

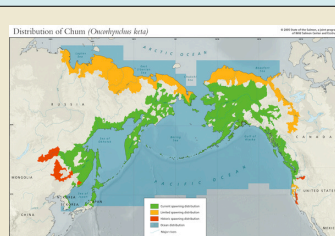
Southern Chum - Fish on the Edge of Survival

2012 Update on Occurrence, Life History and Genetics

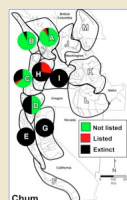
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Chum salmon present and historical distributions, Wild Salmon Center, 2005

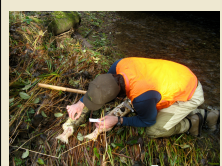


Loss of chum salmon in southern portion of North American range (Gustafson et al. 2007)

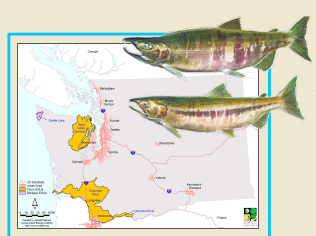
Background

Chum salmon (*Oncorhynchus keta*) have historically been considered a stable and plentiful species with the widest natural geographic and spawning distribution of any Pacific salmonid. They are documented to spawn from Korea and the Japanese island of Honshu, north to the Laptev Sea in Russia and the Mackenzie River in Canada, and as far south in North America as San Lorenzo River in California and 322 km upstream in the Sacramento River (Hallock and Fry 1967). In 1905-06 chum salmon was the most abundant salmon species in streams surveyed between the Sacramento and Columbia rivers. Over a million chum salmon returned to the Columbia River as late as the 1950s, with a thriving commercial fishery in Tillamook Bay, Oregon.

Present Day: Still plentiful across its northern range, but populations south of Tillamook, Oregon have all but vanished, and Columbia River chum salmon are now listed under the ESA as a threatened species. Until recently the demographic, genetics, and life history of these southern chum had not been well documented.



Sampling on the Oregon coast (above)
Specimens ready for sampling (below)

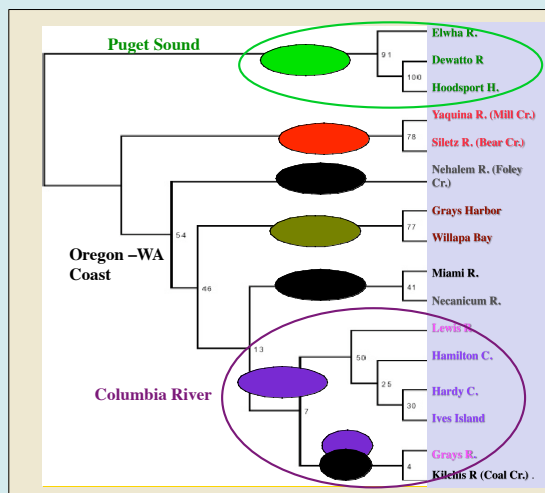


Presently, the southern-most major chum population is in the Lower Columbia River and along with the Hood Canal Summer-run, is federally listed as threatened with extinction under the Endangered Species Act.

Methods

From 2003 to 2009 we collected genetic samples from chum salmon in Oregon and California and are comparing them to Columbia River, Washington coast, and Puget Sound fish. Samples are collected primarily from adults after they have spawned so that spawning adults will not be removed from the population. We used microsatellite analysis (Hillis et al. 1996) and developed for chum salmon by WDFW (Maureen Small et al. 2006) and NWFSC (Linda Park, personal communication) to develop genetic relationships among populations.

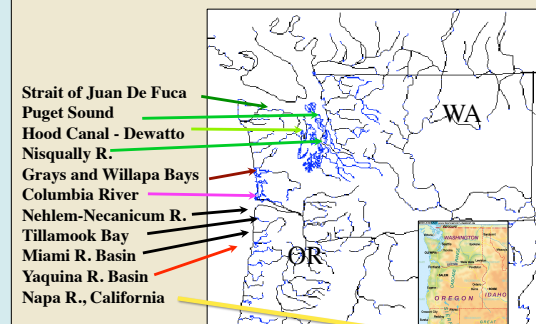
Life history and demographic data was collected following protocols established in the Chum Salmon Status Reviews (Johnson et al. 1997, Johnson et al. 1999) from data collected by ODFW, CDFG, and WDFW. chum had not been well documented.



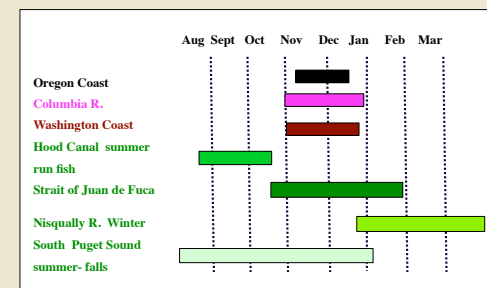
Tree illustrating Nei's genetics distances for chum salmon from six Oregon and other collection sites

Preliminary Results

- Oregon-Washington coastal populations differed genetically from Puget Sound and interior Columbia River populations
- There was heterogeneity in genotypic distribution among Washington and Oregon (north and south) coast populations
- Some N. Oregon groups similar to Coastal Columbia R. groups
- Coastal populations have a narrower run-timing window than stocks in more protected waters such as Columbia River and Puget Sound



Collection Locations - Oregon Rivers (green, red, and black) where samples were collected compared to other sample locations in Washington and California



Return time - Dates when live fish observed in rivers. Fall-run fish unless noted. Oregon populations in shades of green compared to return times for other NW chum populations. Oregon coastal chum salmon have a narrower time of return than other populations

Collaborators and Colleagues

Oregon Depart of Fish and Wildlife (ODFW) Robert Buckman, District Biologist; Mark Lewis, Jon Nott, Michael Sinnott, Dave Steward and Briana Sounhein, ODFW biologists.

Washington Department of Fish and Wildlife (WDFW) Dan Rawding, Curt Holt, WDFW biologists and Maureen Small, WDFW Genetics Division, Olympia WA

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