Meeting of the Science Group

of the

Scientific and Technical Committee

for the

Convention on the Conservation and Management

of Pollock Resources in the Central Bering Sea

September 3-5, 1997
Gdynia, Poland

Held at
The Sea Fisheries Institute
Gdynia, Poland

<u>Attachments</u>

Meeting of the Science Group of the Scientific and Technical Committee for the Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea

September 3-5, 1997
Gdynia, Poland

Delegations from the People's Republic of China, Japan, the Republic of Korea, the Republic of Poland, and the United States participated in an intersessional meeting of the Parties to the Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea, Scientific and Technical Committee's Science Group. The Russian Federation did not participate in the meeting.

1. Welcome Address

2. Election of Chairman and Rapporteur

The group elected Dr. Richard Marasco (USA) as chairman of the meeting. Messrs. Stetson Tinkham and Bill Hines (USA) were appointed as rapporteurs.

3. Adoption of Agenda

Attached to this report are: (1) the revised agenda of the meeting; (2) a list of participants; and (3) a list of reports distributed at the meeting.

4. Opening Statements

5. Pollock Stock Assessment

5.1 Update catch and effort statistics

The data manager (Dr. Wespestad) provided a list and disk file of all the data submitted to him by the Parties. The Parties are asked to review them and submit corrections directly to him.

5.2 Present Results of Trial Fishing

Poland presented their trial fishing results which took place during September 1-11, 1996 in the central Bering Sea (Attachment 1). Pollock was caught only in the northeastern and eastern part of the donut hole. During the cruise, 11 hauls were made of which only six hauls contained pollock. A total of 184 individual fish were caught during the trial fishing operations of which 116 individual fish were taken in one haul. Older pollock dominated the catch (1978-1980 year classes). 1986 and 1989 year classes were also represented in the sample. During the 1995 trial fishing, no 1986 and 1989 year classes were observed. Ages were determined for 50 individual fish from otoliths.

Korea did not conduct trial fishing during 1996.

The United States did not conduct trial fishing during 1996.

Japan did not conduct trial fishing during 1996.

The Russian Federation sent to the meeting a facsimile describing their trial fishing operation which took place during August 16-19, 1997 (Attachment 2). The report indicated no fish was detected during the operation.

The People's Republic of China presented preliminary 1997 trial fishing results. The results showed that the abundance of pollock in the Central Bering Sea from June to August remained low, with catch per haul ranging from several to 60 individuals. The written report will be provided at the second annual conference.

5.3 Review results of the 1996-1997 research cruises

The United States presented results from the echo integration-trawl survey of pollock in the southeastern Aleutian Basin near Bogoslof Island during February - March 1997 (Attachment 3). The abundance estimate for the entire survey area was 392,000 t. The estimate for the Bogoslof Area specified in the Convention was 342,000 t. The U.S. noted that the biomass estimate for 1997 was the lowest since the surveys were initiated.

The People's Republic of China presented a paper, *Some biological characteristics of walleye pollock in the Bogoslof spawning ground during February-March, 1997* (Attachment 4), based on samples collected from the *Miller Freeman* cruise.

Japan presented results of their research cruises conducted in 1996 and 1997 (Attachments 5 and 6 respectively). The 1996 cruise conducted during November 8-17 in the central Bering Sea indicated no pollock was caught and no significant echo signs of adult pollock was observed. The 1997 cruise conducted during May 19-July 4 focused on larval pollock. The size of the larvae observed during the 1997 cruise exceeded the size of those observed during past surveys which took place during 1993 and 1995. The 1997 report also indicates that water temperatures were higher.

The Republic of Korea presented their May-June 1997 cruise report (Attachment 7). The survey was divided into four areas with corresponding biomass estimates: Bogoslof Island Area - 13,274 t; Area between Bogoslof and the central Bering Sea - 17,795 t; Continental Shelf - 157,098 t; and the Donut Hole - 12,096 t.

5.4 Review and update status of the Aleutian Basin stock

5.4.a. Relative and absolute abundance of pollock resources in the Aleutian Basin.

There is insufficient information to estimate the absolute biomass of the pollock resource in the Aleutian Basin directly (Table 1).
However, information from scientific surveys and trial fishing experiments conducted by the Parties indicate that relative abundance of pollock in the Aleutian Basin remains low.

Based on survey information by the Korean R/V *Pusan 851*, a partial estimate of absolute biomass was made for the Donut Hole area. An estimate of 12,096 t (Area D) was made between 17 May and June 12. A research survey conducted by the Japanese stern trawler *Meisho Maru* during November 8-17, 1996 in the Donut Hole area indicated that "no significant echo sign of adult walleye pollock was observed in the international waters".....and....there was no pollock catch".

The Polish stern trawler *Acamar* conducted trial fishing during September 1-11, 1996 and indicated that "...pollock was caught only in the north-eastern and eastern part of the Donut Hole.

During the cruise 11 hauls were made of which 6 hauls pollock appeared. All together 184 individuals of pollock were caught". The Russian F/V *Vigo* conducted trial fishing in the Donut Hole area in 1997 (from August 16-19) and indicated that "no fish ...was..detected in the layer from 0 to 500 meters". China also conducted trial fishing in 1997 and will report its final results at the next meeting. The group agreed that more information should be obtained about pollock abundance in the Aleutian Basin.

5.4.b Biomass in the area identified in Annex 1(b).

Only two estimates of absolute abundance of pollock in the Annex 1(b) area were made in 1997 (Table 2). These direct estimates were made from data collected during echo integration-trawl surveys in the Bogoslof Island area by the U.S. and the Republic of Korea. The ROK estimate was for an area slightly larger than that defined in Annex 1(b). Documents presented by the delegations with details on results and methodology are attached to this report.

Table 1. Aleutian Basin pollock biomass estimates

Absolute Abundance estimates:	insufficient information to estimate biomass directly
Relative Abundance estimates:	Bogoslof survey series (U.S. in 1997) -- low abundance
	Aleutian Basin survey series (Korea in 1997) -- low abundance in eastern and central part of the Aleutian Basin
	Donut Hole survey (Japan in 1996) -- low abundance
	Donut Hole trial fishing (Poland in 1996) -- low abundance
	Donut Hole trial fishing (Russia in 1997) -- low abundance

Table 2. Annex 1(b) Area pollock biomass estimates

Estimate	Dates	Description	Estimate
by U.S.	Mar 1-Mar 10, 1997	spawning	342,000 t
by ROK	May 17 - June 12, 1997	after spawning	13,274 t (for area larger than Annex 1(b) area)

5.4.c. The status of pollock stocks forming foraging accumulations in the central Bering Sea and fishery prospects.

This agenda item was proposed by the Russian delegation. Discussion was deferred.

5.4.d. Coordination of age determination methods for pollock

The Japanese delegation submitted a paper, *False ring observed in the otolith of age 1 walleye pollock collected in the Bering Sea* (Attachment 8), which highlighted the possibility for misinterpreting the first annual ring in relation to false ring formation and suggested a way of avoiding the problem.

Consensus was reached supporting the principle of standardizing age determination using otoliths. A recommendation will be made to the S&T to consider organizing a workshop in 1998 for this purpose. The U.S. has proposed to host a workshop to standardize aging techniques at the Alaska Fisheries Science Center as well as develop a tentative agenda prior to the Second Annual Conference.

6. Review Cooperative Research plans

The United States informed the other parties that surveys in the Bogoslof Area by U.S. vessels on an annual basis may not be possible due to budgetary, manpower and scheduling constraints. The U.S. inquired whether other parties plan on conducting a Bogoslof survey in 1998. All parties, with the possible exception of the Republic of Korea and the Russian Federation (not present), indicated they do not have plans to survey the Area. As an alternative, the U.S. submitted a paper, *Proposed Assessment Procedures for Aleutian Basin Pollock Utilizing Biennial Surveys in the Bogoslof Island Area* (contained in Attachment 3), for the other parties to consider and discuss at the S&T meeting prior to the Second Annual Conference. The paper proposes alternative methods to determine biomass estimates if the U.S. or any other party cannot conduct the Bogoslof survey.

The Republic of Korea stated that they have not determined their research cruise schedule for 1998.

Japan indicated they will not conduct research cruises in the Bogoslof Area in 1998, but consideration is being given to conducting a Bogoslof research cruise in 1999. The Japanese delegation also presented their intention to conduct research in the central Bering Sea during November 1997 (Attachment 9).

The People's Republic of China indicated no research cruises are planned for 1998 as their scientists will be dedicated to supporting trial fishing operations. Beyond 1998, China will contemplate cooperative research cruises pending funding considerations.

There was consensus that cooperative research planning is necessary to maximize all resources. The Scientific and Technical Committee will address this issue prior to the Second Annual Conference.

7. Review Trial Fishing Plans

The Republic of Poland indicated they will conduct trial fishing operations with one vessel during mid-September of 1997; as well as tentative plans to conduct trial fishing in 1998.

The Republic of Korea will advise the other parties of their intentions to conduct trial fishing during the Second Annual Conference.

Japan indicated they will not conduct trial fishing in 1997 and 1998.

The People's Republic of China will conduct trial fishing in 1998 utilizing two vessels. The intended timing of the trial fishing operations will be during June-August.

The United States indicated it will not conduct trial fishing and suggested that all parties submit their written trial fishing plans at the Second Annual Conference.

8. Observer Plans

All parties participated in an Observer Training Program hosted by the U.S. during March 24-29, 1997.

9. Other Business

Deferred discussion of the Russian Federation proposal to host a Pollock Symposium in Magadan during February 1998.

The United States informed all parties that logistical information regarding the Second Annual Conference is available.

The issue of future meetings of the Science Group was discussed. Each Party was asked to consider the issue before the Second Annual Conference. The issue will be referred to the S & T Meeting for decision.

Agenda

1. Welcome address
2. Election of chairperson and rapporteur
3. Adoption of agenda
4. Opening statements
5. Pollock stock assessments
    - 5.1. Update catch and effort statistics
    - 5.2. Present results of trial fishing
    - 5.3. Review results of 1996/1997 research cruises
    - 5.4. Review and update status of pollock stocks
        - a. Relative and absolute abundance of pollock resources in the Aleutian Basin
        - b. Biomass of pollock in the area identified in Annex Part 1(b)
        - c. The status of pollock stocks forming foraging accumulations in the central Bering Sea and fishery prospects
        - d. Coordination of age determination methods for pollock
6. Review cooperative research plans
7. Review trial fishing plans
8. Observer plans
9. Other business
10. Review of reports to the annual conference
11. Closing statements

LIST of PARTICIPANTS

China	
Xin Deli	Bureau of Fisheries, Ministry of Agriculture, Beijing
Gu Dingfang	Shanghai Deep Sea Fisheries Co., Shanghai
Zhao Xianyong	Yellow Sea Fisheries Research Institute, Qingdao
Japan	
Kiyoshi Wakabayashi	National Research Institute of Far Seas Fisheries
Akira Nishimura	National Research Institute of Far Seas Fisheries
Yoshitsugu Shikada	Marine Resources Division, Fishery Agency of Japan
Poland	
Andrzej Kiedrzyn	Ministry of Transport and Maritime Economy, Warsaw
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Loh-Lee Low	Alaska Fisheries Science Center, National Marine Fisheries Service
Stetson Tinkham	Department of State
William Hines	National Marine Fisheries Service, Alaska Region
Jimmie Traynor	Alaska Fisheries Science Center, National Marine Fisheries Service
Vidar Wespestad	Alaska Fisheries Science Center, National Marine Fisheries Service
Doug Eggers	Alaska Department of Fish and Game
Richard Marasco	Alaska Fisheries Science Center, National Marine Fisheries Service

List of Attachments

1. Report on Polish fishing trial operations on pollock in the international waters of the Bering Sea in 1996. (Jerzy Janusz, Poland).

2. Results of trial fishing by the Russian *F/V Vigo*. (Unofficial translation of Russian fax submitted from the Russian Federation to the Science Group meeting).

3. Pollock stock assessment documents submitted by the United States Party. (contains 5 documents).
   i. Preliminary Bering Sea-Aleutian Islands walleye pollock assessment for 1998.
   ii. Bering Sea-Aleutian Islands walleye pollock assessment for 1997.
   iii. Gulf of Alaska walleye pollock assessment for 1997.
   iv. Walleye pollock abundance in the southeastern Aleutian Basin near Bogoslof Island during February-March, 1997
   v. Proposed asssessment procedures for Aleutian Basin pollock utilizing biennial surveys in the Bogoslof Island Area.

4. Some biological characteristics of walleye pollock in the Bogoslof spawning ground during February-March, 1997. (Xianyong Zhao, China)

5. Cruise results of mid-water trawl survey on pelagic pollock in the international waters of the Bering Sea, 1996. (FAJ, Japan)

6. Outline of the *Kaiyo Maru* survey cruise in 1997 (May 19, 1997-July 4, 1997). (Akira Nishimura, Japan).

7. Results from the 1997 echo integration and midwater trawl survey for the Bering Sea walleye pollock by the R/V *Pusan 851* (NFRDI, Korea).

8. False ring observed in the otolith of age 1 walleye pollock collected in the Bering Sea. (Akira Nishimura, Japan).

9. Cruise Plan for Mid-water Trawl Survey on Pelagic Pollock in the International Waters of the Bering Sea, 1997. (FAJ, Japan).

REPORT ON POLISH FISHING TRIAL OPERATIONS ON POLLOCK IN THE INTERNATIONAL WATERS OF THE BERING SEA IN 1996

Jerzy Janusz
Sea Fisheries Institute,
Kollataja 1, 81-332 Gdynia, Poland

The trial fishing operations in the international waters of the Bering Sea (Donut hole) were carried out by the Polish fishing trawler m/t ACAMAR in the period from September 1 through September 11, 1996 in accordance with the intention indicated during First Annual Conference (Nov. 13-15, 1996, Moscow). The purpose of the trial cruise of the Polish vessel was to determine the geographical distribution of pollock in the international waters of the Bering Sea and to collect the biological data.

Results

Acoustic observations started in the north part of the Donut hole. The hydroacoustic trackline of the vessel is presented in Fig.1.

During all the time of research, at the depth of about 250 m., the echograms indicated the presence of a layer of thickness about 60 m. In the control hauls it was observed that the layer consisted mainly of Myctophids and also jellyfish, squids and Pacific lamprey were observed.

Pollock was caught only in the north-eastern and eastern part of the Donut hole. During the cruise 11 hauls were made of which only in 6 hauls pollock appeared. All together 184 individuals of pollock were caught. The sex ratio was nearly 1:1 (93 males and 91 females).

The length of pollock (fork lenght) ranging from 42 to 62 cm, with the majority between 52-58 cm (Fig.2). The mode for males was 54 cm, and for females 58 cm.

The age of pollock determinated on the basis of 68 fish is presented in figure 3. In the samples pollock at age 16-18 years old (1978-1980 year classes) dominated. The younger pollock at age 10 and 7 years old (1986 and 1989 year-classes) was also represented in the sample. In the 1995 trial catches such a young year classes were not observed.

Gonads maturity indicated that majority of pollock (83%) had their gonads in the resting stage (2-nd stage according to the 8-grade Maier scale), 9% in spent stage (8-th stage) and 8% in the developing stage (3-th stage).

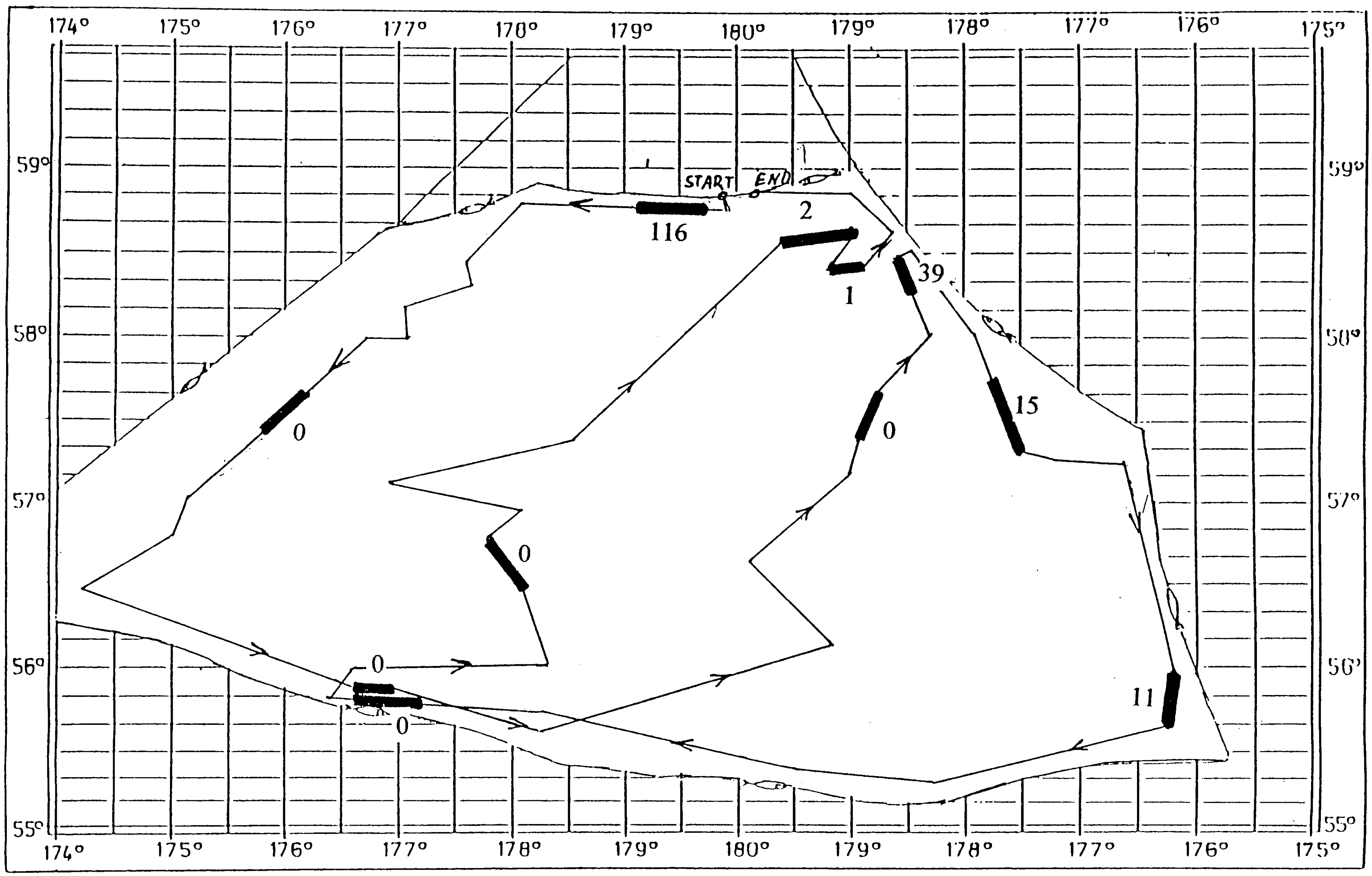


Fig. 1 Hydroacoustic trackline and hauls (solid lines) conducted during trial fishing of Polish vessel m/t "ACAMAR" in the international waters of the Bering Sea in September 1996. Figures indicate the number of pollock (individuals) in each haul.

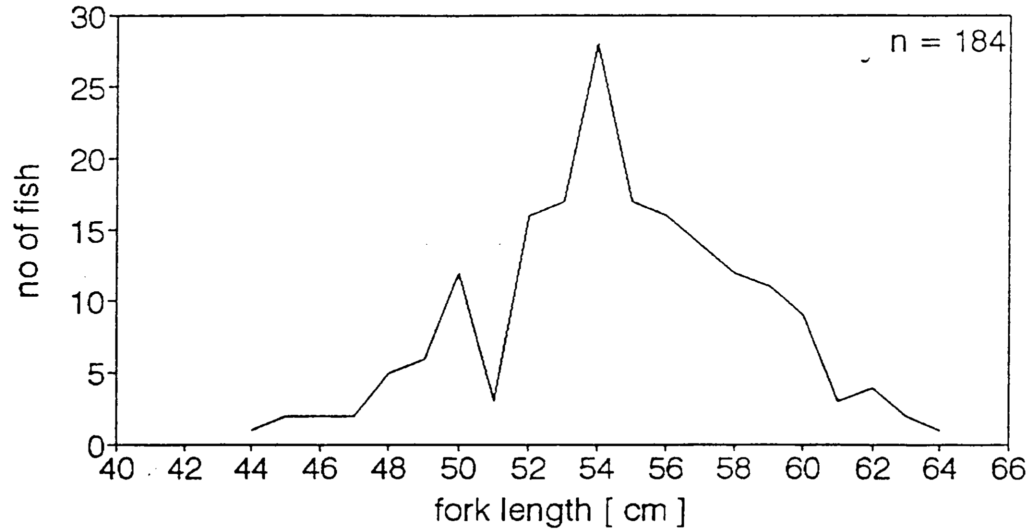


Fig. 2
Length distribution of pollock during Polish trial catches, (September 1996)

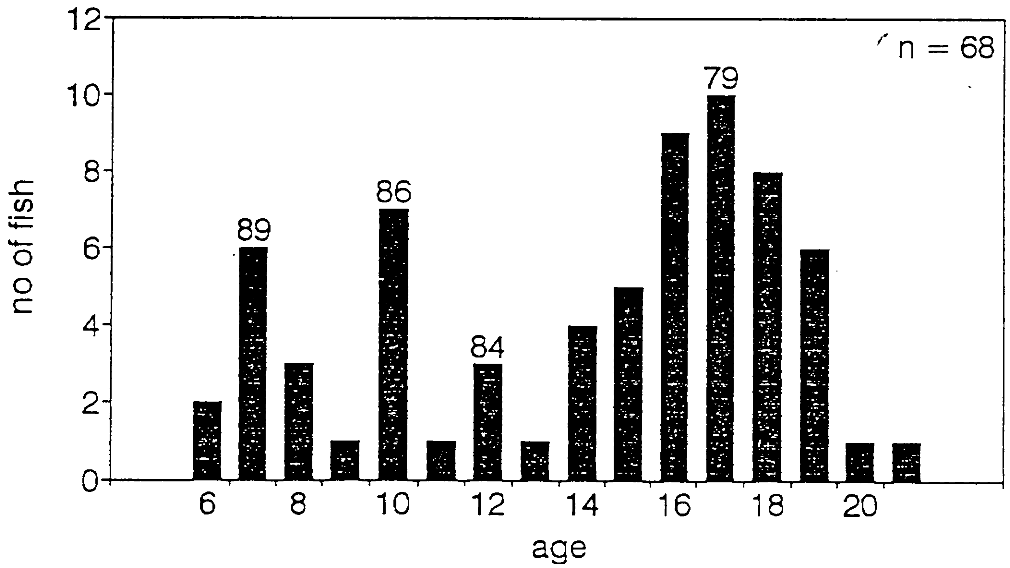
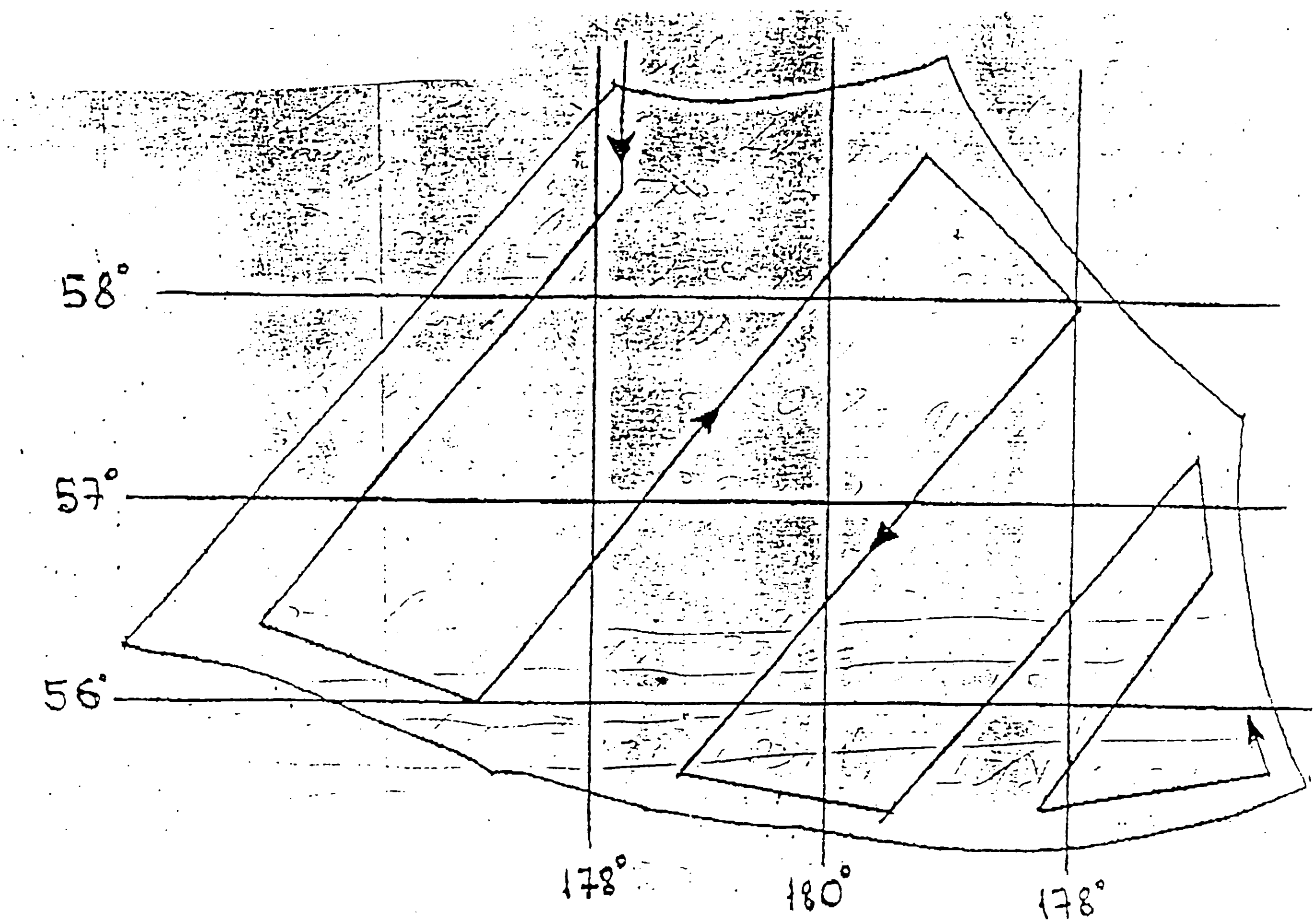


Fig. 3
Age distribution of pollock during Polish trial catches, (September 1996)

Submitted (by fax) from Russian Federation to the Science Group meeting (Sea Fisheries Institute, 3-5 Sept. 1997, Gdynia, Poland)

Unofficial translation from Russian language

Diagram of hydroacoustic profiles

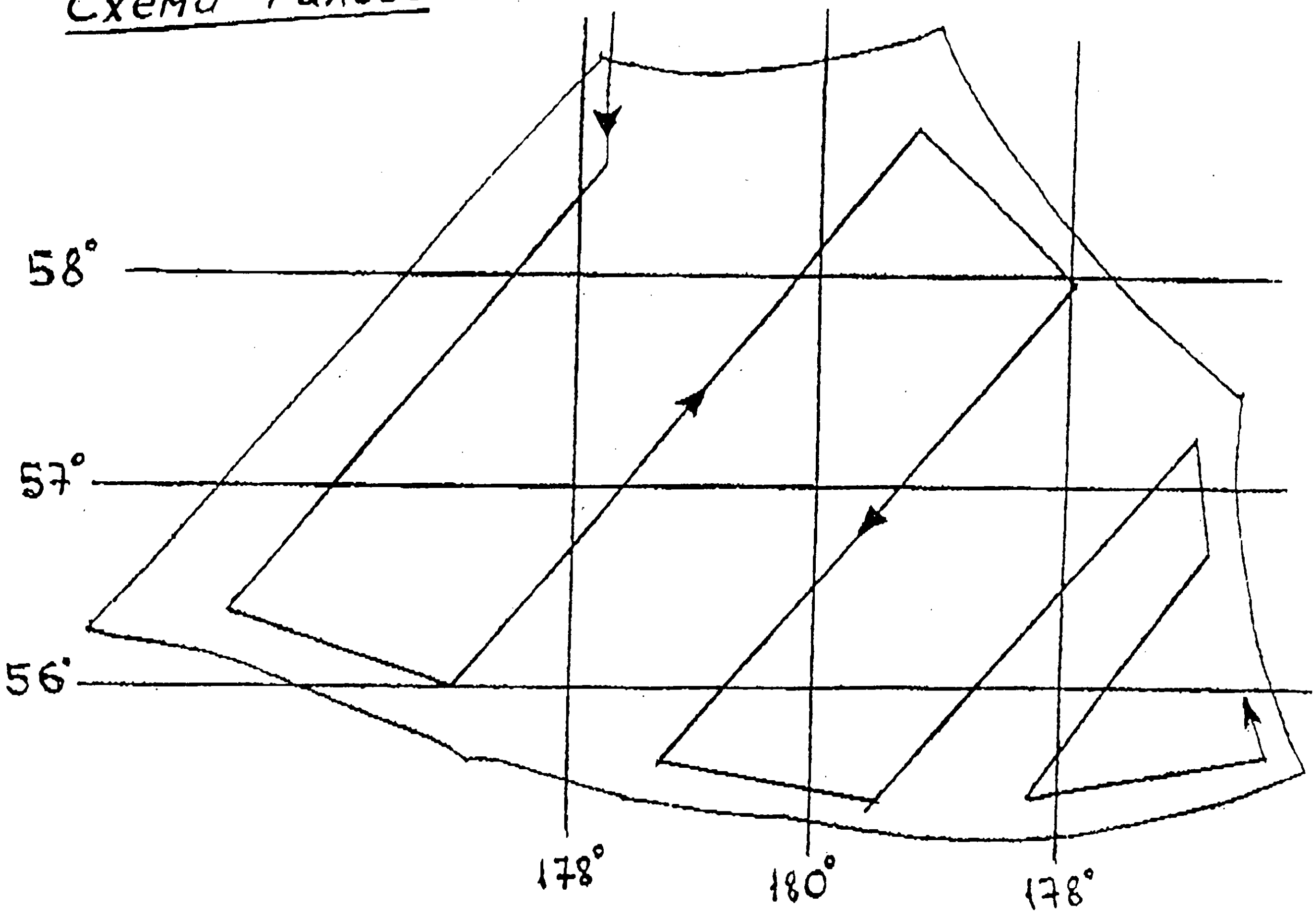


In the period from 16 till 19 August (inclusive) this year has been performed reconnaissance in the area 51 of the Bering Sea directed for finding the pollock concentrations, by F/V VIGO.

During hydroacoustic research the SIMRAD equipment has been used: the SIMRAD 240 sonar which has the possibility of penetration for remote distance, as well as the SIMRAD ES 381 type - the typical commercial fishfinding vertical echosounder.

During this research no fish has been detected in the layer from 0 to 500 metres. There were no records on the echosounding monitor of Deep Scattering Layer.

Схема галсов



В период с 16 по19 августа включительно на МРКТ " ВИГО " были выполнены поисковые работы в 51- ом районе Берингова моря на предмет обнаружения скоплений минтая.

При гидроакустическом поиске применялась аппаратура фирмы " Simrad ": Simrad - 240 - сонар кругового обзора с большой дальностью действия и Simrad ES 381 - промысловый эхолот.

За этот период наблюдений наличие каких-либо рыбных объектов в слое 0–500 м. отмечено не было, полностью отсутствовали записи - "ЗРС"

Attachment 3

Pollock Stock Assessment Documents

Submitted by
the United States Party

for the
Meeting of
The Science and Technical Committee

Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea

September 3-4, 1997
Gdynia, Poland

Table of Contents

Preliminary

Bering Sea-Aleutian Islands
Walleye Pollock
Assessment for 1998

Preliminary estimates are provided for eastern Bering Sea and Aleutian Islands pollock based on last years SAFE projections. A complete pollock survey (bottom trawl and midwater hydroacoustic) were again carried out in 1997. The results of these surveys need to be incorporated in assessment models to obtain a final 1998 ABC recommendation. A bottom trawl survey was also conducted in the Aleutian Islands in 1997, these results will also be utilized to estimate the Aleutian Islands ABC.

The preliminary 1988 eastern Bering Sea pollock ABC is 1.1 million t. The 1998 SAFE document projected an increasing trend in pollock based on slightly above average recruitment in 1999-2000. Preliminary observations from the 1997 surveys indicate that the 1996 year-class may extremely strong, therefore pollock abundance may increase much more than projected.

The Aleutian Islands preliminary estimate is the same as the 1997 estimate 17-28 thousand t. For the Bogoslov Island area 1998 ABC is estimated to be 58.8 thousand t based on a projection of the 1997 survey biomass estimate of 342 thousand t.

Summary of ABC Estimates, 1996-1998 by area.

Eastern Bering Sea	ABC Recommendation			
	1996	1997	1998	F
ABC at $F_{0\,40}$	1.29 million t	1.13 million t	1.10 million t	.30
Aleutian Islands				
$F_{0\,40}$	26,200 t	17,413 - 28,000 t	17,413 - 28,000 t	0.38
Bogoslov Island				
Biomass	682,000 t	342,000 t	280,000 t	
Yield $F_{0\,40}$	286,000 t	115,000 t	58,801 t	0.27

Projected Age 3+ biomass (million t), catch (million t), age 3 recruits (billions) and exploitation rates at $F_{0.1}$ and $F_{.35}$ using cohort analysis estimates of abundance.

	Year	Age 3+ Biomass	Catch	Age 3 Recruits	F	Exploitation
$F=F_{0\,40}$	1998	5.928	1.011	4.851	0.300	17%
	1999	6.861	1.036	7.952	0.300	15%
	2000	7.668	1.158	7.603	0.300	15%

Exploitation = Catch in biomass / Jan 1. Biomass
Recruits estimated from spawner-recruit relationship, 1998-2000.

Bering Sea-Aleutian Islands
Walleye Pollock
Assessment for 1997

Vidar G. Wespestad, James Ianelli, Lowell Fritz, Taina Honkalehto, Gary Walters

Summary

Pollock stocks in the eastern Bering Sea and Aleutian Islands (Excluding the central Bering Sea and the Bogoslov Island Region) are expected to be in the 6 million t range in 1997. The eastern Bering Sea biomass in 1996 was estimated to be 5.51 million t. by survey, and 6.1-6.2 million t. by age-structured models.

Summary of ABC Estimates for 1997 by area.

Eastern Bering Sea	TAC	ABC Recommendation		
Fishing Level	1996	1996	1997	F
$F_{0.40}$	1.19 million t	1.29 million t	1.10 million t	0.30
F overfishing			1.98 million t	0.46
Aleutian Islands				
$F_{0.40}$	35,600 t	26,200 t	17,413 - 28,000 t	0.38
F overfishing		At ($F_{.35\%}$)	24,000 - 38,000 t	0.57
Bogoslov Island				
$F_{0.40}$	1,000 t	286,000 t	115,000 t	0.27
F overfishing			157,500 t	0.37

The 1996 assessment incorporates catch data from the 1995 eastern Bering Sea, and Aleutian Islands area fisheries. Also, included are biomass estimates and age composition estimates from the 1996 eastern Bering Sea bottom trawl and hydroacoustic-midwater trawl surveys (Appendix A). These data are used in catch-age models to estimate the current population size and project 1997 biomass and ABC estimates. A catch-age model is used to provide a fisheries based estimate of abundance for the Aleutian Islands area. A new catch-age model is applied for the eastern Bering Sea pollock population, and a detailed paper on the methodology is included (Appendix B). The results of a 1996 Bogoslov Island hydroacoustic-midwater trawl survey is included as Appendix C.

1.1 INTRODUCTION

This year's assessment updates the Bering Sea pollock assessment through the 1995 fishing year. Throughout the history of pollock fishing in the eastern Bering Sea the catch has averaged 1.1 million t, and has ranged from a minimum of 0.2 million t in 1964 to a maximum of 1.9 million t in 1972. Since the advent of the U.S. EEZ in 1977 the annual average eastern Bering pollock catch has been 1.2 million t and has ranged from 0.9 million in 1987 to 1.6 million t in 1991 while stock biomass has ranged from a low of 4-5 million to highs of 12-14 million t. The stability of the eastern Bering Sea pollock stock is remarkable in light of trends in most Asian pollock stocks and North Atlantic gadoid stocks which have collapsed or undergone strong fluctuations in catches and abundance. It appears that eastern Bering Sea pollock catches in the range of recent years are sustainable, and within the productive capacity of the stock and stock fluctuations observed over the history of the fishery.

This assessment updates the 1995 assessment by including results from 1996 eastern Bering Sea hydroacoustic and bottom trawl surveys, the 1996 Bogoslof hydroacoustic survey, and data from 1995 and 1996 pollock fisheries.

1.1.1 STOCK STRUCTURE

The stock structure of Bering Sea pollock is not well defined. In the U.S. portion of the Bering Sea pollock are considered to form three stocks for management purposes. These are: eastern Bering Sea which consists of pollock occurring on the eastern Bering Sea shelf from Unimak Pass to the U.S.-Russia Convention line; Aleutian Islands Region which encompasses the Aleutian Islands shelf region from 170°W to the U.S.-Russia Convention line; and Central Bering Sea -Bogoslov Island pollock, which are thought be a mixture of pollock that migrate from the U.S. and Russian shelves to the Aleutian Basin around the time of maturity.

In the Russian EEZ pollock are considered toform two stocks, a western Bering Sea centered in the Gulf of Olyutorski, and a northern stock located along the Navarin shelf from 171°E to the U.S.-Russia Convention line. The northern stock is believed to be a mixture of eastern and western Bering Sea pollock with the former predominant.

1.2 CATCH HISTORY

Eastern Bering Sea

From 1954 to 1963, pollock were harvested at low levels in the Eastern Bering Sea and directed fisheries began in 1964. Catches increased rapidly during the late 1960s and reached a peak in 1970-75 when catches ranged from 1.3 to 1.9 million t annually (Figure 1.1). Following a peak catch of 1.9 million t in 1972, catches were reduced through bilateral agreements with Japan and the