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## **S.E. Georgian Bay Historical Musky Nursery Habitat Productivity:**

Importance of Water Levels, Human Development &  
Invasive Species on Population Dynamics

**Presented by:** JP Leblanc  
**Supervised by:** Dr. Chow-Fraser



# Muskies in Georgian Bay

- Apex Predators & Long-Lived (> 30 yrs of age)
- Economically Important
- Naturally Reproducing Populations Sensitive to Habitat Alterations
  - Muskies Spawn & YOY establish territories in Coastal Wetlands (< 1.5 m deep)
- Data Suggest that S.E. GB Muskies are Experiencing Population Difficulties





# Study Site: S.E. Georgian Bay

**Water Level Declines Systemic  
Throughout Georgian Bay  
(Ongoing since 1999)**



**Human Shoreline  
Development is  
Greater in the South**

**S.E. Georgian Bay Site:**

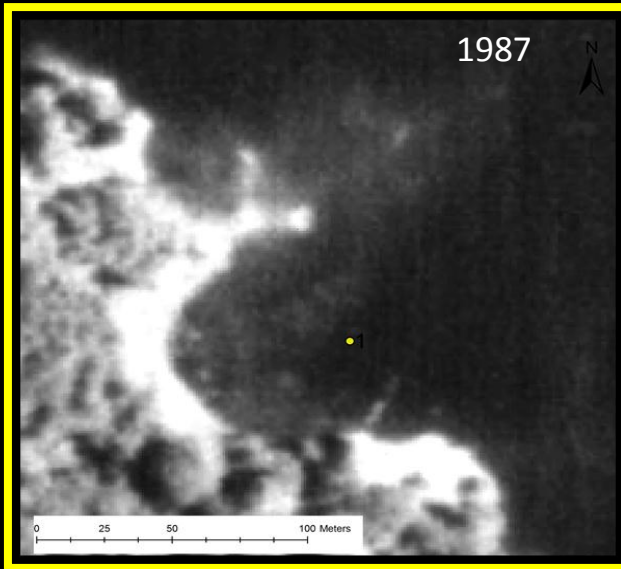
- **Suspected Failed Reproduction**
- **Historical Nursery Site Inventory**

59 km

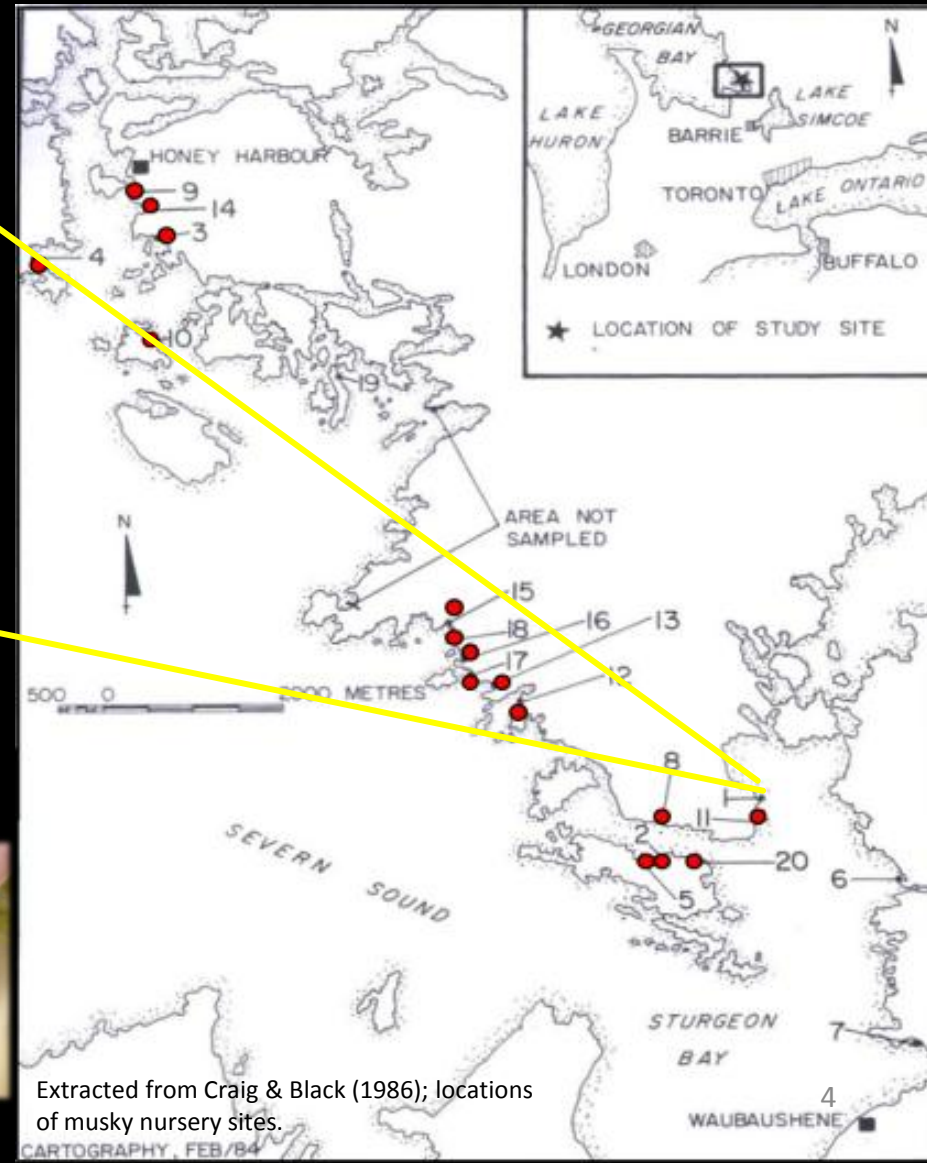
Image  
© 201



# Historic Musky Nursery Sites in S.E. Georgian Bay: Craig & Black (MNR 1981)



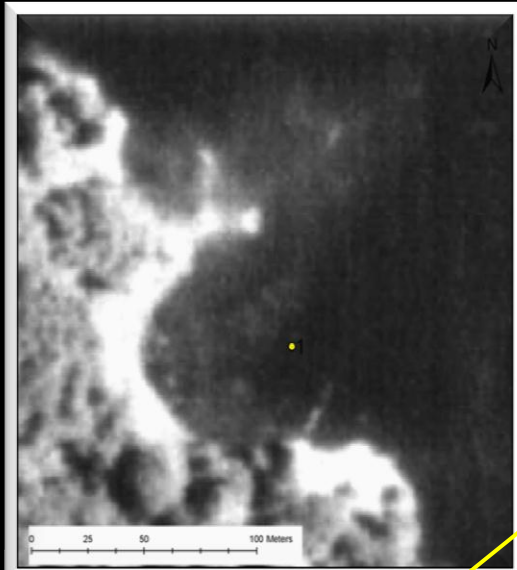
**Successful Musky Reproduction  
in S.E. Georgian Bay in 1981**





# What's Happened Since Then: Historical Nursery Sites & Low Water Levels

1987

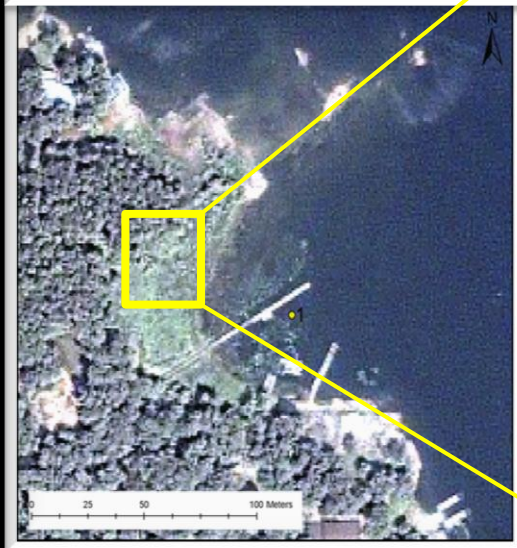


Lost Wetland Area: > 50%

Altered Community Structure

- Homogenization of Flora and Fauna  
(Midwood et al. 2012)
- Reduced Habitat Structure

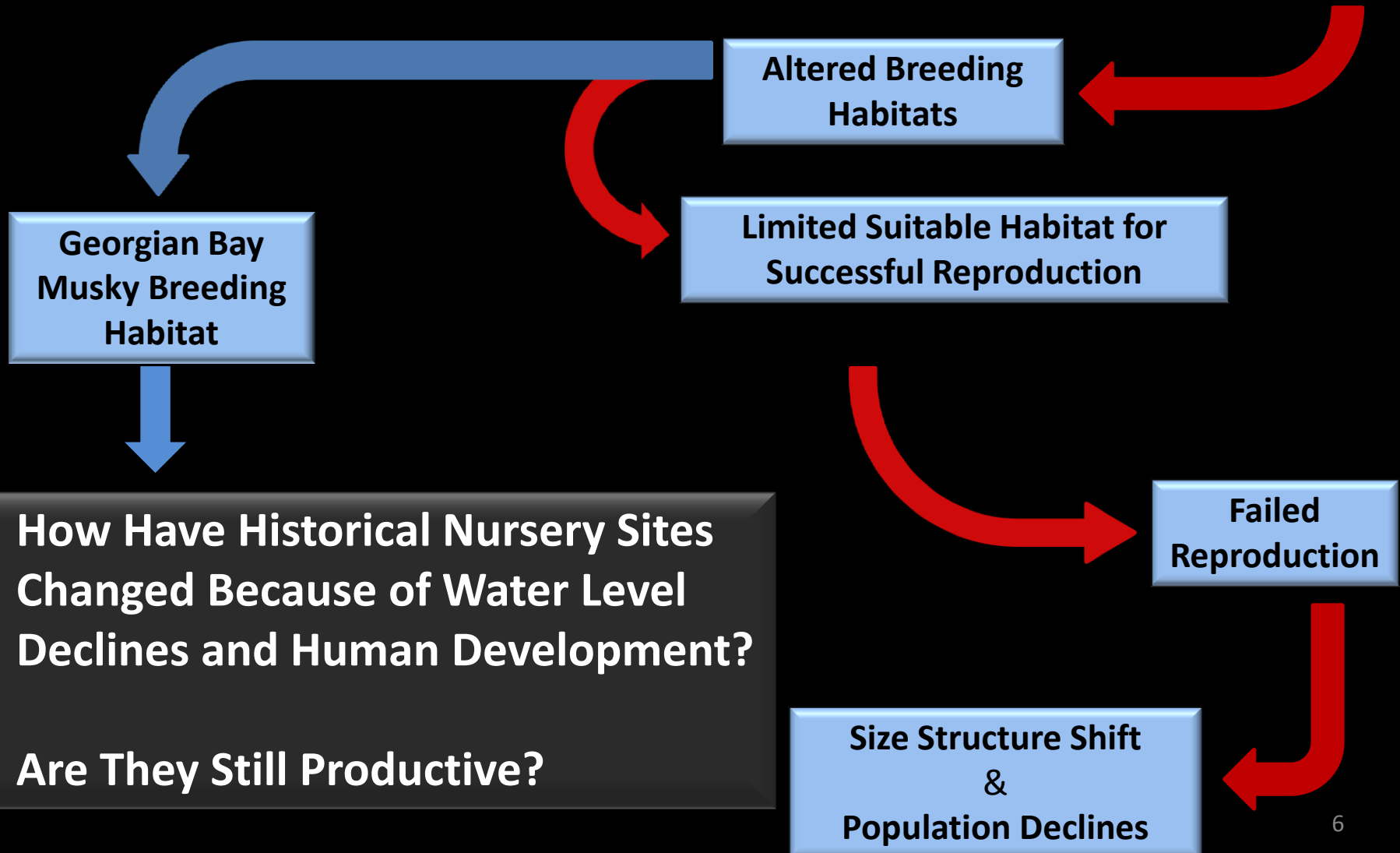
2002



# Sensitive Musky Populations



Naturally Reproducing Musky Populations are Sensitive

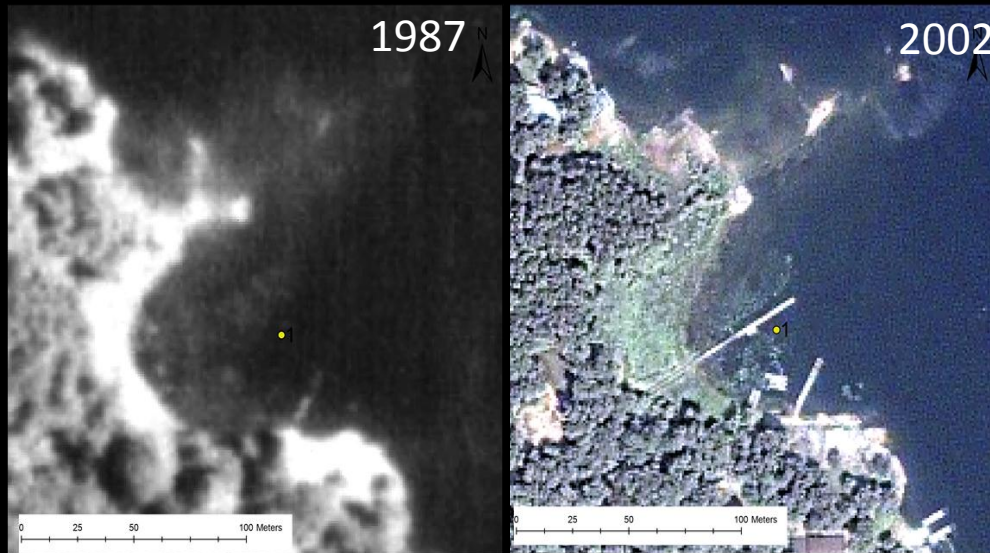




# Historical Coastal Musky Nursery Sites are NO Longer Productive

Water Level Declines & Increased Human  
Development Homogenizes Habitat  
Structure

Invasive Species (i.e., Round Gobies)  
& Altered Fish Community Increases  
Competition and Depredation



**S.E. Georgian Bay has Lost a Substantial Amount of  
Historically Critical Nursery Habitat**

# Implications:

Muskies in S.E. Georgian Bay may still be reproducing successfully

- Smaller muskies are still angled



Currently it cannot be determined if recruitment can sustain current population densities



The loss of musky nursery habitat may lead to population declines



# Future Research Needs:

If muskies have found novel spawning/nursery sites that have become available due to sustained water level declines where are they?

Even if novel spawning/nursery sites have suitable structural habitat (e.g., submergent vegetative edges) does Round Goby egg predation limit musky reproduction?



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# Questions?

