

Silversides, Smelt, and the Slough of Dreams: Who Will Come if We Restore It?

William A. Bennett
University of California
Bodega Marine Laboratory
P.O. Box 247
Bodega Bay CA 94923

Unlike many other species, Delta Smelt (*Hypomesus transpacificus*) abundance is not strongly associated with seasonal freshwater outflow or position of the low salinity zone, frustrating management and restoration planning in the San Francisco Bay-Delta estuary. One potential complicating factor is that exotic Inland Silversides (*Menidia beryllina*) may be important in regulating the abundance of Delta Smelt since this population crashed in 1981. Inland Silversides, though an unintentional and fairly innocuous addition to the Delta's food web, may have a substantial effect as intraguild predators of Delta Smelt, by consuming larvae and competing for resources with juvenile and adult Delta Smelt. Several lines of evidence are presented to support this hypothesis.

- (1) The two species are ecologically very similar.
- (2) Inland Silversides are notoriously efficient colonizers and competitors elsewhere in the United States.
- (3) Inland Silversides are known to often occur in schools near the shoreline in Delta Smelt spawning habitat.

- (4) Inland Silversides have been shown to be very efficient predators of Striped Bass (*Morone saxatilis*) larvae during experiments using large enclosures deployed in Suisun Marsh.
- (5) Analyses of monitoring data indicates that abundances of Inland Silversides and Delta Smelt are negatively correlated during years of low freshwater outflow.

Seasonal freshwater outflow may influence the degree of co-occurrence between the species, such that the effects of Inland Silversides may be greatest when the low salinity zone is positioned landward. While such evidence indicates the potential benefit of maintaining adequate freshwater outflow to transport young Delta Smelt away from habitats occupied by Inland Silversides, it also suggests caution be used in the design and implementation of habitat restoration projects, because they may disproportionately benefit exotic species, including Inland Silversides.