Management of Small Pelagics in Atlantic Canada:
A case study of herring and mackerel

Katie Schleit and Heather Grant

Drivers and Dynamics of Small Pelagic Fish Resources International Symposium
Victoria, BC
March 7, 2017

Outline

- Overview of the Ecology Action Centre
- Analysis of current challenges of small pelagic management in Canada
- Overview of Atlantic herring and mackerel fisheries
- Recommendations for improvement

About the Ecology Action Centre:

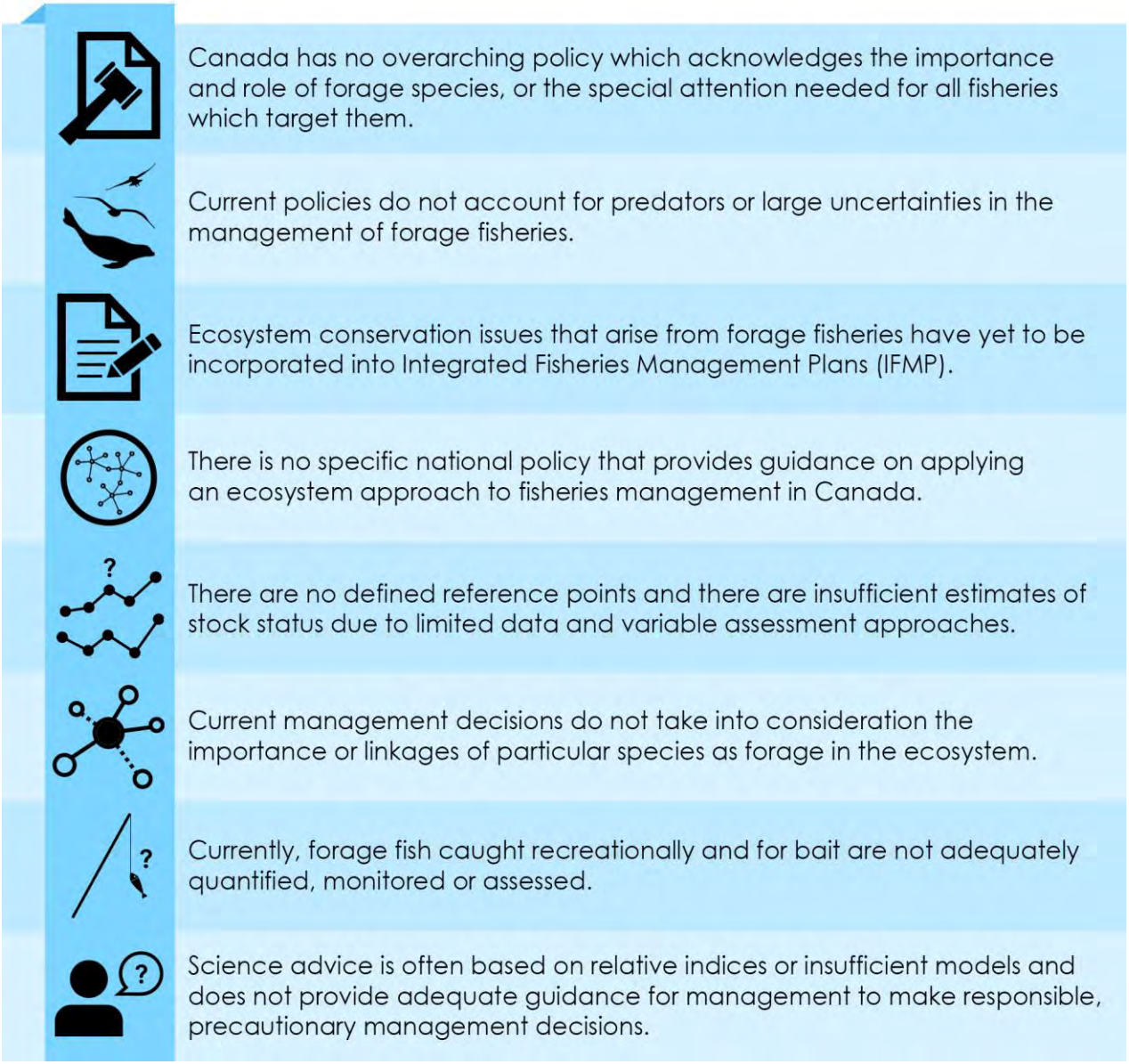
- We take leadership on critical environmental issues from biodiversity to climate change to environmental justice.
- We work to catalyze change though policy advocacy, community development, and building awareness, working in partnerships with our community.
- We work locally, nationally and internationally towards conserving and protecting the marine ecosystem and maintaining sustainable fisheries and vibrant coastal communities.

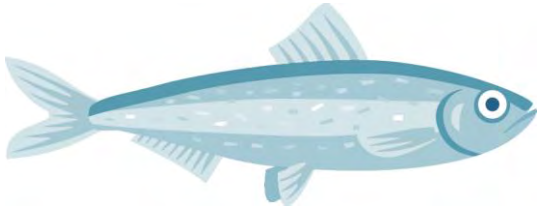
Fisheries Management Overview in Canada

- Oceans Act
- Fisheries Act
- Sustainable Fisheries Framework
  - Principles of Ecosystem-based Fisheries Management
  - Policy on New Fisheries for Forage Species

Overall Shortcomings of Small Pelagic Management

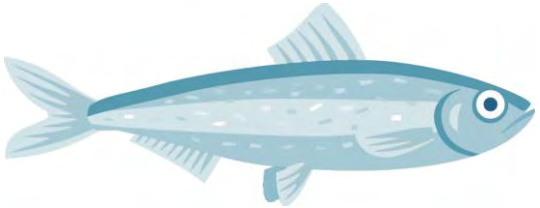
(Guénette et al. 2014)



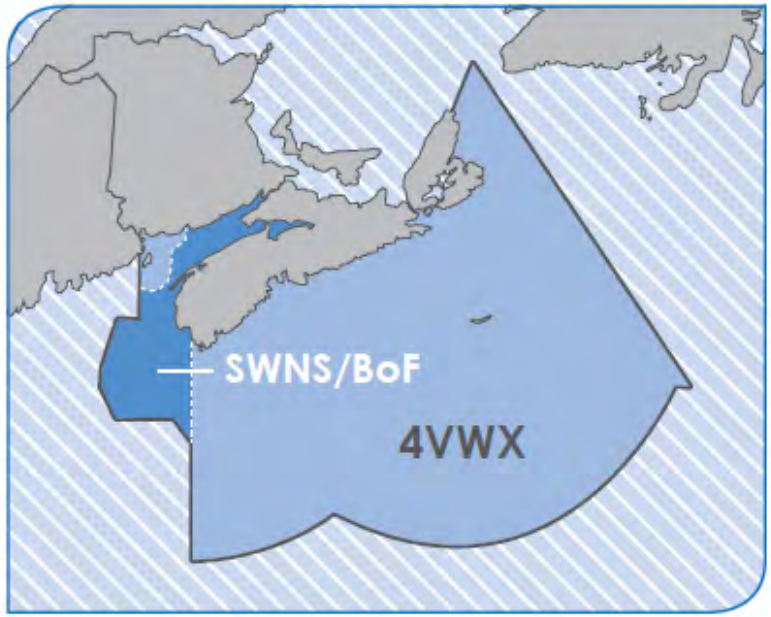


Atlantic Herring

Photo credit: NOAA FishWatch

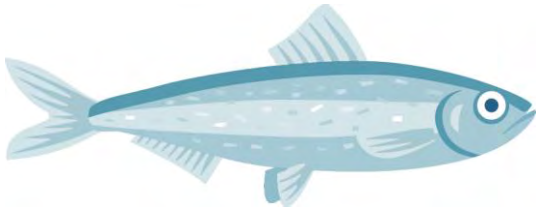


Atlantic Herring



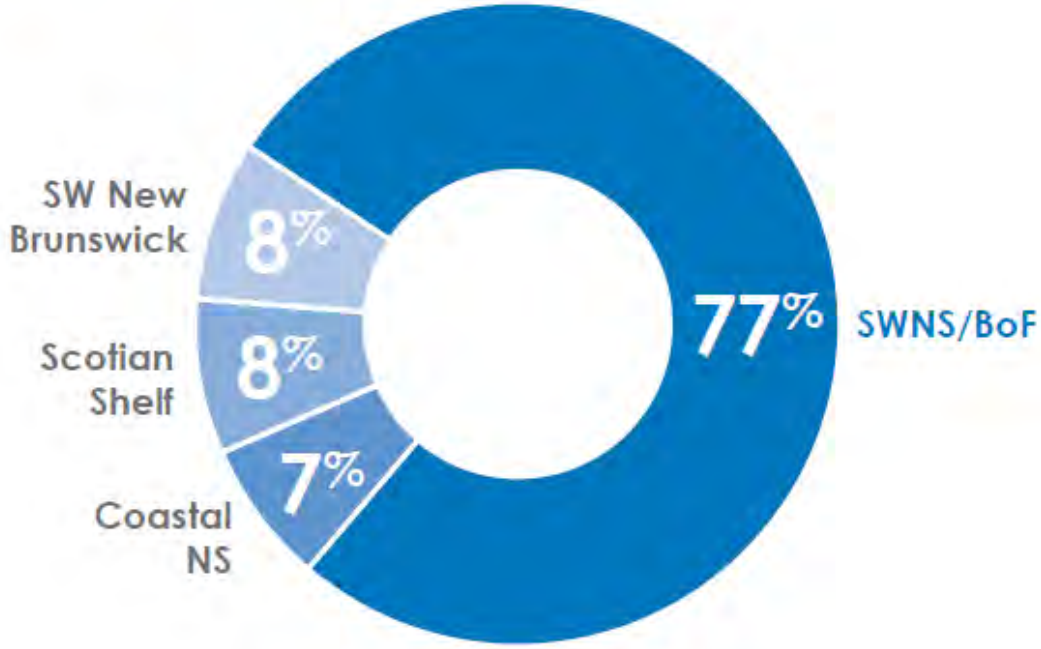
The Fishery

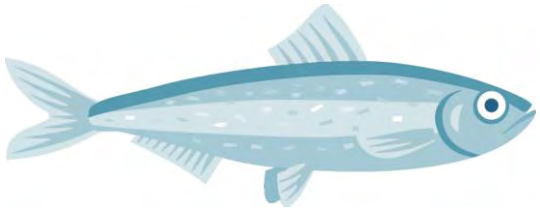
- Gear types:
  - Fixed gear
    - Weirs, traps, gillnets
  - Mobile gear
    - Midwater trawls, purse seines
      - Purse seine 80-90% of fishery



Atlantic Herring

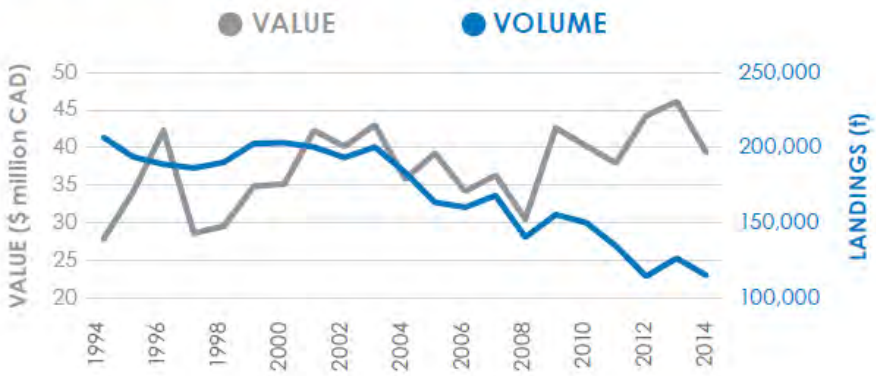
FIGURE 1. Average percentage of total 4VWX landings by spawning component from 2010-2014





Atlantic Herring

FIGURE 2. Landings by volume and value of Atlantic herring for all Atlantic Canada from 1994-2014



- Directly, 1.7% of value of all Atlantic Canada's $2.4 billion fishing industry (2014)
- Indirectly, important source of bait for lobster, snow crab, groundfish, tuna and swordfish.
  - The lobster fishery makes up 40% of the total value, at $942m (2014)
  - Snow crab was 23% or $534m

Stock Status

- Need for rebuilding since 2001, recovery not yet occurred
- Trend of declining weight at age – evidence that population is becoming less productive
- Lack of historical context
- No target reference point
- Fishing mortality is unknown
- No analytical model used in the stock assessment
- Significant unreported bait catch

Stock Status

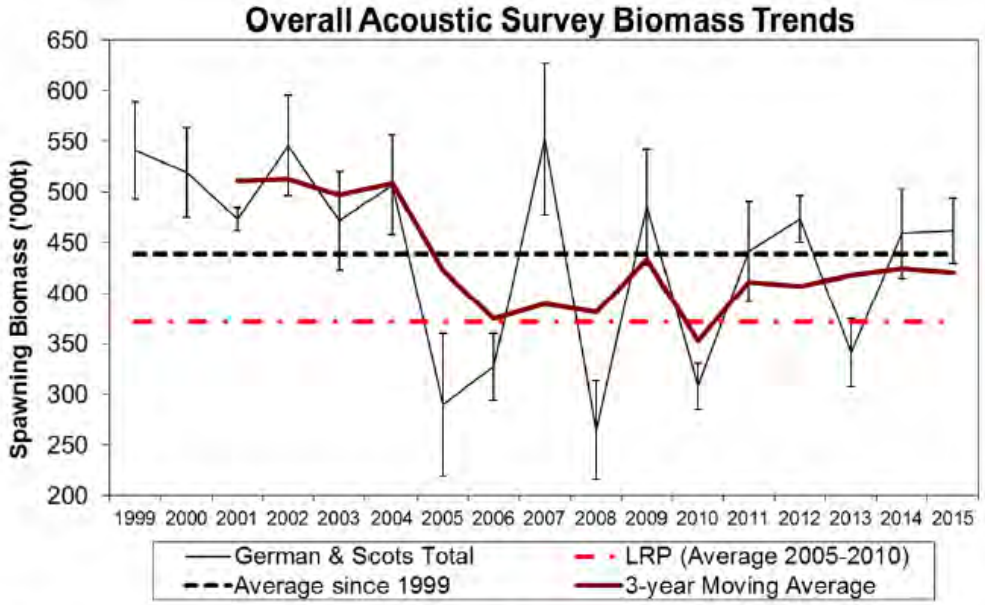


Figure 4. Relative spawning stock biomass index (with 95% standard errors), the calculated 3-year moving average, the average since 1999, and the limit reference point (LRP) for the Southwest Nova Scotia/Bay of Fundy spawning component (German Bank and Scots Bay).

Canadian Science Advisory Secretariat
Maritimes Region Science Response 2016/nnn

Atlantic Mackerel

Photo credit: Vincent van Zeijst (CC BY-SA)

Atlantic Mackerel

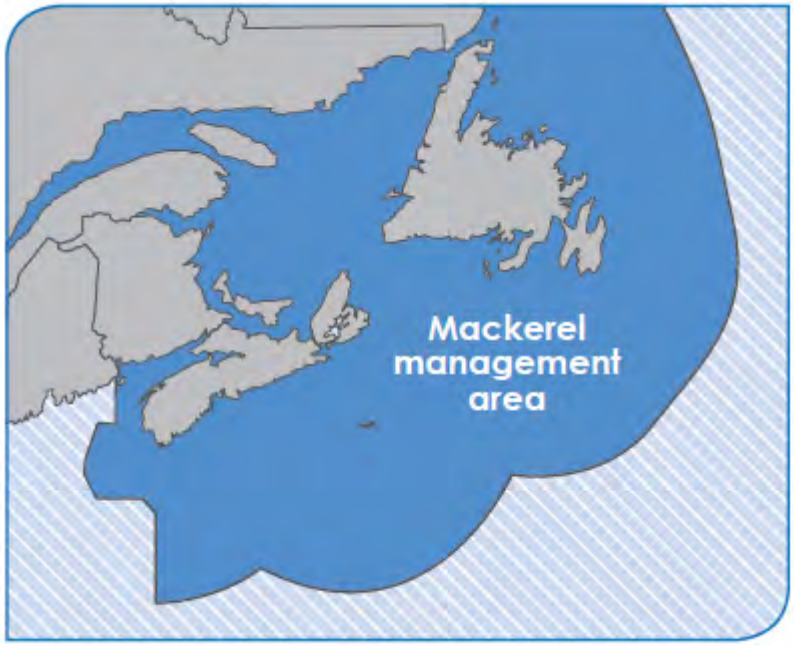
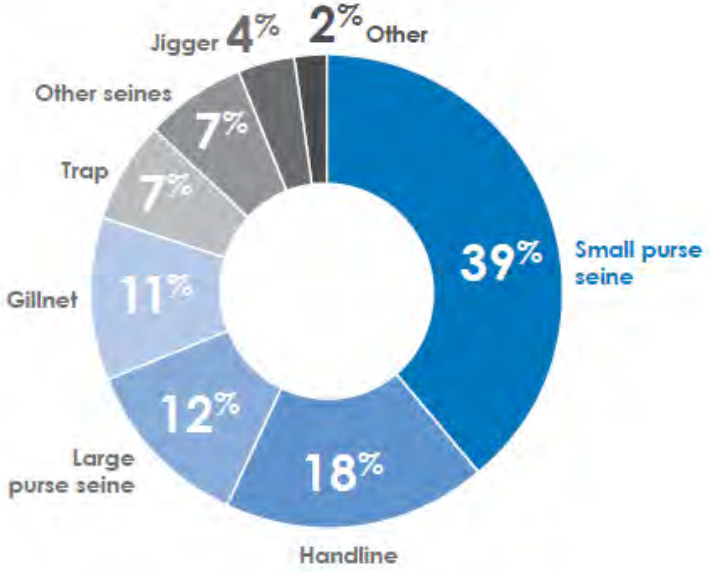
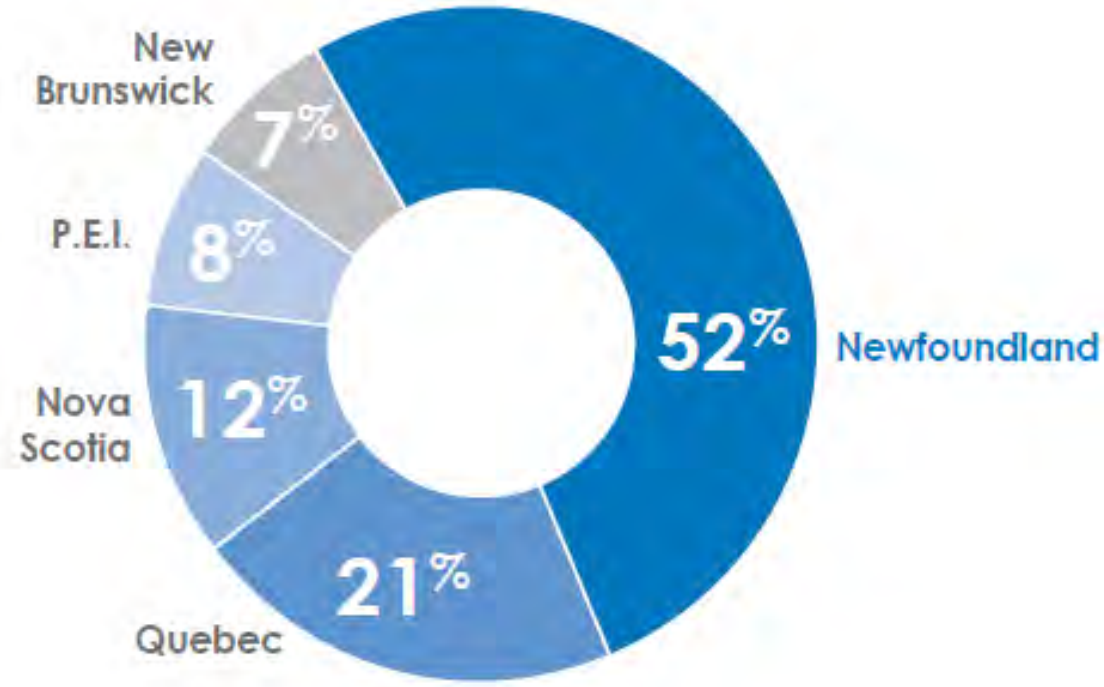


FIGURE 4. Average Atlantic Canadian mackerel landings by gear type between 2011-2014



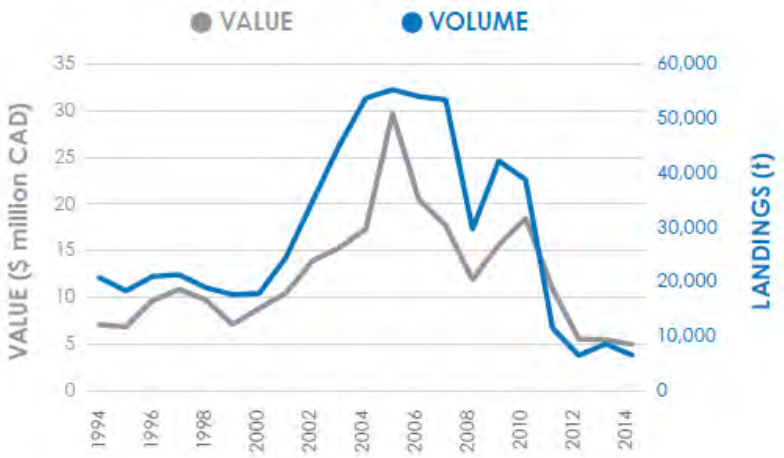
Atlantic Mackerel

FIGURE 3. Atlantic mackerel landings by province.



Atlantic Mackerel

FIGURE 5. Landings of mackerel by value and tonnes from 1994-2014 in the Atlantic region



- Direct value less than 0.2% of Atlantic Canada's total $2.4 billion fishing industries (2014)
- Also an important source of bait for lobster, snow crab
- Value and volume of mackerel have followed the same trends

Stock Status

- Stock is in critical state
- No target **or** limit reference point
- Significant recreational fishery without regulation, monitoring or catch limits
- Significant unreported bait catch
- Quota set at 8000 tonnes, recommendation 800 tonnes

Stock Status

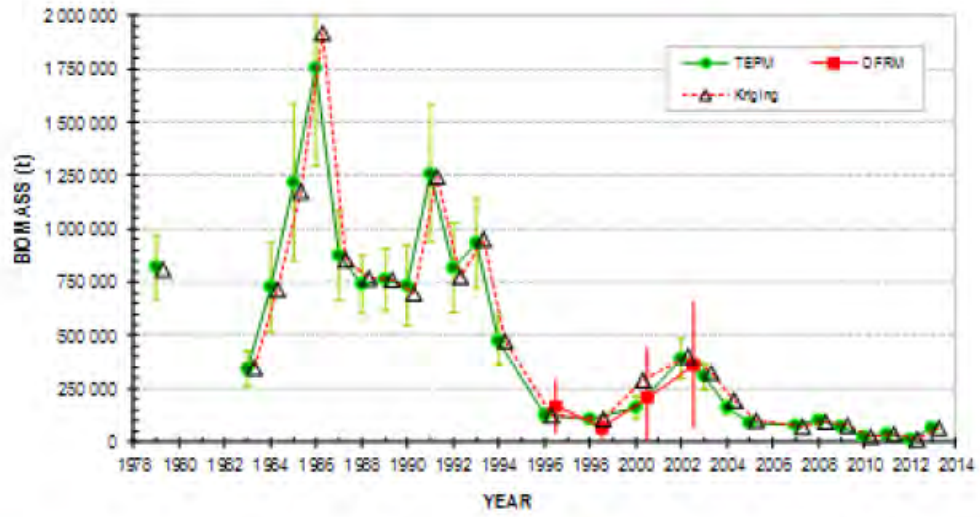


Figure 10. Abundance (t) index of Atlantic mackerel calculated using two approaches (TEPM: Total Egg Production Method; DFRM: Daily Fecundity Reduction Method) and two different techniques (stratified and kriging means) in the case of the first approach. No index was calculated in 2006 because the survey was conducted at the end of the spawning season.

Canadian Science Advisory Secretariat Quebec Region
Science Advisory Report 2014/030

Recommendations

- Implement and/or create small pelagics specific policy
- Acquire ecological knowledge
- Implement an ecosystem based approach
- Develop data sources outside of the fishery

Recommendations

- Develop reference points
- Increase capacity to monitor fisheries/abundance
- Implement a catch monitoring system for recreational and bait fisheries

Other Current Issues

- Herring die-off
- Mackerel fishery closure
- 4R spring spawning stocks below limit reference point

Questions?

Katie Schleit

Senior Marine Campaign Coordinator

kschleit@ecologyaction.ca

Heather Grant

Marine Communications Coordinator

hgrant@ecologyaction.ca