

Patterns in sea otter resource selection in Kachemak Bay, Alaska

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Sea otters (*Enhydra lutris*) are known to forage extensively in both rocky and soft-bottom habitats throughout their range in Alaska. Their ability to significantly reduce prey abundance, limit prey size, and consequently alter community structure has been well documented. Much of this research, however, has focused on sea otter interactions with rocky habitats and associated epifaunal invertebrate prey. Relatively little is known about how sea otter interact with heterogeneous habitat types within their natural range and how this relates to patterns in their local foraging ecology and distribution.

In South Central Alaska, sea otters occupying the shallow, broad shelf habitats of Kachemak Bay have access to both rocky and soft-bottom habitat types. The proximity of different grain sizes in the bay provides a unique opportunity to relate known sea otter foraging activity, gathered via telemetry, to a particular substrate type and associated prey community. The recent VHF tagging of 44 sea otter in Kachemak Bay (FWS 2007) has indicated a broad use of habitats and highly variable patterns in seasonal resource use. Our study, carried out during the summer of 2008 in collaboration with FWS, sampled across contours in sea otter utilization distribution in order to investigate mechanisms driving local resource selection.

Sea otter foraging sites (n=36) were identified using GIS and binned based on magnitude of use. Habitat type was quantified by grain size and live prey and the sea otter cracked-shell record were sampled using SCUBA. Length to mass and mass to energy density were calculated using species-specific conversion factors. Multivariate analysis was used to interpret the contribution of biomass (mg dry mass/m²) and energy per unit area (J/mg dry mass/m²) of available prey species to patterns in the preferential selection of certain grain sizes. Results from this research suggest that otter prefer gravel and cobble habitats, grain sizes most commonly associated with patchy but calorically rich crab species in the bay.

Findings from this study provide a baseline description of the relative productivity and potential contribution of particular habitats to sea otter diet in Kachemak Bay, information critical to the monitoring and management of sea otter.

Student Presentation