



A Decade of Scales: Growth Patterns and Age Composition of Juvenile Steelhead in Idaho Streams

Daniel Trovillion, Micah Davison, Tyler Zumwault and Leslie Reinhardt



Introduction

- Juvenile Steelhead (*O. mykiss*) rear in diverse streams throughout intermountain Idaho producing populations with dynamic growth patterns and age compositions. This high level of adaptability decreases the efficacy of using traditional length at age associations for management and evaluation purposes in these populations.
- Annual review of common growth patterns found in juvenile steelhead scales on a per-location basis, provides valuable insight into normal and changing age structure. These reviews are used to calibrate ageing lab staff to expected growth patterns for each site, and to help identify potential outliers in assigned ages.

Objective

- We examined the length-at-age relationship from ten years of scale-ageing data to gain a better understanding of the following:
 - Age composition at four collection sites in Idaho over a combined ten year period
 - Similarities and differences in freshwater growth patterns at each location

Methods

- Juvenile scales were collected at screw traps throughout the Snake River Basin of Idaho from 2007-2016.
- Four sites were selected representing different populations: 1. Pahsimeroi River (N=2423), 2. Fish Creek (N=3519), 3. Rapid River (N=3520) and 4. Big Creek (N=3727) (Fig.3).
- Scales are mounted to slides and digitally imaged using a Leica DM4000B microscope and DC500 digital camera.
- Scales are independently aged by 2 readers through examination of annulus formation patterns without reference to fish length.
- Discrepancies are refereed and checked against historical length-at-age relationships of site.

Results

Figure 1. Age composition and length-at-age comparison of juvenile steelhead at four Idaho screw trap locations over 10 years

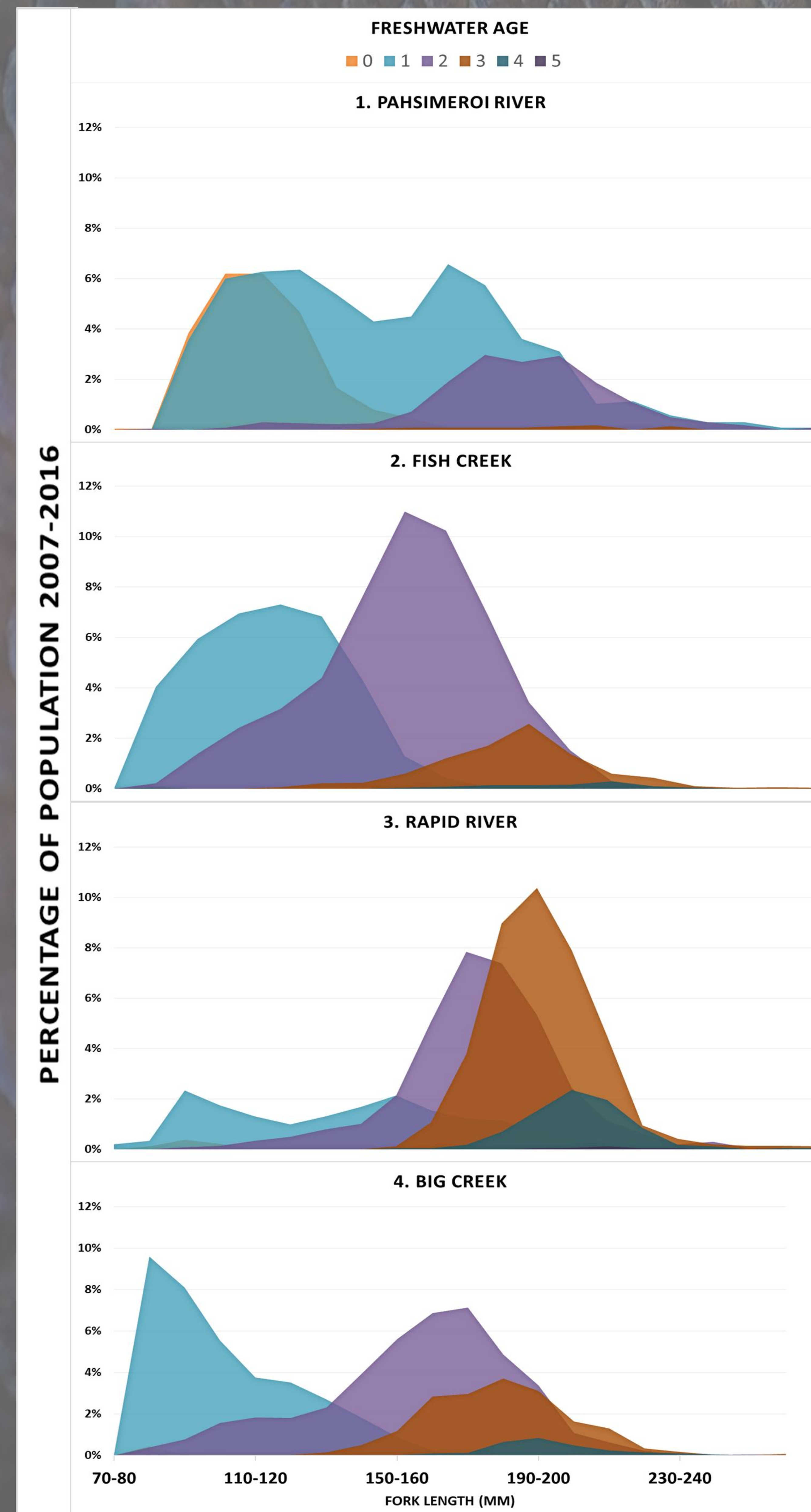


Figure 2. Comparison of scale growth patterns of similar sized fish from different rearing habitats

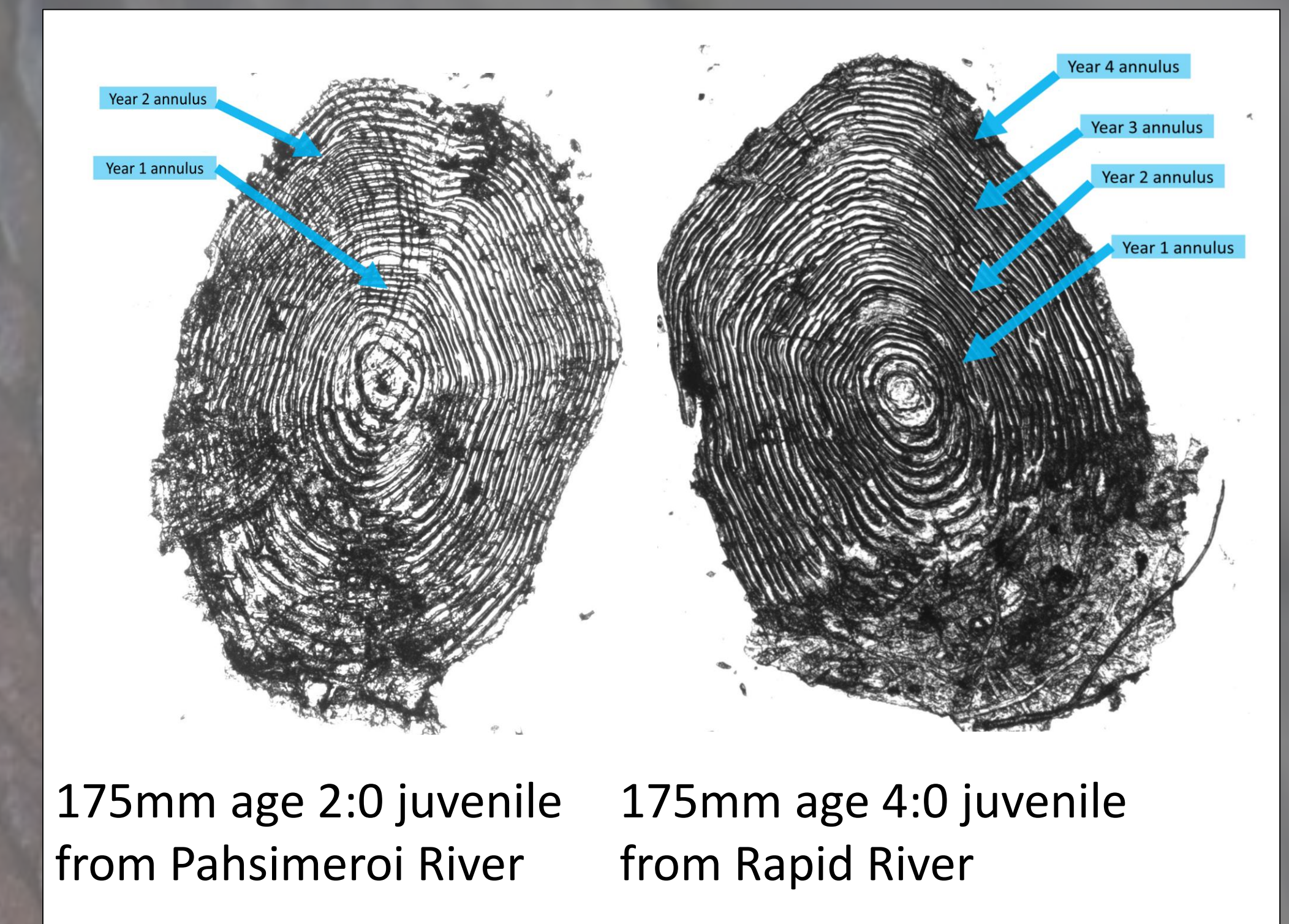
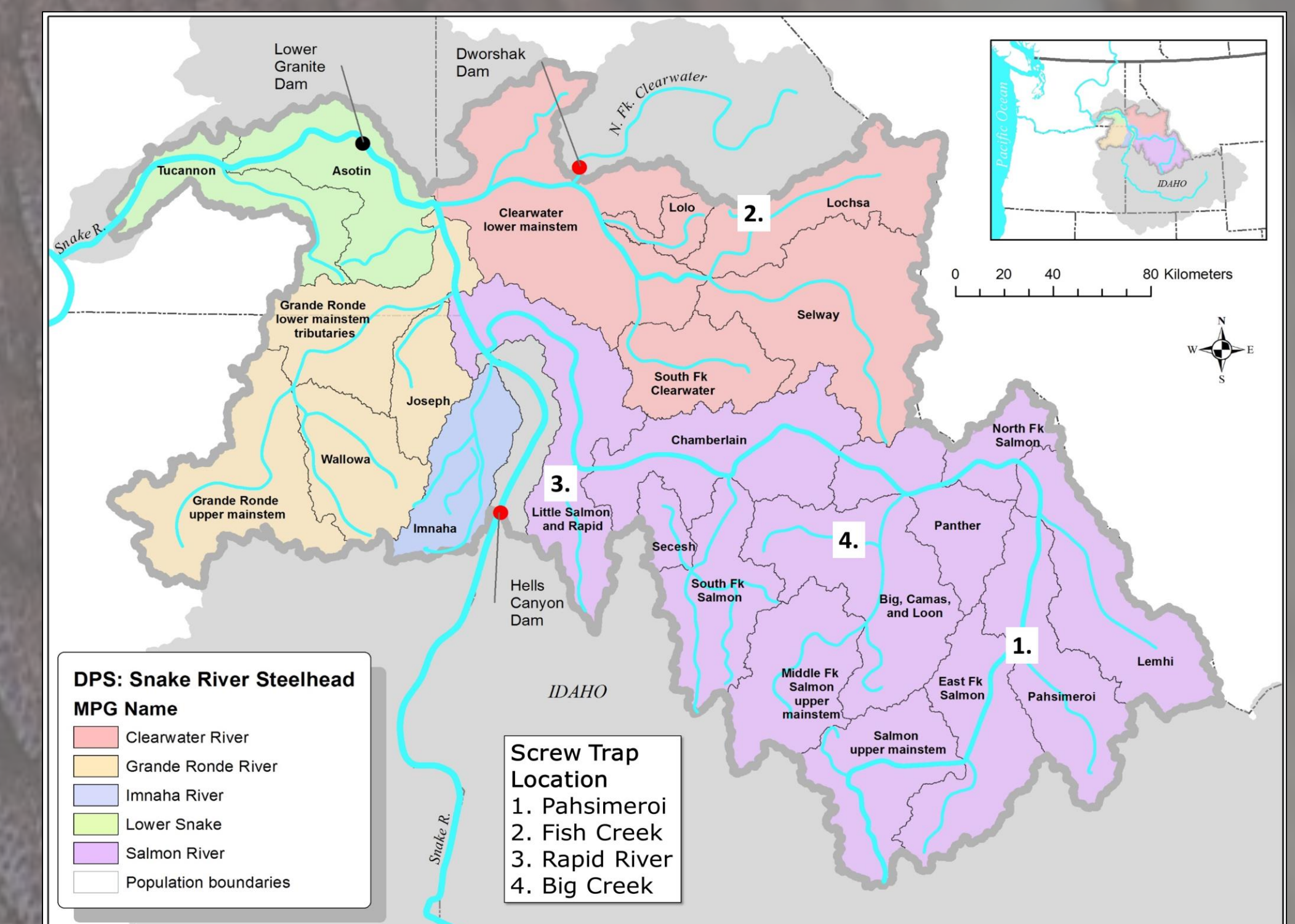


Figure 3. Juvenile screw trap location and steelhead Major Population Groups



Discussion

- With a 10 year data set, we are able to clearly distinguish that natal stream conditions influence the growth rate and length-at-age of juvenile Steelhead in Idaho, resulting in differences in the age composition and timing of emigration in juvenile populations.
- Accounting for variability and understanding a particular site's historical age composition and length-at-age relationship aids in the identification of outliers and the quality control of freshwater age assessments.
- Future research will include an analysis of habitat characteristics that may influence observed growth patterns, age composition and emigration timing.