Estuarine Habitat and Juvenile Salmon: Current and Historic Linkages in the Lower Columbia River and Estuary

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From 2002-2007, our Columbia River estuarine research team has monitored monthly distribution of fish assemblages; evaluated associations of juvenile salmonids to nearshore and tidal wetland habitats; continuously monitored temperature, depth, salinity, and other physical parameters throughout the lower estuary; and quantified changes in estuarine habitat features and physical conditions during the last century.

Juvenile salmonids, representing different life histories, are present throughout the year in all habitats that we sample. Patterns of habitat use and residency are size-dependent, with larger individuals occupying deeper habitats and moving rapidly through the estuary, while smaller individuals rear in shallow-water habitats for periods of days to months.

Lower Columbia River Chinook is the dominant stock, however, all ESUs are represented in our samples, and we see an increase in interior stocks during the late summer. The late summer is also when wetland habitat becomes limited by high temperatures and low flow. Comparisons between historic and contemporary habitat landscape and tidal regime indicate that alteration in flow and loss of wetlands has reduced availability of salmon rearing habitat in the Columbia River estuary.

Distribution of fish assemblages and patterns of habitat use in the lower estuary have been examined for several years. We have begun sampling in the upper estuary to see how the dynamics compare to the lower estuary. However, further surveys are needed to understand salmon habitat associations, life histories, and source populations in the upper estuary between Rkm 100 and Bonneville Dam.

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