

Pacific Northwest tide channel utilization by fish as an ecosystem service

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Background/Question/Methods:

Saltwater marsh tide channels are considered to be important in the ecology of estuarine fish serving both as a refuge and as a provider of enhanced food resources. However, this presumed function of tide channels in Pacific Northwest estuaries has received little study. The channels are typically only intermittently available to the fish because of the region's large tidal range and semidiurnal tide cycle. We report on a three year study during which the populations of fish utilizing two tide channels in Oregon's Yaquina River were sampled approximately every two weeks. Sampling was done by completely blocking the channel with a modified fyke net at high tide, and then enumerating numbers and sizes of fish as they attempted to exit the channel on the ebbing tide. Day/night sampling over six consecutive tide cycles was done on multiple occasions. Both channels drained into areas of extensive mud flats that were typically fully exposed during low tide.

Results/Conclusions:

Fish catches in the channels were strongly dominated by juveniles of shiner perch (*Cymatogaster aggregata*) and Pacific staghorn sculpin (*Leptocottus armatus*). Larger species known to inhabit the main estuary channel were not captured. During their spawning season large numbers of juvenile clupeids, such as Northern anchovy, topsmelt, and surf smelt were also captured, but adults were rarely captured. Dungeness crab were also caught infrequently, except for one nighttime sample when an anomalously large number of individuals were captured. The day/night sampling highlighted the considerable day-night and tide to tide variability in the fish community using the channels. Further, no clear relationships between fish abundances and water parameters such as salinity and temperature were observed. We conclude that although marsh tide channels may provide an ecosystem service of refuge and enhanced food production for forage fish, there is insufficient evidence that the species captured in this study are actively selecting tide channels when the channels are available to them.