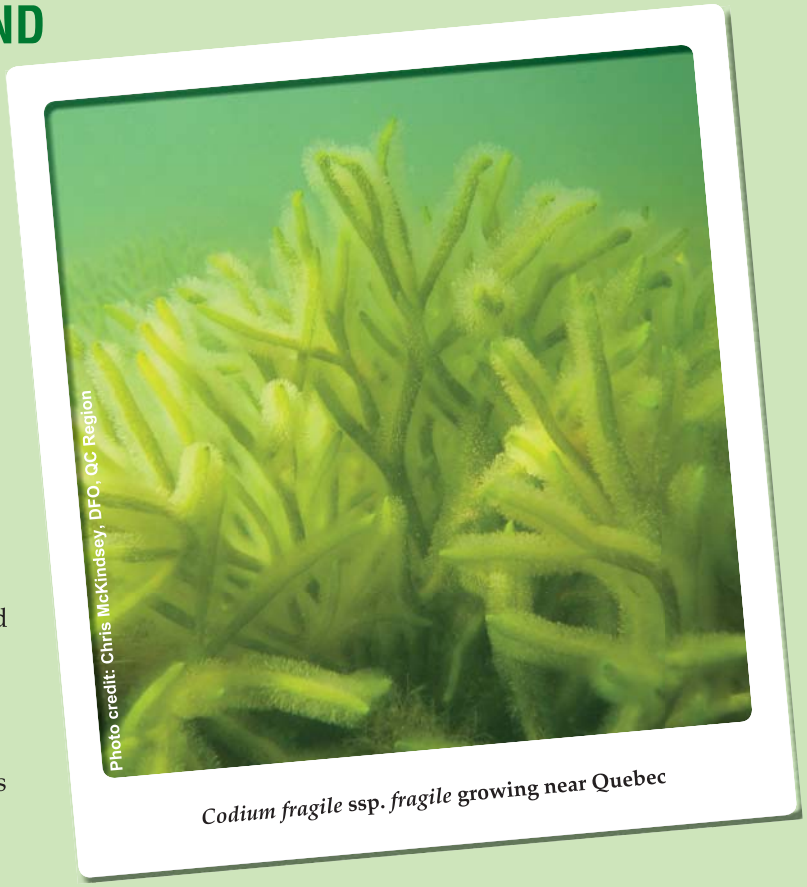
Aquatic Invasive Species

OYSTER THIEF IN NEWFOUNDLAND AND LABRADOR WATERS

Oyster Thief *(Codium fragile* ssp. *fragile)*, also known as Dead Man's Fingers (for its bleached and white appearance when dead) or Felt Fingers, is a green alga characterized by numerous dark green cylindrical branches that arise from its holdfast, which keeps the plant attached to the seabed. The plant can grow up to 90 cm and when alive the branches are described as soft and fuzzy in texture. Juvenile stages of oyster thief appear as fuzzy, moss-like mats. It grows in shallow coastal waters up to 15 m in depth.

Oyster thief is believed to have originated in the Pacific Ocean near Japan and has invaded coastlines in Europe, Australia, New Zealand, South Africa, and North America. The first reported case of oyster thief in North America was in Long Island Sound, New York in 1957. It was first observed in Nova Scotia in 1989 and has since become well established in the Gulf of St. Lawrence. Oyster thief was discovered in Newfoundland waters on November 27, 2012 (see map).

Oyster thief attaches to hard substrates such as bedrock, rocks and both living and dead shellfish and can grow and cover man-made structures, such as wharf pilings, ropes and aquaculture equipment. They are able to tolerate large changes in salinity (12 - 42 ‰) and temperature (-2 to 33°C), but growth is limited in colder waters (< 10°C). In optimal conditions (24°C and salinity between 24-30 ‰), oyster thief can grow rapidly (up to 9 cm/month). It can reproduce both sexually and asexually. New plants can also become established from fragments that disperse in ocean currents and attach to stable substrates. The ability to regenerate from fragments assists oyster thief to outcompete native seagrasses and seaweeds, such as eelgrass and kelp.



Codium fragile ssp. *fragile* growing near Quebec

Oyster thief algae found in Spanish Room

Environmental Impact of Oyster Thief

Oyster Thief is able to replace native seaweeds such as kelp and seagrasses (eelgrass) as the dominant seaweed, particularly when native seaweeds have decreased. This can disrupt natural cycles between underwater kelp forests and barrens normally

controlled by sea urchin populations. Kelp is the primary food source for urchins, which are harvested for their roe. The formation of dense and 'low lying' meadows by oyster thief can restrict movement of many species (including lobster) that often live under and rely on kelp as habitat, food, and shelter from predation. Oyster thief also attaches to shellfish (such as clams, scallops and oysters) and can disrupt their movement and feeding. When attached to shellfish, wave conditions can carry the plant away, taking its host shellfish with it, hence the name oyster thief. In particular, oyster thief can have large impacts through fouling of shellfish beds and can increase maintenance labour for aquaculture set-ups.

Discovery and Survey Findings

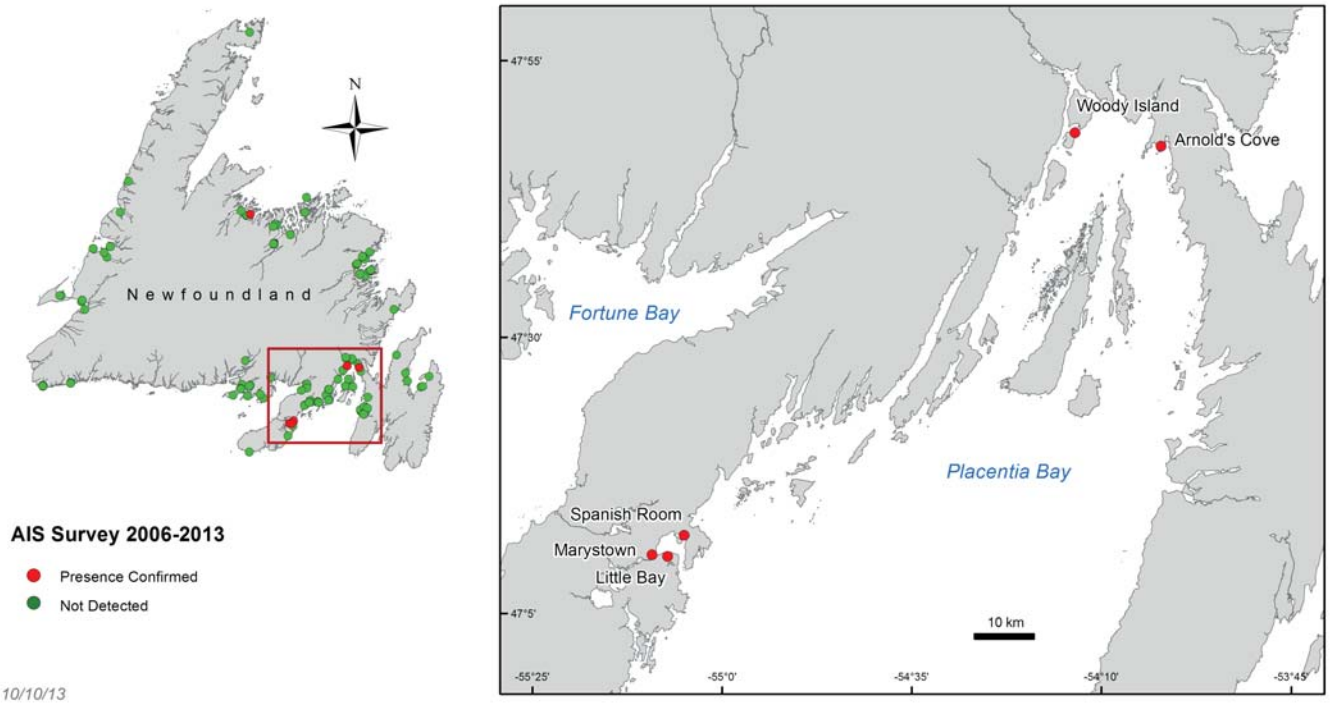
Oyster thief was first reported washed up on shore near Arnold's Cove, Woody Island and Spanish Room, Newfoundland in July and August 2012, during Fisheries and Oceans Canada's aquatic invasive species surveys. However, follow-up surveys confirmed the establishment of oyster thief near Marystown, NL, on November 27, 2012. In August-September 2013 whole plants were also found growing in Little Bay and Arnold's Cove (Placentia Bay) and Triton (Notre Dame Bay).

Methods to Control the Spread of Oyster Thief

Oyster thief can be easily spread through movement of gear, shellfish, and commercial and recreational boats. To control the spread of oyster thief, boat hulls and gear should be visually inspected and cleaned regularly. Plant and animal material and water from inside the boat should be disposed of on land. Antifouling paints are effective in preventing settlement of a wide variety of bio foulers and should be applied regularly.

Surveys and monitoring for oyster thief in Newfoundland are effective tools in early detection, which can provide an opportunity to control, contain or ideally eradicate new populations before they spread. The ability of oyster thief to survive by fragmentation makes it very difficult to remove populations. While manual removal methods can immediately reduce densities, populations can return quickly because of survival of fragments. Although some native species feed on oyster thief, it is unlikely that these organisms will provide significant control of an invasion. Public education is one of the best ways to limit the spread of oyster thief. Research is ongoing to learn about the biology of this species in Newfoundland environments and to develop mitigation methods and communication strategies to control and prevent its spread throughout the province.

Oyster Thief Algae Distribution in Newfoundland Waters



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