Fox Chain O'Lakes Watershed Planning Meeting

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Alana Bartolai
Ecological Services Program Coordinator
abartolai2@lakecountyil.gov
847-377-8009

LakeCounty
Health Department and
Community Health Center

Lake County Health Department – Ecological Services

- Water Quality
  - Beach Sampling
  - Lake Sampling
  - Chloride Sampling
- Vector Surveillance (Mosquitos and Ticks)
- Aquatic Invasive Species
  - Carp removal
  - Plant monitoring

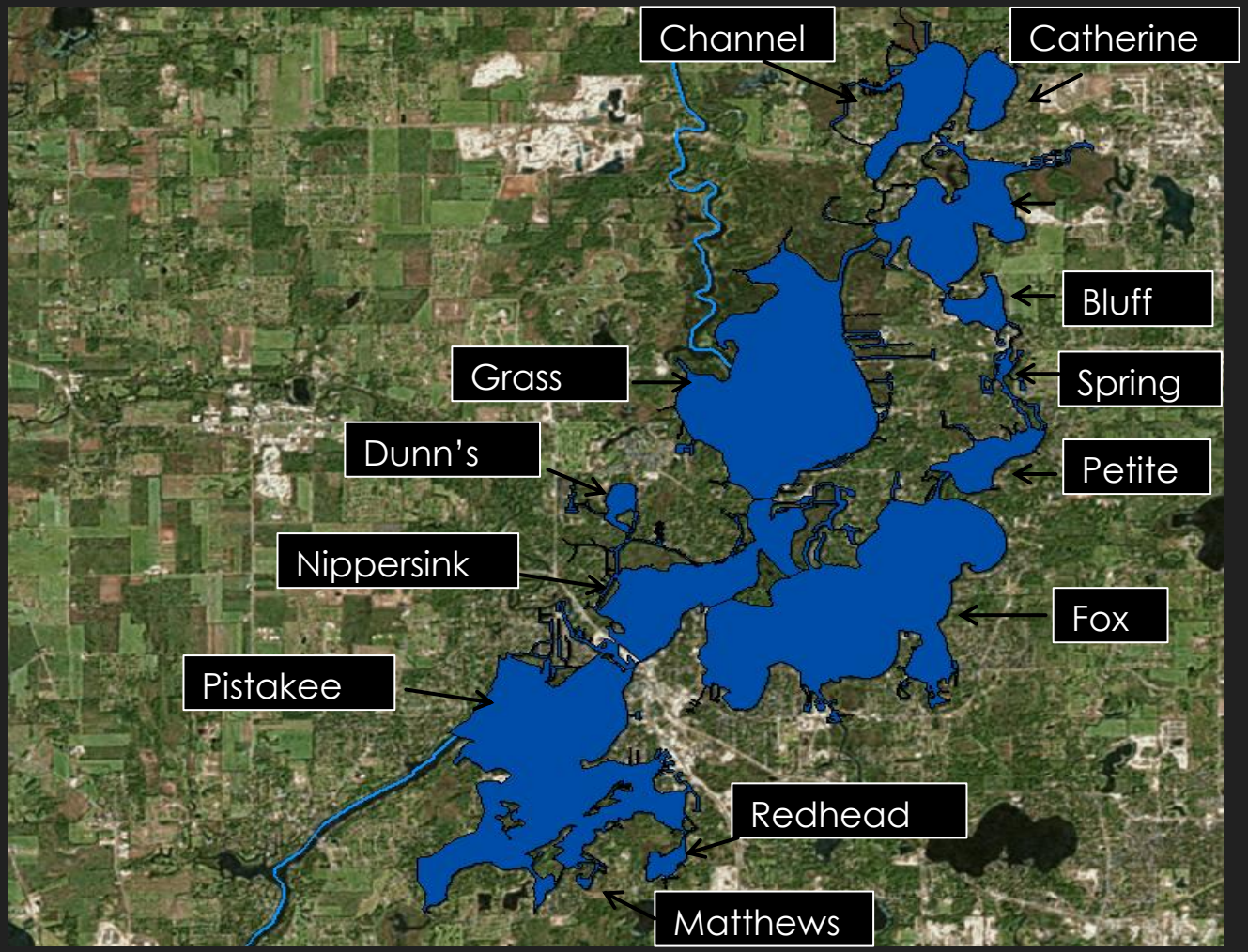
A bit of History

- 1870's the "Pistaqua Lakes Region" was a series of meandering streams, shallow lakes and marshlands.
- The damming of the Fox River as early as 1906-7 increased the surface area of the lakes' and provided greater access by boats.
- Grass Lake tourist spot for lotus beds
- Today the Fox Chain O' Lakes is known as one of the busiest inland lakes in the world.

Fox Chain O'Lakes

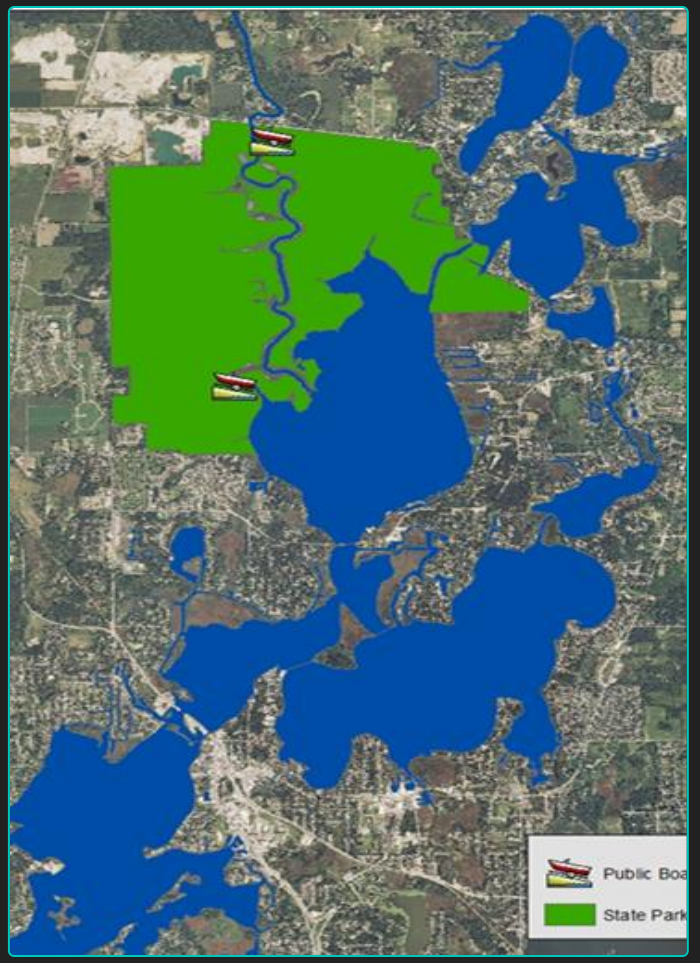
13 lakes (9 main core lakes)

Lake	Max Depth (ft.)	Average Depth (ft.)
Bluff	28	10.5
Channel	36	14.5
Catherine	35	17.5
Dunns	7.5	3.8
Fox	12	5.6
Grass	6	2.3
Marie	31	9.2
Matthews	5	2.5
Nippersink	6	2.5
Petite	19	7.8
Pistakee	30	5.2
Redhead	4.6	1.8
Spring	5	



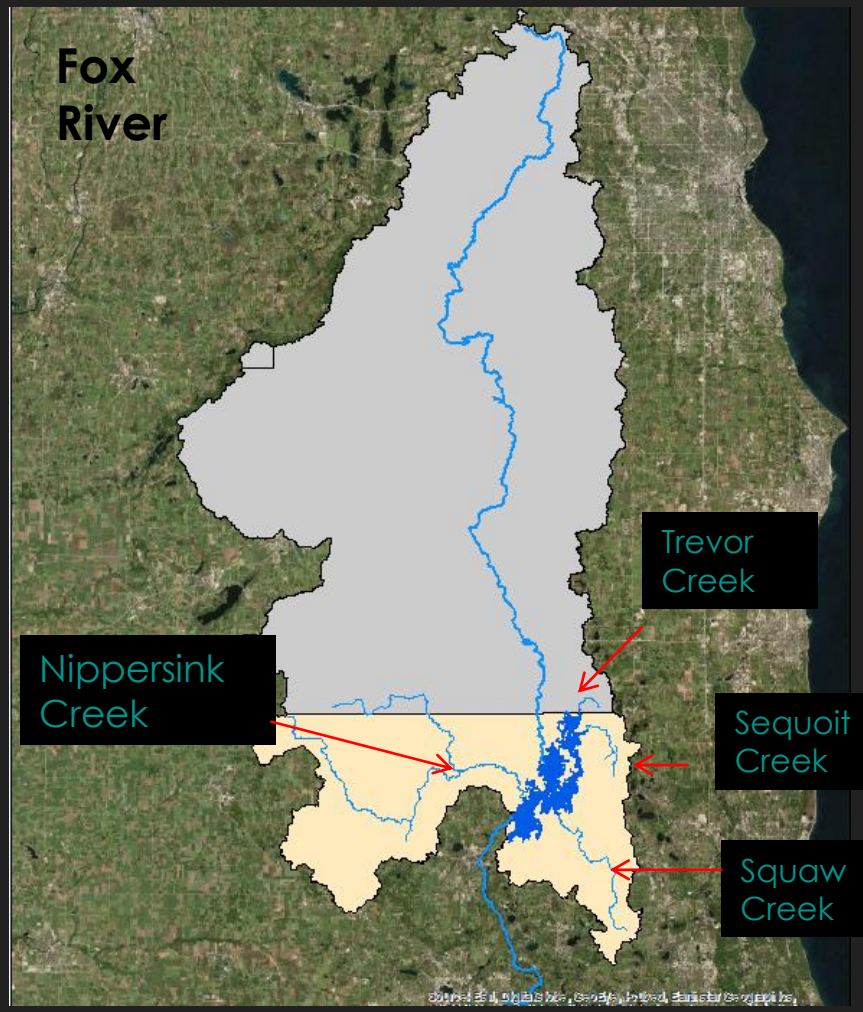
Lake Access

- Public waters (DNR)
- HOA's & individuals can have lake-bottom ownership
- Most shoreline access is private.
- Free public boat launch within Chain O'Lakes State Park.
- Other public fee launch areas available.



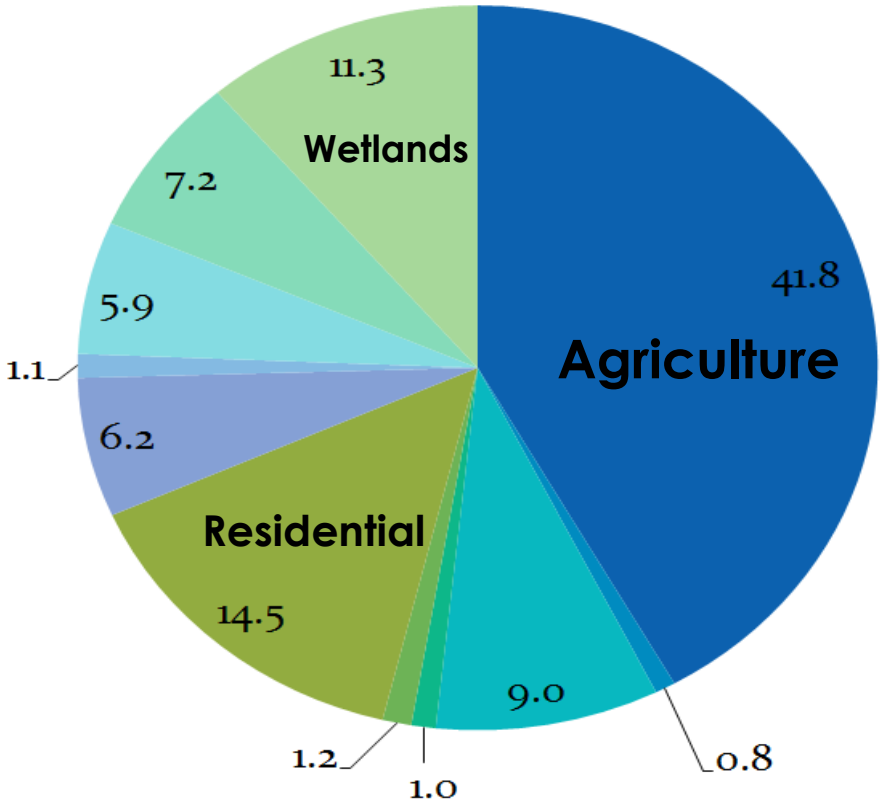
Watershed

- ~1300 sq. miles (930,000 acr.)
- Main tributaries include:
  - Fox River*
  - Nippersink Creek
  - Sequoit Creek
  - Squaw Creek
  - Trevor Creek



*Needs to be updated

Land Use

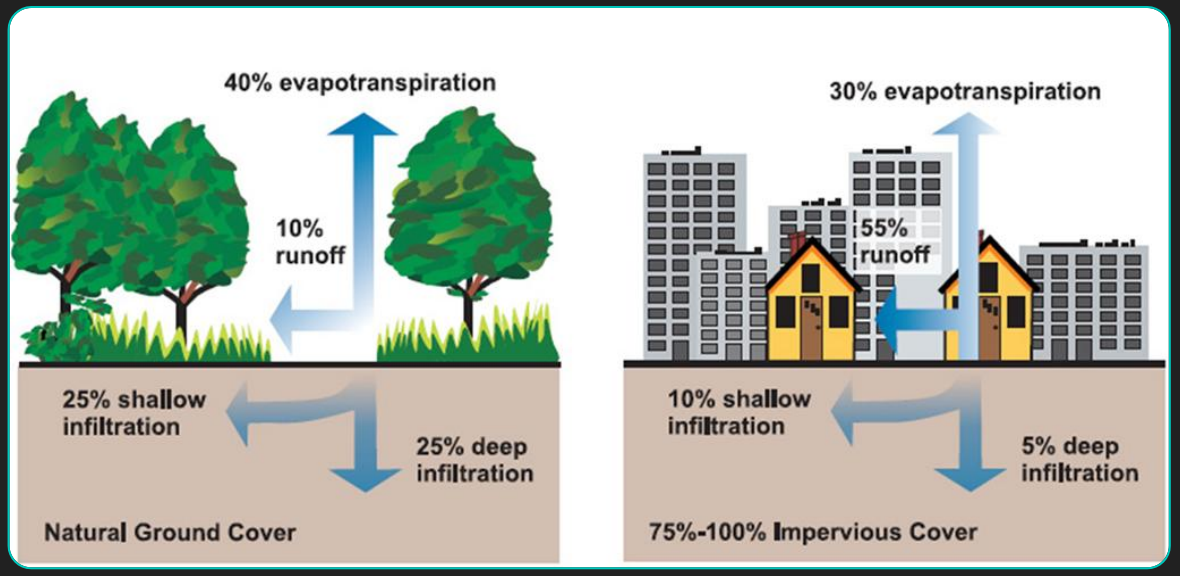


- Agricultural
- Disturbed Land
- Forest and Grassland
- Government and Institutional
- Industrial
- Residential (Multi & single)
- Public and Private Open Space
- Retail/Commercial
- Transportation, Utilities & Waste Facilities
- Water
- Wetlands

Lake Concerns: Watershed

- Agricultural Runoff
- Urban Stormwater
- Wetland Loss
- Critical Habitat Loss

These can be identified through nutrient and sediment loads, land use assessments, land management assessments



Lake Concerns: Watershed - Solutions

Solutions include reducing nutrient runoff into lake on watershed scale

Examples

- Rain Gardens
- Native Plant Buffers
- Permeable Pavement
- Residential Bioswales
- Urban Tree Canopy
- Rain Barrels
- P-Free Fertilizer
- Dog Waste Management
- Septic Symptom Maintenance

Lake Concerns: Water Quality

Problems with:

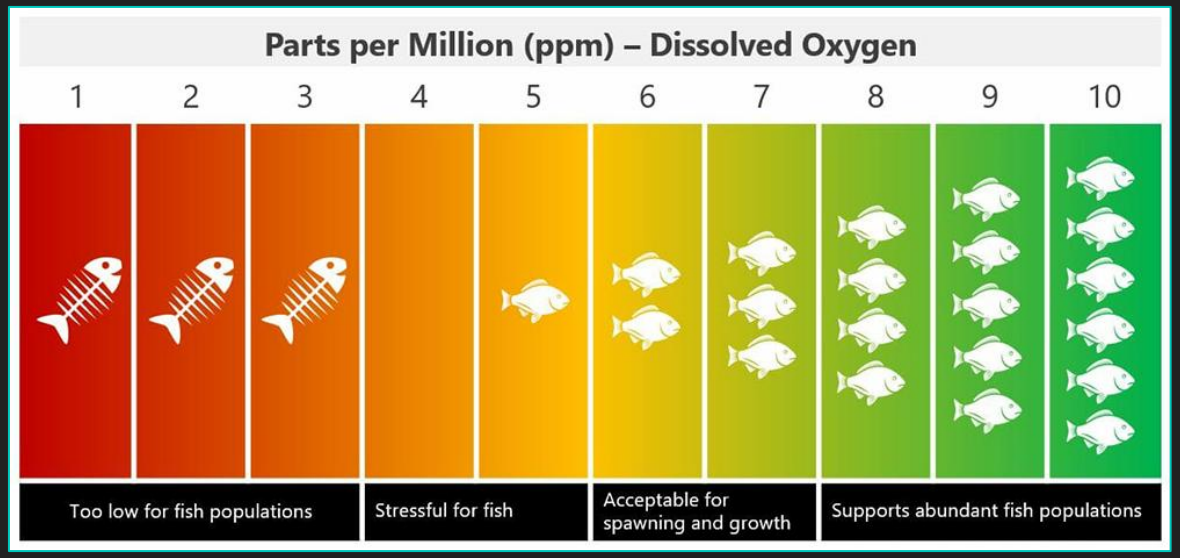
- Internal Nutrient Loading
- Sedimentation
- Algae Blooms
- Fish Kills
- Anoxic Hypolimnion

These can be identified by monitoring:

- Nutrients
- Secchi
- Chlorophyll
- Temperature & DO profiles

Lake Concerns: Dissolved Oxygen

- DO ≤ 5 mg/L can cause stress for aquatic life.
- Stormwater from the precipitation events carry oxygen-demanding substances.
- Warm water holds less oxygen than cold water.



Lake concerns: Water clarity

Secchi Depth ~ indicator of water clarity

What does it mean if the water clarity is low?

- Nutrients
  - Phosphorus
  - Nitrogen
- Total Suspended Solids (TSS)
  - Sediments
  - Plankton/Algae
- Precipitation
- Presence or absence of aquatic vegetation
- Boat propellers & carp
- Invasive species

Lake Concerns: Total Suspended Solids

- Solid materials suspended in water column
- High concentrations can lower water quality
  - Absorb light, increases temperature
  - Decrease ability of water to hold DO
  - Make it difficult for aquatic plants
  - Make it difficult for aquatic life (fish eggs, macro-invertebrates, fish gills, etc.)

Lake Concerns: Suspended Solids

Non-volatile (sediment)

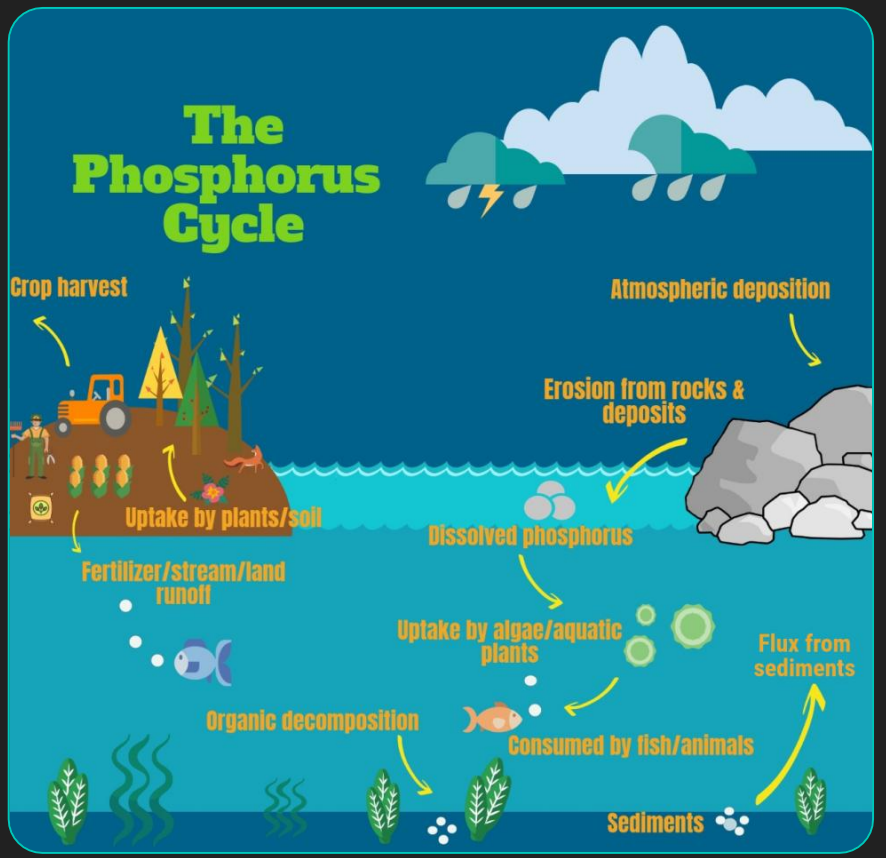
- Fox River Watershed 100,000 cu-yds.
- Failing sea walls or eroding shorelines
- Carp
- Boat propeller

Volatile – organic

- Plankton
- Algae
- Plant material
- Macro invertebrates

Lake Concerns: Total Phosphorus

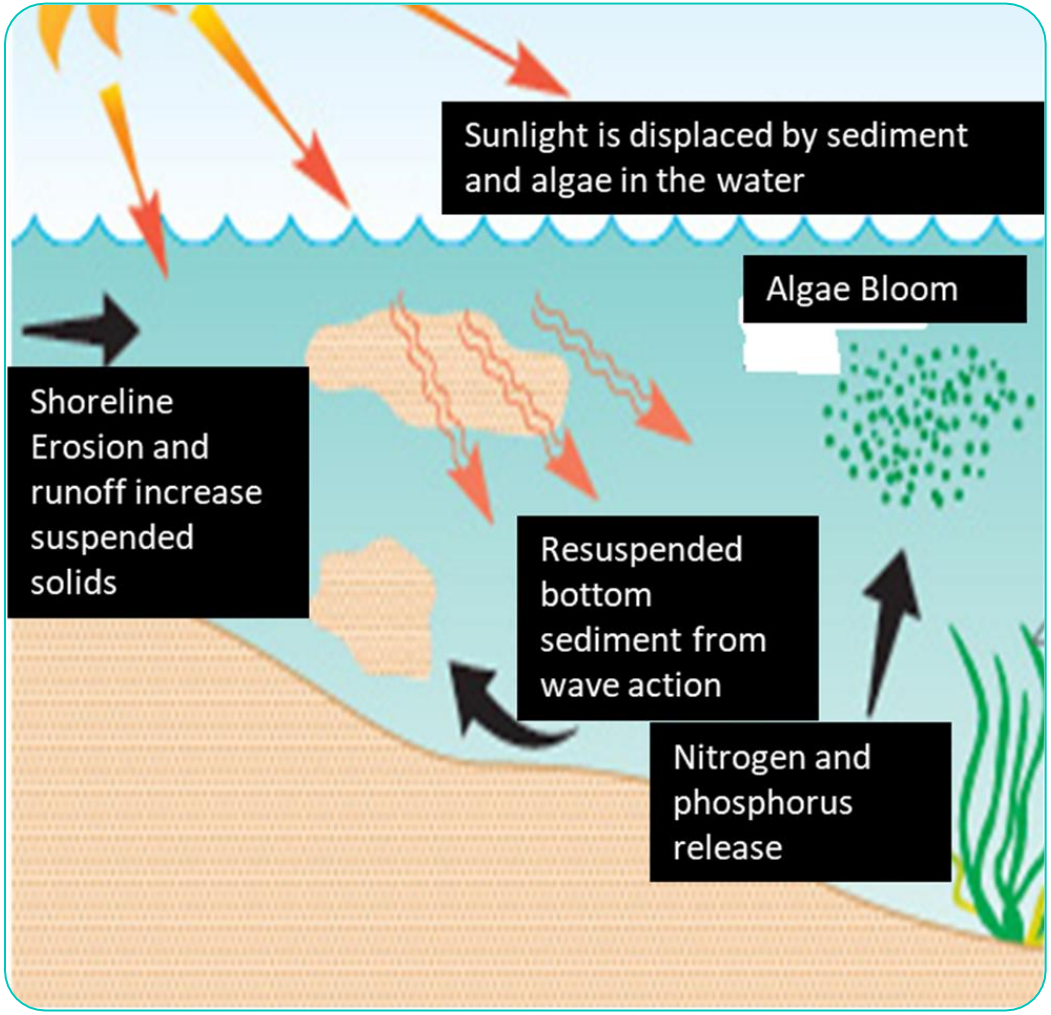
- Primary nutrient for plant and algal growth
- Too much TP increases eutrophication
- Sources : External and Internal
  - Human and animal waste
  - Soil erosion
  - Detergents
  - Sewage treatment plants
  - Septic systems
  - Runoff
  - Re-suspension of sediments (carp, boat) (internal)
  - Lake mixing (internal)



Lake Concerns: Algae

Algae is a result of excess nutrients (think: Phosphorus & Nitrogen)

- Shoreline erosion
- Resuspended bottom sediments



Lake concerns: Algae

*Blue Green/ HAB/ Cyanobacteria

Filamentous algae

Lake Concerns: Harmful Algal Blooms (HABs)

- Blue-green algae, or "cyanobacteria" are a type of algae that can bloom and produce toxins
- Water can appear blue-green, bright green, brown, or red and may look like paint floating on the water.
- Not all blue-green algae have toxins. The presence of toxins can only be verified through a sample analyzed in the lab.

Example of blue-green algae on Dunns Lake

Lake concerns: Harmful Algal Blooms

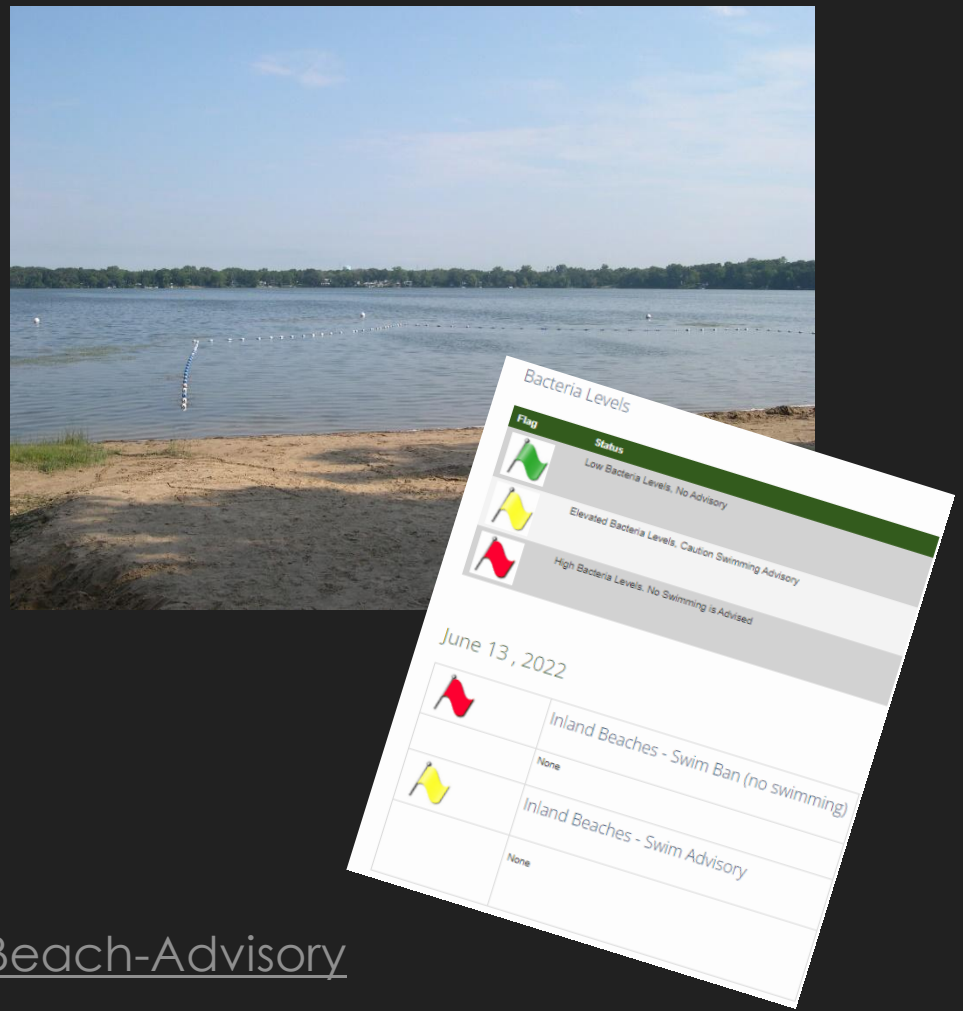
- LCHD samples HABS routinely at a select licensed swimming beaches (3)
- Sample "events"

Report blooms to: Lake County Health Department Environmental Services (847) 377-8030.

Lake Concerns: Swimming Beaches

- Beaches sampled every 2 weeks Memorial Day to Labor Day at licensed swimming beaches
- Testing for E.coli bacteria
- 16 Licensed beaches on Chain O Lakes

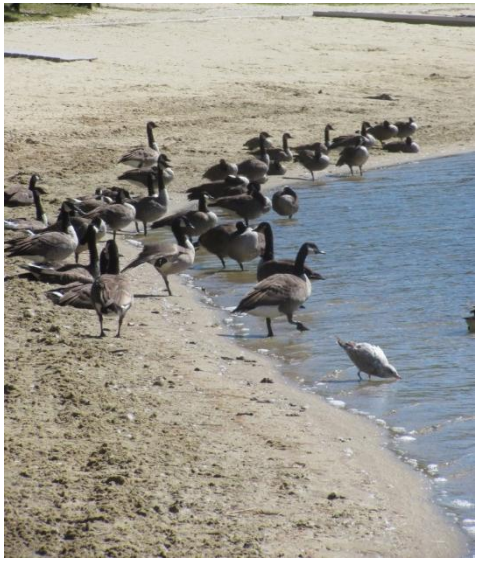
Check beach status on Lake County Health Department Beach Advisory page for any active beach closures. Updated by 10 AM.



https://www.lakecountyil.gov/2385/Beach-Advisory

Lake Concerns: Swimming Beaches

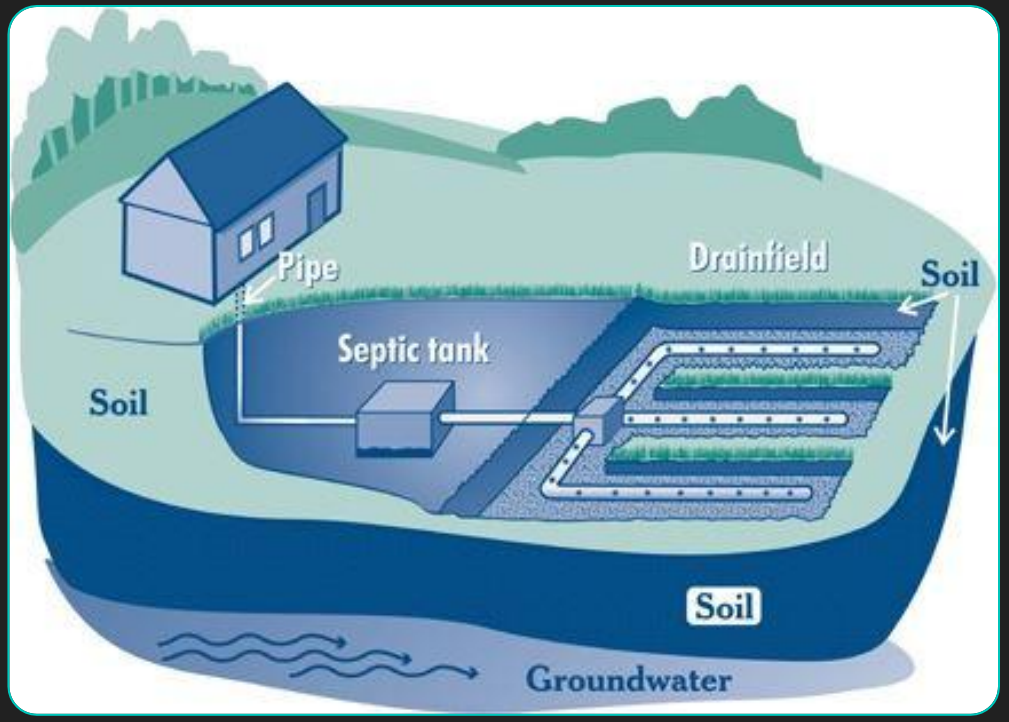
- High levels of E.coli can close beaches.
- Geese and waterfowl can be a cause.
- Dog waste
- Failing septic systems



Lake Concerns: Septic Systems & E.coli

Septic BMPS:

- Pumping/inspecting the system once every three years.
- Avoid driving/ parking on the drain field to prevent soil compaction
- Keep roots of trees/ shrubs away from the drain field
- Consider aerobic digesters when it is time to replace the system.

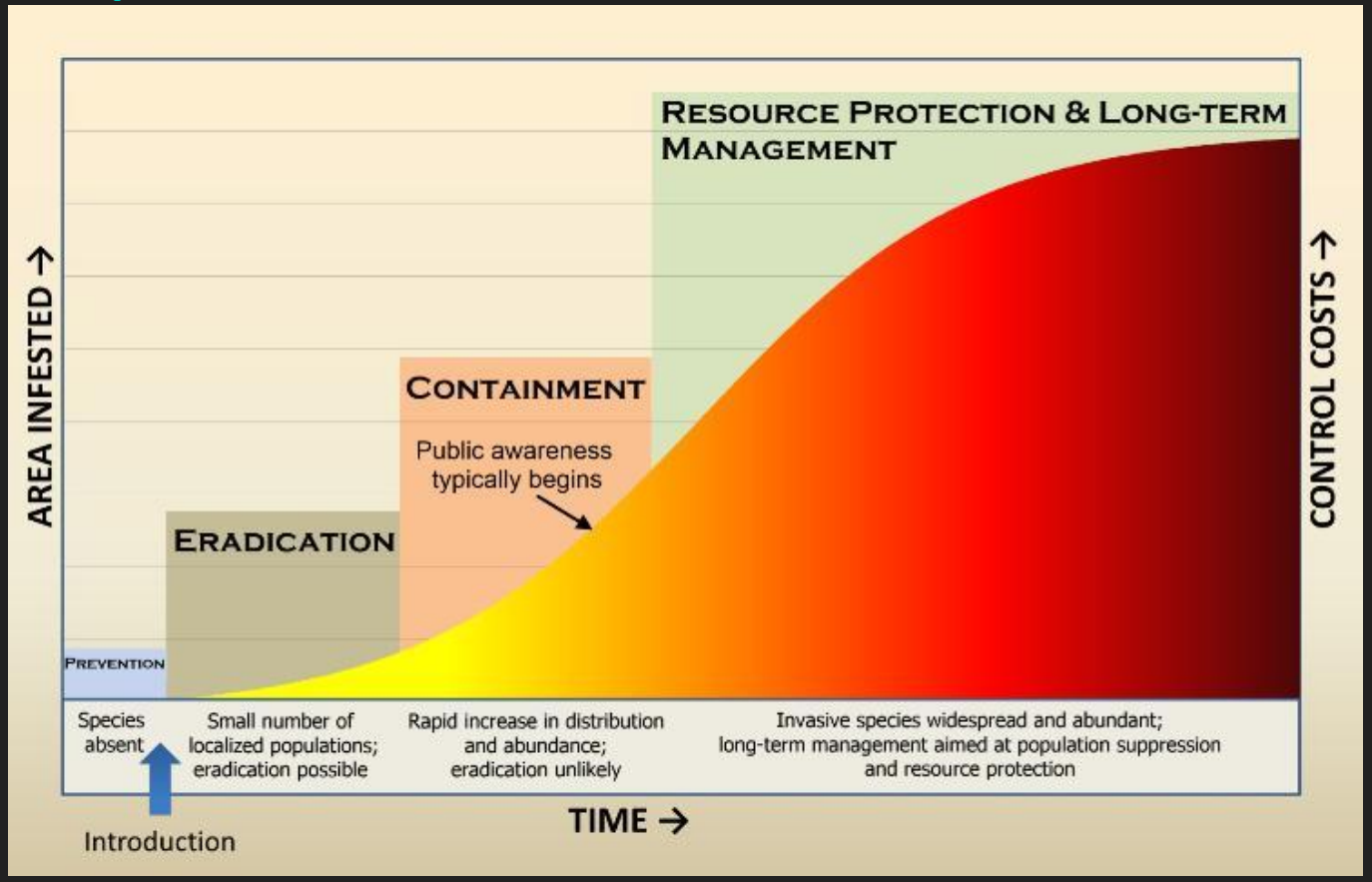


Indicators of failing septic:

- Sewage backing up in the basement or drains
- Ponded water or wet areas over the drain field
- Bright green grass over the drain field
- A dense stand of aquatic plants along your shoreline
- Sewage odors
- Biodegradable dye flushed through your system is detectable in the lake

Call LCHD if you believe failing septic

Lake Concerns: Invasive Species



Transport -> Introduce -> Establish -> Spread -> Impact

Kolar and Lodge 2001

AIS Regulation

Four main regulations for sale and movement of aquatic plant species:

- Illinois Exotic Weed Act,
- Injurious Species Rule,
- Fish and Aquatic Life Code (IDNR)
- Illinois Noxious Weed Law (IDOA).

Illinois prohibits certain plants & animals from being bought and sold within the state and released into waterbodies.

Illinois Boat Registration and Safety Act (IDNR).

- No person may place of operate a vehicle/watercraft or other object of any kind in waters of this State if it has any aquatic plants or aquatic animals attached to it (excluding duckweed)

Lake Concerns: Invasive Species

- Eurasian Water Milfoil
- Curly leaf Pondweed
- Common Carp
- Zebra Mussels

Starry Stonewort: Invasive Species Highlight

- Bushy, bright green macroalgae
- Produces characteristic star-shaped bulbil
- Macro-algae means it does not have a vascular system like true plants.
- Native to Eurasia
- Unintentionally introduced in US Great Lakes through discharge of contaminated cargo ship ballast water
- First occurrent in 1978 along St. Lawrence River.
- First found in Illinois recently – suspect could be in more lakes

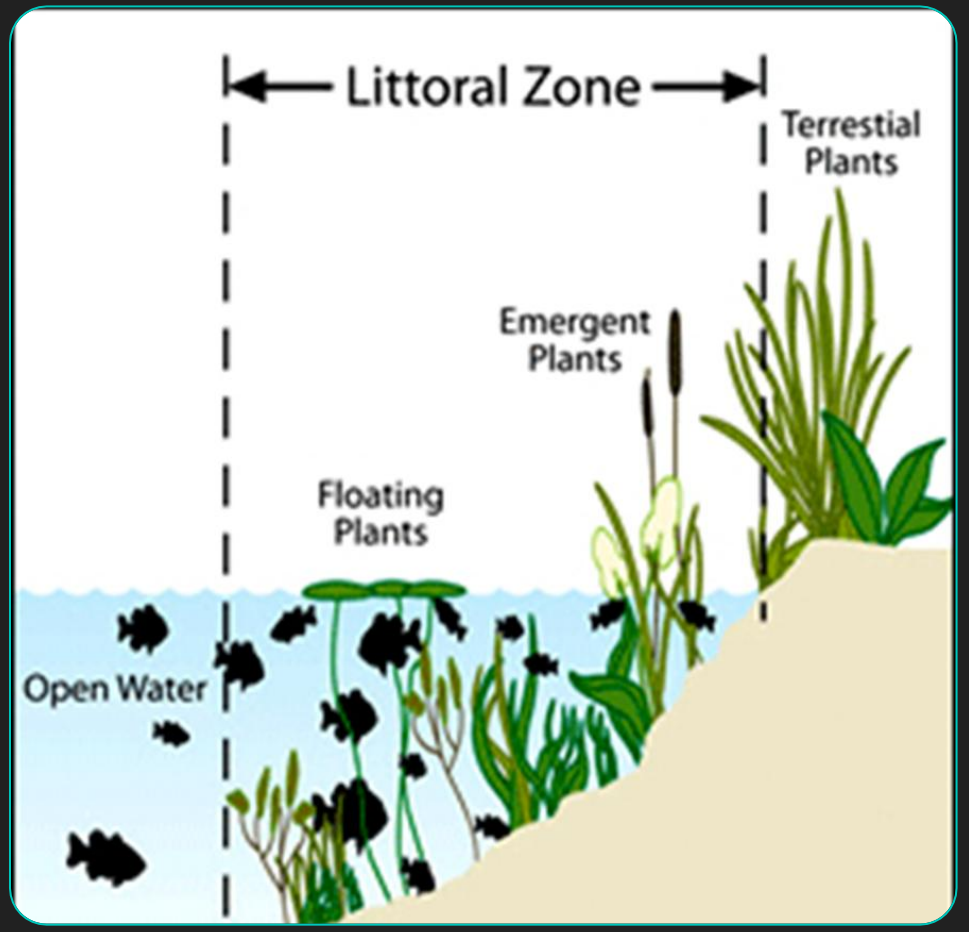
Hydrilla: Invasive species highlight

- Blocks sunlight and displaces native plants
- Weight & size of sportfish can be reduced when open water and natural vegetation is lost
- Value of shorefront property reduced
- Low light needs – competitive advantage
- Contribute to nutrient rich environments and cyanobacteria
- Can be hard to control when become so dense – early detection and rapid response is crucial for containment!

If you suspect that you have encountered in Illinois Contact IL-DNR or LCHD

Lake Concerns: Aquatic Plant Management

- Benefits of Native Aquatic Plants
  - Emergent
    - Filter runoff
    - Reduce Erosion
    - Spawning areas
  - Floating-Leaved
    - Shade and refuge
  - Submersed
    - Create oxygen
    - Compete with algae
    - Reduce turbidity
- More diversity of plants = healthy ecosystem



Aquatic Plant Management - Herbicides

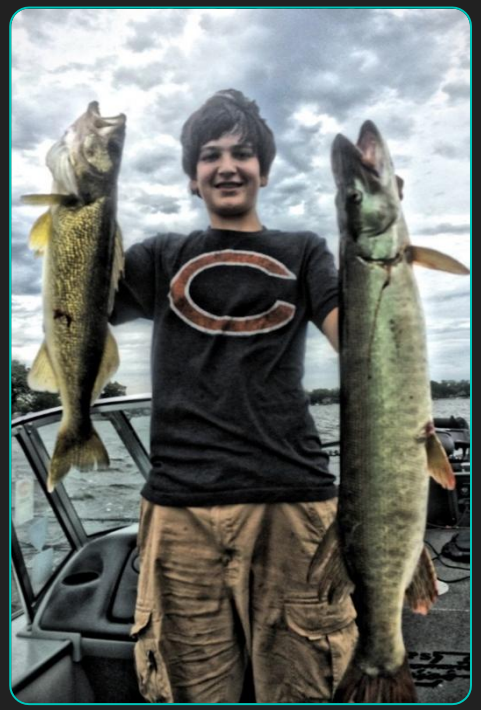
- If you plan to use herbicides for plant control (invasive species)
  - Apply to the IDNR for a Letter of Permission (LOP) and receive permit per Administrative Code Part 895.
  - Illinois - NPDES Notice of Intent also needs to be filed and permit issued.

Aquatic Plant Management

- Timing matters – the earlier the better!
- Know your plants (ex: hybrid milfoil)
- Monitor and record herbicide applications – evaluate success
- Request for Proposals (RFP)
- Attend LCHD Aquatic Plant Management Workshop

What ICHD has seen on the chain

- Lakes with aquatic vegetation have better water clarity(quality) than those with no or little vegetation present.
- Lakes with balanced aquatic vegetation benefits all users!
  - Fishermen are provided habitat and water clarity supports sight feeders.
  - Property owners in lakes with clear waters have higher property values than lakes with poor clarity.
  - Recreational boaters do not have to worry about getting sick in waters with good water quality.
  - Lakes with balanced aquatic plant community are more aesthetically pleasing than those without.



Potential needs for Fox Chain

- Update bathymetric maps for Fox Chain O'Lakes
- Regularly inspect septic systems
- Report HAB's
- Clean Boat Crew Program (AIS)
- Best Management Practices (BMPs)
  - Shoreland buffers
  - Native plantings

QUESTIONS?

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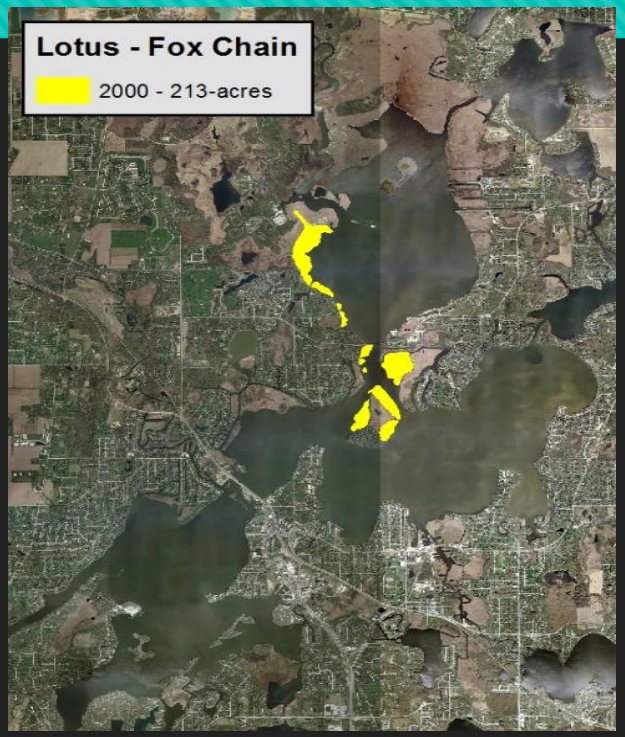
Lotus 2000 – 2014 LCHD-ES



Lotus on the Fox Chain 'O' Lakes 1939 - 2014.											
Year	2014	2012	2011	2008	2007	2002	2000	1959	1954	1946	1939
Acres	272	115	105*	97	290	295	213	0	406	1114	1057