

Possible Effects of Sea Ice in the Southern Okhotsk Sea on the Survival of Pink Salmon Juveniles from Hokkaido and East Sakhalin

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During spring and early summer, pink salmon (*Oncorhynchus gorbuscha*) fry and juveniles from Hokkaido and East Sakhalin go to the sea and stay in coastal waters of the southern Okhotsk Sea (Takagi et al. 1981), which are covered with sea ice during winter and early spring. This paper examines the effects of sea ice in the southern Okhotsk Sea on the stocks of Hokkaido and East Sakhalin pink salmon (see Nagasawa 2000).

During the period when the intensity of the Aleutian Low strengthened from 1977 to 1988, the sea ice area expanded in the Okhotsk Sea, coastal pink salmon catches declined in East Sakhalin and remained low in Hokkaido. The decline was not caused by offshore fishing because Japanese high seas salmon fisheries were banned in 1977. After the Aleutian Low weakened in 1989, the sea ice area sharply decreased in the Okhotsk Sea, and coastal pink salmon catches increased dramatically in these regions. In Hokkaido, the marine survival of pink salmon juveniles released from hatcheries similarly increased. Although long-term data on sea surface temperature (SST) are not available from these regions, fluctuations in coastal sea-ice related environmental conditions in the southern Okhotsk Sea appear to be associated with variations in the stock size of pink salmon. It is likely that juveniles have a higher mortality due to decreased SST in the Okhotsk Sea when the sea ice area expands, and also that the sea-ice cover affects the survival of fed, large-sized pink salmon juveniles from hatcheries.

REFERENCES

- Nagasawa, K. 2000. Long-term changes in the climate and ocean environment in the Okhotsk Sea and western North Pacific and abundance and body weight of East Sakhalin pink salmon (*Oncorhynchus gorbuscha*). N. Pac. Anadr. Fish Comm. Bull. No. 2: 203–211.
- Takagi, K., K.V. Aro, A.C. Hartt, and M.B. Dell. 1981. Distribution and origin of pink salmon (*Oncorhynchus gorbuscha*) in offshore waters of the North Pacific Ocean. Int. North Pac. Fish. Comm. Bull. No. 40.