

Student Resource: An Otter's Life



A sea otter's time and attention on any given day is preoccupied with the capture and consumption of food. Attracted by the varied and voluminous dietary offerings in Glacier Bay, the otter population has been increasing steadily since 1995. Most of their food is found in or near kelp beds. Ages ago, sea otters foraged for food near the shoreline. Over the generations, as they began to spend more and more time in the water swimming and diving, they found there was more food available in the sea.

What Does an Otter Eat?

An adult otter male weighs 31 to 42 kg (68 to 92.5 pounds), with some individuals weighing as much as 45 kg (99 pounds). A female weighs an average of 18-27 kg (40-60 pounds). To maintain this weight, otters must consume 253 calories/kg of body weight/day. While they eat mostly invertebrates, otters have been known to eat birds and fish. More than a third of the Glacier Bay otters' diet is clams. The otters' diet consists of hundreds of different types of invertebrates hiding on the ocean bottom. Look at the chart below to get a breakdown of the otter diet discovered by researchers in Glacier Bay.

Otter Food	Caloric Value	Percent of otter daily diet
Clams	40 calories/2-ounce clam	36%
Mussels	75 calories/3-ounce mussel	26%
Urchins	126 calories/3.5-ounce urchin	11%
Dungeness Crabs	80 calories/3-ounce crab	3%
Other (snails, scallops, octopus)	75 calories/3-ounce scallop 65 calories/3-ounce octopus 20 calories/1-ounce snail	2%
Unidentified		20%
Unknown		2%

Each prey takes a distinct amount of time to hunt and eat, and each one has a specific caloric value.



Why Does an Otter Eat So Much?

An otter's basal metabolic rate is twice as high as that of other mammals of similar size, a result, possibly, of living in the water which drains their bodily heat 25% faster than air. Otters are also small so they lose heat faster. Unlike seals, they do not have blubber; they must rely on their fur to keep warm. In order to help its bodily temperature, a sea otter also burns calories at nearly 3 times the rate you do. To fuel its rapid metabolism, an otter has to eat a *lot* of food. In one day, an otter eats 25%-30%

of its body weight. Compare this with dolphins, which eat only 7% of their body weight!

Sea otters also expend a lot of energy grooming their extremely dense fur which is comprised of two sets of hair: the long guard hairs, which are waterproof, and the thick underfur. Otters depend on the air trapped in their underfur to maintain their body temperature, which means their fur must remain clean, free of oil and debris, or it will lose its ability to insulate the otter and the animal will die.



How Does an Otter Get its Food?

A sea otter dive for food is successful 85% of the time. Otters take a big breath, dive into the water, and go directly to the bottom to search for food. A typical dive lasts an average of a little more than a minute, and otters recover two items of prey on each dive. Their physical attributes aid in their hunt for food. They use their sensitive whiskers to locate small prey inside crevices and their strong forepaws to dig for clams which can burrow down 10-50 cm into the sand.

According to the Alaska Department of Fish and Game, sea otters are adept at handling food with the toes on their front feet, feeding themselves sea urchins, crabs, clams, mussels, octopus and fish.

After diving down as far as 76.2 m (250 feet) and returning with food slipped into their loose armpit skin, they roll onto their backs, put the food on their chests and eat it piece by piece. Wild sea otters never eat on land. Sometimes, otters will use a rock to crack the shells. They are the only tool-using marine animal.



Urchin Barrens

What Impact Does an Otter Have on its Environment?

So far, sea otters have not exploited Glacier Bay's large crab population. However, based on researchers' observations, they believe that, as otters continue to colonize the bay, they will have a deep impact on the clam communities.

Otters' predation can define the health of the marine environment. When otters eat the sea urchins, the urchin population does down but the kelp population — a tasty treat for the sea urchins — goes up. This eating pattern also benefits snails and fish because they like to eat kelp and the kelp shields them from predators.

Otter foraging will probably cause a reduction in clam communities that will subsequently lead to changes in the characteristics and numbers of other predator populations. Because clams and mussels are top on the otters' list of preferred foods, researchers expect that, eventually, the numbers and average sizes of both will decline in Glacier Bay.



Adapted from the following resources:

Alaska Science Center: http://www.absc.usgs.gov/research/sea_otters/pdf_files/GLBA_ANN_RPT_2002_final.pdf

Counting Calories for Sea Otters <http://seaotters.org/pdfs/fall01.pdf>

Sea Otters <http://www.peninsulaclarion.com/kids/seaotter.shtml>

Otternet: Species Profile – Sea Otter <http://www.otternet.com/species/seaotter.htm>

