

Biology Seminar

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Habitat-forming species as the mediating link between disasters (predator loss, heatwaves) and biodiversity

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The mechanisms that maintain biodiversity have long been a central focus of ecology, and this area of research has taken on increased urgency as the pace of global change accelerates. I will discuss the importance of habitat-forming foundation species as key mediators of biodiversity patterns in space and time using one classical ecological concept and one recent extreme event. In classic work conducted on rocky shores, UW's own Bob Paine famously demonstrated that a keystone predator, *Pisaster*, promoted diversity by preventing a competitively dominant mussel

from monopolizing space. However, this interpretation of *Pisaster*'s role has been criticized for neglecting the many species that depend on mussel beds for habitat. As it turns out, mussel beds really are terrific habitat for other species, but so are the barnacles and seaweeds that mussels would outcompete. The effects of *Pisaster* are best understood by taking a step back and considering patterns of beta-diversity in addition to more traditional plot-scale averages of species richness. For the extreme event, I will describe what we have learned from the 2021 Pacific Northwest heat dome. That event killed literal billions of intertidal invertebrates, but the consequences for intertidal communities depended heavily on the presence and identity of habitat-forming species. Rockweeds, mussels, and oysters saved countless lives, but did not do so equally. Ironically, an introduced species might be the most important when it comes to maintaining native biodiversity in the face of continued climatic warming in the Salish Sea.

Seminar Speaker Host: Jack Litle

