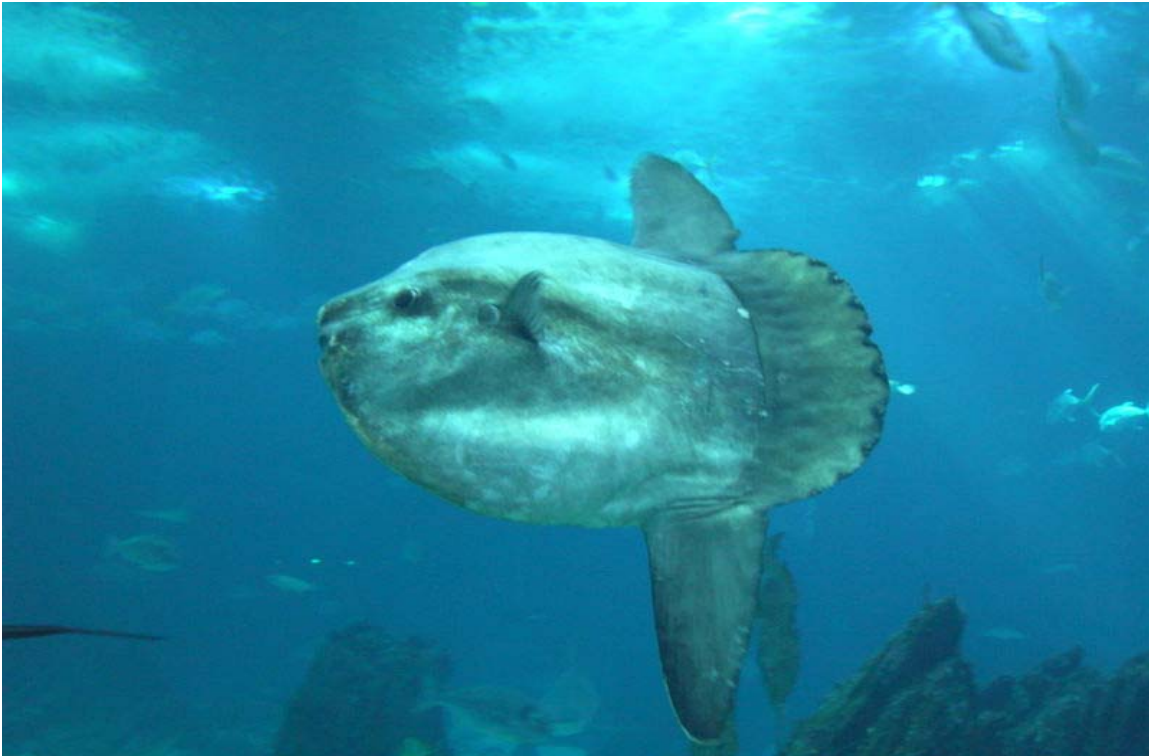


# Species Spotlight:

## Ocean Sunfish: (*Mola mola*)

A.K.A. (Moonfish, Headfish, Makua (Hawaii), Poisson Lune (France), Pesce Luna (Italy), Manbo (Japan), Lua (Brazil), Pez Luna (Cuba))



**Class:** Actinopterygii (ray-finned fishes)  
**Order:** Tetraodontiformes (“four-toothed”)  
**Family:** Molidae  
**Genus:** Mola (“Millstone”)  
**Species:** mola

This month’s species spotlight examines one of the ocean’s leviathan oddities, the Ocean Sunfish (here after referred to as Mola or *Mola mola*). Mola are an open ocean fish that range throughout all the temperate and tropical oceans of the world. They are commonly observed basking in the sun near the surface, where their huge dorsal fins are often mistaken for the dorsal fins of sharks. They are the heaviest of all the bony fishes, with individuals being recorded at over 14 feet in length and over 5,000 pounds. They are also the most fecund fish in the sea, producing as many as 300,000,000 eggs at a time, more than any other known vertebrate.

The Mola belong to the order of fishes known as Tetraodontiformes. This order, which includes 10 families and approximately 360 species overall, are predominately marine fishes that live on or near coral reefs, with a handful of these species native to freshwater streams and estuaries. Members of this order include other oddly shaped fishes whose body design and lifestyle is anything but stream-lined and agile, such as the square boxfishes, the spherical pufferfishes, and the laterally compressed filefishes.

As swimmers the Tetraodontiformes are termed ostraciiforms, meaning that their body is inflexible, and undulation during movement is limited to the paired and median fins. Because of this, they are a comparatively slow-moving species of fish.

The survival strategy of tetraodontiform fishes is defense at the expense of speed, with all member species exhibiting some form of scales modified into strong plates or spines, with some spines being retractable and able to lock in place, like the triggerfishes, or modified into the tough leathery skin of the filefishes and Molidae.

Members of the family Molidae have the fewest vertebrae of any fish, with only 16 vertebrae present in *Mola mola*, and most of their skeleton is comprised of cartilage. Molids possess very tall dorsal and anal fins, and their tail fins are reduced to a stiff rudder-like structure called a clavus which is essentially useless for propulsion. Molids also lack swim bladders.



The family Molidae contains only three genera and five species distinctions:

**Masturus** :

- *Masturus lanceolatus* - sharptail mola
- *Masturus oxyuropterus*

**Mola:**

- *Mola mola* - ocean sunfish,
- *Mola ramsayi* - southern sunfish

**Ranzania:**

- *Ranzania laevis* - slender sunfish

**Description:**

The word Mola comes from Latin and means millstone, which is in reference to these fishes' round shape. The common name of ocean sunfish comes from the *Mola mola*'s habit of lying atop the surface of the ocean appearing to sunbathe.

More than 40 species of parasite are known to infest the Mola, and in seeking relief from the invaders the Mola will often venture inshore. In temperate regions, drifting kelp fields shelter cleaner wrasses and other fish which remove parasites from the skin of visiting Molas. In the tropics, Mola will often seek help from reef cleaner fishes. By basking on its side at the surface, the Mola also allows seabirds to feed on parasites from their skin. Molas have been reported to breach more than ten feet above the surface, possibly as another effort to dislodge parasites from their bodies.

Molas are able to propel themselves forward by sculling with their dorsal and anal fins from side to side. A Mola can steer itself by squirting a strong jet of water out of one of its gill openings or out of its mouth, or by flapping his pectoral fins.

**Color:**

Mola coloration ranges from brown to silvery-gray or white, with a variety of mottled skin patterns also possible. Typical pelagic camouflage coloration is often observed in this species, with the dorsal portion of the fish the darkest, and fading to light a lighter shade ventrally. The leathery sandpaper textured skin of the Mola is covered by a thick layer of mucus instead of scales.

**Size:**

Adult *Mola mola* typically average 5.9 feet in length, and exhibit an average weight of around 2,000 Lbs.

A young Mola recently kept at the Monterey Bay Aquarium increased in weight from 57 to 880 lb and reached a height of nearly 5.9 ft in fifteen months.

**Range:**

Mola range throughout all the temperate and tropical oceans of the world.

Sunfish are pelagic (open ocean dwellers) and are known to regularly visit depths of up to 2,000 feet.

Mola usually stay in waters that are 50 F or warmer, with exposure to lower temperatures for prolonged periods resulting in death.

**Feeding:**

Mola eat crustaceans, starfish, jellyfish, sponges, mollusks, algae, plankton, squid, and small fish. They will eat basically anything that floats within range of their relatively small mouths. A feeding Mola will slurp its prey in through its teeth which are fused

together forming a beak, shredding the food in the process, then spitting it out, and repeating until the food is small enough for the fish to swallow.

Mola also possess pharyngeal teeth located in their throat that grind food items into smaller pieces before passing them to its stomach.

Due to their sheer size and thick leathery skin, adult Molas have few predators; with orcas and white sharks known to eat Molas, and there are reports of sea lions tearing off the fins of Molas.

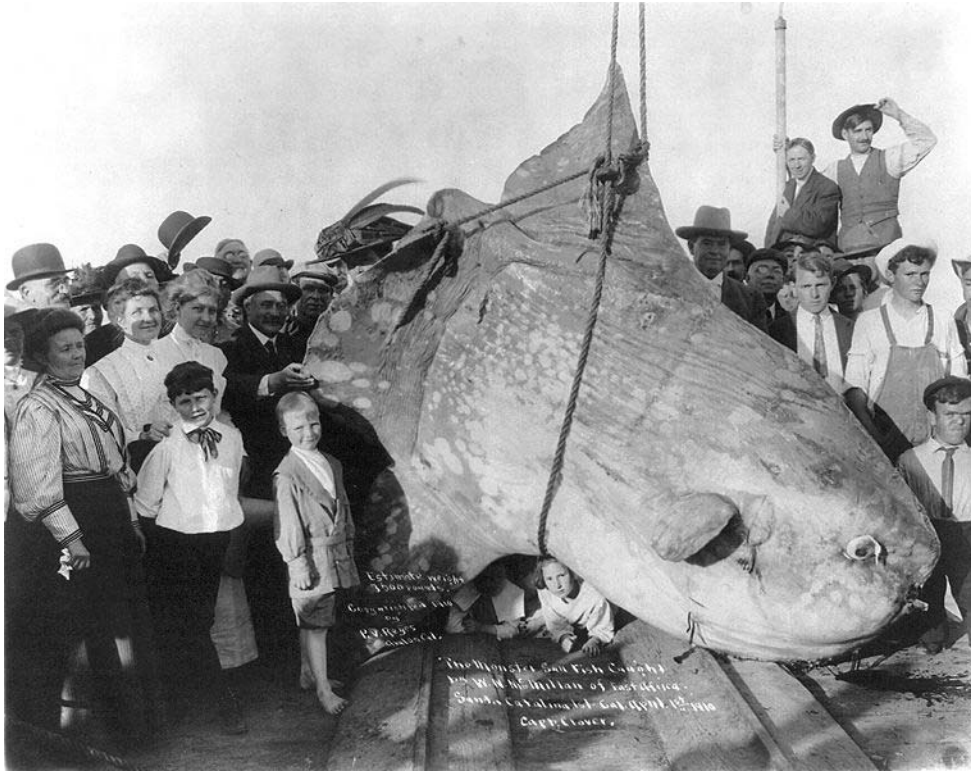
Predators of juvenile Molas include other pelagic fishes such as the tunas, and Mahi Mahi (dolphin fishes).

### **Reproduction:**

The mating behaviors of the Mola are poorly understood, and its specific spawning grounds have not been definitively described. Female Molas may produce as many as 300 million eggs at a time, more than any other known vertebrate. Mola eggs are released into the water and externally fertilized by the sperm of the male.

Newly hatched Mola larvae are only 2.5 mm (0.098 in) long.

Oddly enough, Mola fry, with their large pectoral fins, a tail fin and body spines resemble miniature pufferfish, their close Tetraodontiform relative.



### **Conservation status:**

Mola are accidentally but frequently caught in drift gillnet fisheries, historically making up a large portion of the total catch of the swordfish fishery employing drifting gillnets in California. The by-catch rate is even higher for the Mediterranean swordfish industry, with the majority of the total catch being Mola species.

The meat of the Mola is considered a delicacy in some regions, with the largest markets in Taiwan and Japan. Mola is also used in Chinese traditional medicine. Molas may possess the same toxin as puffers and porcupine fish (conflicting reports). Since 2002, promotion of an ocean sunfish festival in Hualien County, Taiwan has increased demand for the meat of the sunfish (called "manbo fish" after a public vote). The month-long April festival draws some 120,000 visitors and features "101 ways to eat" sunfish. Consequently, catches of sunfishes off eastern Taiwan have risen sharply; Mola are also threatened by floating litter such as plastic bags which resemble jellyfish. The drifting gillnet fishery for swordfish in the Mediterranean is particularly destructive to local Mola populations, with the sharptail Mola comprising 90% of the catch (as by-catch), in that fishery. In 2005, 208 tons of Mola were landed and the annual sunfish catch was valued at one million US dollars.

### **References:**

This article draws freely from Henry Bigelow and William Schroeder"s classic "Fishes of the Gulf of Maine", fishery bulletin 74, Vol. 53 1953, as well as the newer edition of this document, "Fishes of the Gulf of Maine" Collette and Klein-MacPhee 3<sup>rd</sup> edition of 2002, and from Bernard Ludwig Gordon"s, "The Secret Lives Of Fishes" 1977 Grosset and Dunlap publishers, New York, NY, two books that any fish lover must have on their bookshelf.

### **More Mola info and references:**

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