



Estuarine Crab Resource Monitoring and Assessment Project: Yaquina Bay and Alesha Bay, Oregon

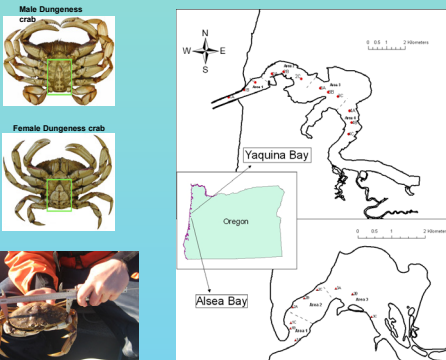
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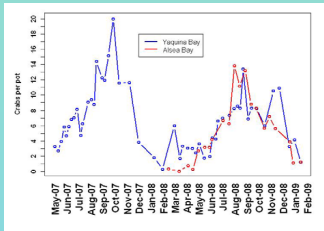


INTRODUCTION:

To describe spatial and temporal patterns that occur within estuarine crab populations, standardized periodic crab sampling has been conducted two to three times a month in Yaquina Bay since May 2007 and in Alesha Bay since February 2008. One of our goals is to characterize the crab populations in Oregon's estuaries and to measure certain environmental variables that may influence their life history or behavior. By identifying seasonal trends and annual variation in the catch rate, size distribution, sex ratio, and other aspects of the estuarine crab populations, ODFW will be more informed when management issues arise.

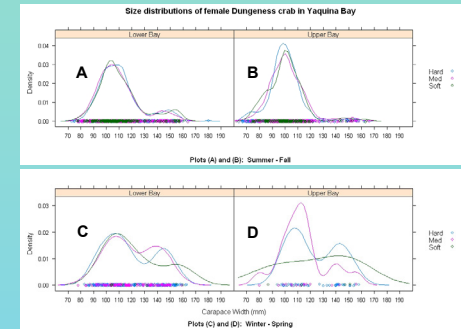


Overall Catch of Dungeness Crab



The overall catch (both sexes and all sizes) of Dungeness crab in both Yaquina and Alesha bay varies dramatically throughout the year. Peak average catch rates of 10-20 crab per pot per pull occurred from late summer through fall. The lowest catch rates (0-3 crab per pot per pull) occurred from January through May. In Yaquina Bay, an annual difference is evident with overall numbers being higher in 2007 when compared with 2008.

Size Distributions



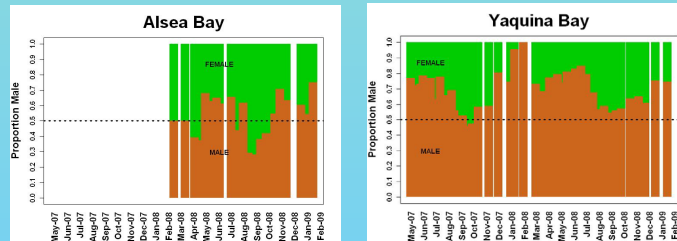
The summer/fall period represents sampling from May 2007 to November 2007.

The winter/spring period represents sampling from December 2007 to May 2008.

The distributions of carapace widths of female Dungeness crabs changed through time and by area within Yaquina Bay. During the summer/fall period in the upper bay (plot B) the size distribution exhibited a relatively normal distribution around 100 mm. Lower in the bay during that same time period (plot A), there was evidence of a second size class that, while not as abundant, was much larger (140-150 mm).

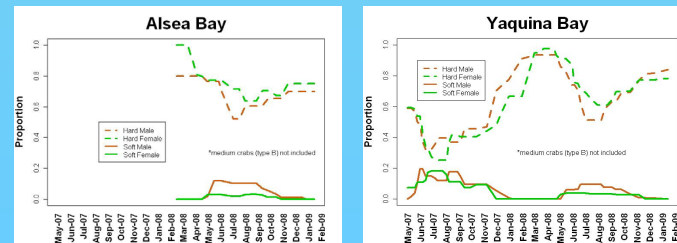
During the winter/spring time period (plots C and D), the size distributions showed several different patterns depending on their location in the bay and which shell-hardness group was being examined. Size distribution patterns showed one, two, or even four distinct size classes.

Sex Ratio



The proportion of males to females captured in our pots varied throughout the year. We saw the lowest relative number of males in both bays from August – October. The proportion of males increased in May – July and reached its highest level during January and February. The overall proportion of males was lower in Alesha Bay where it varied from 0.25 to 0.7; in Yaquina Bay it was never below 0.45 and was generally between 0.55 and 0.9.

Shell Hardness



Molting schedules dictate the occurrence of soft-shelled crab through the year. Soft-shell condition (Hard, Medium, or Soft) is determined by squeezing the anterior portion of the carapace. While this method is somewhat subjective, it does provide a relative measure of time since molting. Soft-shelled Dungeness crab (both males and females) were first captured in May and were found in significant numbers through November. That seasonal trend was evident in both Yaquina and Alesha Bay. An annual trend was also noted in that the proportion of soft-shelled crab in Yaquina Bay during the summer of 2007 was higher than in 2008.

METHODS:

Each sampling day, three crab pots were set in each sampling area. Alesha Bay is divided into three areas and Yaquina Bay, due to its longer dredged main channel, has four areas.

We measured carapace width, total weight, shell hardness, sex, parasite occurrence, epiphyte presence, and appendage status for virtually every crab (subsampling was sometimes necessary due to very large numbers of crab in some pots). We also measured salinity, temperature, and dissolved oxygen at the sediment surface in each sampling area during each soak.

Each pot was soaked and pulled three times. Soak times (~2hr), pot placement, and baiting regimens remained constant so that effort was standardized throughout the year.

RESULTS:

Species Composition



In Yaquina Bay, Dungeness crab made up 80.5% of the captured individuals overall. 18.7% were red rock crab and only 0.7% were Pacific rock crab. In Alesha Bay, Dungeness was the only species caught.

DISCUSSION:

As our database expands with time, seasonal trends will become more clearly defined. Annual differences will also be able to be quantified. We have identified seasonal patterns in overall catch per unit effort, sex ratios, molt timing, and size distribution patterns that vary through time and space in Yaquina Bay. The fact that estuaries are open systems with connection to the ocean makes it difficult to determine whether trends in our data are actual changes in the overall population, a change in the local population due to emigration to or immigration from the ocean, or even a change in the behavior of a subset of the estuarine population.

Yaquina and Alesha bays are distinctly different estuarine ecosystems due to the differences in their size and drainage, their level of marine dominance, and anthropogenic alterations. Differences between the crab populations in these two estuaries may be related to the differences in the bays themselves. For example, the fact that we do not catch any red rock crab in Alesha Bay is probably due to the lack of rocky habitat that they prefer.

By combining our pot catch data with other types of monitoring efforts (trawl collections, video data, dive transects, etc.) we hope to produce a bay crab population model that could be used for future management decisions concerning estuarine crabs.

Acknowledgements:

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