

# Sea life: It's all about real estate

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Sea life habitat in Charlotte Harbor is no different than our own neighborhood; value is driven by location, location, location.

Like us, marine organisms need shelter — a place that offers protection from the elements, competitors, and predators; a nearby source of food; and a place to raise their young. For some species, communities themselves provide protection, stabilizing habitat and reducing exploitation.

These attributes are rare in the open ocean. Nearly every available surface is rapidly colonized. From floating algae and debris to ice and even the water's surface tension, organisms — from bacteria and microscopic algae to invertebrates and fish — find ways to occupy available space. Some diatoms are especially well adapted to living on the underside of sea ice — though obviously not Florida residents.

Insects are rare in the open ocean, but one — the water strider or sea skater — has successfully adapted to life on both ocean and estuarine surfaces, even occurring thousands of miles from land.

Fishing spiders, often seen on docks, seawalls, and mangroves margins, skate easily across the water. Charlotte Harbor hosts two species: the dark fishing spider and the six-spotted fishing spider — and yes, they will eat small fish, crustaceans, and tadpoles. Even bacteria concentrate under the surface layer, including familiar bacteria like *E. coli* and enterococci.

Below the surface, plankton and swimmers dominate the water column, but once you reach the bottom, nearly every spot is colonized by specialists or opportunistic species.

Even the shifting sands of a beach host highly adapted organisms beneath the swash zone. Along the shore, birds such as herons, egrets, and ibis — and mammals like opossums, raccoons, river otters, and bobcats — hunt for food here, though they rely on safer habitats for shelter and raising young.

In marine environments, life often grows on life. Seagrasses, macroalgae, mollusks, corals, and rocky outcrops form layered housing opportunities that support extraordinary biodiversity and productivity.

Even harbor animals like manatees, dolphins, and sea turtles carry hitchhikers — barnacles, algae, crustaceans and parasites — on their bodies.

Ocean life occupies many habitats and boasts an impressive diversity of species. But aside from coral reefs, few environments rival estuaries in habitat diversity, stability, and productivity. Think of them as cities along the ocean's edge — or more famously, as the nursery of the seas. Charlotte Harbor, second only to Tampa Bay in size, is among the most productive estuaries in Florida.

## HABITAT BEGINS WITH MICROBES

The first colonizers of any estuarine substrate are generally microscopic organisms that form their own domicile—a thin slicky layer called a biofilm. Biofilms provide stability against physical and chemical stress. Their resilience is well known — even in medical science, where biofilm-associated pathogens are notoriously difficult to eliminate. In addition to providing a living matrix that supports diverse microbial communities (e.g., bacteria, algae, protozoan, and microscopic animals), biofilms serve several critical ecological functions:

- Converting nutrients into biologically usable forms,
- Conditioning harsh substrates for colonization, and
- Providing food for grazers and scavengers.

As the biofilm matures grazers become established—nematodes, polychaetes, snails, copepods, amphipods, and isopods—become prey for larger organisms, linking microbial production to fisheries.

Biofilms offer some protection, but they are readily consumed by snails, shrimp, crabs, juvenile fish, and even adults such as mullet, pinfish, killifish, mojarras and tilapia. Shorebirds like sandpipers also feed on this rich mixture of microbes and invertebrates.

## PRIME WATERFRONT PROPERTY

Any stable substrate can serve as habitat — but some are far more valuable than others.

Seagrass meadows and mangroves forest represent high value habitat/prime real estate. Floating debris, seawalls, riprap, and sticks offer less value. Silty bottoms in the open harbor and unvegetated shores have less real estate value due to low oxygen, toxic substances such as ammonia and sulfides, surface instability, and higher predation risk.

The most valuable habitats share key features:

- High surface area,
- Structural complexity, and
- Access to shelter, food, and breeding space.

In short — location matters.

Mangroves provide all of these, with intricate root systems and inputs of leaves and terrestrial organic matter. Oysters and barnacles further multiply available surface area, creating countless microhabitats and supporting some of the most diverse ecosystems in the estuary.

Oysters begin life as free-swimming larvae — more like microscopic plankton than the shellfish we recognize. Once they settle, they become oyster spat and eventually adult. Once they settle become oyster spat and adults, they transform the landscape, building reef structures that enhance habitat, stabilize sediments, and increase productivity. However, siltation and excessive freshwater can limit or kill oyster beds. Competition



Ashley Cook, Charlotte Harbor Environmental Center, teaches a group at Bocilla Island Conservancy how to construct Vertical Oyster Gardens.

PHOTOGRAPH BY LARRY LYNN



Kate Rose, Sea Grant's Charlotte County Extension agent, demonstrates Eyes on Sea Grass monitoring techniques.

VIDEO CLIP BY RYAN SMITH, SEAGRANT

from invasive species such as the green mussel can also displace native oysters.

Multiple community efforts are working to restore and protect this prime real estate. The Charlotte Harbor Environmental Center sponsors vertical oyster gardening — hands-on projects where participants build hanging shell structures that attract new oysters and marine life. Their next workshop is April 17.

Seagrass restoration is also a major, multi-agency effort. Charlotte Harbor has lost a significant amount of its seagrass over the last decade — habitat that once supported millions of organisms. If your favorite fishing spot seems empty, look first at the habitat, especially seagrass.

Programs like Sea Grant's Eyes on Seagrass offer opportunities for volunteers to get involved in monitoring seagrass meadows. The Coastal and Heartland



PICTURE PROVIDED BY SEA GRANT

Oyster beds are home to a wide variety of creatures and help purify Charlotte Harbor water.

National Estuary Partnership helps coordinate many of these efforts and serves as a hub for information and engagement.

Working alongside these partners, Heal Our Harbor also provides training and opportunities in water quality monitoring, fecal indicator bacteria, oyster restoration, wildlife and fish ecology.

The University of Florida Master Naturalist Program offers several courses on area ecology, including coastal and shore, wetlands, and uplands classes. Check out their web pages.

In Charlotte Harbor restoration isn't only about water quality — it's protecting real estate on which sea life depends.