Green Crab Mitigation in Newfoundland: Lessons learned from a stewardship harvest

Cynthia H. McKenzie, Terri Wells and Kyle Matheson
Northwest Atlantic Fisheries Centre,
Fisheries and Oceans Canada, St. John's, NL

Green Crab Summit
Orono, Maine, December 16, 2013


Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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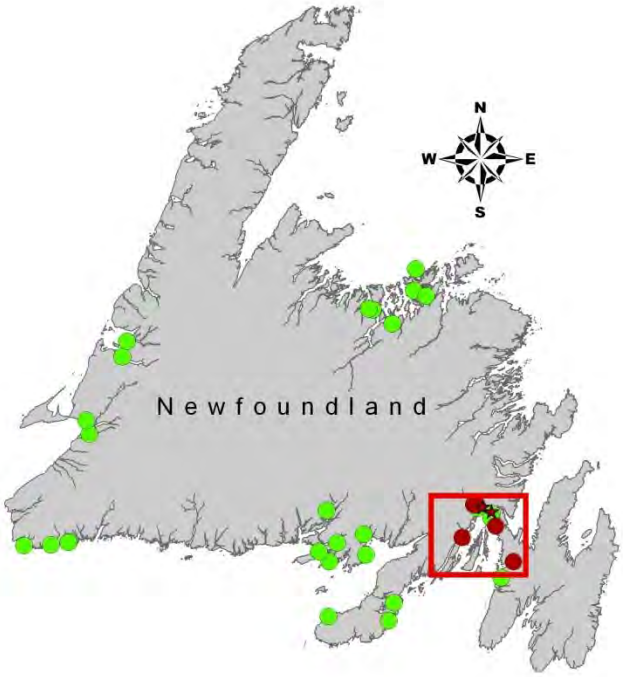
Image IBCAO

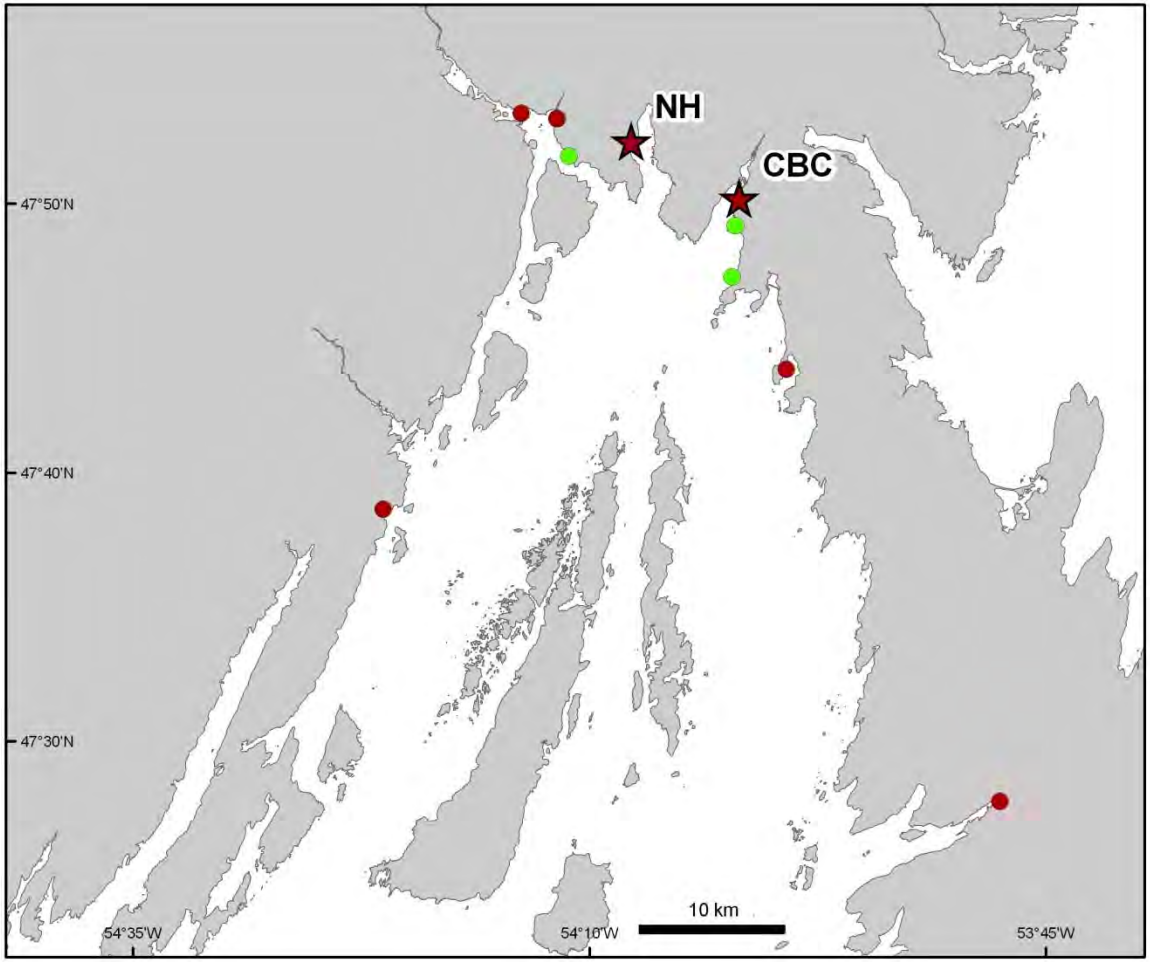
Discovery of European green crab, *Carcinus maenas* North Harbour – Aug. 23, 2007

Detection of *Carcinus maenas* (August 23, 2007)



***C. maenas* Distribution in Newfoundland Waters (2007)**

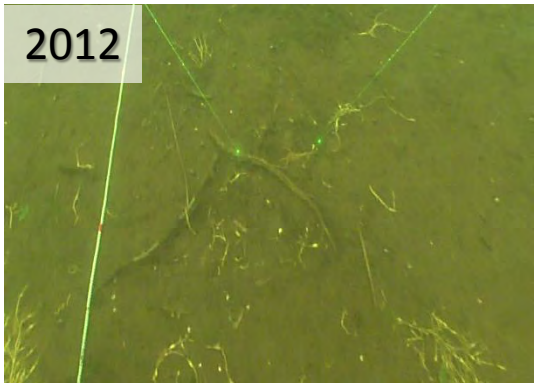
- Present
- Not Detected



Green Crab Impact on Biodiversity and Environment

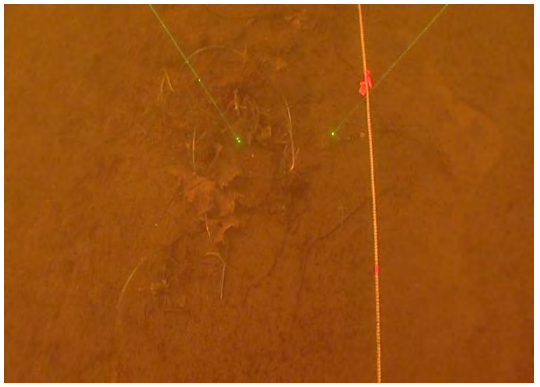
Results: Eelgrass Coverage (visual trends)

Placentia Sound



Southern Hr

Swift Current



Matheson et al submitted

Risk Assessment and Management Options

Newfoundland and Labrador Region AIS Science Strategy is based on the AIS Rapid Response Framework developed with regional collaboration within Fisheries & Oceans Canada (Locke et al 2011)

Mitigation Options include:

- Contain the problem to a given area
- Suppress the population to slow its spread
- Develop management strategies to keep the species at an abundance below an economic or ecological threshold
- Learn to adapt with the problems caused by the species

Green Crab Mitigation Workshop
February 2008 in St. John's

Recommendations for Science Priorities

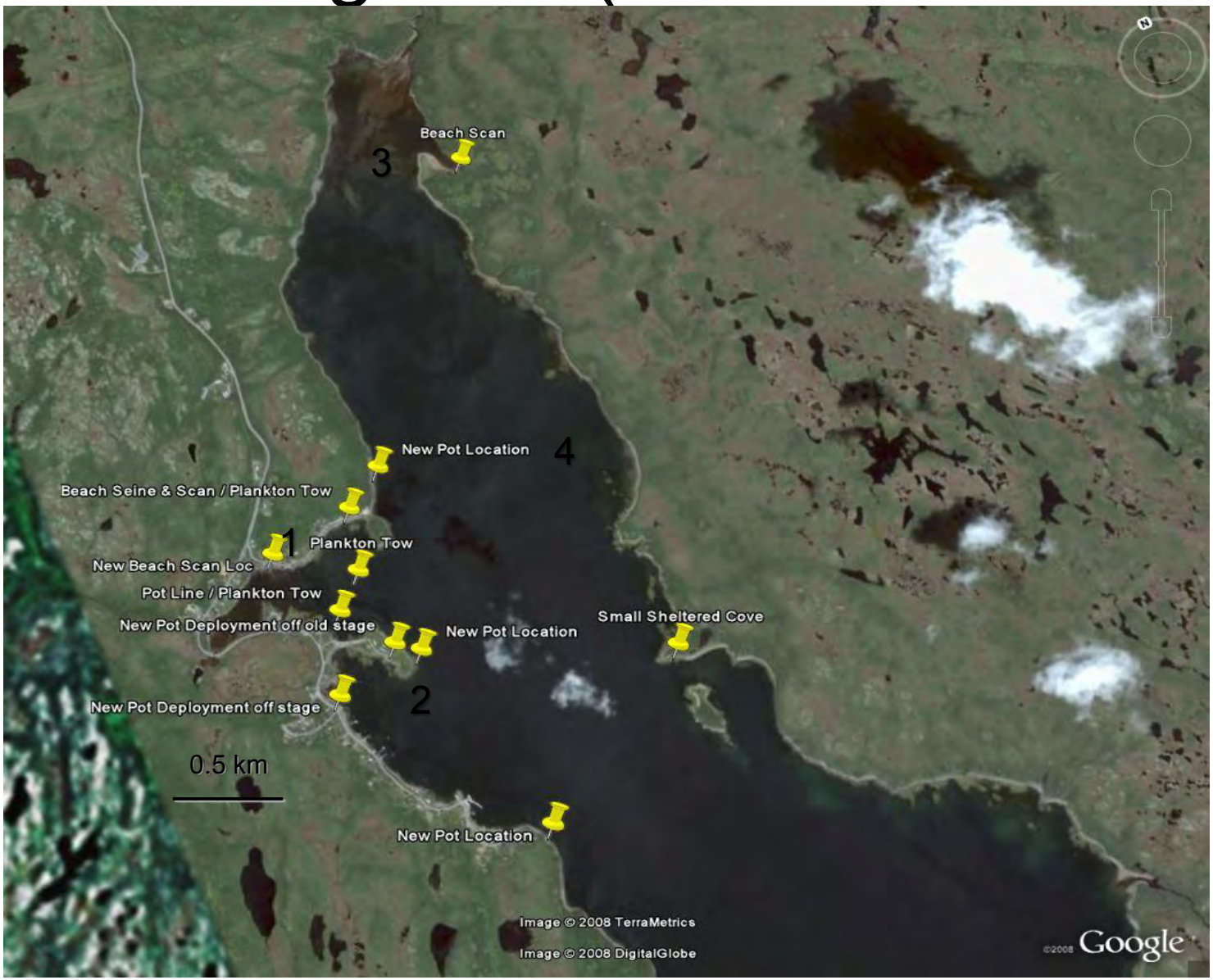
- ✓ Research/risk assessment on the impact of the green crab on the eelgrass habitat through burrowing and through predation of nursery species.
- ✓ Research on larval survival and spread, female crab distribution and habitat (K. Best)
- ✓ Research on the movement and impact on commercial species (seasonality, gender differences and habitat preferences) of the green crab in the NL environment using telemetry tracking and tagged crabs.

Green Crab Mitigation Workshop
February 2008 in St. John's

Recommendations for Science Priorities

Research on **mitigation methods** utilizing 1. local fish harvesters to remove AIS green crab and 2. community groups or school groups as part of a communication and "beach clean up" programme in affected areas.

FFAW Mitigation (Fed/Prov funded)



Mitigation - FFAW Pilot Green Crab Fishery

Phase 1 July 2008 (12 days) Phase 2 Sept 2008 (10 days)

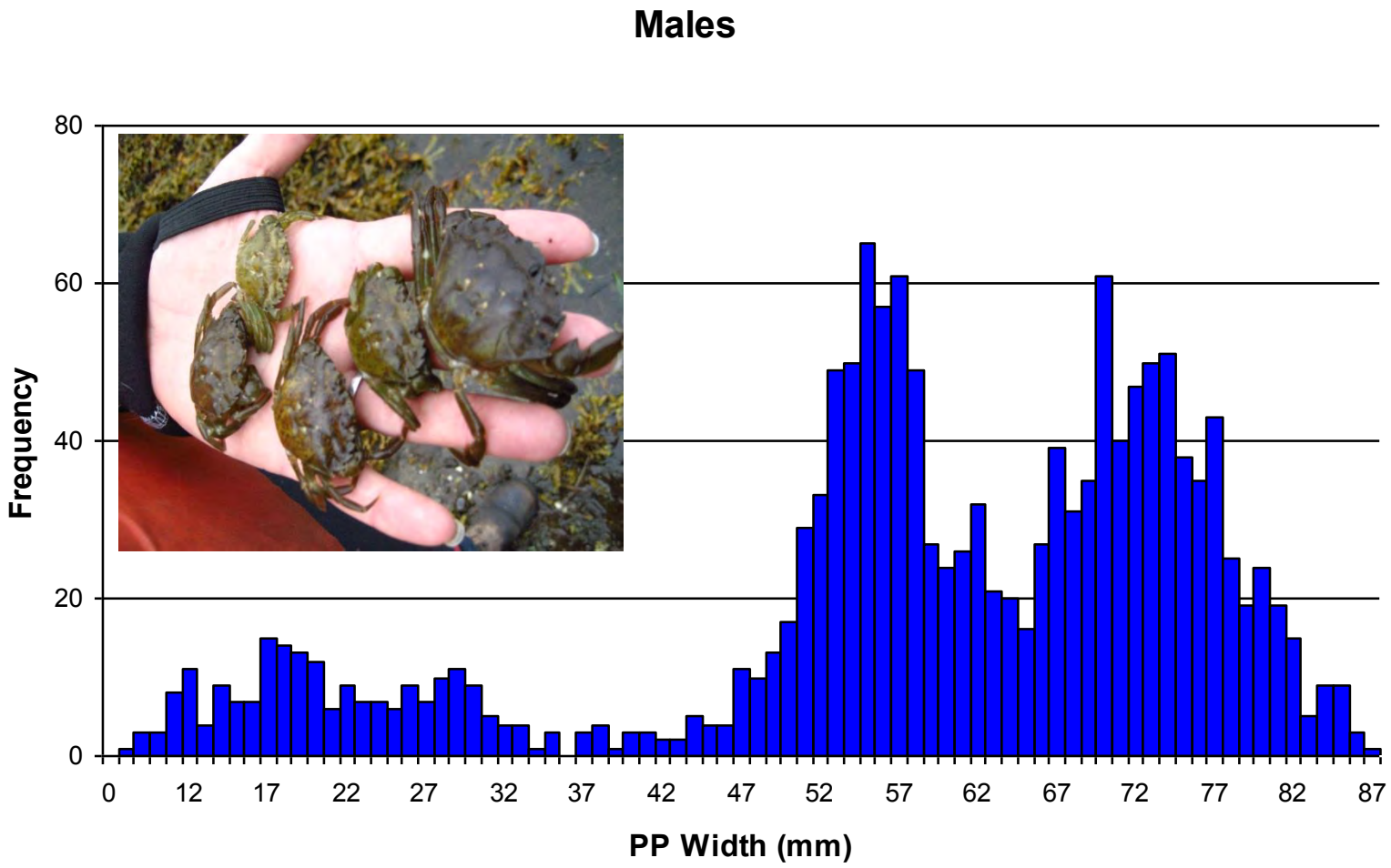
Phase 3 July 2009 (9 days targeted at berried females)

Population and Impact

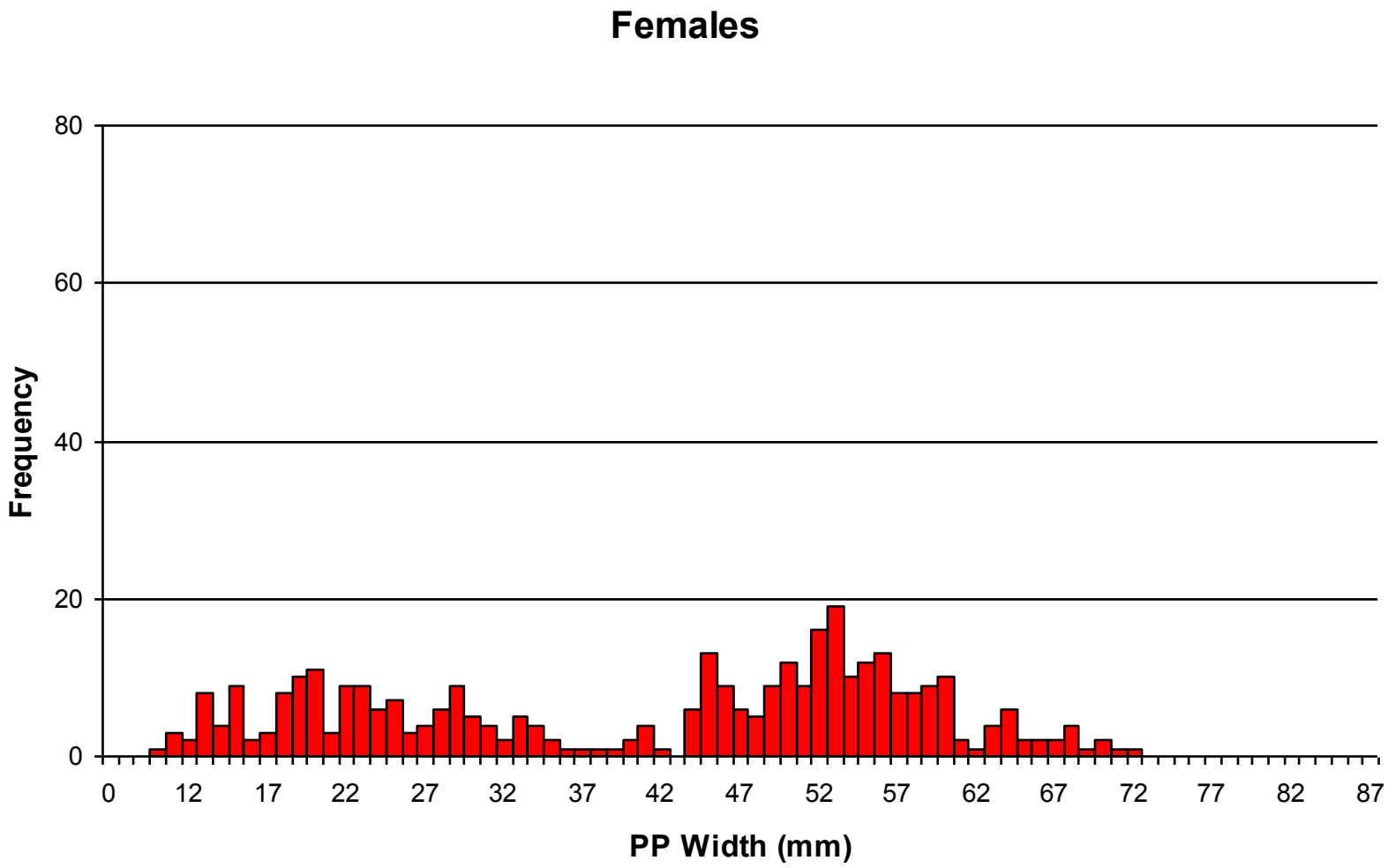
P1&2 25,000 lbs P3 >6,000 lbs

Mitigation –
Swift Current School Beach Survey
September 29, 2008

Size Frequency Distribution of Male Green Crabs sampled in 2007



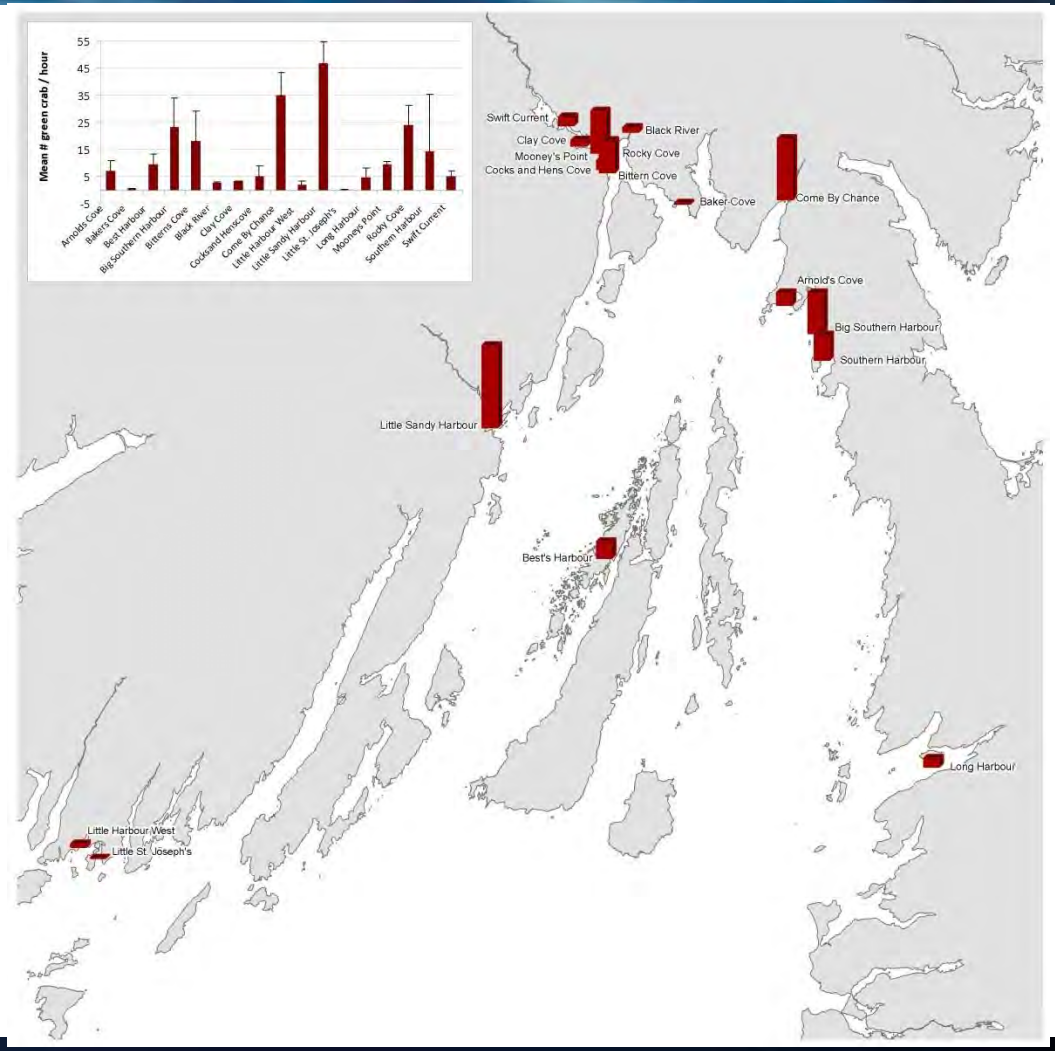
Size Frequency Distribution of Female Green Crabs sampled in 2007



Green Crab Experimental license

- Available to any licensed lobster or eel harvester
- Fukui traps provided by science
- License valid from end of lobster season to Dec. 31
- Green crabs utilized for compost- all other species released
- Log sheets for data required

Green Crab Stewardship in Placentia Bay

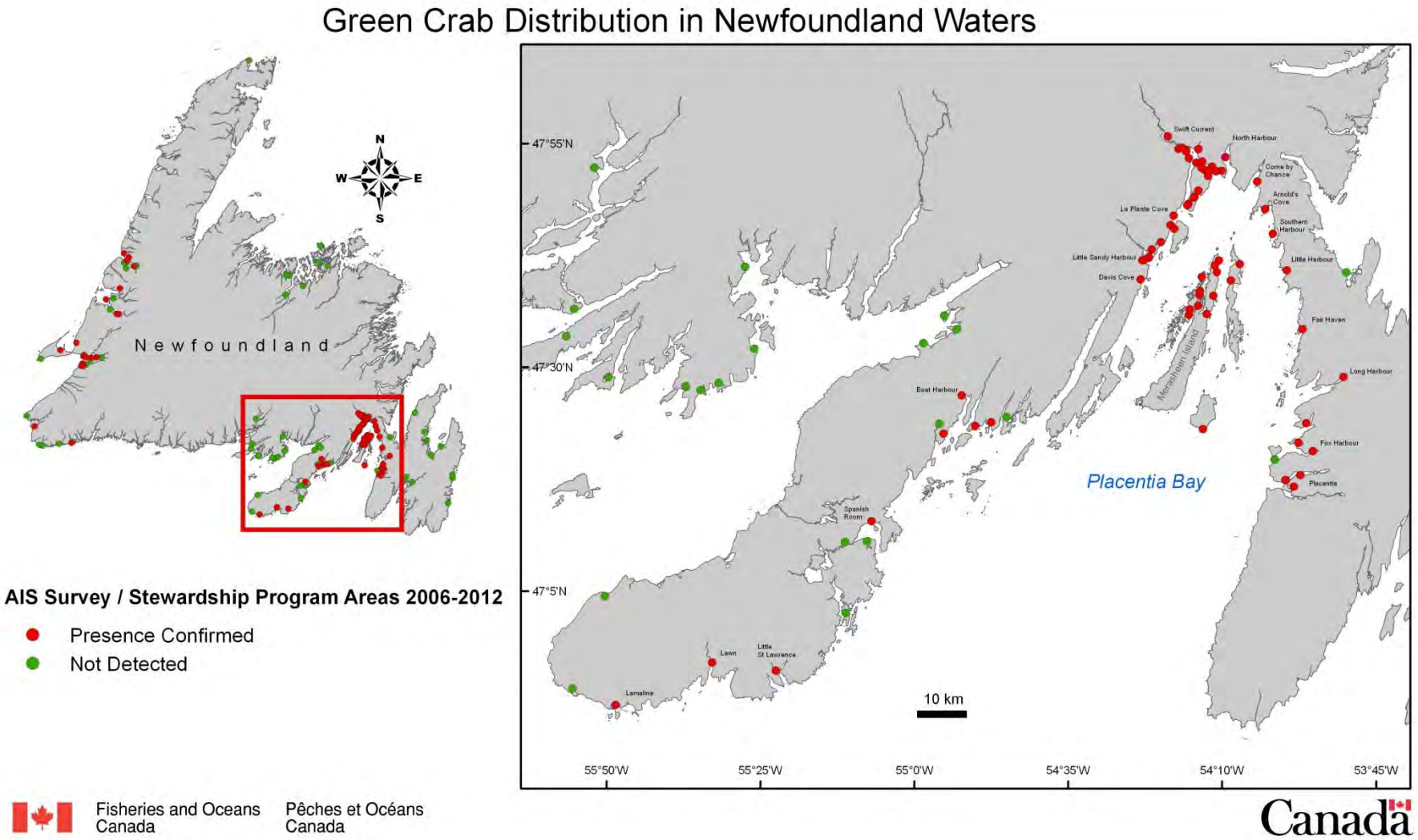


ECOLOGICAL ASSESSMENT OF THE INVASIVE EUROPEAN GREEN CRAB (*CARCINUS MAENAS*) IN NEWFOUNDLAND 2007-2009

Mitigation Measures and Their Effectiveness to Control Green Crab Populations

- Direct removal of green crab by trapping has been determined to be an effective mitigation measure to evaluate. Trapping has been used as an experimental control method in Newfoundland Prince Edward Island, Nova Scotia and California.
- In all cases (across regions), analyses of trapping methods indicate that catch rates decrease with concentrated trapping.
- Continuous trapping gradually reduces the average size of green crab, eventually shifting the green crab from being primarily a predator to a more vulnerable size as prey for several native predators, e.g. shorebirds and some larger crustaceans.
- In areas where intense trapping takes place, the native rock crab species numbers often increase over time.
- Intense trapping appears to be an effective control method for mitigation of green crab invasions; however, threshold levels of green crab population densities, timelines for action relative to impact, and measures of success still need to be well-defined based on specific environments.

Distribution of *C. maenas* in 2012



Fisheries and Oceans Canada
Pêches et Océans Canada

Canada

Future Plans – Mitigation and Stewardship 2014

- External funding – Stewardship-based to FFAW with DFO Science collaboration
- Focus on invasion fronts on east and west coasts of Placentia Bay
- Utilize expertise of fish harvesters
- Targeted areas
  - Minimize impact to remaining biologically and ecologically significant eelgrass beds
  - Protect native biodiversity
- Demonstrate effectiveness of control method
- Disposal of catch through environmentally friendly composting/fertilizer
- Collaborate with community groups and schools for education and action

Collaborative Partners and Funding Sources

- Fisheries and Oceans Canada
  - AIS Science Programme, Science Branch, Oceans, Policy & Economics, Communications
- Memorial University of Newfoundland
  - Department of Ocean Sciences, Marine Institute
- Provincial Department of Fisheries and Aquaculture
- Industry Partners at FFAW and NAIA
- Native Partnerships
- ACAP Humber Arm
- Parks Canada

Thank you!