



LOBSTER MOULT TIMING AND QUALITY MONITORING PROJECT

“Building research and development capacity for the Canadian Lobster Industry through the AVC Lobster Science Centre”

Background & Rationale

Since the early 2000s there have been fluctuations in the quality (soft-shell and low meat yield) of lobster landed in Southwest Nova Scotia resulting in an economic challenge for the area. Understanding the factors that control the variation of lobster quality is vital to the sustainability and health of the lobster industry. To better explain the variation in lobster quality, continuous and annual sampling are required.

In 2004, lobster harvesters, buyers, dealers, processors and scientists began working together to develop this collaborative research program designed to document and understand the annual changes in moult-timing and lobster quality in LFAs 33 and 34. Success in these locations urged expansion into a number of other locations in LFAs 24, 25 and 26a.

Project Goals

Lobster quality is directly related to the timing of the moult which, in turn, can be affected by a number of different components including water temperature, diet and other ecosystem factors. A certain amount of time is necessary after a moult for the lobster to return to top market quality. Collection of biological data such as blood protein levels, moult stage and shell hardness, will allow for the investigation of the causes of reduced lobster quality.

The Lobster Moult & Quality Monitoring project provides a new focus and resource to the lobster industry by building on knowledge and capacity developed over many years of research at the AVC Lobster Science Centre.

One of the goals of the project is to expand the ongoing sampling infrastructure. The information collected from this monitoring program will be used to build predictive models for landed lobster quality based on environmental and biological data along with historical data.

What Are We Doing?

Monitoring of lobster hemolymph (blood) protein levels has now been ongoing since the summer 2004 with pre-season, during and post-season sampling.

The monitoring currently includes 16 areas in LFAs 33, 34 and 35 and 8 areas in LFAs 24, 25 and 26a.

For each sample, 125 lobsters are selected, when available. Each lobster is sexed, measured, assessed for shell hardness and moult cycle. A needle and syringe are used to extract a few drops of blood from the underside of the tail. The blood is then placed on a hand-held refractometer to determine blood protein levels. The final step is to take a small clipping from the tip of a pleopod, or swimmeret. This is examined within 48 hours under a microscope to determine moult stage. Additionally, lobsters are assessed for shell disease lesions and available environmental data (bottom water temperatures, depth and sea surface water temperatures, etc.) are being investigated for potential correlations with other parameters collected.

What Have We Done So Far?

- *The sexes can differ in their moulting pattern throughout the year, but this is less pronounced than differences observed between deep and shallow areas.*
- *Moult-timing can also be influenced by lobster size with small (<82.5mm) lobsters moulting later and less inclined to moult in unison than large lobsters.*
- *Water temperatures in the spring of 2005 and 2006 warmed more quickly than in 2004 resulting in a relatively early moult that year, in LFAs 33 and 34.*

Future Research

This monitoring program could lead to several other research projects. Among others, we are hoping to:

- *establish better sampling platforms to carry out monitoring programs tailored to the lobster industry, for example: shell disease;*
- *expand and enhance the database and information delivery system describing lobster populations in SWNS, the Northumberland Strait and the north shore of PEI;*
- *create new and more accurate tests to determine moult stage/meat yield and female reproductive status; and*
- *develop non-lethal methods to assess nutritional status and reproductive status in lobsters.*

For more information, contact:

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To measure blood protein levels, a small amount of blood is collected from the underside of the lobster tail. Shell hardness is evaluated by 'squeezing' the carapace while moult stage is assessed by looking at the tip of a swimmeret under a microscope. Although both the blood sample and clipping the tip of a swimmeret are inflicting small wounds, the lobster's clotting system is fast and very effective and therefore, these procedures do not cause any harm to the lobster.

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To all, a sincere thank-you...



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... and the lobster industry.