

# NPAFC LOOKS TO THE NEW MILLENNIUM

## PRESIDENT'S MESSAGE

AS WE BEGIN LIFE in the new millennium and look back at the 20<sup>th</sup> century, we see an explosion of information and technology. We see also a trend toward greater specialization in all areas of knowledge. Within each field, scientists and managers increasingly focused on specialty areas as the total body of knowledge expanded exponentially.

Unfortunately more information does not necessarily result in a full understanding of our world and how it works. We certainly don't fully understand the complexities of ecosystems nor can scientists predict what will happen in the future.

There is a growing recognition that scientists must integrate this new knowledge and look at the earth and ocean systems more holistically. We need to create meaning out of the vast stores of data and information we have already collected, make connections between different disciplines, focus future research on essential questions that will broaden our un-

derstanding, and effectively communicate our understanding to a wider audience.

As we heard at the NPAFC meeting in Tokyo, recent changes in the North Pacific and Bering Sea are having profound effects on the resources and fisheries of each of our member nations. We don't have answers to many important questions, nor a full understanding of the North Pacific ecosystem and what changes we may face in the future. But in Tokyo we came to significant agreement on the need

for increased scientific collaboration and coordination, and jointly identified the highest priority research needs.

Now we must take the next step in determining the details and methods of implementing our joint research priorities. This will require increasing communication among scientists, efficient use of limited resources, and identifying new sources of funding, particularly for fisheries research on the high seas.

Our great opportunity and challenge is to work together to connect our various efforts and resources into a focused and cohesive effort that will help us construct a fuller and more integrated understanding of the North Pacific ecosystem. This will help all of us answer the questions facing NPAFC member nations in this new century and millennium. ■



*(Official State photo)*

*Lt. Governor Fran Ulmer  
NPAFC President*

### INSIDE THIS ISSUE

PRESIDENT'S MESSAGE	1
8TH ANNUAL MEETING OF NPAFC	2
NPAFC-PICES WORKSHOP ON JUVENILE SALMON	3
SNAPSHOTS FROM THE	
NPAFC ANNUAL MEETING AND RECEPTION	4
RUSSIAN MARINE FISHING INDUSTRY IN	
TRANSITION TO THE FREE MARKET SYSTEM	6
NPAFC SCIENCE PLAN 2001-2005	7
NEWS FROM SECRETARIAT	8

# 8<sup>TH</sup> ANNUAL MEETING OF NPAFC

**REPRESENTATIVES OF CANADA,** Japan, Russia, and the United States met in Tokyo, Japan from October 30-November 2, 2000, for the Eighth Annual Meeting of the North Pacific Anadromous Fish Commission (NPAFC). Observers from the North Pacific Marine Science Organization (PICES), the International Baltic Sea Fishery Commission (IBSFC) and the Republic of Korea were also in attendance. The meeting was chaired by Ms. Fran Ulmer, Lieutenant Governor of Alaska and President of the NPAFC.

The NPAFC's Committees on Enforcement, Scientific Research and Statistics, and Finance and Administration met to consider activities of the Parties in support of the objectives of the Convention.

The Committee on Enforcement, chaired by Capt. V. O'Shea (USA), reviewed enforcement efforts and unauthorized salmon fishing activities in the Convention Area in 2000. The cooperative enforcement efforts were highlighted by the apprehension of the Honduran registered fishing vessel *ARCTIC WIND*. Due to the continued threat of high seas fishing for salmon in the Convention Area, all Parties agreed to maintain 2001 enforcement activities at high levels as a deterrent to the threat of potential unauthorized fishing activities. The Russian Federation invited all the participants to an enforcement coordination meeting in 2001, which will be held in Petropavlovsk - Kamchatsky.

The Committee on Scientific Research and Statistics, chaired by Dr. Y. Ishida (Japan), reviewed and discussed scientific research on a broad range of issues concerning Pacific salmonid.

A new NPAFC Science Plan was adopted, in response to recent unanticipated declines in salmon abundance. This Plan will focus on three areas of cooperative research: Bering Sea salmon research, juvenile salmon research, and winter salmon research. Work plans

will be further defined at the Research Planning and Coordinating Meeting (RPCM) in Seattle in March 2001 which will be held in conjunction with Workshop on Salmonid Otolith Marking.

The NPAFC discussed ways to increase cooperation with PICES, NASCO, IBSFC, and other relevant international organizations to examine research and data needed to meet the common challenges facing salmon. NPAFC will contribute salmon information to the PICES' "North Pacific Ecosystem Status Report". The joint meeting with NASCO, IBSFC and other organizations will be held in Vancouver, Canada in March 2002.

Nearly 4.7 billion juvenile hatchery salmon were released in the North Pacific in 1999 and total commercial salmon catch was 834,730 metric tons.

The Committee on Finance and Administration, chaired by Mr. Aaron Sarna (Canada), considered and adopted the 2000/2001 budget. Administrative topics were discussed and approved.

The Commission recommended that the President and the Executive Director continue to correspond with the authorities of the Republic of Korea as well as the People's Republic of China on the issue of their future accession to the Convention.

The Ninth Annual Meeting of the NPAFC is scheduled to be held in Victoria, Canada in October 2001. ■



(Photo by Fuji Enterprise)

*(Top Row, left to right) Wakako Morris, Russ Jones, Guy McMinds, William Hines, David Bevan, Gerry Kristianson, Vladimir Fedorenko (Bottom Row, left to right) Vladimir Izmailov, Aaron Sarna, Shiro Yuge, Fran Ulmer, Vincent O'Shea, Koji Imamura, Yukimasa Ishida.*

# NPAFC-PICES Workshop on Juvenile Salmon

*"Factors Affecting Production of Juvenile Salmon: Comparative studies on juvenile salmon ecology between the east and west North Pacific Ocean"*

Overseas Fishery Cooperation Foundation, Tokyo, Japan, October 29, 2000.

**THE FIRST SALMON WORKSHOP** co-organized by NPAFC and PICES was held between the annual meetings of both organizations. Over 80 participants attended the workshop, which included 5 review, 6 oral and 17 poster presentations. Through the workshop, we were able to clarify what kind of research we should do and what kind of cooperation we should promote between the NPAFC and PICES in the future.

In the morning session, Dr. Beamish presented an extensive review of Canadian juvenile surveys and pointed out that the Pacific salmon are primarily marine species, yet we still have much to learn about the factors that regulate their abundance in the ocean. Dr.



Photo by NPAFC

Mayama summarized Japanese juvenile survey and the future issues for juvenile salmon studies such as abundance estimation, stock identification, and the investigation of factors affecting the survival and abundance in the Okhotsk Sea. Reviewing the Russian juvenile survey, Dr. Karpenko recommended that monitoring in the standard areas be continued, and a new investigation of the biological interactions of enhanced and wild salmonids be organized. Dr. Brodeur introduced the US juvenile survey and pointed out the need to examine more fully the role of ocean physics and biology

in determining salmon production. Also Dr. Ó Maoiléidigh (ICES) reported the recent Norwegian and Scottish salmon surveys which clarified the oceanic migration route of some Atlantic salmon stocks.



Photo by NPAFC

In the afternoon session, Dr. Urawa (Japan) presented a migration model of Japanese chum salmon during early ocean life.

Mr. Heard (U.S.A.) pointed out the most critical issues which determine the early sea-life survival of juvenile salmon. They include the abundance of preferred foods, environmental conditions, abundance of competitors and predators. Mr. Fukuwaka (Japan) also reported the fact that the early sea mortality of juvenile chum salmon in coastal waters is much higher than the subsequent ocean mortality. About predation, Dr. Kawamura (Japan) showed that predation by seabirds has more affect on the survival of juvenile chum salmon than that by fish in coastal waters. On the other hand, Dr. Beamish (Canada) indicated that the major predators of salmon such as spiny dogfish and river lamprey feed on salmon as an incidental part of their diet and predation mortality may have to be seen in perspective with other



Photo by NPAFC

sources of mortality. Based on the survey in Prince William Sound, Dr. Willette (U.S.A.) indicated that reduced large copepod densities caused reduced growth of juvenile pink salmon when their densities were high, and greater predation losses to planktivorous fishes such as herring and walleye pollock as they switched to alternative prey including salmon.

Unfortunately, oral presenters scheduled from Russia could not attend the workshop, but Dr. Belyaev presented the monitoring results of salmon juvenile in the Khabarovsk region. After the oral presentation, a number of topics were discussed including ocean distribution and migrations, factor affecting survival and growth, and future research for juvenile salmon. There were different ideas about the relationship between salmon distribution and sea surface temperature, and also about the impact of predators on juvenile salmon.

In her closing remarks, NPAFC President, Alaska Lt. Governor Fran Ulmer, stressed the need for cooperation to promote our understanding of salmon. The extended abstracts in the afternoon session including the oral and poster presentations will be published in the NPAFC Technical Report No. 2. The review papers will be published in the NPAFC bulletin series. After the Workshop, the NPAFC Science Plan was developed during the annual meeting of the NPAFC. Detailed cooperative research activities will be discussed at the next Research Planning and Coordinating Meeting in March 2001. ■

*Yukimasa Ishida*  
Chairman of the CSRS

# SNAP FROM NPAFC ANNUAL MEE



Photo by NPAFC



Photo by NPAFC



Photo by NPAFC



Photo by NPAFC



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography



Photo by NPAFC



Photo by NPAFC



Photo by NPAFC



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography

# HOTS THE ING AND RECEPTION



Photo by NPAFC



Photo by Autographs Photography and Ogden Photography



Photo by NPAFC



Photo by NPAFC



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography



Photo by Autographs Photography and Ogden Photography

# Russian Marine Fishing Industry in Transition to the Free Market System

**DURING THE EIGHT YEARS** of market reforms undertaken by the Russian Government (1992-1999), the national marine fishing industry has experienced considerable changes. These changes, first of all, affected the geographic range of fishing operations by the Russian distant-water fleets. They also affected the total catch, production of the seafood for local consumption, operation costs, and employment in the fishery industry.

Before 1990, apart from fish resources within USSR's territorial waters, and 200-mile exclusive economic zone, the fishing fleet of the Soviet Union exploited resources in the high seas, and in the 200-mile economic zones of foreign countries (under the intergovernmental agreements). In 1990, 44% of the total catch (7.8 million tons) was taken in the Russian 200-mile zone and in the continental shelf; 17.7% of the total catch was taken on the high seas; 28.9% was in the 200-mile zones of foreign countries and 9.4% of the catch was generated by fresh water resource exploitation including aquaculture. Despite such a broad spectrum of fishing possibilities, the North Pacific Ocean contributed the most toward the total catch. In 1988, 62% of the total catch of Russia was taken in this area (White Book of Russian Fisheries, 1997).

During the reform time, activities of the Russian fleet shifted from the overseas fishing grounds to the 200-mile exclusive economic zone of Russia, primarily to the Okhotsk and Bering seas in the Far East. At the same time, the total Russian catch dropped from 7.8 million tons in 1990 to 4.5 million tons in 1998 (decline equal to 42.4%). From the total catch of 4.5 million tons, 3.3 million tons (73.3%) were taken in the 200-mile zone and continental shelf of Russia; 0.8 million tons (17.8%) were taken in the 200-mile zones of foreign countries (according to intergovernmental agreements); 0.1 (2.2%) were taken in the high seas of the world's oceans and 0.3 (6.7%) were taken in fresh waters (White Book of Russian Fisheries 1995, 1996 and 1997). With such a "narrowing" of the geographic area of the Russian fleet, the importance of the Far East marine living resources has substantially increased. The total catch in the Far East regions grew in comparison with other marine regions of Russia. From international-regional perspective, the shrinking of Russian total catch from 6,365,000 tons in 1988 to 3,115,000 tons in 1996 (58%) was equal to the decline suffered by Japan in the same time (from 11.3 million in 1989 to 6.7 million tons in 1996, i.e., 58%). People's Republic of China was the only North Pacific country that increased substantially its marine harvest and aquaculture production. In 1996 PRC produced 25 million tons of fish and other marine organisms. In 1996 the share of PRC in total North Pacific catch was equal to 58%. It is evident,

therefore, that Chinese fishery industry will have significant impact on the aquatic resources and environments of the North Pacific region.

Along with a shift in the geography of fishing and decrease of catches the Russian fishing fleet that operated as a state-owned and subsidized fleet had experienced a substantial reduction in its size. In 1990, the total number of Russian fishing vessels, including catching, processing, support, transport, and other ships, consisted of 10,335 vessels. As of January 1999, the fleet was composed of 5,767 vessels only. Reduction was equal to 44.2%. At the same time, there were changes in the ownership of the vessels. As a result of privatization, 56.7% of the vessels were transferred to the joint stock companies; 23.7% to fisheries cooperatives (kolkhozes); 12.5% to entirely privately owned companies; 2.4% to joint Russian-foreign ventures; and only 4.7% of the fleet were left under full government ownership (scientific research vessels, fishery enforcement and rescue vessels).

With the reduction of the total catch, the production of fish products has also decreased. The most reduction was observed in the production of canned fish, fishmeal and salted fish. Production of edible fish products decreased from 4.1 million tons in 1990 to 2.5 million tons in 1998, while the volume of canned fish dropped four times (Russian Fisheries on the threshold of the 21<sup>st</sup> Century, 1999). However, the production of higher value seafood commodities that are very popular in the international market has increased. Such products are pollock fillets, pollock roe, salmon and crab.

The total amount of people employed in the fisheries industry, including catching, processing and shipyard sectors, was 565,000 in 1990, 473,000 in 1993, and 398,000 in 1998. During the time of market reforms, the reduction of the employment in fisheries industry was almost 30%. At the same time, the reduction of the fleet was 44%, drop in catches was 42%, and reduction of seafood production was 39.1% (Yermakov, 1999).

Among the major changes in the Russian fisheries industry during the implementation of market reforms is the increase of the importance of the Far East marine living resources for the Russian fisheries, as well as the integration of Russian fisheries with the North Pacific Rim markets. ■



*Professor  
Vyacheslav K. Zilanov  
NPAFC President  
1993-1995*

# NPAFC SCIENCE PLAN 2001-2005

**SALMON ARE IMPORTANT** to the economies, cultural activities, and heritage of the people of the North Pacific Rim. As we enter the 21st Century, the total North Pacific Rim catch of salmon is almost 1 million metric tons at a gross value of more than \$1 billion annually. Approximately 5 billion hatchery salmon per year are released into Convention waters and adjacent seas to augment natural salmon runs. The NPAFC Convention area forms a common feeding ground for salmon from all NPAFC member parties. To achieve our common goal of conservation and sustainable management of anadromous fish resources, we need the best available scientific information on the condition of fish migrating in the Convention area. Questions about ocean migration, distribution, intermixing of stocks, associated effects on growth rates, and the need for international baselines to identify stock origins of salmon are major research issues faced by all NPAFC member parties. A growing body of scientific evidence supports hypotheses about the direct and indirect effects of environmental change on salmon production. For example, there is a strong correspondence between salmon catch and climate indices, indicating a shift to a more productive regime in the late 1970s. To address the broader questions of salmon carrying capacity in the North Pacific Ocean and how the environment influences salmon biology and population dynamics, we need stock-specific information on ocean distribution, migration, and behaviour patterns of salmon. Knowledge of underlying processes gained from research in specific areas should be applicable to stocks in other regions. Changes in the production of salmon are often the consequence of complex changes in marine and freshwater ecosystems. To assess and manage salmon populations methods must be developed to incorporate all relevant information affecting their production including the effects of climate change, stock-recruitment relationships, and fishing. The NPAFC provides a forum for international coordination of regional salmon research programs, essential to resolution of these important issues.

## Focus of Cooperative NPAFC Science Activities

For sustainable conservation of salmon stocks in their ocean ecosystems, we plan to focus our cooperative research activities on the following three areas:

### 1. Bering Sea Salmon Research

Asian and North American salmon stocks are distributed in high density in the Bering Sea during summer. Intra- and inter-specific interactions have been observed in some species and stocks. Physical and biological conditions in the Bering Sea changed drastically in the 1990s, and there were extreme fluctuations in the abundance and growth of some stocks. These changes in carrying capacity and salmon growth and production are not coincidental, but show a clear linkage between the marine environment and salmon production. Specific mechanisms underlying these linkages, however, are unknown principally due to absent or outdated information on the life history of many salmon populations in the Bering Sea. A coordinated program of cooperative research in the Bering Sea will clarify

the mechanisms of biological response by salmon to the conditions caused by climate changes. Scientific issues that will provide necessary direction to the research include:

- Seasonal-specific migration patterns of salmon and their relation to the Bering Sea ecosystem
- Key biological, climatic, and oceanographic factors affecting long-term changes in Bering Sea food production and salmon growth rates
- Similarities in production trends between salmon populations in the Bering Sea and common factors associated with their trends in survival
- Overall limit or carrying capacity of the Bering Sea ecosystem to produce salmon

### 2. Juvenile Salmon Research in Eastern and Western North Pacific Waters

Ocean production of salmon in terms of numbers of fish is closely linked with their early ocean survival. Recent reviews of national research on juvenile salmon show wide diversity of survival rates, predation, interannual variation, etc. The decrease of many stocks and intermixing of stocks in the eastern and western North Pacific coastal waters has increased concern and interest in this critical period. Variations in early marine growth and survival are often related to climate-induced changes in distribution and abundance of predator and prey populations. In order to increase our understanding of determination of population sizes and our ability to forecast stock sizes, we must address the following research issues:

- Seasonal distribution and migration of juvenile salmon
- Population size and survival estimates of juvenile salmon
- Trophic linkages and growth changes of juvenile salmon
- Primary production and salmon food resources

### 3. Winter Salmon Research

Compression of salmon distribution in winter intermixes many stocks at a time of reduced food resources, and extremely low salmon lipid content suggests some stocks face starvation in this critical period. Salmon size at the end of the winter also determines size of their potential prey and growth in the coming summer. In spite of difficult research conditions, the impacts of winter conditions on salmon need to be addressed by the following research issues:

- Winter distribution of salmon
- Population size and survival estimates of overwintering salmon
- Survival strategies of salmon in winter
- Feeding, growth, and condition of salmon in winter
- 24-hour sampling to elucidate possible day-night differences

The Parties of the Commission are coordinating their respective research activities to address the issues identified in the Commission's Science Plan. ■

# News from Secretariat



(Photo by Omori)

Hiroko & Takahiro

## Former NPAFC Deputy Director became a mom

**HIROKO OMORI**, former Deputy Director, gave birth to a baby boy on October 13, 2000. The baby's weight was 3,132 g. He is named Takahiro, taking the partial names of his parents Takaaki and Hiroko. Hiroko is struggling with her new role as a mother. In spite of that, the baby is growing quickly and is able to do new things day by day.

Hiroko left the NPAFC Secretariat for Japan at the end of August 2000 to give birth and to live

with her family. She recalls the work at the Secretariat and life in Vancouver as "wonderful and precious", and says she learned the importance of understanding people of different cultural background.

She hopes that people reaffirm the important role of the NPAFC and continue to cooperate to ensure the healthy condition of salmon resources so that her son can enjoy eating delicious salmon.

Hiroko will take parental leave for a year and will then resume her work at the Fisheries Agency of Japan.

## New Deputy Director has arrived

**YOSHIKIYO KONDO** took position of the Deputy Director of the Commission as of December 1, 2000. He was formerly a fisheries inspector located in Niigata, Japan. He majored in marine fish biology at the University of Tokyo.

## Upcoming Events

### *Research Planning and Coordinating Meeting (RPCM)*

University of Washington, Seattle, USA      **MARCH 19-20, 2001**

### *International Workshop on Salmonid Otolith Marking*

University of Washington, Seattle, USA      **MARCH 21, 2001**

### *Enforcement Evaluation and Coordination Meeting (EECM)*

Petropavlovsk-Kamchatsky, Russia      **MAY, 2001**

### *NPAFC 9th Annual Meeting*

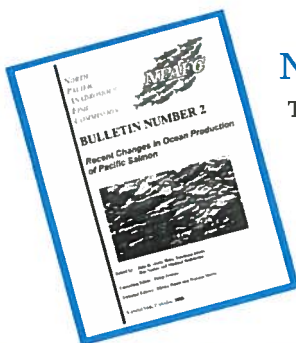
Victoria Conference Centre, Victoria, Canada      **OCTOBER 28-NOVEMBER 2, 2001**

### *Second International Symposium on Stock Enhancement and*

### *Sea Ranching (NPAFC co-sponsored)*

Kobe, Japan      **JANUARY 28 - FEBRUARY 1, 2002**

*Joint Scientific Meeting of North Pacific Anadromous Fish Commission (NPAFC), North Atlantic Salmon Conservation Organization (NASCO), International Baltic Sea Fishery Commission (IBSFC), and other international organizations*  
Vancouver, Canada      **MARCH, 2002**



## NPAFC Bulletin No. 2

This publication contains 39 papers presented during the International Symposium on "Recent Changes in Ocean Production of Pacific Salmon" held in Juneau, AK in November 1999. To order a copy, or a specific paper, visit our website [www.npafc.org](http://www.npafc.org) or call NPAFC Secretariat.

## NPAFC REPRESENTATIVES

### CANADA

David Bevan  
Department of Fisheries and Oceans  
Russ Jones  
Consultant  
Gerry Kristianson  
Sport Fishing Institute

### JAPAN

Koji Imamura  
Japan Sea-Farming Association  
Chikao Kawai  
Ministry of Foreign Affairs  
Shiro Yuge  
Fisheries Agency

### RUSSIA

Vladimir Izmailov  
State Fisheries Committee  
Vladimir Pautov  
Dalryba

### UNITED STATES

James Balsiger  
NOAA/NMFS  
Guy McMinds  
Quinault Indian Nation  
Fran Ulmer  
Lieutenant Governor, State of Alaska

Visit the NPAFC website:

<http://www.npafc.org> for more information on events, publications, scientific documents, and salmon catch statistics.

## PUBLISHED BY

NPAFC Secretariat  
Suite 502, 889 West Pender Street  
Vancouver, B.C., V6C 3B2 CANADA  
Tel: (604) 775-5550  
Fax: (604) 775-5577  
Website: <http://www.npafc.org>  
E-mail: [secretariat@npafc.org](mailto:secretariat@npafc.org)  
Vladimir Fedorenko: [vladf@npafc.org](mailto:vladf@npafc.org)  
Yoshikiyo Kondo: [kondo@npafc.org](mailto:kondo@npafc.org)  
Wakako Morris: [wmorris@npafc.org](mailto:wmorris@npafc.org)  
Denise McGrann: [denisem@npafc.org](mailto:denisem@npafc.org)

The Commission invites you to submit articles and photos or slides on NPAFC related activities for publication in the newsletter.

Masthead photo: Vancouver Maritime Museum floating display.

ISSN 1028-0227

♻️ Printed on recycled paper.