GUIDE TO MARINE INVADERS
IN THE GULF OF MAINE

Undaria pinnatifida

undaria kelp, wakame seaweed

Photos: Steve Lonhart /Monterey Bay NMS

HABITAT PREFERENCE

- Found from low intertidal to subtidal depths of approx. 15 ft (5 m)
- Grows on hard surfaces including rocks, ropes, docks, pilings, moorings, and other structures
- Can form dense 'kelp forests' in sheltered waters

PHYSICAL DESCRIPTION

- Brown kelp with wide, brown to yellow-tan blades
- Mature plants have a divided blade (with pinnae) with conspicuous midrib, holdfast, stipe (stem), and spiral, folded sporophyll
- Young plants have holdfast, stipe, undivided blade, and initially no midrib
- Grows rapidly to 3-9 ft (1-3 m) long

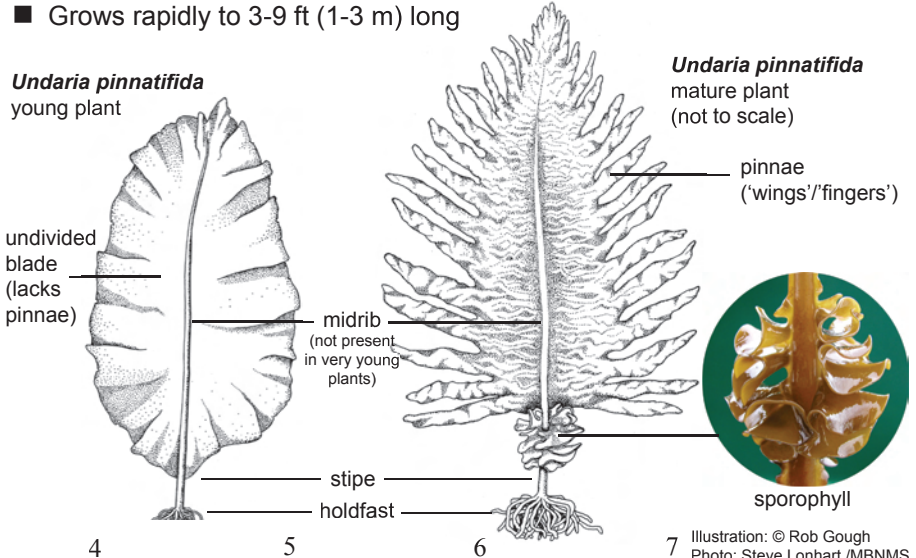

Illustration: © Rob Gough
Photo: Steve Lonhart /MBNMS

GUIDE TO MARINE INVADERS
IN THE GULF OF MAINE

Undaria pinnatifida
undaria kelp, wakame seaweed

INVASION STATUS & ECOLOGICAL CONCERNS

Undaria pinnatifida is an invasive kelp native to Japan. Commonly known as 'wakame', an ingredient in miso soup, this alga is commercially grown throughout Asia for human consumption. It has invaded many of the world's ocean's, from European waters, to waters off New Zealand. In 2001, *U. pinnatifida* was discovered on North American shores in Monterey Bay, CA, where efforts to manually remove it continue today.

This alga is a very prolific and hardy species, with a growth rate measured at 1-2 cm per day, and a max. length of 9 ft (3 m). It can establish itself on a wide variety of surfaces. As a result of its amazing growth rate and wide blades, this seaweed quickly starves the natural understory algae of light. As these algae die, fish and invertebrates must move elsewhere to find food, thus creating extra feeding pressure on adjacent areas. *U. pinnatifida* has drastically affected the ecosystem of many waters that it has invaded. In addition to such ecological damages, it is a fouling species on ship hulls, nets, fishing gear, moorings, ropes, and other structures, and as such, increases labor and maintenance costs.

SIMILAR SPECIES

Photos (left to right):
1. *L. saccharina* blade, stipe and holdfast
2. *L. saccharina* blade showing absence of midrib
3. *Alaria sp.* showing midrib


1.


Lisa Gough
2.


Lisa Gough
3.

Robert Buchsbaum (sh

Laminaria saccharina (sugar kelp)
Undaria pinnnatifida may be mistaken for our region's native brown kelps, particularly *Laminaria saccharina*. However, *L. saccharina* has ruffled edges along undivided blades with no midrib, vs. divided blades and conspicuous midrib of *U. pinnatifida*.

Other local kelps
While several of the Gulf of Maine's native kelp species possess some of the features of *U. pinnatifida* (i.e. midrib in *Alaria* sp., divided blades of *Laminaria digitata*), none possess the folded, spiral sporophyll.

This identification card is one of a series produced by Salem Sound Coastwatch highlighting introduced species that pose a threat to the marine environments of Massachusetts and the Gulf of Maine. These cards were funded by the MA Executive Office of Environmental Affairs, Office of Coastal Zone Management with funding from the U.S. Fish and Wildlife Service. For additional information on these species, or to report sightings, please visit www.marineID.org or email marineID@northeastANS.org.

CZM