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Jonathan P. Williams

Vantuna Research Group, Department of Biology, Occidental College, jonwilliams@oxy.edu

Daniel J. Pondella II

Vantuna Research Group, Department of Biology, Occidental College

Brent M. Haggin

California State University Northridge

Larry G. Allen

California State University Northridge, larry.allen@csun.edu

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New record of Pacific sierra (*Scomberomorus sierra*) with notes on previous California records

JONATHAN P. WILLIAMS*, DANIEL J. PONDELLA II, BRENT M. HAGGIN, AND LARRY G. ALLEN

*Vantuna Research Group, Occidental College, 1600 Campus Road,
Los Angeles, CA 90041, USA (JPW, DJP)*

*Nearshore Marine Fish Research Program, California State University
Northridge, 18111 Nordhoff Street, Northridge, CA 91330, USA (BMH, LGA)*

Correspondent: jonwilliams@oxy.edu

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On 22 October 2006, a Pacific sierra (*Scomberomorus sierra*) (Figure 1) was caught by gillnet near Mother's Beach, Marina del Rey, Los Angeles County, California (33°58'50"N, 118°27'25"W) during sampling for juvenile white seabass (*Atractoscion nobilis*) (as described in Allen et al. 2007). This catch represents the northernmost record of Pacific sierra, and one of several specimens known from California. The net was set perpendicular to shore the previous evening (21 October 2006) approximately 1.4 hours before sunset at 1650 PDT in 20.2° C water and at a depth of 3.4 m. The net was retrieved at 0933 PDT, approximately 2.5 hours after sunrise and four minutes after a 1.76-m high tide. A new moon occurred the previous evening at 2214 PDT and helped produce a 1.26-m flooding tidal swing overnight.



FIGURE 1.—Pacific sierra (*Scomberomorus sierra*) captured on 22 October 2006 at Marina del Rey, Los Angeles County, California. Photograph by J. P. Williams.

With the exception of the Pacific sierra, the fish assemblage captured that morning was similar to assemblages captured during other sampling efforts (Stephens et al. 1992). The captured Pacific sierra was deceased when it was retrieved from the net. Though the specimen was whole, undamaged, and still had all identifiable markings, it had apparently died several hours prior as rigor mortis had well set in. All characters, counts, and measurements for this fish are consistent with reported values for this species (Jordan 1895, Collette et al. 1963, Miller and Lea 1972, Collette and Nauen 1983). The specimen measured 449 mm standard length and 525 mm total length and was deposited at the Natural History Museum of Los Angeles County (collection number LACM 57166-1) (Table 1). In fifteen years of standardized sampling throughout the Southern California Bight for the juvenile white seabass sampling program, this was the only Pacific sierra captured.

The Pacific sierra is a common mackerel in the tropical eastern Pacific, considered to be abundant off the coast of mainland Mexico and areas to the south, and at one time considered “a pest” (Fitch and Flehsig 1949) and “a nuisance by anglers who are out for bigger game” (Walford 1937). Its previously reported range is from Antofagasta, Chile north to Santa Monica Bay, California, including the Galapagos Islands (Walford 1937, Daugherty 1946, Miller and Lea 1972, Kong 1978), though catches in the Southern California Bight are considered rare (Daugherty 1946). Unverified reports of Pacific sierra catches by anglers in California waters are occasional, including that of one near Santa Cruz Island in October 2009 and one in San Diego Bay in April 2010, but verified records are few and far between. The reported catch of Pacific sierra in Santa Monica Bay in 1929 that accounts for the published northern range limit, as well as all other reports from California prior to 1962 (e.g., Daugherty 1946, Fitch 1949), were believed to be that of a Monterey Spanish mackerel (*S. concolor*) and not *S. sierra* (Roedel 1953, Collette et al. 1963). The first verified Pacific sierra from the state was not captured until July 1962 (Collette et al. 1963). Additional confusion is created by the similarity between Pacific sierra and its Atlantic congener, the Spanish mackerel (*S. maculatus*). In fact, the two species are so similar that many considered them to be synonymous. Hildebrand (1946) described the two species to be “at most different races for the opposite coasts”. The description of Pacific sierra as Spanish mackerel by Kong (1978) provides the southern range limit for this species as Antofagasta, Chile.

TABLE 1.—Date, location, and collection number of Pacific sierra (*Scomberomorus sierra*) caught in California and deposited in museum collections, 1962-present.

Date	Location	Collection Number
10 July 1962	La Jolla	SIO 62-338
unknown	unknown	LACM 22589
06 Sept 1963	Horseshoe Kelp	LACM 51809-1
17 Sept 1963	Redondo Beach	LACM 51810-1
?? Dec 1995	San Diego Bay	SIO 97-141
05 Mar 1997	San Diego Bay	SIO 97-144
24 Aug 1998	Carlsbad	SIO 98-171
22 Oct 2006	Marina del Rey	LACM 57166-1

The first verified Pacific sierra in California waters was a specimen captured from a party boat in a kelp bed off La Jolla on 10 July 1962 (Collette et al. 1963) and deposited into the Scripps Institution of Oceanography (SIO) Marine Vertebrate Collection (SIO 62-338) (Table 1). Since then, six more California-caught Pacific sierra have been deposited into museum collections, three at SIO and three at the Natural History Museum of Los Angeles County (Table 1). The occurrence of this Pacific sierra inside Marina del Rey represents a northward range extension of only 15 km in terms of verified records, but of nearly 165 km since the last published range extension (Collette et al. 1963).

As Collette et al. (1963) noted, the northward range extension of the Pacific sierra represents a typically Panamic species which has gone beyond the tropical zone. These authors suggested that southern species, like the Pacific sierra, may be migrants during warm-water periods in the Southern California Bight, though they correctly noted that the catch in July 1962 would not fit the profile as the mean sea-surface temperature that summer at SIO Pier was one of the coolest on record (data from the Southern California Coastal Ocean Observing System: <http://www.sccoos.org>). However, and also as noted by Collette et al. (1963), sea-surface temperatures during the summer of 1959 were some of the warmest on record, and the specimen may have been a southern California resident since that time. Anecdotal reports state that Pacific sierra were occasionally caught as far north as Seal Beach during the late 1950s (Wisch 2010). San Diego Bay, just a few kilometers from La Jolla, could have provided warm water refuge as it does with other species (Allen et al. 2002), and the captures of SIO 97-141 and SIO 97-144 inside the bay (Table 1) are consistent with this hypothesis.

Possibly coincidental, though certainly intriguing, is that all museum records of Pacific sierra in the Southern California Bight, with the exception of the current specimen, were captured within a few years of one another on two separate occasions (Table 1): three between July 1962 and September 1963, and three between December 1995 and August 1998. It should be considered that an El Niño period in 1963 (Smith et al. 2008) and a particularly strong and persistent El Niño in 1997 and 1998 might have contributed to the presence of the Pacific sierra in southern California during those years. In the case of the current specimen, sea-surface temperatures during the summer immediately preceding the catch were among the highest on record, and that summer is also considered to be part of an El Niño period (Smith et al. 2008).

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