



Life History and Habitat Needs

Geographic Range: Horseshoe crabs range from Maine to the Gulf of Mexico, but are most abundant from New Jersey to Virginia with their center of abundance around Delaware Bay.

Movement/Migration: Adults migrate inshore to intertidal sandy beaches to spawn in the spring. In the fall, adults move to deep bay waters or migrate to the Atlantic continental shelf to overwinter.

Spawning: Spawning generally occurs on protected sandy beaches from March through July, with peak activity occurring on the evening new and full moon high tides in May and June. Delaware Bay has the largest concentration of spawning horseshoe crabs.

Habitat Use: The horseshoe crab is a benthic or bottom-dwelling arthropod that utilizes both estuarine and continental shelf habitats.

Spawning Habitat — Spawning adults prefer sandy beach areas within bays and coves that are protected from wave energy. Horseshoe crabs spawn multiple times per season. Egg development is dependent on temperature, moisture, and oxygen content of the nest environment. Spawning habitat varies throughout the horseshoe crab range. In Massachusetts, New Jersey, and Delaware beaches are typically coarse-grained and well-drained as opposed to Florida beaches, which are typically fine-grained and poorly drained. Optimal spawning beaches may be a limiting reproductive factor for horseshoe crabs because they typically select beaches based on geochemical criteria. For example, results from a geomorphology study conducted along the New Jersey side of the Delaware Bay estimated that only 10.6 percent of the New Jersey shore adjacent to Delaware Bay provided optimal horseshoe crab spawning habitat and only 21.1 percent provided suitable spawning habitat.

Nursery Habitat — The shoal water and shallow water areas of bays (e.g., Delaware Bay and Chesapeake Bay) are important nursery areas. Juveniles usually spend their first two years on intertidal sand flats. Older juveniles move out of intertidal areas to a few miles offshore, except during breeding migrations.

Adult Habitat — Adults are exclusively subtidal, except during spawning. Specific requirements for adult habitat are not known. Although horseshoe crabs have been taken at depths >200 meters, scientists suggest that adults prefer depths <30 meters. During the spawning season, adults typically inhabit bay areas adjacent to spawning beaches and feed on bivalves. In the fall, adults may remain in bay areas or migrate to the Atlantic Ocean to overwinter on the continental shelf. Deep water areas are used by larger juveniles and adults to forage for food.

Threats to Habitat

- Coastal erosion
- Human development (particularly shoreline stabilization structures such as bulkheads, groins, seawalls and revetments)
- Sea level rise/land subsidence
- Channel dredging
- Contaminants such as mosquito larvicides applied in coastal marshes
- Oil spills in spawning areas

ASMFC Habitat Areas of Particular Concern

Nearshore, shallow water intertidal flats are important habitats for juvenile development. Beach areas that provide spawning habitat are important areas for adult horseshoe crabs. The spawning beaches within Delaware Bay are critical because they support the largest numbers of spawning horseshoe crabs. Prime spawning beaches within the Delaware Bay consist of sand beaches between Maurice River and the Cape May Canal in New Jersey, and between Bowers Beach and Lewes in Delaware. Prime spawning habitat is widely distributed throughout Maryland's Chesapeake and coastal bays, including tributaries. In the Chesapeake Bay, spawning habitat generally extends to the mouth of the Chester River, but can occur farther north during years of above normal salinity levels.

Recommendations to Improve Habitat Quality

- Identify spawning and nursery habitat and include it in state ASMFC annual reports. Categorize and prioritize important horseshoe crab habitat (both spawning and nursery habitat) within areas of state jurisdiction.
- Ensure that spawning and nursery habitat is conserved, and the quality and productivity is maintained
- Consider obtaining land adjacent to critical spawning beaches through acquisition, deed restrictions, or conservation easements to ensure the long-term protection of these beaches
- Reduce human disturbance such as all-terrain vehicles and beach watercraft on spawning beaches during the spawning season

Habitat Research Needs

- Determine beach fidelity by horseshoe crabs to determine habitat use
- Identify important juvenile habitat and document extent of use
- Better assess the long-term and short-term benefits and potential adverse impacts from beach nourishment projects on horseshoe crabs

Additional Information

Horseshoe crabs are managed under the Interstate Fishery Management Plan for Horseshoe Crab (1998), and under Addenda I (2000), II (2001), and III (2004), which can be found on the ASMFC website at www.asmfc.org or by contacting the ASMFC Habitat Specialist at (202) 289-6400.