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Official Program and Abstract



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VISTAS Hotel, Pukyong National University,
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Sponsors:



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ES-7

Estimation of Japanese sandeel (*Ammodytes personatus*) distribution in the northern coast of Hokkaido, Japan, using a quantitative echo sounder

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The Japanese sandeel (*Ammodytes personatus*) is widely distributed in the coastal area of Japan, and especially in the summer months, they could be found in the northern coast of Hokkaido. Sandeel plays an important role in marine ecosystem and represents one of the most commercial coastal fisheries species in Japan. In order to get a better understanding of the Japanese sandeel distribution in the northern coast of Hokkaido for sandeel abundance estimation and management, fishery-independent method for sandeel distribution estimates is needed. The main objective of this study is to estimate the Japanese sandeel distribution in the northern coast of Hokkaido and the secondary objective is to characterize the suitable condition as sandeel habitat. The study area is located off Wakkanai, in the northern coast of Hokkaido, Japan. Acoustic surveys and measurement of oceanographic conditions were conducted in June 2010 and 2011 respectively. Sandeel distribution was estimated by species identification using the volume backscattering strength (SV) difference method. Target strength (TS) of sandeel was estimated by theoretical TS method (distorted-wave Born approximation, DWBA) and the mean and standard deviation for the tilt angle distribution were substituted into theoretical model. Using this TS values, echo trace of sandeel schools was converted to number of individual per unit area. Spatial patterns of sandeel schools were analyzed based on acoustic data and oceanographic conditions such as temperature, salinity, and depth. In this study, number of sandeel schools in 2010 was 8 and 11 schools in 2011, respectively. Most of sandeel abundance was found in the coastal area of 30 to 50 m in bottom depths, and they existed in the near sea bottom. In relation with oceanographic condition, this study showed that sandeel densities tended to be highest in the specific range of 9 - 10°C in temperature, and 33.8 - 33.9 psu in salinity. Probably, sandeel distribution was affected by the mixed water of Soya Warm Current (SWC) and East Sakhalin Current (ESC). From these results, there is a possibility that the oceanographic condition is an important factor for explaining the spatial distribution of Japanese sandeel in the northern coast of Hokkaido.

Keywords: Japanese sandeel, distribution, quantitative echo sounder, oceanographic conditions