

RECRUITMENT DYNAMICS OF TWO ECOSYSTEM ENGINEERS COULD DRIVE SHELLFISH POPULATIONS IN U.S. WEST COAST ESTUARIES

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Two species of burrowing shrimp, *Neotrypaea californiensis* and *Upogebia pugettensis* are important members of intertidal mudflat communities in US West coast estuaries. Both species act as ecosystem engineers and influence the presence of other structured habitats and suspension feeding bivalves including cultured species. We have monitored populations of these shrimp in Willapa Bay, Washington for two decades and in Yaquina Bay, Oregon since 2002. Densities of both shrimp species were either increasing or stable through the mid 1990's in Willapa Bay and then began to decline. *U. pugettensis* are now almost absent in Willapa Bay and many other estuaries along the West Coast due in part to the introduced parasitic isopod, *Orthonoe griffenis* which compromises reproduction. Recent surveys of *N. californiensis* populations however, suggest that they too declined over this decade. Since both shrimp have pelagic larval stages that develop in the coastal ocean, we asked whether inter-annual fluctuations in larval survival and estuary recruitment influenced adult shrimp populations and consequently the distribution of shellfish. High recruitment levels for both shrimp were observed in Willapa Bay through the mid 1990's, but a period of about 10 years lapsed with very low recruitment. This loosely correlates with the decline in adult shrimp density in that estuary and we found relationships between recruitment and the abundance of older shrimp in both estuaries. Evidence suggests that the presence of shrimp also influences the distribution of some species of large suspension feeding bivalves in these estuaries, so we suspect these trends in shrimp populations link directly to long term trends in bivalve shellfish resources.