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INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

Tokyo, Japan, 1980 May 10

REPORT OF THE WORKING GROUP ON JOINT SURVEYS OF THE SUB-COMMITTEE ON NON-ANADROMOUS SPECIES

The Working Group on Joint Surveys met May 6 to 10 in Tokyo, Japan. Mr. Kazuo Shima, Executive Director of INPFC, convened the meeting. Commissioner Hiroya Sano of Japan welcomed the participants and wished them success in their endeavour. Dr. Ikuo Ikeda of Japan served as chairman and Mr. Miles Alton of the United States acted as rapporteur.

Commissioner Hiroya Sano welcomed the working group participants on behalf of the Japanese Section. He noted that the working group meeting had been arranged at the time of the 26th Annual Meeting in Tokyo in 1979. It was well known, he said, that groundfish research in the North Pacific has been conducted with the close cooperation of the three Contracting Parties for many years.

Mr. Sano referred to the large scale cooperative survey which United States and Japan entered into last year and that they agreed that the results of that survey would be analyzed under the framework of INPFC. He said that such a large scale cooperative survey was the first in the history of the management of groundfish resources in the North Pacific which is one of the most important fishing grounds in the world. He stated that a cooperative survey of the Aleutians would be carried out in 1980. He added that such cooperation would contribute to better management of fishery resources in the region and accelerate the rational use of the resources.

Mr. Sano said that he appreciated that the members of the working group would review and examine a large amount of data within a limited time but hoped, however, that they would discuss fully the problems concerning the estimate of the resources.

He closed his remarks by wishing the participants success and an enjoyable stay in Tokyo.

1. PARTICIPANTS. The following persons took part in the working group sessions:

CANADA	Louis Lapi	Pacific Biological Station Fisheries and Oceans, Nanaimo
JAPAN	Ikuo Ikeda	Far Seas Fish. Res. Lab. Fishery Agency, Shimizu
	Keisuke Okada	"
	Hirotsune Yamaguchi	"
	Takashi Sasaki	"
	Kiyoshi Wakabayashi	"
	Yasuhiko Saeki	International Affairs Div. Fishery Agency, Tokyo
	Koji Imamura	Long Distance Fisheries Div. Fishery Agency
	Yoshiya Ishibe	"
	Jun Yamashita	International Affairs Div. Fishery Agency, Tokyo
	Masanori Miyahara	"
	Akihiko Asakawa	"
	Hideo Kono	Japan Marine Fishery Resource Research Center Tokyo
UNITED STATES	Richard G. Bakkala	Northwest & Alaska Fisheries Center, NMFS, NOAA, Seattle
	Miles S. Alton	"
	Loh-Lee Low	"
SECRETARIAT	Kazuo Shima	Executive Director
	Mayumi Kainuma	Office Assistant, Inter-Group
INTERPRETER	Chuta Funayama	Inter-Group

2. AGENDA. The following agenda was adopted:

1. Opening remarks
2. Welcome address
3. Introduction of members and advisers
4. Selection of Chairman
5. Appointment of Rapporteur
6. Adoption of agenda
7. Cooperative research--1980
   (a) Final survey plans
   (b) Information requested by U.S. investigators
8. Data exchange--1979 cooperative survey
   (a) U.S. data
   (b) Japanese data
      (1) Description of trawls
      (2) Detailed catch data by species

9. Data analysis
   (a) Fishing efficiency
   (b) Analytical methods
   (c) Review of the number of samples and stratification
   (d) Discussion of questions raised in correspondence

10. Joint report--1979 cooperative survey results
   (a) Outline
   (b) Introduction
   (c) Methods
      (1) U.S. demersal trawl survey
      (2) U.S. hydroacoustic survey
      (3) Japanese demersal trawl survey
      (4) Japanese hydroacoustic survey
      (5) Combined U.S. and Japanese demersal trawl survey
   (d) Results
      (1) Lists of species taken
      (2) Distribution figures
      (3) U.S. hydroacoustic survey
   (e) Assignment of authors for remaining sections
   (f) Methods of authorship
   (g) Schedule for completion of report
      (1) INPFC document
      (2) Publication
11. Report of working group meeting
12. Other business
13. Future meetings
14. Closing remarks

3. TERMS OF REFERENCE. The terms of reference of the working group are:

   (a) Facilitate the completion of a report on the results of the U.S.-Japan joint survey of Bering Sea groundfish that was conducted in 1979 through exchange of data, agreement on methods of analysis, and review of work completed so far.

   (b) Review and reach agreement on cooperative surveys in 1980.

4. DOCUMENTS. Thirteen papers were submitted for review and discussion. Since these were working papers, they were not given official INPFC document numbers. These working papers are:

Working Paper no. and origin	Title
WP1--U.S.	Scientific operation plan--Aleutian Island survey
WP2--U.S.	Draft cruise instruction--1980 Bering Sea crab-groundfish survey
WP3--U.S.	U.S. hydroacoustic survey
WP4--Japan	Cruise plan for cooperative research on the distribution and abundance of blackcod and Pacific cod in the Aleutian Region and the northeastern Pacific in 1980
WP5--Japan	Cruise plan for cooperative research on the trawl survey in the Aleutian Region and the Bering Sea in 1980
WP6--U.S.	Outline--Report on U.S.-Japan 1979 cooperative groundfish investigation in the eastern Bering Sea
WP7-1--Japan	Methods of the Japanese demersal trawl survey
WP7-2--Japan	Methods of the U.S. and Japanese demersal trawl survey
WP7-3--Japan	Methods of the Japanese hydroacoustic survey
WP7-4--Japan	Table and figures for 1979 U.S.-Japan joint trawl survey
WP8--U.S.	Introduction for joint report and methods of U.S. groundfish survey
WP9--U.S.	Examples of figures and tables for 1979 joint survey
WP10--U.S.	List of species collected by U.S. vessels during the 1979 joint survey
WP11--U.S.	Examples of distribution figures proposed for the 1979 joint survey
WP12--U.S.	Fishing power factors to use for the combined analysis of U.S. and Japanese survey data on the continental shelf
WP13--U.S.	Fishing power factors to use for the combined analysis of U.S. and Japanese survey data on the continental slope

5. COOPERATIVE RESEARCH PLANS FOR 1980

(a) Japan-U.S. survey of groundfish in the Aleutians. Japanese and U.S. scientists reviewed their respective plans (WP1 and WP5) for a joint survey in the Aleutians. Japan has made arrangements to charter the 349 ton stern trawler, Hatsue maru No. 62 for approximately 120 days starting in July. The actual period and duration of the cruise will be decided at a later date. A complicating factor is that the Japanese research vessel may have to return to Japan for refueling at the midpoint of the cruise resulting in the loss of valuable survey time. If this occurs then only 90 of the 120 days would be available for the actual Aleutian survey. U.S. scientists will investigate the possibility of the Japanese research vessel obtaining fuel in a U.S. port.

The U.S. will have two chartered trawlers, Ocean Harvester and Sunset Bay, and possibly the NOAA research vessel, Chapman, for the Aleutian survey (WP1). The uncertainties regarding the Chapman cruise arise because of shipyard delays. The Chapman is tentatively scheduled to operate in the Aleutians during the August to October period. Survey period for the Sunset Bay is July 2 to August 21, and for the Ocean Harvester, July 29 to August 21.

U.S. and Japanese scientists agreed to adopt the U.S. survey station plan for all vessels. This plan establishes bottom trawl stations for shallow to deep (900 meters) sections of 30 minutes of longitude both north and south of the Aleutian Chain (WP1, Figures 1 to 4). The sections are numbered from 1, starting at the western end (170°30'E), to 49, at the eastern end near Unimak Pass. In addition, Bowers Bank is also subdivided into sections (WP1, Figure 2).

U.S. vessels would survey all even numbered sections from 20 to 48 both north and south of the Aleutians and from 14 to 20 on the south side of the Aleutian Chain.

The Japanese vessel would sample all the odd numbered sections from 1 to 49 north of the Aleutians and from 14 to 20 on the south side, and all the sections on Bowers Bank.

Survey results in areas that overlap would be used to compare relative catching efficiencies between the Japanese vessel and the U.S. vessels. Therefore, it is desirable that whenever possible U.S. and Japanese vessels operate in common areas during the same period. If there is extra cruise time and/or the vessel Chapman becomes available, the region south of the Aleutians (sections 1 to 13) would be surveyed.

For the Aleutian survey, Japanese scientists suggested that U.S. investigators estimate the width of their trawl while fishing at each station because Japanese scientists have found trawl width changes with depth of sampling (WP7, Figure 2). U.S. scientists agreed and will use both a trawl mensuration system (acoustical device) and the Japanese warp angle-cable length method. U.S. scientists will provide details to the Japanese scientists regarding the trawl mensuration system.

The policy concerning the disposition of fish specimens between U.S. and Japanese investigators on board the Japanese vessel for ichthyological studies was discussed. It was agreed that the policy established for the 1979 Bering Sea survey would be continued for the 1980 Aleutian survey.

(b) Eastern Bering Sea crab-groundfish survey. The U.S. scientists reviewed their research plan (WP2) for the eastern Bering Sea. Their survey would be a continuation of their annual survey of crab and groundfish and would cover extensive areas of the continental shelf (less than 100 fathoms) using the NOAA research vessel, Oregon, and the chartered trawler, Ocean Harvester, during the period May 9 to July 21.

The Japanese would not be able to participate in the survey in 1980 because of a reduction in the survey period caused by high fuel costs and the necessity to concentrate survey effort in the Aleutian region in 1980.

(c) Cooperative research on the distribution and abundance of blackcod and Pacific cod in the Aleutian Region and the northeastern Pacific. Japanese scientists reviewed their research plan for blackcod and Pacific cod (WP4). They plan to continue their annual survey in 1980 which was begun in 1978. The vessel to be used and the exact dates of the cruise are yet to be finalized, but it is expected that the vessel will depart Japan in May. During the first 3 months of the cruise there will be a general coverage of the survey area; the last 2 months would be devoted to sampling in areas of abundance located during the general survey. The intensity of sampling would be in relation to the density of fish. The directed sampling would take place in areas where the fisheries are allowed and be under the direction of the Japan Marine Resource Research Center, Tokyo. This center indicated that they plan to conduct similar studies in 1981.

The United States plans to have an observer, Mr. Ron Tanino, on board during the first leg of the cruise who would possibly board the vessel in Kushiro, Japan. Confirmation of the place of departure will be made later. Mr. Duane Rodman would be the U.S. observer during the second leg of the cruise and would board the vessel in Kodiak, Alaska.

Japanese scientists expressed interest in winter surveys in the northeastern Pacific and also in a joint Japan-Canada tagging study to examine migrations. The Canadian representative said that he would look into the matter. Interest was also expressed in a future Japan-Canada-U.S. survey of blackcod abundance.

6. RESULTS OF THE 1979 COOPERATIVE SURVEY IN THE BERING SEA

(a) Exchange of data and analytical results. U.S. and Japanese scientists have exchanged their basic bottom trawl survey data and computer listings giving catch rate and biomass information based on their own survey stratification schemes. The U.S. members had also planned to provide Japanese scientists with U.S. survey results based on a Japan-U.S. agreed upon stratification scheme by the time of the meeting, but this submission was delayed and was scheduled to take place between May 16 and 20.

Japanese scientists will send to the United States their flounder age data when compiled.

The U.S. delegation requested Japanese survey results concerning species catch rates on certain non-commercial fish groups. U.S. scientists agreed to accept copies of the original vessel sampling forms which contain this information and will convert this information to a computer format for analysis.

(b) Agreement on analytical procedures

(1) Fishing efficiency. A Japanese scientist reviewed the methods used in determining the relative catching efficiencies of Japanese and U.S. survey vessels for various fish species and presented the results of this analysis (WP7-4). Biomass estimates for a given species would be based on the most efficient vessel for that species and the catch rates of all other vessels would be adjusted to the most efficient vessel.

The chairman was concerned by the lack of a standard vessel for future survey comparisons. The Oregon which is a standard vessel for the U.S. annual survey of Bering Sea crab and groundfish will be retired from the NOAA fleet in 1980. Its replacement, the Chapman, will not be available for the Bering Sea surveys until 1981. It was finally agreed that the U.S. commercial trawler, Paragon II, and its 400 m mesh eastern trawl gear would be an interim standard until comparative fishing between this trawler type (combination crab trawler) and the Chapman could take place in 1981; thereafter the Chapman would be the standard vessel.

It was also agreed that for the 1979 survey analysis the biomass of a species would be based on the most efficient vessel as explained by a Japanese scientist but that for measuring abundance changes through time series surveys, a standard vessel and its gear would be used. Fishing power correction factors would only be used when significant differences existed between abundance estimates of the survey vessels.

U.S. scientists suggested that since there were several vessels involved in the 1979 survey and that their areas of coverage overlapped with one another, it might be possible to estimate the catchability coefficients of these vessels through simultaneous equations. The chairman asked U.S. scientists to investigate this possibility.

(2) Stratification survey area. Since each nation used a different stratification scheme for estimating biomass and population size, a new stratification scheme was developed for analyzing the results of the combined Japan-U.S. survey data sets. The chairman stated that post stratification may introduce additional bias in a statistical sense. He advised that for future cooperative surveys a common stratification scheme should be used. All national sections agreed with this suggestion, but that the development of a stratification scheme for future surveys would be worked out by Japanese and U.S. investigators outside of the framework of INPFC and that Canada would be kept informed of progress.

(3) Estimate of size composition. Japanese and U.S. investigators use different methods for determining the length of fish. U.S. scientists use a non-integer 1 cm interval (e.g. 14.5-15.5) for determining the size of a fish to the nearest cm; the Japanese use an integer of 1 cm width (e.g. 14.0-15.0) for the nearest cm measurement. To combine U.S. and Japanese length data it was agreed that the procedure outlined in WP7-2 (page 14) would be used.

(4) Estimate of age composition of pollock. The working group noted that comparisons of age readings for pollock by U.S. and Japanese scientists have shown differences in the past. It was agreed that both U.S. and Japanese age-length keys would be applied to combined U.S. and Japanese length-frequency data to illustrate differences in age composition resulting from the variation in methods of aging pollock.

(c) Joint report progress

(1) Outline. An outline (WP6) for the joint report on results of the 1979 cooperative U.S.-Japan survey in the eastern Bering Sea was reviewed by the working group. Japan expressed the view that the section dealing with results of the Japanese hydroacoustic survey of pelagic pollock over the Bering Sea deep water basin should be deleted because this information will be included in a separate report. However, in order to present a comprehensive picture of the pollock resource from the 1979 survey data, Japan agreed to incorporate these results in the joint report.

The working group also agreed to adopt other portions of the outline as presented in WP6.

(2) Introduction. Contents of the draft of the introduction section (WP8) were agreed upon by the working group. Japan proposed that historical background information on surveys in the Bering Sea contained on pages 2 and 3 of the working paper was too detailed and that it be condensed. The U.S. delegation was in agreement with this view and will shorten that section.

(3) Methods

(i) U.S. and Japanese survey methods and analytical procedures. Separate drafts describing methods used during the U.S. and Japanese demersal trawl surveys, and in analysis of the survey data were presented by the U.S. (WP8) and Japan (WP7-1). In reviewing these drafts the working group noted that similar information was presented in the two drafts and that they should be combined.

(ii) Procedures for the combined analysis of the U.S.-Japan survey data. The draft of this section (WP7-2) was accepted as written although Japan requested that the text be edited.

(iii) U.S. hydroacoustic survey. The working group accepted the draft of the methods section for the U.S. hydroacoustic survey without comment (WP3).

(iv) Japan hydroacoustic survey. The working group accepted the draft of the methods of the Japanese hydroacoustic survey without comment (WP7-3).

(4) Results. The only draft of the results section completed by the time of the working group meeting was that on the U.S. hydroacoustic survey (WP3). Japan will make comments at a later time.

(5) Assignment of authors. It was decided that at this time authors would not be identified but that the national section responsible for the completion of individual sections and subsections be indicated as follows:

Section	National Section
I. Introduction and background	U.S.
II. Bottom trawl survey methodology	Japan and U.S.
A. Japan survey	Japan
B. U.S. survey	U.S.
III. Acoustic methodology	
A. U.S. survey	U.S.
B. Japan survey	Japan

IV.	Results of bottom trawl surveys	Japan and U.S.
	A. Species distribution (combined data)	
	B. Biomass and population characteristics	
	1. Japan survey	
	2. U.S. survey	
	C. Special topics	
V.	Results of acoustic survey	
	A. U.S.	U.S.
	B. Japan	Japan
VI.	Oceanographic features (combined data)	Japan
VII.	Synthesis of joint survey	Japan and U.S.

(6) Method of citing authors. The working group discussed the method of citing authors; whether they should be given on the title page or whether the authors should be listed in each section of the report. It was tentatively agreed that authors would be listed in each section of the report, but that this would be determined at a later date.

(7) Schedule for completion of report. The working group agreed that the joint report may not be completed by the 1980 Annual Meeting of INPFC. A partial draft of the report would be submitted at the meeting as an INPFC document and a schedule for the completion of the report would be determined at that time

(8) Outlet for publication. The working group agreed that the best outlet for the report would be the INPFC Bulletin series. Mr. Shima, Executive Director of INPFC, stated that the Secretariat would give the joint report high priority in order to have the report published in as short a time as possible.

7. OTHER BUSINESS. It was agreed that in the exchange of data between Japan and the U.S. regarding the joint report a copy of the covering letter accompanying this exchange would be sent to the INPFC Secretariat.

8. FUTURE MEETINGS. The working group recommends that a similar working group meeting be held in Seattle after the 1980 Annual Meeting of INPFC to continue with the preparation of draft sections of the joint report for submission as an INPFC Bulletin. It is estimated that one week would be required for this meeting.
