

## **Simulating Fish Assemblages in Riverine Networks**

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We describe a modeling approach for simulating assemblages of fish in riverine landscapes. The approach allows a user to determine the grain and extent of river networks within which fish populations reproduce, move, and survive in response to both environmental drivers and assemblage interactions. We apply the model to a fish assemblage in the Willamette River basin of Oregon, a region where human population and water demand are expected to grow substantially over the next 50 years. By explicitly defining fish population responses to environmental factors such as streamflow and temperature, and interaction weights accounting for predation and competition, the approach provides a heuristic tool for identifying critical data gaps for projecting the effects of future landscape scenarios on fish assemblages. Initial results provide testable hypotheses regarding species distributions within the basin and projected responses to climate change, water consumption, and hydropower management.