

Integrated Pest Management

Cornell Cooperative Extension
Suffolk County

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Anti-fouling Paints and Boat Bottom Maintenance

3.3 Best Management Practices for Saltwater Invasive Species

Keep up to date by frequent reference to NEMESIS, the National Exotic Marine and Estuarine Species Information System web page

<https://invasions.si.edu/nemesis/>

NOTE: Marine worms are commonly used as bait for sport fishing, BUT:

- They are from tidal mudflats in other parts of the world, then:
 - Packed with seaweed to keep them moist and shipped all over:
 - The seaweed, if not disposed of properly, can carry invaders as well such as:
 - ♦ small crustaceans
 - ♦ juvenile shellfish
 - ♦ snails
 - ♦ other worms

Sea squirts, also known as tunicates or ascidians

- Tunicates (sea squirts, ascidians): often top of the list
 - Look like sponges but have primitive spinal cord
 - Will create new infestations as boat travels to new locations
 - Many areas of the Long Island sound are carpeted in sea squirts, with up to 80% of the sides of docks covered with them
 - Some sea squirts are solitary, some are colonial (especially one of the most invasive ones), some are blob like
 - Some squirts produce defensive chemicals and some concentrate HEAVY METALS: this greatly reduces predation
 - Sea squirts are effective and aggressive competitors
 - Sea squirts may use toxins to dominate a space and to make more space for themselves
- Nine common sea squirts in Long Island sound, seven of them are invasive
 - Invasive sea squirts can foul aquaculture gear
 - They can foul the aquaculture organisms themselves, especially bivalves
 - Their weight makes hauling gear more difficult

- They compete with aquaculture organisms for food
- Squirts may increase worms and snails thus changing the food web
- Make sure boat hulls are free of sea squirt fouls

Sea squirt *Didemnum vexillum*

- filter feeder on phytoplankton and bacteria
- shoots water from siphons when picked up
- grows on hard surfaces
- rapid growth on:
 - docks
 - pilings
 - HULLS
- outcompetes and suffocates filter-feeding bivalves such as:
 - mussels
 - scallops
 - oysters

Carpet tunicate

- introduced as a ship hull foul
- common from Maine to the south shore of Long Island
- blob-like
- yellowish to cream color, and leathery
- veined or marbled
- large, sponge like masses
 - long, flexible leaf or flag-like projections that are cylindrical and branched
- filter feeders, have large pores and when closed they look like tiny white spots
- rapid growth
- makes dense colonies that smother and reduce native aquatic organisms
- can attach to and encrust any substance it touches
 - completely changes habitat structure
- causes negative effects for the following:
 - fisheries
 - bottom fish
 - scallops
 - lobsters
 - mussels

Asian sea squirt

- leathery or club tunicate
- accidentally introduced through hull fouling and imported oysters
- cylindrical or club shaped
- thin, leathery, bumpy tunic

- disc shaped hold fast
- long as a dollar bill
- yellow, red, or brown
- competes with and displaces native species
- adversely affects aquaculture production
- solitary species but grows in dense clumps
- can outcompete other aquatic fouling species
- may reduce mussel harvest in aquaculture
- fouls ropes, rocks, and fish cages

European rock shrimp

- recent invader of Long Island Sound
- competitive
- abundant
- displaces natives
- orange or yellow spots on body, white leg joints, and neon blue claws
- body mostly translucent, with dark reddish-brown bands along the margins of body plates
- associated with docks and inshore along rocky coasts and tidepools
- often found in dense algal growths and in protected, shaded spots
- tolerant of salinities from nearly freshwater to highly saline
- tolerant of temperature ranges from 32° to upwards of 85°F

Veined rapa whelk

- predatory gastropod
- introduced with ballast water
- habitats include:
 - rocky shorelines
 - oyster reefs
 - mussel beds
 - sand
 - silt
 - eel grass beds
 - pilings
- tolerates low salinities
- tolerates temperatures of 35-95 degrees F
- heavy bodied with a wide lip
- found at depths of 1.6-82 feet
- can reach a size of about 6.5 inches
- attacks the following:
 - clams
 - mussels
 - oysters
 - scallops
- actively competes with other whelks for food and space
- negatively impacts knobbed and channeled whelks

European Green Crab

(Also known as Joe Rocker, or shore crab)

- introduced in ballast water
- pentagon shaped carapace
- 5 spines on each side of the eye
- 4 inches wide

- sheltered intertidal and subtidal habitats with mud, sand, and pebble
- tolerates wide range of salinities (some as low as 6 parts per trillion)
- one of worst invasive species
- becomes the dominant predator of:
 - clams
 - oysters
 - scallops
 - mollusks
 - crustaceans
 - marine invertebrates
- blamed for reduction and collapse of economically important industries of soft-shell clams and bivalves
- impact commercial oyster farms

Asian Shore Crab

- tolerates a wide range of environmental conditions
- Maine to North Carolina
- may have been introduced through ballast water
- SQUARE carapace
- green, purple, orange, red, brown color variants
- found in natural and artificial intertidal rocky habitats, salt marshes, and subtidal habitats
- their populations are increasing while native crab populations are decreasing; predator and competitor for natives
- can cause decreases in blue crabs, rock lobsters, lobster
- now the dominant crab species in the upper intertidal zone of the Long Island Sound (which is similar to its native habitat in Japan)

Deadman's fingers

(Also known as oyster thief or green fleece)

dark green algae

- attaches to a variety of substrates
 - rocks
 - shells
 - hard surfaces
- often covered with a variety of epiphytic species
- impacts bottom habitats by:
 - prohibiting movement of native animals
 - smothering shellfish populations
- likes sheltered habitats
- outcompetes kelp, oysters, and scallops
- lifts shellfish off sea floor
- not as common as it once was in Long Island sound

Siphoned feather weed

- fast growing red algae discovered in Southold, NY 2009
- aggressive
- clones itself asexually
- thrives in water with high nitrogen
- outcompetes natives for nutrients

- as it dies it drops the oxygen content of the water and smells like rotting eggs

Devil's Tongue Weed

- one of the largest red algae
- deep red, burgundy, maroon (also may be yellowish when dying)
- survives in both cold and warm regions
- survives in native and artificial habitats
- grows on a large number of substrates:
 - bedrock
 - cobbles
 - boulders
 - shells

- SHIP HULLS
- introduced in ballast water and by hull fouling
- varies in size and shape:
 - irregularly divided into one to eight blades which transition to short, narrow, cylindrical stems that attach to substrates with small, disk-shaped holdfasts
 - 0.5 feet to 3.2 feet long
 - plants are thick and firm
- can outcompete native algae
- alters bottom habitat
- supports few biological organisms such as epiphytes and invertebrates compared to local red algae

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