

NPAFC  
Doc. 1747  
Rev.

**Trawl Survey Plans for Pacific Salmon Marine Life Period Studies in the Far Eastern  
Seas in 2018**

by

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Submitted to the

**NORTH PACIFIC ANADROMOUS FISH COMMISSION**

by

Russia

March 2018

**THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:**

Starovoytov A.N., O.S. Temnykh. 2018. Trawl survey plans for Pacific salmon marine life period studies in the Far Eastern Seas in 2018. NPAFC Doc. 1747. 4 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 2018**

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

Two Russian research vessels are scheduled to conduct salmon surveys in summer and fall 2018. R/V “Professor Kaganovsky” will carry out a summer monitoring survey in the Pacific waters off Kuril Islands in June-July. 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 catches on the coasts of the Sea of Okhotsk.

Two Russian research vessels “Professor Levanidov” and R/V “Professor Kaganovsky” will carry out salmon surveys in fall 2018 in the southern Okhotsk Sea. The major purpose of these studies is the estimation of Pacific salmon juvenile’s abundance for forecasting of their returns and possible catch in the next years. A similar salmon survey will be performed by R/V “Professor Levanidov” in the western part of the Bering Sea in September.

## **INTRODUCTION**

Surveys plan for Pacific salmon research in 2018 is a logical continuation of previous studies on salmon marine ecology. 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, the influence of biotic and abiotic environment upon the salmon quantitative allocation and migrations, stock composition are planned. The major purpose of these studies is improving of forecast of the salmon returns.

## **METHODOLOGY OF STUDIES**

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 expressing methods of analysis that were developed by TINRO-Center.

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.

## **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 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, 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 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 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 hydrological survey for evaluation of climate-oceanic conditions of the Pacific waters off Kuril Islands.

### 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 (tentatively June 1–July 10, 2018) (Fig. 1).

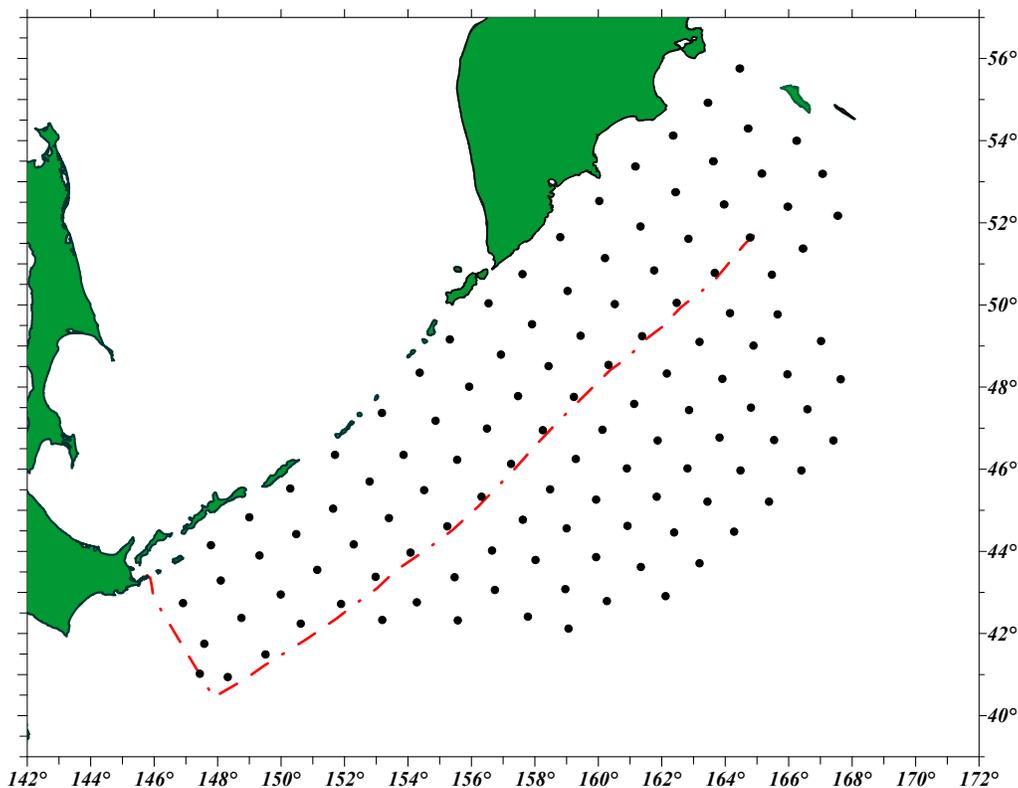


Figure 1. Station locations to be sampled during the comprehensive survey of the upper epipelagic layer of the Pacific waters off Kuril Islands by RV “Professor Kaganovsky” according to TINRO-Center plan for June 1–July 10. Line is the border of Russian EEZ

# 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, and Okhotsk Seas. 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, 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 trawl survey of epipelagic zone in the western Bering Sea, the southern Sea of Okhotsk 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 plankton survey of epipelagic zone for collection of data on plankton communities composition and structure, salmon and other nekton species forage base;
- 3) carrying out hydrological survey for evaluation of climate-oceanic conditions of the southern Okhotsk Sea and western Bering Sea.

## LOCATIONS AND PERIOD OF SURVEY

Studies of Pacific salmon during their catadromous migrations will be conducted by R/V “Professor Levanidov” in the western Bering Sea during September (Fig. 2).

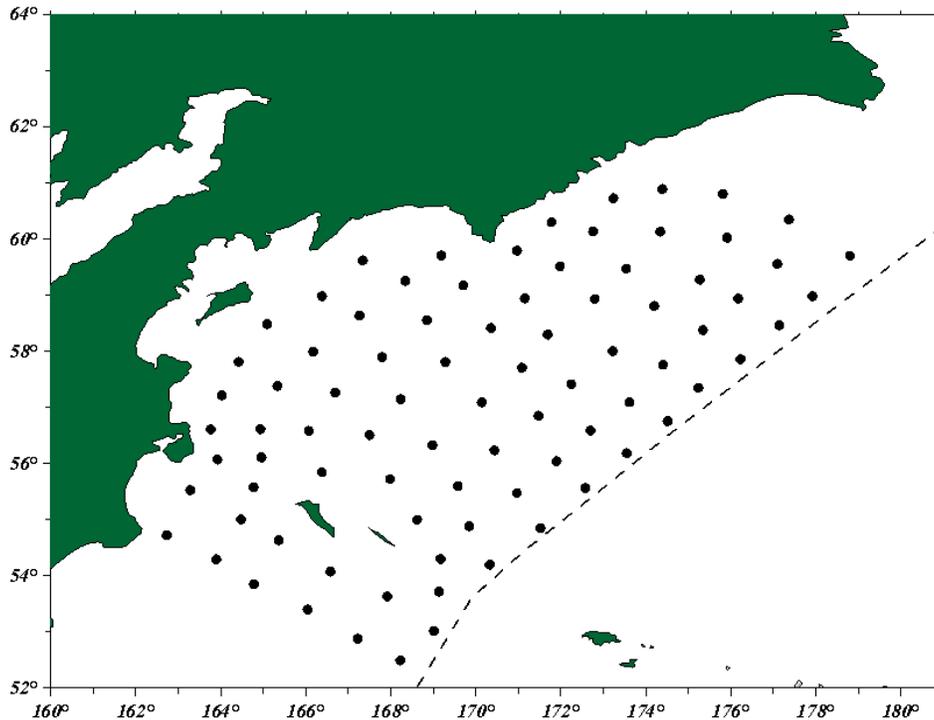


Figure 2. Station locations to be sampled during the comprehensive survey of the upper epipelagic layer in the western Bering Sea (mid-September–early October)

Two research vessels R/V “Professor Levanidov” and "Professor Kaganovsky" are planned to conduct survey in the southern Okhotsk Sea in October–November 2018 (Fig. 3).

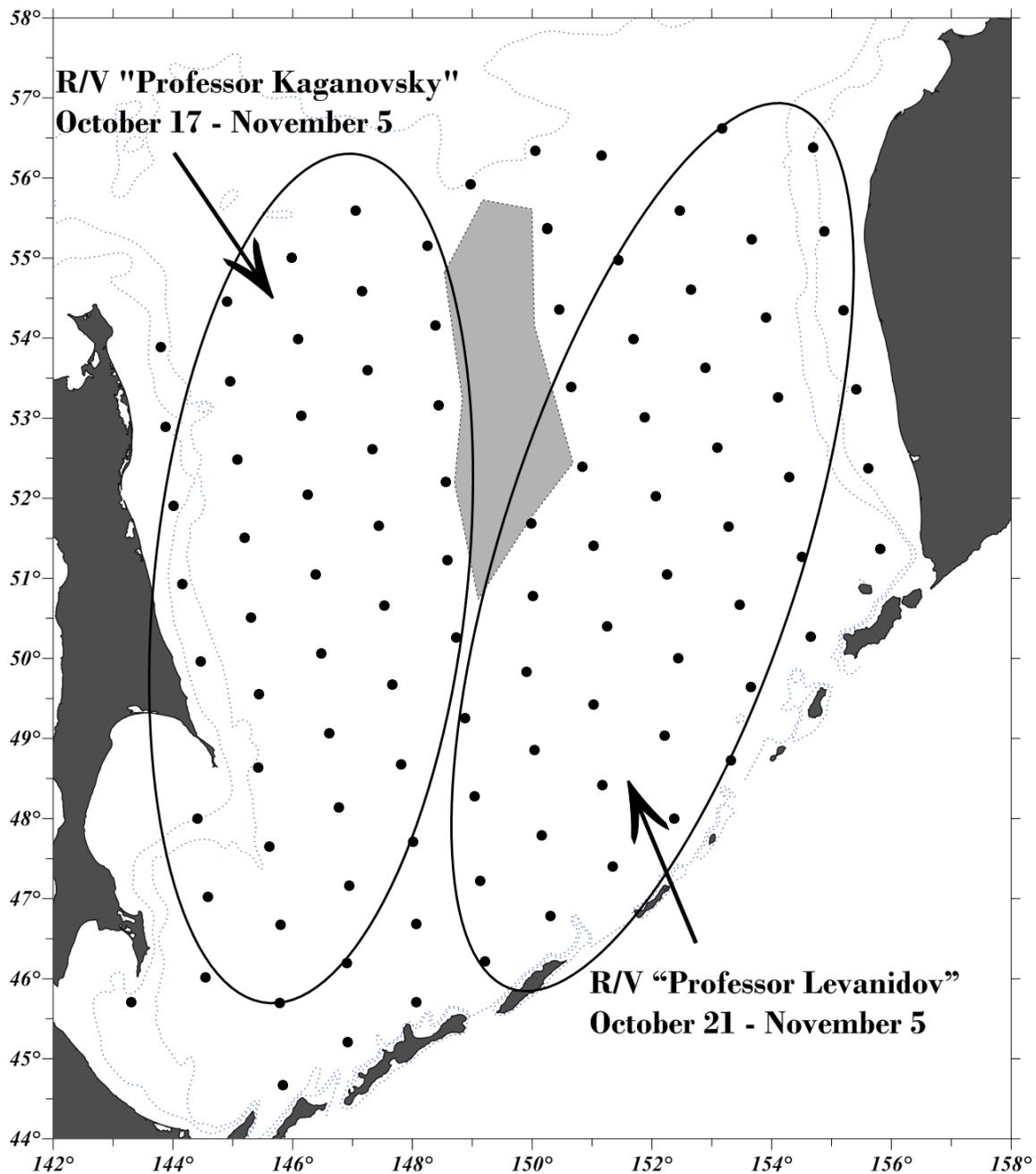


Figure 3. Station locations to be sampled during the comprehensive survey of the upper epipelagic layer in the southern Okhotsk Sea (October–November)