

NPAFC
Doc. 1376
Rev.

Trawl Survey Plans for Pacific Salmon Marine Life Period Studies in the Far Eastern Seas in summer and fall 2012 by Russia

by

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Submitted to the

NORTH PACIFIC ANADROMOUS FISH COMMISSION

by

Russia

March 2012

THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:

Temnykh O.S, A.V. Zavolokin, A.N. Starovoytov, and A.V. Bugaev. 2012. Trawl Survey Plans for Pacific Salmon Marine Life Period Studies in the Far Eastern Seas in Summer and Fall 2012 by Russia. NPAFC Doc. 1376. 7 pp. (Available at <http://www.npafc.org>).

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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 2012 by Russia (TINRO-Center and KamchatNIRO). The outline of materials, methods, surveys timing and theoretical background are provided.

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 2012 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).

In last years the abundance of many Russian salmon stocks (especially some stocks of pink and chum salmon) has increased. In 2005-2011, the total catch of Pacific salmon by Russia was at 260-542 th. ton. In this year salmon abundance is expected to be also high. 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 2012 Russia will continue monitoring of the state of Bering Sea, Okhotsk Sea, and Pacific waters off Kuril and Commander 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 by vessels of TINRO-Center (“TINRO” and “Professor Kaganovsky”) and KamchatNIRO (“MRTK-316”) using uniform methods and approaches. Trawlings of R/V “TINRO” and “Professor Kaganovsky” are carried out by the standard midwater trawl, model RT/TM 80/376 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.

Trawlings of R/V “MRTK-316” are carried out by the trawls RP 33.6/72 and 33.6/56. The vertical spread of these trawls is 6-12 m and horizontal spread is 28-30 m. At each station the net is towed for fifteen minutes. The net is towed at about 3.5-4.5 kts with the headrope located at the surface. Each trawling is accompanied (before or after) by the collection of plankton samples using the Jeday 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 (R/V “TINRO” and “Professor Kaganovsky”) or SBE-19 plus (R/V “MRTK-316”). 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 were 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.
- 3) carrying out of hydrological survey for evaluation of climate-oceanic conditions of the Pacific waters off Kuril Islands.

Research vessel TINRO are planned to study Pacific salmon anadromous migrations.

LOCATIONS AND PERIOD OF SURVEY

The salmon studies of research vessel "TINRO" will begin in the Pacific waters in summer. In June – early July, R/V "TINRO" will conduct studies in Pacific waters off Kuril Islands (Figure 1).

PARTICIPATING SCIENTISTS

Scientific field party will include 15: 8 ichthyologists, 4 hydrobiologists, 3 hydrologists (preliminary).

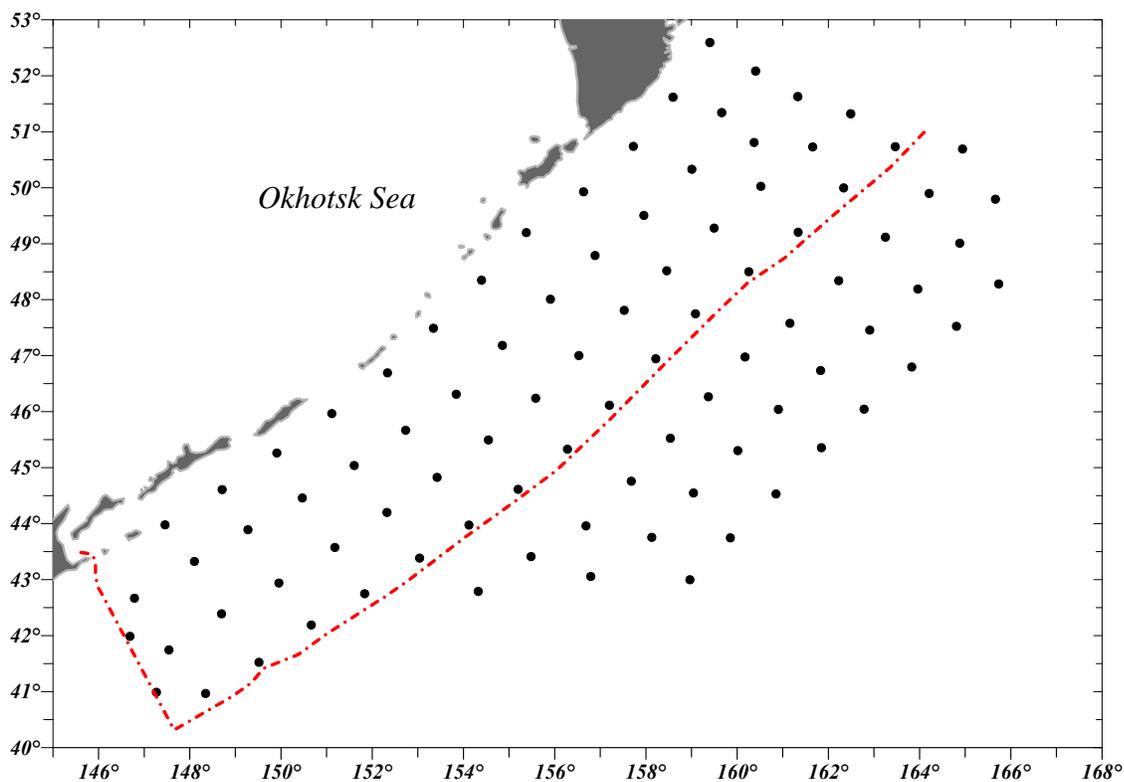


Figure 1. Station locations to be sampled by the standard comprehensive survey of the upper epipelagic layer of the Pacific waters off Kuril Islands by RV «TINRO» according to TINRO-Center plan for June-July, 2012.

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 were 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 pacific waters off eastern Kamchatka 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 western Bering Sea, southern Okhotsk Sea and pacific waters off eastern Kamchatka.
- Studies of Pacific salmon during their catadromous migrations will be conducted by R/V “MRTK-316”, “TINRO” and “Professor Kaganovsky”.

LOCATIONS AND PERIOD OF SURVEY

Studies during Pacific salmon catadromous migrations will begin in July and August. R/V “MRTK-316” will conduct studies in the south-eastern Okhotsk Sea in July and in the Kamchatsky Bay in August (preliminary) (Figure 2). R/V “Professor Kaganovsky” are planned to study the catadromous migrations of Pacific salmon in the western Bering Sea in September and October (Figure 3). R/V “TINRO” will conduct studies in the southern and central parts of Okhotsk Sea in October and November (Figure 4).

PARTICIPATING SCIENTISTS

Scientific field party will include 6 persons on R/V “MRTK-316” (7 ichthyologists, 3 hydrobiologists, 3 hydrologists), 16 persons on R/V “Professor Kaganovsky” (7 ichthyologists, 5 hydrobiologists, 2 hydrologists, 2 acousticians) and 13 persons on R/V “TINRO” (6 ichthyologists, 4 hydrobiologists, 3 hydrologists).

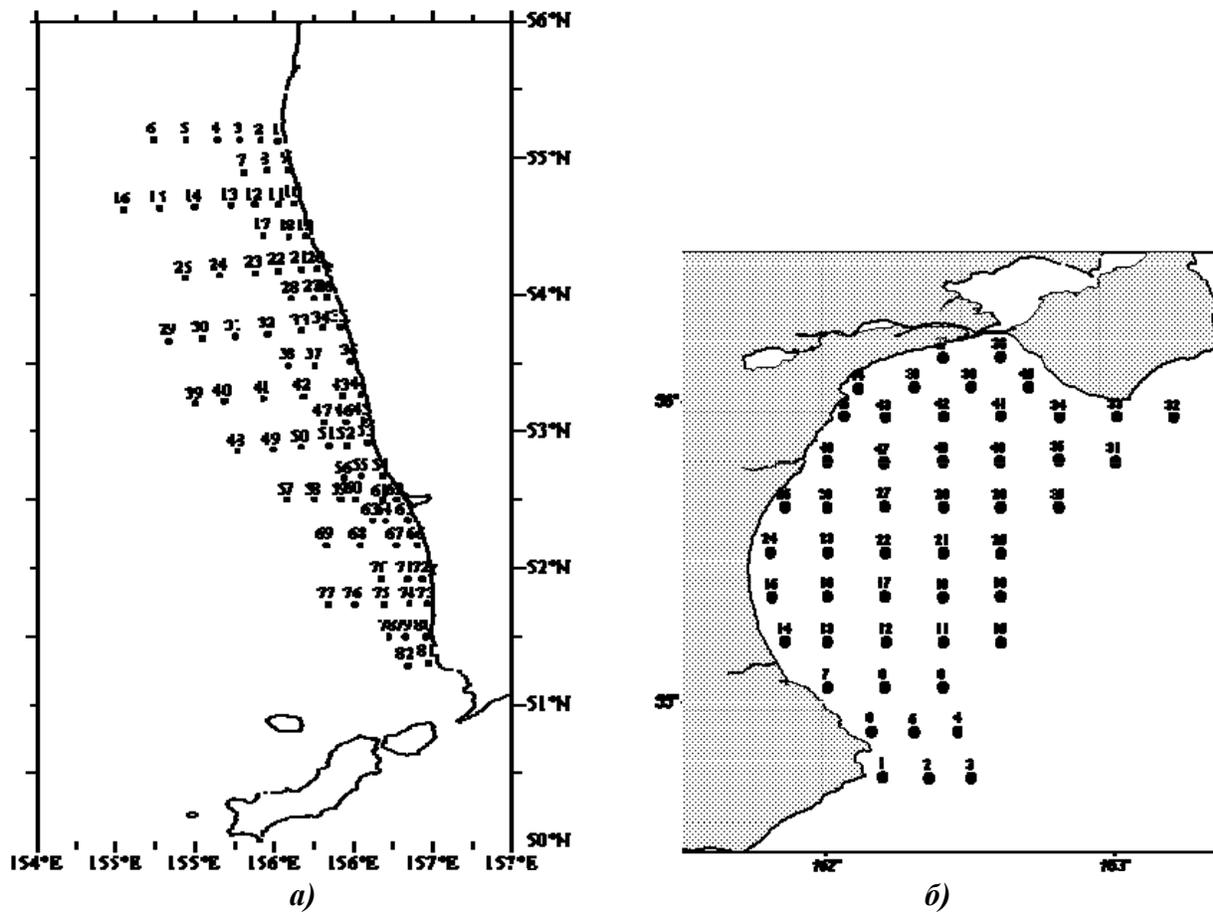


Figure 2. Station locations to be sampled in the south-eastern Okhotsk Sea in July and in the Kamchatsky Bay in August.

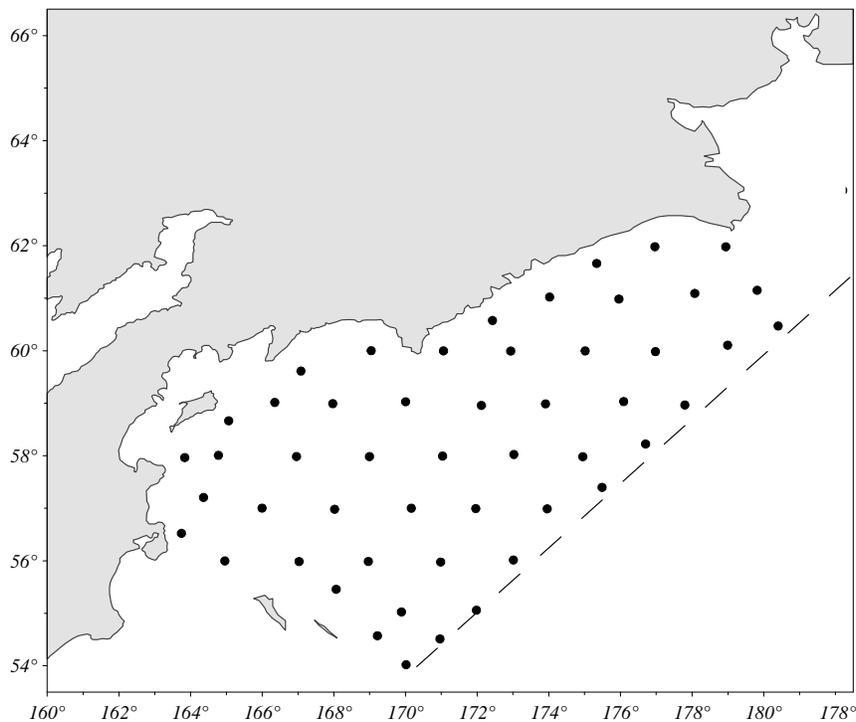


Figure 3. Station locations to be sampled by the standard comprehensive survey of the upper epipelagic layer of the western Bering Sea in September and October by RV “Professor Kaganovsky”.

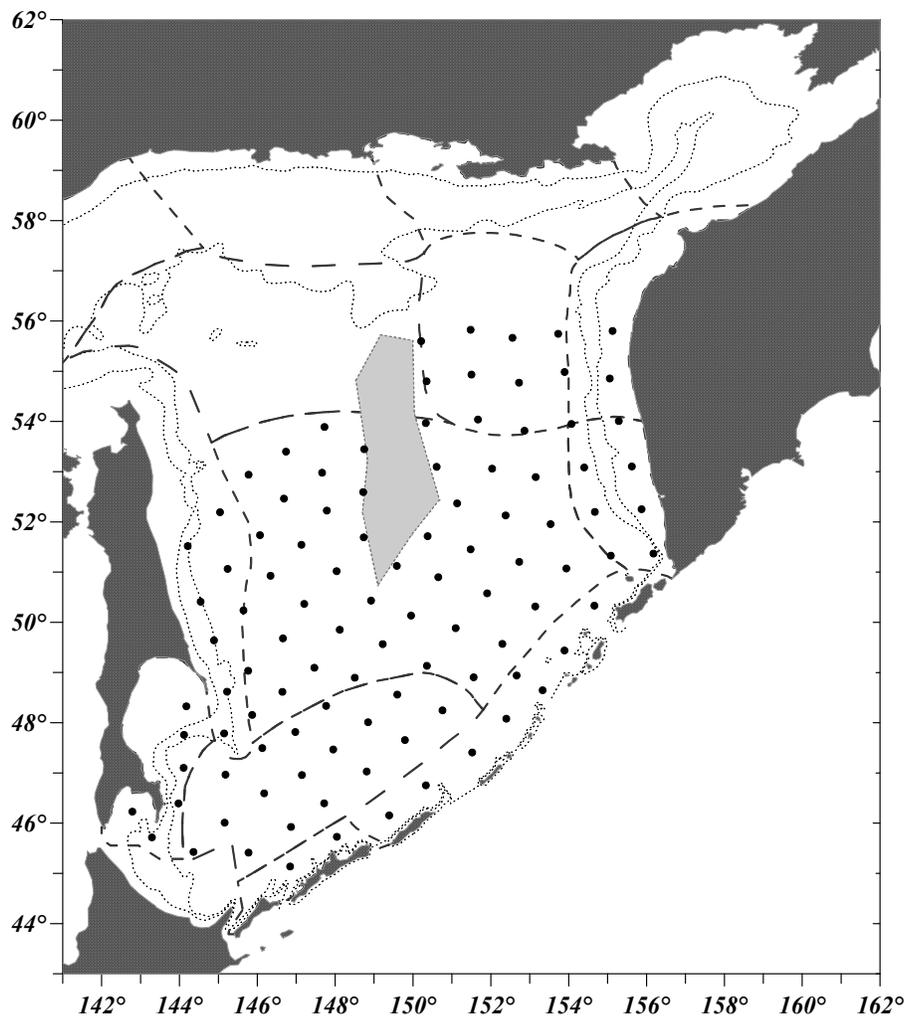


Figure 4. Station locations to be sampled by the standard comprehensive survey of the upper epipelagic layer of the southern Okhotsk Sea in October and November by RV "TINRO".