Southwest Alaska Network
Inventory & Monitoring Program
National Park Service
U.S. Department of the Interior

Alagnak Aniakchak Katmai Kenai Fjords Lake Clark

Marine Intertidal Invertebrates

Resource Brief
October 2011

Importance

Marine invertebrates provide a critical prey resource for shorebirds, ducks, fish, bears, sea otters, and other marine invertebrate predators. Benthic invertebrates are ecologically diverse in both habitat and trophic requirements, have a wide range of physiological tolerances and feeding modes, are relatively sedentary, and have short generation times. Changes in species composition, abundance, contaminant levels, and biomass of intertidal invertebrates can indicate important changes in the coastal ecosystems of which they are a part and can have effects that cascade to other trophic levels.

Clams are separated from soft sediments by repeated filtering.

Long-term Monitoring

Five rocky and soft sediment sites were established in Katmai NPP (KATM) and Kenai NP (KEFJ) in 2006 and 2007, respectively. Sampling is conducted annually at these rocky intertidal sites to estimate size distributions of limpets (*Lottia spp.*) and mussels. Because mussels are an important food source for black oystercatchers and sea otters, a separate sampling protocol was successfully implemented in 2008. Soft sediment sampling occurs biennially to estimate the composition, size distribution and density of clam species. In 2009, soft sediment sampling was repeated at KATM and KEFJ, and initiated in LACL. Current protocols for soft sediment invertebrate sampling were deemed inappropriate for the LACL coastline and will not be continued until revisions specific to LACL are made.

Discussion

Results from soft sediment bivalve sampling in 2009 indicates that clam distribution and density varies widely in both parks. Mean size for *Macoma spp.*, a dominant clam species, was similar at both parks. However, size distribution varied by site in KEFJ. This variation in size distribution may be attributed to predation pressure. Mean size and distribution by species will provide some of the best evidence of a possible predator effect at our sampling sites. Clam populations that persist in areas with prolonged sea otter foraging are characterized by reduced densities and size distributions. We expect that as marine predators continue to exert foraging pressure on intertidal communities, the overall abundance of preferred invertebrates will decrease shifting size distributions toward higher proportions of smaller individuals. In 2010 we estimated the abundance and sizes of mussels using the protocols developed in 2008. In general, mussel density is greater in KEFJ than in KATM for all mussels as well as mussels ≥ 20 mm in size (Figure 1 A and B); whereas mussel sizes are greater in KATM than KEFJ.

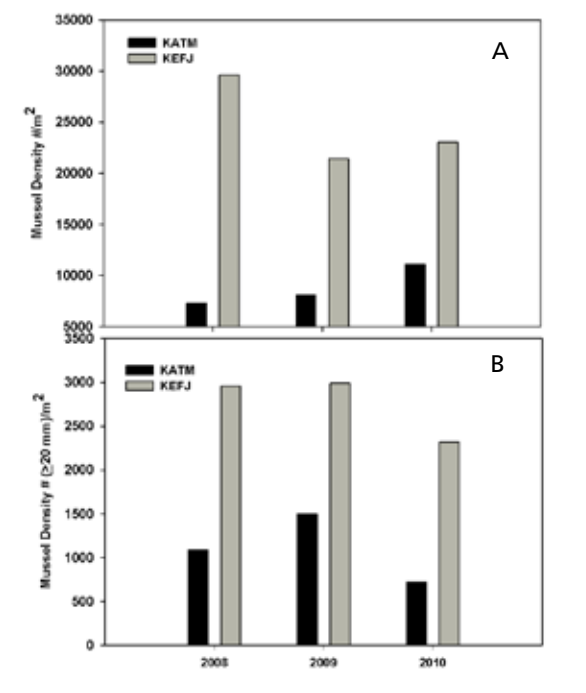

Figure 1. Mussel density varies by an order of magnitude between KATM and KEFJ for all size classes (A - upper) and mussels ≥ 20 mm (B - lower). The larger mussels are the preferred prey for black oystercatchers and sea otters.

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