Clues to Chinook Salmon Nearshore Migration in Southeast Alaska from Estimates of Stock Composition in Troll Harvests

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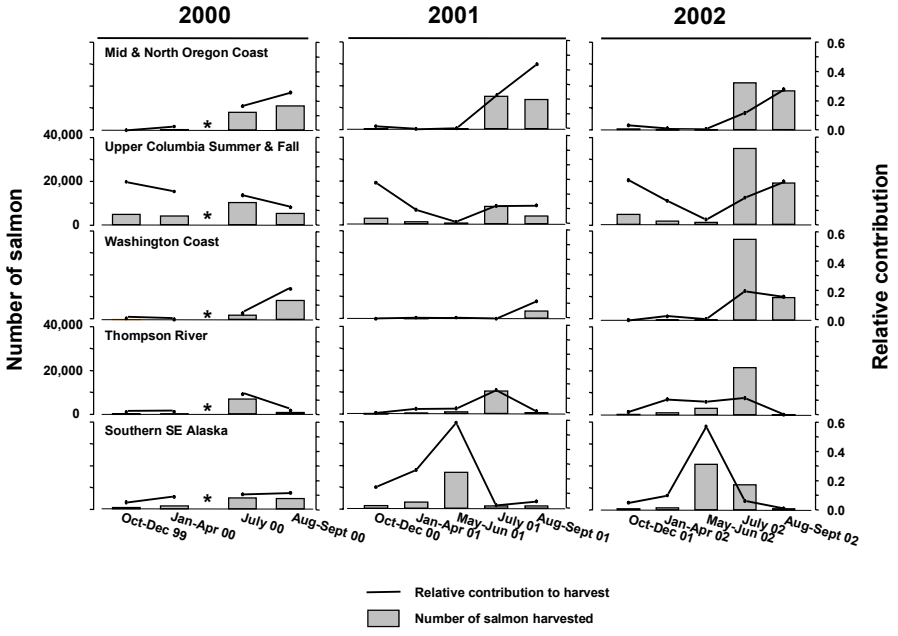
The Southeast Alaska troll fishery harvests stocks of Chinook salmon *Oncorhynchus tshawytscha* originating from Alaska, British Columbia, and the Pacific Northwest. Management of the Chinook salmon harvest in Southeast Alaska depends, in part, on information from coded-wire tag recoveries, a marker applied only to a subset of populations (mainly hatcheries). Genetic stock identification can provide stock composition information complementary to tag data. This method has been used extensively to estimate the composition of mixed-stock fisheries for Chinook salmon in the Pacific Northwest (e.g. Marshall et al. 1991; Miller et al. 1993) and is possible because standardized baseline data for allozyme loci are available from throughout the species range (Teel et al. 1999). Since 1999, the Alaska Department of Fish and Game has used allozymes to provide independent estimates of the stock composition of the harvest throughout the year in Southeast Alaska troll fisheries (Crane et al. 2000). Legal-sized (≥ 71 cm in length) Chinook salmon are sampled from landings during the early winter (October to December), late winter (January to April), spring (May to June), and summer (July to September) troll fisheries. Sublegal-sized (<71 cm in length) Chinook salmon incidentally caught during the summer fisheries are also sampled.

Estimates of the contribution of major stock groups to the troll harvest reflect the migratory behavior of these stock groups in the nearshore waters of Southeast Alaska. Analysis of the temporal changes in estimates of abundance and relative contribution to the 2000, 2001 and 2002 troll harvests shows the following major trends (Fig. 1). First, Chinook salmon from the Oregon and Washington coasts are major contributors to the summer troll fishery, but are absent during the winter and spring. Second, Chinook salmon from the Upper Columbia River summer and fall and Snake River fall stocks are major contributors to the fishery all year except during the spring. The abundance of these stocks in the harvest is greatest in the summer. Third, Chinook salmon from the Thompson River watershed (Canada) are usually present in large numbers only in July. Fourth, Chinook salmon from southern Southeast Alaska are present year round but are mainly harvested during the spring fishery.

Fig. 1. Seasonal variation in abundance and relative contribution of selected stock groups to the Southeast Alaska Chinook salmon troll fishery, 2000–2002. Solid lines indicate the relative contribution to the harvest and bars indicate the number of Chinook salmon harvested. No samples were taken from the spring (May to June) troll fishery in 2000, denoted with an asterisk (*).



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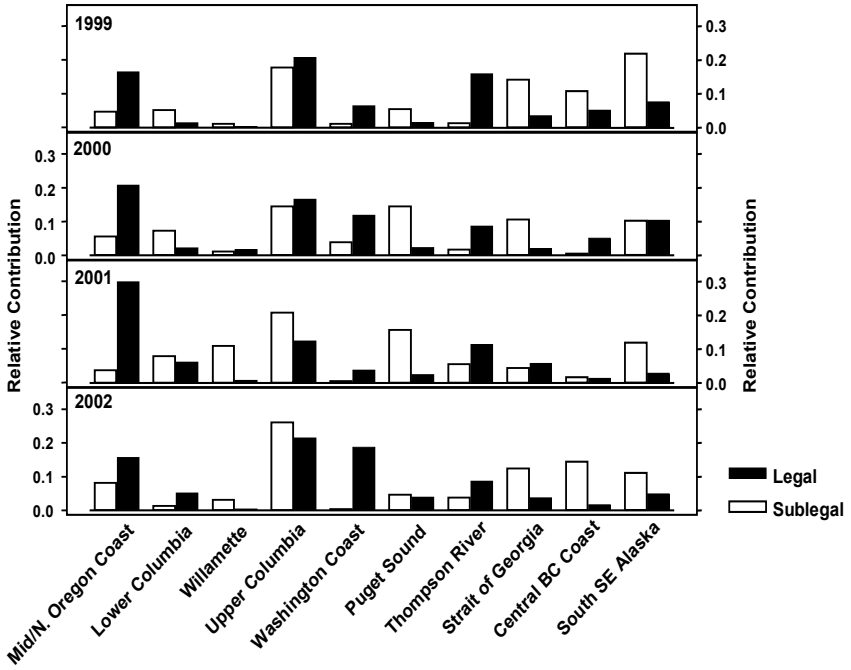
Differences in the stock composition of samples from legal- and sublegal-sized Chinook salmon present in Southeast Alaska during the summer indicate that different stock groups of Chinook salmon use the nearshore waters of Southeast Alaska at different lifestages (Fig. 2). Chinook salmon from the Oregon and Washington coasts and Thompson River are generally present as larger, more mature individuals. Chinook salmon from the Upper Columbia River summer, fall and Snake River fall stock groups are abundant in both size classes. Chinook salmon from the Lower Columbia River, Willamette River, Puget Sound, coastal British Columbia and southern Southeast Alaska are generally present as smaller, less mature individuals during the summer.

Fig. 2. Relative contributions of legal-sized (≥ 71 cm) and sublegal-sized (< 71 cm) Chinook salmon from selected stock groups to samples taken during the summer (July to September) troll fisheries, 1999–2002.



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