The Wonder of Chatham's Salt Marshes

by Gerry Stahl
Chair of CCF Salt Marsh Task force

Gifts from salt marshes

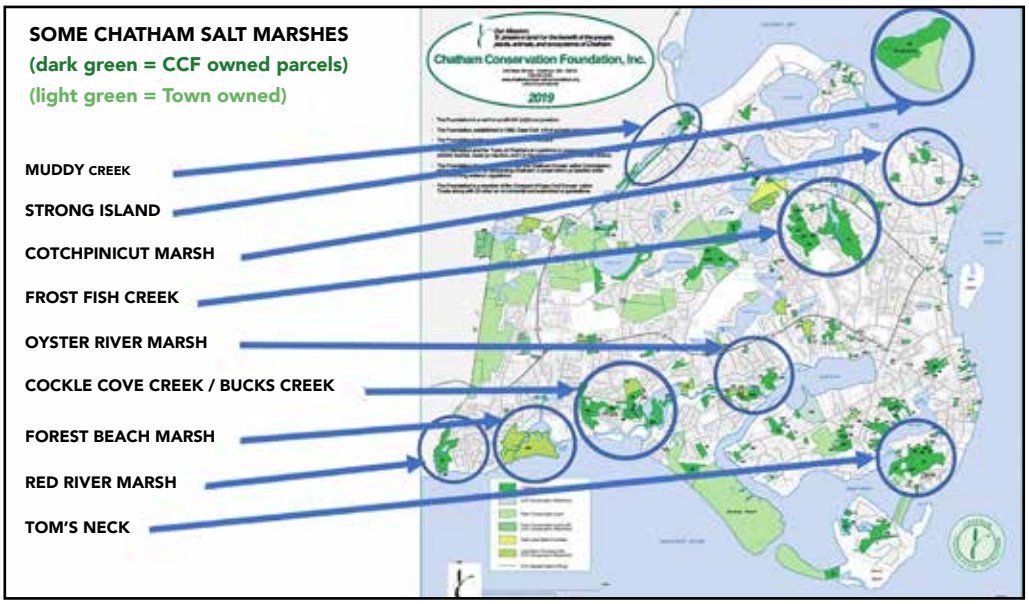
Salt marshes are the lifeblood of Chatham. Much as your arteries bring salty blood to your body parts and flush away toxins, the salt marshes of Chatham allow vital services to flow in and out with the tides:

- **Filtering pollutants and other harsh chemicals in the watershed before they reach the ocean.**
- **Absorbing carbon dioxide and other greenhouse gases that fuel climate change.**
- **Protecting coastal homes from storm impacts by dissipating surging wave action.**
- **Providing habitat for many species of fish, shellfish, migratory birds.**
- **Responding to sea-level rise by building marsh elevation and migrating upland.**

Preserving the land of the salt marsh

Chatham's marshes were frequented by the Wampanoag natives, who enjoyed the plentiful fish and shellfish there. Later European settlers adapted the marshes for boating and agriculture. Eventually, roads and housing cut off tidal flow and many marshes were filled in for farming. Most of Chatham's major salt marshes were converted to cranberry bogs in the 1800s.

Since 1962, (CCF) has been acquiring properties in Chatham and protecting them from development and preserving their natural beauty. Many of the land donations are in and around salt marsh.



CCF has successfully protected and preserved important and beautiful marshes in Chatham. However, in the face of tidal restrictions, invasive weeds and climate change, a more active approach is called for. So CCF formed a Salt Marsh Task Force and has begun to work with the Association to Preserve Cape Cod (APCC) and other non-profit and governmental agencies to monitor and restore salt marsh health, initially targeting Frost Fish Creek and Cockle Cove/Bucks Creek.

The flow of tides through the salt marsh

Tides roll into salt marshes every 13 hours. Their depth and penetration vary depending on the relative positions of the moon and sun, as well as weather and marsh conditions. They flush nutrients and small creatures into the marsh and then out to sea. This creates an active basis for the chain of life, particularly important to the fishing industry of Chatham.

Monitoring the health of a marsh begins with identifying tidal restrictions, such as damaged culverts, which constrain the eco-system processes which support flora and fauna that are adapted to periodic salt-water flushing.

Salt Tolerant grasses of the marsh

The most visible feature of a salt marsh is its vegetation. Flora in marshes is determined by the saltwater tides: only specialized grasses and reeds can thrive in daily flooding and high salinity. Where marshes are well flushed by the tides, "saltmarsh grass" (spatina alterniflora) dominates, creating flowing waves of green. Toward the higher ground around the edges, "salt meadow grass" (spatina patens) grows somewhat higher.

Where the tides are restricted or the salinity is reduced by mixing with fresh water from creeks, springs or runoff from roads and lawns, a non-native "common reed" (phragmites australis) can establish an invasive presence, which can out-compete native plants and be hard to control.

Plants observed in healthy local marsh areas include: "spike grass" (distichlis spicata), "black grass" (juncus gerardii) and "cattails" (typha angustifolia). Areas with more

Photo by Matthew Hamilton.

Researchers from CCF and APCC cataloging plant coverage in the marsh.

brackish water have more diverse flora, including bordering shrubs that are not specialized for marshes.

Inhabitants of the salt marshes

Many birds frequent the marshes, some during migrations. Over 150 have been documented around Frost Fish Creek. At Cockle Cove marsh one can often see ducks, great blue heron, egrets or osprey soaring across the sky. Hidden in the brush, one can also find "saltmarsh sparrows"—an important reassurance of healthy salt marsh.

Tides pump nutrients in and out between the ocean and the marsh. This is the beginning of the food chain for shellfish, fish, birds and mammals. Micro-organisms nourish the smallest life forms, which in turn feed larger and larger creatures. Many fish, shellfish and other animals spend important stages of their lives in the marsh. The abundance of fish in the oceans is dependent upon the foundation of the food chain in the marshes along the shores.

Salt marsh eco-system evolution

The first step in actively preserving and restoring healthy marsh is to research the current functioning of the marsh as an ecosystem involving: (1) flowing water (mixing tidal salt water and fresh ground water), (2) vegetation (marsh grasses, native and invasive reeds, bushes) (3) animal life (birds, fish, shellfish, small mammals) (4) soil (sedimentation, carbon capture, water filtering).

Photo by Gerry Stahl

A view of Cockle Cove marsh from Cockle Cove Road.

These complex and interrelated factors determine the quality of the marsh and of the services it provides to the environment and to people. A disturbance in one factor may influence others and it may take years for the multiple factors to co-evolve to a stable state, making restoration of marsh health a complex, slow and costly process.

Discoveries in Cockle Cove

Fiddler crabs are popular salt marsh inhabitants—for instance around Ridgevale Beach. However, our marsh research project just discovered a rare relative, somewhat larger, with red markings on their joints and favoring lower salinity waters: "brackish water" or "red-jointed fiddler crab" (minuca minax). They live further upstream on Cockle Cove Creek and Bucks Creek. Although previously observed along Buzzards Bay, this is the first documented sighting on this part of the Cape.

Photo by Adrianne Lovuolo.

The minuca minax crab has been discovered upstream in Cockle Cove.

Another exciting discovery in Cockle Cove marsh is the presence of a relatively rare native strain of phragmites. This is a non-invasive version, known as "American reed" (phragmites americanus). It does not out-compete other native plants. It is rare outside of Massachusetts and is in danger of extinction.

Chatham's future and its salt marshes

The Cockle Cove area is projected to undergo significant environmental change in the next decades, with sea-level rise and surge from increasingly harsh storms flooding the marshes, beaches and many roads and homes, unless the marshes can grow and migrate in response to the changes. We want to ensure that there are areas for the marsh to migrate to as the sea level rises, so we try to own and protect adjacent wetlands.

As stewards of the land, we need to track the marsh eco-systems over time. We want to monitor the presence of native plants, fish, birds and animals, so we know if they are continuing to thrive. We also want to optimize the growth of salt marsh grasses that sequester carbon.

Preserving healthy marshes is the most effective way to lower the carbon footprint of Chatham. Healthy salt marshes are key to Chatham's future economy, climate change resilience and natural beauty.

Photo by Gerry Stahl

Native phragmites in Cockle Cove marsh.