

## **Sporadic die-off of *Mola mola* in Monterey Bay November 2012, (2009) Tierney Thys**

### **FACTS:**

- *Mola mola*, also known as ocean sunfish, occur in all tropical and temperate ocean basins and can be found year-round in the California current system with sightings as far north as Alaska's Kenai peninsula.
- In Monterey Bay, the best chance for sightings is between August through November.
- The most commonly encountered molas in Monterey are juveniles 40-100cm in length. Adults are found in the Bay as well albeit more rarely. Adults can grow to more than 3 m in length and weigh 2.5 tons.
- Mola are non-schooling as adults and not targeted by domestic commercial fisheries. While they are members of the order Tetraodontiform, their flesh is non-toxic and they are eaten throughout Asia.
- *Mola mola* are believed to have comprised a prehistory California fishery dating back 4000-6000 years ago and many remains of these jelly-eating giants have been found on Santa Catalina Island in the Channel Islands off Southern California. (Porcasi and Andrews, 2001).
- In California, mola comprise an alarmingly large portion of the California driftnet fishery—upwards of 55% according to recent NMFS reports and the DGN Observed Bycatch Report for the 2011 season.
- *Mola mola* is the top fish species (by number of fish caught) caught in bycatch according to the California Drift Gillnet Fishery reports from 2001 to 2010. This is a distinct cause for concern since population status of *Mola mola* is currently unknown.
- According to Chelsea Protasio of the Fish and Game Department, 12 pounds of mola were reported as bycatch as of December 1<sup>st</sup> 2012 in Monterey Bay.

In early November 2012, more than one hundred juvenile *Mola mola* washed up dead on the shores the Bay. Most were young of the year--40-50 cm in length--and were missing their dorsal and anal fins and eyes. Similar occurrences have occurred in 1959 and 1960 (Gotshall, 1961) with the most recent one happening in October 2009. See

([http://www.sanctuarysimon.org/monterey/sections/other/sporadic\\_moladieoff.php](http://www.sanctuarysimon.org/monterey/sections/other/sporadic_moladieoff.php))

Sporadic die-offs during this period are mainly due to predation events by California sea lions that eat the fish or tear off the mola's dorsal/anal fins leaving them to the mercy of seagulls that remove the immobilized fish's eyes. The bodies then wash ashore or sink to the seafloor where they are consumed by seastars and/or other benthic dwellers.



Photos by Lisa Emanuelson NOAA.

The first report came from volunteer beachCOMBERS

(<http://www.sanctuarysimon.org/monterey/sections/beachCombers/index.php>)

who reported a mola carcass on Marina State beach on October 7<sup>th</sup>. In mid-October, CSUMB observed at least 6-12 dead/dying molas with their ROVs off Pt Pinos. An October Big Sur subtidal survey conducted by Chad King from NOAA also observed dozens of molas being ripped apart on the surface and at least several dead/dying molas at depth. See photos below:



Photo 1



Photo 2

Caption: Photo 1: South Wreck Beach (36.22476667 N, 121.7904333 W), north of Big Creek on Oct 30 2012 approx 55 to 70 feet. Credit: Chad King NOAA

Caption Photo 2: The mola being slowly consumed by the *Urticina piscivora* was still alive at the time. Depths ranged from 40-500 meters. Credit: Chad King NOAA

On November 3<sup>rd</sup>, beachcombers noted 5 mola on Zmudowski beach and in that same week more than 100 mola between Casa Verde and the commercial wharf. On Nov 6<sup>th</sup> two more were reported on Morro Bay sand spit. In the first week of December, dozens more were reported on Aptos, Manresa and Sunset beaches as well as Del Monte beach and Asilomar Beach, many of which may have been remnants from the previous months' wash-ups. Estimates of total mola carcasses along the California coast number greater than 200 individuals.

No jelly blooms were reported at this time according to jellywatch.org. Concurrent with the mola wash up however was an incidence of Humboldt squid strandings attributed to the possible effects of a red tide. See:

<http://sanctuarysimon.org/news/index.php/2012/12/humboldt-squid-stranding-events-2012-2003/>

Monterey Bay is one of a handful of places to experience mass wash-ups of mola. Other species of mola, namely the slender mola, *Ranzania laevis*, have similar large-scale wash-ups along the coast of South Africa during the summer months when ocean temperatures increase. Mass wash-ups of *Ranzania* have also been reported in Australia.

Why some years, more *Mola mola* wash up than in other years remains unanswered but may be attributed potentially to oceanographic conditions, sea lion numbers and/or high recruitment years that allow more juveniles to find their way into the Bay.

Mrs. Osorio's second grade class at Carmel River School conducted an investigation to solve *The Mystery of the Mangled Mola* and created a compelling video report documenting their findings. The report includes footage of a sea lion attacking a mola in front of the Monterey Bay Aquarium. <https://vimeo.com/57169011>

**References:**

Gotshall, D.W. 1961. Observations on a die-off of molas (*Mola mola*) in Monterey Bay. California Fish and Game 47(4): 339-341.

Porcasi, J. F., and Andrews, S. L. 2001. Evidence for a prehistoric *Mola mola* fishery on the southern California Coast. Journal of California and Great Basin Anthropology, 23 (1): 51 – 66.

*Ranzania* strandings in Australia

[www.ipfc2009asfb.com/pdf/speaker\\_presentations/Smith,%20Kim.pdf](http://www.ipfc2009asfb.com/pdf/speaker_presentations/Smith,%20Kim.pdf)