

FOOD OF THE ELEPHANT SEAL

Below are thumbnail descriptions of the animals most commonly listed as food for elephant seals. In most cases several species of the animal pictured are prey.



Dogfish: Like all sharks, skates, rays and hagfish, dogfish are cartilaginous; i.e. their skeletons are entirely made of cartilage. Dogfish are slender, small sharks with a flattened head and a snout tapering to a blunt tip. They have long jaws with low, flat, grinding teeth, as well as a set of small, very sharp front teeth. There are more than seventy species collectively referred to as dogfish. Their average size is 2.5 to 3 feet long. They are found around the world and are especially common along sub-arctic and temperate coastlines. Dogfish feed on small fish, squid, and crustaceans hunting both alone and in groups. Some have been recorded at depths of 3,000 feet and may hunt even deeper.

Hagfish: The body of the hagfish resembles that of an eel, but it is not a true eel. The hagfish lacks a jaw, scales, paired fins and a dorsal fin. The typical hagfish habitat is a muddy bottom. They will often burrow into the soft bottom and keep only their head above the mud. They can form dense congregations consisting of up to 15,000 specimens. In many regions, hagfish are one of the most abundant groups of fish that live at or near the sea floor. Hagfish are famous for their ability to emit mucus—probably a way for it to fend off predators. Its slime is strong and hard to remove because, unlike the other forms of slime found in nature, hagfish slime is reinforced with special fibers. Inside the slime, each fiber is no thicker than 40 millionths of an inch, but the fibers are very strong and can reach a length of 20 inches. If a fish tries to eat through the protective slime-cocoon, the slime can clog its gills and suffocate it. Attempts to chew it cause the slime to absorb water and expand. When the predator is gone and the hagfish needs to get rid of the slime, it simply ties itself into a knot and wipes the slime away by passing the knot along its body. When feeding on the dead bodies of large marine creatures, the hagfish can move a knot toward its head to help it pull a mouthful from the carcass.



Ratfish: Ratfish take their name from sharp front incisors, which are used to feed on crustaceans, and from their thin, narrow tail. Found from Alaska to Baja California, they reside near the bottom to depths of 3,000 feet and are among the deepest fishes living in Monterey Bay. Females grow to about three feet; males are smaller. Ratfish have a long venomous spine in front of the dorsal fin. They are related to sharks, and are considered the missing link between bony and cartilaginous fishes because they have characteristics of both.

Pacific Hake: Also known as whiting, these are the most abundant of the hakes in the USA. A small member of the cod family, it may grow to 3 ft in length. The average hake is about 19 inches long and weighs 1.3 pounds. Their flesh is soft and often processed into surimi—a paste that may be colored, flavored and textured to mimic crab, lobster and other shellfish. They occur from the surface to depths of 3000 ft, but usually shallower than 750 ft. North Pacific hake are nocturnal feeders that undergo daily vertical migrations off the bottom in order to feed on a variety of fishes, as well as shrimp and plankton. They are an important prey item for elephant seals, sea lions, small cetaceans, and dogfish sharks.





Typical Skate



Typical Ray

Skates and Rays: These are flat fishes related to sharks; their shapes vary from triangular to diamond to round. Rays have whip-like tails with one or two stinging spines, while skates have fleshier tails and a dorsal fin. Rays protect themselves with stinging spines or barbs while skates rely on thorny projections on their backs and tails for protection from predators. Rays have plate-like teeth adapted for crushing prey, while skates have small teeth. Rays are generally much larger than skates. The major difference between rays and skates is their reproductive strategies. Rays are live bearing (viviparous) while skates are egg laying (oviparous), releasing their eggs in tough, rectangular cases. Skate egg cases are often preyed upon by elephant seals, other seals and sea lions. Rays range from four inches to 30 feet long. Skates range from 2.5 to 8 feet long, including the tail. Skates and rays also have a sense organ on the ventral surface called the lateral line which detects movement and vibration in surrounding water such as small jets of water produced by clams that are often the prey of these fishes. Several species of skates and rays are known to occur around the Gulf of Alaska at depths from a few feet to more than 5000 feet. Many of these species are widely distributed, within ranges extending south along the coast of North America as well as into the western North Pacific.

Lanternfish: The lanternfish gets its name from its ability to produce light in a chemical process known as bioluminescence. Every species produces a different light pattern. Living in all the world's oceans, they are among the most common deep ocean creatures. There are over two hundred and forty different species of lanternfish making up as much as 65% of the deep-sea biomass. They typically grow to a length of up to 6 inches although different species range in size from 1 to 12 inches. They have a large, round head and large eyes, a very slender body and small fins. Lanternfish are known for their vertical migrations. They spend the day in the deep ocean (1,000 to 5,000 feet), but come close to the surface (30 to 300 feet) at night in search of food. They do this to follow the similar migrations of zooplankton such as amphipods (including krill) and copepods, which serve as their primary food source. Different species are known to segregate themselves by depth, forming dense, discrete layers. Due to the lanternfishes' gas bladders, these layers are visible on [sonar](#) scans and give the impression of a "false bottom": this is the so-called deep-scattering layer that so perplexed early oceanographers. There is great variability in migration patterns. Some deeper-living species may not migrate at all, while others may do so only sporadically. At shallower depths, lanternfish provide an important food source to a number of organisms including





whales, dolphins, tuna, sharks, seals, squid, and sea birds.

Squid and Octopuses: These animals have extremely tough beaks that are often found undigested in the stomachs of their predators. This is one way predators of squid and octopuses are identified. Both are capable of detaching and discarding a portion of an arm to distract a predator and then re-growing it later.

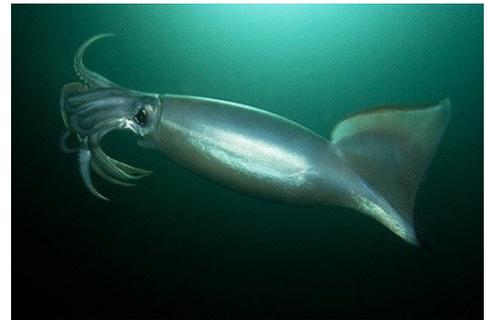
Their eyes contain a hard lens which is moved for focus like the lens of a camera, rather than changing shape as in the human eye. One method of propulsion is a directional water

jet. Squid have a swimming fin along each side.

The head end of the squid has eight arms lined with suckers and two tentacles with suckers at their ends. The tentacles don't grow back if severed. The main body mass is enclosed in the mantle, which has a stiff structure known as a pen that acts like a flexible backbone.

The majority of squid are no more than 24 inches long, Although the giant squid may reach 43 ft in length. Life span of the smaller species is believed to be 1 to 2 years. The Humboldt (jumbo) squid is a large (up to 7 ft, 100 lb) animal that is rapidly increasing its range northerly from southern California. Some have been reported as far north as Alaska. Since it preys voraciously on Pacific Hake, it may become both competition and prey for the elephant seal.

Bioluminescence is common among squid. It is estimated that two-thirds of all squid genera include bioluminescent species. Light organs, or photophores, can be found throughout the body of the squid. The color of maximum visual sensitivity for elephant seals is close to the color of bioluminescence of squid and other creatures living at the elephant seals' foraging depths.



An octopus has eight arms, which trail behind it as it swims propelled by its water jet. Octopuses can "walk" along the ocean floor using two or more arms. Most octopuses have no internal or external skeleton, allowing them to squeeze through any space large enough to accommodate their eye—its largest inflexible structure. Octopuses are highly intelligent. For defense against predators, they hide, expel ink, use color-changing camouflage or flee quickly. Life span for octopuses generally is reported as 6 months to 3 years.