

Erin Foster

Fisheries and Oceans Canada

Profile

I grew up in coastal British Columbia where I spent a lot of time in nature. I completed my PhD at the University of Victoria examining sea otter foraging niches, sea otter effects in seagrass ecosystems, and sea otter effects in ancient Indigenous clam gardens. I am currently a researcher with Fisheries and Oceans Canada where I am using environmental DNA to examine the historical distribution of sea otters in eelgrass meadows.

Title

The role of sea otters in seagrass communities: past and present.

Abstract

Most knowledge about the role of predation is focused on community structure. However, many predators disturb plants and substrates when foraging. Such disturbance can increase genetic diversity, which can in turn influence species' potential for adaptation and resilience. My colleagues and I found that sea otter (*Enhydra lutris*) digging – a foraging behaviour used to excavate prey from eelgrass (*Zostera marina*) meadows – increased eelgrass genetic diversity by promoting conditions that favoured sexual reproduction over vegetative reproduction. Eelgrass allelic richness was 30% higher where sea otters were established (20–30 yrs) compared to where they had recently arrived (<10 yrs) or were absent (>100 yrs). Across North America, sea otter recovery is positively correlated with eelgrass biomass. This interaction occurs through a trophic cascade, and potentially through clam excavation that reduces space-competition in eelgrass. The maritime fur trade caused an enormous disruption in almost every aspect of nearshore ecology, obscuring ecological processes of the past. Recent advances in environmental DNA analyses are now being used to examine the historical role of sea otters in seagrass communities. Taken together, these recent and emerging studies illustrate novel consequences of trophic downgrading, and the benefits of species recovery.