Lobster Research Planning Video Conference

NSERC / FFAW Project: Sustainable Fisheries

Lobsters in Western Newfoundland: Reproductive Relative to Economic Value

13 & 14 May 2009
Participants/Organizations – Investigators
Participants/Organizations – Advisory
Background
Proposed Research
  • Conservation measures
    • Closed areas
    • V-notching
    • Slot Fishery
  • Do these measures matter?
    • Reproductive / Economic Value
    • Measuring fecundity
    • Measuring growth
Location and Methods
Your advice
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
Participants/Organizations – Investigators

• Jens Currie – Department of Biology, MUN
• Barbara Neis – Department of Sociology, MUN
• David Schneider – Ocean Sciences Centre, MUN
• Paul Snelgrove – Ocean Sciences Centre MUN
• Jason Spingle (FFAW)
• Monte Way (FFAW)
• Kathy Whiffen – Department of Biology, MUN
• Kate Wilke – 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)
- Helen Griffiths (Oceans Branch)
- Jennifer Janes (Oceans 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
Conservation measures

• Closed areas

• V-notching

• Slot Fishery
Proposed Research

• Conservation measures
• Do these measures matter?

• Reproductive / Economic Value

• Measuring fecundity
• Measuring growth
Do these measures matter?

- Reproductive / Economic Value

What is a lobster worth to the person who catches it?
Do these measures matter?
• Reproductive / Economic Value

What is a lobster worth to its population?
Do these measures matter?
• Reproductive / Economic Value

Fecundity by itself a misleading measure in long lived species as it discounts future egg production if the measure is fecundity at age rather than lifetime fecundity

Walters and Martell 2004
*Fisheries Ecology and Management*
Princeton University Press
Location and Methods

Figure 1: Newfoundland and Labrador Lobster Fishing Areas.
Methods

• Measuring fecundity

\[ \text{Eggs} = e^{(0.0292 \times \text{length}) + 6.9721} \]

Lobster egg production and larval drift potential in the Tickles MPA

D.W. Ings, P.V. R. Snelgrove, D.C. Schneider
Report to DFO Oceans, 2005
Methods
• Measuring growth

To obtain the lower triangular growth transition matrix $P$ in (9.30), a stochastic LVB growth model (cf. section 4.7.3) is used, although in principle any stochastic growth model could be used. The goal is to find the proportion, $P_{m,l}$, of fish in length class $l$ at the start of a time period that survive and are in length class $m$ at the start of the next time period. If $l_l$ and $l_u$ are the two ends of length class $l$ and $l^*$ is the midpoint $(l_l + l_u)/2$, then the expected length change or growth increment, $\Delta_l$, over one time period for an individual at mid-length, $l^*$, from the LVB model is

$$\Delta_l = \left( L_\infty - l^* \right) \left( 1 - e^{-\kappa} \right).$$

Hence, the expected length, $E(x)$, of a fish of mid-length $l^*$ one time unit later is

$$E(x) = l^* + \Delta_l.$$

Quinn and Deriso 1999
Quantitative Fish Dynamics
Oxford University Press
Evaluation of conservation measures

- Closed areas

- V-notching

- Slot Fishery

\[ \frac{v_x}{v_0} \] With and without a closed area at several spatial scales

\[ \frac{v_x}{v_0} \] With and without v-notching, depending on % notched

\[ \frac{v_x}{v_0} \] As it depends on the upper limit of the slot
And now, your advice and your queries