58-13 Invaders Helping Invaders: Expansion of Largemouth Bass in the Sacramento-San Joaquin Delta Facilitated by Brazilian Waterweed, Egeria Densa

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While numerous pelagic organisms in the Sacramento-San Joaquin Delta have declined precipitously in recent years, abundance of non-native centrarchids in the littoral zone has increased substantially. Between the 1980s and the early 2000s, the abundance of non-native centrarchids increased dramatically. In just the last half-decade, largemouth bass (*Micropterus salmoides*) populations specifically have continued to increase. These sharp population inclines have been concurrent with a dramatic expansion of introduced species of aquatic macrophytes, particularly Brazilian waterweed, *Egeria densa.* These two changes in the biotic community of the nearshore zone of the Delta are now considered important indicators of an ecological regime shift for the estuary. The aims of this study were to address potential mechanisms for the population increase in largemouth bass by determining abiotic and biotic factors influencing their distribution and abundance in the Delta, and to describe the diet composition of largemouth bass across seasons. Specifically, we address the hypothesis that the expansion of *Egeria densa* supports larger bass populations. We conducted bimonthly boat electrofishing surveys and characterized aquatic macrophyte species composition and biomass at 33 locations throughout the Delta for two years (October 2008 – October 2010). Diet samples were collected from both juvenile and adult largemouth bass for the entire study. Results from a generalized linear mixed model indicate that areas with relatively high biomass densities of *Egeria densa* support greater abundances of both juvenile and adult largemouth bass. We hypothesize that increased biomass of submerged aquatic vegetation promotes bass growth due to higher concentrations of food resources. Indeed, adult bass diet is composed primarily of vegetation-associated prey (e.g. sunfish and crayfish) throughout the year, suggesting that foraging excursions into pelagic areas are rare. Juvenile bass subsist on aquatic invertebrates that are also

associated with submerged vegetation. We test our hypothesis with a bioenergetic model, comparing bass growth and prey energy density between sites with varying densities of *Egeria densa.* This study provides new insight into how submerged vegetation may provide a mechanism for population increases for largemouth bass in the Delta, as well as a quantification of biological relationships in a new ecological regime for the system.

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