NSERC / FFAW Project: Sustainable Fisheries

Lobsters in Western Newfoundland: Reproductive Relative to Economic Value

5 November 2010





Natural Sciences and Engineering Research Council of Canada Conseil de recherches en sciences naturelles et en génie du Canada



Participants/Organizations – Investigators Participants/Organizations – Advisory Background

Evaluation of conservation measures: Results

- Closed areas (Collins thesis, Wilke & Janes)
 V-notching (Whiffen thesis)
 Slot Fishery (Currie thesis)
- Summary and comparison

Evaluation of conservation measures: Eggs / \$\$ •Reproductive Value / Dollar Value •Compare V-notching, Closed areas, Slot

Your advice



Community - University Research for Recovery Alliance

About Us

Collaborative Research

Events & News Succes

Success Stories

Publications & Reports

Overview

- Globalization & Recovery
- Rural Youth & Recovery
- Fishplants Past & Future
- Critical Habitat
- Governing for the Future
- New Initiatives
- Curriculum for Recovery

Promoting Dialogue

Collaborative Research - an Overview

Researchers at Sir Wilfred Grenfell College and Memorial University along with multiple community partners have received funding for a Community-University Research for Recovery Alliance focusing on Newfoundland's west coast marine ecosystems and fishing communities. Our activities will include:

- Broadening use and public engagement with the Bonne Bay Marine Station
- Linking research and local

knowledge to develop key recovery strategies for the region

- Enhancing the capacity of fish harvesters and fishing communities within the region to engage in recovery strategies
- Integrating existing knowledge and developing new knowledge about fish, fisheries and fishing communities
- Transferring knowledge to the region and between generations through innovative community-based educational programs and initiatives
- Create a multi-disciplinary platform for future research and collaborations



Social Sciences and Humanities Research Council (SSHRC)



Memorial University

Participants/Organizations – Investigators

Jens Currie – Department of Biology, MUN
Barbara Neis – Department of Sociology, MUN
Jamie Raper – Department of Biology, MUN
David Schneider – Ocean Sciences Centre, MUN
Jason Spingle (FFAW)
Monty Way (FFAW)
Cathy Whiffen – Department of Biology, MUN
Kate Wilke – Ocean Science Centre, MUN

Cailin Xu – Ocean Science Centre, MUN

•And of course....



Participants/Organizations - Advisory

NSERC Advisory Committee

- Lew Incze (University of Southern Maine)
- Bob Steneck (University of Maine)
- Rick Wahle (Bigelow Lab, Boothbay Harbor, Maine)

Industry

Harvey Jarvis (FFAW)

Department of Fisheries and Oceans, St. John's, NL

- Roanne Collins (Science Branch)
- Jennifer Janes (Öceans Branch)

Informal

- Jerry Ennis (DFO Science, retired)
- Bob Hooper (MUN)

NSERC / FFAW Project: Sustainable Fisheries •Lobsters in Western Newfoundland: Reproductive Relative to Economic Value

Background

\$550 million/year in landed value, export market
Value of regular income to rural communities
Value of sustainable fishery, export and local



Closed areas



Egg Production: **Roanne Collins thesis**

•V-notching



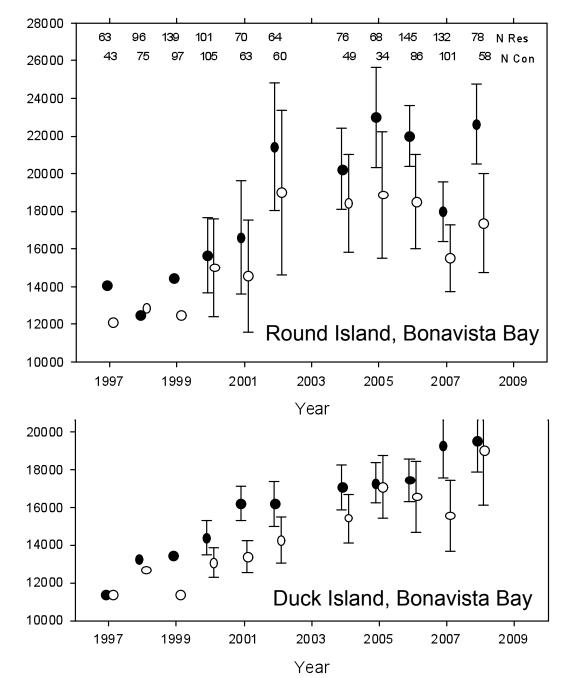
Slot Fishery



Egg Production:

Jens Currie thesis

Egg Production: Cathy Whiffen thesis



Closed areas



Egg Production/female is consistently higher in closed areas.

Increase due to larger size

Roanne Collins (2010) thesis

Reserve (•) and Adjacent (°) locations Sample sizes above estimates.

Evaluation of conservation measures: Results Closed areas

Roanne Collins thesis (2010) More results.

•Mean sizes of males and females were greater inside the reserves, as compared to adjacent control areas.

•Mean size of males and females increased over time inside and outside both Round Island and Duck Islands reserves - (spillover?)

•More pronounced size response to protection occurred for males at both protected areas.

•Higher proportion of females in both protected areas (Duck and Round).

•Density higher inside the protected area at Round Island, but not at Duck Island

•Density in the closed area did not increase over time (1997 to 2008).

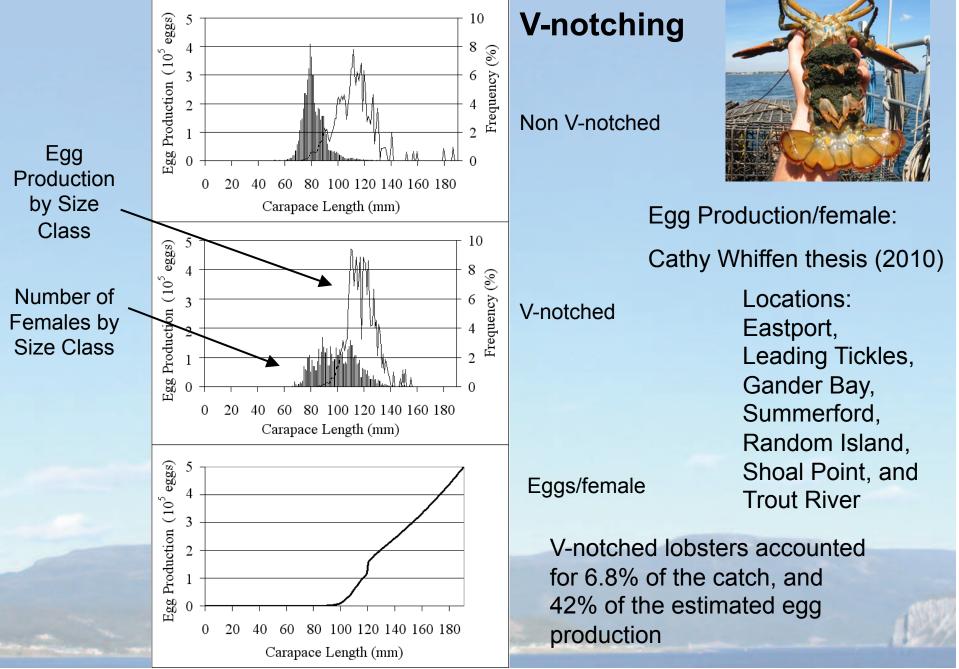


Comparing Closed Areas - lobster size inside vs. outside

Results (Kate Wilke and Jennifer Janes) :
•Establishment of a closed area results in larger lobsters inside the closed area at some locations, but not at others.
•Longer time since closure does not result in larger lobsters.

Summerford **Trout River** Lobster Closed Areas (closed 2003) (closed 2002) in Newfoundland Area = $.41 \text{ km}^2$ Area = nd Males: larger inside Males: no sig diff Females: no sig diff Females: larger inside 50°N -50°N **Shoal Point Gander Bay** (closed 2002) Island of (closed 2003) $Area = .57 \text{ km}^2$ Area = 77.57 km^2 Newfoundlan Males: no sig diff Males: larger inside ST. JOHN'S Females: no sig diff Females: larger inside 55°W Round Island **Duck Island** (closed 1997) (closed 1997) Area = $.47 \text{ km}^2$ $Area = 1.96 \text{ km}^2$ Males: larger inside Males: larger inside Females: no sig diff Females: no sig diff

*based on 2004 data



Egg Production/female:

Slot fishery

Jens Currie thesis (2010)

Currie, J.C. D.C.Schneider, K.M. Wilke (in press). Validation of a non-invasive technique for estimating fecundity in the American lobster *Homarus americanus*. *Journal of Shellfish Research*

Results.

•Fecundity estimates to date based on removal of 7000 egg masses and 140 million eggs, or 1.4 million lobsters, assuming 1% survival

•A non-invasive technique was developed, based on field estimate of egg mass volume and sample of 10 eggs/female. Lobsters are released with egg mass left intact.

•Estimates were within 4% of those based on complete removal of egg mass.



Egg Production/female: Jens Currie thesis (2010)

Currie, J.C., D.C. Schneider (submitted mss). A General Model of Fecundity in a Commercially Important Species.

Results.

•All available data on lobster fecundity in relation to size was assembled (Newfoundland to Massachusetts).

•Fecundity decreases in a regular way with increasing latitude

•Lobster fecundity can now be estimated at any location in the species range.

Slot Fishery Effects

- •Increase in egg production ? (Cailin Xu)
- Increase in number of large lobsters in catch?
- •If increase in number or large lobsters, does this affect density or egg production of smaller lobsters?



Slot fishery

Growth rate:

Slot fishery

Jamie Raper thesis (2011)

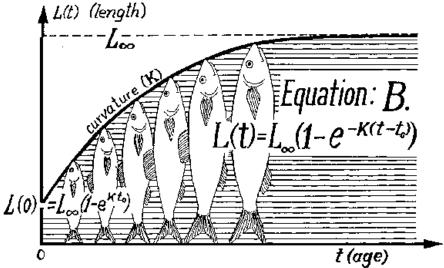
Results.

•All available data on lobster growth in relation to size was assembled (Newfoundland to Massachusetts).

•Growth decreases in a regular way with increasing latitude

•Lobster growth can now be estimated at any location in the species range.







- •Closed areas. Some increase in egg production. Window for survival of large, highly fecund lobsters.
- •V-notching. Substantial effect (42% of eggs from 7% of catch)
- •Slot Fishery. Effect cannot be evaluated from catch data – lack of catch data for lobsters above 127 mm







Next steps:

Evaluation of conservation measures: Eggs / \$\$ Reproductive value/\$\$

Evaluation of conservation measures: Eggs / \$\$ •Reproductive / Economic Value

Home > Live Lobster > Jumbo Live Lobsters (4 - 10 pounds)

SEARCH

Categories

GO

Home

Live Lobster New England Clambake Alaskan King Crab Legs Fresh Seafood & Fillets Lobster Meat Live Lobster & King Crab Chowder & Bisques Scallops Lobster Tails Shrimp Smoked Seafood Fresh Shellfish Stuffed Quahogs Seafood Combo Meals Accessories Corporate Gifts Gift Certificates



Resources

Seafood Articles NEW Seafood Recipes Wine Recommendation Seafood Facts & Info Our History Testimonials

Customer Service

Shopping Cart Shipping Policies &



Jumbo Live Lobsters (4 - 10 pounds)

We keep these massive live lobsters in darkened seawater tanks. The water is kept chilled at a constant 38 degrees so as to simulate their natural environment. This process keeps the lobsters strong and healthy. These are hard shelled lobsters and full of meat.



Four Pound Jumbo Lobster \$67.34



Eight Pound Jumbo Lobster \$134.68



Nine Pound Jumbo Lobster \$151.52

What is a lobster worth to the population, relative to what it is worth to the person who catches it?

Evaluation of conservation measures: Reproductive Value / \$\$

•Closed areas



 $\frac{\mathcal{V}_{x}}{\mathcal{V}_{0}} \quad \begin{array}{l} \text{With and without} \\ \text{a closed area at} \\ \text{several spatial} \\ \text{scales} \end{array}$

V-notching

Slot Fishery





 $\frac{v_x}{v_0}$ As it depends on the upper limit of the slot

And now, your advice and your queries



Français

Но

Home

Contact Us

Help

Search

Home > Oceans > Marine Areas > Marine Protected Areas > Eastport

Topics

Aquaculture

Aquatic Species

Fisheries

Fish Habitat

Management

Marine Navigation

<u>Oceans</u>

About Canada's Oceans

Oceans Management Approach

Marine Areas

Ocean Industries

Events and Awareness

Reports and Publications

Information by Region

Marine Protected Area

Eastport

The Eastport Peninsula, one of the most picturesque areas of Bonavista Bay, is located approximately three hours drive from St.John's, Newfoundland. The rugged coastline is interrupted by a number of headlands, coves, and beaches. Numerous islands found in the area provide habitat for a variety of marine wildlife. The rich, productive waters surrounding the Eastport Peninsula are host to a wide range of groundfish, pelagic fish, shellfish, marine mammals, and aquatic plants. Since early settlement the people of the Eastport Peninsula have relied on the fishery for their economic subsistence.

In 1995, to address declining catches, the Eastport Peninsula lobster fish harvesters formed the Eastport Peninsula Lobster Protection Committee (EPLPC). The aim of the Committee was to implement an overall lobster conservation strategy for the Eastport Peninsula. Committee members provided information and data required for the management of the resource and implemented various measures to address conservation and sustainability. Based on the initial success



of various initiatives, the EPLPC developed an agreement with Fisheries and Oceans Canada in 1997 to limit local fisheries and close two areas of prime lobster habitat to lobster harvesting. One benefit of these initiatives has been the ability of fish harvesters, government, community youth, academics, and scientists to work together and share information and knowledge for better management of the lobster fishery.