

From the Bay and Back Again

The life cycle of the blue crab

By Brenda K. Davis

The blue crab embodies a unique life experience for aquatic animals in the Chesapeake Bay.

Unlike finfish, this invertebrate has a hard exoskeleton and must *molt*, or shed, its shell in order to grow. As you can imagine, this process puts the crab in a vulnerable situation as it loses its protective hard shell and becomes a soft crab—a top menu item on many predators' lists, including ours.

Before a crab can achieve this delectable point in its life, it must survive a gauntlet of challenges from the mouth of the Chesapeake Bay out into the Atlantic Ocean and back up the bay toward Maryland.

Spawning

We might say that the life cycle process begins with the *terminal*, or final molt, of an adult female crab. Just before this

occurs, a male will cradle the soon-to-shed female and carry her to a protected area. These paired crabs or *doublers* are a common sight in Maryland waters in the late summer. Once she molts, they mate while she is in the soft shell stage.

The male continues to cradle and protect her until her new shell hardens. Even though mating has occurred, the eggs are not yet fertilized. The female stores the sperm and delays fertilization until water temperature, salinity, food availability and other environmental conditions are favorable for the survival of her offspring.

When the doublers separate, the female joins other recently matured females in the fall to migrate to the mouth of the bay, while the male continues to search for other mates. After mating, the female

will not molt again. The male will continue to shed throughout his lifetime.

Development

Crab eggs need a salinity of at least 18 parts per thousand to survive. Crab larvae need the higher ocean salinities of more than 30 parts per thousand in order to endure. When a female crab makes it to the salty lower bay, she fertilizes the eggs and develops an external sponge-like egg mass containing more than a million eggs. In fact, a female crab can produce more than one egg mass from a single mating event.

The eggs hatch into a microscopic first larval stage called zoea, which are swept out to the Atlantic Ocean by the bay's

currents. It takes about 31 to 49 days for the zoea to transform into *megalops*, the next larval stage. At this phase of development the larvae can crawl along the bottom and feed on tiny fish larvae as they find their way back to the bay.

After six to 20 days, megalops metamorphose into the first crab stage. A tiny juvenile crab measures just one-fifth of an inch from point-to-point, with claws capable of preying on small fish and even other baby crabs. This tiny crab will molt often and grow rapidly, reaching maturity within 18 months, to bring the cycle full circle.

Survival

As you can imagine, the journeys up and

down the Chesapeake Bay for both juvenile crabs and spawning adult females are not an easy trip. The blue crab life cycle can cover the entire Chesapeake Bay, and is finally dependent on the currents of the near shore ocean. This complexity means the number of little crabs returning is highly variable. Other environmental factors such as water temperature, the abundance of predators and the amount of protective subaquatic vegetation also impact how many crabs survive to reproduce and keep the cycle going.

Management

Maintaining a healthy blue crab population means preserving a robust spawning female population.

For this reason, Maryland shares a bay-wide commitment

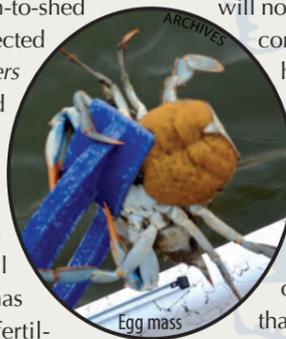
with Virginia and the Potomac River to conserve spawning females by managing the harvest and protecting vital spawning grounds.

Fortunately for us, blue crabs are a fast-maturing, prolific species with a high reproductive capacity, so the population has the ability to rebound quickly under favorable environmental conditions so that they can remain a keystone of our summer diet. ■

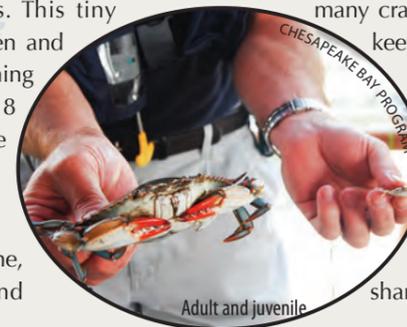
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Brenda K. Davis is the blue crab program manager with the Maryland Fisheries Service.



Egg mass



Adult and juvenile

ADULT

MATE

MIGRATE

EGG

ZOEAL

MEGALOPE

JUVENILE



Soft crab



Doublers



Developing crabs next to adults



Juvenile