

3-4. Production Trends and Carrying Capacity of Salmon (Poster-29)

Dynamics of Escapement and Spawning of Pink Salmon (*Oncorhynchus gorbuscha*) at Rivers in the Shiretoko World Natural Heritage Area, 2007

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Pacific salmon (*Oncorhynchus* spp.) play as an ecosystem service for sustaining biodiversity and production in the terrestrial ecosystem because of supplying the marine-derived material to rivers at the spawning migration. Accurate estimation of their escapement and spawning dynamics is basically important for the evaluation to quantify effect of salmon on the riparian ecosystems. The objective of this paper is to establish census method of escapement and spawning dynamics of pink salmon (*O. gorbuscha*) in the Rusha River, the Shiretoko World Natural Heritage area. We studied the dynamics of escapement and spawning of pink salmon in the Rusha River in 2007. Escapement of pink salmon was estimated by the area under the curve method (AUC) and the evaluation model using maximum likelihood approach method (MLA), and was calculated standard error by Bootstrap method. The number of their escapement was estimated as 39 ± 8 thousands individuals. The total number of spawning redds and density was counted about 3,300 redds and 0.063 redds m⁻², respectively. Namely, number of their spawning redds was extremely fewer than the adult escapement. We estimated number of pink salmon carcasses in the Rusha River based on the method of Quinn et al. (2003). The survey categorized all salmon by mode of death: "senescent" and "bear-kill". Number of senescent pink salmon was counted as about 23 thousand individuals. The total number of bear-killed salmon was counted about 9 thousands individuals and occupied 24% of the escapement. This proportion of bear-kill salmon in the Rusha River was higher than it (9%) in Alaskan sockeye salmon case based on the estimation formula (Ruggerone et al. 2000). These results suggest that almost all of spawning redds will be re-excavated many times by more than 20 thousands pink salmon since available spawning areas are limited in the Rusha River.