

“Fish SCALES: Scaling, Conservation, and Landscape Ecology in Streams”

Abstract:

Scale is considered a central problem in ecology and a bridge over the divide between basic and applied fields. The dimensions of scale include space, time, and organizational complexity, while scale components include grain and extent. The manner in which components of scale vary in space or time is a focus for most landscape ecologists, but many of us tend to stay within our preferred level of organizational complexity. Population ecologists tend to study populations, community ecologists tend to study communities, and so forth, with little integration across levels of organizational complexity. Using stream fishes as a focal system, I will share how interactions at the nexus of population and community levels of organizational complexity link fishes with microbes, aquatic invertebrates, and environmental disturbances. The emergent properties apparent from such multiscale approaches support basic theoretical frameworks such as hierarchy theory, life history theory, and metacommunity theory, but also provide direction for conservation actions aimed at preserving aquatic biodiversity in an increasingly fragmented and water-stressed world.