

NPAFC
Doc. 1784
Rev.

**United States Cruise Plan for Northern Bering Sea Surface Trawl
Surveys, August–September 2018**

by

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Submitted to the

NORTH PACIFIC ANADROMOUS FISH COMMISSION

by

United States of America

April 2018

THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:

Ciciel, K., and E. Farley. 2018. United States cruise plan for northern Bering Sea surface trawl surveys, August–September 2018. NPAFC Doc. 1784. 3 pp. National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), Alaska Fisheries Science Center, Auke Bay Laboratories (Available at <http://www.npafc.org>).

Northern Bering Sea Surface Trawl Survey Plan for 2018

Keywords: juvenile salmon, forage fish, northern Bering Sea, Loss of Sea Ice.

Abstract

This survey plan details the proposed sampling of juvenile salmon and forage fish in the northern Bering Sea in August-September 2018. This represents a project that includes participation from the Alaska Department of Fish and Game (ADF&G), US Fish and Wildlife, and the Alaska Fisheries Science Center, Auke Bay Laboratories (ABL). This project builds upon prior surveys conducted in the northern Bering Sea and led by ABL.

Introduction

Scientists from the Alaska Fisheries Science Center's Ecosystem Monitoring and Assessment Program, will conduct a survey during late summer and fall 2018 within the northern Bering Sea. Primary objectives of the survey will be to: 1) provide information on how species distribution and marine food webs are altered by climate and seasonal ice in the northern Bering Sea (Sigler et al 2015). 2) collect biological and oceanographic information pertinent to juvenile salmon and forage fishes in the region; and 3) continue oceanographic time series sampling on the DBO2 (Distributed Biological Observatory) station line.

Survey

Primary survey operations will be conducted between hours of 08:00 to 21:00. Stations will be sampled using a systematic grid design with a station grid of approximately 30 nm with stations spaced every 0.5 degree of latitude and 1.0 degree of longitude. Trawl locations within Norton Sound were adjusted to sample just the deepest portion of Norton Sound and therefore are not placed on latitude and longitude grid coordinates. The Distributed Biological Observatory station locations have their own unique station coordinates set by NOAA. The sampling will begin 27 August 2018 in Dutch Harbor, Alaska and end on 20 September in Dutch Harbor, Alaska. The survey will include a total of 25 sea days and cover the area from 60°N to 65.5°N (Fig. 1, Table 1).

Fish samples will be collected using a midwater rope trawl. At most stations, the net will be towed at or near the surface for 30 minutes at speeds between 3.5 and 5 kts. All fish species will be counted and standard biological measurements including length and weight will be taken from subsamples of each species.

Ichthyoplankton and zooplankton will be sampled with double oblique bongo tows with a 60 cm diameter bongo frame with 505 (Net 1) and 505 (Net 2) micron nets, and a 20 cm bongo frame with 153 micron nets. The bongo array will be deployed using real time CTD data, collected with a Seabird SBE-49 FastCat using an oceanographic winch.

Plankton samples will be preserved in 5% buffered formalin. Bongo tows will be from 5m of bottom to the surface.

CTD data will be collected at each station with a SBE 911+ CTD that includes a dual TC sensors, a PAR spherical sensor (Biospherical Instruments QSP 2300), chl-a fluorometer, beam transmissometer (Wet Labs C-star), and two dissolved oxygen sensors (SBE 43). CTD casts will be to near-bottom (5 m from bottom). Water samples will be collected with Niskin bottles attached to the CTD carousel and will be used to sample chlorophyll a, nutrients, salinity, and particulate organic carbon.

Visual surveys for marine birds and mammals will be conducted while the vessel is in transit between stations and when transiting to and from the northern Bering Sea. A single observer located inside on the bridge will record observations during daylight hours.

References

Sigler, MF, KY Aydin, PL Boveng, EV Farley Jr, RA Heintz, and RR Lauth. 2015 Alaska Fisheries Science Center Loss of Sea Ice (LOSI) Plan for FY15-FY19. AFSC Processed Rep. 2015-01, 11p. Alaska Fish. Sci. Cent., NOAA Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115

Table 1. Tentative cruise itinerary for the pelagic trawl survey in the coastal north eastern Bering Sea, 27 August–20 September 2018.

Date	Location/Activity
<u>Leg 1</u>	
Aug 27	Embark scientists and load gear at OSI, Dutch Harbor, AK
Aug 29	Depart Dutch Harbor, transit to 60° N
August 30	Proceed with sample grid stations (Fig. 1)
Sep 8	Port call Nome, AK, crew change
<u>Leg 2</u>	
Sep 8	Port call Nome, AK, crew change
Sep 7	Continue sampling grid stations in Norton Sound to Bering Strait
Sep 18	Transit to Dutch Harbor, AK
Sep 20	Offload gear at OSI in Dutch Harbor, AK, survey ends.

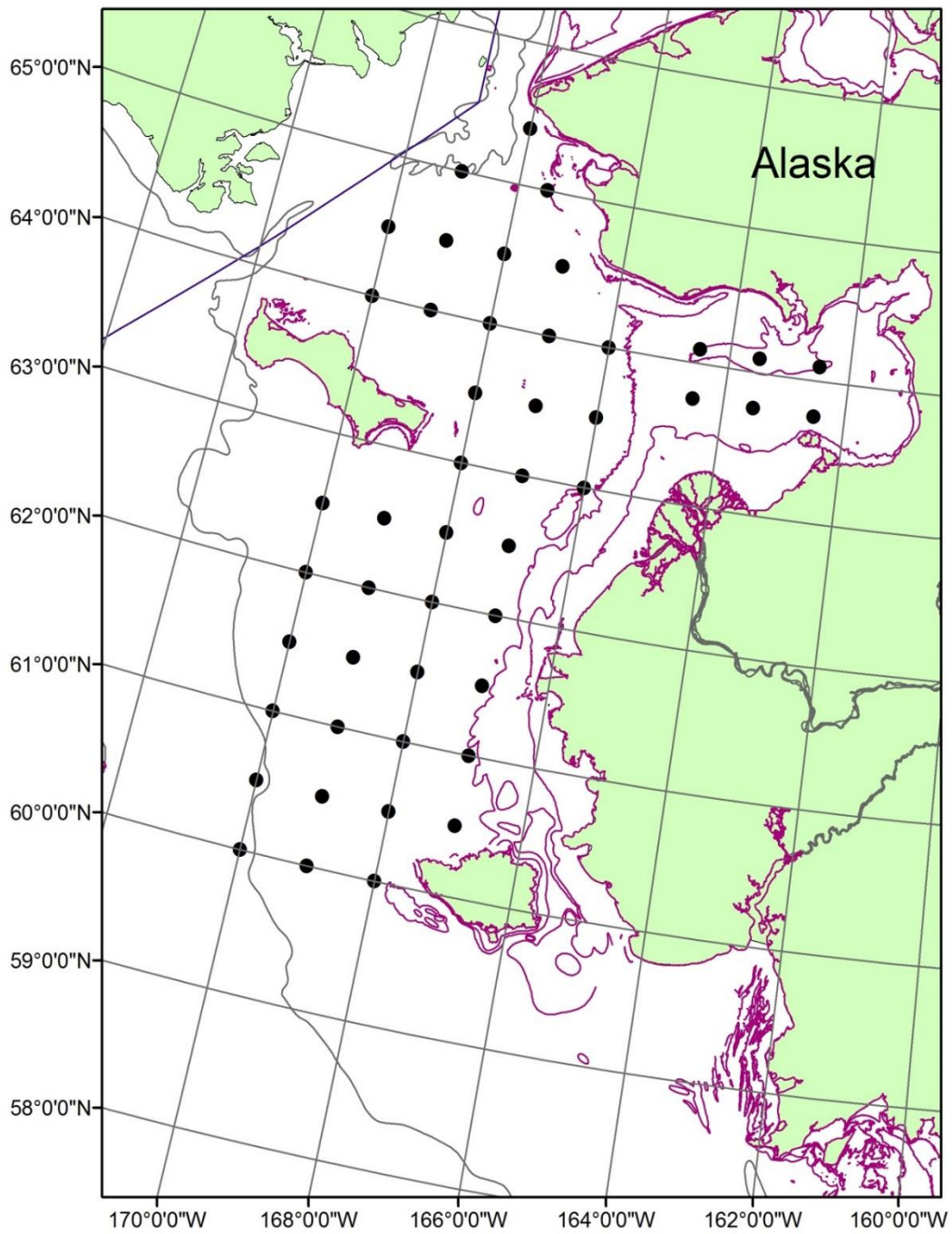


Figure 1. Proposed stations for surface trawl survey in the northern Bering Sea, conducted by a chartered fishing vessel.