SEASONAL DISTRIBUTION PATTERNS OF SUBYEARLING CHINOOK SALMON IN WVP RESERVOIRS

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We assessed the longitudinal distribution (head-of-reservoir to dam) of subyearling Chinook salmon in reservoirs during spring, summer and fall of 2014. In the spring we sampled small subyearling 'fry' in Foster, Cougar, and Lookout Point reservoirs with box traps and Oneida Lake traps set throughout the nearshore habitat of the reservoirs. In summer (July-August) and fall (October-November) we sampled parr distribution with gill nets set in five areas of Lookout Point Reservoir. Subyearling Chinook salmon demonstrated seasonal shifts in their longitudinal distribution. In the spring, small subyearling 'fry' in all reservoirs were more abundant in the upper end of reservoirs where natal stream enter. We also demonstrated that small subyearlings dispersed farther into Cougar Reservoir each consecutive month from April-June **(Figure 1).** In summer, both natural and hatchery parr had a bimodal distribution in Lookout Point Reservoir with abundance greater in the forebay and in the upper reservoir **(Figure 2).** Hatchery fish were released in the Lookout Point forebay and head-of-reservoir in June. During summer sampling, 23% of hatchery parr collected in the upper reservoir were from the forebay release group and 38% of hatchery parr collected in the forebay were from the head-of-reservoir release group, suggesting some fish traversed the length of the reservoir. The distribution observed in summer would be expected if parr regularly traverse the length of the reservoir but mill for a period of time when they reach a barrier (the dam at one end and shallow/warm water at the other). In the fall, most parr in Lookout Point were captured in the forebay with very few remaining in the upper reservoir, similar to our 2013 observations **(Figure 3).** The fall distribution pattern would be consistent with known behavior of spring Chinook salmon in unimpounded river systems that move from upper rearing areas to overwinter downstream. The distribution in the fall occurred prior to any increase in outflow discharge through the dam. The greater distribution of fish in the forebay in the fall also coincides with peak passage timing we observed through most WVP project dams.

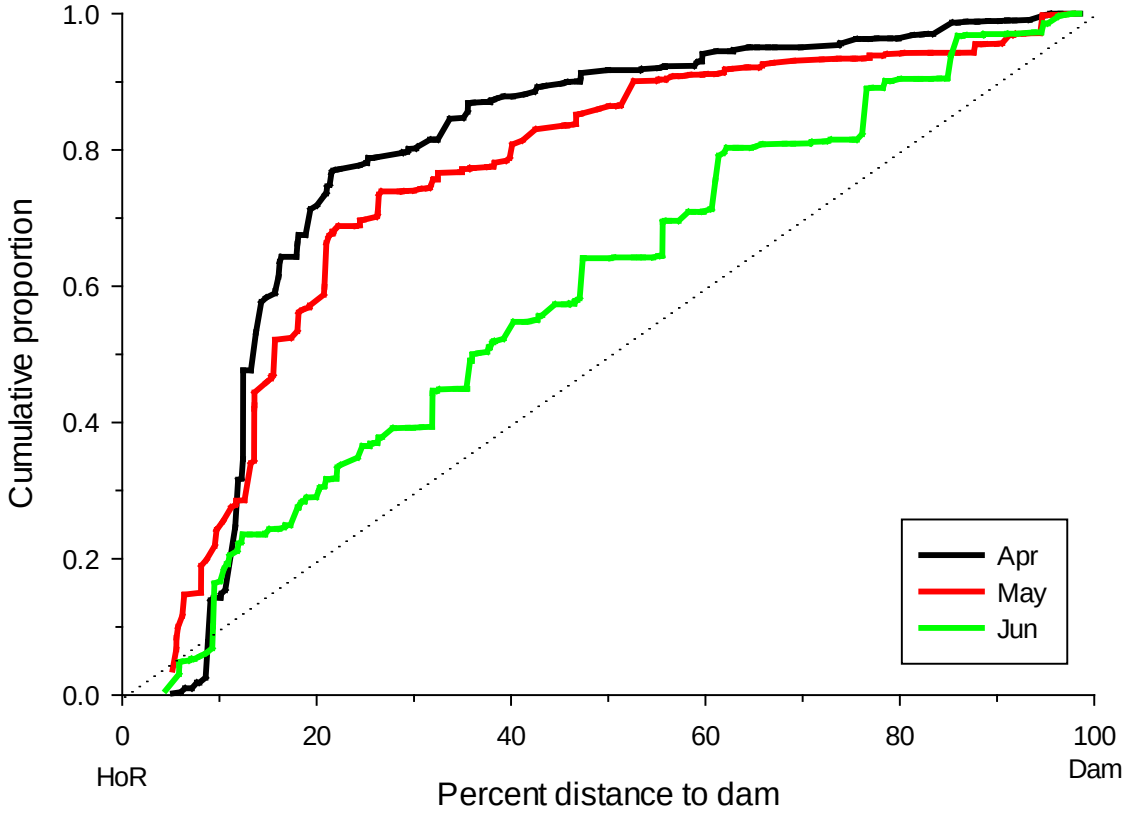

Figure 1. Monthly cumulative proportions of subyearling Chinook salmon catch in nearshore floating box traps and small Oneida Lake traps in relation to percent of shoreline distance to Cougar Dam, 2014. Dotted line represents the cumulative proportion of a theoretical population that is evenly distributed throughout the reservoir.

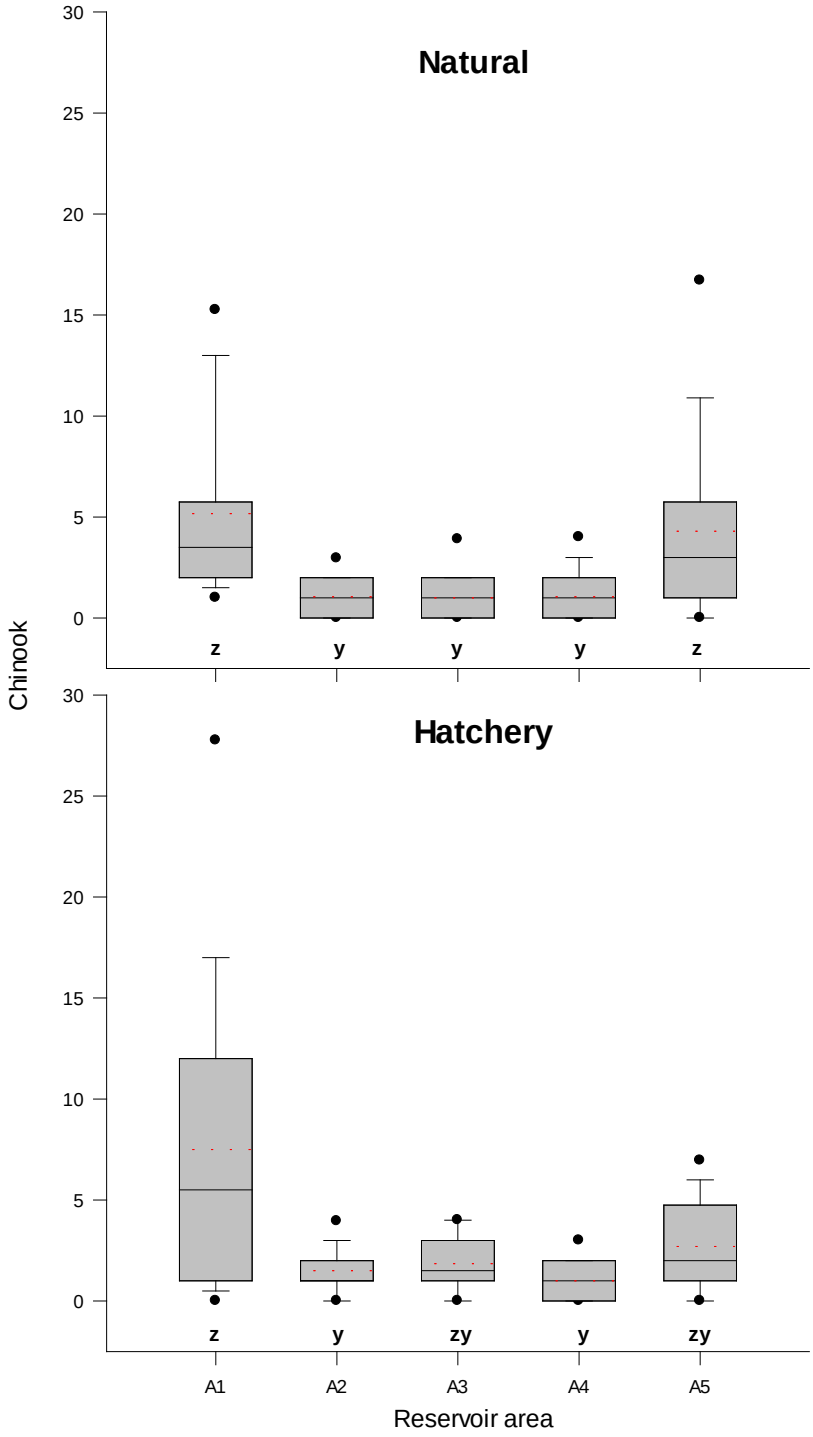

Figure 2. Number of natural- and hatchery-origin Chinook parr caught during the summer in five areas of Lookout Point Reservoir, 2014. Solid lines denote medians, red dashed lines denote means, the box represents 25th-75th percentiles, whiskers are the 10th -90th percentile and circles are outliers. Areas sharing the same letter are not significantly different by Dunn's multiple comparison test (*P*>0.05).

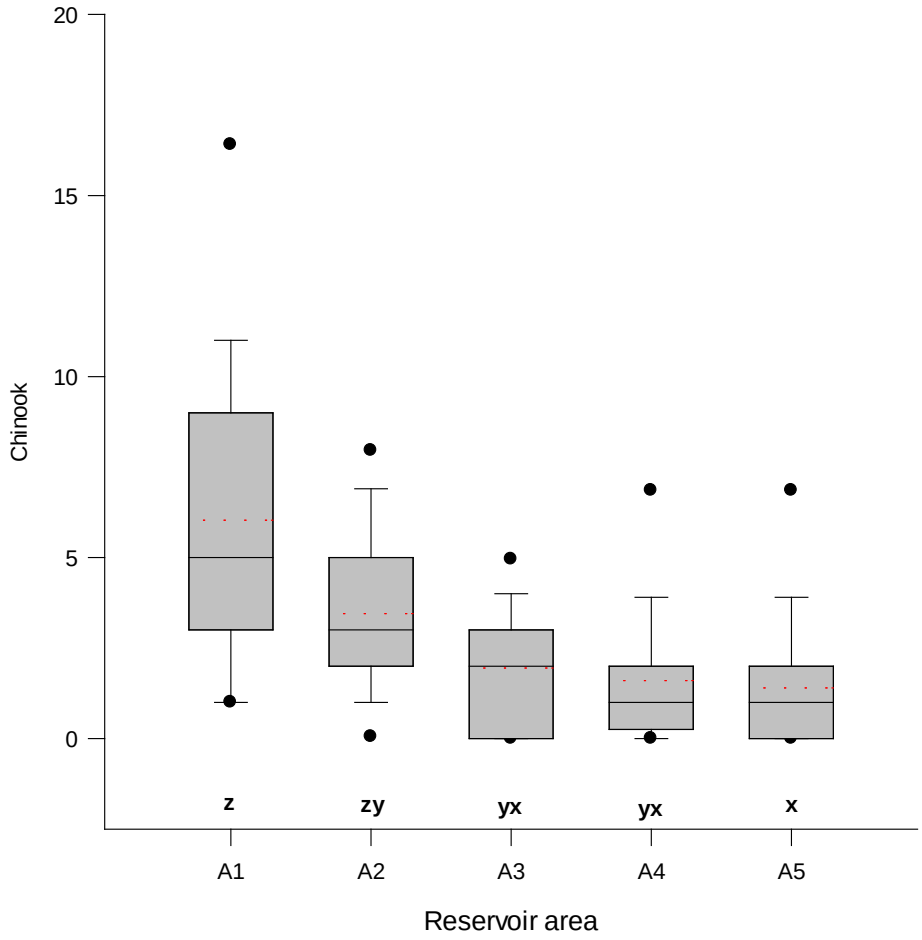

Figure 3. Number of Chinook parr (hatchery and natural combined) caught during the fall in five areas of Lookout Point Reservoir, 2014. Solid lines denote medians, red dashed lines denote means, the box represents 25th-75th percentiles, whiskers are the 10th -90th percentile and circles are outliers. Areas sharing the same letter are not significantly different by Dunn's multiple comparison test (*P*>0.05).