

Aquatic Invasive Species Guidebook



FOR THE PUGET SOUND AREA

Marine Animals, Estuarine Animals, Marine Plants

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Aquatic Invasive Species Guidebook

INTRODUCTION

Nonnative species are altering freshwater, estuarine and marine ecosystems in the Pacific Northwest, and more species are introduced every year. We developed this guide to help you identify and report nonnative aquatic species that are considered invasive. Please scan your boat hulls, outboard drive gear, propellers, drive shafts, trim tabs, through-hull fittings, rudders, floats and fenders for organisms that look similar to those identified in this guide book. Use the pictures, background information and the description of key characteristics to properly identify aquatic invaders. Some are easily confused with native species. All nonnative species identified in this guide are already established or likely to become established in Puget Sound. The guide also suggests steps you can take to remove these organisms.

REPORT INVASIVE SPECIES

They pose a serious risk to the aquatic ecosystem. By identifying and reporting them, you can help ensure they don't become significant problems.

REPORT SIGHTINGS

Please take a sample of the suspect organism. Put it in a plastic bag. If you cannot freeze it, please keep it refrigerated. Label the bag with the date and time you found the sample, the registration number of the boat on which it was found, its home marina, and contact information of the boat owner. If you have a digital camera, take a series of photos and send them to the Washington Department of Fish and Wildlife. Contact The department at 1.800.933.9247 or wdfw.wa.gov.

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It is **ILLEGAL** to transport or spread Aquatic Invasive Species. **REPORT SIGHTINGS: 1-888-933-9247 or WDFW.WA. GOV**

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For More Information

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Aquatic Invasive Species (AIS)

BACKGROUND

The presence of aquatic invasive species is one of the most pervasive and potentially irreversible impacts on estuary and marine ecosystems. The International Union for Conservation of Nature (IUCN), the U.S. Commission on Ocean Policy and the Pew Oceans Commission all rate aquatic invasive species as one of the four greatest threats to the world's oceans, along with pollution, over-exploitation of resources, the destruction of habitat and climate change.

Aquatic invasive species in Puget Sound's marine environment pose significant ecological and economic risks. Most introduced nonnative species do not have natural predators and spread quickly, outcompeting native organisms for food and space. The majority of species listed in this guide are classified according to their invasive potential. Nonnative marine seaweeds and eelgrasses are not classified by the state.

Classification of Nonnative Marine Animals

Washington state law (Chapter 77.08.010.28 RCW) defines invasive species as "a plant species or a nonnative animal species that either: (a) Causes or may cause displacement of, or otherwise threatens, native species in their natural communities; (b) Threatens or may threaten natural resources or their use in the state; (c) Causes or may cause economic damage to commercial or recreational activities that are dependent upon state waters; or (d) Threatens or harms human health."

Under the same law, the state Fish and Wildlife Commission classifies nonnative animals. Here is their classification system:

DELETERIOUS EXOTIC WILDLIFE	are not native and are dangerous to the environment or wildlife of the state.
PROHIBITED AQUATIC ANIMAL SPECIES	are not native, have a high risk of becoming invasive and may not be possessed, imported, purchased, sold, propagated, transported, or released into the wild.
REGULATED AQUATIC ANIMAL SPECIES	are not native, have a moderate but manageable risk of becoming an invasive species, and may not be released into the wild without a permit from the Department of Fish and Wildlife.
UNREGULATED AQUATIC ANIMAL SPECIES	are not native and are not regulated.
UNLISTED AQUATIC ANIMAL SPECIES	are not native and may not be released without the Fish and Wildlife Commission first classifying them.



Photos courtesy of Heidi Gartner (top, bottom)



Photo courtesy of Lucie Hannah

Golden Star Tunicate

SCIENTIFIC NAME	<i>Botryllus schlosseri</i>	STATE REGULATORY CLASSIFICATION	Unlisted Aquatic Invasive Species
DISTINGUISHING FEATURES	<ul style="list-style-type: none"> • Colonial tunicate forming thin, flat sheets. • Individual animals of the colony, called zooids, are recumbent (horizontal to substrate) with the pointy-end directed toward the center of the cluster. • Zooids are organized into star- or flower-shaped patterns. • Zooids are held together in a clear, firm gelatinous material. • All zooids are the same color. Predominant colors are black, brown, orange or green. 		
ORIGIN	Mediterranean		
HABITAT AND GROWTH	<i>Botryllus schlosseri</i> is a subtidal (up to 200 m) tunicate found mainly in protected areas growing on both natural and artificial hard surfaces. This tunicate species can withstand estuarine habitats with low salinities (18 ppt or less).		
REPRODUCTION	This tunicate reproduces both sexually and asexually. Larvae remain in the water column for less than 36 hours before settling on a hard substrate to grow into juvenile tunicate colonies. The colony can also regrow from fragments.		
ENVIRONMENTAL IMPACTS	Tunicates are fouling organisms. They grow on hard substrates such as rock, boulders and gravel, as well as artificial substrates such as boat hulls, docks, and aquaculture and boating gear. They grow on cultured shellfish including oysters and mussels. They also grow on eelgrass and seaweeds. Tunicates also can outcompete and suffocate filter-feeding bivalves such as mussels and oysters.		
SIMILAR NATIVE SPECIES	<ul style="list-style-type: none"> • Most sponges – Tunicates have a gelatinous texture, as opposed to a soft and spongy texture. • <i>Botrylloides violaceus</i> – Unlike the golden star tunicate, these colonies are mainly one color with zooids in elongated rows, not in the typical star shape. 		
MANAGEMENT	Remove colonial tunicates manually and place in garbage receptacle or let dry out of the water. If you must pressure wash colonial tunicates off equipment, only do so on land and make sure the outflow does not go into the Sound. These colonies can regrow from small fragments. Completely dry boat(s), boating gear, and aquaculture equipment before placing colonial tunicates back in the water or moving between sites.		



Photos courtesy of Lucie Hannah



Photo courtesy of Heidi Gartner

Violet Tunicate

SCIENTIFIC NAME	<i>Botrylloides violaceus</i>	STATE REGULATORY CLASSIFICATION	Unlisted Aquatic Invasive Species
DISTINGUISHING FEATURES	<ul style="list-style-type: none"> • Colonial tunicate forming large sheets. • Colony usually one solid color (purple, pink, tan, yellow, orange or white). • Individual animals of the colony, called zooids, are upright (vertical to substrate). • Zooids usually organized into systems of elongated rows. • Zooids are held together in a firm, gelatinous material that is usually clear but can take on the color of the zooids. 		
ORIGIN	Japan		
HABITAT AND GROWTH	<i>Botrylloides violaceus</i> is a shallow subtidal (<50 m) tunicate found mainly in protected areas growing on both natural and artificial hard surfaces. This tunicate is known to withstand polluted habitats.		
REPRODUCTION	This tunicate reproduces both sexually and asexually. Larvae remain in the water column for less than a day before settling on a hard substrate to grow into juvenile tunicate colonies. The colony can regrow from fragments.		
ENVIRONMENTAL IMPACTS	Tunicates are fouling organisms. They grow on hard substrates such as rock, boulders and gravel, as well as artificial substrates such as boat hulls, docks, and aquaculture and boating gear. Tunicates also can outcompete and suffocate filter-feeding bivalves such as mussels and oysters. They also cover eelgrass, seaweeds, barnacles, and other living organisms.		
SIMILAR NATIVE SPECIES	<ul style="list-style-type: none"> • Most sponges - Tunicates have a gelatinous texture as opposed to a soft and spongy texture. • <i>Botryllus schlosseri</i> - Unlike the violet tunicate, zooids in these colonies are arranged in star patterns. 		
MANAGEMENT	Remove colonial tunicates manually and place in garbage receptacle or let dry out of the water. If you must pressure wash colonial tunicates off equipment, only do so on land and make sure the outflow does not go into the Sound. These colonies can regrow from small fragments. Completely dry boat(s), boating gear, and aquaculture equipment before placing colonial tunicates back in the water or moving it between sites.		

Simon Geerlofs



Photo clockwise from top: Lucie Hannah, Heidi Gartner, Lucie Hannah and Anna Epelbaum

Club Tunicate

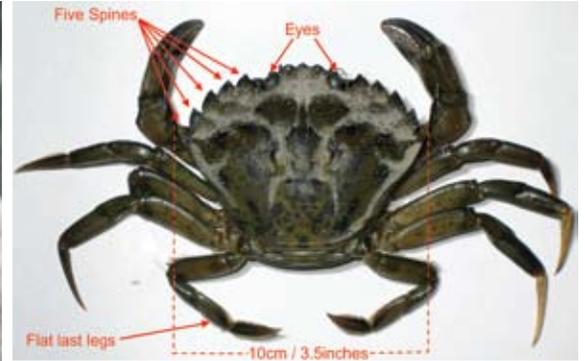
SCIENTIFIC NAME	<i>Styela clava</i>	STATE REGULATORY CLASSIFICATION	Unlisted Aquatic Invasive Species
DISTINGUISHING FEATURES	<ul style="list-style-type: none"> • Solitary “club-shaped” tunicate between 3 and 5 inches (8 and 12 cm) long, occasionally longer. • Tunic (outer skin) is tough, brown, bumpy and wrinkly. • Attached to substrate by a stalk (about 1/3 of the total length). • Two short siphons, closely spaced, with alternate red and tan bands. • Often overgrown by other fouling organisms. 		
ORIGIN	Japan and Korea		
HABITAT AND GROWTH	<i>Styela clava</i> is a lower intertidal to subtidal tunicate that is found growing in protected environments, predominantly on artificial structures such as pilings, aquaculture and boating gear, floats, etc. <i>Styela clava</i> can withstand a wide range of temperatures and salinities, and therefore may be found in most estuarine environments.		
REPRODUCTION	<i>Styela clava</i> is a broadcast spawner, releasing eggs and sperm that can stay in the water column for 1-3 days during spring and summer.		
ENVIRONMENTAL IMPACTS	Tunicates are fouling organisms. They grow on hard substrates such as rock, boulders and gravel, as well as artificial substrates such as boat hulls, docks, and aquaculture and boating gear. Tunicates also can outcompete and suffocate filter-feeding bivalves such as mussels and oysters.		
SIMILAR NATIVE SPECIES	<ul style="list-style-type: none"> • <i>Styela montereyensis</i>, which is longer (up to 30 cm) and more slender. <i>Styela montereyensis</i> also has lines and furrows along the entire length. <i>Styela montereyensis</i> has closely spaced siphons; these have no banding and one is siphon curved. • <i>Styela gibbsii</i>, which is shorter (often not over 4 cm) and does not have a stalk. 		
MANAGEMENT	Remove solitary tunicates from boat(s), boating gear, and aquaculture equipment. Cut or pull tunicates off by the stalk. Dispose of at a landfill.		



Photo clockwise from top: U.S. Geologic Survey Science Center, Anna Epelbaum, Anna Epelbaum, Anna Epelbaum

Didemnum vexillum

SCIENTIFIC NAME	<i>Didemnum vexillum</i>	STATE REGULATORY CLASSIFICATION	Unlisted Aquatic Invasive Species
DISTINGUISHING FEATURES	<ul style="list-style-type: none"> • Colonial tunicate growing in large sheets that form long slender lobes. • Predominant colors are tan, yellow to orange. • Dark lines may run between grouping of individual animals, called zooids, in the colony. • May have a 'spotted' appearance due to calcareous spicules embedded in the tunic. • To distinguish from local sponges, check for a gelatinous texture (as opposed to soft and spongy texture). 		
ORIGIN	Japan		
HABITAT AND GROWTH	<p><i>Didemnum vexillum</i> is a subtidal tunicate that grows on any hard substrate ranging from docks, to the shells of bivalves, to gravel seabeds. Mature colonies can form large lobes when growing from a suspended structure, or form large "blanket" sheets when growing along the seafloor. On the east coast of North America, at Georges Bank, scientists have measured <i>Didemnum sp.</i> blanketing over 100 square kilometers of the seafloor covering between 50 and 90 percent of the area.</p>		
REPRODUCTION	This tunicate reproduces both sexually and asexually. The colony can regrow from fragments. Larvae only remain in the water column for minutes to hours before settling on a hard substrate to grow into juvenile tunicate colonies.		
ENVIRONMENTAL IMPACTS	Tunicates are fouling organisms. They overgrow seaweeds, sponges, hydroids, anemones, limpets, oysters, mussels, scallops, barnacles, bryozoans and other species of sea squirts. Tunicates also can outcompete and suffocate filter feeding bivalves such as mussels and oysters.		
SIMILAR NATIVE SPECIES	<ul style="list-style-type: none"> • Most sponges - <i>Didemnum vexillum</i> has a gelatinous texture as opposed to a soft and spongy texture. • Native tunicate - <i>Cystodytes lobatus</i> is generally purple in color, thicker and has many lobes. 		
MANAGEMENT	Remove colonial tunicates manually and place in garbage receptacle or let dry out of the water. If you must pressure wash colonial tunicates off equipment, only do so on land and make sure the outflow does not go into the Sound. These colonies can regrow from small fragments. Completely dry boat(s), boating gear, and aquaculture equipment before placing colonial tunicates back in the water or moving between sites.		



Clockwise, photos courtesy of Leif-Matthias Herborg, and (bottom right) Brent Dumbauld

European Green Crab

SCIENTIFIC NAME	<i>Carcinus maenas</i>	STATE REGULATORY CLASSIFICATION	Prohibited Aquatic Animal Species Deleterious Exotic Wildlife
DISTINGUISHING FEATURES	<ul style="list-style-type: none"> • Color of carapace (top shell) is usually mottled, dark brown to dark green, with small yellowish patches. • Shell up to 3.5 inches (10 cm) wide. • Five distinct spines between the widest part of the shell and the eyes on each side. • Three rounded lobes between the eyes. • Little to no hair on the carapace and claws, and only very little along the edge of the walking legs. • Both claws are the same size. • Last pair of legs somewhat flattened. 		
ORIGIN	Europe		
HABITAT AND GROWTH	European green crab live in a wide range of protected and semi-protected habitats on a wide range of substrates. This crab can be dispersed by various mechanical means including hitching rides on fouled boat hulls, and submerged floating vegetation, as well as shipments of live marine organisms.		
REPRODUCTION	Females can reproduce twice in one season, spawning up to 185,000 eggs at a time. Larval forms of the crab settle out between 30 to 60 days depending, on environmental conditions.		
ENVIRONMENTAL IMPACTS	European green crab compete with native crab and are a major predator on clams, mussels, juvenile fishes, and other species in the natural environment and in aquaculture settings.		
SIMILAR NATIVE SPECIES	See next page.		
MANAGEMENT	Thoroughly examine the hull and boating equipment for the presence of these animals. Remove any you find, put them in a plastic bag and freeze the bag. This will help the state positively identify the animal. People often confuse native crab that are green in color with European green crab. Please make sure you correctly identify your specimen. Refer to the following page that describes native crab.		



Clockwise, Helmet crab by Graham Gillespie; Red Rock, Dungeness, and Graceful Crabs by Leif-Matthias Herborg, Kelp Crab by Lucie Hannah

Similar Native Species

HELMET CRAB	<i>Telmessus cheiragonus</i>	<ul style="list-style-type: none"> • Six unequal, jagged spines (teeth) on each side of the carapace (shell) • The shell between the eyes protrudes past the eyes • The shell and legs are covered with stiff, bristly hair • Body is yellowish green with darkened claw tips
DUNGENESS CRAB	<i>Cancer magister</i>	<ul style="list-style-type: none"> • Oval carapace (shell) with 10 spines (teeth) on each side • Five small, unequal teeth between the eyes • Light-colored leg tips • Adult Dungeness crab grow up to 23 cm (9 inches)
RED ROCK CRAB	<i>Cancer productus</i>	<ul style="list-style-type: none"> • Ten teeth on each side of the shell • Area between the eyes protrudes beyond them • Claws are dark at the tips • Reddish color
NORTHERN KELP CRAB	<i>Pugettia producta</i>	<ul style="list-style-type: none"> • Green, reddish or brown in color • Two teeth on each side of the carapace • Elongated body with a very pointed front • Long, pointy and spider-like legs • Up to 9 cm (3.5 inches) across
GRACEFUL CRAB	<i>Cancer gracilis</i>	<ul style="list-style-type: none"> • Brown to purple in color • Nine spines (teeth) on each side of carapace • All legs are very pointed and without hairs • Up to 12 cm (5 inches) across



Photos courtesy of U.S. Fish and Wildlife Service

Chinese Mitten Crab

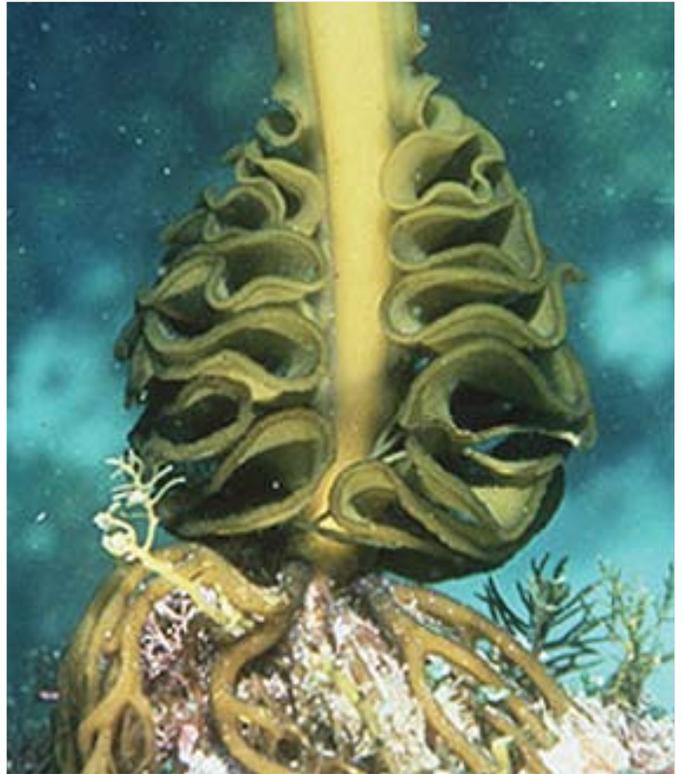
SCIENTIFIC NAME	<i>Eriocheir sinensis</i>	STATE REGULATORY CLASSIFICATION	Prohibited Animal Species Deleterious Exotic Wildlife Species
DISTINGUISHING FEATURES	<p>Adults have:</p> <ul style="list-style-type: none"> • Hairy claws with white tips that are normally equal in size. • Notch between the eyes and four lateral carapace spines (fourth spine is small). • Maximum carapace width of about 3 inches (10cm) and are light brown color. 		
ORIGIN	Coastal estuaries of Asia from Korea to China		
HABITAT AND GROWTH	Mitten crab are catadromous. They spend most of their life in freshwater, but they must return to the sea to breed. They migrate downstream in late summer, and attain sexual maturity in the tidal estuaries. After mating, the females winter over in deeper waters. They return to brackish water in the spring to hatch their eggs. Juvenile crab migrate upstream.		
REPRODUCTION	The females carry their eggs until hatching and both sexes die soon after reproduction. A single female can carry 250,000 to 1 million eggs. After hatching, larvae are planktonic for approximately 1 to 2 months. The small juvenile crab settle in salt or brackish water and migrate to freshwater to rear.		
ENVIRONMENTAL IMPACTS	Mitten crab pose several possible threats. They are the intermediate host for the Oriental lung fluke, with mammals, including humans, as the final host. They burrow into banks and levees and accelerate erosion. In San Francisco Bay, they damage commercial fishing nets and clog fish diversion structures. As omnivores, they also reportedly scavenge for salmon and steelhead eggs.		
SIMILAR NATIVE SPECIES	This state does not have native freshwater crab. If you find one in freshwater, report it immediately.		
MANAGEMENT	Thoroughly examine the hull and boating equipment for the presence of mitten crabs. Remove any you find. Put them in a plastic bag and freeze them. Note the date and time when you found them. Get contact information for the boat owner. This will help the state positively identify the animal.		



Photo courtesy of Washington Department of Fish & Wildlife

Conrad's False Mussel

SCIENTIFIC NAME	<i>Mytilopsis leucophaeata</i>	STATE REGULATORY CLASSIFICATION	Unlisted Aquatic Animal Species
DISTINGUISHING FEATURES	<ul style="list-style-type: none"> • Adults are usually even brown in color and do not have a zigzag pattern or stripes typical of young individuals. • Adults are about 3/4 inches (2 cm) in length. • Shell is less angular and does not have a longitudinal ridge typical to zebra mussels. • Has a tooth-like structure, called the apophysis, which can be seen when the shell is opened and viewed with a hand lens or dissecting microscope. 		
ORIGIN	Atlantic and Gulf of Mexico		
HABITAT AND GROWTH	This mussel attaches to hard surfaces (rocks, boats, marina structures, etc) using byssal threads. It grows in very dense clumps. It is found most abundantly in brackish water with relatively low salinities. It is also found in both temperate and semitropical waters. It dies in very cold water at near-freezing temperatures.		
REPRODUCTION	This mussel is a broadcast spawner. Larvae settle out quickly, within 1 to 2 days. Once settled, they produce a hard shell and grow quickly to adult size.		
ENVIRONMENTAL IMPACTS	<i>Mytilopsis leucophaeata</i> competes for space and food with native organisms. In Europe, this species is a prodigious fouling organism. It clogs the cooling-water intakes of industrial installations. It also fouls aquaculture cages, boat hulls and ropes.		
SIMILAR NATIVE SPECIES	The Conrad's false mussel is a cousin to the zebra mussel and resembles it, especially when young.		
MANAGEMENT	Use superheated, high-pressure water to kill these bivalves. Scrape them off hard surfaces. Dispose of detached mussels in garbage cans.		



Photos courtesy of Kathy Ann Miller and Rick Cooper

Japanese Kelp

SCIENTIFIC NAME	<i>Undaria pinnatifida</i>	STATE REGULATORY CLASSIFICATION	Not Classified
DISTINGUISHING FEATURES	<ul style="list-style-type: none"> • This kelp has wide, brown to yellow-tan blades. • Mature plants have a divided blade with conspicuous midrib, holdfast stem, and a spiral, folded structure at the base of the blade. • Young plants have undivided blades and initially no midrib. • They can reach overall lengths of 3 to 9 feet (1 to 3 meters). 		
ORIGIN	Asia		
HABITAT AND GROWTH	This brown kelp is found from low intertidal to subtidal to depths of about 15 feet. It grows on hard surfaces including rocks, ropes, docks, boat hulls, pilings, moorings, and other structures. It grows aggressively and very rapidly, often forming dense “kelp forests” in sheltered waters.		
REPRODUCTION	This kelp has a macroscopic and microscopic life stage. Adult plants release reproductive spores. When conditions are right, the spores release eggs and sperm, which fertilize and grow into adult plants. In its native range, the adult plant is found in the late winter to early summer months and the microscopic stage is present during the colder months.		
ENVIRONMENTAL IMPACTS	This alga is a very prolific and hardy species. It grows extremely quickly, and up to 9 feet in length, on a wide range of surfaces. As a result of its amazing growth rate and wide blades, it quickly starves the natural algae found in the understory of light leading to the exclusion or displacement of native plants and animals. In addition to such ecological damage, it fouls ship hulls, nets, fishing gear, moorings, ropes, and other structures, increasing labor and maintenance costs. It also blocks out light essential for native marine plants.		
SIMILAR NATIVE SPECIES	Sugar kelp <i>Laminaria saccharina</i> has ruffled edges along undivided blades without a midrib.		
MANAGEMENT	Inspect the hull, chain lockers and anchor wells. Hand remove attached algae and dispose of fragments on land.		



Photos courtesy of Jenn Forman Orth

Dead Man's Fingers

SCIENTIFIC NAME	<i>Codium fragile tomentosoides</i>	STATE REGULATORY CLASSIFICATION	Not Classified
DISTINGUISHING FEATURES	<ul style="list-style-type: none"> • Dark green alga 4 to 12 inches (10 to 30 cm) tall with several erect branches from a broad basal disk. • The “fingers” are branched and as thick as a pencil or finger. • The fingers die back in winter and regenerate from the holdfast in the spring. • Branches float in the water when covered and hang down when not. 		
ORIGIN	Japan. It has invaded waters of eastern U.S. and Canada seaboard.		
HABITAT AND GROWTH	<p>Codium tolerates a wide range of salinities and temperatures and grows in both estuarine and marine habitats. It prefers intertidal areas on both hard and soft substrates that do not freeze and are protected from waves.</p> <p>Codium probably arrived in the eastern U.S. as a hitchhike on fouled hulls of commercial vessels. It is spread locally by the translocation of infested objects, including recreational vessels, barges and equipment that is kept in water.</p>		
REPRODUCTION	Codium reproduces sexually by releasing female spores that can germinate in the water column without fertilization, and asexually from plant fragments.		
ENVIRONMENTAL IMPACTS	Codium competes with native organisms for space and food. It grows densely, forming large tracts. The alga is buoyant and will lift oysters, mussels and scallops on which they settle and move them from aquaculture sites on currents. It also inhibits the ability of shellfish to filter water for food. In many instances, the plant accumulates in large windrows on beaches and over shellfish growing areas, requiring mechanical removal.		
SIMILAR NATIVE SPECIES	There are no native <i>Codium</i> species in Puget Sound.		
MANAGEMENT	Inspect hulls, trim tabs, drive gear, rudders, chain lockers and anchor wells. Hand remove attached alga and dispose of fragments on land.		



Photos courtesy of Mary Jo Adams and Gwylan

Sargassum Weed

SCIENTIFIC NAME	<i>Sargassum muticum</i>	STATE REGULATORY CLASSIFICATION	Not Classified
DISTINGUISHING FEATURES	<ul style="list-style-type: none"> • It has a long central stem (stipe) up to 3 feet (1 meter) in length. • Branches alternate perpendicular from the stem. • Small blades grow from the branches. • Float bladders are interspersed with the blades. • It has a disk-shaped holdfast. 		
ORIGIN	Asia. It is also found along the coast from British Columbia to Baja California.		
HABITAT AND GROWTH	This species occupies lower intertidal and shallow subtidal rocky habitats throughout Puget Sound, the Strait of Juan de Fuca and the San Juan Islands.		
REPRODUCTION	It reproduces during the summer by releasing millions of embryos from reproductive bodies along the edge of branches of the plant. These quickly attach to hard surfaces including boat hulls. Some embryos remain in the reproductive bodies after a branch breaks and these are dispersed by currents and winds buoyed by the float bladders.		
ENVIRONMENTAL IMPACTS	It outcompetes native kelp for light and indirectly harms green urchins. Native kelps are critical habitat for many species in the nearshore ecosystem. Sargassum also fouls propellers, fishing lines and nets, and marina structures. The plants occasionally form large floating mats that can deposit on shore over shellfish-growing areas and must be removed mechanically.		
SIMILAR NATIVE SPECIES	<i>Sargassum muticum</i> is distinctive and should not easily be confused with native brown algae such as bull kelp or sugar kelp.		
MANAGEMENT	Inspect rudders, propellers, trim tabs, chain lockers and anchor wells. Hand remove attached alga and dispose of fragments on land.		



Photo courtesy of Jeffrey Gaeckle



(top) *Z. japonica*, (bottom) *Zostera marina*,
Both photos courtesy of Mary Jo Adams

Japanese Eelgrass

SCIENTIFIC NAME	<i>Zostera japonica</i>	STATE REGULATORY CLASSIFICATION	Not Classified
DISTINGUISHING FEATURES	<ul style="list-style-type: none"> • It is bright green and has ribbon like blades about 8 inches (20 cm) long and only 1/8th inch (2-3 mm) wide. • It is also known as dwarf or narrow bladed eelgrass. 		
ORIGIN	Asia. Also occasionally found in southern British Columbia and Puget Sound.		
HABITAT AND GROWTH	<i>Zostera japonica</i> is an annual plant. It grows in the mid-intertidal zone on beaches with sand and mud substrate.		
REPRODUCTION	It reproduces as clones or produces seeds. It colonizes new locations by seeds.		
ENVIRONMENTAL IMPACTS	<i>Zostera japonica</i> is the only documented invasive seagrass in Pacific Coast estuaries in Canada and the United States. It alters physical habitat structure as well as the richness and densities of resident fauna. Researchers have discovered that it changes the structure of the benthic invertebrate community.		
SIMILAR NATIVE SPECIES	<i>Zostera marina</i> , a native in Puget Sound, blades are about 1 cm wide and are 20 cm to 50 cm (8 to 20 inches) long. Short stems grow up from extensive, white branching root system.		
MANAGEMENT	Inspect chain lockers, sea chests, and around propellers, rudders and trim tabs for entangled plant pieces. Remove these by hand and dispose of them on land.		

