

Essential Habitat for Blue King Crab Phase I (316)

Dr. Bradley Stevens (NMFS), Dr. Loren Buck (U.A.F.)

Background: Adult female blue king crabs live primarily in the rocky nearshore areas around the Pribilof Islands and St. Matthew Island, whereas males tend to be farther offshore. Blue king crab produce eggs every two years. After molting, females mate and extrude eggs, which develop for a 13 months before hatching. Crab larvae in the Pribilof Islands generally hatch in the late winter or early spring (April-June), but crab larvae at St. Matthew Island may not hatch until autumn. Female crabs carry the empty egg cases for another year until they subsequently molt the following spring.



“The glaucothoe is a transitional stage between the larval and juvenile stages of crabs”

The population of blue king crab in the Pribilof Islands, Alaska has declined sharply over the past ten years and is now defined as overfished. However, the decline may result from natural factors that affect survival in the first year of the crab’s life. Trawling for groundfish has been prohibited in the nearshore area surrounding the Pribilof Islands since 1994, so no bycatch of crab has occurred there in 8 years. Inhabitants of the Pribilof Islands are highly dependent on local fisheries such as blue king crab for income, and their community has suffered economic hardship as a result of fisheries closures.

In their first few years of life blue king crab are restricted to limited habitats that are critical to their survival. We seek to understand the relationship between “essential fish habitat” for Pribilof Islands Blue King Crab and survival in the first year of life.

The Study: In this three-year laboratory study we will observe and record settlement behavior, habitat selection, and survival of larval, glaucothoe and juvenile blue king crabs, in a variety of habitat types. (The glaucothoe is a transitional stage between the larval and juvenile stages of crabs; it can swim like the larvae, but has claws).

During the first year of work, adult female blue king crab with eggs were obtained during the 2003 National Marine Fisheries Service Bering Sea Crab survey, shipped alive in coolers back to the Kodiak Fisheries Research Center, and held in chilled seawater until the eggs hatched in the spring of 2004. Crab larvae were cultivated in the laboratory under a variety of different diets, temperatures, and densities to identify the best laboratory conditions to raise them. The goal of phase I was to develop techniques for producing enough larvae, glaucothoe, and juveniles (approximately 1000) for research on settlement behavior which is being conducted in phase 2, starting 2005.



Conclusions: The researchers concluded that: blue king crab larvae need to feed, glaucothoe do not feed, and larvae can be cultivated with high survival using a diet of unenriched *Artemia nauplii* fed in addition to *Thalassiosira nordenskiöldii*, at 6 degrees C and a mean density of 16 zoea·l⁻¹. These results will be used to produce large numbers of juvenile crab for laboratory research. A modification of this technique might someday be used to increase the stock of blue king crab.