



Undaria pinnatifida

Wakame (Japanese)

Threat scores

1. Ecological impact
 - Reduces biodiversity by overgrowing in native habitats; economic losses in aquaculture. Wakame is economically important as a food crop but is also a fouling organism. It is able to compete with native kelp species in the shallow sublittoral/infralittoral zone (Farrell & Fletcher, 2000). It is also effective in providing habitats, nursery areas and protective cover for many species. It grows well in estuarine conditions unlike many of the native kelp species (Farrell & Fletcher, 2000).
2. Invasive potential
 - Natural dispersal occurs following the release of motile spores from the sporophyte. The distance over which spores travel before settling will largely be determined by their viability and behaviour and the speed of ambient water currents, it can extend from hundreds of meters to several kilometers.
 - It produces millions of spores with motile periods of up to 5 hours and has a propensity for colonising floating objects (Fletcher & Manfredi 1995) which suggests it can easily be spread locally by natural dispersion and more remotely through the agency of shipping.
3. Geographic extent
 - Regionally patchy
4. Management difficulty
 - Prevention most effective, eradication unlikely to succeed. Natural dispersal allows reintroductions.



Geography and Habitat

1. Origin: China, Japan, North and South Korea
2. Marine, fouling communities, estuaries/bays
3. A fouling organism, it is able to compete with native kelp species in the shallow sublittoral infralittoral zone (Farrell & Fletcher, 2000).

Invasion Pathways

1. Ballast Water and Sediments
 - Accidental probable
 - Cause- ballast water
 - Various types and life stages of this species can be transported in ballast water
2. Natural Spread
 - Known
 - Cause- natural spread
 - localized spread via ambient water currents
3. Hull/Surface Fouling
 - Accidental known
 - Cause- hull fouling
 - Fouling organism on ships

4. Aquaculture and Mariculture Activities

- Accidental probable
- Cause- aquaculture
- Can be transported through fouling of aquaculture equipment and with fish/shellfish

Non native locations

1. 58- Northern California
2. 59- Southern California Bight

Sources

1. Molnar, Jennifer, et al. 2008. "Assessing the global threat of invasive species to marine biodiversity." *Frontiers in Ecology and the Environment*. 6 (9), pp. 485-492.
1. <http://conserveonline.org/workspaces/global.invasive.assessment>
2. http://www.marine-genomics-europe.org/upload/undaria_pinnatifida_mail.jpg