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Conserving Sakhalin Taimen, One of the Largest Salmonids In the World: Applying Results of Studies On Life History Diversity, Population Differentiation and Local Extinction Risk

Abstract

We have made substantial progress on filling key research gaps and providing guidance on conservation activities related to Sakhalin taimen Parahucho perryi through their limited range in the Russian Far East and northern Japan. The species is recognized as threatened by various authorities, including the governments of Russia and Japan, and the IUCN. Through active international collaboration, we have increased our understanding of life history diversity, population differentiation and extinction risk to the species. Through otolith microchemistry, we have documented the existence of dramatically different migration phenotypes, ranging from adfluvial, to amphidromous, to fully anadromous types. There is evidence that the anadromous type may be under the greatest threat based on their vulnerability as bycatch in the commercial salmon fishery. Using DNA markers, we have provided evidence for small effective population sizes and hybridization with Salvelinus in some rivers. After compiling distributional data on the species and analyzing the data using a classification tree, we have identified important watershed characteristics that are associated with the presence and stability of taimen populations. We infer from these results that taimen require watersheds that are minimally developed for agriculture, receive intermediate levels of annual precipitation, and are situated in a cold climate (< 5.2 C annual average air temperature). We suspect this species is sensitive to land use and climate change. We report on successful conservation efforts, including important steps taken by a private timber company in Japan and a regional government body in Russia to create special protected areas for this species.