

NPAFC
Doc. 1572
Rev.

**Trawl Survey Plans for Pacific Salmon Marine Life Period Studies in the Far
Eastern Seas in Summer and Fall 2015 by Russia**

by

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Submitted to the

NORTH PACIFIC ANADROMOUS FISH COMMISSION

by

Russia

April 2015

THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:

Temnykh O.S. and A.V. Zavolokin. 2015. Trawl survey plans for Pacific salmon marine life period studies in the Far Eastern Seas in summer and fall 2015 by Russia. NPAFC Doc. 1572. 6 pp. Pacific Scientific Research Fisheries Center (TINRO-center) (Available at <http://www.npafc.org>).

Trawl Survey Plans for Pacific Salmon Marine Life Period Studies in the Far Eastern Seas in Summer and Fall 2015 by Russia

Keywords: Pacific salmon, cruise activity, trawl survey, Okhotsk Sea, Bering Sea, Pacific Ocean.

Abstract: Two Russian research vessels are scheduled to conduct high-seas salmon surveys in summer 2015. R/v “Professor Kaganovsky” will carry out a summer monitoring survey in the Pacific waters off Kuril Islands in June-July. R/v “Professor Levanidov” will conduct a summer monitoring survey in the western Bering Sea. The primary objectives are to collect biological information on plankton and nekton communities, and describe the physical and biological oceanographic conditions in this region. The major purpose of these studies is the estimation of anadromous Pacific salmon abundance and biomass for short-term forecasting of their returns and possible catch. Two epipelagic surveys will be conducted in the western Bering and Okhotsk Seas in fall 2015. These cruises will be conducted aboard the TINRO-center’ research vessels “TINRO” and “Professor Kaganovsky”. The major purpose of these studies is the estimation of catadromous Pacific salmon abundance for forecasting of their returns and possible catch in the next years.

INTRODUCTION

Surveys plan for Pacific salmon research in 2015 is a logical continuation of previous studies on salmon marine ecology (NPAFC Doc 1231). According to the national research plan, Russia will continue monitoring of the state of the Okhotsk and Bering Seas and Pacific waters off Kuril Islands ecosystems. The studies on salmon distribution, food habits, dependence of salmon feeding on biomass and composition of plankton and nekton communities, changes of biological condition of fishes during the foraging, salmon spatial differentiation, structure of stocks contributing to the mixture and the influence of abiotic environment upon the salmon quantitative allocation and migrations are planned. The major purpose of these studies is improving of forecast of the salmon returns.

METHODOLOGY OF STUDIES

Surveys will be conducted aboard vessels of TINRO-Center (“TINRO”, “Professor Kaganovsky” and “Professor Levanidov”) using uniform methods and approaches. Trawlings are

carried out by the standard midwater trawl, model RT/TM 80/396 m fished with four 120 m bridles. Heavy orbicular midwater trawl doors, each one of 6 sq.m, are used. Depending on towing speed the vertical spread of the trawl is 32-42 m and horizontal spread is 30-34 m. At each station the net is towed for 1 hour. The net is towed at about 4.5-5.0 kts with the headrope located at the surface (fixed layer – 0 m), particularly at night. The length of warps is 250-310 m.

Each trawling is accompanied (before or after) by the collection of plankton samples using the Jedy net. Samples for fish and squid diet studies are taken from the catch of every trawling and these samples undergo on-board processing. The processing of all samples is carried out by means of express methods of analysis that were developed by TINRO-Center. Research on caloric content of food items and their isotope composition will provide further insights into understanding of Pacific salmon biological environment.

Hydrological studies are conducted during the whole period of the survey by means of hydrological probe Neil-Brown and ICTD. The data is recorded for the fixed layer 0-1000 meters and for the areas with the depth less than 1000 meters – down to the bottom.

I. CRUISE PLAN FOR PACIFIC SALMON MARINE PERIOD OF LIFE RESEARCH DURING THEIR ANADROMOUS MIGRATIONS

SURVEYS OBJECTIVES AND TASKS

Studies during Pacific salmon anadromous migrations are planned in the Pacific waters off Kuril Islands as well as in the western Bering Sea and Pacific waters off eastern Kamchatka. The major purpose of these studies is the estimation of anadromous Pacific salmon abundance for short-term forecasting of their returns and possible catch. The studies on salmon distribution, salmon food habits, dependence of salmon feeding on biomass and composition of plankton and nekton communities, changes of biological condition of salmon during the anadromous migrations and foraging, salmon spatial differentiation, structure of stocks contributing to the mixture and the influence of abiotic environment upon the salmon quantitative allocation and migrations are planned.

Achievement of these objectives will be accomplished through the fulfillment of the following tasks:

1) carrying out of trawl survey of epipelagic zone in the Pacific waters off Kuril Islands, western Bering Sea and Pacific waters off eastern Kamchatka for estimation of mature and immature Pacific salmon and other nekton species abundance and biomass, assessment of their biological condition and spatial distribution patterns, size and age composition of stocks, sampling for feeding studies;

2) carrying out of plankton survey of epipelagic zone for collection of data on plankton communities composition and structure, salmon and other nekton species forage base; description and development of nektonic communities trophic structure models;

3) carrying out of hydrological survey for evaluation of climate-oceanic conditions of the Pacific waters off Kuril Islands.

Research vessels “Professor Kaganovsky” and “Professor Levanidov” are planned to study Pacific salmon anadromous migrations.

LOCATIONS AND PERIOD OF SURVEY

The salmon studies of research vessel “Professor Kaganovsky” will begin in the Pacific waters in June and end by the middle July (Figure 1). The research vessel “Professor Levanidov” will operate in the western Bering Sea from June to early July (Figure 2).

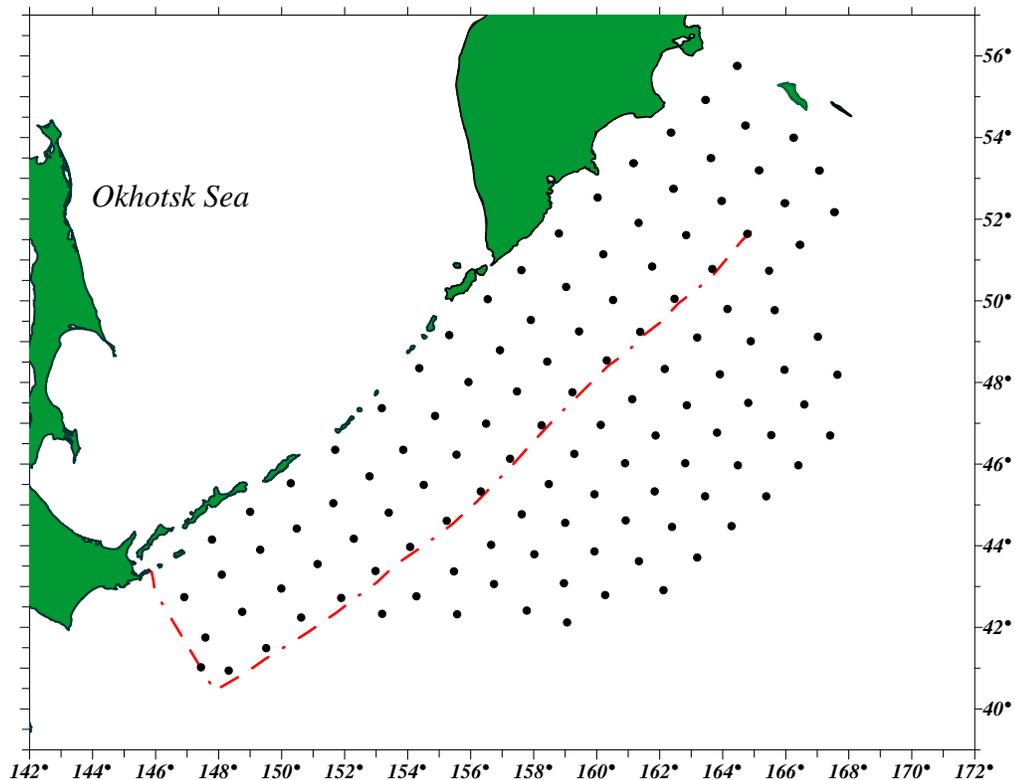


Figure 1. Station locations to be sampled during the comprehensive survey of the upper epipelagic layer of the Pacific waters off Kuril Islands by RV “Professor Kaganovsky” according to TINRO-Center plan for June-July, 2015. Red line is the border of Russian EEZ

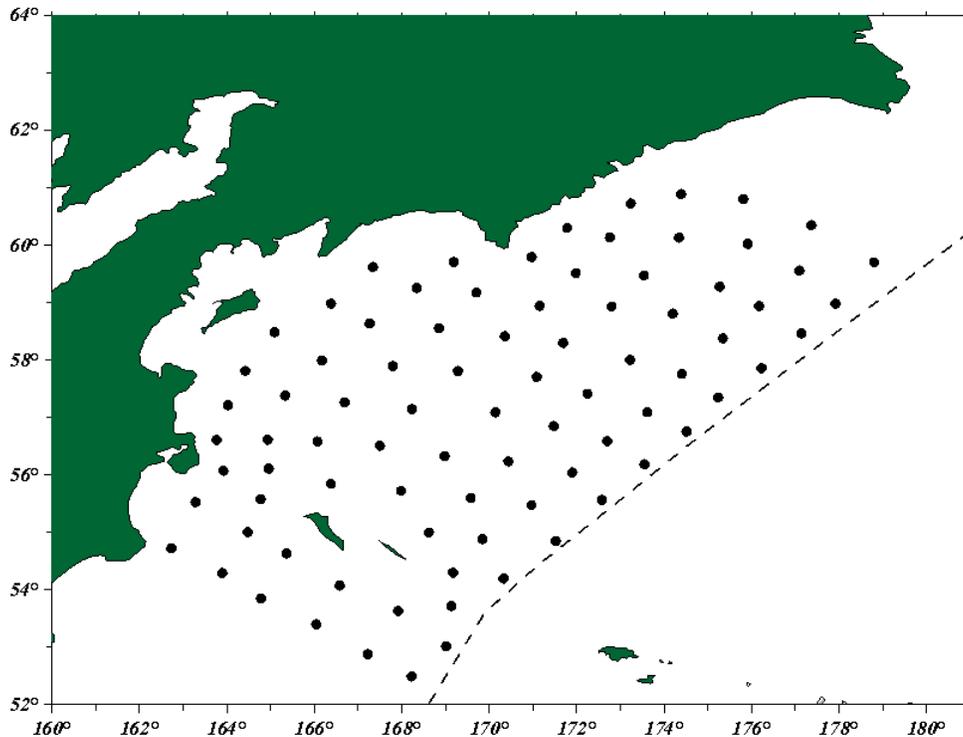


Figure 2. Station locations to be sampled during the comprehensive survey of the upper epipelagic layer in the western Bering Sea and adjacent pacific waters in June-July by RV “Professor Levanidov”

II. CRUISE PLAN FOR PACIFIC SALMON MARINE PERIOD OF LIFE RESEARCH DURING THEIR CATADROMOUS MIGRATIONS

SURVEYS OBJECTIVES AND TASKS

Studies during Pacific salmon catadromous migrations are planned in the Bering, Okhotsk Seas and adjacent waters. The major purpose of these studies is the estimation of catadromous Pacific salmon abundance and biomass for forecasting of their returns and possible catch in the next years. The studies on salmon distribution, salmon food habits, dependence of salmon feeding on biomass and composition of plankton and nekton communities, changes of biological condition of salmon during the catadromous migrations and foraging, salmon spatial differentiation, structure of stocks contributing to the mixture and the influence of abiotic

environment upon the salmon quantitative allocation and migrations are planned.

Achievement of these objectives will be accomplished through the fulfillment of the following tasks:

1) carrying out of trawl survey of epipelagic zone in the western Bering Sea, southern Okhotsk Sea and adjacent Pacific waters for estimation of juvenile and immature Pacific salmon and other nekton species abundance and biomass, assessment of their biological condition and spatial distribution patterns, size and age composition of stocks, sampling for feeding studies;

2) carrying out of plankton survey of epipelagic zone for collection of data on plankton communities composition and structure, salmon and other nekton species forage base; description and development of nektonic communities trophic structure models;

3) carrying out of hydrological survey for evaluation of climate-oceanic conditions of the southern Okhotsk Sea.

Studies of Pacific salmon during their catadromous migrations will be conducted by R/V “TINRO” and R/V “Professor Kaganovsky”.

LOCATIONS AND PERIOD OF SURVEY

Studies during Pacific salmon catadromous migrations will be conducted in the western Bering Sea and pacific waters off eastern Kamchatka from September to early October and in the Okhotsk Sea from October to November (Figure 3).

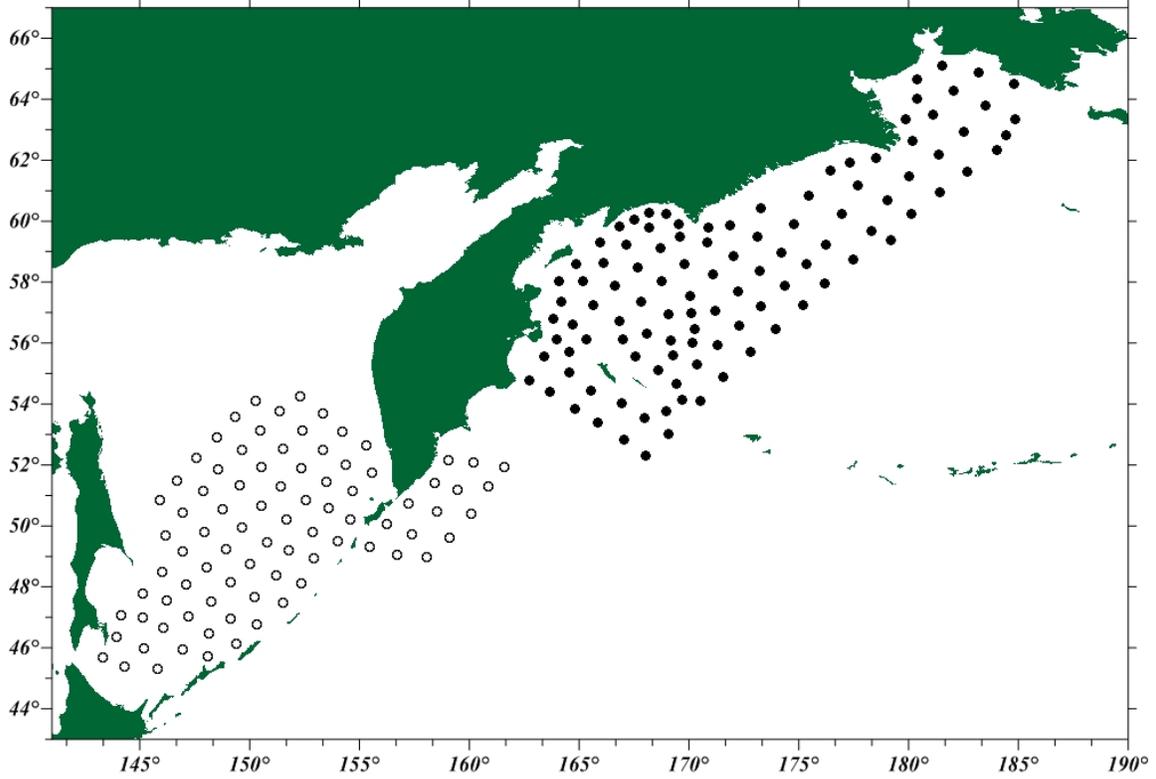


Figure 3. Station locations to be sampled during the comprehensive survey of the upper epipelagic layer in the western Bering Sea (September-October), the southern Okhotsk Sea (October-November) and adjacent pacific waters