

3.3.8 White croaker *Genyonemus lineatus*



Distribution map for adult white croaker

Adult Range: From Todos Santos Bay, Baja California north to Barkley Sound, Vancouver Island, British Columbia.

Life History: Size: up to 380 mm (15 in.) and 0.5 kg (1 lb); Age at maturity: one to four years; Fecundity: spawns 18 to 24 times a season, annual fecundity–105,000 eggs; Life span: twelve years.

Adult Habitat: Near shore areas less than 30 m (98 ft) deep just outside the surf zone; offshore waters to 100 m (328 ft) in depth.

Adult Fishery: Recreational, small commercial market.

The white croaker belongs to the family Sciaenidae (order Perciformes), which contains over 210 species. In North America, there are about 34 species of croaker, many of them important sport and commercial fishes (Moyle and Cech 1988). White croaker are found from southern Baja California to Vancouver Island, British Columbia. They are most abundant from southern California northward to about Monterey and are uncommon north of San Francisco (Love 1996). White croaker were collected during both MBPP impingement studies (Behrens and Sommerville 1982, 1999-2000 impingement [Section 4.0]) and in the CDFG otter trawls (CDFG unpubl. otter trawl data); they were not collected by either Fierstine et al. (1973) or Horn (1980) (Appendix B).

White croaker are bottom-dwelling fishes found schooling and feeding along warm, shallow, nearshore coasts. White croaker are usually found in loose schools over sand or mud bottoms of bays and estuaries and in areas less than 30 m (98 ft) deep just outside the surf zone (Streamnet 1999). They may also, however, inhabit offshore waters up to

100 m (328 ft) deep (Frey 1971). These fish seem to move inshore during summer months and offshore in winter. White croaker can reach 380 mm (15 in.) in length and can weigh over 0.5 kg (1 lb) (Streamnet 1999). These fish reach maturity in one to four years and may live from 12 to 15 years (Frey 1971, Love et al. 1984).

Although some spawning takes place throughout the year, most occurs between November and May (Skogsberg 1939) with the heaviest concentration during the early spring months. Adults spawn in both near-shore shallow waters and the open waters of bays and estuaries. A large spawning center is located north and south of the Palos Verdes Peninsula, from Redondo Beach to Laguna Beach, and a smaller center is found north of Ventura (Love et al. 1984). Females lay from 800 to 37,000 eggs, and are able to spawn 18 to 24 times a season (Love et al. 1984). The fertilized eggs are pelagic and most drift into the shallow sand and gravel bottom regions of the bays and estuaries.

The spherical eggs hatch in about one week, with the newly hatched larvae averaging about 1.6 mm (0.06 in.) (Watson 1982). The young larvae are pelagic and post-flexion larvae settle out to the sand and gravel bottom substrate as they develop (Love et al. 1984). The shallows of bays and estuaries are used as nursery grounds for the white croaker, but larvae are found in open water as well (Wang 1986). While a few larvae have been taken as far as 150 miles offshore, most larvae reside within 20 miles of the coast (Love 1996). Murdoch et al. (1989) estimates a daily larval growth rate of 0.20 mm/day (0.008 in./day).

3.3.8.1 White Croaker Results

Larval white croaker entrainment concentrations show several peaks through the year (Figure 3-36), which is consistent with literature reports of year-round spawning. The largest concentrations were observed in December 1999, January 2000, and October 2000. A representative sample of white croaker larvae had a relatively wide size range of 1.2 to 7.6 mm (0.05 to 0.3 in.), but the majority of the larvae were small with an average size of 2.8 mm (0.11 in.) (Figure 3-37). These larvae are only a few days old based on the estimated hatch size of 1.6 mm (0.06 in.) (Watson 1982).

There was considerable variability in the concentrations of white croaker larvae among the stations collected in the monthly source water surveys (Figure 3-38). Concentrations were generally highest at the stations in the upper bay (stations 1, 2 and 3) or in Estero Bay (Station 5), but there was no consistent pattern between surveys. White croaker larvae were generally in lower concentration and less common at Station 4 in the back bay, except in November 2000 when concentration was highest at that station.

Concentrations (#/m³) of larval white croaker were compared among stations for samples collected at ebb and flood tides (Figure 3-39). There was no clear relationship between larval concentration and tidal current. During the March 2000 survey concentrations were higher on ebb tides, while during the November and December surveys they were higher on flood tides. The absence of any clear pattern is consistent with the comparison of concentrations among stations (Figure 3-38) showing that white croaker larval abundances are highly variable in the bay over time.

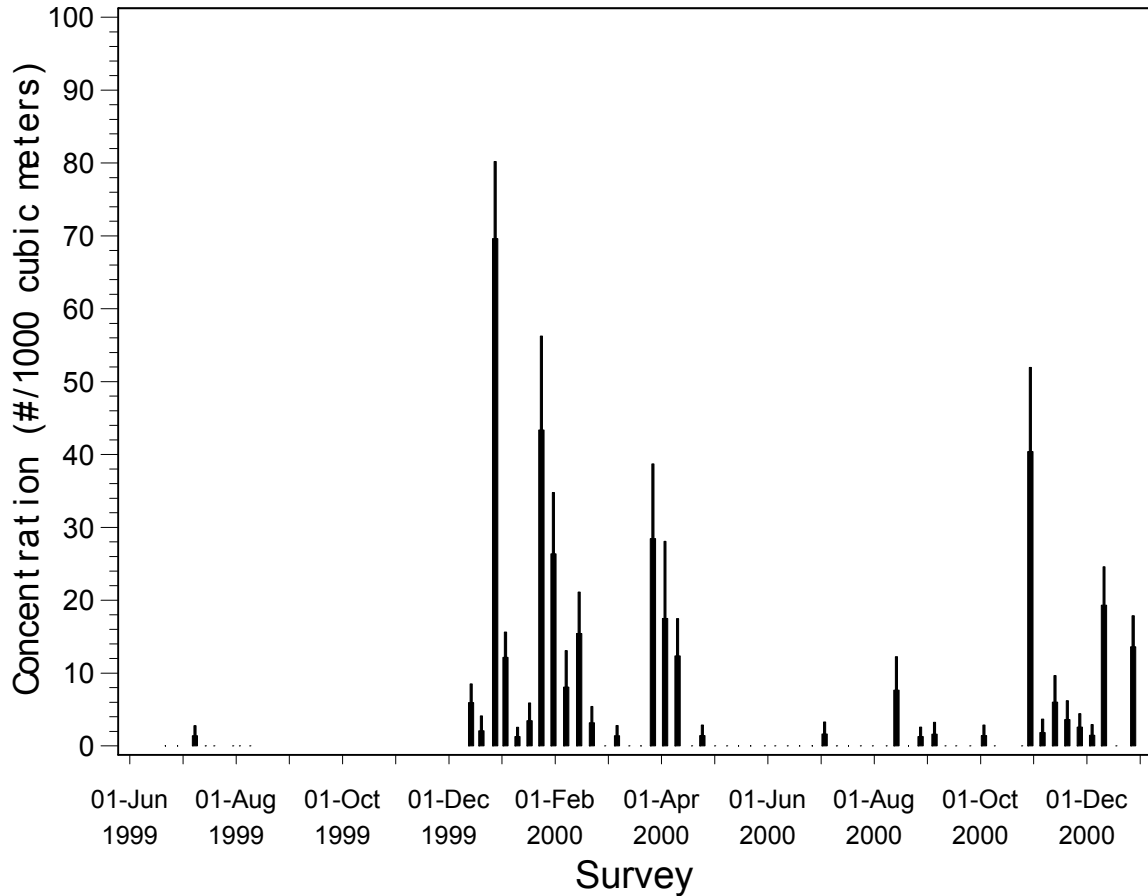


Figure 3-36. Weekly survey mean concentrations of larval white croaker collected at the MBPP intake station with standard error indicated (+1 SE). Weekly surveys were collected from June 21 through August 10, 1999 and from December 14, 1999 through December 29, 2000.

Note: The October 16, 2000 survey was cancelled due to the unavailability of a boat.

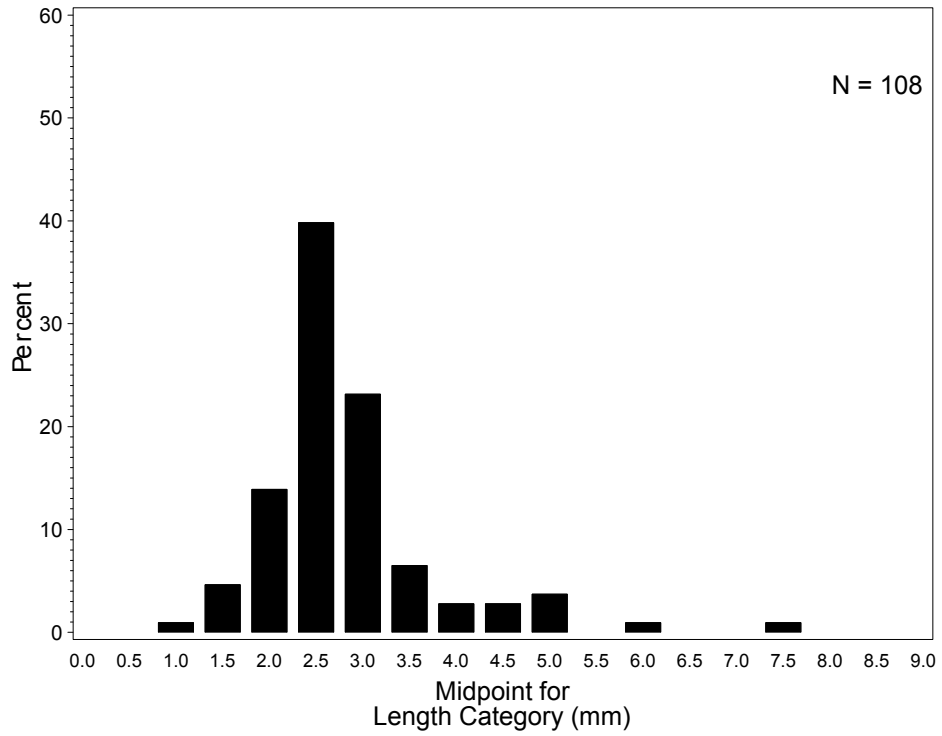


Figure 3-37. Length frequency distribution (mm) for white croaker larvae collected at the MBPP intake station from January – December 2000. The frequency distribution is based on the lengths of a representative sample of approximately 100 larvae.

Survey Station

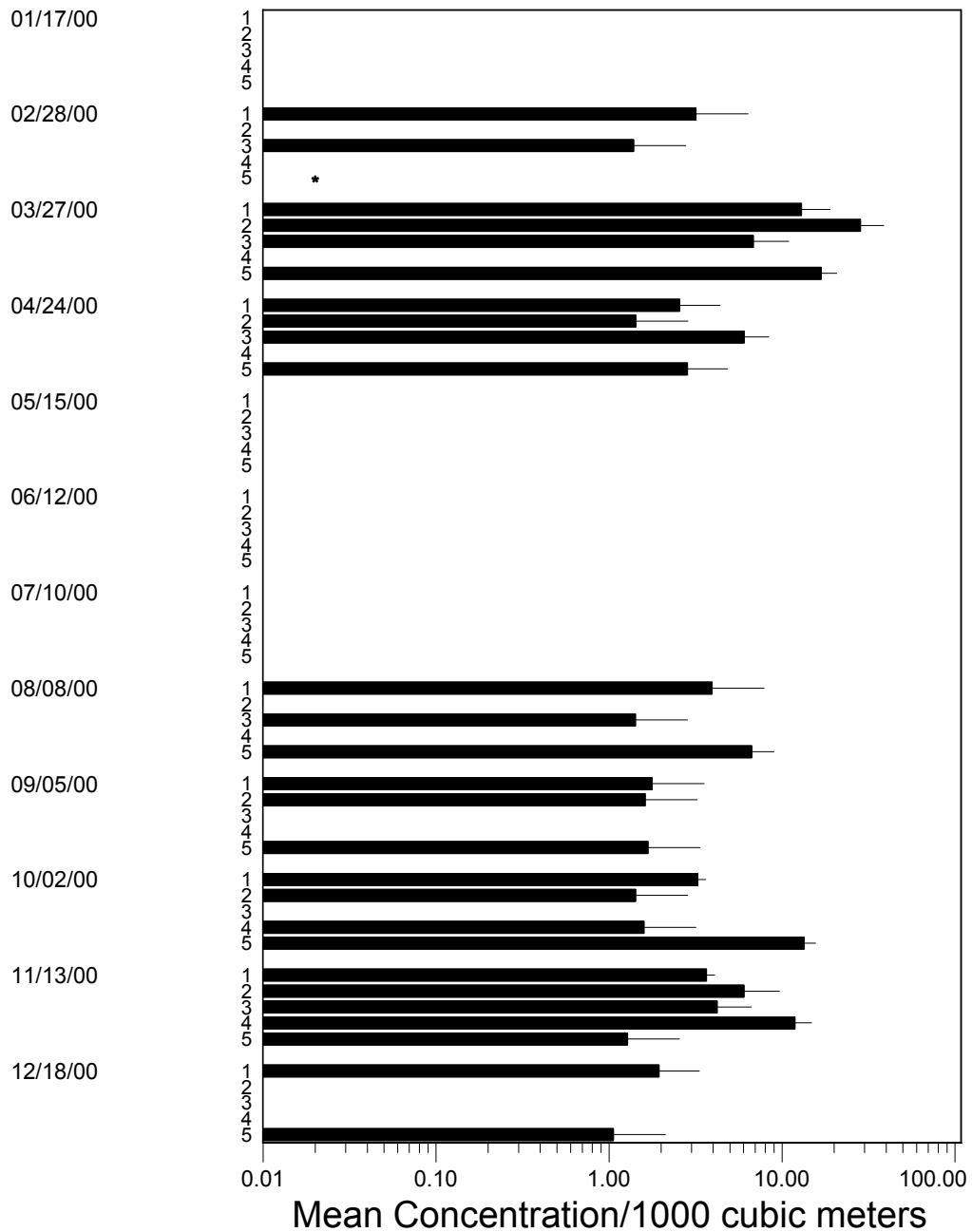


Figure 3-38. Mean larval white croaker concentration in monthly paired surveys at the MBPP intake (Station 2), Morro Bay source water (Stations 1, 3, 4), and Estero Bay (Station 5) from January – December 2000 with standard error indicated (+1 SE).

Note: During the January 17, 2000 survey, source water stations 1, 3, 4, and 5 were sampled only in daylight hours. Beginning in February 2000 the sampling frequency was increased to cover a 24-hour period.

* Estero Bay Station 5 could not be sampled in February 2000 due to unsafe sea conditions.

Survey Station

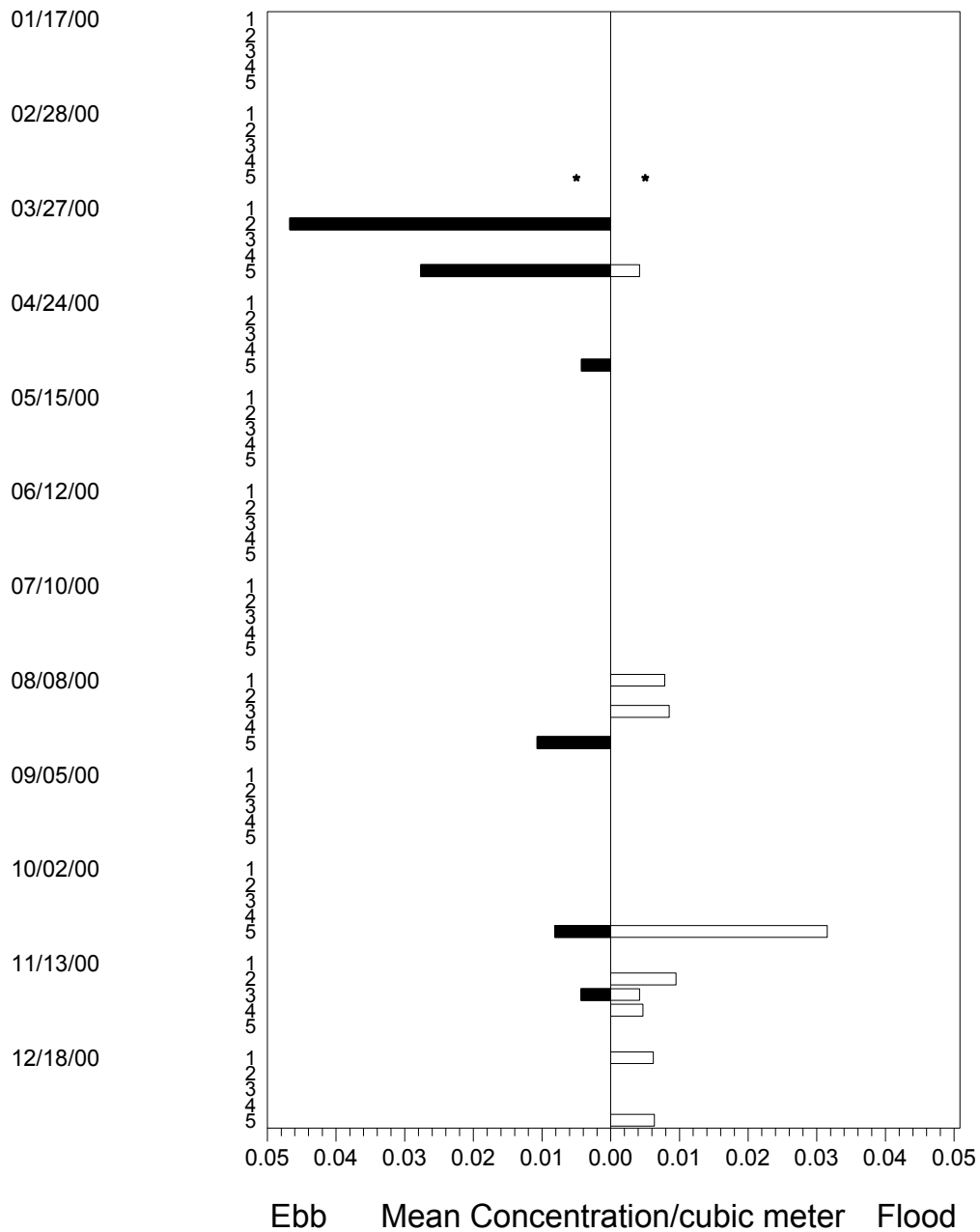


Figure 3-39. Mean concentration of larval white croaker from monthly paired surveys by tidal current (ebb – solid bars; flood – clear bars) and sampling station (Morro Bay stations 1–4 and Estero Bay Station 5) from January through December 2000.

Note: During the January 17, 2000 survey, source water stations 1, 3, 4, and 5 were sampled only in daylight hours. Beginning in February 2000 the sampling frequency was increased to cover a 24-hour period.

*Estero Bay Station 5 could not be sampled in February 2000 due to unsafe sea conditions.

