

## Fish population surveys and lower trophic level sampling



## Management Objectives

- Management of dominant percid (walleye and yellow perch) populations and their associated fisheries
- Manage for diverse ecosystem, fish community and fisheries
- Restoration of native species and control of non-natives
- Manage for long-term sustainability

## Knowledge Gaps

- Understanding yellow perch recruitment dynamics and bottlenecks to production
- Understanding walleye recruitment dynamics and bottlenecks to production
- Elucidation of fish community dynamics (incl. role of forage fish and invasive species in Saginaw Bay)
- Is reestablishment of lake herring in Saginaw Bay feasible?
- What are the important ecological connections between Lake Huron and Saginaw Bay?

## Fish population surveys and lower trophic level sampling

It is not only important for management agencies to establish predictive links between particular actions and fish production.

It is also beneficial for management agencies to be equipped with a qualitative understanding of processes affecting fish productions.

Our field and modeling efforts are structured to facilitate both prediction and understanding.

## Yellow perch and Walleye recruitment

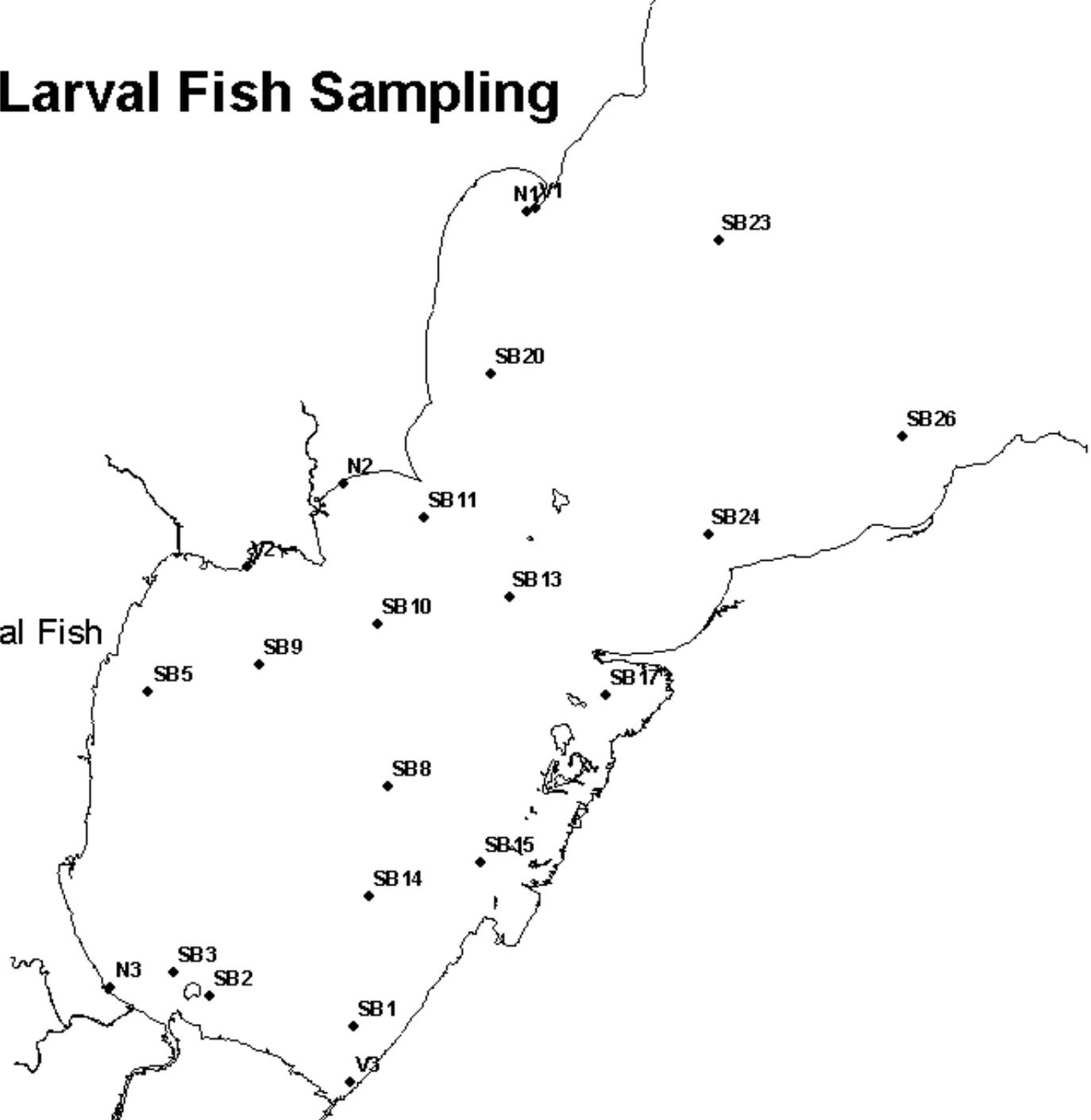
- Weekly daytime sampling mid April thru June
- 22 stations
- Larval fish tows (bongo nets, push nets, neuston nets)
  - Abundance
  - Size
  - Otoliths (growth)
  - Diet
- zooplankton collections
  - prey availability and community composition



# Saginaw Bay Larval Fish Sampling

## Legend

- Preliminary Larval Fish Sampling Sites
- Shoreline



## Yellow perch and Walleye recruitment

- Nearshore vs Offshore habitat use
  - concurrent sampling 1 week during summer
  - otolith chemistry



## Yellow perch and Walleye recruitment / Fish community dynamics

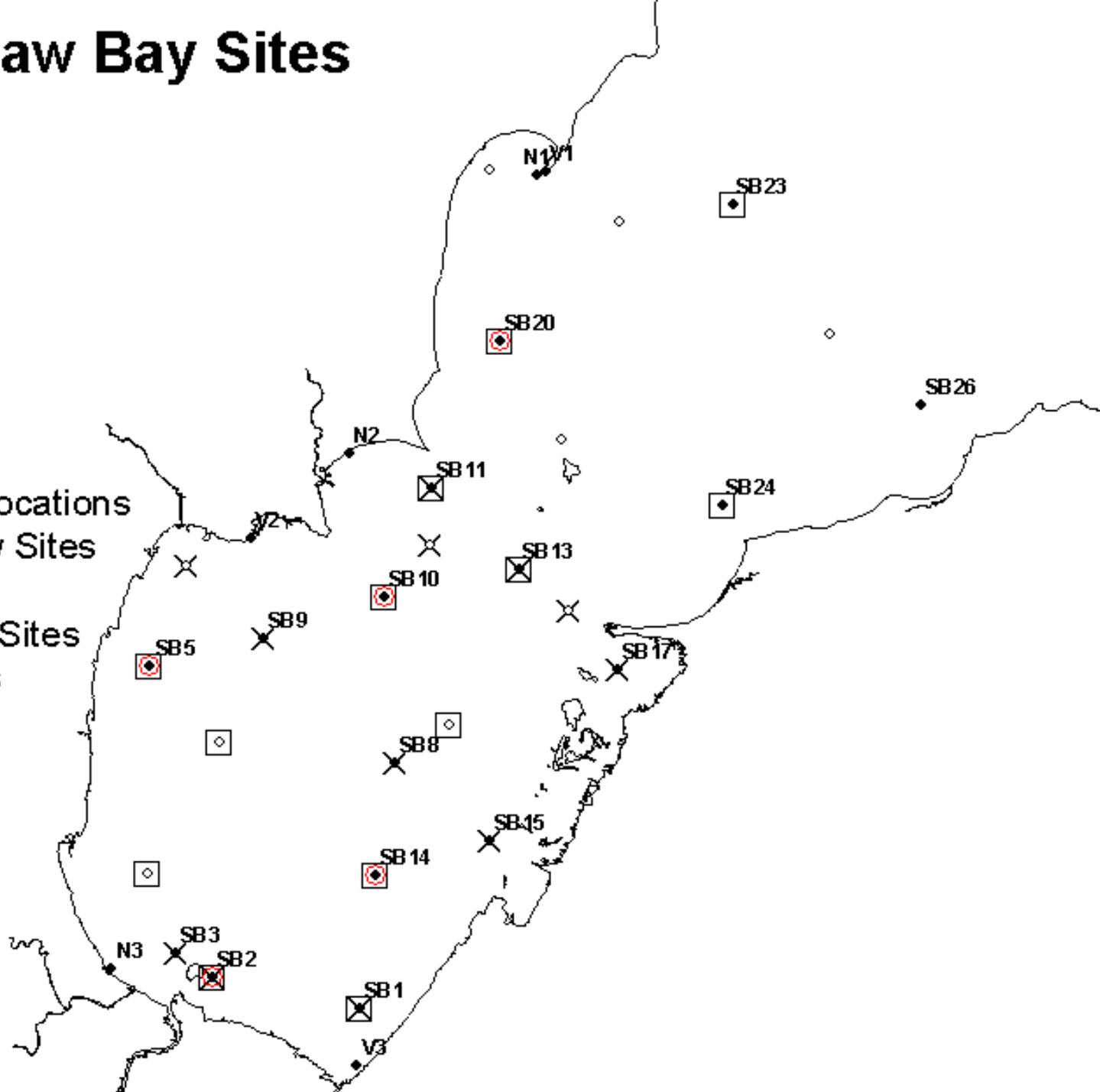
- Monthly sampling May thru October/November
  - Sampling in spring 2010 critical to understand overwinter dynamics
- 5 Master stations
- Bottom trawls (25'; day)
- Gill nets (?)
- Nearshore sampling (seines, electrofishing)



# Saginaw Bay Sites

## Legend

- Larval Fish Locations
- Water Quality Sites
- Master Sites
- ◇ Other NOAA Sites
- × D. Jude Sites
- Shoreline



# Yellow perch and Walleye recruitment / Fish community dynamics

- Fish Analysis
  - Relative Abundance
  - Species composition
  - Size distribution
  - Growth
  - Condition/Energy content
  - Diets
    - Predators (walleye, catfish, adult yellow perch)
    - Invasive (white perch, round goby)
    - Forage (shiners, smelt)



## Yellow perch and Walleye recruitment / Fish community dynamics

- Monthly sampling May thru October/November
- 5 Master stations
- zooplankton
  - 64  $\mu\text{m}$  net
  - bongo nets for large predatory zooplankton
  - prey availability
  - water quality input
- Benthos
  - ponars
  - prey availability/mussel density





