

Regions of Optimal Reproduction of Pink Salmon

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Peculiarities of abundance dynamics of pink salmon often result in unsuccessful efforts to develop fishery forecasts and improve artificial propagation. Measures necessary to achieve success in fishery and artificial propagation of pink salmon require the consecutive solution of two tasks: 1) identification of regions of ecologically optimum conditions, and 2) determination of the environmental conditions favouring this optimum. To distinguish the regions of ecologically optimum conditions for pink salmon, we analysed the following reproductive parameters at the macro-scale: 1) effectiveness of reproduction (catch per square unit of spawning grounds); 2) complexity of population structure; 3) expressiveness of dominance phenomenon; 4) features of long-term variations in abundance. During the analysis we proceeded from an assumption that in the optimal zone one could observe the highest effectiveness of reproduction, the most complicated population structure, the least pronounced dominance phenomenon, and the least variable long-term changes in abundance. On the basis of analysis of the above parameters we concluded that Iturup Island was a zone of ecological optimum. In particular, a curve of long-term changes in abundance of pink salmon of Iturup Is. is smoothed and reflects variation with a

period of several decades. This indicates that reproduction of pink salmon of Iturup Island is determined first of all by long-term changes in oceanological regime and not by interannual variations of climatic conditions as it occurs in the continental regions of reproduction. In a broader sense, the whole south-western Sea of Okhotsk may be considered as a zone of optimum condition. Chukotski Peninsula and continental coast of the Sea of Okhotsk are zones of poor condition. Comparing the conditions of pink salmon existence in the zones of optimum and poor condition, one may conclude that reproduction of pink salmon is favored by: 1) proximity between oceanic feeding grounds and spawning grounds; 2) remoteness of spawning grounds from the continent and the stabilising influence of the ocean. Influence of the continent with the sharp seasonal changes in climatic conditions varying from year to year, presence of permafrost in some regions often negatively affect both the survival of embryos in the ground and conditions of juvenile survival in the beginning of their marine period of life. Duration of marine migrations of the juveniles may also negatively affect them. In contrast, the proximity of the ocean provides the stable conditions of existence.