
Chapter 13

Contrasting Stock-Recruitment and Harvest Patterns of the Columbia River Stream-Type Chinook Populations

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Intentions

Gilbert (1913) separated chinook into two life-styles based on outmigration age. Stocks that outmigrate as yearling are called stream-type, while those that outmigrate as sub-yearlings are known as ocean-type. In the Columbia River Basin, stream-type life style is exhibited by the spring chinook run, and the Snake River component of the summer chinook run. The Snake River spring and summer chinook populations have declined dramatically during the past twenty years. They were listed as threatened under the Endangered Species Act in 1992, and reclassified as endangered in August 1994 on an emergency basis. Other spring chinook populations in the Columbia River Basin, while not listed as endangered or threatened, are considered depressed stocks. Population dynamic models of salmon have evolved with different hypotheses regarding the distribution of survival rates at different stages of the life cycle, and regarding natural and anthropogenic causes.

Over-harvest (during the Upstream Passage (UP) life-stage) has been suggested as one of the main anthropogenic causes of the decline. Unlike ocean-type chinook, harvest on stream-type chinook during the Estuarine/ Ocean Survival (EOS) life-stage is very limited. Therefore, we restrict our hypothesis testing to examining evidence related to: (1) whether escapement, productivity, and survival declines are associated with increased harvest rates in the Columbia River; (2) whether fishing effort increased over time; (3) whether in-river fisheries' catch per unit efforts declined over time; (4) whether harvest practices resulted in changes to the age and length composition of the upriver spring chinook aggregate run; (5) whether there has been a change in the composition of the catch during the Winter and Spring commercial fisheries; (6) whether other species are being targeted during the Winter and Spring commercial fisheries (thus biasing effort data); (7) whether the effectiveness of a unit of commercial effort has changed over the past two decades; (8) whether the distribution of catch has shifted away from lower river commercial fisheries to sport and tribal fisheries (i.e., the significance of each fishery to the management of listed or depressed stocks); and, (9) whether pre-season forecasting errors resulted in target harvest rates being exceeded. In-river harvest of summer chinook has been primarily incidental and insignificant; therefore, our analysis will focus on the spring chinook populations. This retrospective analysis will also include a discussion of how harvest is managed in the Columbia River fisheries, and a decision tree (enclosed here in a draft form) will be presented. In the upcoming prospective analysis draft, a list of potential strategies to meet harvest rate schedules (now in draft form) will be presented and discussed. During FY- 97, fall chinook and steelhead harvest will be analyzed.