

# Re-establishment of Great Lakes Spotted Musky on Green Bay



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# Outline

- Introduction
- Current status of population
- Management Plan
  - Goals
    - Objectives
    - Strategies
- Management Recommendations



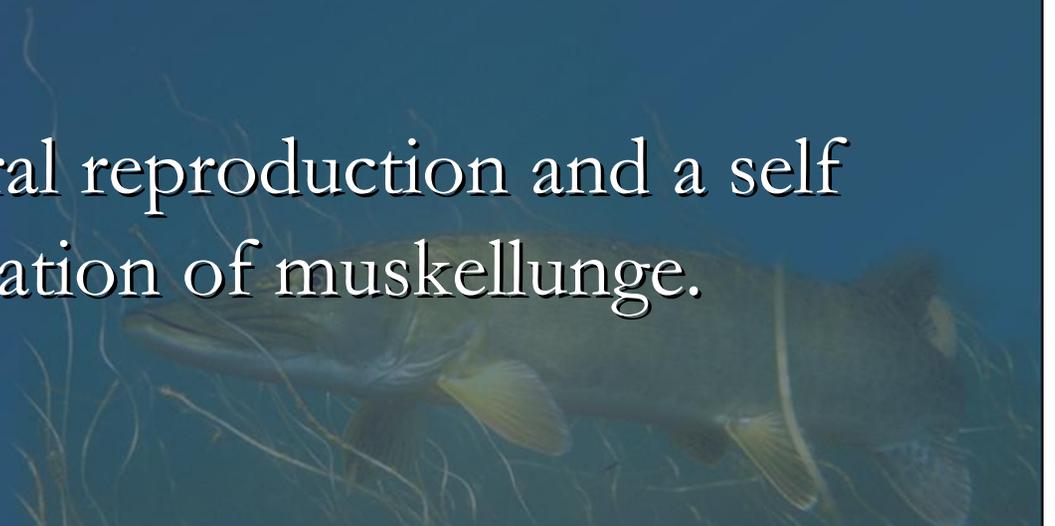
# History

- Habitat destruction
- Water Pollution
- Unregulated Fishery
- 1972 Clean Water Act
- Fox River Clean Up
- Restoration of Fisheries
  - Lower GB RAP
  - Lake Michigan Fisheries Management Plan

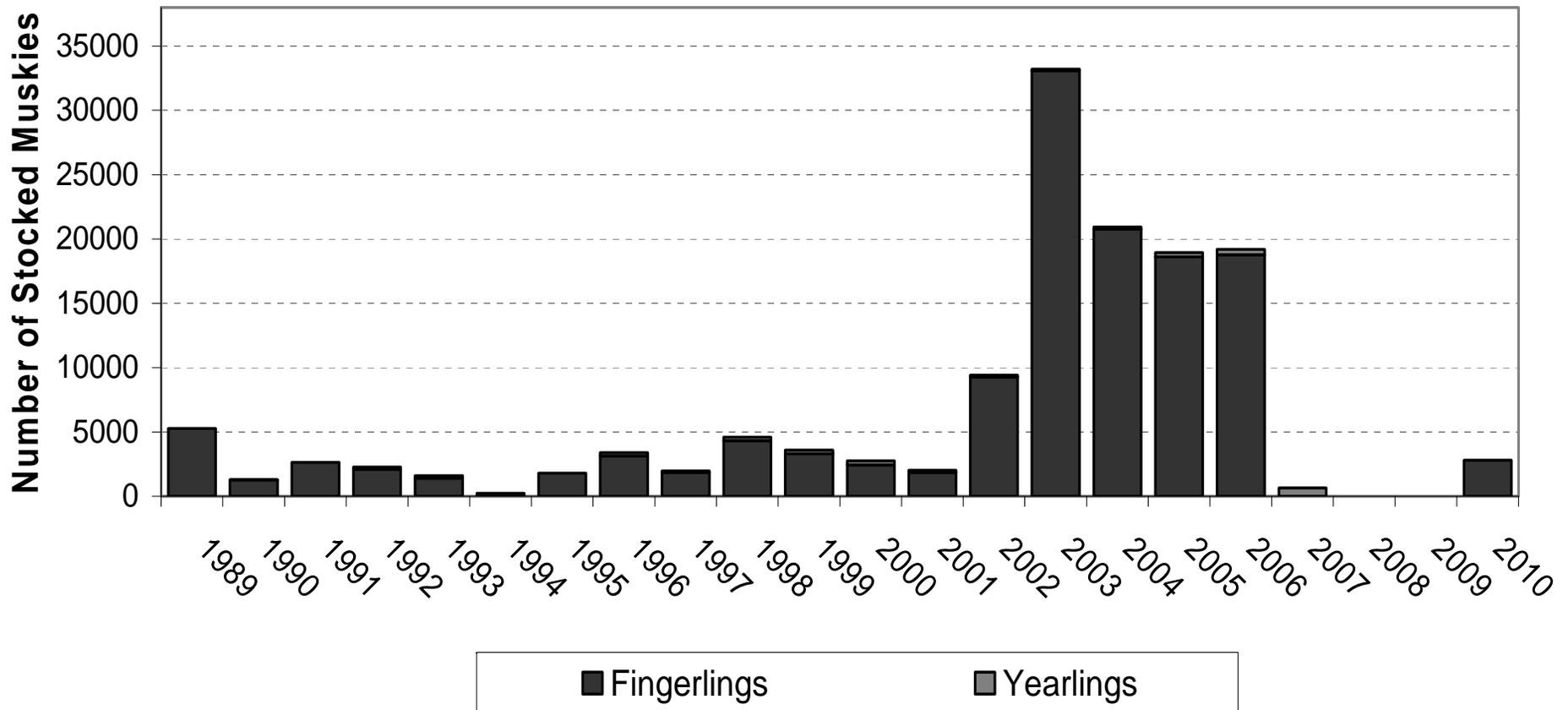


# Reintroduction Plan

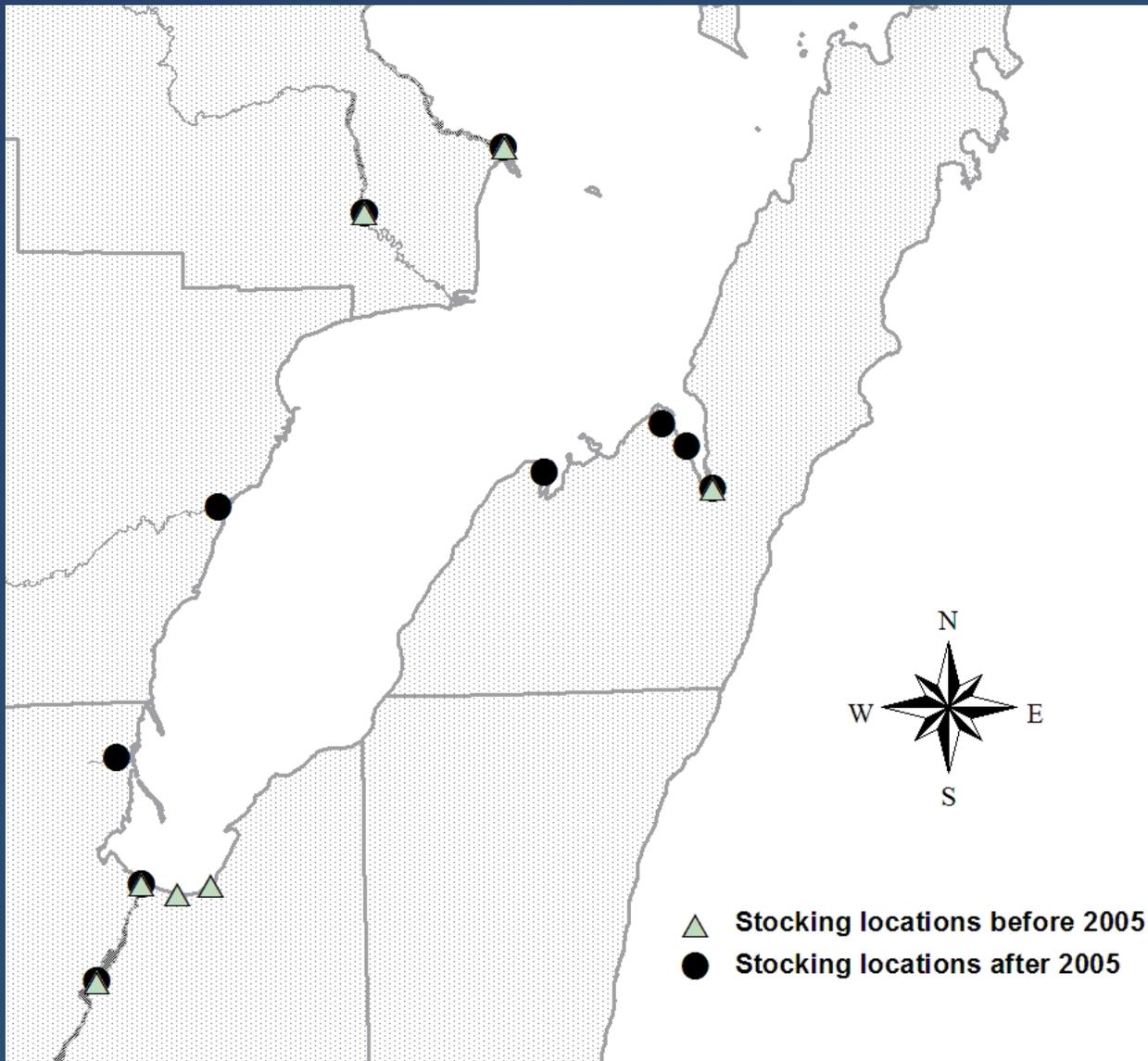
- 3 incremental phases (Belonger 1995)
  - 1) Identify appropriate source population, collect gametes and successfully rear and release fish.
  - 2) Establish a captive brood stock population in Wisconsin
  - 3) Document natural reproduction and a self sustaining population of muskellunge.



# Stocking Totals – Excluding Fry



# Stocking Locations



# Phase III

- No natural reproduction documented in spring netting or fall electrofishing surveys until 2008

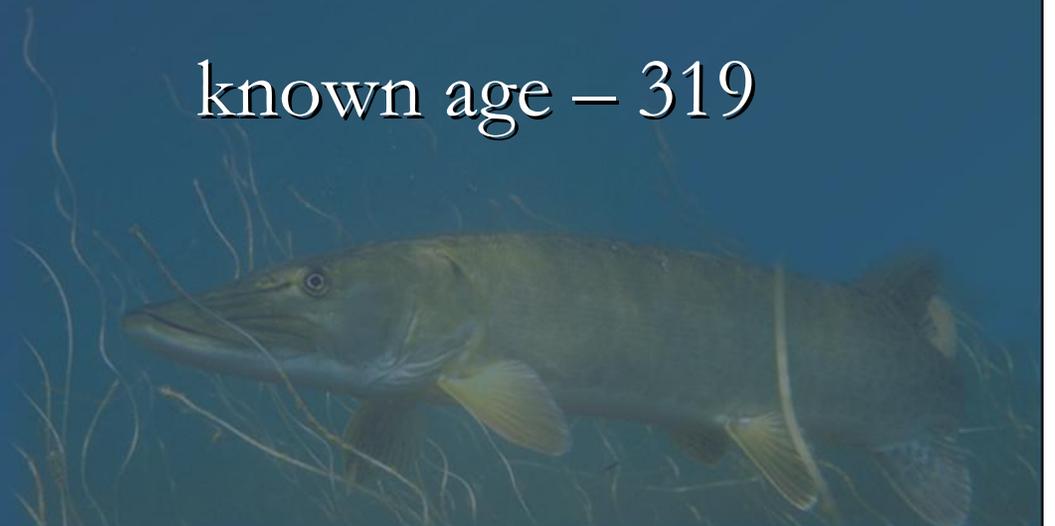


# Current Status

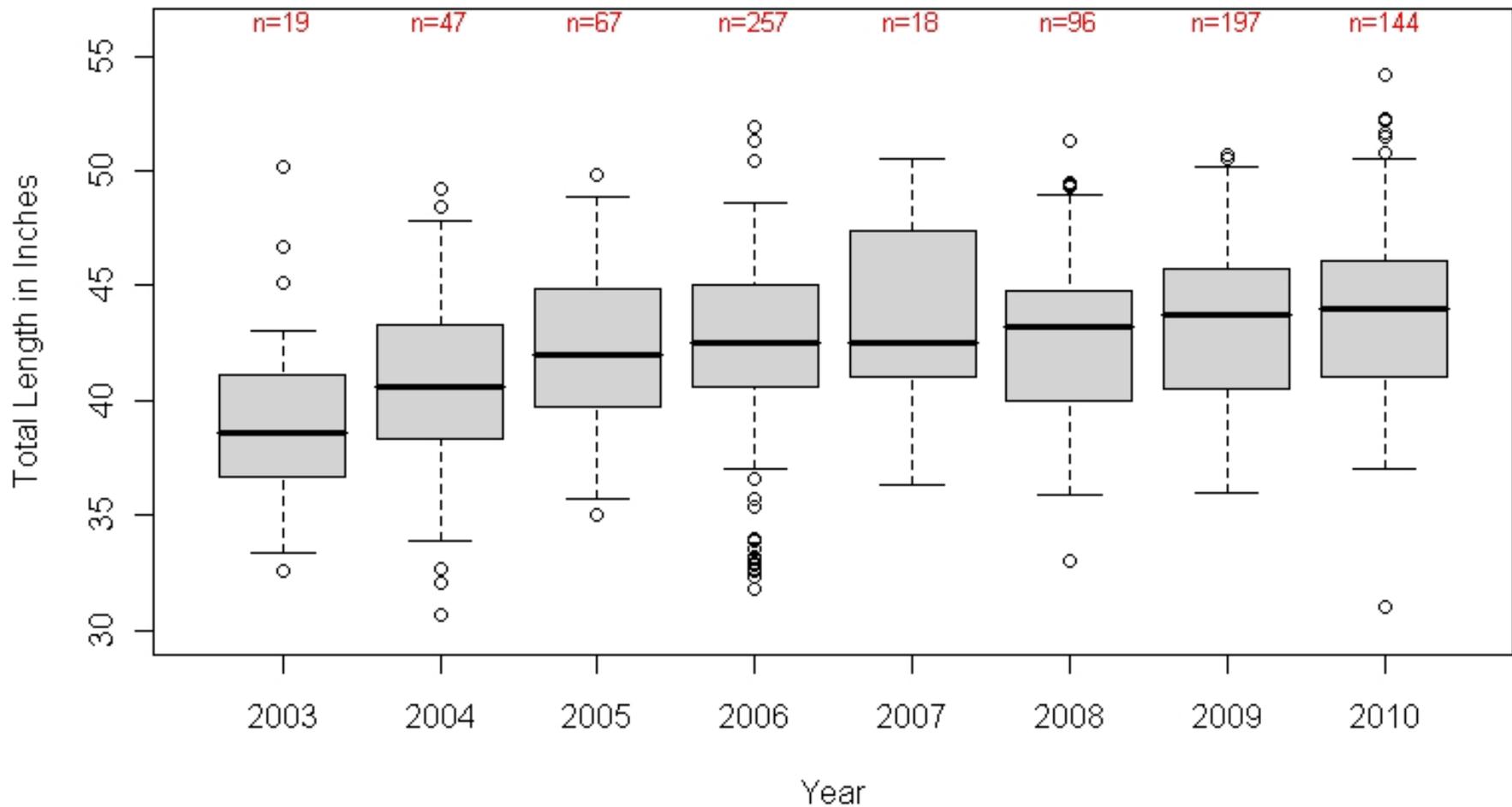


# Current Status

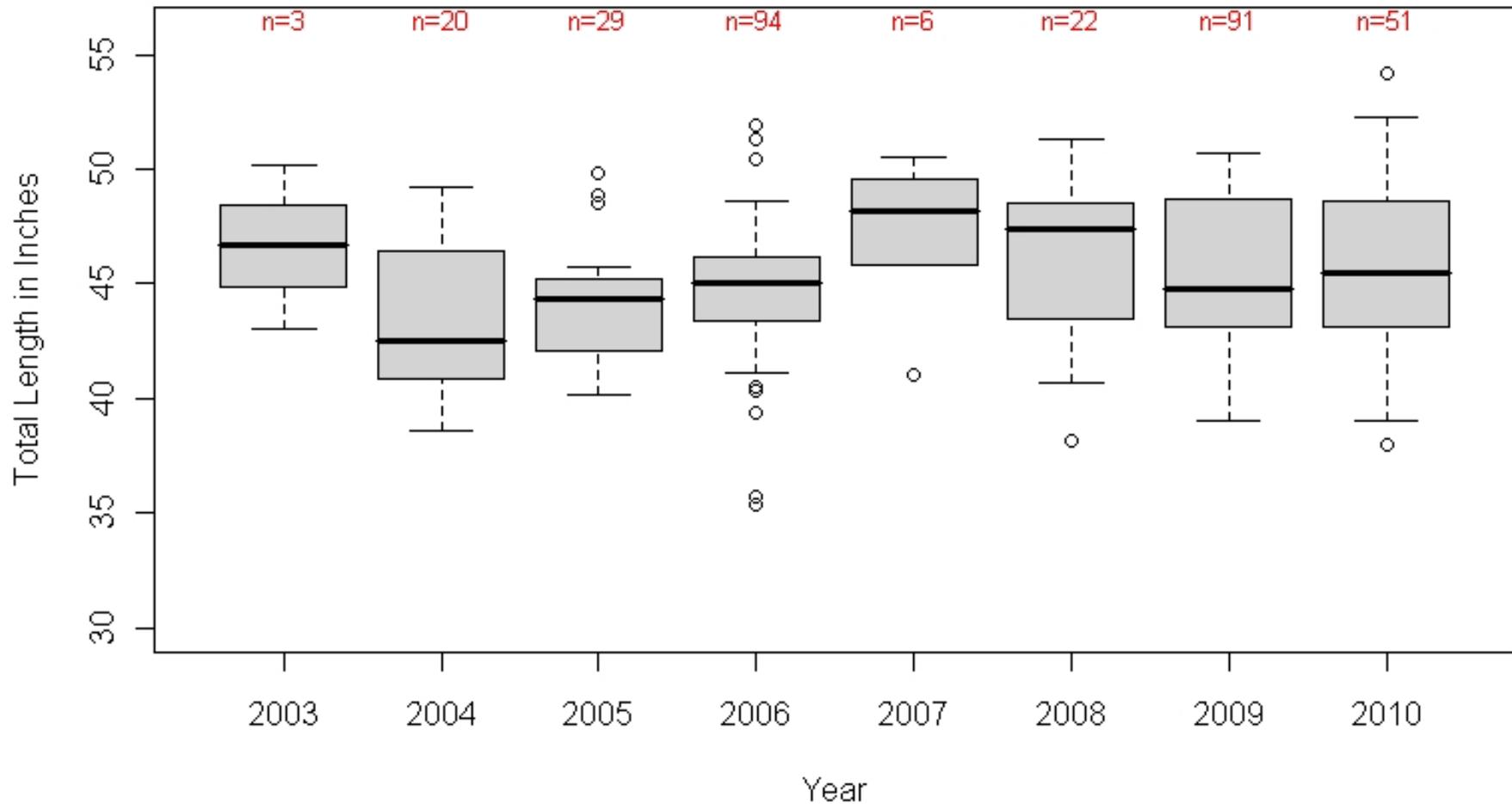
- Number of tagged fish
  - Total – 4413
  - FLOY – 2591      known age – 2099
  - PIT – 2192      known age – 1451
  - Recaps – 502      known age – 319



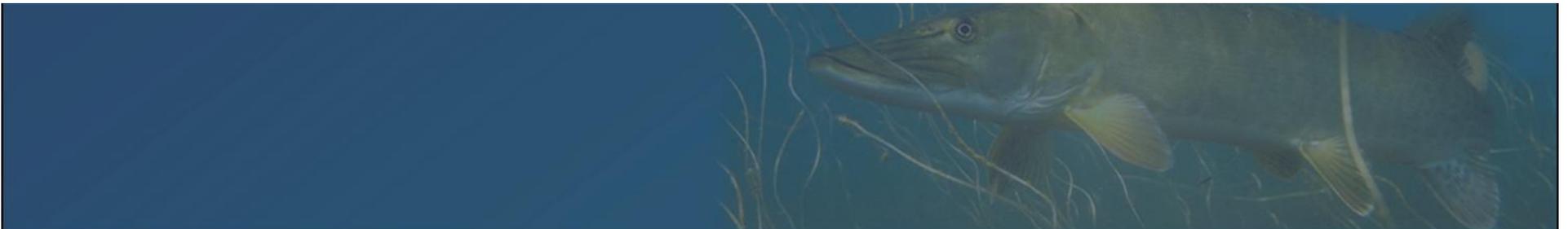
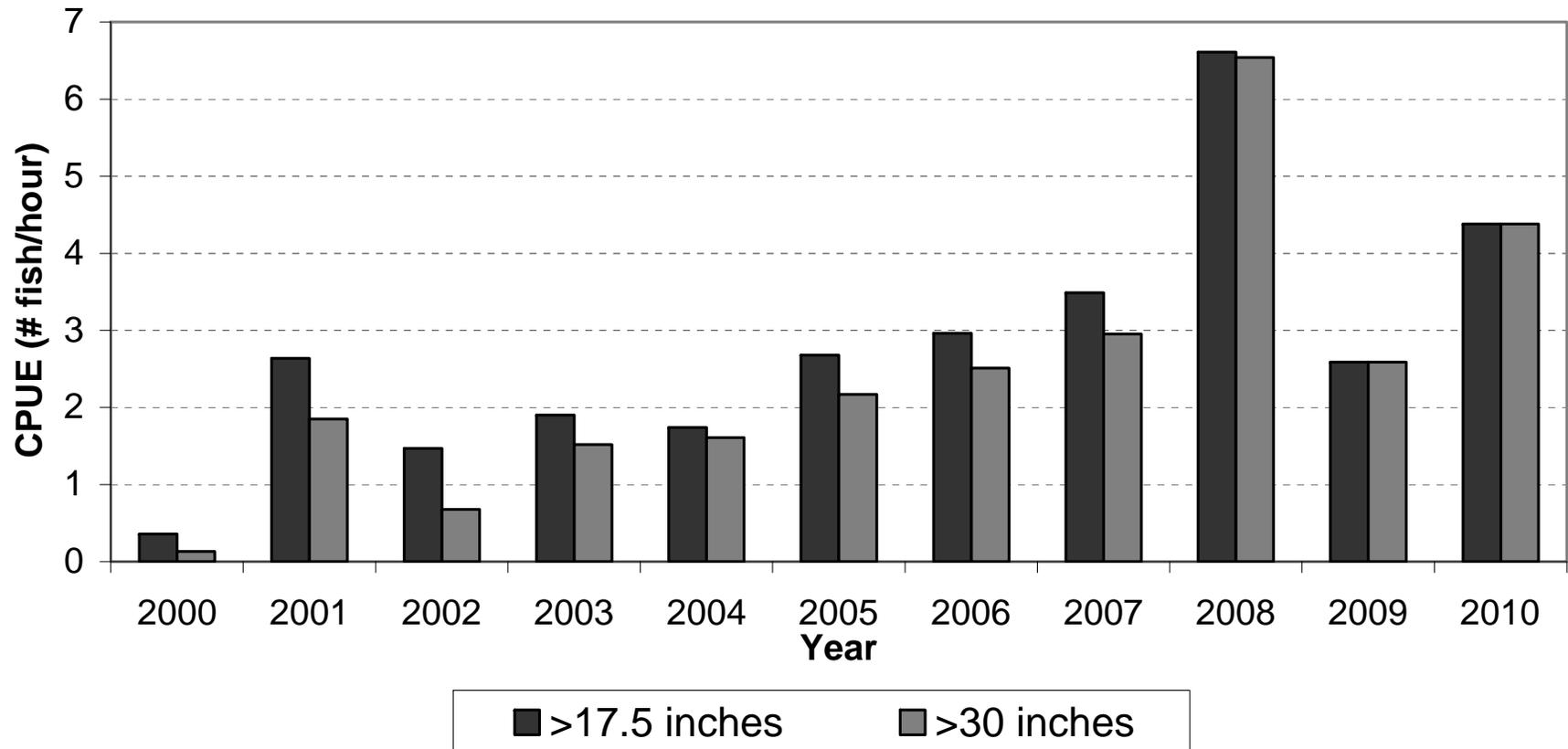
# Spring Length Distributions



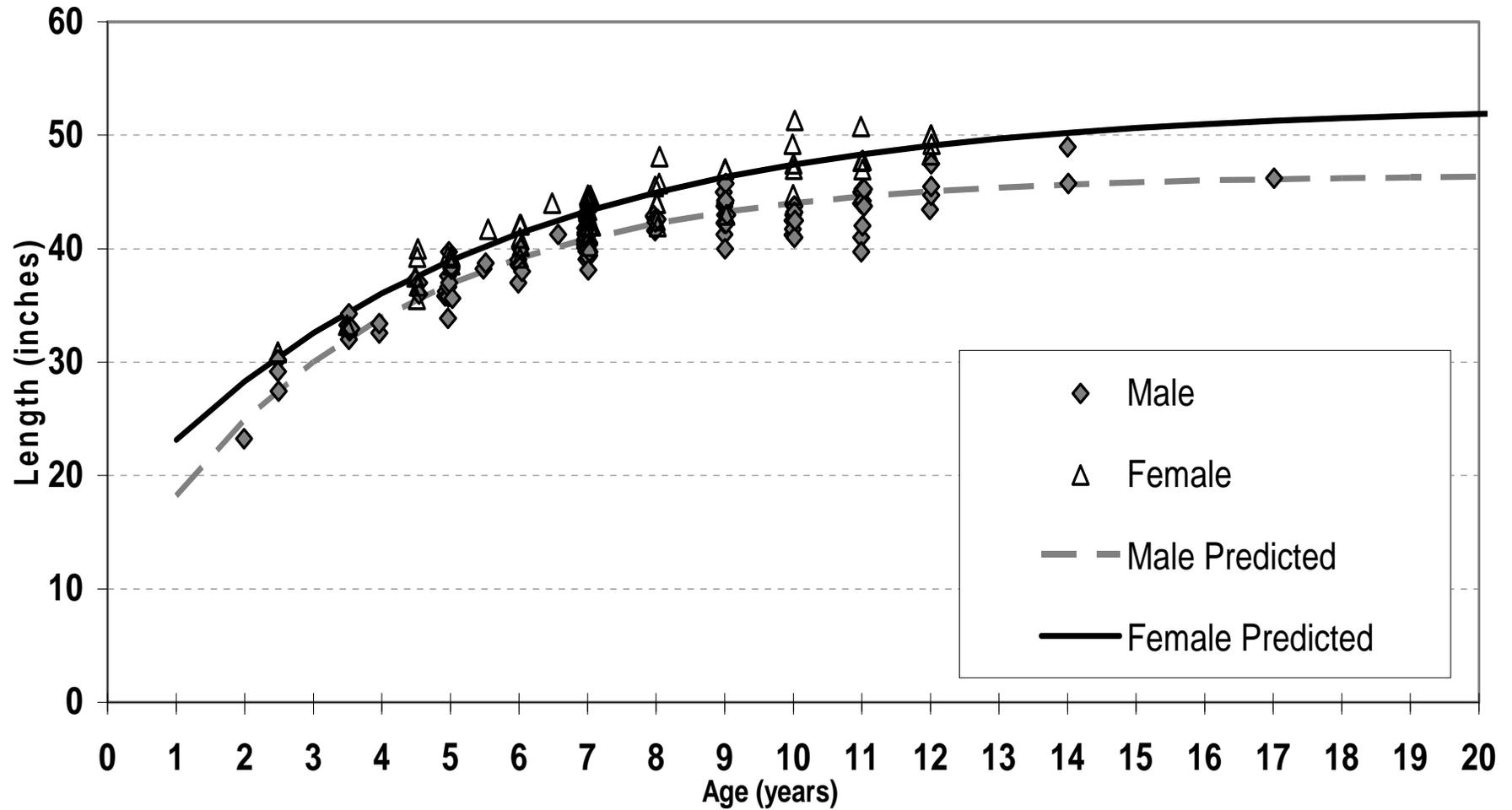
# Female Length Distributions



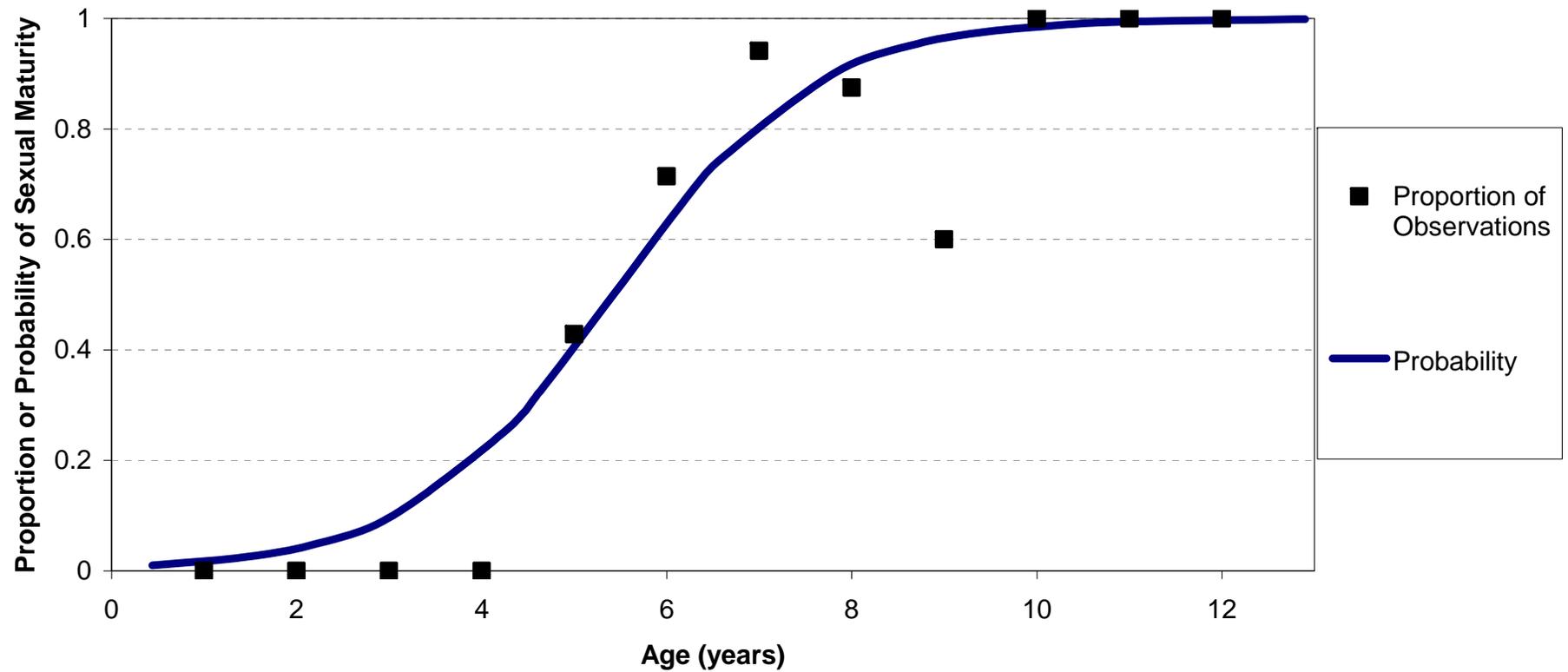
# Fall Index CPUE



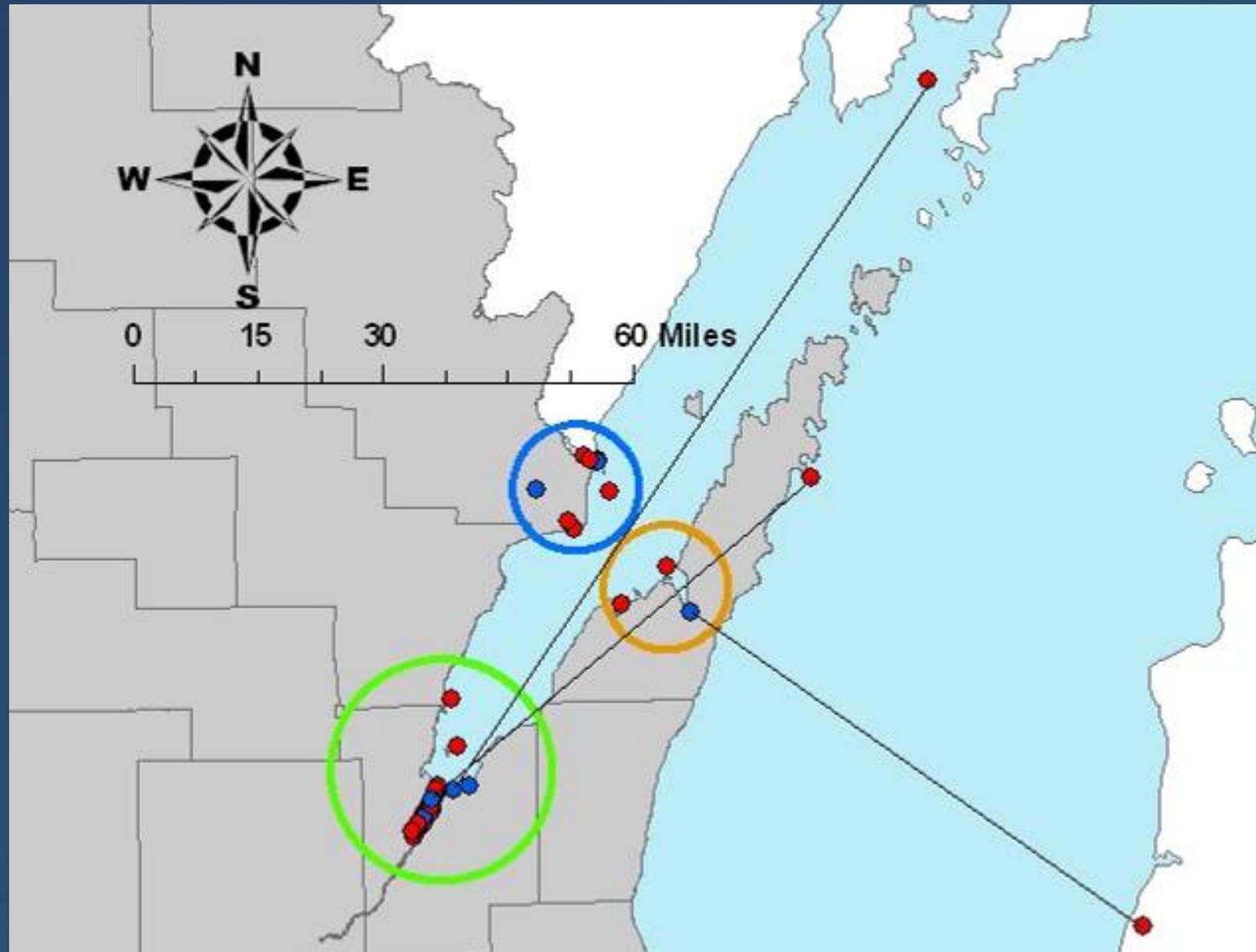
# Growth Model – Known Age



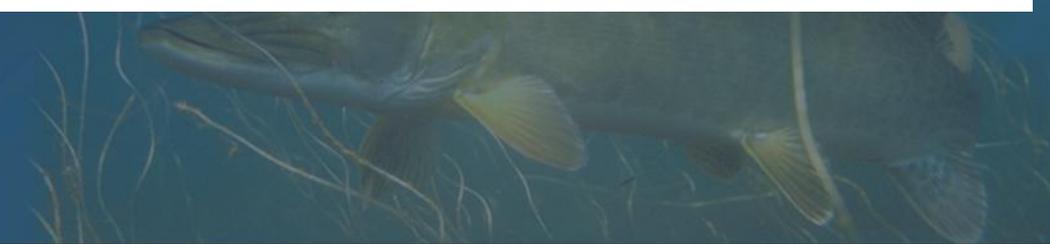
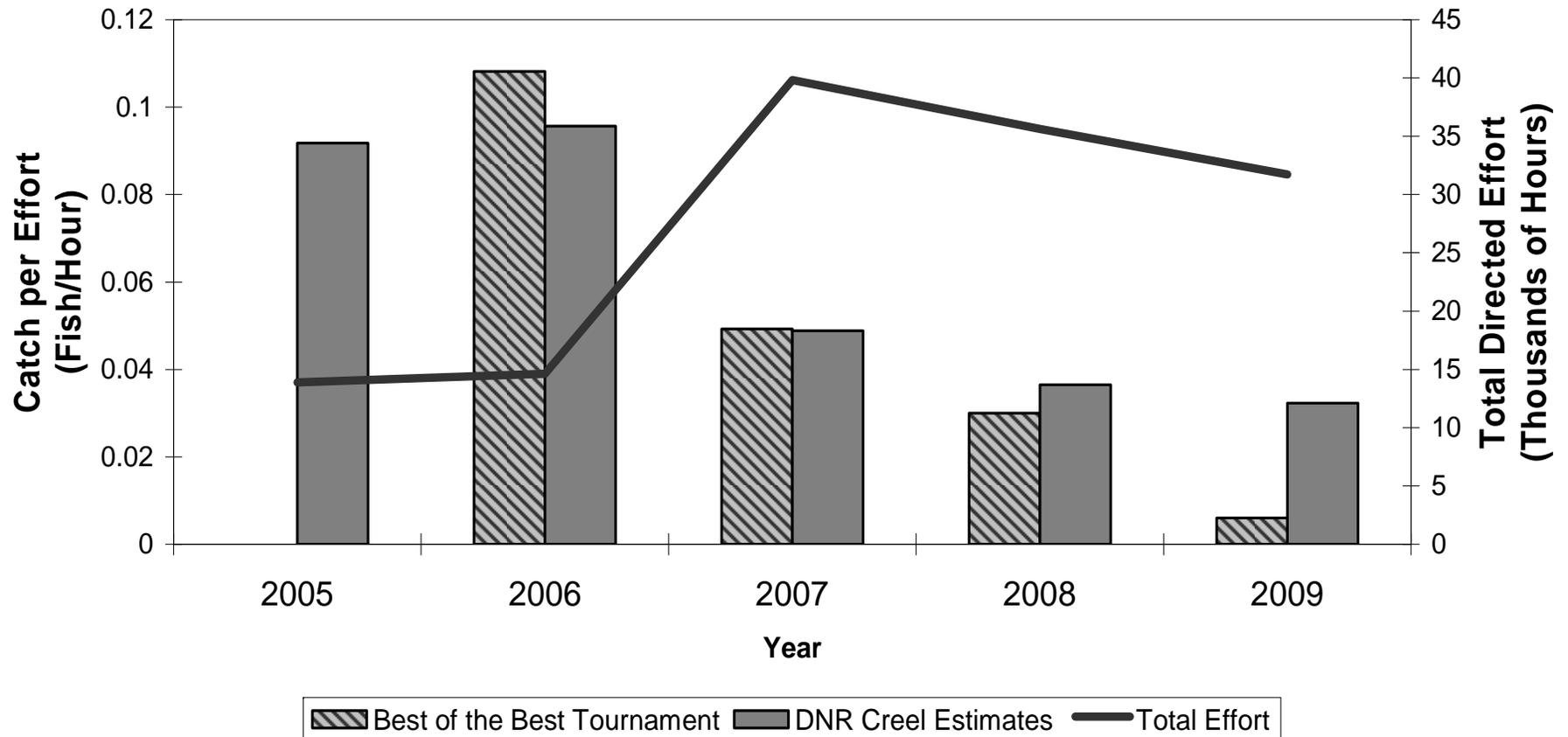
# Age at Maturity



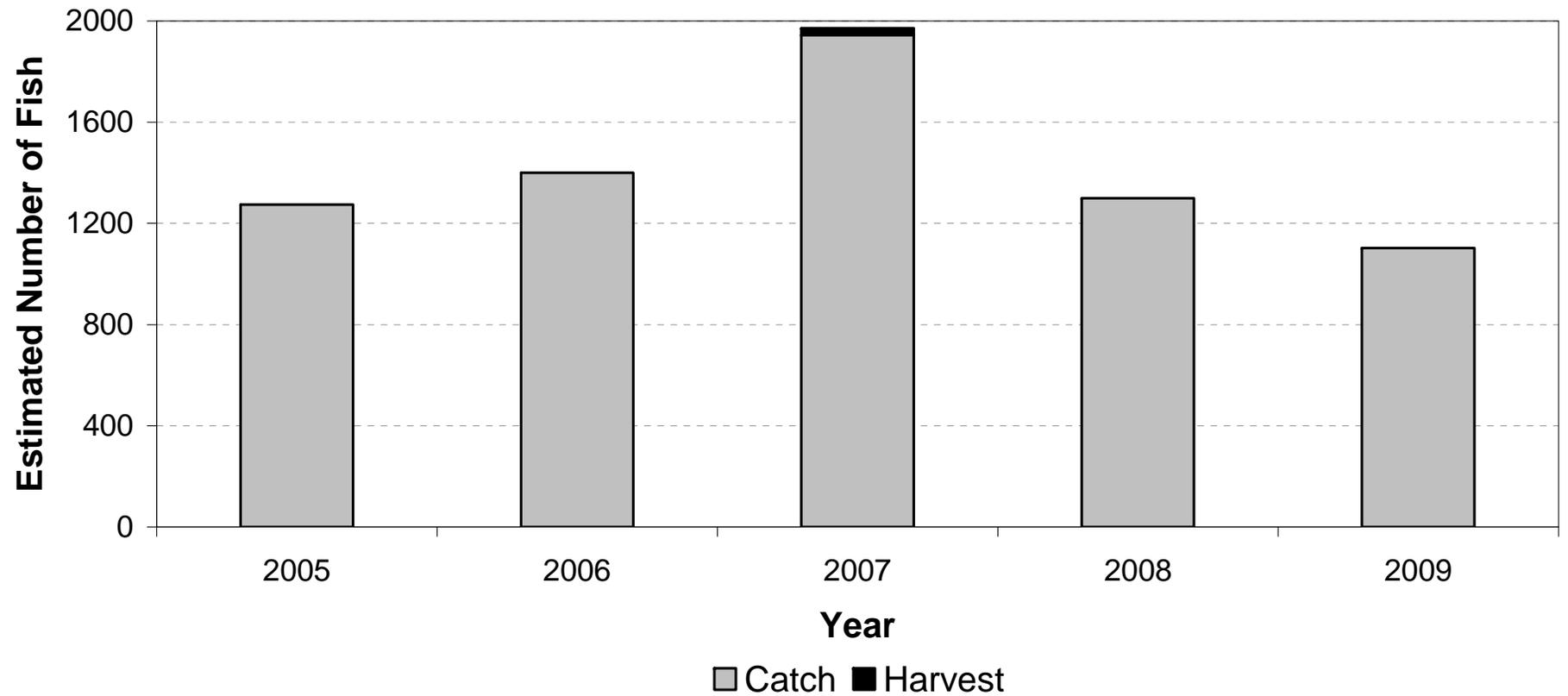
# Recapture Locations



# Total Effort and Catch Rate



# Catch and Harvest



□ Catch ■ Harvest



# Research-Spawning

- Spawning Study Funded by US Fish and Wildlife Service Great Lakes Fish and Wildlife Restoration Act



# Research-Genetic Diversity

- Current Population of Green Bay is descended from 24-30 individuals
- Need for greater genetic diversity



# 2010 Management Plan

- Goals- What do we want
  - Objective – How do we measure our progress
    - Strategy – Action to reach goal

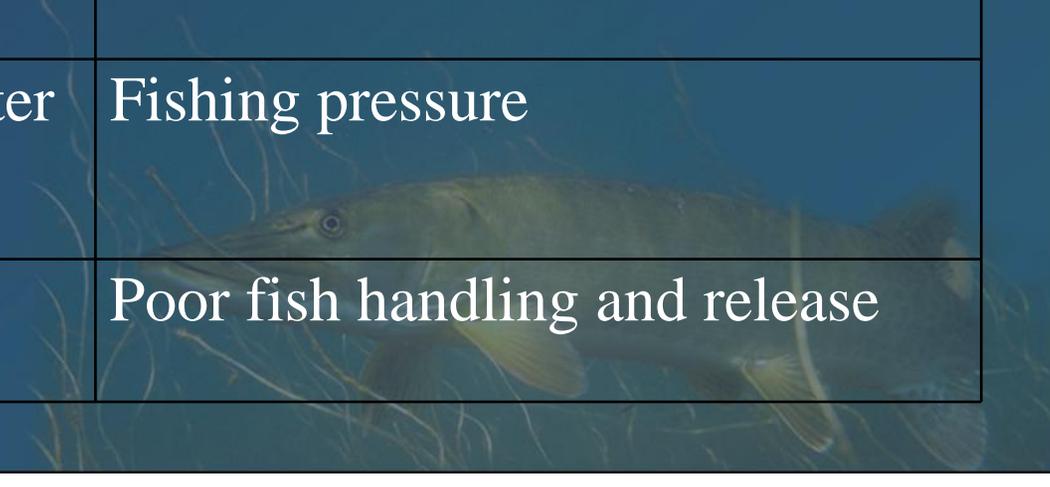
Management Recommendations are specific actions that follow as part of the strategy (tactics).



# 2010 Management Plan

- Input from anglers at Feb 17<sup>th</sup> meeting

Likes	Dislikes/concerns
Large size/Trophy potential	Overharvest
Close to home	Stocking limitations
Numbers of fish	VHS virus
Fishing experience on big Water	Fishing pressure
	Poor fish handling and release



# 2010 Management Plan

- Five Goals as established by consensus
  - 1: Sustain the sport fishery and trophy potential of fishery.
  - 2: Re-establish a naturally reproducing population.
  - 3: Re-establish a viable population with sufficient genetic diversity.
  - 4: Educate anglers on safe handling and compliance with regulations.
  - 5: Restore/rehabilitate native habitats in Green Bay to support ecosystem functions.



# 2010 Management Plan

- **Goal 1: Sustain the sport fishery and trophy potential of fishery**

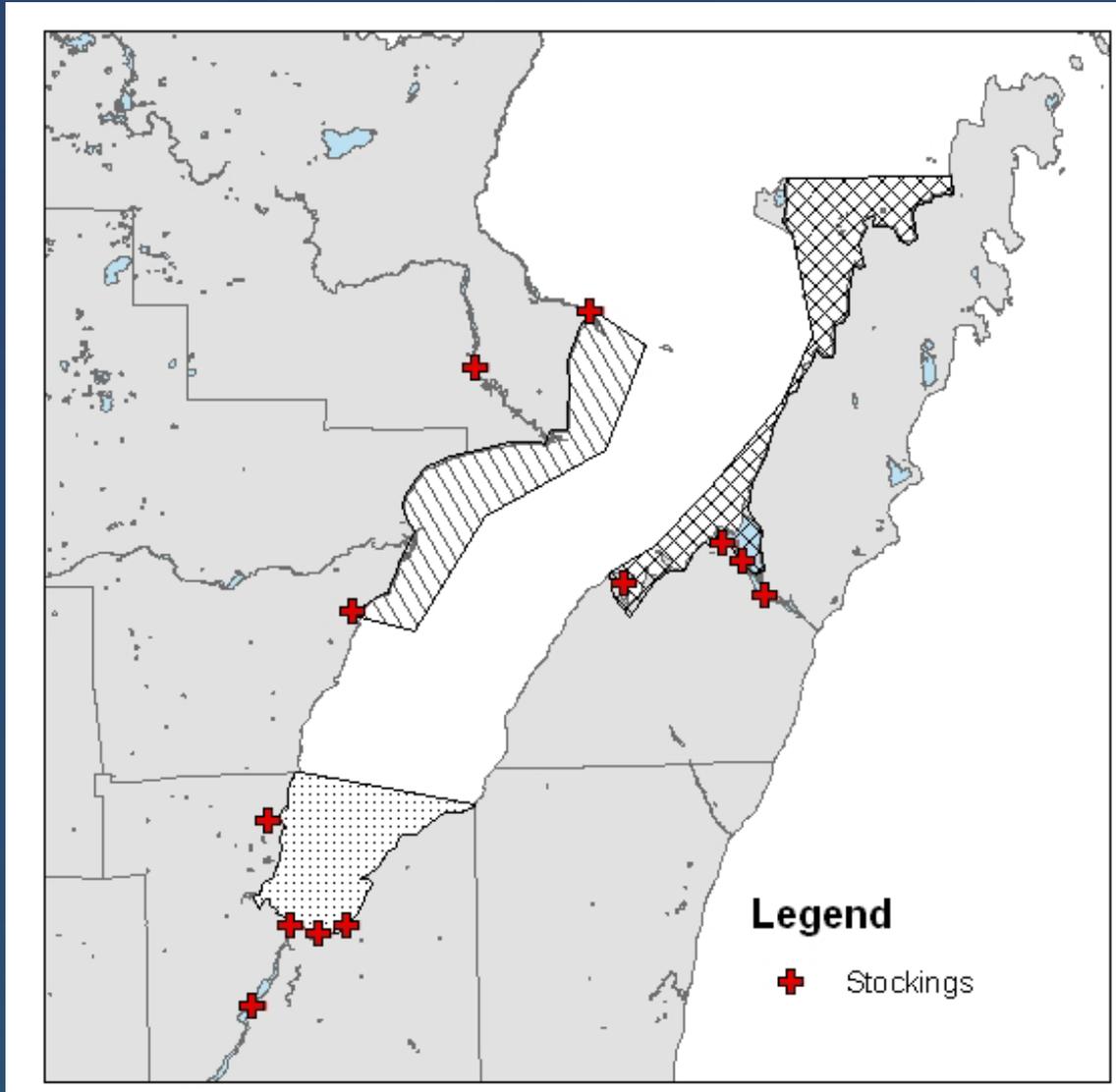
- *Objective 1.1 Angler catch rate of 0.04 fish per angler hour of directed effort as estimated by the Lake Michigan Creel Survey (30 hours of directed fishing/catch)*
- *Objective 1.2 Maintain a high size structure with RSD-50 of 5 and RSD-46 of 20 during spring fyke netting*
  - Strategies: maintain stocking until sufficient natural reproduction is occurring to sustain the abundance of the population. Maintain restrictive harvest regulations to maintain/achieve size structure.

# 2010 Management Plan

- **Goal 2: Re-establish a naturally reproducing population(s)**
  - *Objective 2.1 PE 0.2 adult muskellunge per acre in the Lower Bay/Fox River management area*
  - *Objective 2.2 PE of 0.1 adult muskellunge per acre in the West Shore management area*
  - *Objective 2.3 PE of 0.1 adult muskellunge per acre in Door county management area*



# 2010 Management Plan



# 2010 Management Plan

- **Goal 2: Re-establish a naturally reproducing population(s)**
  - *Objective 2.5 Fall electrofishing catch rates of 1 YOY muskellunge per mile.*
    - Strategies: Maintain population abundance through stocking and restrictive harvest regulations until population is self sustaining. Move stocking locations to areas that are more likely to support natural reproduction. Use conclusions and recommendations from GLFWRA study to select future stocking locations. Use closed season to prevent fishing during pre- and active spawning

# 2010 Management Plan

- **Goal 3: Establish a viable population with sufficient genetic diversity.**

- *Objective 3.1 Increase the number of founding individuals to >50*

- *Objective 3.2 Establish an allelic richness and diversity equal to or greater than the source populations.*

- **Strategies:** Import additional fish from other Great Lakes populations, use best hatchery practices to ensure genetic diversity of hatchery products.



# 2010 Management Plan

- **Goal 4: Reduce hooking and handling mortalities and increase compliance with regulations.**
  - *Objective 4.1 Achieve 100% compliance with fishing regulations.*
  - *Objective 4.2 Reduce handling mortalities to less than 5%.*
    - Strategies: Perform outreach activities to teach handling and improve compliance with regulations. Maintain and improve signage at access points.



# 2010 Management Plan

- **Goal 5: Restore/rehabilitate habitat in Green Bay to support ecosystem functions.**
  - *Objective 5.1 Improve and enhance aquatic habitat in order to achieve Goal 2.*
    - Strategies: Identify habitat limitations on musky life history strategies and design and implement habitat improvement/restoration projects to overcome deficiencies. Cooperate with internal (WDNR Wildlife and Watershed Bureaus) and external partnerships (USEPA, UWGB, USFWS), to improve and restore water quality and ecosystem functions of Greater Green Bay ecosystem.

# Management Recommendations



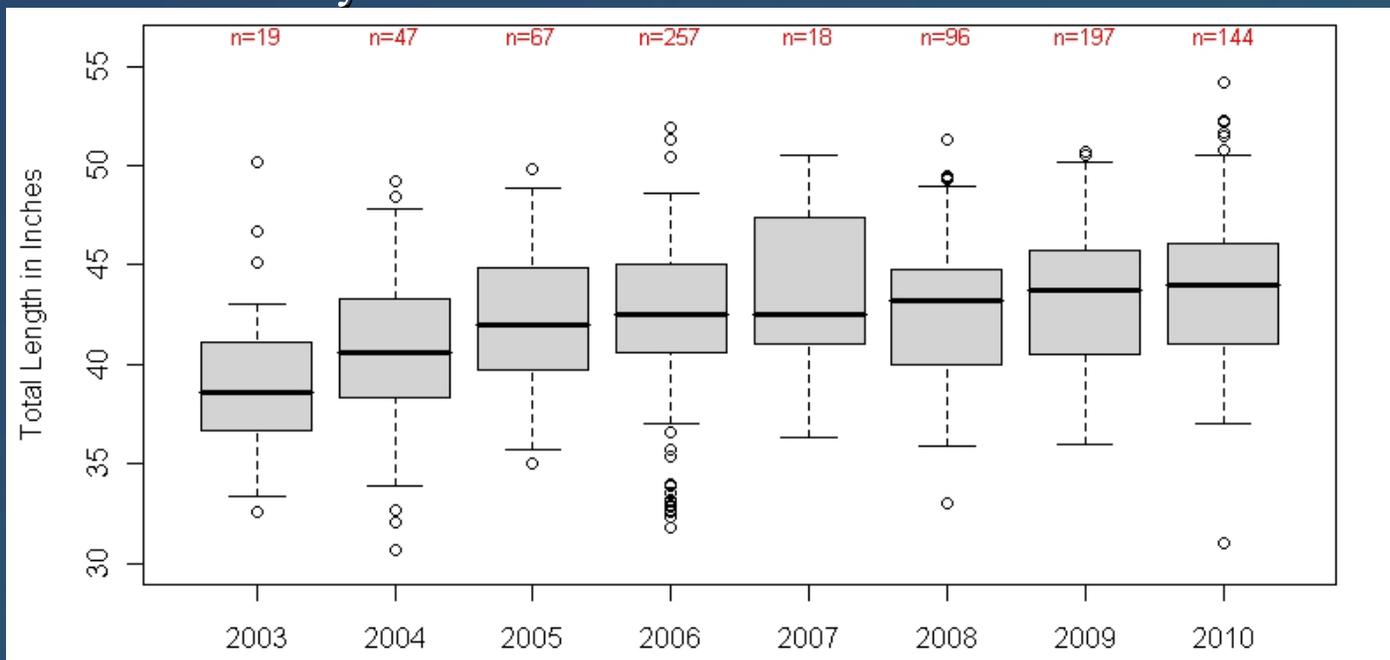
# Management Recommendations

- Continue Stocking
  - Green Bay/Fox River source to maintain abundance
  - Great Lakes source for genetic diversity



# Management Recommendations

- Maintain 50” minimum length limit unless unable to achieve or maintain *Objective 1.2*
  - If growth overfishing is evident recommend a catch and release only season to assess the impact to size structure by harvest.



# Management Recommendations

- Delay the open season on the WI-MI Boundary waters of the Lower Menominee River to prevent disturbance of spawning muskies.
  - Make the opening date consistent with the rest of the Wisconsin waters of Green Bay.



# Management Recommendations

- Improve Knowledge of Fishery
  - Harvest Reporting Requirement.
  - Extend Creel Survey until end of November.



# Management Recommendations

- Continue cooperation with internal and external partners to protect and enhance aquatic habitats to encourage natural reproduction of muskellunge.



Questions?

