


## Research


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## Kara Cromwell

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 Fisheries Resources  
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**"Spatial variation in juvenile Chinook habitat quality: is food limiting in a wilderness watershed?"**

### Research Summary

Long term monitoring of Chinook salmon indicates that growth, density and survival of rearing juveniles vary at different sites in Big Creek. We do not know what causes these differences, or how this changes over smaller increments of space or time. We do know, however, that the factors affecting juvenile performance are also relevant to long-term population success because fish that perform well in early life may have advantages later.

Our research in Big Creek is designed to measure differences in growth, density, and survival of juvenile Chinook in multiple sites within the Big Creek drainage, and also to measure biotic and abiotic habitat features that may contribute to these differences. We collect these data at several time points early in the growing season to see how the fish are affected during this vulnerable young life state. For my Master's project I will focus on Chinook food webs; I would like to understand how much food is available, what prey items fish select, how much competition they experience and, finally, how this relates to growth and survival.



Benthic macroinvertebrate sampling.



Chinook and steelhead fry.



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Kara weighing and measuring fish.



2006 Field Crew: Trevor Johnson, Dean Holecek and Brad Rogers.

#### Data Collection 2006

In summer 2006 we established 8 study sites throughout the drainage. Dean Holecek supervised a comprehensive juvenile Chinook habitat availability and use study which required detailed physical habitat measurements and snorkeling observations of fish. We also electrofished to quantify fish community demographics, including juvenile Chinook population densities and growth rates. During electrofishing surveys we collected Chinook stomach contents through gastric lavage and sampled macroinvertebrates from the benthos and drift. We also collected fish tissue and macroinvertebrate samples for stable isotope analysis.

#### Data Collection Plans 2007

In summer 2007 we plan to add an assessment of juvenile Chinook foraging behavior to our suite of measurements. Through snorkeling observations of individual fish we hope to record and analyze patterns in juvenile Chinook forage behavior and relate these to local fish densities. We plan to conduct these observations during both day and night snorkeling surveys.

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