



Aquatic Invasive Species:

COFFIN BOX IN NEWFOUNDLAND AND LABRADOR WATERS

The coffin box (*Membranipora membranacea*) is a 'bryozoan', a type of tiny invertebrate animal. Although each individual animal is tiny, it lives together with others in colonies. The coffin box feeds by filtering sea water through its body. It is an aquatic invasive species to Newfoundland and Labrador that can damage our important kelp beds.

The coffin box is native to the kelp forests of Pacific North America. It was first introduced to the Gulf of Maine in the 1980s and is now found from Long Island Sound to southern Labrador. Coffin box was first observed in Newfoundland and Labrador in 2002. It has already become a prominent part of kelp beds throughout coastal areas of the island.

Coffin box forms colonies of hundreds to thousands of small rectangular or 'coffin' shaped individuals. Each individual animal is less than 1 mm in length. Colonies of coffin box can grow 10 cm or more in width and form white sheets that cover surfaces of rockweed, kelp, and even boat hulls. Typically, colonies of coffin box are circular in shape, but they can form irregular shapes when crowded by other colonies.



Photo credit: DFO

Coffin box forming large colonies on native kelp

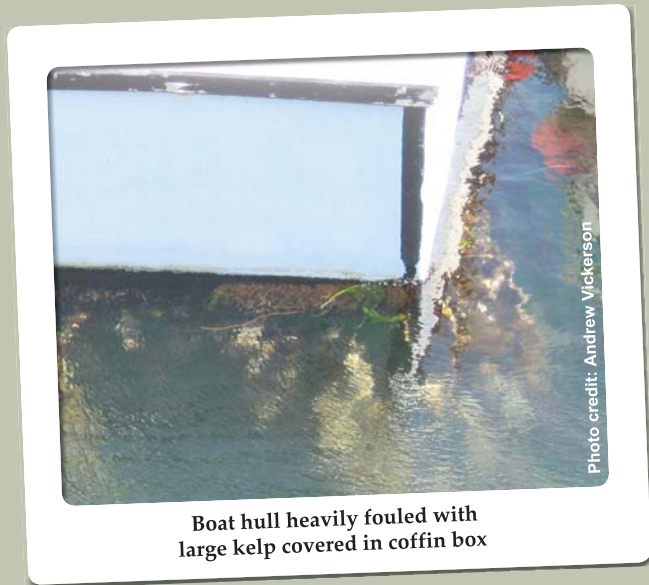


Photo credit: Andrew Vickerson

Boat hull heavily fouled with large kelp covered in coffin box

Another species of bryozoan, the hairy sea-mat (*Electra pilosa*), is sometimes confused with the coffin box. It also forms white sheets on seaweed, but it can be distinguished from the coffin box by its star-shaped colonies, hairy extensions and small oval-shaped individuals.



Photo credit: DFO

Enlarged coffin box showing rectangular "coffin-shape" of individuals in the colony

Environmental Impact of Coffin Box

Kelp beds are important because they are highly productive marine habitats. They are a source of food for many animals, as well as a hiding place for many species of fish and invertebrates.

In the fall, colonies of coffin box can entirely cover a blade of kelp, causing it to become brittle and eventually kill it. The growth of coffin box can starve kelp by preventing it from absorbing nutrients. Coffin box can reduce the amount of light available for photosynthesis, which may affect growth rates. It can also reduce the kelp's ability to reproduce by preventing the release of spores. Overall, these effects can decrease the abundance of kelp, so the spread of coffin box in Newfoundland and Labrador may permanently alter our kelp beds and affect biodiversity along our coasts.

Discovery and Survey Findings

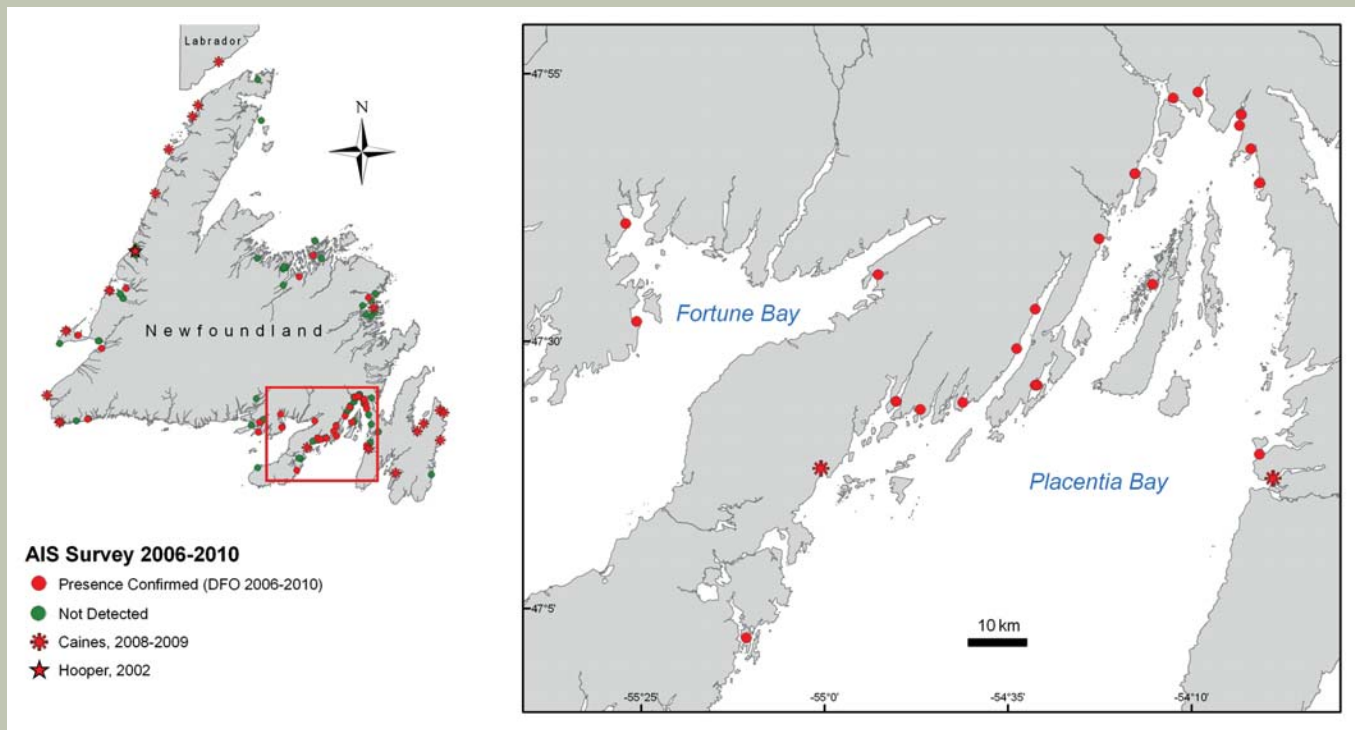
From June to November 2008, a survey for coffin box was conducted along the west coast of Newfoundland and the southeast coast of Labrador. This survey was a partnership between Memorial University of Newfoundland, Fisheries

and Oceans Canada, the Institute for Biodiversity, Ecosystem Science and Sustainability, the Department of Fisheries and Aquaculture, and the Fish, Food and Allied Workers Union. The largest populations of coffin box were found in the Bay of Islands and Bonne Bay. North of these locations, the amount of coffin box on kelp decreased, with the smallest populations observed along the Strait of Belle Isle. During the entire survey, the greatest number of colonies of coffin box on kelp was observed in the fall of 2008. In September and October of 2009, another survey found many colonies of coffin box on kelp at North Harbour and Arnold's Cove and a few individual colonies at Eastport, Red Harbour, Holyrood and Bay Bulls.

Methods to Control the Spread of Coffin Box

Coffin box can spread over large distances by releasing larvae, which are carried by ocean currents. They can also be spread through human activity. Coffin box has been observed on boat hulls, growing on the kelp that is attached to the hull. To help control the spread of this aquatic invasive species, regularly clean and disinfect boats and boating gear.

Coffin Box Distribution in Newfoundland Waters



References

- Chapman, A. S., R. E. Scheibling, and A. R. O. Chapman. 2002. Species introductions and changes in the marine vegetation of Atlantic Canada. Pages 133-148 in R. Claudi, P. Nantel, and E. Muckle-Jeffs, eds. *Alien invaders in Canada's waters, wetlands, and forests*. Natural Resources Canada, Canadian Forest Service, Ottawa.
- Caines, S. and P. Gagnon. 2010. Population dynamics of the invasive bryozoan *Membranipora membranacea* along subarctic and temperate longitudinal and latitudinal gradients. Newfoundland and Labrador Aquatic Invasive Species Workshop. St. John's, NL.

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