Introduction to Pond Management

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Topics

- Species selection and stocking
- Fisheries management strategies
- Vegetation management Strategies

KISS

Limited Space and lack of habitat diversity limits functionality of a fishery

- Lake Erie - 9,910 square miles (6,342,400 acres)
- Average pond ~.5 acre
- Single Level of Predator-Prey interaction
  - Largemouth Bass-Bluegill
  - Supplement Channel Catfish

Species Selection

Largemouth Bass

- Best Predator for pond and small-lake environments
- Warm water species; prefer vegetated habitats
- Up to 7lbs in pond- Couple lbs common
- 20 inches “Fish Ohio”
- Can easily be over harvested

Bluegill

- Primary food source for Bass
- Warm water species; prefer vegetated habitats
- Up to 10 inches in ponds, 6-8 inches common
- 9 inches “Fish Ohio”
- Can easily become overpopulated and stunted

Stocking

New or Renovated Ponds

	Number to stock per acre			
Stocking strategy	Bass	Bluegill	Redear	Catfish
Largemouth Bass-Bluegill Sunfish	100	500		
Largemouth Bass-Bluegill-Channel Catfish	100	500		100
Largemouth Bass-Redear Sunfish	100		500	
Largemouth Bass-Bluegill and Redear Sunfishes	100	350	150	
Largemouth Bass-Bluegill-Redear-Catfish	100	350	150	100
Recommended size:	3–5 in.	2–3 in.	2–3 in.	3–5 in.

Supplemental Stocking

	Number to stock per acre			
Stocking strategy	Bass	Bluegill	Redear	Catfish
Largemouth Bass-Bluegill Sunfish	50	250		
Largemouth Bass-Bluegill-Channel Catfish	50	250		50
Largemouth Bass-Redear Sunfish	50		250	
Largemouth Bass-Bluegill and Redear Sunfishes	50	175	75	
Largemouth Bass-Bluegill-Redear-Catfish	50	175	75	50
→ Recommended size:	6–8 in.	3–5 in.	3–5 in.	6–8 in.

*estimates – ponds vary

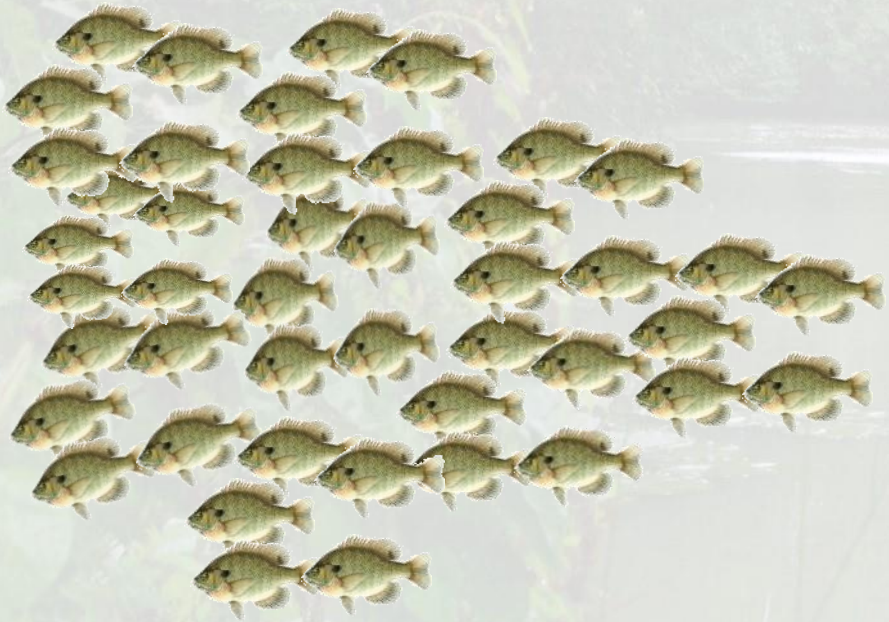
Beware…

- Degrades habitat by bottom-rooting activities, muddying water
- Eats eggs of Bluegills and Largemouth Bass
- Quickly overpopulates and stunts!
- Out-competes Bluegills and Redear sunfish

Fisheries Management

- It’s a balancing act…
- “All I want is lots of big fish”
- No likely to have Trophy size Sunfish and trophy sized Largemouth Bass

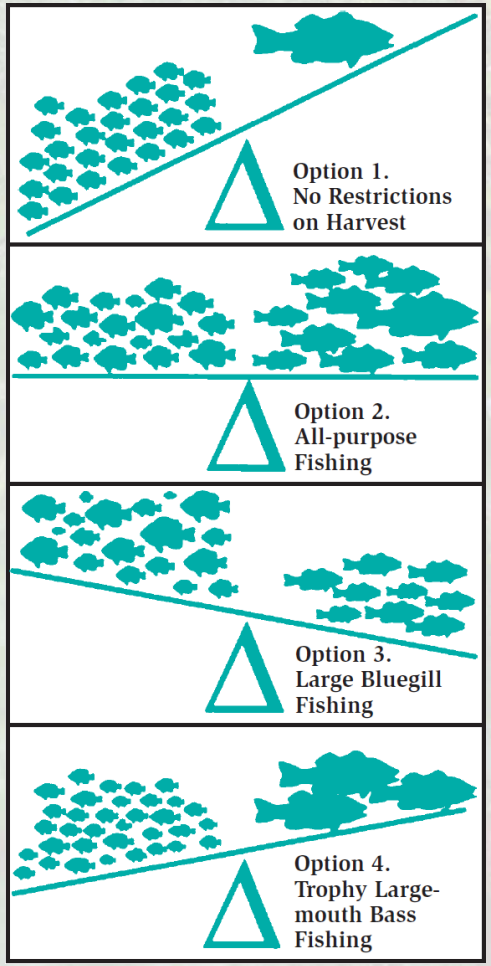
Ecological Capacity



More fish = slower growth rates and smaller fish

Fewer fish= faster growth rates and bigger fish

Fisheries Management Strategies

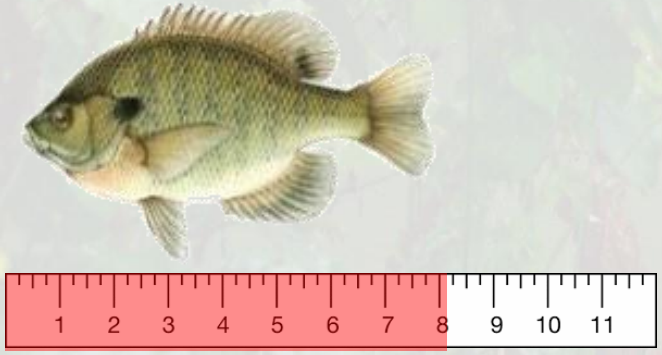


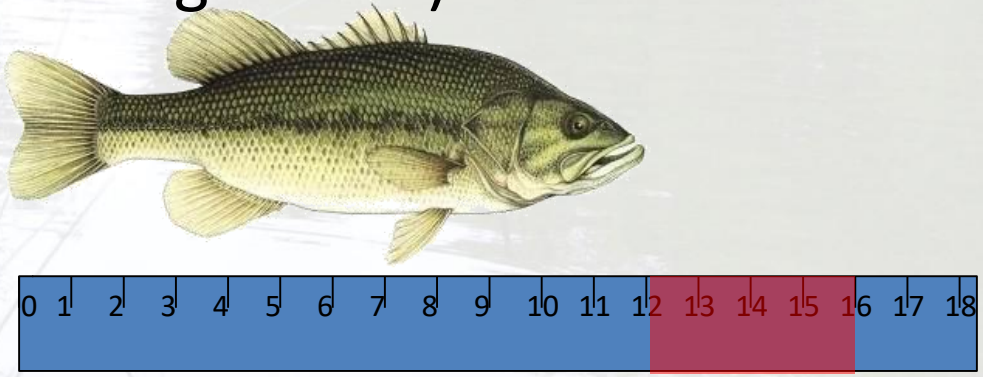
(Austin et al. 1996)

- Management strategy is yours to determine:
  1. "**Do nothing**" option rarely yields good fishing.
  2. **All-purpose/Balanced** is surprisingly difficult to maintain.
  3. **Big-Bluegill strategy** is a big hit with families and children.
  4. **Big-bass strategy** is really for the fishing purist. Not for small child- or family-friendly option.
- Remember, you can't have both big Bluegills and big bass in most situations.

Maintaining a Balanced Fishery in ponds with High Fishing Pressure

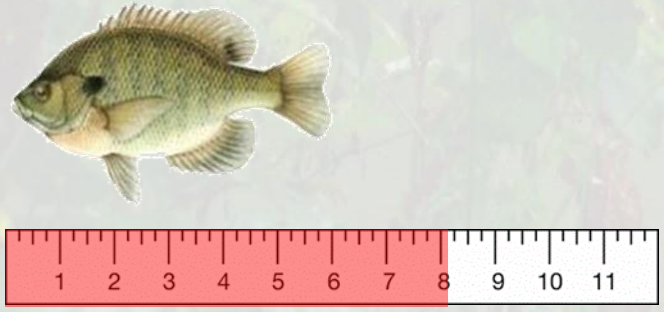
- Maintain submerged vegetation and algae at 15–20% of pond surface area. Provides balance in predator-prey interactions.
- No harvest of 12–16-inch bass! (Referred to as a slot-length limit.)
- Harvest only Bluegills larger than 8 inches (referred to as a minimum-length limit).

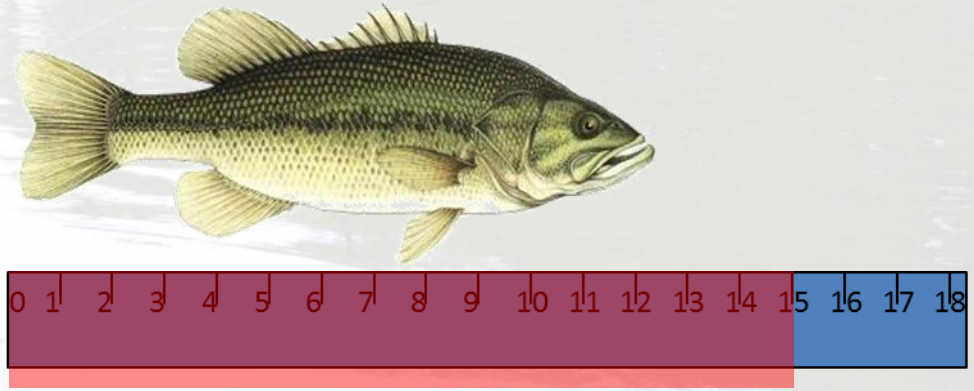




Maintaining a Big-Bluegill Fishery in Ponds

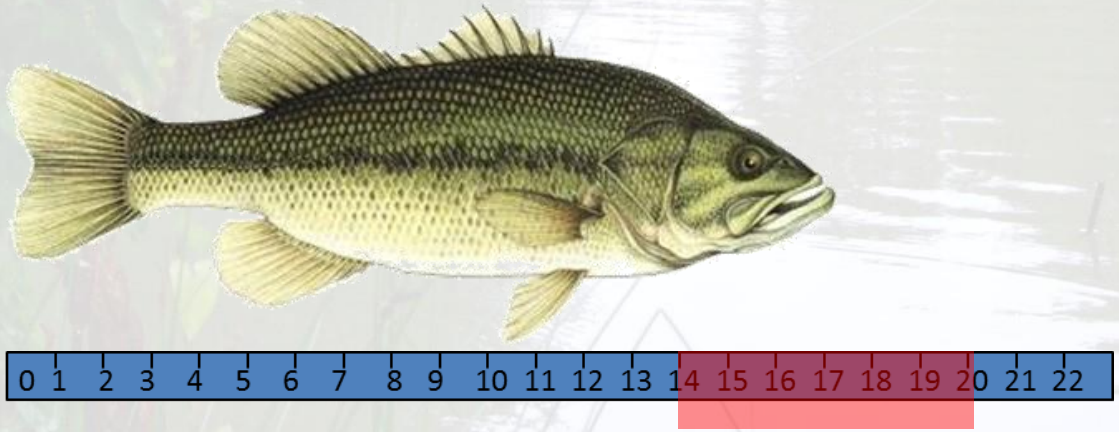
- Maintain submerged vegetation and algae at 5–10% of pond surface area. No-vegetation strategy is acceptable.
- Do not harvest Bass less than 15 inches
- Do not harvest Bluegill less than 8 inches
- If Bluegill harvest appears too high, consider setting a harvest limit





Growing LUNKS

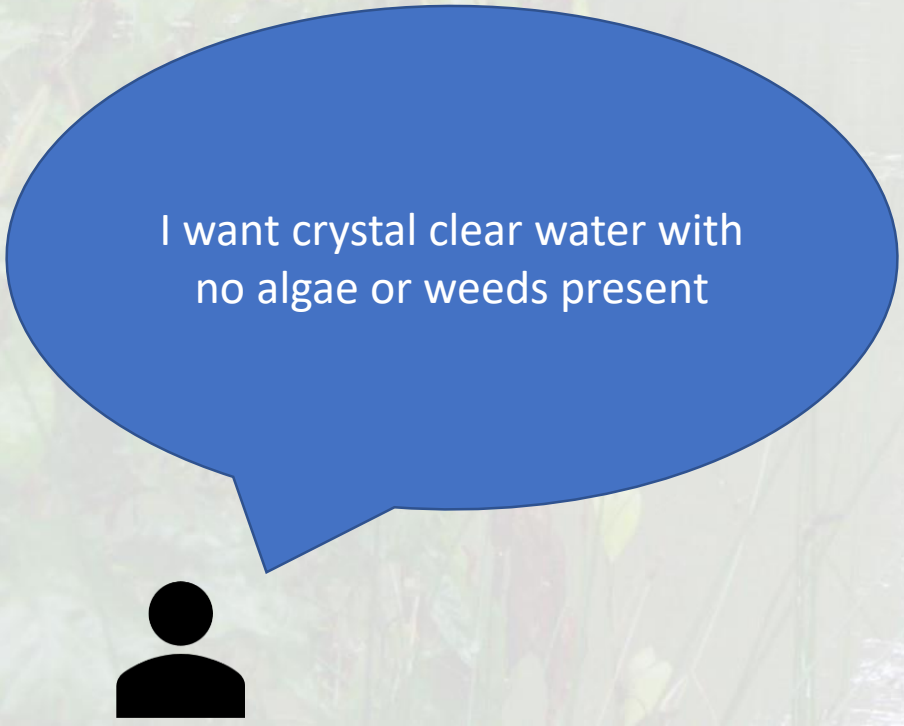
- Maintain submerged vegetation and algae at 5–10% of pond surface area. No-vegetation strategy is acceptable
- Can allow trophy bass to be kept if caught (no more than 3–5/acre each year)
- No harvest of bass between 14–20 inches (a slot-length limit)
- No Bluegill harvest



Well.. I don't care about fishing

- Well what *ARE* the ***management goals*** that you have for the pond?

are they ***realistic and obtainable??***



Is a pond right for you?

Is this in your future?

Most issues…Vegetation Management

- **Why do I have an excess of aquatic plants?**
- Shallow water
- Clear water
- Excess fertility (nutrients) notability Phosphorus is the source

How do I fix it?!

- 1st Nutrient management

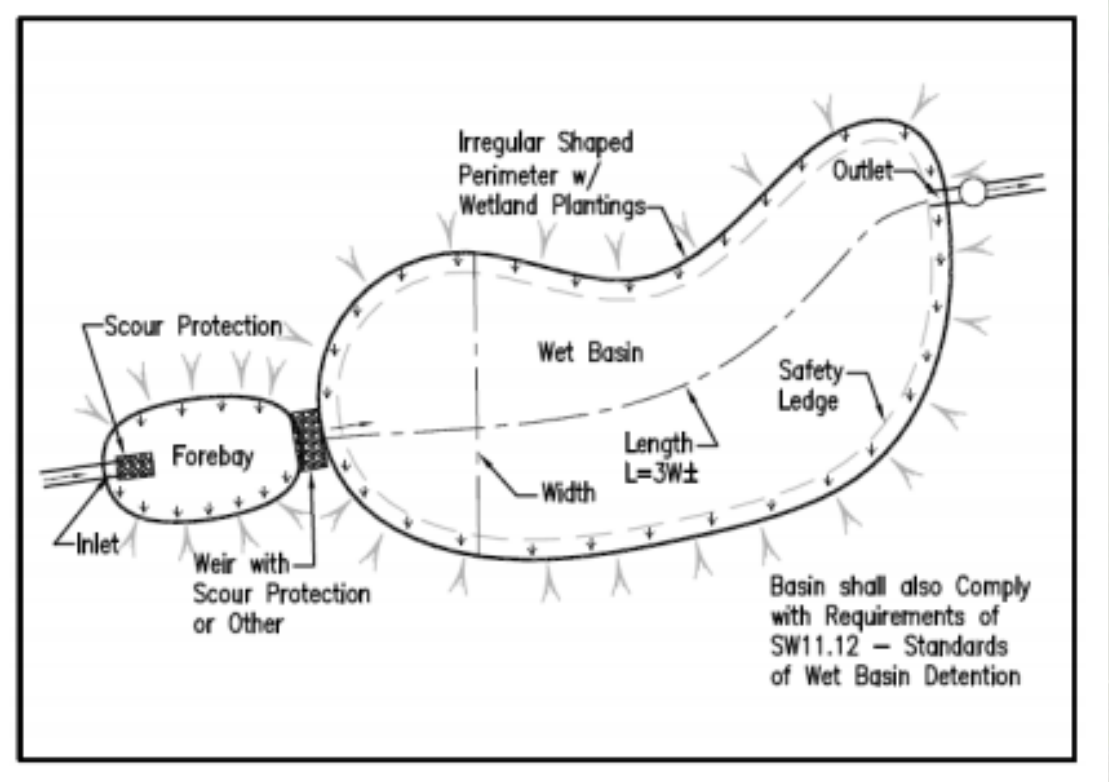
- Recognize and manage **external** sources of nutrients from within the watershed.
- Apply fertilizers conservatively, avoiding phosphorus.
- Maintain septic systems.
- Make Canada Geese unwelcome to small ponds.
- Tolerate stands of terrestrial and wetland vegetation.

Physical

- Raking
- Dredging

Physical

- Blue Dye
- Buffer
- Forebay
- Barley Straw



Physical

Drawdown		
Known to Decrease	No change or Varaible	Known to Increase
Brazillian Elodea	bladderwort	Duckweed
Coontail	cattails	Most Naiads
Fanwort	common waterweed	Most other pondweeds
Hydrilla	eelgrass	Water bulrush
Millfoils	muskgrass	
Robbins pondweed	waterchestnut	
Curly leaf pondweed	white water lily	
Southern Naiad		
Watersheild		
Yellow Waterlilly		

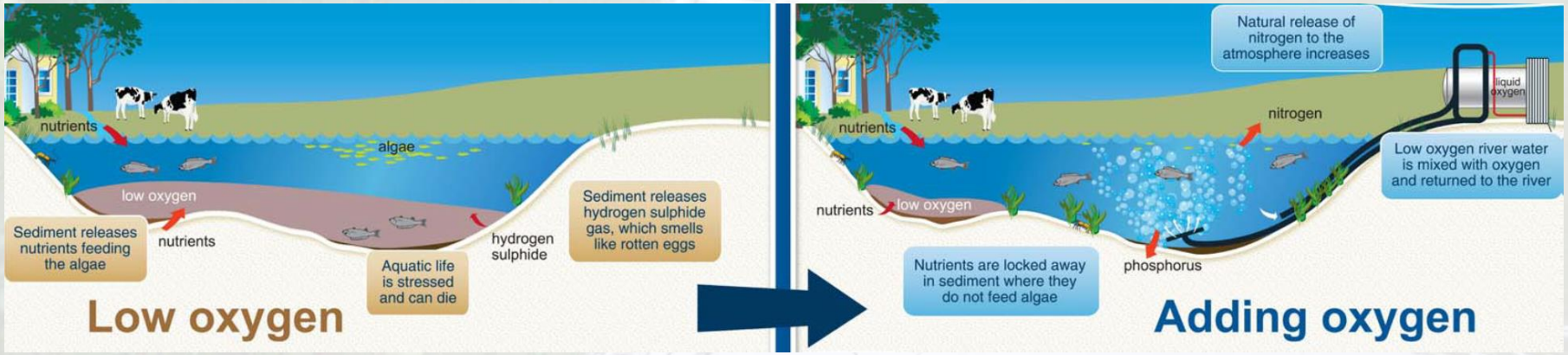
https://aquaplant.tamu.edu/plant-identification/

Biological

- Grass carp
  - Can be picky
  - Helper.. not solver
  - Not cattails, Lillys, or **Algae**

Aeration

- Minimizes the internal recycling of available phosphorus.
- Promotes beneficial bacteria that reduce the accumulation of organic muck.
- Suspends harmful-algal-bloom organisms, reducing competitive advantage.
- Reduces water stagnation(Water meal and Duckweed)



Water.wa.gov.au

How many?

- **2–3 diffusers per acre** positioned along deep water.

- Check manufacturer specs:

- Relatively common objective: **turn over pond volume twice per day**

Chemical

- Herbicides and algaecides are the cheapest most effective

OSU Fact sheet- Chemical Control of Aquatic Plants

Table 1. Aquatic herbicides labeled for control of common aquatic plants and algae in Ohio. "x" = control, "p" = partial control as indicated by manufacturers, and "–" = no control or unknown. Check product labels for additional species controlled.

Common Name	2,4-D	Copper Chelate	Copper Sulfate	Diquat Dibromide	Endothall Amine Salt	Endothall Potassium Salt	Fluridone	Glyphosate	Imazamox	Imazapyr	Sodium Carbonate Peroxyhydrate	Triclopyr
EMERGENT PLANTS												
Arrowhead	x	–	–	x	–	–	x	x	x	x	–	–
Bulrush	–	–	–	–	–	–	–	x	–	–	–	–
Cattails	–	–	–	x	–	–	p	x	x	x	–	–
Purple loosestrife	–	–	–	–	–	–	–	x	–	x	–	x
Smartweeds	x	–	–	x	–	–	x	x	x	x	–	x
Spike-rush	–	–	–	x	–	–	p	x	–	x	–	–
Willows	–	–	–	–	–	–	–	x	x	x	–	–
ALGAE												
Algae—filamentous	–	x	x	p	x	–	–	–	–	–	x	–
Algae—planktonic	–	x	x	–	x	–	–	–	–	–	x	–
Chara (muskgrass)	–	x	x	–	x	–	–	–	–	–	-	–
FLOATING-LEAVED PLANTS												
American lotus	x	–	–	–	–	x	–	x	x	–	–	x
Duckweed	–	–	–	x	–	–	x	–	–	x	–	–
Watermeal	–	–	–	–	–	–	x	–	–	–	–	–
Water-shield	p	–	–	–	–	–	x	x	x	x	–	x
White water lily	p	–	–	–	–	–	x	x	x	x	–	x
Yellow water lily	p	–	–	–	–	–	x	x	x	x	–	x
SUBMERGED PLANTS (SOME MAY HAVE FLOATING LEAVES)												
American pondweed	–	–	–	x	x	x	x	–	x	–	–	–
Bladderwort	x	–	–	x	–	–	x	–	x	–	–	–
Brittle naiad	–	–	–	x	x	x	x	–	–	–	–	–
Coontail	x	–	–	x	x	x	x	–	–	–	–	–
Curly-leaf pondweed	–	–	–	x	x	x	x	–	x	–	–	–
Eelgrass	–	–	–	x	x	–	–	–	–	–	–	–
Elodea, waterweed	–	–	–	x	–	–	x	–	–	–	–	–
Eurasian watermilfoil	x	–	–	x	x	x	x	–	x	–	–	x
Floating pondweed	–	–	–	x	x	x	x	–	x	–	–	–
Horned pondweed	–	–	–	–	x	–	–	–	–	–	–	–
Large-leaved pondweed	–	–	–	x	x	x	x	–	x	–	–	–
Leafy pondweed	–	–	–	x	x	x	x	–	x	–	–	–
Sago pondweed	–	–	–	x	x	x	x	–	x	–	–	–
Small pondweed	–	–	–	x	x	x	x	–	x	–	–	–
Southern naiad	–	x	–	x	x	x	x	–	–	–	–	–
Watermilfoils	x	–	–	x	x	x	x	–	x	–	–	x

Tread lightly…

- Estimate volume (surface area x average depth = volume in acre-feet)
- Follow label
- Treat in early spring when water is 60s
- Careful with treatments in summer

Avoiding Fish Kills

- Almost all fish kills are due to low-oxygen events, especially late in summer or overwinter.

- Low oxygen can be caused or enhanced by warm water temperatures, decomposition, or a sudden decrease in photosynthetic activity.

Pond Management Resources

- Austin, M. et al. 1996. Ohio pond management handbook: a guide to managing ponds for fishing and attracting wildlife. Ohio Department of Natural Resources, Division of Wildlife, Columbus, OH.

- Can be downloaded from:

http://wildlife.ohiodnr.gov/species-and-habitats/pond-management

Chemical control of Aquatic Plants

https://www.athensswcd.org/uploads/3/0/1/0/30105193/chemical_control_of_aquatic_plants.pdf

- Many older pond-management fact sheets available via correspondence (revisions pending):

➢ Eugene Braig

★ braig.1@osu.edu

- Occasional newsletter articles:

http://senr.osu.edu/YourPondUpdate