



**NOVA SCOTIA**  
**Agriculture and Fisheries**

Distribution of the Tunicate, *Ciona intestinalis*, in Nova Scotia.

2004

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## Nova Scotia Tunicate Survey Results

### April 2004

In an continued attempt to monitor the distribution of *Ciona intestinalis* a survey was mailed to all aquaculturists in Nova Scotia who possess marine aquaculture leases. This was done to help provide a simple assessment of the distribution of this fouling tunicate along the coast of the province and any changes that might have occurred in the distribution between 2002 and 2003.

In January 2004, 175 surveys were mailed out to lease owners, 49 replies were received. Also included with the survey were photographs describing the two species of tunicates of concern in Nova Scotia and Prince Edward Island. The inclusion of the photographs has helped clear some confusion associated with identifying tunicates on leases. It is important to note that the tunicate species causing the most impact in Nova Scotia, *Ciona intestinalis*, is not the same species causing problems in Prince Edward Island, *Styela clava*. However, lease owners should be diligent in reporting any new species that occur on their sites.

A geographical representation of the 2004 survey results are given in Figure #1. In 2003, three main areas of heavy infestation by *C. intestinalis* were identified by the respondents of the survey. These areas included, the Lobster Bay area in South Western NS, St. Margaret's Bay and Mahone Bay on the South Shore, and two small areas on the Northern and Southern portions of

Isle Madame in Cape Breton. A light infestation was reported at the eastern portion of St. Margaret's Bay.

The distribution of *Ciona intestinalis* in 2004 remains in these three areas, however the concentrations that the lease owners are reporting are diminished compared to those reported in 2003. It should be noted that some lease owners that had previously submitted results in 2003 chose not to reply to the survey in 2004. Those that did indicate concentrations significantly lower than those observed in 2003. Most of the reported "Heavy" concentrations have been reduced to "Moderate" in 2004 while a few sites that reported "None" in 2003 are now reporting "Light" concentrations. Overall, the trend is a reduction in concentration of infestation with only a few exceptions. One lease owner who was reporting "None" in 2003 submitted a report of "Heavy" in 2004. This exemplifies the need for continued monitoring of this organism in Nova Scotia.

A number of lease owners observed dead or dying tunicates on their gear in spring which they attributed to the relatively cold temperatures experienced last winter compared to warmer winter conditions in the previous few years. Some growers indicated that some resettlement occurred shortly after this "die-off" in spring. One lease owner has reported that tunicate spawning occurred from July through October, with moderate spawning in July and heavy spawning in October.

Physical removal of tunicates by hand scrubbing, scraping or high pressure spraying remained the most common treatments used to remove tunicates from gear. Three or four treatments per season are required to keep tunicate numbers at a minimum. Air drying and gear rotation are also still good control methods.

This survey provides a baseline of data that will be used in the future to track the movement and population trends of *C. intestinalis* in Nova Scotia. The results of the survey can be also used to identify the risk of importing *C. intestinalis* into tunicate-free areas via shellfish shipments, or, at least pinpoint areas that should practice diligence in cleaning seedstock or market shellfish prior to shipments within the province. In addition to the movement of *C. intestinalis*, new invading species of tunicates still hold the potential to move into the waters of Nova Scotia. Growers should continuously check their farms for unusual species on a regular basis. In particular, *Styela clava*, the club tunicate, is responsible for the present damage to the mussel industry in Prince Edward Island. *Styela clava* is native to Asia and has managed to live in a wide variety of environments. It's present proximity to Nova Scotia should not be overlooked as it is possible that *S. Clava* could easily reach Nova Scotia waters by traversing the Northumberland Strait via attachment to boat hulls or in shipments of live shellfish.

# Nova Scotia Tunicate Survey

**2004**

*Ciona intestinalis*

Tunicate Levels\*

None      Light      Moderate      Heavy



\* Tunicate levels reflected here as reported by aquaculture lease owners in response to Department survey - April 2004.

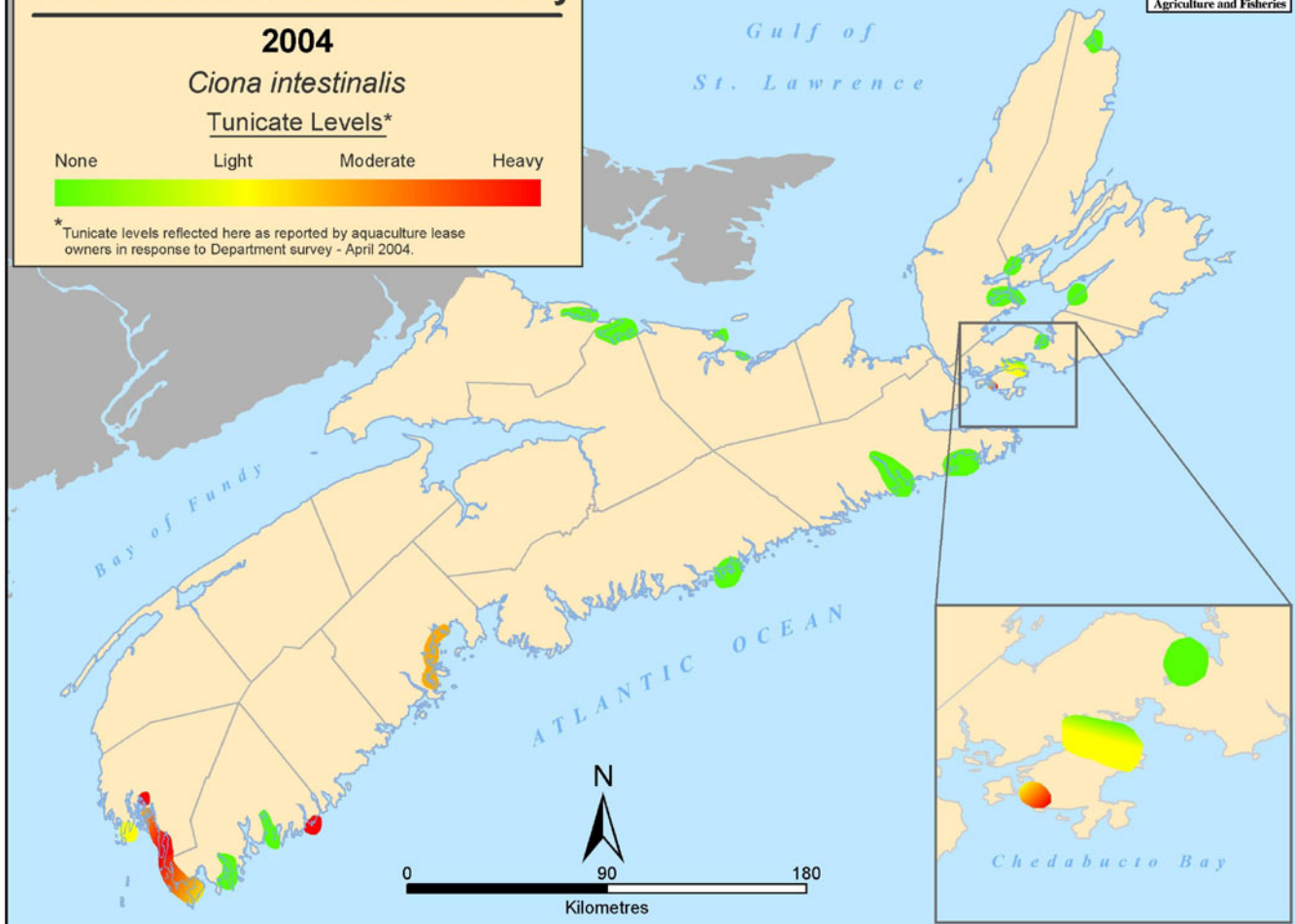


Figure #1: *Ciona intestinalis* distribution in NS.

## Acknowledgments

We would like to thank those lease holders that took the time to reply to the survey. Your suggestions and comments are welcome, please call 902-424-0353, fax 902- 424-1766 or mail responses to;

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