

An Intro to Managing Pond Fisheries:

Ohio Pond Clinics 2017



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Eugene Braig,
Program Director,
Aquatic Ecosystems

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AND ENVIRONMENTAL SCIENCES

OSU Extension, School
of Environment and
Natural Resources

Some Pond Management References

- 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>
- Many older pond-management fact sheets available via correspondence (revisions pending):
 - braig.1@osu.edu
- Occasional newsletter articles:
 - <http://senr.osu.edu/YourPondUpdate>



Intro to Pond Fisheries

The Outline:

- Intro
- Species Selection and Stocking
- Fish Management Strategies
- Avoiding Fish Kills



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A Gross Generalization

The nature of smallness: limited space and lack of habitat diversity.
A pond cannot function like Lake Erie in supporting a fishery!

- Less than $\frac{1}{2}$ acre is likely to require active management, possibly supplemental feeding.
- Keep fisheries extremely simple! ...Usually a single level of predator–prey interaction.
- Largemouth Bass–Bluegill (supplementing with Channel Catfish if desired) is our region's tried and true.



A Delaware Co., OH pond (Steve Collignon 2014)



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Remember, Submerged Plants = Free Cover



(Donald Cameron 2015)

Tolerate the appropriate coverage of diverse, native submerged vegetation.

- It's your pond; what constitutes the "appropriate" coverage is yours to determine.
- Ordinarily **5–20% in ponds with fisheries considerations** (much higher possible for ponds without fisheries).



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Success Starts With The Right Species

Largemouth Bass



- Best predator for pond & small-lake environments.
- Evolved to reproduce and prey effectively in warm, vegetated habitats.
- To 7 lbs in ponds, 1–2 lbs common.
- Can easily be overharvested!

Bluegill



- Primary food source for bass.
- Also evolved to reproduce and prey effectively in warm, vegetated habitats.
- To 10 inches in ponds, 6–8 inches common.
- Can easily become stunted, i.e., small!



Success Starts With The Right Species

Redear Sunfish



- Secondary food source for bass if stocked.
- Also evolved to reproduce and prey effectively in warm, vegetated habitats.
- To 12 inches in ponds, 8–10 inches common.
- Produce fewer young than Bluegills, so not as prone to stunting.
- Voracious eaters of pond snails!

Channel Catfish



- Does well , but does not reproduce in ponds unless habitat provided (i.e., cavities present).
- Not likely to recruit in small ponds with bass population.
- Prefers warm water.
- To 10 lbs in ponds, 1–3 lbs common.
- Can easily be overharvested!
- Omnivore (meaning anything is fair game as prey).



How Many to Stock?

A. New or Renovated Ponds

Stocking strategy	Number to stock per acre			
	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.

Could stock larger if budget permits



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How Many to Stock?

B. Supplemental Stocking

Stocking strategy	Number to stock per acre			
	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.

Could stock larger if budget permits



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Specialty Stocking

Rainbow Trout



- Will survive in ponds during late fall through early spring.
- Cannot tolerate sustained water temperatures exceeding 64° F.
- Strictly a winter put-and-take fishery. What is not caught can likely be counted as dead by May 1 in most OH ponds!
- Stock 50 adults per acre of approx. 10–14-inch.

Yellow Perch



- Rarely reproduces in ponds with an existing bass–Bluegill population.
- Ohio strain survives and grows in warm, vegetated habitats.
- Stock 50–75 adults per acre of approx. 8–10-inch.

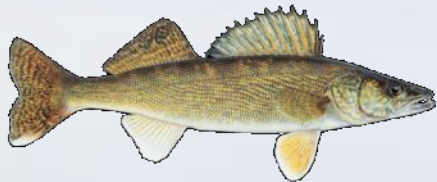
...And a handful of others.
Ask with specifics.



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Think Twice about these Species



Walleye



Northern Pike



Smallmouth Bass



White Crappie

- Degrades habitat by bottom-rooting activities, muddying water.
- Novelty catch is all that can be hoped for.
- Eats eggs of Bluegills and Largemouth Bass.
- Quickly overpopulates and stunts!
- Out-competes Bluegills and redear sunfish.



Common Carp



bullheads



Green Sunfish



When to Stock Fish

- Best accomplished in spring or fall when water temperatures below 65°F.
- Lower temperature is better.
- If pond temperature differs by more than 5°F from transport temperature, fish must be slowly acclimated to pond temperature.
- Optimum method: transport in a bag with oxygen and let bag float for at least an hour to equalize temperatures.



When to Stock Fish?

- Spring: appropriate but rising temperatures.
 - Carries with it seasonal increase in potential fish diseases/pathogens.
- Autumn: appropriate and falling temperatures.
 - More game-species fingerlings available from commercial hatcheries.
 - Seasonal decline in fish pathogens.
- Ideal: Stock new pond with Fathead Minnows and spawning habitat in spring. Follow with game species in fall.



Purchasing Considerations

- Buyer beware! Impossible to return fish once stocked.
- Buy from long established state licensed commercial hatcheries or SWCD fish sales. They know what they are doing!
- Order knowing what and how many you want to stock.
- Avoid asking the question “Which species should I stock?”



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Intro to Pond Fisheries

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- Species Selection and Stocking
- **Fish Management Strategies**
- Avoiding Fish Kills

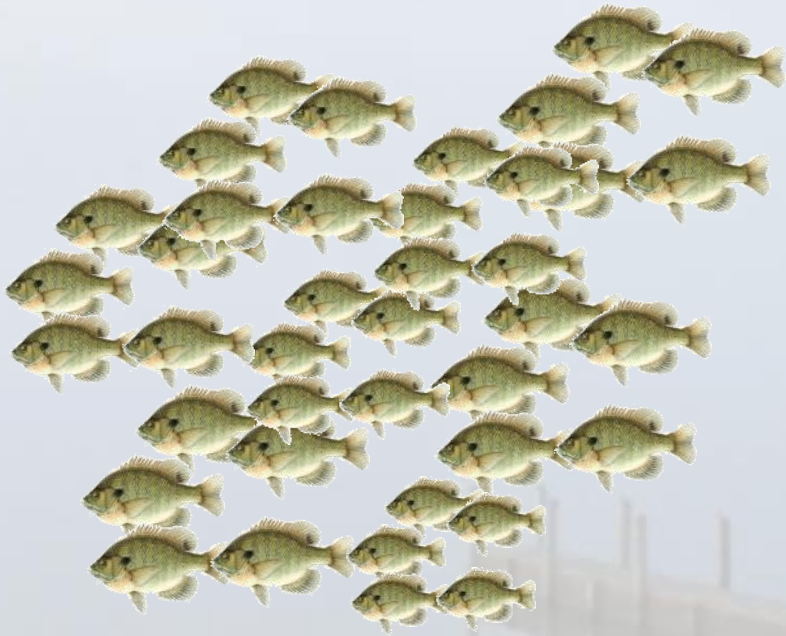


Fisheries Management Strategies

- Do you get to have both lots of fish and big fish?
- Do you get to have both trophy-sized Bluegills and trophy-sized Largemouth Bass?
- Not likely, eh?



A Key Ecological Concept!



More fish = slower growth
and smaller fish



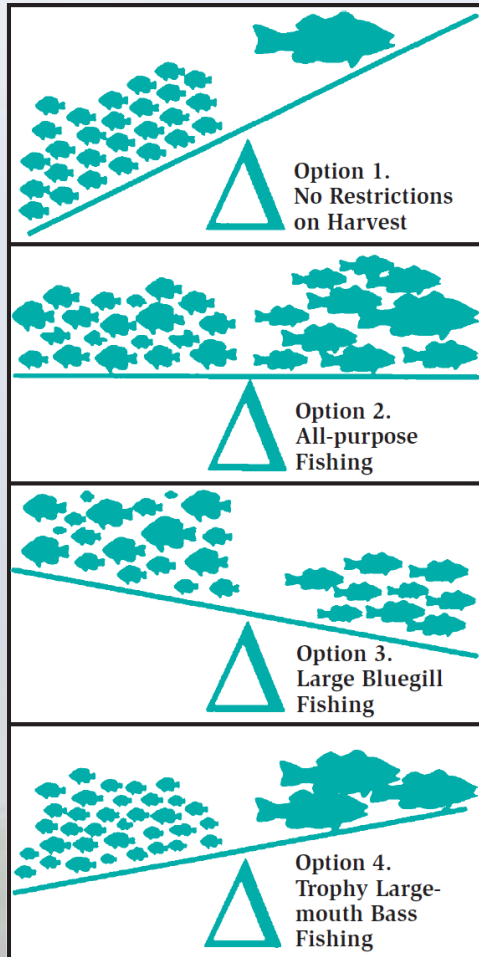
Fewer fish = faster growth
and bigger fish



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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 fleeting and relatively 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 a child- or family-friendly option.
- Remember, you can’t have both big Bluegills and big bass in most situations.
- You’re also not likely to have both large numbers and large sizes of any fish species.

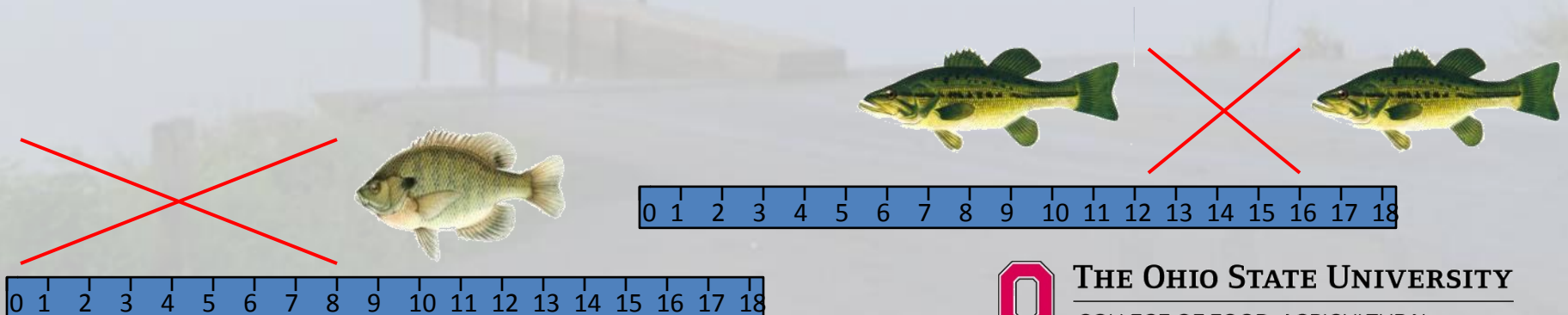


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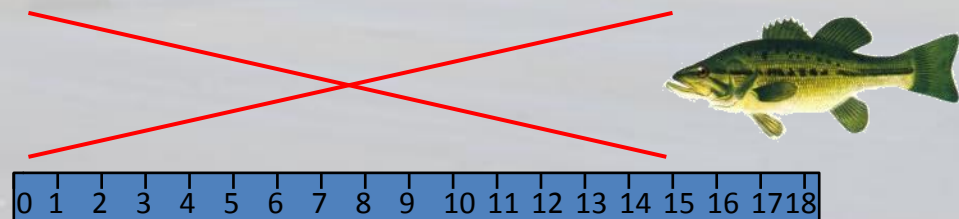
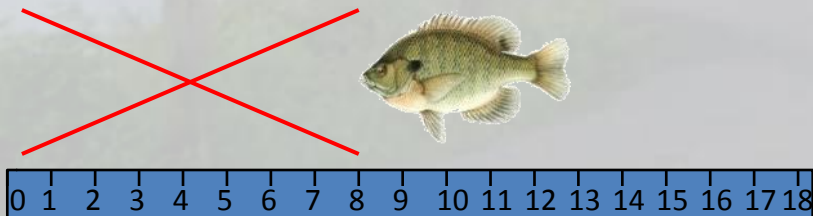
Maintaining a Balanced Fishery in Ponds with High Fishing Pressure

- 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 with High Fishing Pressure

- 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 (a minimum-length limit).
- Harvest only Bluegills larger than 8 inches (a minimum-length limit).
- If Bluegill harvest appears too high, consider setting a creel limit (i.e., the number of fish an angler is permitted to harvest per day).

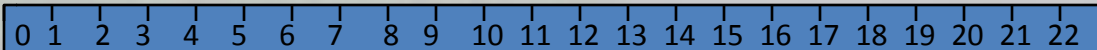


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Growing Big Largemouth Bass

- 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.



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- **Avoiding Fish Kills**



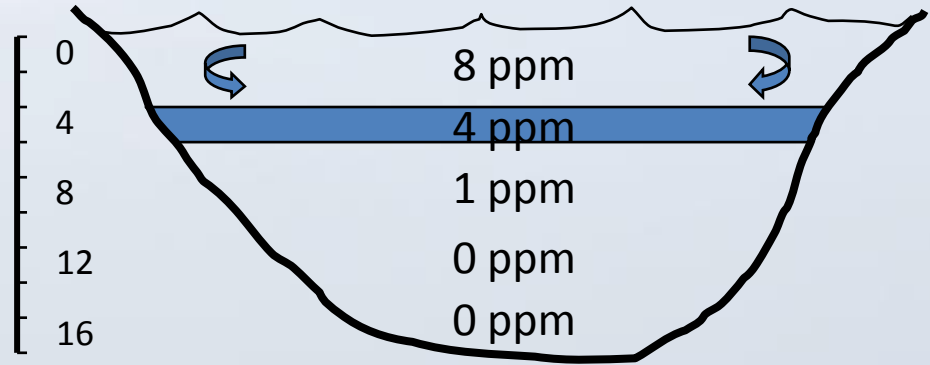
Avoiding Fish Kills

- 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.
- In Ohio, winter kills are relatively rare (2014 and '15 are recent exceptions), but summer kills are common.



Summer-kill: Premature Turnover

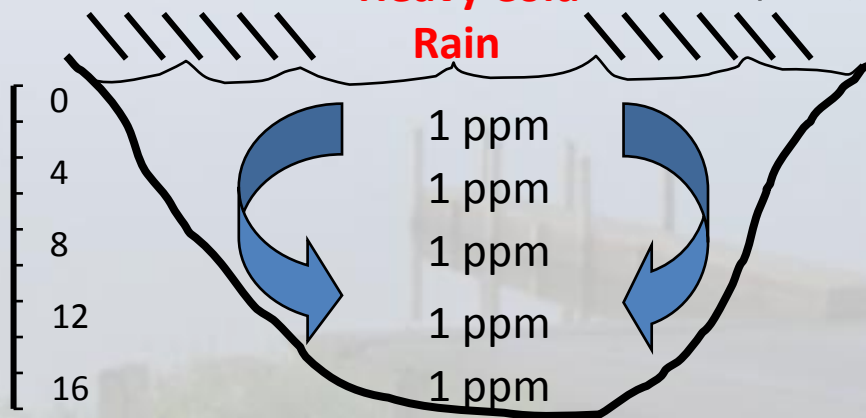
Distinct Summer Stratification



Heavy Cold Rain

Depth (ft)

Note: larger, shallow, or windswept ponds may never stratify.



Depth (ft) Note: A bad premature turnover can cause a serious fish kill beginning only hours after a rain event.



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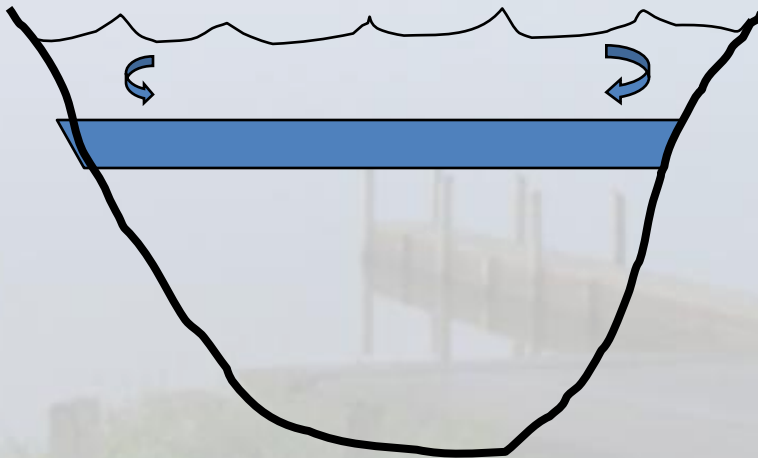
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Critical Causative Factor

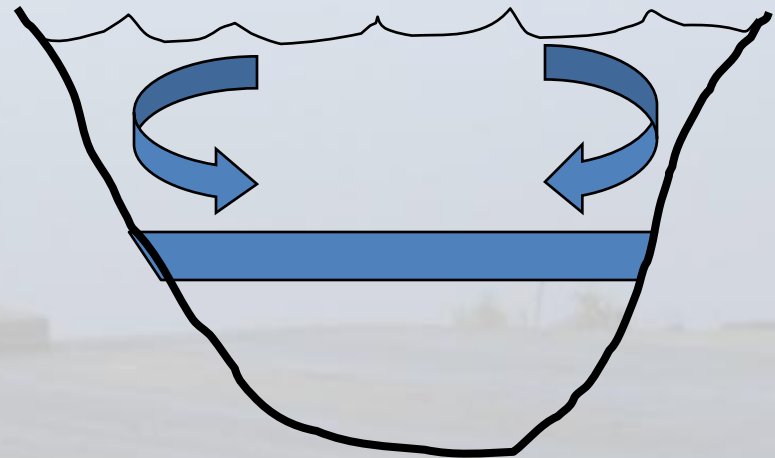
Volume of Oxygenated Upper Layer

$$\frac{\text{Volume of Oxygenated Upper Layer}}{\text{Volume of Un-oxygenated Lower Layer}} < 0.33$$

Volume of Un-oxygenated Lower Layer



Bad!



Good!



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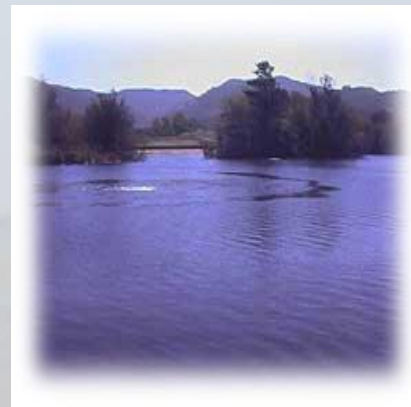
Summer Kill

Enhancing factors:

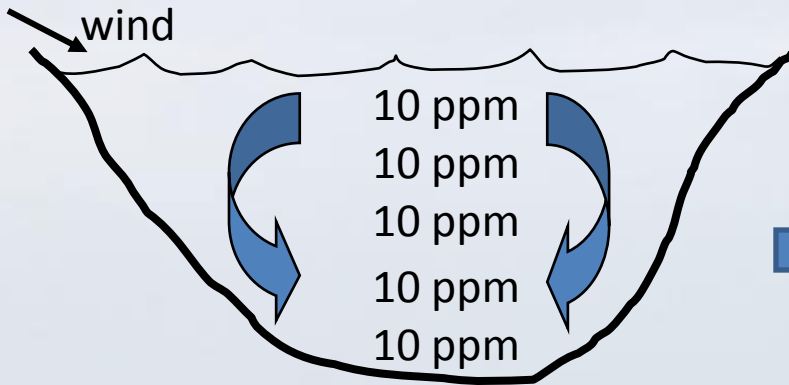
- Susceptibility:
 - Small, relatively deep ponds.
 - Protected ponds.
 - Old ponds with accumulated muck and high oxygen demand.
- Causes:
 - Heavy, cold late-summer rain.
 - Turning on aeration for the first time after pond is stratified.

Avoiding summer kill:

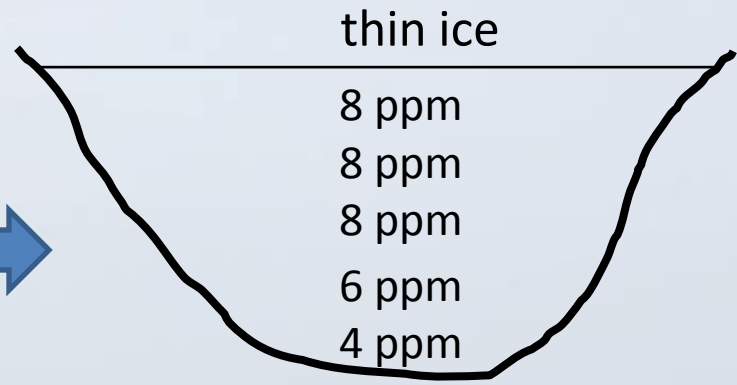
- Aerate! ...and, if using diffusers, before the onset of stratification.
- Manage vegetation as early in the season and as conservatively as possible.



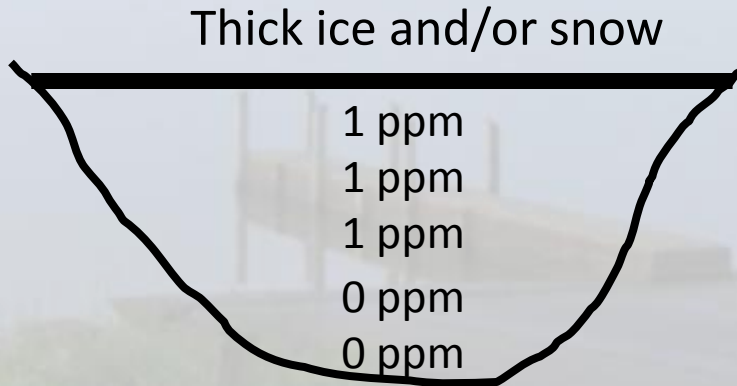
Winter-kill Scenario



No ice = no winter kill



As long as ice is thin or not covered by snow, winter-kill risk is negligible.



Often a **near-total** kill. Not pretty at ice out!



Winter Kill

Enhancing factors:

- Severe, long winter.
- Heavy, wet snows.
- Thick, opaque ice.
- Shallow ponds.
- Protected ponds.
- Old ponds with accumulated muck and high oxygen demand.
- Eradicating excessive vegetation the previous summer.

Avoiding winter kill:

- Shovel snow from at least 25% of pond. Be careful!
- Repurpose aeration: aerate periodically or from shallower water during ice cover to create open water.
- Pick one: ice on aerated ponds is never safe!



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If a Fish Kill Occurs:



- Figure out why it occurred if possible.
- Take corrective steps to avoid repeat kills in future.
- Let pond “rest” for at least a month.
- Restock fish when water is cool (i.e., spring or fall).



Questions?



An Intro to Pond Fisheries

Eugene Braig,
Program Director,
Aquatic Ecosystems
614-292-3823
braig.1@osu.edu

Pond Clinics,
a smattering around
the state of Ohio,
Spring–Summer 2017



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