

Title: Can omnivores mediate the effects of degradation?

Omnivores feed at multiple trophic levels and have large effects on community structuring and stability. The magnitude and direction of such effects, whether omnivores stabilize or destabilize communities, remains unresolved. Shifts in omnivore diet and trophic position may be of particular importance to community stability in degraded habitats, where resources are sparse. For example, omnivores may reduce the severity and duration of community responses to degradation by dampening the effects of any disturbance-mediated trophic cascade. The relatively simple food webs of freshwater systems are ideal for studying trophic ecology, and in the western U.S., streams are heavily degraded by overgrazing, beaver extirpation, and drought. In many of these systems, the omnivorous speckled dace (*Rhinichthys osculus*) has replaced trout as an important vertebrate consumer. I propose to test the hypothesis that omnivore diet shifts stabilize communities and increase resilience to degradation. In an observational study, I will use stable isotope analysis of speckled dace tissue to assess trophic position in stream reaches suffering varying levels of habitat degradation. In an experimental mesocosm array, I will conduct a 2x2x2 manipulation of i) dace presence, ii) shade, and iii) nutrient input, with low shade and high nutrients both representing degraded conditions. I will compare the rate of change of community composition by analyzing invertebrate biodiversity and biomass in mesocosms, testing the prediction that stability will be higher when dace are present, particularly under degraded conditions.

