



North Pacific Fisheries Commission

NPFC-2020-SC05-WP04

Cooperation between NPFC and NPAFC

Abstract:

In accordance with Memorandum for Cooperation (MoC) between NPFC and NPAFC, the Commissions agreed to develop a five-year work plan that identifies key activities, timelines and deliverables. The MoC recognized participation in scientific research activities of mutual benefit as one the mechanisms for enhanced collaboration between the Commissions. SC members are invited (1) to review the scientific aspects of the work plan to implement the MoC and (2) provide suggestions to the program of the NPAFC 2022 pan-Pacific ecosystem survey.

Introduction

The North Pacific Fisheries Commission (NPFC) and the North Pacific Anadromous Fish Commission (NPAFC) signed a [Memorandum of Cooperation](#) (MoC) in May 2019. The MoC identified three major areas for cooperation between the Commissions: (1) exchange of data and information in accordance with information-sharing and data-confidentiality policies of each Commission, (2) collaboration on research efforts relating to stocks and species of mutual interest, including stock assessment, and (3) implementation of conservation and management measures for stocks and species of mutual interest. In order to implement the MoC, it has been agreed to develop a five-year work plan that identifies key activities, timelines and deliverables. The NPAFC Secretariat shared some initial ideas for a draft work plan for consideration by the NPFC. *The SC members are invited to review the scientific aspects of the Work plan to implement NPFC/NPAFC Memorandum of Cooperation.*

The MoC recognized participation in scientific research activities of mutual benefit as one the mechanisms for enhanced collaboration between the Commissions. At its 3rd meeting in 2018, the SC expressed support for the scientific cooperation between the NPFC and NPAFC in regard to the International Year of the Salmon (IYS) initiative and international pan-Pacific ecosystem survey in the North Pacific and recognized it as a SC project. The SC agreed to contribute to the development of a research survey program. The pan-Pacific ecosystem survey was scheduled in early 2021 but it has been postponed due to the covid-19 pandemic.

Although a large-scale pan-Pacific research survey is planned by NPAFC and IYS in 2022, a smaller research survey has already been conducted in the eastern North Pacific to prove the concept of the international collaboration to enhance salmon research. Following this survey

conducted in February-March 2019, NPAFC, PICES and NPFC held a joint workshop “Developing a collaborative, integrated ecosystem survey program to determine climate/ocean mechanisms affecting the productivity and distribution of salmon and associated pelagic fishes across the North Pacific Ocean” in Victoria, Canada in October 2019. The purpose of the workshop was, first, to review the outcomes of the 2019 research survey and, second, to discuss the elements of a program for IYS signature project which is a large-scale pan-Pacific multinational ecosystem survey in the high seas of the North Pacific in 2021. Sections II below provides a report on the participation of the NPFC representative, Dr. Chris Rooper, and the NPFC Science Manager, Dr. Alex Zavolokin, in the PICES-NPAFC-NPFC workshop. Section III describes the details of the 2021 pan-Pacific ecosystem survey and some initial ideas from NPFC for the survey program. *The SC members are invited to discuss NPFC’s involvement in the survey and make suggestions for the research survey planned by NPAFC and IYS in winter-spring 2021.*

I. Work plan to implement NPAFC/NPFC Memorandum of Cooperation, 2021-2025 (drafted by NPAFC Secretariat)

Exchange of data and information in accordance with the information-sharing and data-confidentiality policies of each Commission:

- Create a SharePoint inter-commissions communication system to share news, reports, guideline documents, and other information in easily accessible form
- Establish a mechanism of special information exchange (e.g., plans and results of patrolling, Radarsat information, map of catch and fishing effort on Pacific saury, etc.)
- Exchange information on fishing vessels that do not comply with the requirements of the NPFC CMM 2019-12 “On the vessel monitoring systems”

Collaboration on research efforts relating to stocks and species of mutual interest, including stock assessments:

- Implement Pan-Pacific research survey plans in the winter of 2022, organize a comprehensive study of its outcome at the special session of the IYS wrap up symposium
- Harmonize the NPFC/PICES and NPAFC/PICES Frameworks for Enhanced Scientific Cooperation in the North Pacific Ocean

Implementation of conservation and management measures for stocks and species of mutual interest:

- Harmonize the IUU vessel lists of both commissions
- Expand cooperative investigative efforts towards transshipment vessels and bycatch issues
- Organize joint inspections of fishing vessels operating in the common part of the NPAFC and NPFC Convention Areas

- Develop, publish and distribute a poster about fishery resources conservation at the high seas and consequences of vessel arrest to ports suspected of being the base for IUU fishing vessels

For each agreed item a timeline, milestones, and deliverables will be mutually developed. Work plan will be discussed by the commissions and mutually agreed before the 2020 year-end.

II. Report on the joint PICES-NPAFC-NPFC workshop: Developing a collaborative, integrated ecosystem survey program to determine climate/ocean mechanisms affecting the productivity and distribution of salmon and associated pelagic fishes across the North Pacific Ocean

Dr. Chris Rooper and the Science Manager (SM), Dr. Alex Zavolokin, took part in the joint PICES-NPAFC-NPFC workshop. The SM presented a review on non-salmon species in the North Pacific with the aim to find out which NPFC species can be expected by NPFC to be caught in the pan-Pacific ecosystem research survey. Some potential benefits for NPFC from participation in the research survey were outlined in the presentation. The workshop proposed a topic session at the 2020 PICES meeting to review the recent high seas expeditions and further develop a research program, and the SM was invited to be a co-convenor of the proposed session.

The PICES-NPAFC-NPFC workshop was held on 19-20 October with the aim to convene salmon/fish specialists, oceanographers, climatologists and resource managers to review the progress made during the March 2019 survey in the Gulf of Alaska (GoA) and recommend the elements of pan-Pacific high seas ecosystem research survey program that would be implemented through 2022 to assess the ocean/climate mechanisms affecting salmon distribution and productivity.

Recognizing the benefits of cooperation with NPAFC in both science and compliance, the NPFC signed a Memorandum of Cooperation (MoC) with NPAFC. The MoC, inter alia, states that the cooperation between the organizations will include participation in scientific research activities of mutual interest of both Commissions, collaboration on research efforts and information sharing. At its meetings in 2018 and 2019, the SC expressed support for the scientific cooperation between the NPFC and NPAFC in regard to the International Year of the Salmon (IYS) initiative and international survey in the North Pacific, recognized it as a scientific project and recommended that the Members and/or Secretariat represent NPFC in IYS-related meetings.

The workshop was organized by ten conveners representing IYS, NPAFC, PICES, NPFC and some NPAFC countries: Drs. Mark Saunders (NPAFC), Hal Batchelder (PICES), Dick Beamish (DFO,

Emeritus), Ed Farley (NMFS/NOAA), Suam Kim (Pukyong National University, Korea), Chrys Neville (DFO), Evgeny Pakhomov (UBC, Canada), Shigehiko Urawa (Japan), Laurie Weitkamp (NMFS/NOAA), Alex Zavolokin (NPFC). Dr. Chris Rooper attended the workshop as the NPFC representative.

Invited speakers and workshop participants gave 27 presentations on six major topics:

- Overview of Pacific salmon research in the North Pacific
- Physical and Biological Oceanography Panel: Results, hypotheses and recommendations for future research and methods
- Salmon and higher trophic levels panel: Results, links to physical and biological oceanography hypotheses and recommendations for future research and methods
- Special topics - Stock ID, Plastics, Tagging at Sea
- Related Survey work in North Pacific Coastal regions
- Planning for 2020/2021 Survey Design Panel

Presentations under the topics were followed by a discussion. The workshop ended with a facilitated session to address the issues with Survey design/hypothesis/methods and relevance to resource management, Approaches to data integration, Gear issues, and Outreach and communications.

Most presentations were centered around the recent 2019 GoA expedition. It was a privately organized survey funded by governmental and non-governmental organizations. The scientific crew of 21 scientists from 5 countries were at sea from mid-February to mid-March and conducted fishing and oceanographic sampling to describe the distribution, abundance and condition of salmon and other pelagic species and the associated ocean conditions. The expedition can be considered a successful proof of concept that validates the IYS initiative.

Although the workshop was mainly focused on salmon, there was a number of presentations on non-salmon species. Dr. Laurie Weitkamp (USA) provided an overview of the initial results of the expedition, including physical oceanography, biological oceanography, and nekton including salmon. She pointed out that the spatial distributions and abundances of species had some unexpected surprises, including supposedly coastal species far from shore. Results from this expedition increases our understanding of a region (Gulf of Alaska) and time (late winter) which has received little attention, and provides an important baseline for future studies, including proposed research in 2021. Dr. Albina Kanzeparova (Russia) gave a presentation on the occurrence of non-salmonid species in the Northwestern Pacific Ocean and the Gulf of Alaska during the 2019 winter survey. She presented species composition and their distribution and biomass in the western and eastern parts of the North Pacific. Two NPFC priority species, Japanese sardine and chub mackerel, were abundant in the western North Pacific and accounted for 76% of

the total fish biomass in the area. Dr. Oleg Katugin (Russia) talked about distribution patterns of squid in the upper epipelagic Gulf of Alaska in winter 2019. A total of nine species of squid and one species of pelagic octopus occurred in net hauls during the survey although no NPFC priority species of squids were caught. The observed patterns in distribution for different species of squid are associated with a number of factors, such as species-specific latitudinal and vertical occurrence, as well as differences in ontogenetic and diel vertical migrations, along with the ability of trawl net to catch squid. Dr. Kjell Rong UtneI (Norway) presented information about the international ecosystem survey in the Northeast Atlantic (IESSNS). The primary objective of the survey is an annual swept-area index used in stock assessment of NEA- mackerel, but the survey also targets herring and blue whiting acoustically and Atlantic salmon with surface trawling. Plankton and oceanographic sampling are also done during the survey. The survey has developed from a single vessel in 2007 to six vessels in 2018. Dr. UtneI described the survey methodology, sampling methods, data handling and storing, and how the data are applied in assessment.

The workshop proposed a topic session at the 2020 PICES meeting to review the recent high seas expeditions and further develop a research program (Annex 3), and the SM was invited to be a co-convenor of the proposed session.

The SM presented a review of the past pelagic surveys conducted in the North Pacific with the emphasis on the period from January to March to get an idea which species of NPFC interest can be caught during the pan-Pacific winter research survey. A pan-Pacific high seas ecosystem research survey planned as a part of the IYS initiative provides an opportunity to collect valuable data on non-salmon species in the Subarctic North Pacific. More than 900 species of fish, squids, crustaceans and other marine species, which are formally under the NPFC mandate, have been caught in the high seas from 1969-2019. These include all eight priority species for the NPFC Scientific Committee: Pacific saury, chub and spotted mackerels, Japanese sardine, neon and Japanese flying squids, North Pacific armorhead and splendid alfonsino. Most catches of the priority species occurred in the western North Pacific although their distribution patterns were different. Potential outputs for NPFC from joining the pan-Pacific survey could include improved knowledge about distribution and migration of priority species, validation and adjustment of models, new biological information on priority and other species of fish and squids, and other data related to oceanography, fish diets, and zooplankton.

III. Details of 2022 ecosystem research survey and initial ideas from NPFC on the survey program

Survey area and dates

Multinational pan-Pacific survey will be conducted in the Subarctic North Pacific (Fig. 1) in late

winter – early spring 2022. It should be supplemented by research surveys in the Bering Sea, Sea of Okhotsk and coastal waters off Canada and USA in order to collect information on salmon, non-salmon species and physical and biological oceanography at different stages of salmon marine period of life. Up to five survey sectors are supposed to be covered by the research vessels (Fig. 2).

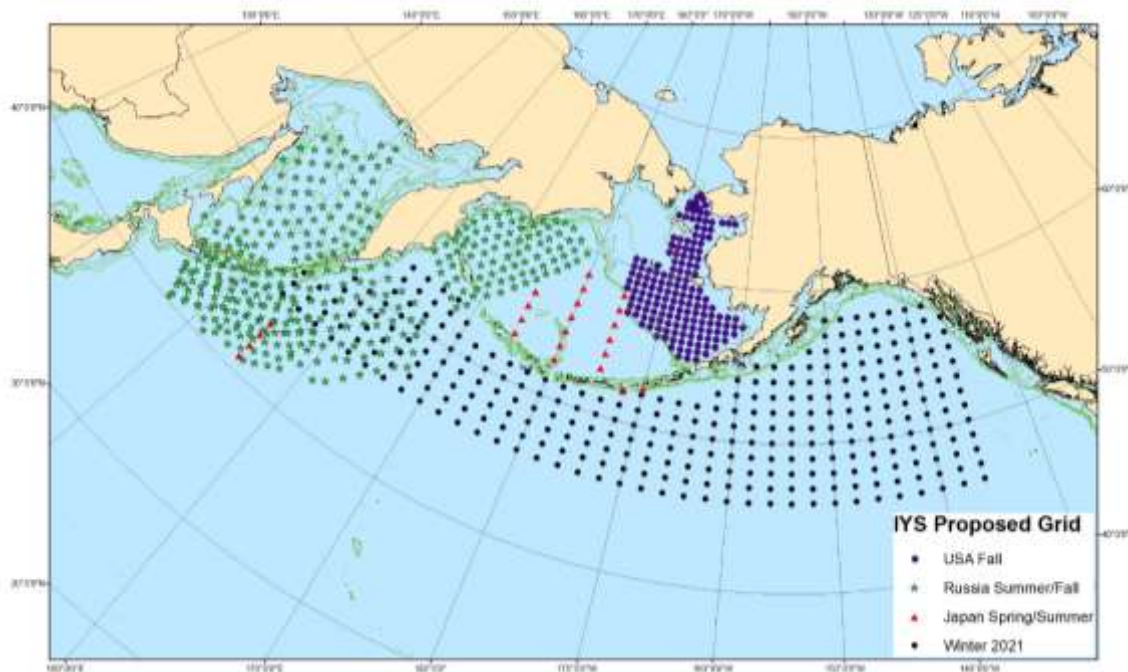


Fig. 1. Proposed research surveys in the North Pacific and adjacent seas in 2021/2022.

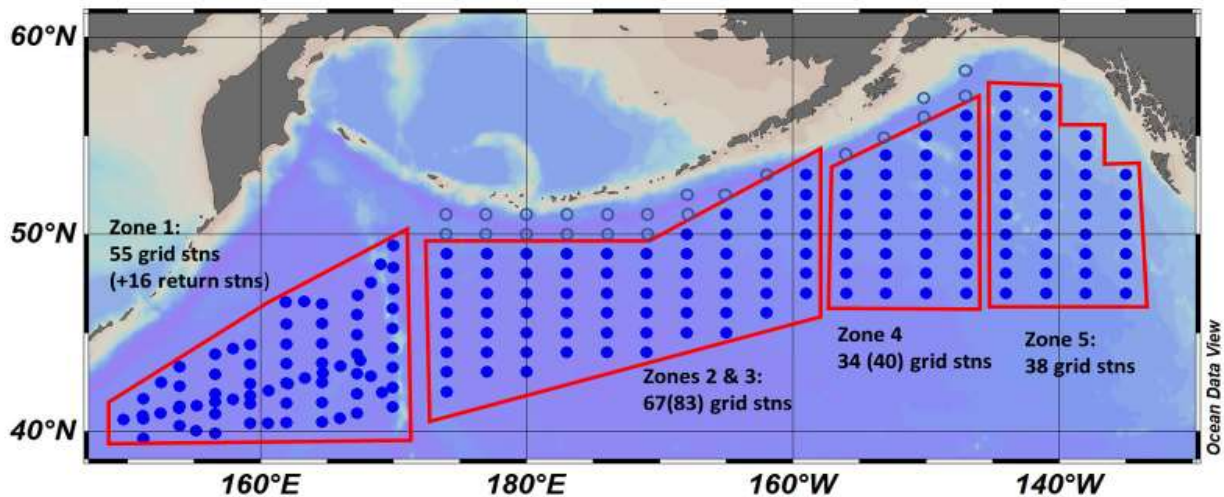


Fig. 2. Sampling zones, demarked by red boxes. Stations, demarked by blue circles are spaced 60 nm north-south along longitudinal transects, 120 nm spacing between transects. Empty blue circles demark stations within the USA EEZ which may only be possible with USA scientists aboard.

Participation

Canada, Russia and USA confirmed their plans to provide ship time for a pan-Pacific survey in

winter-spring 2022. One more research vessel will be chartered using the funds raised by the IYS. It was suggested that scientific team of each vessel would comprise of scientists from all NPAFC countries as this was proven to be an efficient way of collaborative research during the past expeditions in the Gulf of Alaska.

Data collection

Sampling gears: pelagic trawl, plankton nets (Jady, Bongo etc.), oceanographic CTD.

Sampling program:

- CTD water bottle sampling for nutrients, oxygen, POM, microplankton and e-DNA.
- Plankton sampling for composition, abundance and biomass of mesozooplankton.
- Trawl sampling for composition, abundance, biomass and biological information (size, age, stomach content etc.) of pelagic nekton (fish and squids) and macroplankton.
- Macroplankton and nekton tracers (stable isotopes, fatty acids, C/N, DNA, calorimetric) analyses.

Station sampling:



Data exchange and sharing

It is intended that the data collected during the 2022 research surveys will be available to all members and partners and potentially to the public. Standardization of trawl and other gears should be addressed to ensure proper data integration.

Suggestions from NPFC SC

Way of participation in/contribution to the research survey

Intellectually, financially, scientists from NPFC, ship time, other?

Suggestions on the survey design, sampling gears and data collection

- Encouragement to extend the survey area southward, if possible, to catch more species of NPFC interest.
- For non-salmon species, ensure all of them are identified, counted and measured.
- Additional analyses of the NPFC priority species (length, sex, maturity stage, fish scale, stomach content, genetic samples).
- Encouragement to share raw data with NPFC.
- Other?