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Northern Bering Sea Surface Trawl and Ecosystem Survey Cruise Report, 2019

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ABSTRACT

The northern Bering Sea (NBS) surface trawl and ecosystem survey is a multi-disciplinary research survey that has supported annual sampling of the inner domain (bottom depths generally less than 55 m) of the NBS (60°N–66.5°N). Average sea surface temperature (SST, 11.5°C, upper 10 m) during the 2019 survey was the warmest on record and contributed to significant changes in the NBS ecosystem. Similar to prior years, the jellyfish species, northern sea nettle (*Chrysaora melanaster*), had the largest surface trawl catch biomass with a total catch of 6,989 kg in 2019. Pacific herring (*Clupea pallasii*) were the most abundant species of fish with a total catch of 142,512 fish. Juvenile pink salmon (*Oncorhynchus gorbuscha*) were the most abundant species of salmon with a total catch of 13,507 fish. Annual catch rates of several pelagic fish species increased with temperature, reflecting the influence of temperature on the distribution (e.g. Bristol Bay juvenile sockeye salmon (*O. nerka*), $\rho = 0.9$) and survival (e.g. juvenile coho salmon (*O. kisutch*), $\rho = 0.7$). The abundance and proportion of juvenile Yukon River Chinook salmon (*O. tshawytscha*) in 2019 were the lowest observed in the northern Bering Sea. The abundance of the Canadian-origin stock group (stock proportion of 30%) was estimated at 575,100 juveniles. The abundance of the Total Yukon River stock group (stock proportion of 65%) was estimated at 1,246,000 juveniles. Projected run-sizes for Yukon River Chinook salmon in 2021 and 2022 are 52,300 and 46,300 for the Canadian-origin stock group and 143,800 and 129,000 for the Yukon River stock group, respectively. The abundance of juvenile pink salmon reached a record high abundance in 2019, resulting in an outlook of 6.5 million pink salmon for Yukon River and Norton Sound in 2020. Average lengths of juvenile salmon were typical of past years except for coho salmon, which had the lowest recorded average length in 2019. The proportion of non-target prey consumed by juvenile coho and chum (*O. keta*) salmon has increased in recent years suggesting a decrease in preferred prey. A total of 2,870 km of transects were surveyed. We recorded 3,310 birds on transect, comprised of 38 species plus a few unidentified passerines, with the northern fulmar (*Fulmarus glacialis*) the most abundant seabird species encountered.

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