



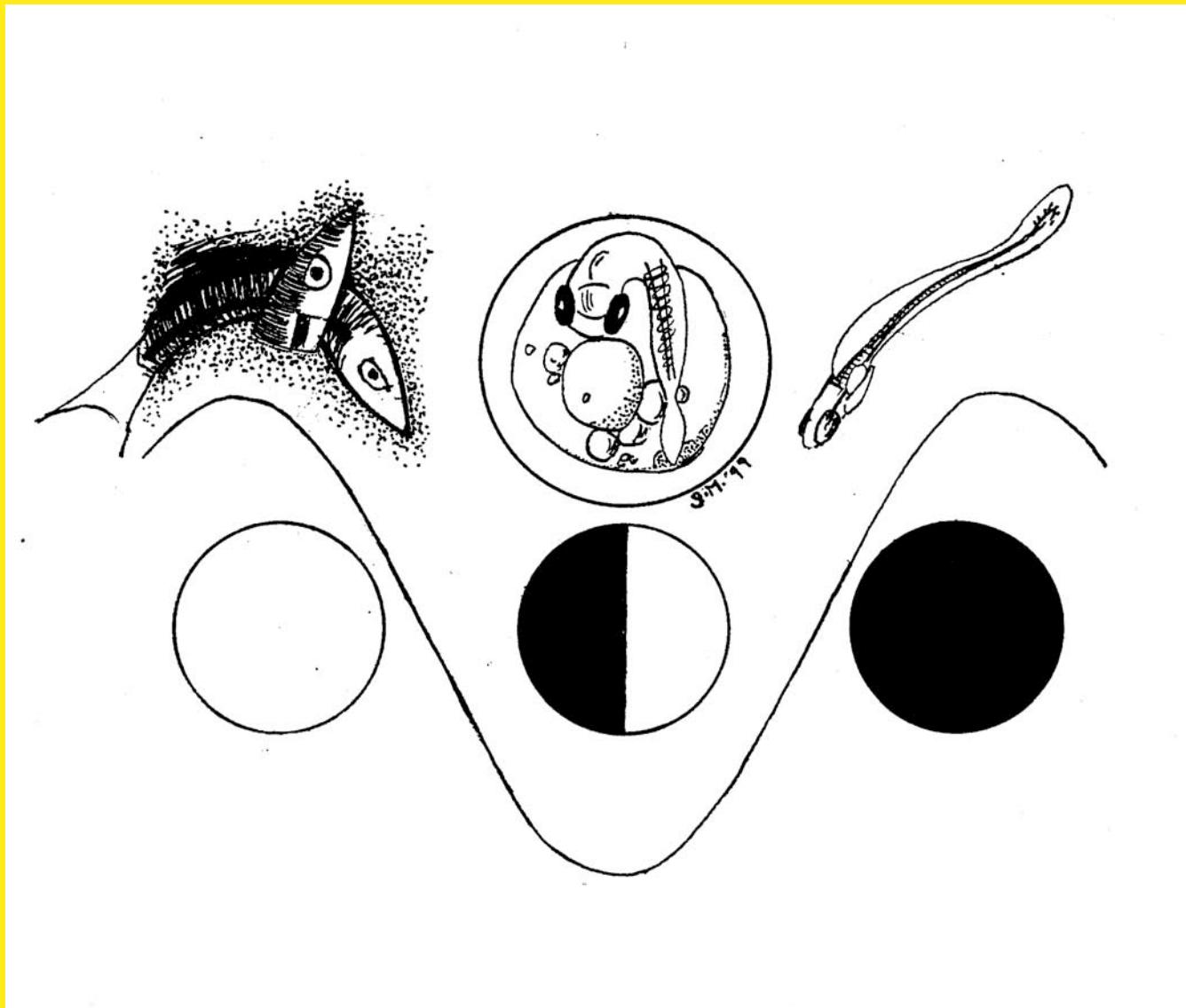
Photo: W. Hootkins

California Beaches as Grunion Habitat

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Pepperdine University

The grunion life cycle

Leuresthes tenuis



Grunion run only on beaches in California and Baja California.





S. Davis

Predators such as great blue herons and other birds are on the beach during some runs.

Fish, dolphins,dogs, and sea lions also chase the grunion.



E. Jones

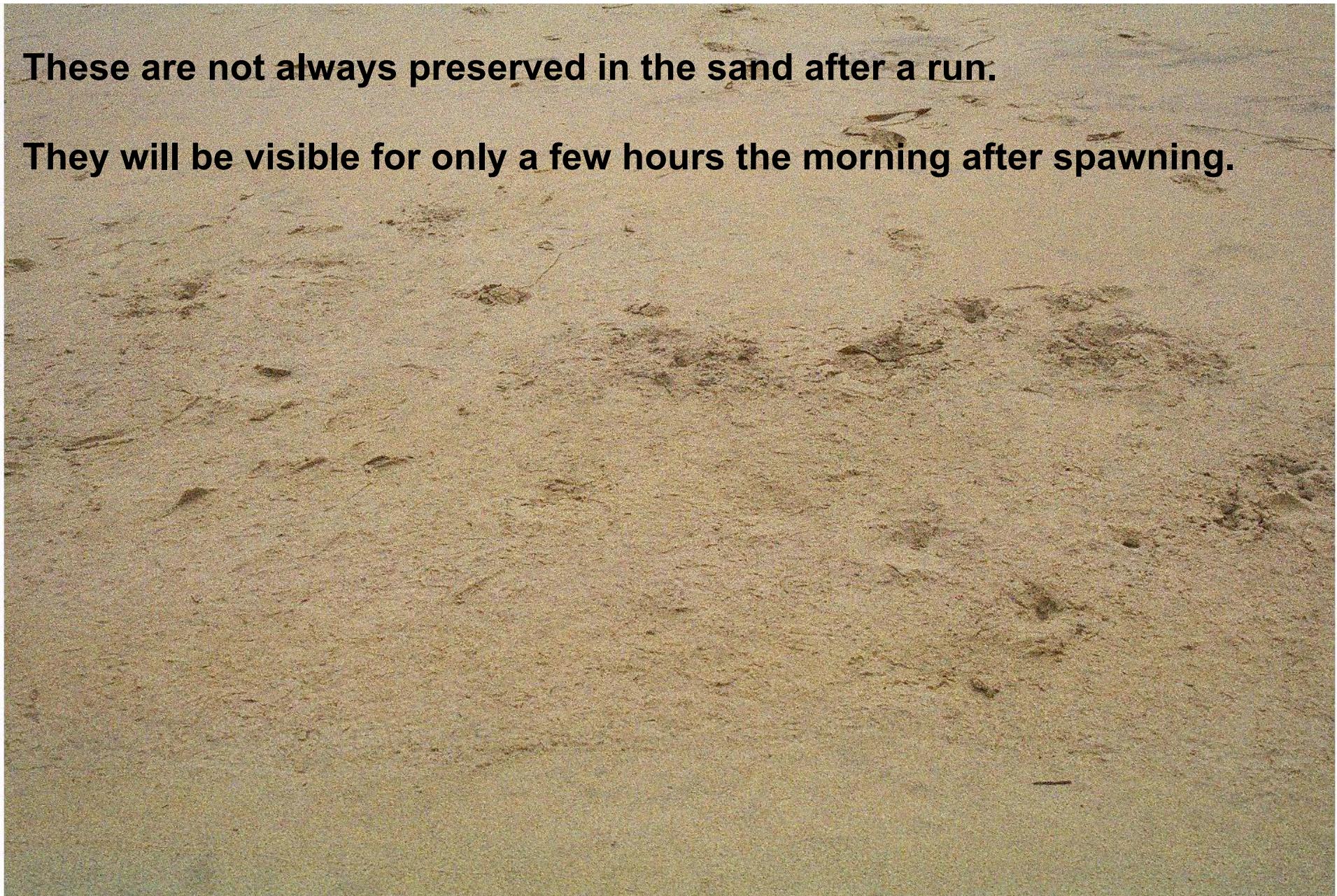


The next day, signs of the run are evident. The trowel points to holes in the sand and tracks on the surface.

This site shows lots of holes and tracks on the surface.

These are not always preserved in the sand after a run.

They will be visible for only a few hours the morning after spawning.



**Signs of spawning near a jetty in Ocean Beach, San Diego.
Grunion often spawn near shore features such as jetties,
piers, and outfalls.**





Dennis Simmons by the Ocean Beach pier. Grunion spawn under and around piers at many places on the coast.

Note the slope of the beach, and the trowel indicating the location of the tracks and holes in the sand where grunion spawned.



Sometimes predators reveal the presence of eggs

A lifeguard truck's tires turned up eggs for these birds.

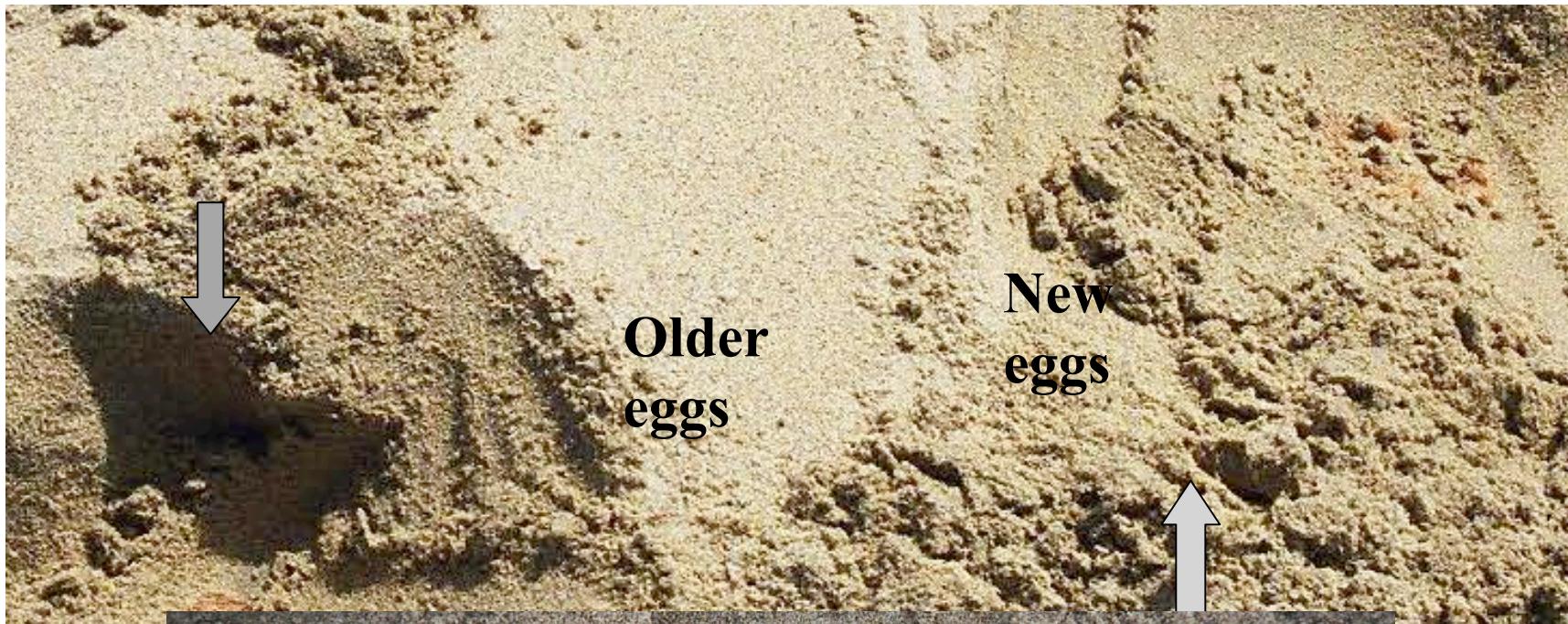




**Mass stranding on the back of the berm at
Doheny Beach, April 2005** Photo by Ranger Jim Serpa



- **Mornings following grunion runs, eggs can be collected from sand.**
- **Notice how low the water line is now. The eggs will not be under water again for almost 2 weeks.**

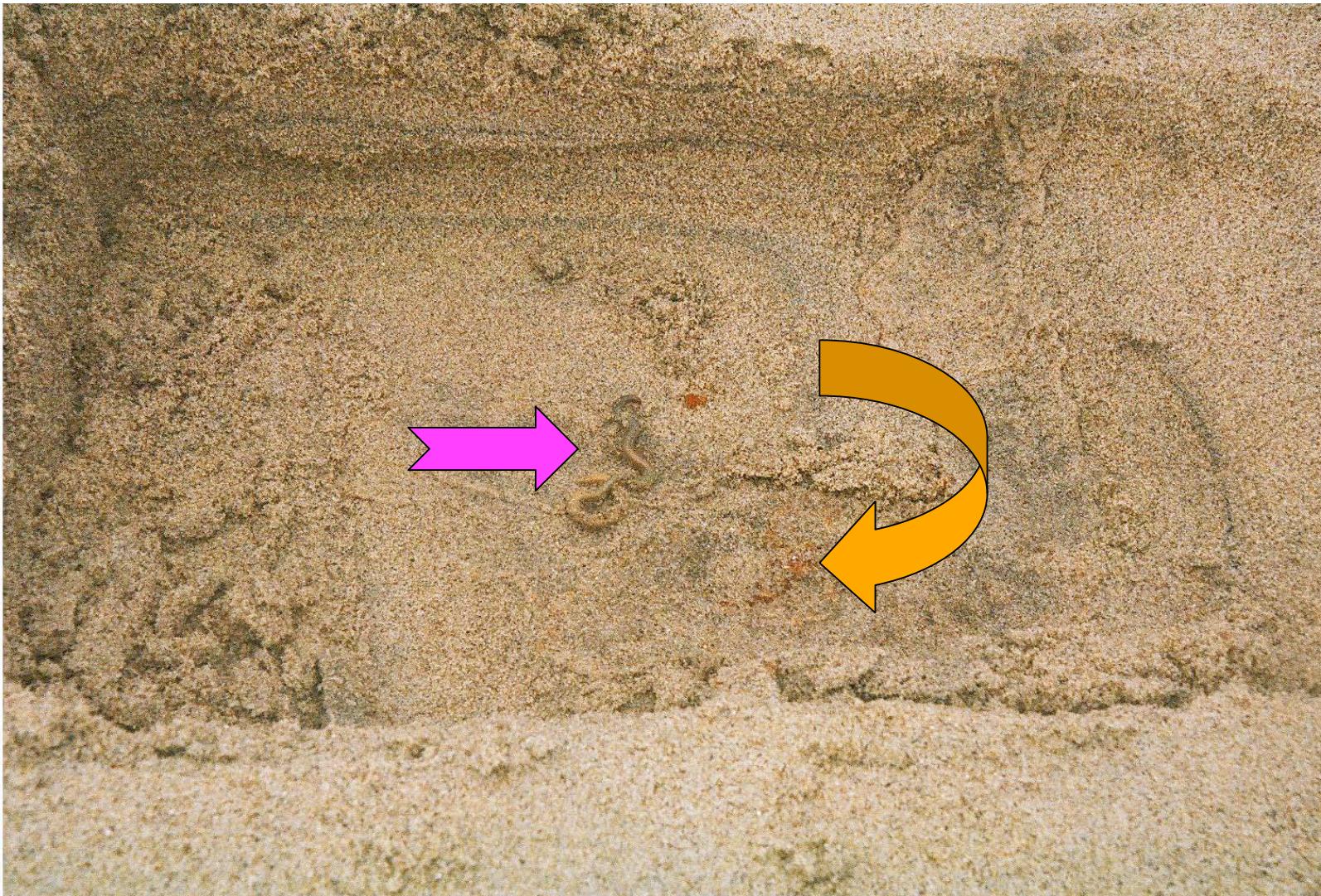


Grunion may spawn at the same tidal height even though the tides differ between full and new moons.



Even buried in sand the eggs are not safe.

Polychaete worms feed on fresh eggs for breakfast.



"Beaches are typically viewed in physical and cultural terms, as natural places of sun, sea, surf and sand that support various hedonistic socio-cultural activities.

But beaches are also recognisable ecosystems that provide various services and have many ecological values."

R. J. James, 2000, Ocean and Coastal Management 43: 495-514. (p. 496.)



D. Longacre

Kelp accumulates on beaches in San Diego.



K. Martin



During beach grooming, kelp, debris, and some sand are raked up and removed by trucks.

The upper layer of sand is disturbed, along with whatever is in the sand.



We did a study to answer 3 Questions:

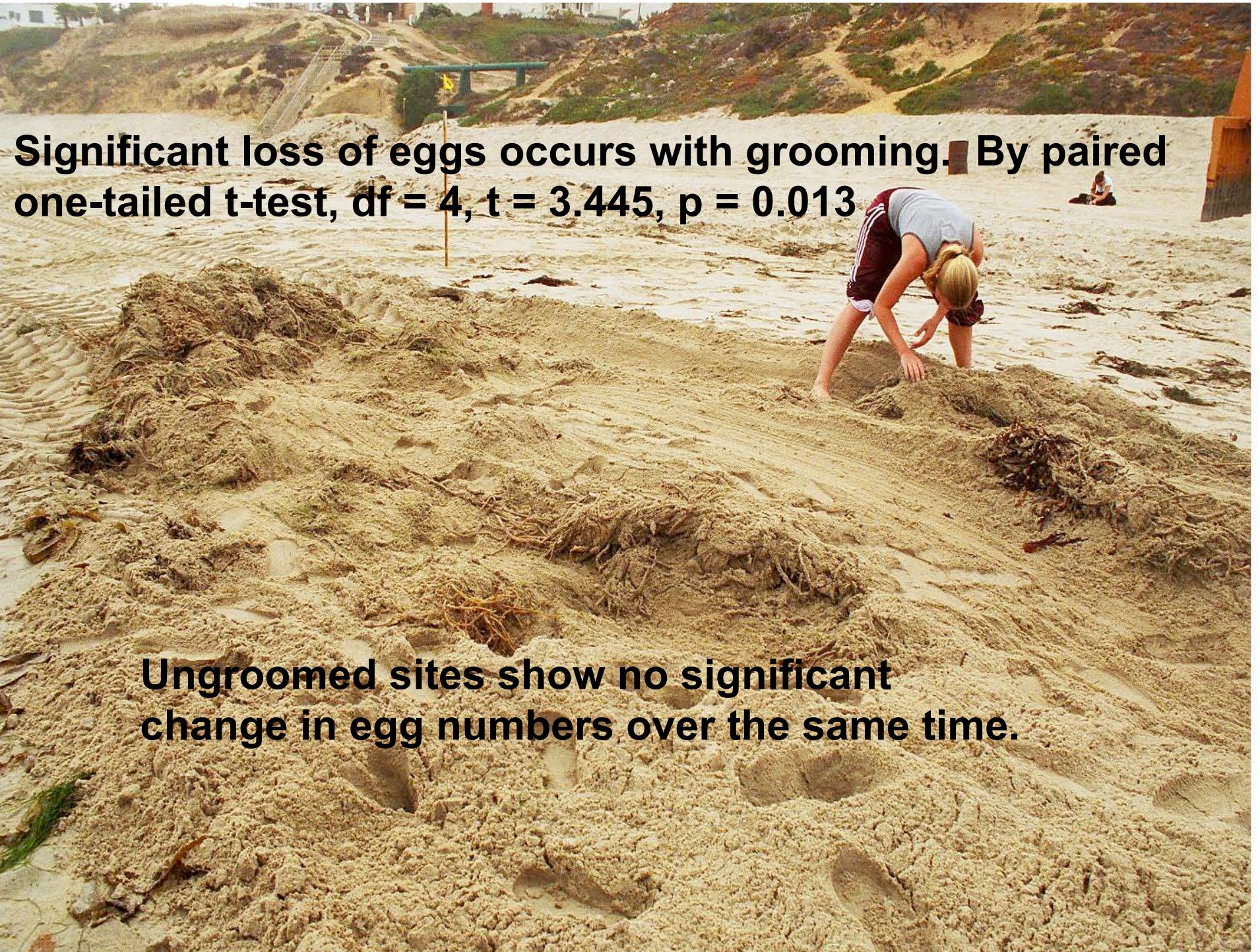
- 1) What is the status of the grunion on San Diego City beaches?**
- 2) Are current beach grooming practices harmful to grunion?**
- 3) Can grooming be modified to reduce impact on grunion eggs**





We did a study to examine the effects of experimental grooming in limited areas where grunion spawned in the intertidal zone

Grunion eggs are brought to the surface, dispersed and destroyed when raking occurs with kelp



Significant loss of eggs occurs with grooming. By paired one-tailed t-test, df = 4, t = 3.445, p = 0.013

Ungroomed sites show no significant change in egg numbers over the same time.

When grooming occurs only above the semilunar high tide mark, as here on Ocean Beach, the grunion nests are not harmed.





Grunion spawning on Mission Beach: their eggs are below the old kelp (marking the high tide wrack line and grooming line) and above the new kelp just washed in overnight.

Grunion eggs will be found in a band on the shore. The width of the band varies with the slope and shape of the beach and the waves.

**Another view of South Mission Beach grunion spawning.
The space between the highest tidemark and the grunion
eggs is highly variable.**



Grunion spawn in front of storm drains and runoff areas. Eggs are often found near freshwater outfalls.



Pacific Beach grunion spawning close to the highest tidemark, indicated by the wrack line. This beach profile is flatter so the waves run up higher on shore.



Black's Beach is not groomed. Kelp builds up above the high tide mark but the washes out lower in the intertidal zone.



We found the spawning grounds of the elusive San Francisco Bay Grunion in Alameda and Oakland.

These grunion spawn right at the wrack line as the tide recedes.

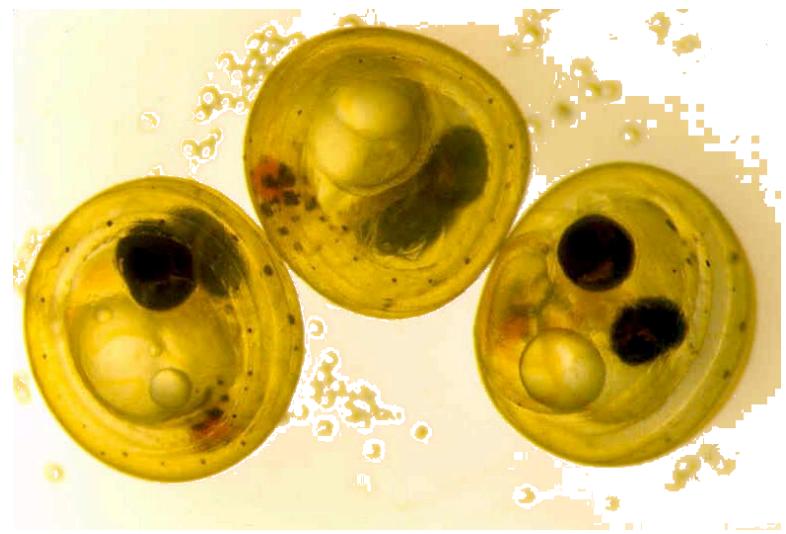


Photo by J. Michael Schiff

So always remember: whenever you see the grunion spawning, there will be eggs in the sand later on, for about 2 weeks...



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RECOMMENDATIONS:

Workshops for beach maintenance staff on grunion eggs and the tides.

•Implementation of the Grunion Grooming Protocol throughout grunion season, until eggs are no longer present in the sand.

•Regular monitoring of grunion, eggs, and grooming practices over spring and summer.

Since 2004, we have convened four workshops for beach managers to discuss ecologically sensitive beach maintenance.



Dave, Solana Beach public works supervisor: “Grunion were sighted last night on our beaches. I'm pleasantly surprised and we are adjusting our activities accordingly.”

S. Lamb



Grunion.Org

We gratefully acknowledge

We are a group of scientists, community members, environmental organizations, surfers, and beach workers dedicated to a better understanding of the habits and habitats of beach-spawning grunion, *Leuresthes tenuis*.

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Photograph by
William Hootkins

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