



Alagnak

Aniakchak

Katmai

Kenai Fjords

Lake Clark

Sea Otters

Growth & Stability: Sea Otter Population Status in KATM & KEFJ

Sea otter population abundance is monitored via aerial surveys, which occur every three years, weather permitting, along the coasts of KATM and KEFJ. Surveys follow a methodology that accounts for incomplete detection. Abundance surveys were flown over KATM in 2008 and 2012, and in KEFJ in 2002, 2007, and 2010. Attempts to conduct the surveys in 2013 were unsuccessful due to inclement weather.

Katmai National Park & Preserve

Abundance estimates from the 2012 KATM survey indicate that the population continues to grow. The population continues to grow. The estimated sea otter population for KATM is 8,644 individuals, with an overall density of 5.95 otters/km². The

2008 population estimate was 7,095 individuals with an estimated density of 4.89 otters/km². Within the four years from 2008 to 2012, the estimated sea otter population increased by 22% within the survey boundaries of KATM.



Aerial image of sea otters.

Kenai Fjords National Park

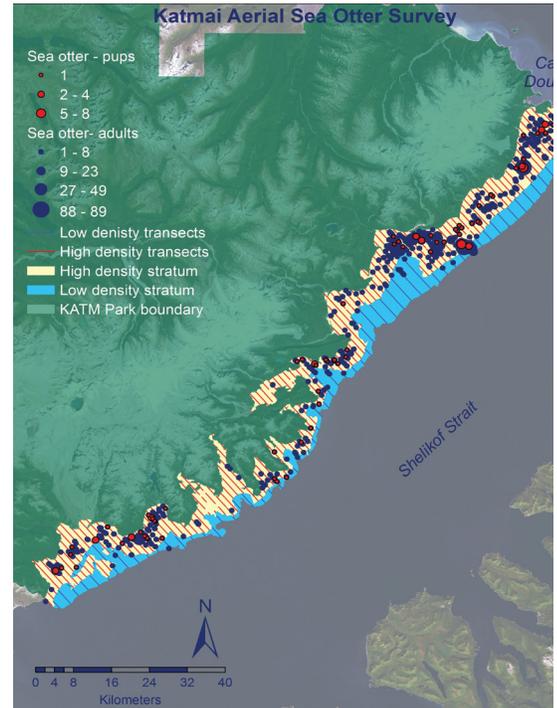
2010 was the most recent sea otter aerial survey completed in KEFJ. This was the third aerial survey completed since 2002 along the Kenai Peninsula, the second specifically conducted within KEFJ. The estimated sea otter population for KEFJ is 1322 individuals, with an overall density of 0.89/km². The 2010 population estimate is similar to that of 2007 (1511 individuals, 1.02/km²). The population appears to be stable. Densities of sea otters in KEFJ are slightly less than in neighboring western Prince William

KEFJ		
Year	Adjusted Population Size	SE
2002	799	349
2007	1511	625
2010	1322	494
KATM		
Year	Adjusted Population Size	SE
2008	7095	922
2012	8644	1243

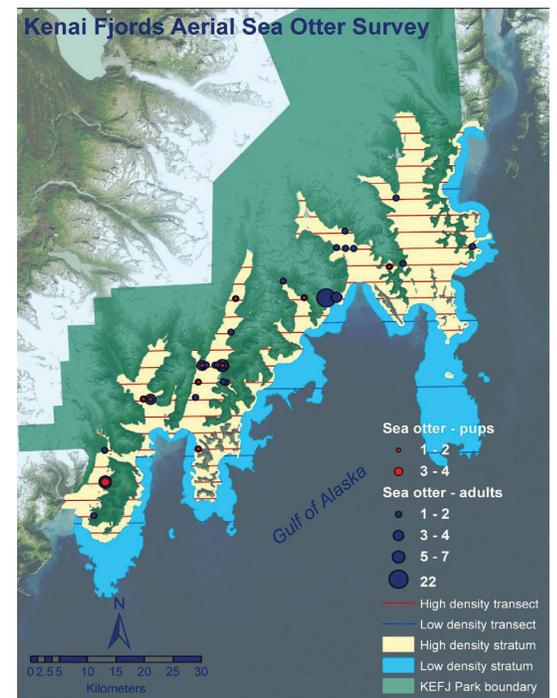
Table 1. Sea otter population in KEFJ and KATM.

Sound where densities range from 0.88 in 2002 to 1.89/km² in 2009. Sea otter habitat is limited in KEFJ (steep and deep), so sea otter abundance is generally low. To optimize monitoring efforts, another survey will be flown in KATM in 2014. Once completed, SWAN will have 3 surveys from each park and can begin a power simulation to evaluate methods to improve precision of estimates and the ability to detect change.

Contact: Heather Coletti, NPS-SWAN, heather_coletti@nps.gov



Katmai National Park and Preserve aerial sea otter survey mapped results for 2012.



Kenai Fjords aerial sea otter survey mapped results for 2010.

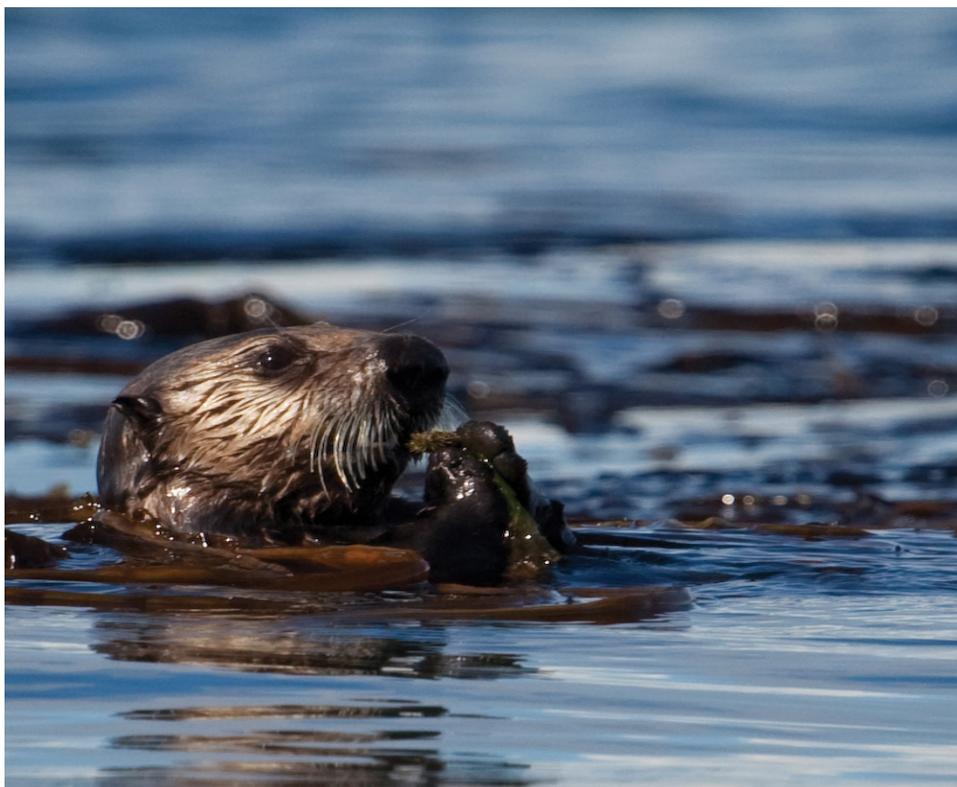
Monitoring Approach

Sea otters are monitored in KEFJ and KATM in several ways. Shore-based observations are conducted using high-powered spotting scopes to monitor foraging success rate as well as prey size and composition. The shore-based surveys are conducted annually during June (KEFJ) and July (KATM). Since monitoring began in 2006, sea otters have been observed feeding on 40 different species of marine invertebrates. In KATM, clams dominate the diet (>60%) while mussels (~61%) dominate the diets of sea otters in KEFJ (Coletti et al. 2014). Sea otter carcasses are opportunistically collected from specified areas along the KEFJ and KATM coasts

to develop age-specific survival estimates based on population models. Carcasses are aged and the data is used to estimate the age composition of dying sea otters. KATM has several sea otter haul out areas where large numbers of carcasses can be collected to obtain an adequate sample size; however, KEFJ has more limited sea otter haul out areas, making it difficult to implement the full protocol. No sea otter carcasses were recovered for age composition at death analysis in 2011 from KEFJ. KATM was not surveyed in 2011. In 2012, 22 carcasses were collected. Sixty-two carcasses were recovered from the KATM coast in 2013 for analysis.



High-powered scopes are set up to observe foraging dives by sea otters as part of the overall monitoring efforts.



Sea otter in kelp. Photograph by Benjamin Weitzman, U.S. Geological Survey.



A female and pup sea otter resting on a rock as seen through the high-powered scopes used to observe foraging habits.

Importance

Sea otters are a “keystone” species that can dramatically affect the structure and complexity of the nearshore environment they inhabit. Sea otters prey on sea urchins (“grazers”) that feed on kelps resulting in top-down cascading effects on the nearshore community structure. Heavy predation on sea urchins greatly alters the abundance and composition of lower trophic levels (e.g., kelps). Also, sea otters tend to have smaller home ranges in comparison to other marine mammals, require high caloric intake, have an incidence of disease that is correlated with contaminants, and have broad appeal to the public, which make them a prime species for monitoring. In September 2005, the Southwestern Alaska stock of sea otters, which includes the Katmai NP population, was federally listed as threatened.



Sea otters hauled out on a rock.

References

Coletti, H. A., T. A. Dean, K. A. Kloecker and B. E. Ballachey. 2014. Nearshore marine vital signs monitoring in the Southwest Alaska Network of National Parks: 2012. Natural Resource Technical Report NPS/SWAN/NRTR—2014/843.