

# Gile Flowage Watershed Project Environmental Information Review and Water Quality Monitoring

White Water Associates, Inc.  
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# Purpose of Presentation:

- Introduce White Water Associates
- Discuss Gile Flowage Watershed Project
- Present Environmental Information Review and Water Quality Monitoring
- Recommendations for Planning

# Who is White Water Associates?

- Environmental Laboratory and Ecological Consulting Services
- Established 1985
- Located in Western Upper Peninsula of Michigan

# Gile Flowage Watershed Project

- Big picture: Watershed Scale Adaptive Management Plan
- Phase I: Environmental Information Review
- Phase II: Water Quality Monitoring
- Overall Report

# Phase I Tasks

- Review land use planning information from Carey and Pence
- Research, collect, and review existing environmental information
- Identify threats to the Flowage
- Identify information gaps
- Fall 2004 presentation

# Phase II Tasks

- Continue information review
- Conduct water quality monitoring
- Educate volunteers
- Prepare final report (Phases I & II)
- Presentation

# Phase II Field Methods

- Two sampling bouts (summer and fall)
- Summer: 2 locations for water sampling and 3 for sediment sampling
- Fall: 1 location for water sampling and low-level mercury sampling
- Demonstration and participation for field method education





# Land Use Planning

- Environmentally grounded land-use plans
- Engaged citizens
- Goals and objectives in plans for Carey and Pence are sound
- Specific suggestions in report

# Views from the People

- UWEX Survey
- 27% Response Rate
- All indicators showed a strongly engaged and environmentally conversant public



# Aquatic Habitat

- 3,400 acres
- 26 miles of shoreline
- Numerous islands
- Seven inlet streams
- Two drawdowns each year





# Aquatic Vegetation

According to 1994 Aquatic Macrophyte Survey

- 15% of littoral zone is vegetated
- 50% is considered "desireable"
- 24 species identified
- Low diversity
- 11 of 24 considered "fisheries valuable"
- Maximum depth of plant growth is 0.4 m

# Riparian Habitat and Aesthetics

- Diverse, healthy forest
- Wetland openings and lowland forests
- Quality wildlife habitat
- Minimal fragmentation



# Flowage Fishes

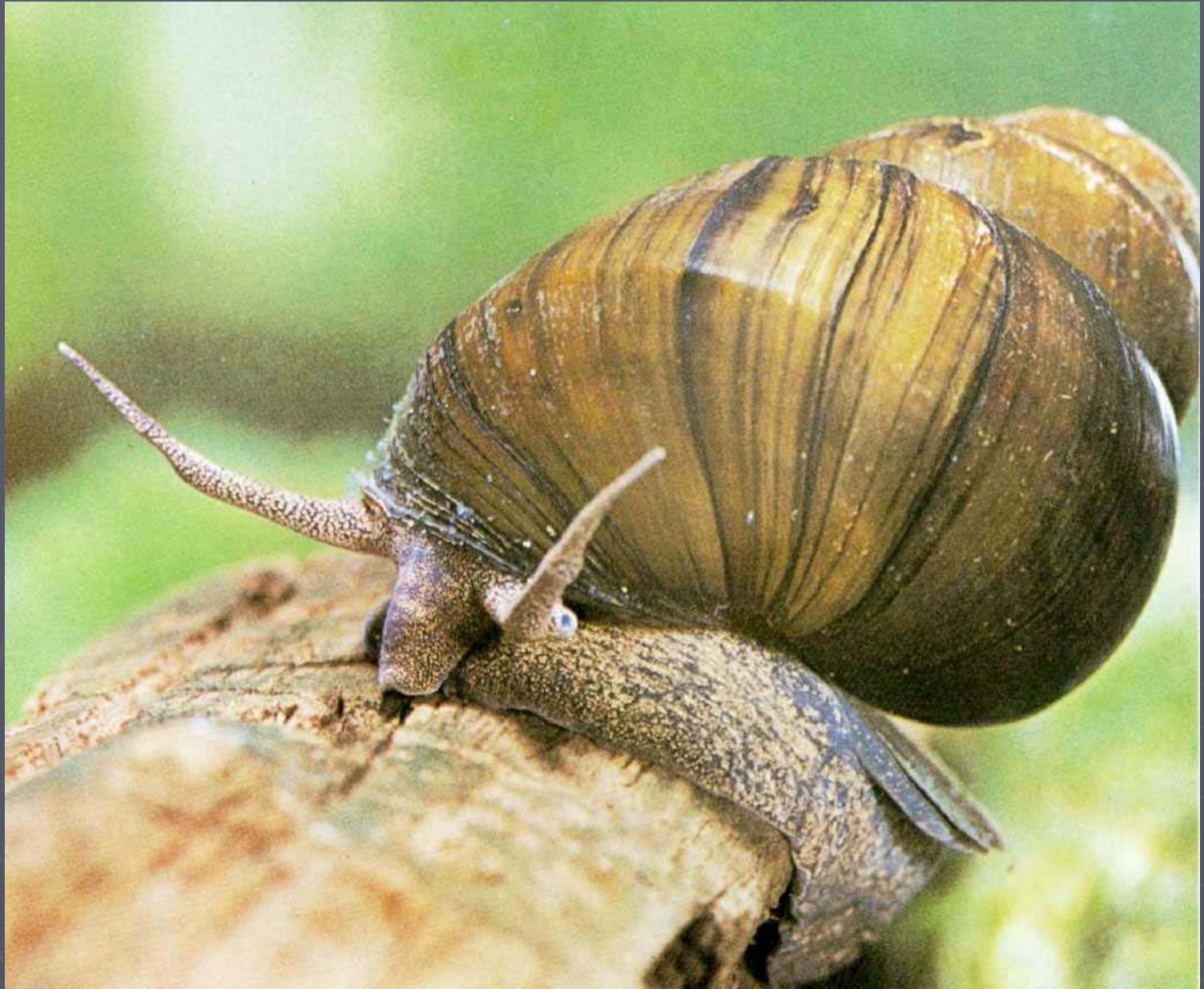
- Diverse community
- Walleye below carrying capacity
- Walleye reproduction is good
- Young walleye may not over-winter in good numbers
- Smallmouth bass fishery is good
- Panfish show low abundance but good growth

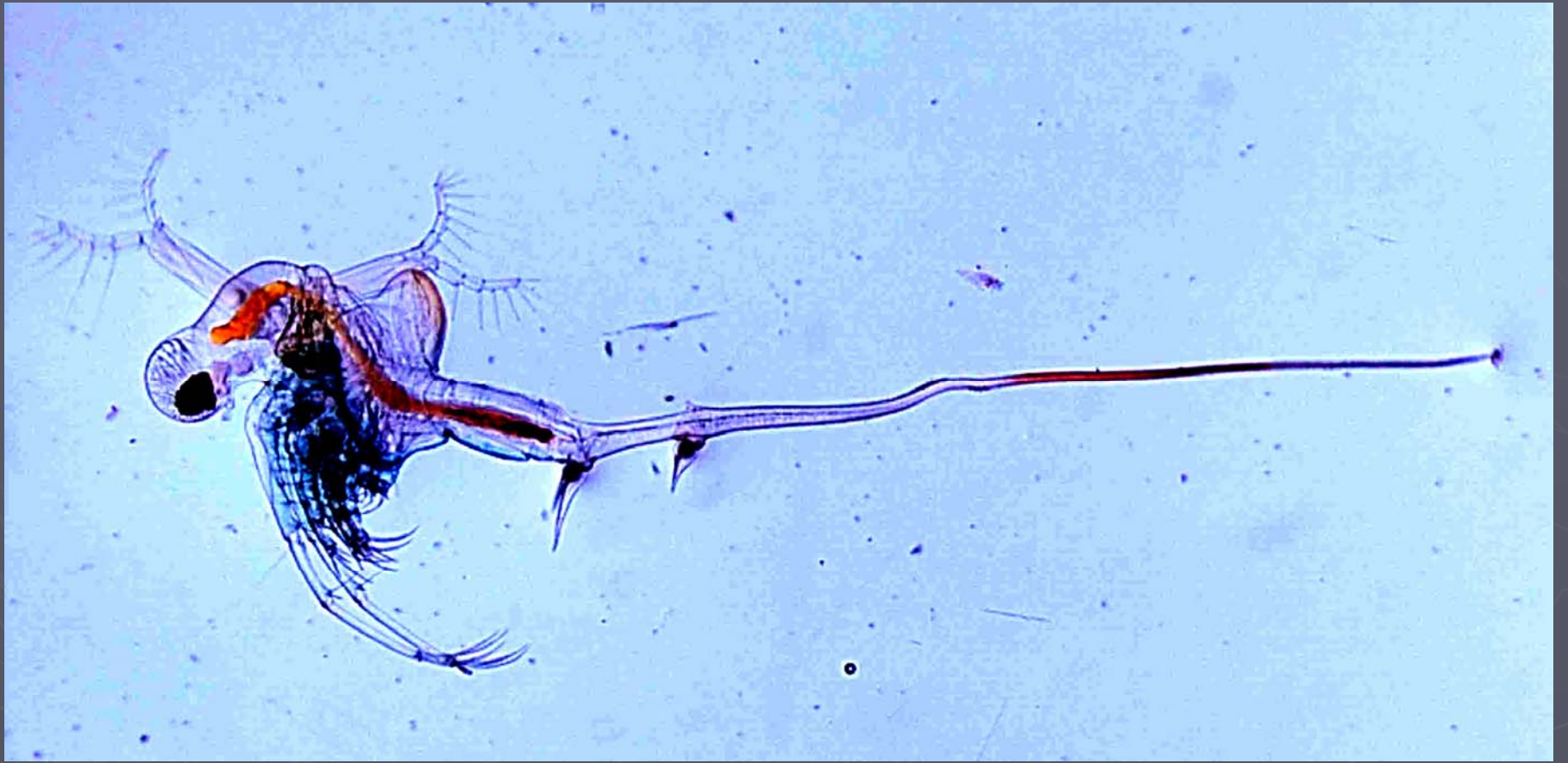
# Area Wildlife

- Nesting loons
- Nesting eagles
- Neotropical migrant birds

# Unwanted Invaders

- No invasive plants
- Two invasive, non-native animals
  - Chinese Mystery Snail
  - Spiny Water Flea





# Potential Sources of Pollution

- Erosion and Sediment
- Forestry and Agriculture
- Roads and Spills
- Watercraft Fuels
- Airborne
- Biological
- Light

# Historical Water Quality

(1994, 1995, 1997, and 2000 from WDNR)

- Mesotrophic
- Moderate nutrient availability
- Moderate algae production
- Summer Secchi depth: average 5.2 ft
- Soft water: 21.5 mg/L (CaCO<sub>3</sub>)
- pH about 7.0
- No apparent stratification
- Chlorophyll "a": 2-7 micrograms/liter
- Total Phosphorus: 13-38 micrograms/liter

# 2005 Water Quality Monitoring: Field Measures

- Transparency was low (1.0 / 1.5 meter)
- No stratification of temperature and oxygen
- pH: 7.4 / 8.1
- Conductivity: 55 / 40

# 2005 Water Quality Monitoring: Water Chemistry

- Alkalinity: 14 / 13 mg/L
- Total phosphorus 34 / 41 micrograms per liter (Eutrophic)
- Nitrate-Nitrite: non-detect in August / 30 micrograms per liter in September
- Total Nitrogen: 0.67 / 0.53 mg/L

Continued...

# 2005 Water Quality Monitoring: Water Chemistry

Continued...

- Borderline between phosphorus and nitrogen limited
- Chlorophyll "a": 10.7 / 5.87 micrograms/L (Eutrophic)
- Carlson TSI: (Eutrophic)
- Low-level Mercury: 2.03 parts per trillion

# 2005 Water Quality Monitoring: Sediment Chemistry

- Metals generally below “Threshold Effect Concentration”
- Exception: Cadmium slightly above TEC
- Exception: Mercury above TEC at 2 of 3 locations and above MEC at one location

# Important Ecosystem Features

- Good water quality
- High quality riparian area
- Diverse fish community
- Reasonable level of recreation
- Islands on the Flowage
- Bald eagle nesting and use
- Common loon nesting and use
- Engaged & interested people

# Possible Threats to the Ecosystem

- Least restrictive lake classification status
- Increasing development
- Increasing recreational use
- Uncertainties over future reservoir management by Xcel
- Sale of public property on reservoir
- Water level fluctuation
- FERC jurisdiction uncertainties

Continued...

# Possible Threats to the Ecosystem

Continued...

- Exotic / aggressive species (spiny water flea, Chinese mystery snail)
- Bluegreen algae blooms
- Mercury in the system
- Low diversity and density of aquatic plants
- Non-point source pollution

**Gile Flowage Watershed Project Report:  
Environmental Information Review and Water  
Quality Monitoring (Iron County, Wisconsin)**

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**Submitted to:**

Towns of Carey and Pence  
Iron County, Wisconsin  
Joint Planning Committees  
Attention: Chuck Splonskowski  
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*Gile Flowage September 2005 (D. Premo photo)*

**Date:** November 17, 2005