NSERC / FFAW Project: Sustainable Fisheries

Lobsters in Western Newfoundland: Reproductive Relative to Economic Value

Community Consultation and Follow-up

Plum Point at the Plum Point Motel, 6 April 2011
Cow Head at the Shallow Bay Motel, 7 April 2011
Stephenville at the Holiday Inn, 8 April 2011

Memorial University of Newfoundland

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

FFAW CAW

Visual presentations at Cow Head and Stephenville

- CURRA context
- Participants/Organizations – Investigators
- Participants/Organizations – Advisory
- Results of NSERC/FFAW research to date
  - Conservation measures
    - Closed areas
    - V-notching
    - Slot Fishery
- Current issues, addressed at consultations

Summary of current issues, slot fishery

Follow-up, 10 April 2011, based on consultations

CURRA

Community - University Research for Recovery Alliance

- 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

SSHRC

Social Sciences and Humanities Research Council (SSHRC)

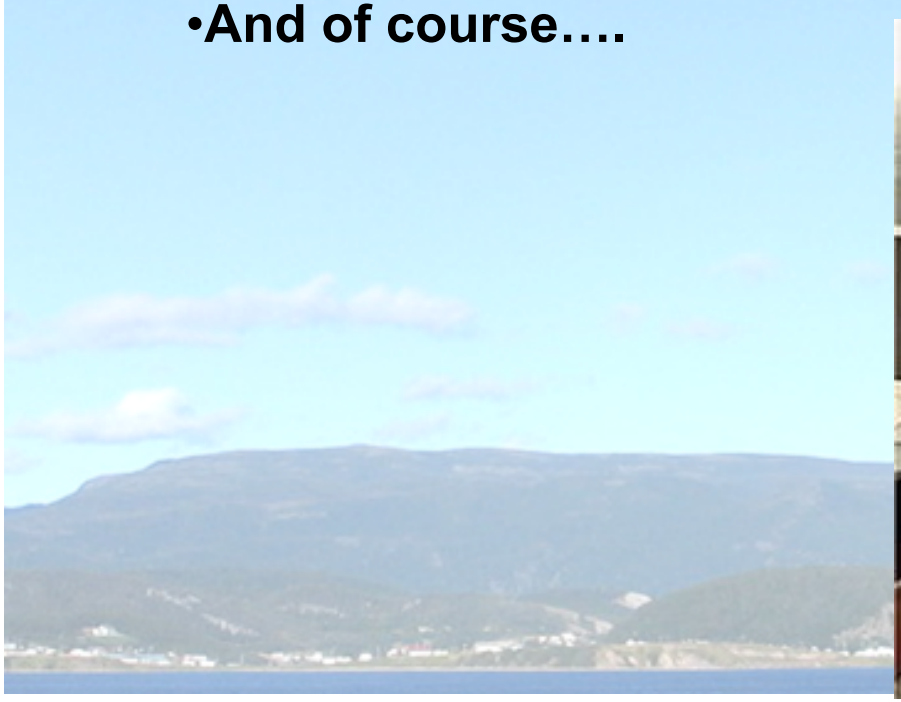
MEMORIAL UNIVERSITY

Memorial University

Participants/Organizations – Investigators

- David Schneider – Ocean Sciences Centre, MUN
- Barbara Neis – Department of Sociology, MUN
- Kate Wilke – Ocean Science Centre, MUN
- Cailin Xu – Ocean Sciences Centre MUN
- MUN Students: Kathy Whiffen, Jens Currie, Jamie Raper
- Jason Spingle (FFAW)
- Monty Way (FFAW)

- 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)

Informal

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

NSERC / FFAW Project: Sustainable Fisheries

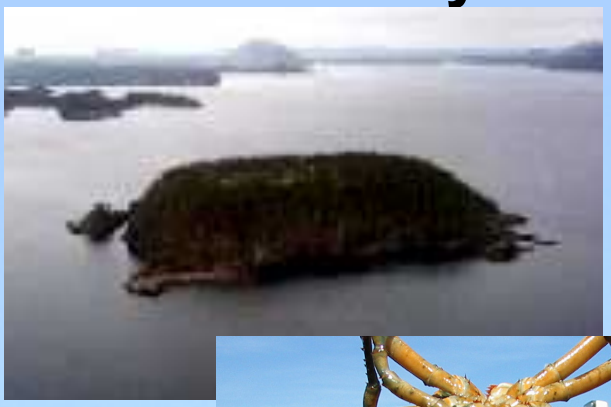
- **Lobsters in Western Newfoundland:**
- **Reproductive Relative to Economic Value**

Background

- **$550 million/year in landed value, export market**
- **Value of regular income to rural communities**

Conservation measures – Do they matter?

- Closed areas



- V-notching

- Slot Fishery

Do these measures matter?

•Reproductive / Economic Value

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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 person who catches it?

What is that lobster worth to the lobster population?

Reproductive / Economic Value

Fecundity by itself a misleading measure in long lived species

as it discounts future egg production

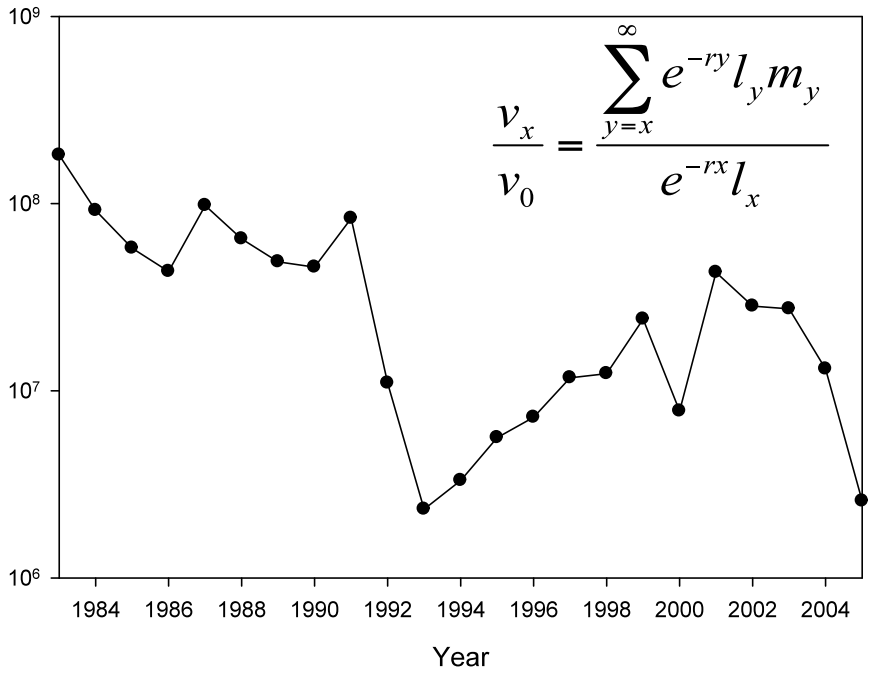
if the measure is fecundity at age rather than lifetime fecundity

Walters and Martell 2004
Fisheries Ecology and Management
Princeton University Press

It's like dividends and interest. What are future dividends worth on a 7 year certificate of deposit at the bank?

[7 years from egg to legal size]

Why use reproductive value?



Evaluation of conservation measures

- **Closed areas**

$\frac{v_x}{v_0}$ Closed area compared to adjacent area

- **V-notching**

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

- **Slot Fishery**

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

Evaluation of conservation measures - Results

- **Closed areas**

$\frac{v_x}{v_0}$ 33% increase in current and future egg production

- **V-notching**

$\frac{v_x}{v_0}$ 20% increase in current and future egg production

- **Slot Fishery**

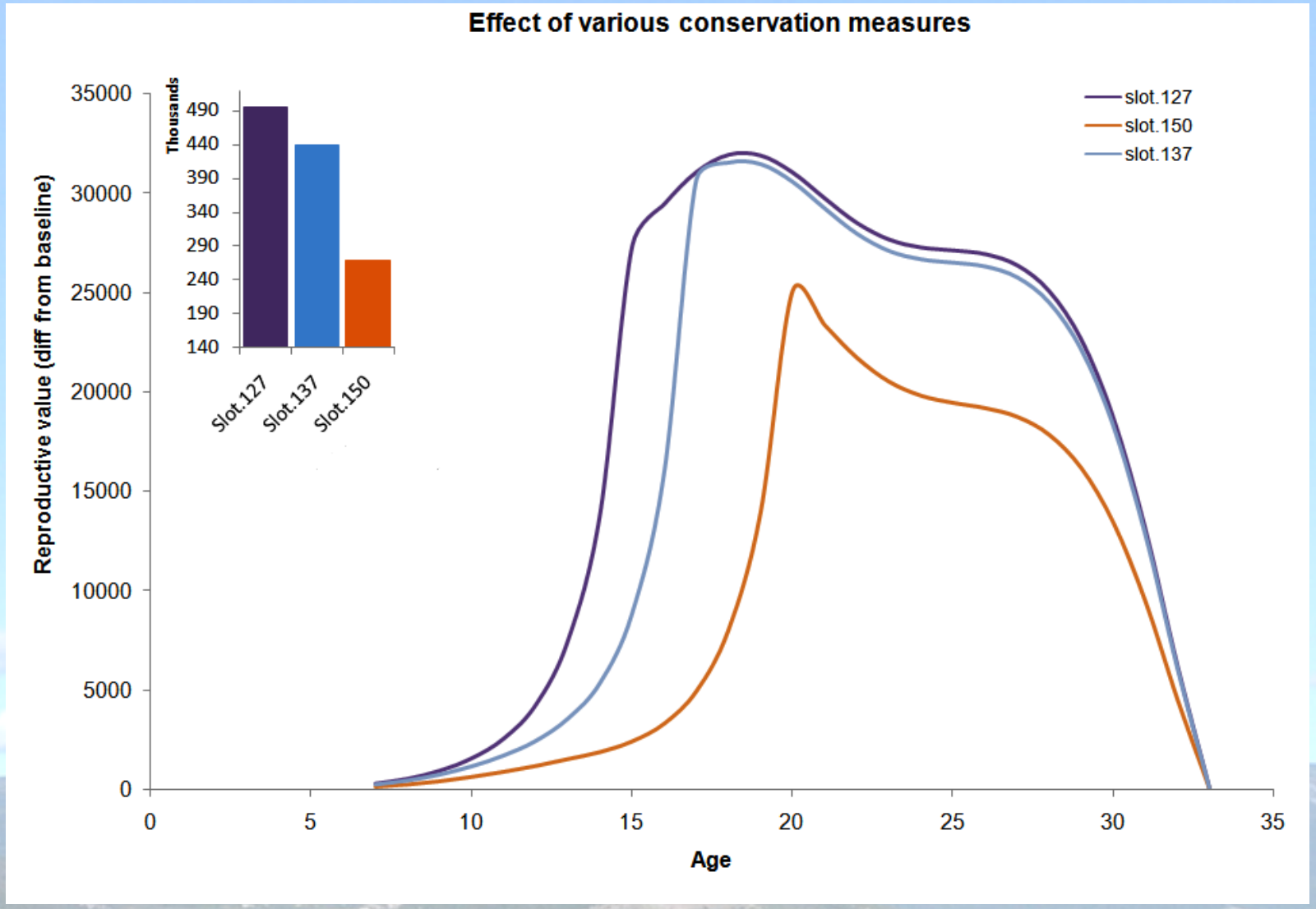
$\frac{v_x}{v_0}$ 30% increase in current and future egg production

Questions arising.

- **What if we change the upper limit on slot?**
- **Does window fishery work? Compared to slot**
- **Does % females with eggs depend on size?**
- **Does heavier fishing on males affect egg number?**
- **Does catch decrease due to more jumbos?**

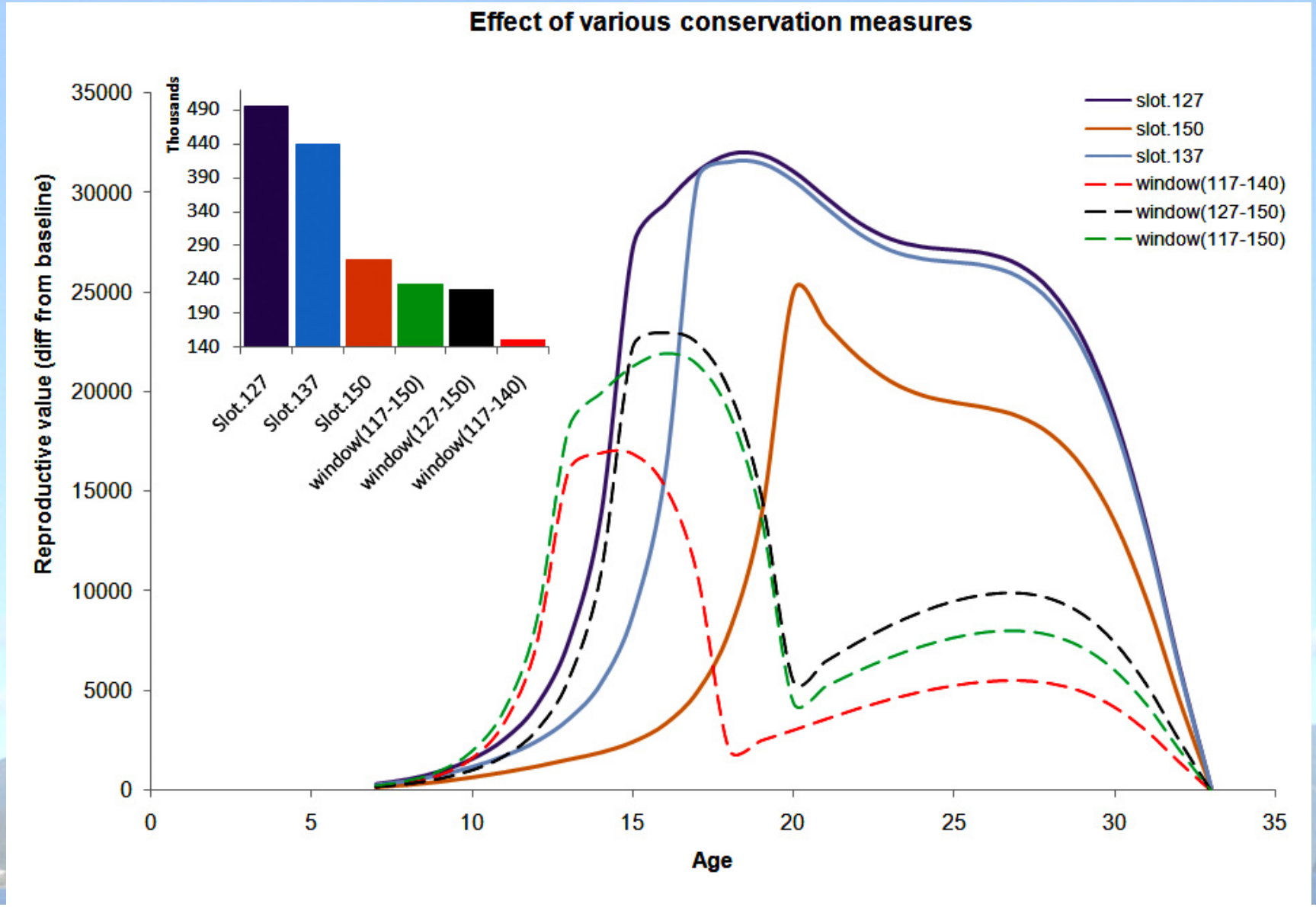
Current issues:

- What if we change the upper limit on slot?



Current issues:

- Does window fishery work? Compared to slot



Discussion at all three consultations was lively and informative.

Summary, based on all three consultations.

- **What if we change the upper limit on slot?**
  - **Substantial reduction in effect if slot to 150 mm**
- **Does window fishery work?**
  - **Eliminates jumbos in fishable areas**
  - **Substantial reduction in effect, similar to 150 mm slot**
- **Does % females with eggs depend on size?**
  - **Preliminary results**
    - **Percent with eggs about 40%, regardless of size**
    - **Small sample size, needs better estimate**
- **Does heavier fishing on males affect egg number?**
  - **Yes, if jumbo males needed to fertilize jumbo females**
- **Does catch decrease due to more jumbos? [Next]**

Summary, based on all three consultations.

Does catch decrease due to more jumbos?

- **We can look at catch but we cannot expect solid science answer on effects of jumbos on catch:**
  - **Catch due to many factors, including effort**
  - **Catch is variable, obscuring effects**
  - **Lag from egg to legal size is 5-7 years**
- **Free-ranging lobsters in large tanks tell us:**
  - **No destruction of small lobsters, if shelter**
  - **Destruction of molting lobsters, despite shelter**

Summary – Slot fishery

Advantages of slot fishery:

- Increased egg production [30%]
- Large males present for fertilization [Yes]
- Egg production by stable numbers of females [Yes]

Disadvantages of slot fishery

- Destruction of small lobsters in traps [Yes]
- Destruction of small lobsters outside traps [No?]
- Effects of increased jumbos on catch [unknown]

Adaptive management

- Mitigate – move jumbos to non fishable areas
- Replace – increase v-notching
- Closures – safe areas for jumbos, within LFA
- Others ?