



Yukon Salmon Sub-Committee

Your Voice in Salmon Management

Salmon stock productivity: What is it and how does it affect our salmon?

Stock productivity is the number of adult salmon returning from each adult spawner. This measure is often designated "R/S" or "Return/Spawner". Higher productivity means that each parent produces several adults, say 4 or more, and lower productivity means that each parent will produce 1 or less than 1 adult offspring. Periods of higher productivity result in an abundance of adult salmon that can be harvested, used for stock restoration activities, or allocated to increased spawning escapement. Periods of lower productivity result in fewer adult salmon and result in limited harvest opportunities and restoration activities, and possibly not meeting minimum numbers of spawning escapement goals. During prolonged periods of low productivity, if harvest is not carefully managed, less and less salmon will return each year.

So, what influences stock productivity? Productivity is influenced by environmental conditions, harvest, predation, and competition. It is difficult to understand and study due to complex interactions over the range of habitats at different life stages (freshwater, coastal, and marine).

Stock productivity has been estimated for the broad Canadian-origin Yukon River Chinook since the 1970s. Chinook productivity has ranged from a low of 0.93 in 2006 up to a high of 5.51 in 1991 with an average productivity of 2.35. However, recently Chinook have been in an extended period of low productivity.

Yukon River fall chum (U.S. and Canadian-origin) estimated stock productivity has been variable over the years and has dipped well below 1 on several occasions. Productivity has ranged from a low of 0.26 in 2005 up to an extremely high productivity of 8.88 with an average of 1.76. Recent productivity is indicating a downward trend.

Klukshu Chinook stock productivity has been estimated since 1986 and has varied. The average productivity is about 1.3 with a very low productivity of 0.25 in 2003 ranging up to 4.74 in 1990. Recent parent years (2009 to 2013) had very low productivity, averaging 0.7. The most recent year is trending upwards with parent year 2014 estimated at 1.8.

Productivity estimates for parent years (1976 to 2014) for Klukshu Sockeye are available and has been variable with an average of about 1.3. Stock productivity has ranged from an extreme low of 0.08 to 3.4 in parent years 2003 and 2005. The two most recent productivity estimates for parent years 2013 and 2014 is about 1.6.