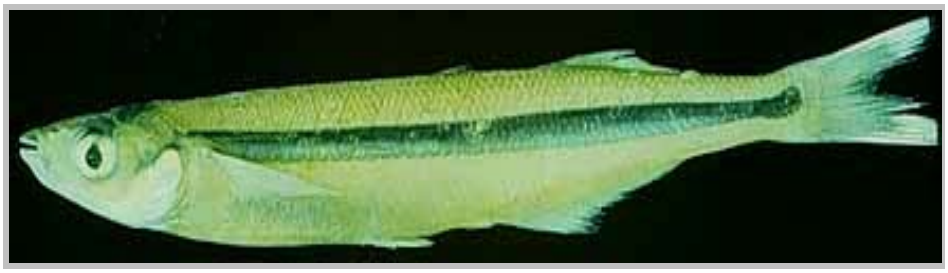
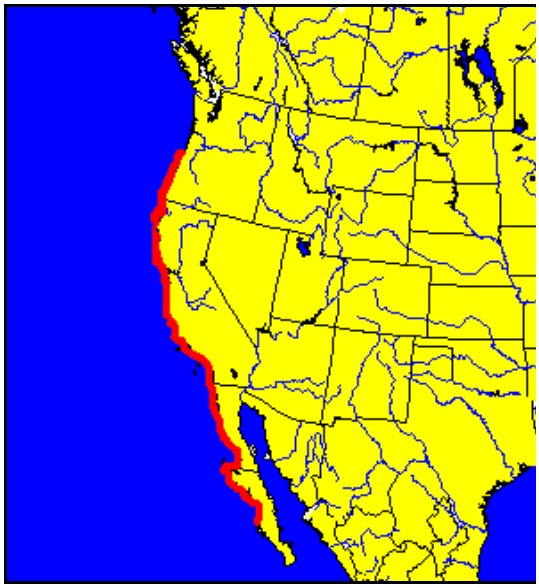
3.3.7 Jacksmelt Atherinopsis californiensis





Distribution map for adult jacksmelt

***Adult Range*:** Yaquina Bay, Oregon to Bahia Magdalena, Baja California.

***Life History*:** Size: to 44 cm (17 in.); Age at maturity: two years; Life span: nine to 10 years.

***Adult Habitat*:** Bays, estuaries, nearshore surface to 29 m (95 ft).

***Adult Fishery*:** Incidental commercial; recreational.

Jacksmelt *Atherinopsis californiensis* are a pelagic fish found in estuaries and coastal marine environments from Yaquina Bay, Oregon to at least Bahía Magdalena, Baja California Sur (Eschmeyer et al. 1983, Cruz-Aguero et al. 1994). Jacksmelt are the largest member of the three species of the family Atherinidae that occur in California coastal waters (Clark 1929, Miller and Lea 1972). The other members of the Atherinidae, or silversides, that occur in California are California grunion and topsmelt (Miller and Lea 1972). Although jacksmelt are not a targeted fishery in California they are commonly caught from piers and in other nearshore areas (Love 1996). Jacksmelt are distributed from Santa Maria Bay, Baja California north to Yaquina Bay, Oregon, and are mostly found in nearshore areas and in bays (Miller and Lea 1972). Jacksmelt were collected during all Morro Bay fish studies (Fierstine et al. 1973, Horn 1980, Behrens and Sommerville 1982, CDFG unpubl. otter trawl data, 1999-2000 impingement study [Section 4.0]; Appendix B). The adults can reach a maximum length of 44 cm (17 in.) SL (Miller and Lea 1972). The fish reach maturity after two years at a size range of 18 to

20 cm (7 to 7.8 in.) SL, and probably can live to a maximum age of nine or ten years (Clark 1929).

The spawning season for jacksmelt is from October through March (Clark 1929), with peak activity from January through March (Allen et al. 1983). Inspection of reproductive females showed that eggs of various sizes and maturities were present because the fish spawn multiple times over the reproductive season (Clark 1929). The spawning activity of another member of the silversides, the topsmelt, corresponded to changes in water temperature (Middaugh et al. 1992). The diameter of mature eggs ranges from 2.0 to 2.5 mm (0.08 to 0.1 in.) (Clark 1929). The females lay the eggs on marine plants and other floating objects where fertilization by male jacksmelt occurs (Love 1996). Topsmelt eggs maintained in the laboratory hatched 10 to 14 days after fertilization (Middaugh et al. 1992). Jacksmelt larvae hatch at an average size of 8 mm (0.31 in.) SL and reach a size of 15 to 16 mm (0.59 to 0.63 in.) after 24 days (Middaugh et al. 1990).

3.3.7.1 Jacksmelt Results

Jacksmelt are reported to spawn from October to April and primarily from November through March (Moser 1996). Peak larval concentration for this species collected at the MBPP intake station occurred in January, which agrees with reported spawning times (Moser 1996) (Figure 3-32). Similar to recorded spawning periodicity, larval jacksmelt reappeared at the MBPP intake in early October 2000.

The length frequency distribution for a representative sample of jacksmelt larvae showed a wide size range of 5.2 to 15.7 mm (0.20 to 0.61 in.) with an average size of 9.6 mm (0.38 in.) Figure 3-33). The results show that the majority of the larvae are close to the estimated hatch length of 8 mm (0.31 in.) (Middaugh et al. 1990).

Most of the jacksmelt larvae in monthly source water surveys were collected from stations inside of Morro Bay (Figure 3-34). Stations 3 and 4 in the southernmost reaches of Morro Bay yielded the greatest concentrations of jacksmelt larvae during the peak spawning period reported by Moser (1996). As the season progressed, there was a shift in their distribution toward the harbor mouth. Jacksmelt larvae were less abundant and less common at Station 5 in Estero Bay though they did occur there.

Concentration (#/m^3) of larval jacksmelt was compared among stations for samples collected at ebb and flood tides (Figure 3-35). Larval jacksmelt concentration was generally highest during ebb tides as would be expected for a taxon that may utilize habitat in the back bay for spawning.

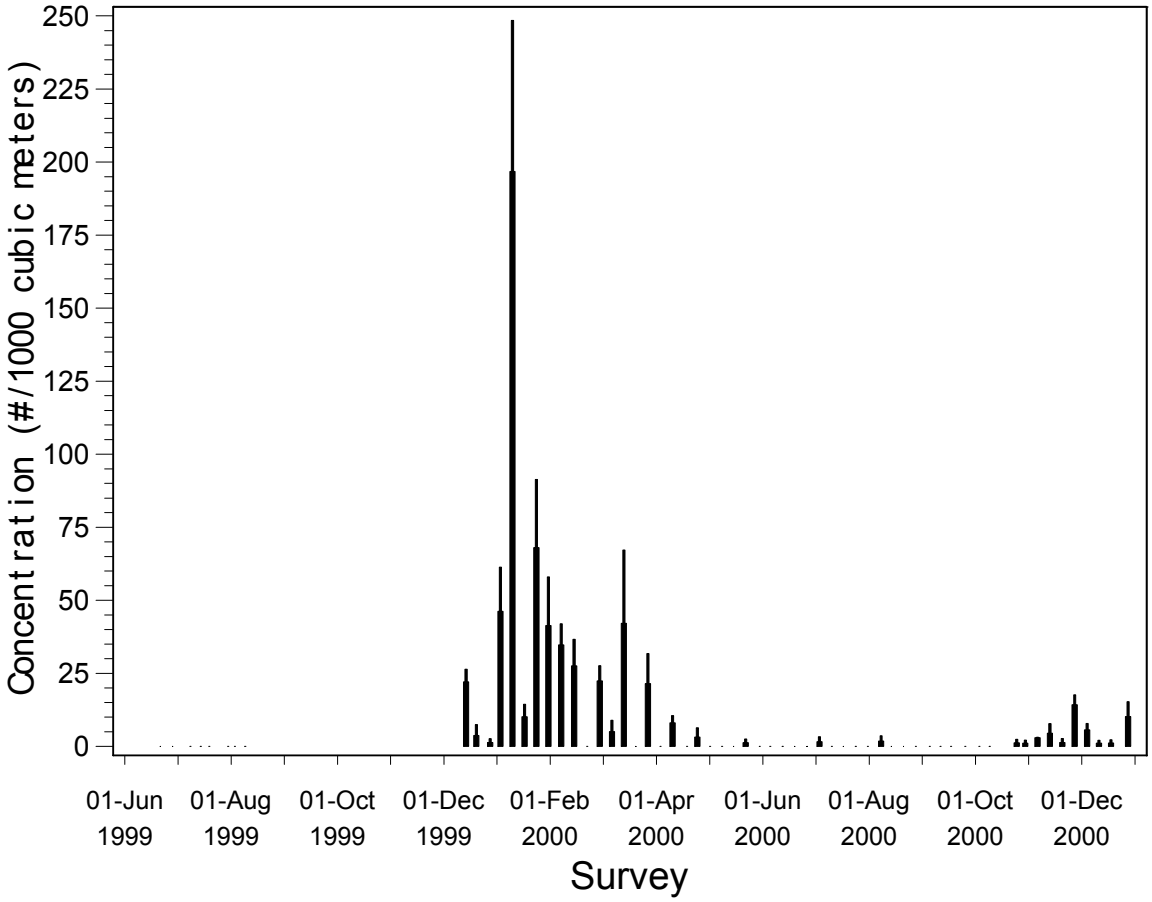


Figure 3-32. Weekly survey mean concentrations of larval jacksmelt collected at the MBPP intake station with standard error indicated (+1 SE). Weekly surveys were collected from June 21 through August 10, 1999 and from December 14, 1999 through December 29, 2000.

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

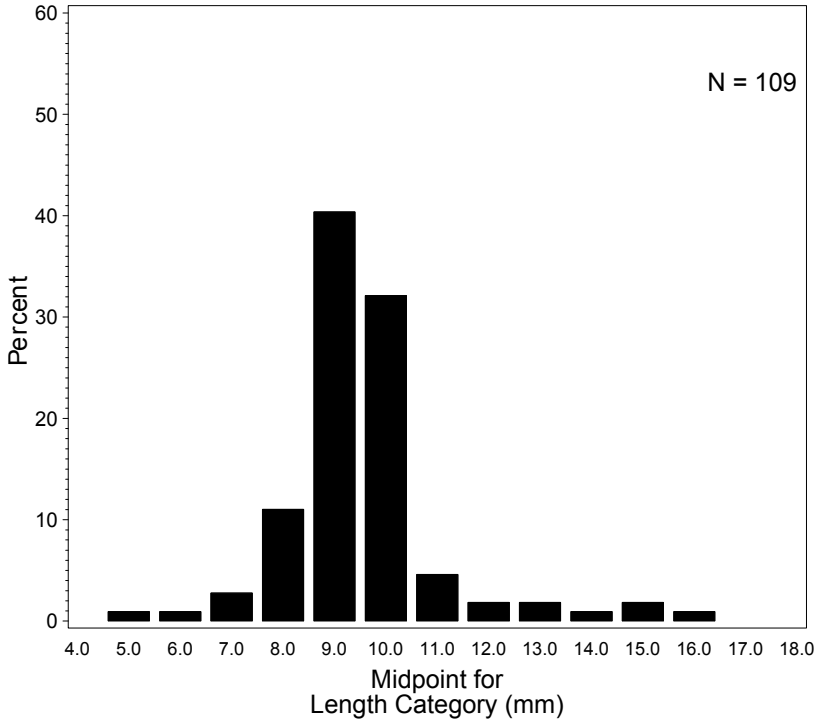


Figure 3-33. Length frequency distribution (mm) for jacksmelt larvae collected at the MBPP intake station from January – December 2000. The frequency distribution is based on the lengths of a representative sample of approximately 100 larvae.

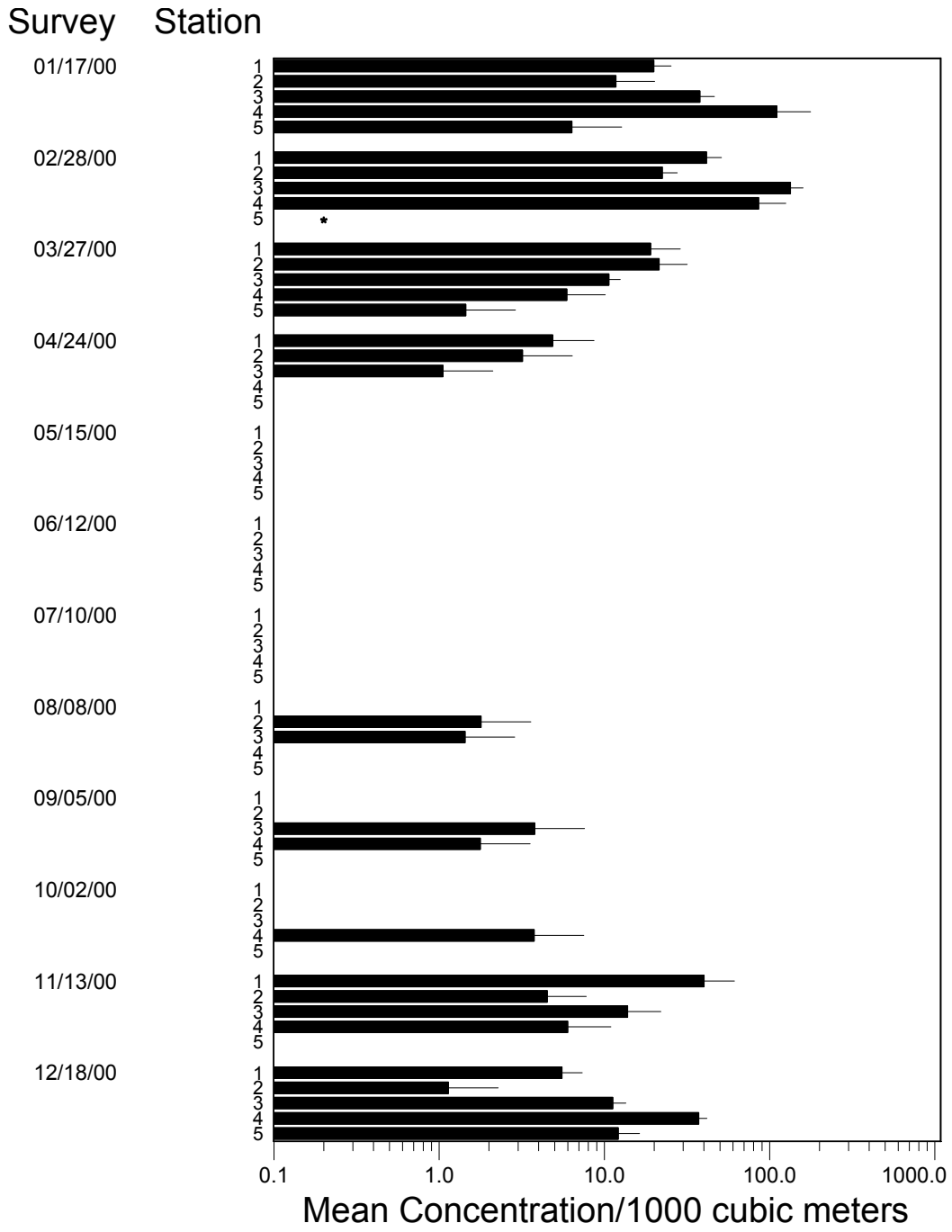


Figure 3-34. Mean larval jacksmelt concentration in monthly paired surveys at the MBPP intake (Station 2), Morro Bay source water (Stations 1, 3, and 4), and Estero Bay (Station 5) from January – December 2000 with standard error indicated (+1 SE).

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.

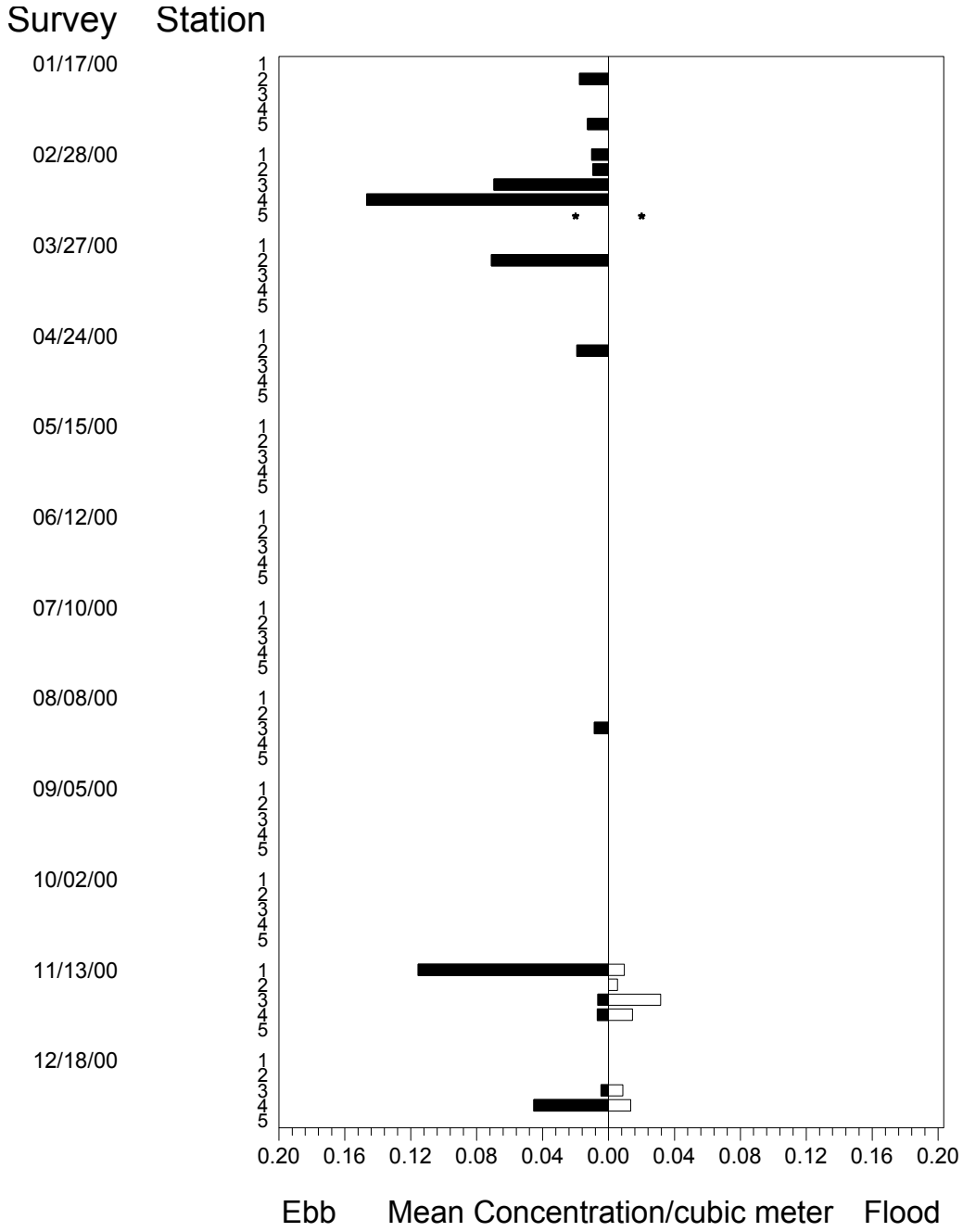


Figure 3-35. Mean concentration of larval jacksmelt from monthly paired surveys by tidal current (ebb – solid bars; flood – clear bars) and sampling station (Morro Bay stations 1–4 and Estero Bay Station 5) from January – December 2000.

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.