

Trawl Survey Plans for Pacific Salmon Marine Life Period Studies in the Far Eastern Seas in Summer and Fall 2014 by Russia

by

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ABSTRACT

The document summarizes trawl survey plans for Pacific salmon marine life period studies in the Far Eastern Seas in summer and fall 2014 by Russia (TINRO-Center). The outline of materials, methods, surveys timing and theoretical background are provided.

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

INTRODUCTION

Pacific salmon marine life period studies are planned in accordance with “Russian Pacific Salmon Research Program for 2010-2014 Period” (NPAFC Doc 1231). Surveys plan for Pacific salmon research in 2014 is a logical continuation of previous studies on salmon marine ecology. It is based on proven methods and approaches for assessment of salmon abundance, biological condition, spatial distribution patterns, size and age composition and others (NPAFC Doc 645, 682, 901, 985 and others).

Last years the abundance of many Russian salmon stocks changed greatly. In 2005-2013, the total catch of Pacific salmon by Russia was at 260-542 th. ton. In this year the total salmon abundance is expected to be relatively low due to decrease in pink salmon abundance while catches of other salmon species are supposed to be at high level.. Continuation of salmon studies in main areas of their habitat will let us to estimate the dynamic of their distribution, abundance, body size, feeding habits, and other features and to improve our knowledge of salmon ecology.

In 2014 Russia will continue monitoring of the state of the Okhotsk Sea 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. One of the goals of these studies is the estimation of Pacific salmon survival/mortality at the different stages of marine life period.

METHODOLOGY OF STUDIES

Surveys will be conducted aboard vessels of TINRO-Center (“TINRO” and “Professor Kaganovsky”) using uniform methods and approaches. Trawlings of R/V “TINRO” and “Professor Kaganovsky” 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. 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. 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 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 mass nekton species feeding environment; description and development of nektonic communities trophic structure models.

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

Research vessel “Professor Kaganovsky” 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 will end by the middle July (Figure 1).

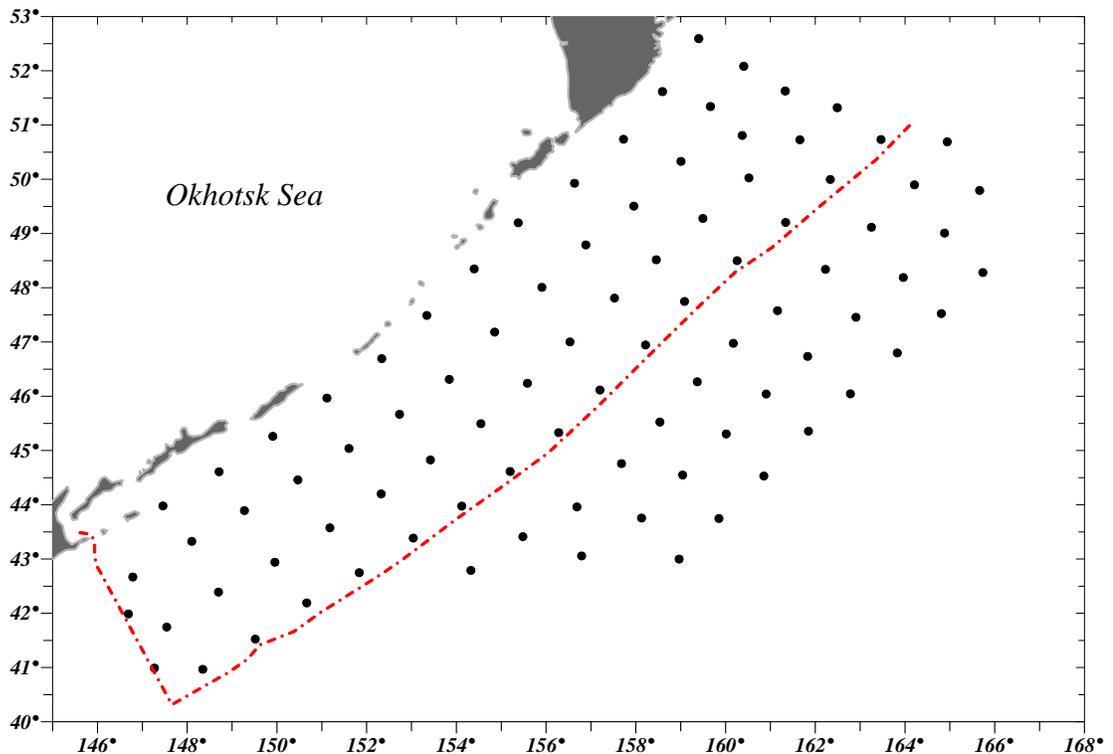


Figure 1. Station locations to be sampled by the comprehensive survey of the upper epipelagic layer of the Pacific waters off Kuril Islands by RV “Professor Kaganovsky” according to TINRO-Center plan for June-July, 2014. Red line is the border of Russian EEZ

PARTICIPATING SCIENTISTS

Scientific team will include 17 persons: 8 ichthyologists, 4 hydrobiologists, 3 hydrologists, 2 acousticians.

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 Okhotsk Sea. 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 southern Okhotsk Sea 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 mass nekton species feeding environment; 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 aboard R/V “TINRO”.

LOCATIONS AND PERIOD OF SURVEY

Studies during Pacific salmon catadromous migrations will begin in the southern part of Okhotsk Sea in early October and will end in early November (Figure 2).

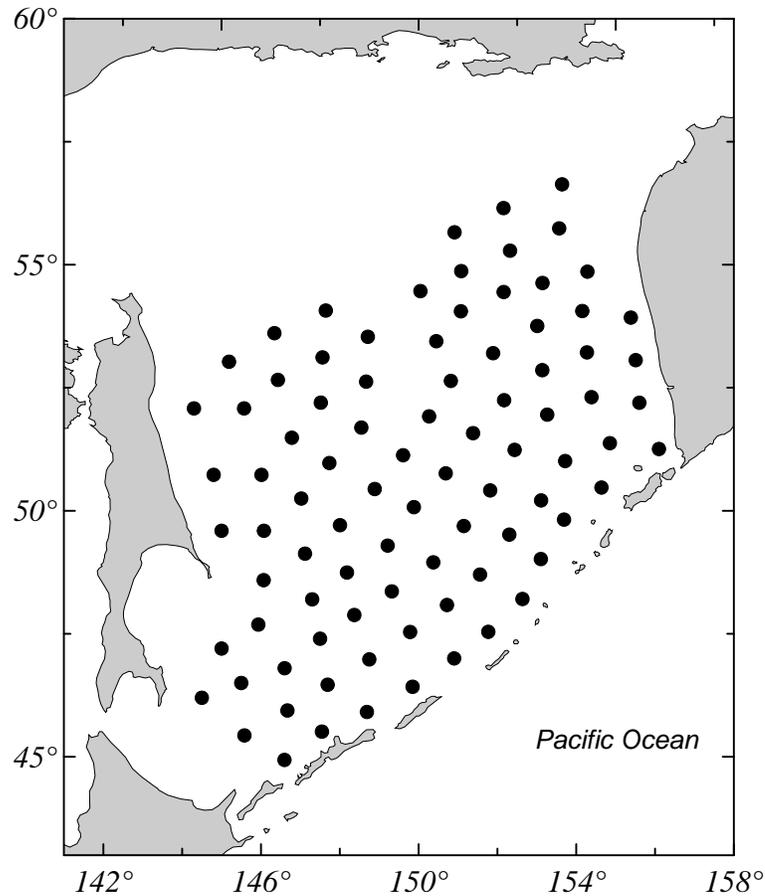


Figure 2. Station locations to be sampled by the standard comprehensive survey of the upper epipelagic layer of the southern Okhotsk Sea (October and November) aboard RV “TINRO”.

PARTICIPATING SCIENTISTS

Scientific team will include 17 persons: 8 ichthyologists, 4 hydrobiologists, 3 hydrologists and 2 acousticians (preliminary).