

## Impact of Aquaculture on Commercial Fisheries Local Ecological Knowledge Study

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## Local Ecological Knowledge (LEK) Study Background

- 2009 – 1000's of pounds lobster found dead from pesticide poisoning - several locations SWNB
- killed by a pesticide used to control sea lice in salmon aquaculture (not approved for use in Canada)
- Insufficient science - nature of the interactions: aquaculture and the inshore fishery
- Reinforces the need for research that targets environmental impacts



- Established in the mid 1980's
- Not-for-profit fishermen's organization
- Approximately 75 members

## Fundy North's Geographical Region

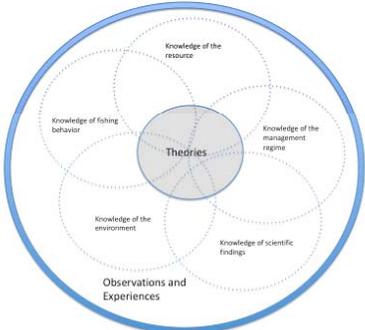


## Study Objectives

- To gain some understanding of the fishermen's local ecological knowledge:
  - Observations of recent environmental changes in their fishing grounds
  - To consolidate and articulate fishermen's concerns so that they can be presented in a more formal context
  - Comparison of areas where aquaculture has been for some time with areas of more recent development
- To suggest directions for future targeted science.



## Complex Nature of Local Ecological Knowledge

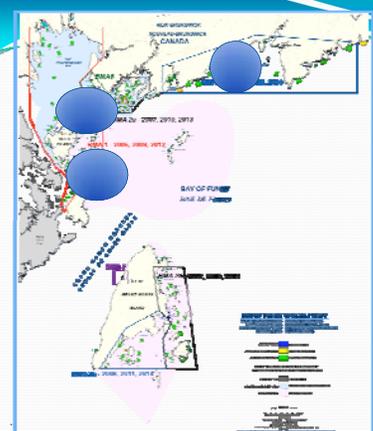


## Data Collection

- 3 communities; 1 heavily impacted, 1 less heavily, and one hardly impacted.
- 5 Focus Groups- 'kitchen' style meetings
  - 3 Fishermen per Focus group.

**Questions:**

- What changes have they observed in marine environment?
- What are their theories about causation?
- How has fishing behavior changed to cope?



Bay of Fundy showing 2010 SWNB marine aquaculture sites, as well as three focus group areas.

Map Credit: NB Department of Agriculture, Aquaculture and Fisheries.

## Lobster



- Displacement of nursery areas.
- Displacement of fishermen leads to increased pressure on healthy stocks.
- Sea lice chemicals killing adult lobster and possibly juveniles.
- Lobster pounds experience more dead lobsters among those held for market.
- Lobster gear is lost or fouled by aquaculture waste.
- Concerns re: adverse affect on markets given traceability.

## Scallop



- Displacement of fishermen leads to increased pressure on stocks.
- Loss of fishing flexibility, especially in winter conditions.
- Meat to shell ratios are lower near aquaculture operations.
- Scallop show thin shells and "mildewed" meats near aquaculture operations.
- Starfish "blooms" near aquaculture sites may affect stocks.

## Herring



- Loss of productive herring weirs/ shut off coves.
- Lights, odors and noise from aquaculture sites may deflect herring schools.
- Herring did not reach normal size or fat ratios over the 2010 season.

## Sea Urchins, Shrimp



- Loss of kelp beds resulting in less healthy roe.
- Shells are brittle and thin adjacent to aquaculture sites.
- Roe is discolored and unmarketable adjacent to aquaculture sites.
- More dead urchins in beds adjacent to aquaculture sites.
- Dead shrimp and crabs observed near well boat operations in summer 2010.

## General Findings

- Loss of species habitat (loss of good bottom).
- Changes to health of commercial stocks.
- Environmental problems & indicators (starfish blooms, loss of kelp beds, changes in seaweeds).
- Displacement from fishing grounds.
- Poor management of aquaculture sites.

## Recommendations

- Research Needs:
  - Cumulative impacts of repeated use of pesticides and other chemicals
  - Track significant environmental changes near aquaculture sites, especially over time
- Effective Integrated Management Institutions:
  - Fisheries & Aquaculture Working Group



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Thank You!



Questions???