

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

Nanaimo, B.C., Canada, 1981 May 14

REPORT OF THE MAY 1981 WORKING GROUP ON SABLEFISH OF THE SUB-COMMITTEE
ON NON-ANADROMOUS SPECIES

The Working Group on Sablefish met May 13 and 14, 1981 in Nanaimo, Canada. C.R. Forrester of INPFC convened the meeting. S.J. Westrheim of the Resource Services Branch, Pacific Region, Canada Department of Fisheries and Oceans welcomed participants. R.J. Beamish of Canada served as chairman and C.R. Forrester acted as rapporteur.

1. PARTICIPANTS

The following persons took part in the working group sessions:

CANADA	R.J. Beamish	Pacific Biological Station Fisheries & Oceans, Nanaimo
	J. Mason	"
	C. Houle	"
	R. Scarsbrook	"
	S. McFarlane	"
	A. Cass	"
	C. Manson	"
	D. Chilton	"
	J.A. Thomson	"
JAPAN	Ikuo Ikeda	Far Seas Fish. Res. Lab. Fisheries Agency, Shimizu
	Keisuke Okada	"
	Takashi Sasaki	"
	Ryoji Koseki	Resources Division, Fisheries Agency, Tokyo
UNITED STATES	J.W. Balsiger	Northwest & Alaska Fisheries Center, NMFS, NOAA, Seattle
	H.H. Zenger	"
SECRETARIAT	K. Shima	INPFC
	C.R. Forrester	"
	K. Kurita	Interpreter

2. AGENDA

The following agenda was adopted:

- (1) Opening remarks
- (2) Introduction of delegation
- (3) Selection of chairman
- (4) Selection of rapporteur
- (5) Adoption of agenda
- (6) Review of terms of reference
- (7) Documents
- (8) Topic discussions
 - (a) Distribution of eggs and larvae
 - (b) 1977 year-class
 - (c) Migration of juvenile sablefish
 - (d) Summary of tagging
 - (e) Reproduction
 - (f) Age determination
 - (g) Relative abundance
 - (h) Exploitation strategies
- (9) Other business
- (10) Recommendations
- (11) Consideration of a report to the Sub-Committee on Non-Anadromous Species

3. TERMS OF REFERENCE

The terms of reference of the working group are:

- (1) To address the age, size, and relative abundance of recruits to the sablefish fishery off the west coast of North America.

4. DOCUMENTS

Several papers were submitted for review and discussed. Since these were working papers, they were not given official INPFC document numbers. The working papers are:

Canada

- (1) Blackcod egg and larval distribution--John Mason
- (2) Blackcod age and length at first maturity, timing and location of spawning, description of maturity states--Dick Beamish
- (3) Movement of juvenile blackcod from inside to outside waters--Dick Beamish
- (4) Summary of results to date of adult tagging--Cecile Houle and Ray Scarsbrook

- (5) The 1977 year-class, its distribution (as juveniles in inside waters), the estimated biomass, potential impact on other fishes and an hypothesis for its success--Sandy McFarlane and Al Cass
- (6) The use of daily growth rings to verify the position of the first annulus on the otolith--Cathy Manson
- (7) Age determination of blackcod--Dick Beamish and Doris Chilton
- (8) Age composition and mortality rates--Cecile Houle

Japan

- (1) Trends in sablefish stocks in the Aleutian Region and the Gulf of Alaska--Takashi Sasaki
- (2) Preliminary report on U.S.-Japan longline survey for sablefish and Pacific cod by Fukuyoshi maru No. 8 in the Gulf of Alaska in the summer of 1980--Takashi Sasaki.

United States

- (1) Changes in relative abundance and size composition of sablefish in the coastal waters of southeast Alaska--H. Zenger and S.E. Hughes, Northwest and Alaska Fisheries Center, NMFS, NOAA Technical Memorandum, NMFS F/NWC-7, January 1981.
- (2) Documentation by T. Sample: Incidence and average lengths of sablefish taken in surveys conducted in the eastern Bering Sea, 1971-1980; comparative biomass estimates, age-length frequencies, etc.

5. DISCUSSIONS

(1) Distribution of eggs and larvae

Canada described studies to determine distribution of sablefish eggs and larvae during four ichthyoplankton cruises conducted in January through April, 1980. It was determined that eggs are laid and develop in outer slope waters along the Canadian coast at depths to 560 meters which was the deepest sampled. Greatest number of eggs were found in January and February with abundance greatly reduced in March and April. No larvae were found until March and April. The samples suggested that main spawning took place in December and January and was over by April. It was also noted that sablefish eggs were more abundant than halibut eggs in deep water layers (greater than 400 m). Of the larger catches of sablefish eggs, 86% were taken at depths greater than 400 m and all large catches of larvae were taken at depths greater than 400 m. It is planned to continue the sampling and attempt to relate the egg density found to biomass of adults through reference to fecundity.

(2) "1977 year-class"

During 1978, 1979, and 1980, juvenile sablefish from the "1977 year-class" were found to be unusually abundant in inshore waters along the entire coast of British Columbia. These fish appeared first as substantial undersized discards in the trawl fishery and by 1980 were appearing as undersized discards in the trap fishery. The estimated discards in 1979 and 1980 were about 4,000 and 3,000 t, respectively.

Using an estimated exploitation rate of 5%, that is thought to overestimate the true exploitation rate, the biomass of the "1977 year-class" in 1979 was estimated to range from 41,000 to 80,000 t and in 1980 from 30,000 to 60,000 t. Using documents submitted by Canada, Japan, and the United States it was estimated that the "1977 year-class" constituted about 40% of the total number of all sablefish in the Gulf of Alaska, the Aleutian Region, and off Canada in 1980.

Canadian studies suggest that the production of this strong year-class may have been aided by the anomalous oceanographic conditions of 1977 when there was stronger and warmer than usual onshore wind-driven water transport from the southwest. The "1977 year-class" was observed as an explosive phenomenon in the eastern Bering Sea, the Aleutian Region, and in most areas of the Gulf of Alaska.

(3) Migration of juvenile sablefish

In 1979 Canada initiated a tagging study to determine the migration pattern of juveniles of the "1977 year-class". During 1979 and 1980, 43,639 juvenile sablefish were tagged in Hecate Strait, Queen Charlotte Sound, and central coast inlets. As of February 1981, 593 juveniles had been recovered from inshore waters and 18 from offshore areas. No recorded movement to offshore areas was noted until April 1980. The offshore recoveries after that time suggest that the main migration to offshore areas may now be taking place. Of the 18 offshore recoveries, 15 were taken in Canadian waters relatively close to the area of tagging and 3 were recovered at greater distances (Kodiak Island, Alaska; Point Arena, California; southeastern Alaska). The recoveries to date suggest that a significant number of juveniles remain in the Canadian zone. If this continues to be the case, it will have important management implications.

Data included in a Japanese document suggest that juvenile sablefish migrated from the Southeastern Area into the central Gulf of Alaska in 1980.

(4) Summary of tagging

Canada reported that a total of 92,848 sablefish had been tagged to the end of 1980. Of these, 49,188 were adults (15,183 of which were injected with oxytetracycline) and 43,660 were juveniles. There have been 4,127 recoveries to date. The movement of the adults initially has been quite localized, but there are some indications that average movement increases with time. A double-tagging experiment suggests that any appreciable tag loss may occur within the first year.

The United States reported that in 1980 sablefish had been tagged in the region from the Southeastern Area to off southern California. No information on recoveries was available.

Japan reported that during 1978-80, in cooperation with the United States, a total of 34,000 sablefish had been tagged (as reported at the 1980 Annual Meeting of INPFC). Recoveries to date suggest that movement of sablefish in the Gulf of Alaska is greater than off Canada and off Washington, Oregon, and California.

Results of all tagging experiments should be examined to determine if there is differential migration by size, sex, etc.

(5) Reproduction

Canada reported on studies of state of maturity of sablefish conducted in late 1979 and early 1980. Ripe or ripening females were observed as early as August and spawning or spawned females were observed in January. Most spawning occurred in February and by March most females had spawned. Males were observed to be in spawning condition before females, and remained in this condition longer. Spawning appeared to take place in the same areas where adults are found throughout the year. Fifty percent of male sablefish were mature at 50 cm fork length and age of 4.7 years. Fifty percent of female sablefish were mature at fork lengths of 52 cm and age of 5.0 years. There was variation in size at maturity with area.

The United States noted that sizes at maturity off the Washington-Oregon coasts were similar to those generally observed off Canada, but 50% maturity occurred at slightly larger sizes in the Gulf of Alaska. It was also noted that Japanese scientists estimated 50% maturity sizes for male and female sablefish to be 58 cm and 62 cm respectively in the Gulf of Alaska.

(6) Age determination

United States scientists reported that they were reviewing their techniques for age determination of sablefish and would probably adopt the breaking and burning routine as a standard procedure.

Canada reported on techniques for aging sablefish and various procedures employed to validate the technique. These included study of daily growth rings during the first year of life, use of oxytetracycline injections in conjunction with tagging studies, tagging of juveniles, etc. Canadian scientists also noted that male sablefish had a slower growth rate than females and that sablefish could reach ages of 40 to 50 years.

(7) Exploitation strategies

Discussion took place on means for rationally exploiting a particularly strong year-class of fish. Should the year-class be heavily fished or should fishing be cautious? Should the recruits be fished hard and larger fish be returned to the sea to ensure adequate brood stock? With no information on stock-recruitment relationships, no decisions could be reached. However, it was agreed that increased catch could be expected from the increased abundance resulting from the strong "1977 year-class".

6. OTHER BUSINESS

There were no items of other business.

7. RECOMMENDATIONS

Workshop participants noted the wealth of valuable information on sablefish contained in the working papers and brought out in discussions during the workshop. The group RECOMMENDS that a joint comprehensive report on sablefish be prepared by the scientists from the three countries. To that end, the group proposes that this matter be discussed by the parent sub-committee at the 1981 Annual Meeting and further that the sub-committee consider a working group recommendation that a sablefish working group meet in Japan prior to the 1982 meetings of the Standing Committee on Biology and Research to review sections of a draft joint comprehensive report on sablefish.