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OCCURRENCE OF JUVENILE MEXICAN LOOKDOWN, *SELENE BREVOORTII* (GILL, 1863), IN SEAL BEACH, CALIFORNIA

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Jacks (Family Carangidae) represent 55 species in 15 genera in North America (Nelson et al. 2004). Within this family, the lookdowns and moonfishes (Genus *Selene*) include six species that are morphologically distinct from other jacks by having highly compressed bodies and steep anterior head profiles. Three of these species occur along the Pacific coast and the Gulf of California: Mexican moonfish, *Selene orstedii* Lutken, 1880; Pacific moonfish, *S. peruviana* (Guichenot, 1866); and Mexican lookdown, *S. brevoortii* (Gill, 1863). The Mexican lookdown is considered a Panamic species that has a range extending from San Diego Bay in southern California (Lea and Walker 1995, Lea and Rosenblatt 2000), to Isla San Lorenzo, Peru (Chirichigno and Velez 1998, as cited in Love et al. 2005), including the Gulf of California (Smith-Vaniz 1995). However, prior to its occurrence in San Diego Bay in the 1990s, Mexican lookdown was only reported as far north as Magdalena Bay, Baja California Sur (Walford 1947, as cited in Lea and Walker, 1995), a temperate-tropical oceanographic boundary. This paper documents the first occurrence of juvenile Mexican lookdown in California and an approximate 150-km northern range extension. Juvenile Mexican lookdown are distinguished from adults by relatively long, filamentous anterior dorsal spines, larger pelvic fins, and dark, interrupted vertical bars on the body (Smith-Vaniz 1995). As they mature, the markings on the body fade, the anterior dorsal spines shorten in length, the pelvic fins reduce in size, and the anterior lobes of both the second dorsal rays and anal rays elongate (Smith-Vaniz 1995, Humann and Deloach 2004).

While conducting monthly surf zone sampling on the morning of 18 November 2008, biologists with the California Department of Fish and Game captured juvenile Mexican lookdown in two consecutive beach seine hauls at Seal Beach, California (33º44’15’’N, 118º06’16’’W). The first lookdown (63 mm SL) occurred in the seine with no other fish species, while the second, smaller lookdown (62 mm SL) occurred with three topsmelt, *Atherinops affinis*, and one jacksmelt, *Atherinopsis californiensis*. The sea floor temperature at 4 m depth ranged from 16.6 to 16.9 ºC, and the tide was flooding (0.6 to 0.7 m).

Both specimens are catalogued in the Los Angeles County Museum of Natural History (LACM) fish collection (LACM 56886-1). Each specimen had long filamentous anterior dorsal spines, although the second dorsal spine of the larger specimen was much shorter than the first (Fig. 1). Both juveniles had large black-tipped pelvic fins and silvery bodies with iridescent blue highlights. Interestingly, the dark interrupted vertical bars on the body were more apparent on the larger specimen, while the smaller specimen had a faint bar extending dorsally from the eye to the anterior dorsal fin (Fig. 1). Morphometrics and meristics of the two specimens are reported in Table 1.

Whereas the northern transport of larvae and/or juveniles via vessel ballast water is a potential, though not probable, mode of arrival for juvenile Mexican lookdown[1], here we discuss oceanographic influence. The presence of juvenile Mexican lookdown at Seal

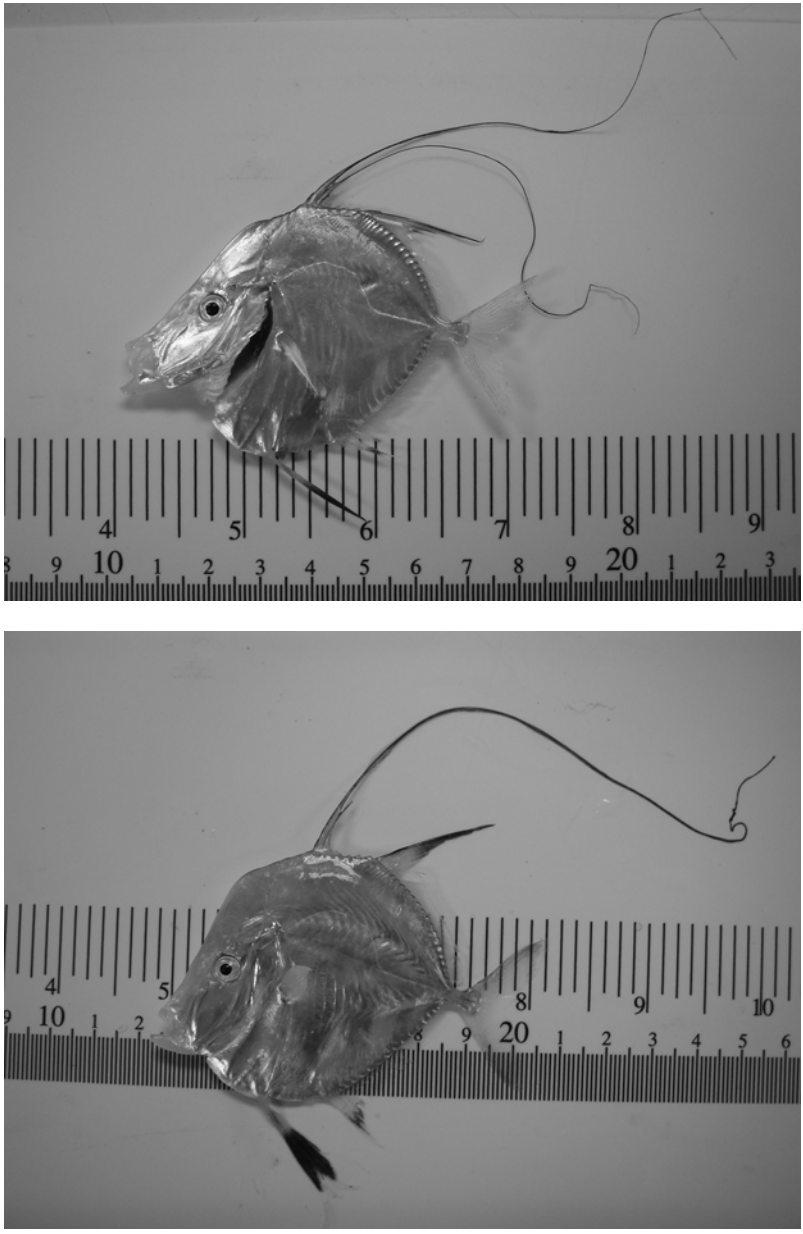

Figure 1. Juvenile Mexican lookdown, *Selene brevoortii*, captured by beach seine at Seal Beach, California, 18 November 2008. The smaller (top) and larger (bottom) specimens measured 62 and 63 mm standard length, respectively. Photographs by E.T. Jarvis.

Table 1. Morphometric and meristic characteristics of juvenile Mexican lookdown, *Selene brevoortii*, captured by beach seine at Seal Beach, California, 18 November 2008.

Characteristic[a]	Specimen 1	Specimen 2
Standard length (mm)	63	62
Total length	1.32	1.27
Fork length	1.14	1.08
Head length	0.49	0.50
Eye diameter	0.10	0.10
Snout length	0.24	0.24
Maxillae length	0.13	0.11
Pectoral length	0.30	0.27
Predorsal length	0.73	0.66
Preanal length	0.60	0.65
Length to D2	0.86	0.82
Body depth at D2	0.81	0.73
Dorsal fin elements	VIII+I,21	VIII+I,21
Anal fin elements	I,18	I,18
Lateral line scutes	present[b]	present[b]
Gill rakers (left)	8+33	7+31

[a]Characteristics listed here are based on those reported by Lea and Walker (1995). Length measurements are represented as a proportion of standard length.

[b]Lateral line scutes could not be precisely enumerated. Lea and Walker (1995) reported 'none' present for an adult Mexican lookdown deposited at Scripps Institution of Oceanography (SIO 93-192).

Beach suggests successful larval recruitment in southern California, although the larval source is unknown. The size of the captured juveniles, in addition to the reported larval transformation length and spawning season of Mexican lookdown (8.2 mm to > 38 mm, January – April; Moser 1996), suggests the fish were spawned in the spring of 2008. The occurrence of adult Mexican lookdown in California waters in 1993 and 1997-98, along with other Panamic fishes, was attributed to adult movement coincident with warm water oceanographic conditions (Lea and Walker 1995, Lea and Rosenblatt 2000). However, since the 1997-98 El Niño, the Southern California Bight (SCB) has not experienced a similar oceanographic event that would facilitate long range larval dispersal into California waters. Moreover, the California Current system has been in a cool phase since the 1997-98 El Niño, and southern California experienced one of the strongest La Niña conditions of the last few decades during the 2007-08 season (McClatchie et al. 2008). Although southern California waters were representative of La Niña conditions in 2007-08, ocean patterns off Baja California

[1]In the fall of 2008, other unusual species occurrences were identified in the recreational fish catch farther north in Santa Monica Bay, southern California (green jack, *Caranx caballus*, and spot, *Leiostomus xanthurus*; T. Carpenter, Pacific States Marine Fisheries Commission, personal communication).

did not show evidence of a response to the La Niña event; in fact, sea surface temperatures were unusually high (McClatchie et al. 2008). If unknown or undocumented populations of Mexican lookdown have persisted farther north into Baja California or even San Diego Bay since the 1997-98 El Niño, net poleward flow of SCB coastal currents during summer months (Hickey 1993, McClatchie et al. 2008) may have facilitated successful local recruitment. It is interesting to note that both California localities of Mexican lookdown occurrences are in close proximity to warm water effluent of power generating stations (South Bay Power Plant in San Diego and Haynes Power Generating Station in Seal Beach), which may provide suitable year-round temperatures for adults and recruits.

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