Santa Monica Bay's Sandy Bottom Habitat

The most unassuming habitat in the Santa Monica Bay is the Sandy Bottom. What appears to be an otherwise barren undersea landscape is actually a bountiful habitat comprised of well-camouflaged, flatbodied fish and infauna or burrowing organisms.

Throughout the year, the sandy bottom undergoes many changes. During the winter, strong swells create a steep slope of course sand. But in the summer months, when the waves are gentle, the sandy bottom becomes broad and flat, made up of finer grains. The animals in this habitat vary depending on which season it is, and what the sandy bottom looks like. Each day, changes in wave strength and direction will also cause the bottom to change. Because of this constant change, sessile animals (animals that don't move) are rare. Large algae (like giant kelp) don't live here, simply because there is nothing for them to hold on to.

Most of the larger organisms, such as fishes, come to the sandy bottom to feed, but spend the majority of their lives in other habitats. These fishes include surfperch, croaker, corbina, sharks and rays, which prey heavily upon sand crabs (*Emerita analoga*) that are found buried in the sand. Sand crabs, as their name implies, are perfectly suited for the sandy bottom. An outstanding ability to dig quickly enables them to deal with the constantly changing environment. Sand crabs dig into the sandy substrate backwards with their specially modified legs and uropods (one of the last pair of appendages on the end of the abdomen of certain crustaceans), allowing their exposed feeding appendages to filter out detritus and small plankton. When threatened, they can quickly retract their antennae and burrow deeper into the sandy bottom. Sand crabs use the waves to transport them up and down the beach with the tides. The sand crabs will leave the sand on an incoming tide, and let the wave action wash them up the beach. The same method, only in reverse, happens on an outgoing tide to carry them back down the beach.

Many clams, such as the bean clam (*Donax gouldii*) burrow into the sand with their muscular foot and filter out microscopic pieces of food via the cilia in the stomach. They cyclically go through population explosions and then vanish for a year or two before returning. During their population explosions, certain areas can have population densities of 20,000 per meter. Shore birds, moon snails, and rays heavily prey them upon.

Some organisms, such as the warty sea cucumber (*Parastichopus parvimensis*), are deposit feeders. They ingest the sandy substrate and remove all the detritus and meiofauna (microscopic wormlike organisms). Not all organisms of the sandy bottom are so generalized in their feeding behavior. Sand dollars (*Dendraster* sp.) are more selective using their tube feet to pick and choose the specific detritus.

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SANDY BOTTOM ANIMALS

Leopard Shark (*Triakis semifasciata*)

Habitat: Various habitats from Oregon to Baja California.

Size: Females can reach up to 7 feet in length.

Food: Feed on crabs, clams, fishes, fish eggs and shrimp.

Interesting Facts: A highly mobile shark that travels in schools, often with smoothhounds or dogfish.

Thornback ray (*Platyrhinoidis triseriata*)

Habitat: Sandy bottoms to 150 m from Northern California to Baja California.

Size: Can reach a length of 3 feet.

Food: They feed on worms, crabs, shrimp and clams.

Interesting Facts: The thornback ray lacks the spine common to stingrays and instead has three rows of serrated spines running the length of the dorsal surface.

California halibut (*Paralichthys californicus*)

Habitat: Sandy bottoms to 60 m from Washington to Baja California.

Size: Can reach a length of 5 feet.

Food: They feed on small fishes, crabs, octopuses and squid.

Interesting Facts: Like all flatfish, the Pacific halibut is not born flat; it hatches with the same body plan as a typical fish. Once the halibut settles on the substrate, one eye migrates so that both eyes are on the same side of its head allowing it blend in with the sandy bottom environment.

Sand Dollar (*Dendraster excentricus*)

Habitat: Shallow sandy bottoms to 40 m from Alaska to Baja California.

Size: Can grow to 3 inches in diameter.

Food: Feeds on tiny microorganisms and organic compounds in the water.

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Warty sea cucumber (*Parastichopus parvimensis*)

Habitat: Rocky reefs and sandy bottoms to 30 m from Monterey California to Baja California.

Size: Up to 10 inches in length.

Food: Feeds on small organisms and organic detritus in sediment.

Interesting Facts: Like many other species of sea cucumbers, the warty sea cucumber will eject its internal organs (**eviscerate**) when threatened by predators in hopes that the organs will be eaten in place of the individual. The organs can be regenerated later.

Armored sand star (*Astropecten armatus*)

Habitat: Sandy bottoms to 60m from Southern California to Ecuador.

Size: Up to 6 inches.

Food: Feeds on mainly on snails but also eats dead fish, sand dollars and sea pansies.

Interesting Facts: Unlike most sea stars, the tube feet of the armored sand star lack suckers.

Bean Clams (*Donax gouldii)*

Habitat: Found buried in sandy beaches from Point Conception to southern Baja California.

Size: Can grow to 1 inch.

Food: Filter feeds on detritus and plankton.

Interesting Facts: Eaten by gulls, rays and moon snails.

Sand Crabs (*Emerita analoga*)

Habitat: Sandy bottom surf zone from Alaska to Baja California.

Size: Females can grow to 1.5 inches and males to 1 inch.

Food: Feeds on organic particles and plankton.

Interesting Facts: Just as wave action and currents move sand from the north to the south by long shore drift, populations of sand crabs will also travel down the California coast.

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Grunion (*Leuresthes tenuis*)

Habitat: Found along the coast of southern California and northern Baja California.

Size: Can grow to 5-7 inches.

Food: Feed on plankton.

Interesting Facts: Spawn on beach 3 or 4 nights following each full or new moon about 1-3 hours after high tide.