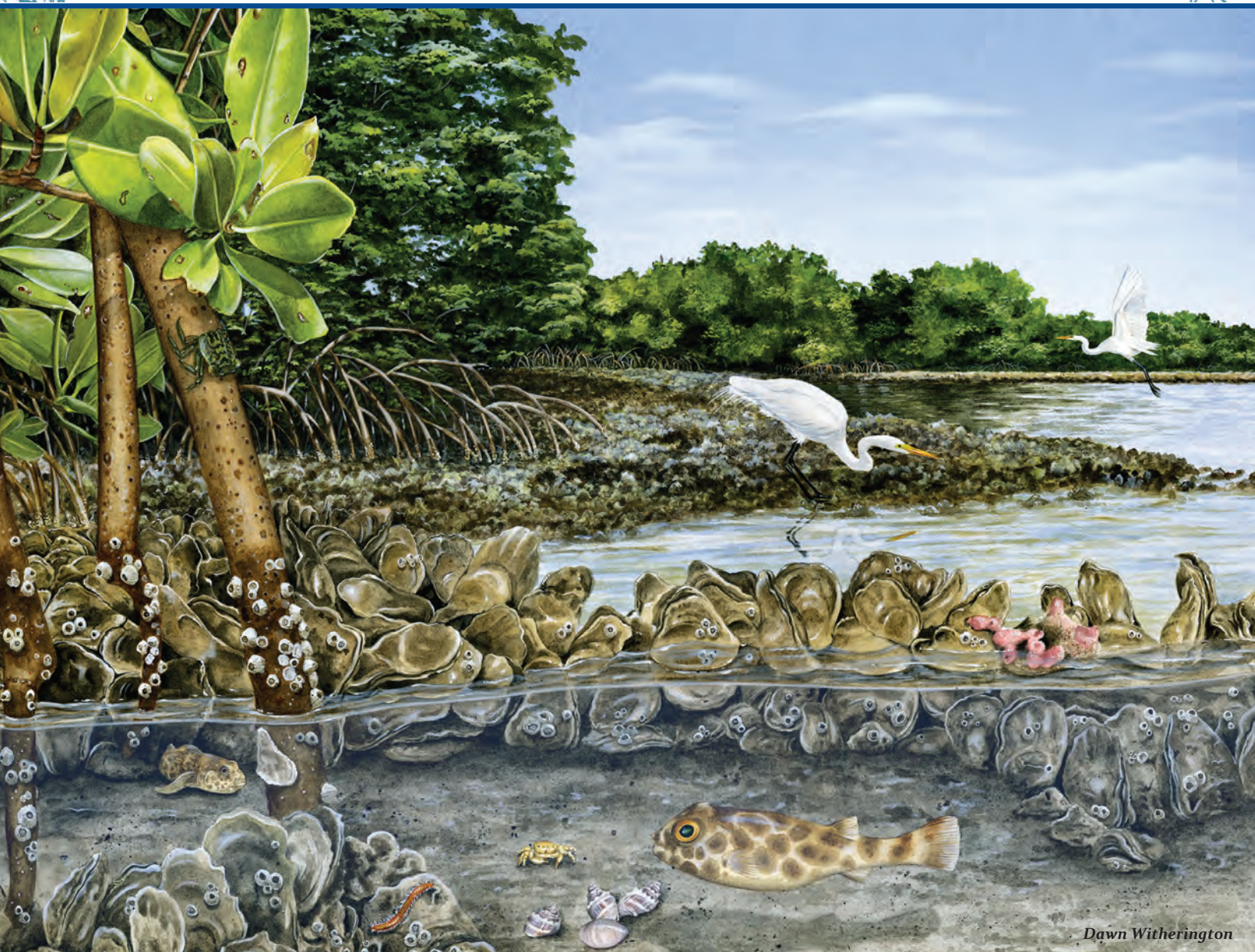
THE MAGAZINE OF THE COASTAL & HEARTLAND NATIONAL ESTUARY PARTNERSHIP

HARBOR HAPPENINGS

Uniting Central and Southwest Florida to protect water and wildlife

Restoration on the Half Shell

Oysters, mussels and clams are nature's water filters—cleansing up to 50 gallons apiece every day! When we lose them, water quality declines. However, in replanting oysters and restoring more natural water flows to maintain the salinity needed for healthy shellfish populations, we are improving water quality and creating aquatic habitat for a number of other species. Learn in this issue what the Coastal & Heartland National Estuary Partnership is doing to support our shellfish, as well as other things we are doing, and can do, to protect and restore our waterways in this region.



Dawn Witherington

Executive Director Update

Jennifer Hecker

The Coastal & Heartland National Estuary Partnership (CHNEP) is excited to share the completion of our new collective Comprehensive Conservation and Management Plan (CCMP). This 2019 strategic plan (pictured right) took nearly two years to draft with extensive input from our committees, volunteers and the public. Thank you to all of you who lent your expertise and time to helping us craft a comprehensive set of actions and activities to chart our collaborative efforts.

We now are focused on developing supporting strategies on scientific monitoring, fundraising, and communications to assist our implementation of the Plan. We encourage each of you to take a moment to weigh in on our Communications Strategy, which we are presently seeking public input on. You have a sense of how to effectively reach and communicate with members of your community; information that is helpful for us to consider in how we implement our future public outreach and engagement initiatives.

Our detailed work plans and budgets for the next two years include funding and kicking off numerous new research, restoration, and environmental education initiatives. Keep an eye out for more information about these in our upcoming annual calendar and on our website, where you will be able to find information about all the exciting new resource protection and restoration projects we are conducting throughout the CHNEP area.

We are also busily preparing for the upcoming season where we have big events like the 20th

Nature Festival, as well as our monthly volunteer events and numerous outreach events planned all across Central and Southwest Florida. If you have an interest in working with us to help spread environmental education and offer fun activities to involve people in conservation, please sign up for one of our upcoming volunteer opportunities.

Finally, we are very pleased to announce that the CHNEP in partnership with the South Florida Water Management District, was successful in obtaining the first Natural Resources Damage Assessment award relating to the Gulf of Mexico BP Oil Spill in Southwest Florida. CHNEP is the technical project manager and is proud to enable this regional multi-jurisdictional project (crossing two counties and two water management districts) to advance for more natural flow and better water quality in our region. We will be sharing more information about this exciting project as it kicks off in the next few months.

We have enjoyed a summer of better water quality thus far, but we must remain vigilant in our efforts to address the systemic issues if we are to truly restore our waters to be the environmental treasures and economic engines they can be.

Thank you for your continued support,

Jennifer Hecher

Welcome to Our New Conservation Associates!

CHNEP has been fortunate to have talented environmental professionals interning with us in our Conservation Associate program. Most recently, we have had three additional Conservation Associates join our team to assist us through fall: Coral Keene, Sheri Leibman, and Sierra Moen.

Coral came to CHNEP after a recent internship with the Florida Fish and Wildlife Conservation Commission, working to protect marine mammals. She looks forward to applying her experience and Bachelors in Biology to continue to work in marine mammal research . "CHNEP is presenting me with opportunities to learn new skills while making an impact in the community and its environment. I am very excited to be working with this team and can't wait to see what the future holds."

After years as a successful financial professional, Sheri decided to follow her passion for the environment in obtaining a Bachelors in Environmental Studies and embarking on a new environmental career. "Having an opportunity to work with CHNEP and its partners provides hands-on experience and exposure to a lot of environmental disciplines, which is very helpful to new environmental professionals such as myself."

Sierra started with CHNEP in the Spring after finishing her Bachelors in Environmental Policy and a year of community organizing work. "I really enjoy working with CHNEP because it combines of my love of the environment and interest in working with volunteers to raise awareness on important issues affecting our plants, animals and ecosystems."

Seeking Your Input

CHNEP has created a draft Communications Strategy to outline our strategy to reach the various audiences we serve.

Please go to www.chnep.org/communications-strategy today to provide your comments for consideration in the finalization of this document.

Your input is valuable, thank you for sharing it.

2019 Nature Festival

CHNEP is proud to host the 20th annual Nature Festival at Laishley Park on Saturday, November 16th!

We are presently seeking environmental education exhibitors, nature art or native plant vendors, volunteers and others to participate. If interested, please search for CHNEP Nature Festival on Eventbrite.com or on CHNEP.org to learn more and sign up today!

Harbor Happenings, Summer 2019: Volume 23, Issue 3

CHNEP publishes this free educational magazine on recycled paper. Sign up for a free subscription on our website — **www.CHNEP.org**

Coastal & Heartland National Estuary Partnership
326 West Marion Ave.
Punta Gorda, FL 33950-4416
941.575.5090 • 866.835.5785

Water for Shellfish and Shellfish for Water

Our World is 70% water. That 70% water houses an enormous number of living organisms — including shellfish. If you like seafood, you are probably familiar with some of our shellfish that grow and thrive in the CHNEP area. What you may not know is that besides providing recreational and commercial value, shellfish provide important water quality and habitat value as well. Shellfish are filter feeders, meaning they naturally filter and cleanse water. During feeding, they can take in contaminants such as bacteria, viruses, and chemicals that can build up and concentrate in their tissues. It is for these reasons that shellfish are important both economically and environmentally for our region. Shellfish can be decimated when there is insufficient freshwater flows due to unnatural hydrology, resulting in salinities out of their natural range. They also can die off from red tide outbreaks. Therefore, to improve our waters, we need to maintain and improve water quality conditions needed to support shellfish.

TYPES OF LOCAL SHELLFISH

Bay Scallops

Bay scallops (*Argopecten irradians*) live in shallow, nearshore waters along Florida's Gulf coast, from Pensacola to the Florida Keys. These bivalves are usually found nestled in seagrass beds and are easily distinguished from other bottom-dwelling animals by their electric blue eyes. Bay scallops are capable of swimming by opening and closing their shells rapidly to generate thrust, which can make catching them more challenging.

Calico Scallops

Although closely related to bay scallops, calico scallops (*Argopecten gibbus*) live in deeper, offshore waters along the east and west coasts of Florida. Calico scallops are found on sandy or shelly bottoms, and their mottled pink-hued shells commonly wash ashore, providing beachgoers with colorful treasures.

Eastern Oysters

Eastern oysters (*Crassostrea virginica*) occur in coastal waters of the Atlantic Ocean and Gulf of Mexico, from Canada to Mexico. Oysters are filter-feeders and can clean large volumes of water over a relatively short period of time. Reef structures formed by oysters are complex and provide refuge for hundreds of other species, including the juvenile stages of several fishes. The bulk of Eastern oyster harvesting in Florida occurs on the Gulf coast, primarily in the Panhandle and Big Bend regions.

Hard Clams

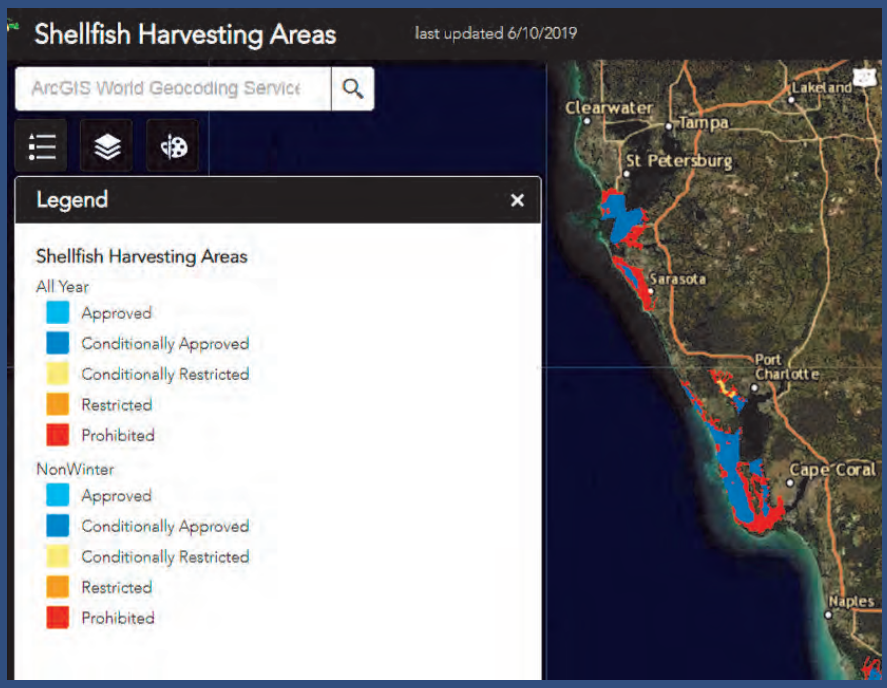
These long-lived, dense-shelled bivalves live in sandy or muddy bottoms throughout Florida waters. Two species of hard clam are found in Florida: the northern quahog (*Mercenaria mercenaria*) and the southern quahog (*Mercenaria campechiensis*). Historically, clams served as a food source and currency for Native Americans.

Queen Conch

A slow-moving, long-lived marine snail, the queen conch (*Strombus gigas*) inhabits seagrass beds in Caribbean and western Atlantic Ocean waters, including those around the Florida Keys. The conch's large, pink-lipped shell is valued among shell collectors, and its meat is a dietary staple for many Caribbean cultures.

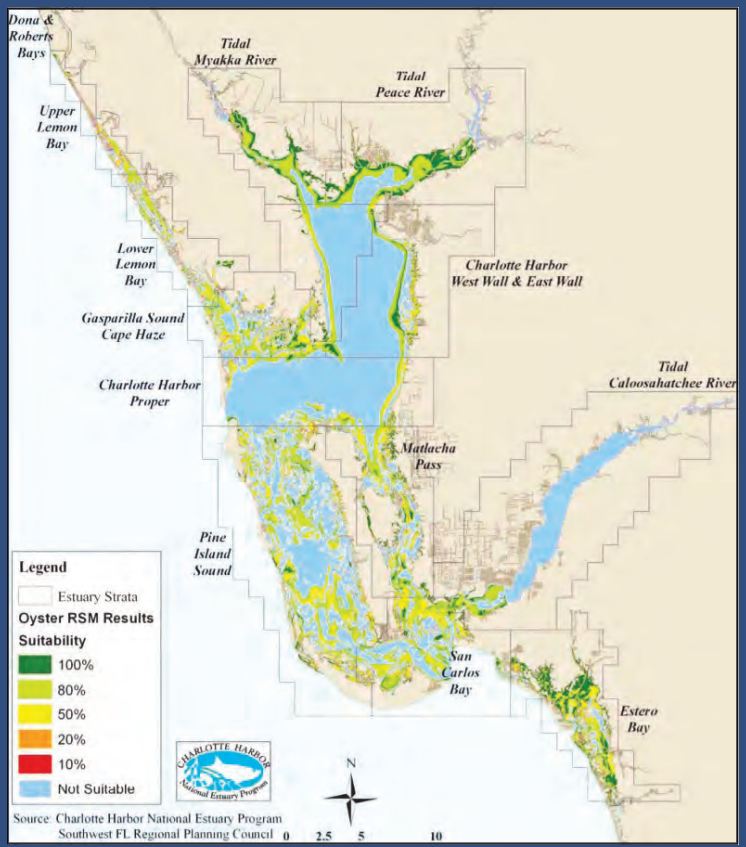
SHELLFISH HARVESTING

Shellfish such as oysters, clams, scallops, and mussels can be legally harvested throughout certain coastal regions of Florida; but are restricted or prohibited from harvesting in other areas (see map to right).



The Shellfish Environmental Assessment Section (SEAS) of the FL Department of Agriculture and Consumer Services (DACS) classifies and manages Florida shellfish harvesting. According to SEAS, the goal of shellfish harvesting area classification and management is "to provide maximum utilization of shellfish resources and to reduce the risk of shellfish-borne illness."

To protect public health and prevent the public from consuming shellfish harvested from polluted waters, SEAS closes shellfish harvesting areas when rainfall in the area reaches a certain amount. Closures are based on rainfall since nonpoint source stormwater runoff transports pollutants into waterways and marine waters where they can impact the shellfish beds. Areas may also be closed under emergency conditions such as red tide blooms, hurricanes, or tropical storms. Eating shellfish from restricted or prohibited areas has in some cases caused illness and in rare instances, even death — due to toxins the shellfish can absorb and their impacts when consumed. Therefore, it is important to check online to see if an area is safe for harvesting (https://www.freshfromflorida.com/Agriculture-Industry/Aquaculture/Shellfish-Harvesting-Area-Classification/Area-Information).



SHELLFISH RESTORATION

The CHNEP has been working with partners to restore shellfish populations in the region. In 2012, the CHNEP (formerly known as the Charlotte Harbor National Estuary Program) in partnership with The Nature Conservancy (TNC) , published an Oyster Habitat Restoration Plan that laid out a technically sound approach to identifying restoration goals and methods for restoring oyster habitat. It identified areas of high suitability for restoration (see map to left), as well as restored acre targets and potential funding sources.

The CHNEP has worked with TNC to implement portions of the Plan, including installing nine created oyster reefs along the shoreline of the Peace River. Those reefs alone have cultivated 300,000 oysters, naturally filtering approximately 19 million gallons of water a day. We hope to continue to expand these efforts to have thriving shellfish beds in all suitable areas of the CHNEP once again.

EASTERN Oyster

Crassostrea virginica

Oyster reefs are vital to our estuaries. They provide suitable habitat for small organisms and are feeding grounds for important species such as snapper and grouper. Their reefs also provide stabilization for our shorelines. Oysters remove nutrients from the water improving water quality, which is critical for seagrasses and fish.

Oyster Reefs are Important

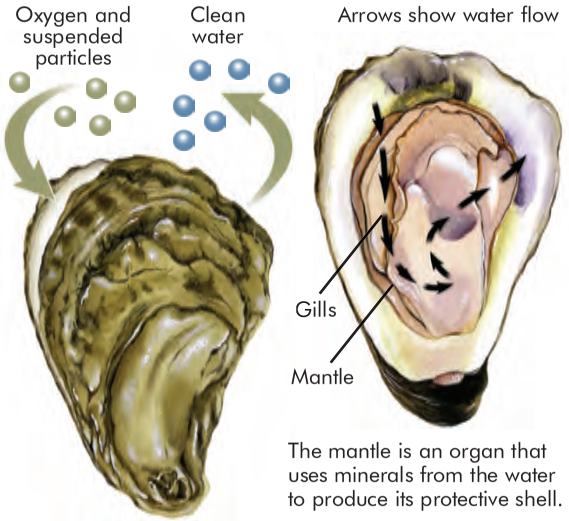
- Hundreds of species are associated with oyster reefs. They provide habitat for juvenile fish and invertebrates as well as substrate for sessile organisms.
- One adult oyster can filter up to 50 gallons of water per day contributing to the water clarity needed for seagrasses to thrive.
- Oyster reefs stabilize shorelines and reduce erosion.
- Oysters are an economically important species throughout the southeastern United States.
- Oyster reefs serve as feeding grounds for wading birds and fish such as snapper, grouper, and snook.

Habitat Requirements

Oysters thrive in brackish waters where the salinity (salt) is lower than ocean water. They need a hard surface, preferably old oyster shells, on which to grow. They rely on currents (water movement) to deliver food to them and to prevent them from becoming buried.

Filter Feeding

Oysters use their gills to absorb oxygen and strain food out of the water. One adult can strain plankton and organic matter out of the water at a rate of up to 50 gallons per day (or 1500 times its body volume). A healthy oyster reef contributes significantly to overall water clarity in the estuary.



The mantle is an organ that uses minerals from the water to produce its protective shell.

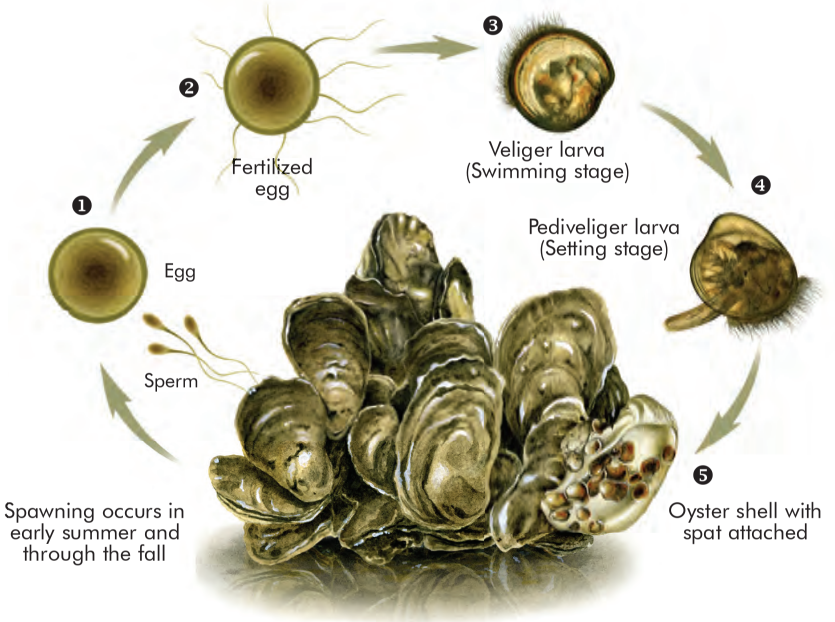
Threats

- **Physical removal**. Oyster reefs are vulnerable to over harvesting and disturbance by development.

Adaptations

Oysters are marine organisms that can live in both the intertidal (between high and low tides) and subtidal (always submerged) zones. The intertidal reefs are exposed to the air during low tide. Oysters are able to survive by tightly closing their shell until high tide returns. This adaptation allows them to avoid predation from organisms that must remain in the water (i.e. marine snails). Their hard shells also prevent many predators from reaching their soft bodies.

In most cases oysters are hermaphroditic. They begin life as a male, change to a female, then change back to a male. Oysters may go back and forth between sexes several times during their lifetime.



Life Cycle

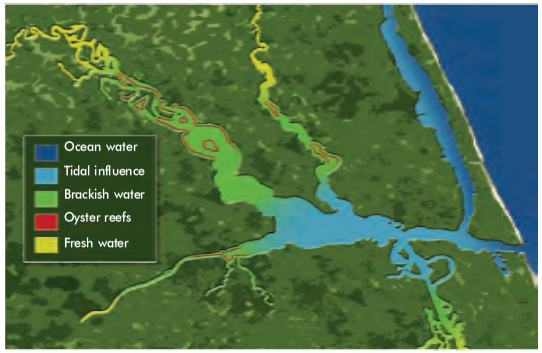
❶&❷ When water temperature warms above 68°, eggs and sperm are released into the water column where they must join together for fertilization.

❸&❹ Within 24 hours a shell and cilia (tiny hairs for swimming and feeding) develop. The larvae swim for up to two weeks before settling to the bottom.

❺&❻ Spat (juvenile oysters) must settle out onto a hard surface, preferably other oyster shells. They reach adulthood in about two years and will remain attached to the same surface for the rest of their life.

Oysters can live up to 20 years.

- **Sedimentation.** Dredging and stormwater runoff can result in the burying of oyster reefs.
- **Boating impacts.** Boat wakes can erode the shoreline and disturb oyster reefs. Boat props can drag along the bottom and dislodge oyster clumps.



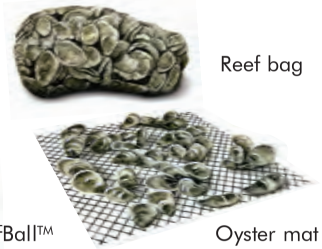
Brackish water has a level of salinity between ocean water and fresh water. Oyster reefs thrive in brackish water.

Restoration

Restoring oyster reefs is an effective way to improve water quality and provide new habitat for fish and invertebrates.

- Empty oyster shells collected from local restaurants are placed in depleted oyster reef areas to provide hard substrate for spat settlement and calcium needed for shell growth.
- Limestone, oyster mats, and artificial reef materials such as concrete ReefBalls™ are other methods being used to provide new substrate for spat to settle.

ReefBall™



Reef bag

Oyster mat

The Nature Conservancy™
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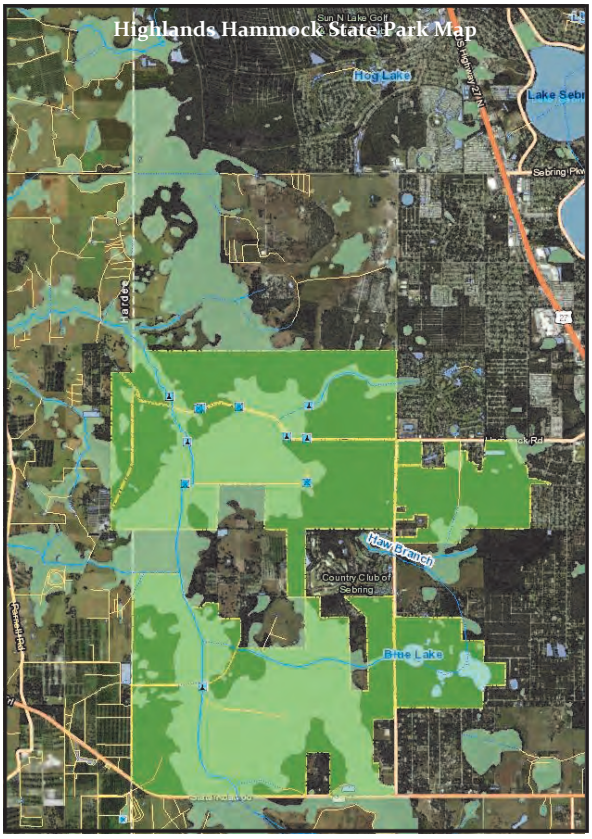
IN FLORIDA'S HEARTLAND:

Highlands Hammock

Special Contributor: Carla Kappmeyer-Sherwin

Highlands Hammock State Park, which first opened to the public in 1931, is one of Florida's oldest parks and at the inland edge of the Coastal & Heartland National Estuary Partnership (CHNEP) area. It has a wealth of natural resources and rich cultural history and it is one of the finest examples of early grass-roots public support for environmental preservation. In the late 1920s, local citizens concerned about losing the hammock to farmland, began raising money to purchase the land. With no state park system in existence at the time, a private group formed and conservation visionary Margaret Shippen Roebling donated $25,000 to purchase the land and later contributed another $25,000, with the condition the community raise $5,000 to show its commitment. The local citizenry rose to the occasion, and nearly everyone contributed something, ranging from one dollar, which was a real sacrifice in the hard times of the Depression, to $1,000. With financial assistance from the Roebling family, the property was acquired, and trails and basic facilities were constructed.



The Civilian Conservation Corps (CCC) was one of President Franklin Roosevelt's most successful New Deal programs to put unemployed young men to work. Highlands Hammock, one of eight original CCC parks, became a state park in 1935. In honoring the legacy of the men who contributed their labor and lives to the construction of our first state parks, the State of Florida Civilian Conservation Corps Museum was established at Highlands Hammock in 1994 in one of the buildings constructed by the Corps.

Located in Hardee and Highlands Counties, the park which originally consisted of 1,280 acres, has grown over the years and now has 18 distinct natural communities in its more than 9,000 acres that include tracts of scrub, pine flatwoods, sandhill, cutthroat seep, baygall, cypress swamp, hardwood swamp and the hydric hammock that was the basis for its creation. High diversity results from the variation of topography from the scrubby high ground of the Lake Wales Ridge on the eastern boundary to the wetlands of the Peace River Valley on the western boundary.

The surface hydrology of the park involves three blackwater streams consisting of Little Charlie Bowlegs Creek, Haw Branch and Tiger Branch. The waters eventually flow to the Peace River watershed. Man-made alterations to the hydrology were largely inherited as additional parcels were acquired, although some were implemented by the founders who had a moat built around the hammock due to their concerns of managing drought and controlling wildfire. At the time, conservationists were not aware of the resilience of natural communities and fire dependent ecosystems. A series of roads and fences and a canal and dike were constructed. Dams were placed in a canal to the north to stepdown the surface of the water as it moved to Little Charlie Bowlegs Creek, and a dam with removable boards was built to prevent

natural drainage and to hold water during the dry season. Another extensive canal and dike running east to west were built along the southern boundary of the park which altered the hydrology by disrupting the natural flow of surface water through this wetland. Visitors may now observe alligators, turtles, water birds, and otters on the park's tram tour as it runs through bay trees, cypress and ferns along historic "South Canal."

As Sebring is the largest city in Highlands County with a burgeoning retirement community, there are subdivisions to the northeast, east and south of the park. Urban growth west of U.S. 27 has brought paved roads, buildings, golf courses, parking lots, tennis courts, homes and driveways to West Sebring. Rain cannot soak into these hard surfaces, and the stormwater runoff eventually empties into the creeks flowing through the park. With the summer rainy season, the northeast, east and southeast boundaries may experience inundation, erosion and major washouts compounded by aging culverts in need of repair or replacement.

Stormwater runoff draining into the park on the northern boundary is responsible for major washouts and severe erosion during the summer rainy season and major storm events.

Some of Highland Hammock habitats are precisely adapted to natural drainage patterns and fluctuating seasonal water levels, so even a minimal change may result in changing the community with a loss of associated plant and animal species. Vegetative communities, soil composition and hydrology may change; and conditions may become more conducive for exotic, invasive plants to grow. The impacts of Hurricane Irma on Highlands County were severe, and the park experienced damage to buildings, trails, the campground and picnic area. Much work has been done to try to restore and recover since.

Damage to the road leading to the Primitive Wilderness Campground from stormwater runoff draining into the park via Haw Branch after Hurricane Irma was severe.

With more rare and endemic species than any other Florida State Park, Highlands Hammock is a place where a sense of wilderness is preserved — where visitors may walk the trails while Florida panther and black bear quietly pass by beneath the ancient towering oaks. To preserve and restore Highlands Hammock, cooperative funding in partnership with SWFWMD and other agencies is being sought for a baseline study of the watershed and hydrological alteration this fall. During the past three years, the park has also hosted a series of lectures sponsored by the Florida Humanities Council with funds from the Florida Department of State, Division of Cultural Affairs and the Florida Council on Arts and Culture, which have focused on topics relating to Florida history, culture and the environment.

To learn more about Highlands Hammock, go to 5931 Hammock Road in Sebring to visit the park or FloridaStateParks.org/park/Highlands-Hammock. For more information on lectures, go to floridahumanities.org/what-we-do/partnership-programs/speaker-program.

C-43 Water Quality Summit a Success!

The C-43 Reservoir is an important Everglades Restoration project being constructed to help feed additional freshwater back to the Caloosahatchee River during the dry season, when it needs additional flow. A water quality component was originally envisioned as being necessary to ensure that the water entering and stored in the Reservoir would be clean enough to return to the River.

To further the CHNEP goals of restoring the natural hydrology and improving water quality, the CHNEP organized a Caloosahatchee C-43 Reservoir Water Quality Summit to bring scientific experts, governmental leaders, private organizations and citizens together to discuss this vital issue.

Over 100 attendees as well as numerous virtual participants took part in interactive sessions on nutrient pollution reduction and water quality improvement methods, Caloosahatchee water quality conditions and projects underway, and how the public can stay engaged. Information including the presentations and videos from the summit are available at www.chnep.org/c-43-reservoir-water-quality-summit .

Bringing it Home

Practical Tips for Personal Action

This "Bringing it Home" column is focused on eating sustainable seafood. Some seafood is harvested in a manner or from areas that are very environmentally damaging. Becoming informed and choosing more sustainable seafood creates a more responsible and environmentally friendly seafood industry.

Monterey Bay Aquarium has created a free and easy Seafood Watch App that you can download to your smartphone and use when you are buying or ordering seafood. They also have state specific seafood guides that help consumers know what best and good choices are available to them, as well as what types of seafood to avoid (see graphic from Florida's below).

- **Best choices** are well managed and caught or farmed responsibly.
- **Good alternatives** are usually safe to buy, but might want to research the source further as sometimes there are concerns with how caught, farmed or managed.
- **Avoid** encompasses seafood that are overfished, lack responsible management, or are caught or farmed in ways that harm other marine life or the environment.

Go to seafoodwatch.org or other sites to learn about sustainable seafood and help make our seafood industry the best it can be!

BEST CHOICES
Barramundi (US & Vietnam farmed)
Bass (US hooks and lines, farmed)
Catfish (US)
Clams, Cockles, Mussels
Cod: Pacific (AK)
Crab: Blue (MD trotline)
Crab: King, Snow & Tanner (AK)
Crab: Stone (US)
Crawfish (US farmed)
Lionfish (US)
Mahi Mahi (US handlines)
Mullet: Striped (US)
Oysters (farmed & Canada)
Pompano (US)
Salmon (New Zealand)
Shrimp (US farmed)
Snapper: Mutton (US diving, handlines)
Squid (US)
Sturgeon (US farmed)
Tilapia (Canada, Ecuador, Peru & US)
Tuna: Albacore (trolls, pole and lines)
Tuna: Skipjack (Pacific trolls, pole and lines)
Wahoo (US Atlantic)
Wreckfish

GOOD ALTERNATIVES
Branzino (Mediterranean farmed)
Cod: Atlantic (handlines, pole and lines)
Conch (Belize, Nicaragua & US)
Crawfish (LA wild)
Crab: Blue (AL, DE, MD & NJ pots)
Grouper: Red (US)
Lobster: Spiny (Bahamas & US)
Mahi Mahi (Ecuador & US longlines)
Oysters (US wild)
Salmon: Atlantic (BC & ME farmed)
Salmon (CA, OR & WA)
Shrimp (Canada & US wild, Ecuador & Honduras farmed)
Snapper (US)
Squid (Chile, Mexico & Peru)
Swordfish (US)
Tilapia (Colombia, Honduras, Indonesia, Mexico & Taiwan)
Trout (Canada & Chile farmed)
Tuna: Albacore (US longlines)
Tuna: Skipjack (free school, imported trolls, pole and lines, US longlines)
Tuna: Yellowfin (free school, trolls, pole and lines, US longlines)

Get Involved

Join our Monthly Volunteer Events!

Our volunteer force of concerned and active citizens working to protect our area's waterways and wildlife is growing! Now at over 300 volunteers strong, our monthly events are great opportunities to learn, bring family and friends, and meet other like-minded people looking to have a positive impact in their communities.

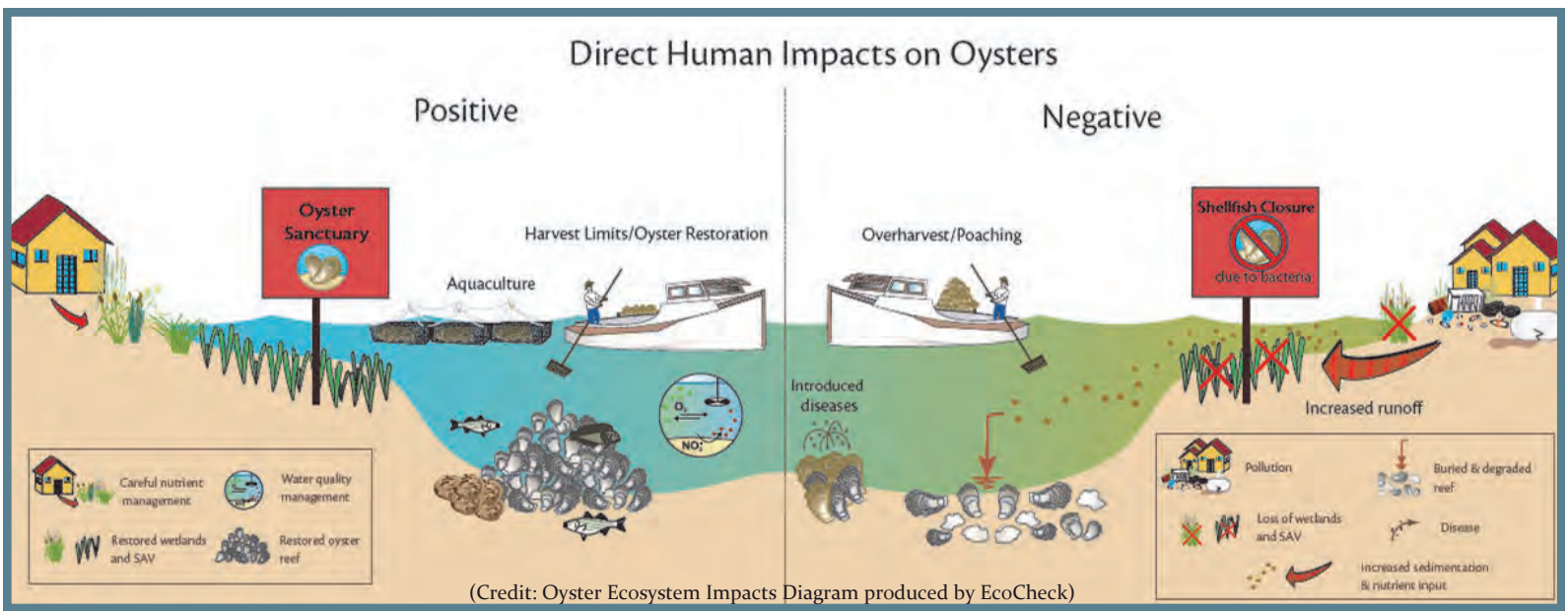
At a recent event in August (pictured above), volunteers learned about the mounting problem of garbage entering our waterways. After the presentation, they divided into several teams to collect trash and gathered over 1,000 pounds of trash - some of which was cleaned for use in building a sculpture at our upcoming Nature Festival to raise awareness on the issue of marine debris.

This is just one of many great events we have had in recent months, which have included making beeswax wraps (to use as alternative to plastic wrap in reducing plastic waste), native plant workshops, water quality testing training, horseshoe crab monitoring, and other activities to protect water and wildlife.

This fall, our upcoming free events include another clean-up in September for International Coastal Clean-up Day, bat house construction in October to boost local bat populations including endangered Florida bonneted bats, sustainable fishing clinics to teach kids basics about water quality and water pollution , and our big Nature Festival in November to provide environmental education to our residents and visitors. Please check the CHNEP events calendar on our website for upcoming free events.

Whether it is being a photographer, ambassador, educator, citizen scientist, or any other way to lend your time and talents, we could really use your help. Please sign up today to be added to the volunteer list and receive notifications on upcoming opportunities at www.chnep.org/get-involved.

326 W. Marion Avenue
Punta Gorda, FL 33950-4417



(Credit: Oyster Ecosystem Impacts Diagram produced by EcoCheck)

The CHNEP is working every day to improve conditions for aquatic life including our shellfish. Planting seagrass and supporting water quality supportive of other submerged aquatic vegetation (SAV), as well as creating oyster reefs, provides habitat for many types of fish, crabs, birds and other wildlife species. These actions also improve water quality, making our water safer for swimming, fishing, and other recreational uses.

We each have a role to play in reducing impacts to our shellfish. Whether its making sure we adhere to harvest limits while enjoying scalloping season, asking where seafood is sourced to ensure we are buying sustainable seafood, or taking actions to reduce fertilizer, plastic, and other potential water contaminants, we can all take part in efforts to ensure we have safe and plentiful seafood for future generations.