

California fish and game

Spring 2007

93:2

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# IA FISH AND GAME

"CONSERVATION THROUGH EDUCATION"

VOLUME 93

SPRING 2007

NUMBER 2



**FIRST RECORD OF THE OCCURRENCE OF THE  
CALIFORNIA GRUNION, *LEURESTHES TENUIS*,  
IN TOMALES BAY, CALIFORNIA:  
A NORTHERN EXTENSION OF THE SPECIES**

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On 8 July 2005, California grunion, *Leuresthes tenuis*, were observed and collected by hand at Sand Point, Tomales Bay, Marin County, California (Latitude 38°13.9'N, Longitude 122°58.4'W). The fish were examined and their identification confirmed by the junior authors. As the previously known range of this species was from Magdalena Bay, Baja California, to San Francisco, this represents a northward expansion by a distance of approximately 40 statute miles (Miller and Lea 1972, Eschmeyer et al. 1983). Although the distance may seem insignificant, the San Francisco locale dates from the original description of the species in 1860 (Ayres 1860). We know of no records of California grunion from San Francisco or San Francisco Bay following the original description until grunion were observed there in 2001 (K. Hieb, California Department of Fish and Game, personal communication).

Approximately 30 individuals were seen at Sand Point in the 'wash zone' in small groups during a 1-hour observation period which began at 0100 hours on 8 July 2005. The fish exhibited spawning behavior typical of this species in which individuals swim onto the sandy beach with the advancing tide. Ten specimens were taken and all were deposited in the Marine Vertebrates Collection of the Scripps Institution of Oceanography (SIO 05-63). A similar run was also observed on this date at Crown State Beach, Alameda, in San Francisco Bay (K.L.M. Martin, unpublished data). Like the San Francisco Bay grunion, those observed in Tomales Bay were not seen advancing beyond the margin of the water's edge as is typically observed in southern California.

The size of the Tomales Bay grunion, 119 to 140 mm Standard Length (SL), more closely approximates the southern California coastal specimens taken in Los Angeles and Orange counties during 2005 (mean of 78 specimens was 130 mm SL) than specimens from San Francisco Bay (mean of 10 specimens was 119 mm SL) (K.L.M. Martin, unpublished data). The run was observed at a date and time predicted for grunion runs in southern California by the California Department of Fish and Game ([www.dfg.ca.gov/mrd/grunschd.html](http://www.dfg.ca.gov/mrd/grunschd.html)).

Even though the type specimen of *Leuresthes tenuis* was taken from a fish market in San Francisco (Ayres 1860), the species is generally considered to be rare north of Point Conception. Spratt (1981) reported on spawning grunion from Monterey Bay and grunion runs have been observed almost annually at Del Monte Beach in Monterey since the mid-1990s (R.N. Lea and G. Bernardi, personal observations). Small numbers began to appear in California Department of Fish and Game midwater trawls in San Francisco Bay during 2001 (K. Hieb, personal communication; California Academy of Sciences catalog number CAS 214805). These findings were corroborated by net surveys conducted by the Port of Oakland in 2003 (A. Jahn, personal communication). Grunion runs were observed on East Bay beaches during 2005 by members of the Grunion Greeters Organization ([www.grunion.org](http://www.grunion.org)).

The senior author's interest in the northern expansion of the grunion's range was piqued by local citizens' reports of a grunion run in Tomales Bay during June 2005. Initially, these reports were discounted as sightings of smelts (Osmeridae) or New World silversides (Atherinopsidae; topsmelt and jacksmelt) which are common in Tomales Bay. However, an interview with a local resident who described typical California grunion spawning behavior during the time of a predicted grunion run lent credence to these reports.

While it may be possible that grunion occurred in previous years in Tomales Bay, it is unlikely. A comprehensive literature and museum search by the National Park Service's Inventory and Monitoring Program to list species occurring at the Point Reyes National Seashore (including Tomales Bay) failed to locate any references to *Leuresthes tenuis*. Sand Point, Tomales Bay, where the grunion were seen, is part of the Lawson's Landing Resort, a trailer park and campground that has been in operation since 1957. If there were grunion runs in other years, it is likely that the fish would have been observed by campers at the resort as they were in 2005. An elder of the family that owns the resort, who is in his 80s, reported that 2005 was the only year he has ever seen grunion in Tomales Bay.

While beach spawning is not common, it has evolved many times in fishes all over the world (Martin et al. 2004), and is probably driven by access to particular oviposition sites and substrates combined with plastic reproductive behavior (Martin and Swiderski 2001). The grunion possibly took advantage of the unusually light winds and favorable ocean conditions of spring 2005 to transit the inhospitable outer coast of Marin County and take up residence in the relatively benign and warmer waters of Tomales Bay.

The northern expansion of the California grunion's range is just one of a number of observations coincident with unusual ocean conditions which were documented during spring-summer 2005 along the West Coast of North America by a number of

investigations. While oceanographers have characterized the period since 1998 as a 'cold water' period (Peterson and Schwing 2004), in 2005 the California Current exhibited anomalously warm sea surface temperatures. Delayed onset of upwelling, which normally occurs in the spring but didn't commence until June-July in 2005, was generally held to be responsible for the warm-water condition. During the spring, the weak upwelling led to lower than normal primary production (Schwing et al. 2006). Coincident with low production was an unprecedented mass abandonment of Cassin's auklet nests on the Farallon Islands (Sydeman et al. 2006) and record low catches of young-of-year rockfishes off central California by the National Marine Fisheries Service juvenile rockfish recruitment survey (Brodeur et al. 2006). The San Francisco Bay herring fishery caught very few fish in 2005 relative to other years. (D. Watters, California Department of Fish and Game, personal communication).

Warm water anomalies are known to be accompanied by latitudinal range shifts of southern fishes into northern waters (Lea and Rosenblatt 2000). While the warm-water episode of 2005 was not characterized as an El Niño, it is possible that the northward movement of *Leuresthes tenuis* is indicative of a poorly known element of the California Current system which we are only beginning to understand.

## ACKNOWLEDGMENTS

The authors wish to thank W. Vogler, B. Becker, and D. Howard for providing information about 2005 California grunion runs in Tomales Bay. K. Harps and C. Ragland assisted in the collection of the Tomales Bay fish. Information about the San Francisco Bay grunion population was contributed by K. Hieb of the California Department of Fish and Game, the Port of Oakland, the East Bay Regional Park District, and the Grunion Greeters Organization. This research was partially supported by grants from the National Fish and Wildlife Foundation and California Sea Grant College Program under NOAA grant #NA40AR4170038 to Karen Martin.

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**Postscript:** Observers returned to Tomales Bay during the summer of 2006 and witnessed hundreds of fish spawning at Sand Point on 28 June and thousands of fish on the beach 27 July.

Received: 7 April 2006  
Accepted: 10 June 2006