. Leaman	
	R. Beamish, F. Taylor, A. Cass	5
United States:		
NMFS	T. Dark	3
California	T. Jow	2
Oregon	R. Demory, J. Robinson	2
Washington	M. Pedersen, M. Fraidenburg	2
Alaska	P. Rigby	2

International Groundfish Committee

Canada	I. Todd	4
United States	J. Harville	4

Advisors and Others

Canada	K. Ketchen	4
United States	C. Fullerton, J. Baxter - California	3
	J. Donaldson, W. Hublou - Oregon	2
	G. Sandison, A. Millikan - Washington	2

International Pacific Halibut Commission		1
	S. Hoag	

Spare copies		5
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