Tool Use Patterns of Sea Otters (*Enhydra lutris kenyoni*) on the Central Coast of British Columbia

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Sea otters can change the size structure and abundance of local benthic invertebrate populations, in turn affecting sea otter foraging strategies and diet. Sea otters are known for using tools, typically rocks, to access hard-shelled prey. Increased tool use may optimize foraging efficiency, by providing access to a wider dietary niche of the population, and may be more favoured where sea otters are energetically constrained. I investigated whether tool use differed with prey type and size, as well as how it affected prey handling time. I also examined variation in tool use with sea otter occupation length, gender, reproductive status, or age in British Columbia, and whether these differences could be explained by trends in dietary variation. Tool use occurred with a frequency of 10.8% (SEM ± 0.006) among all successful foraging bouts (n = 1770). Compared to a study in California, where sea otter densities are higher, tool use frequency was lower in BC, suggesting that energetic constraints affect tool use. Tool use is driven in part by prey morphology, with the highest rates of use on tightly sealed, hard-shelled bivalves and snails. Tool use decreased handling efficiency for "high tool use" prey items, indicating its use occurs only when necessary. Prevalence of certain prey types and sizes, account for some variation in tool use among occupation lengths, genders and age classes. The highest rates of tool use were associated with the lowest diet diversity, for genders, and ages. The inverse was true for occupation length, and tool use occurred least in the most resource limited areas, likely due to smaller, more accessible prey. Determining factors influencing tool use can shed light onto behavioral foraging responses to ecological constraints experienced by sea otters in BC, and improved knowledge of these constraints may assist conservation efforts.