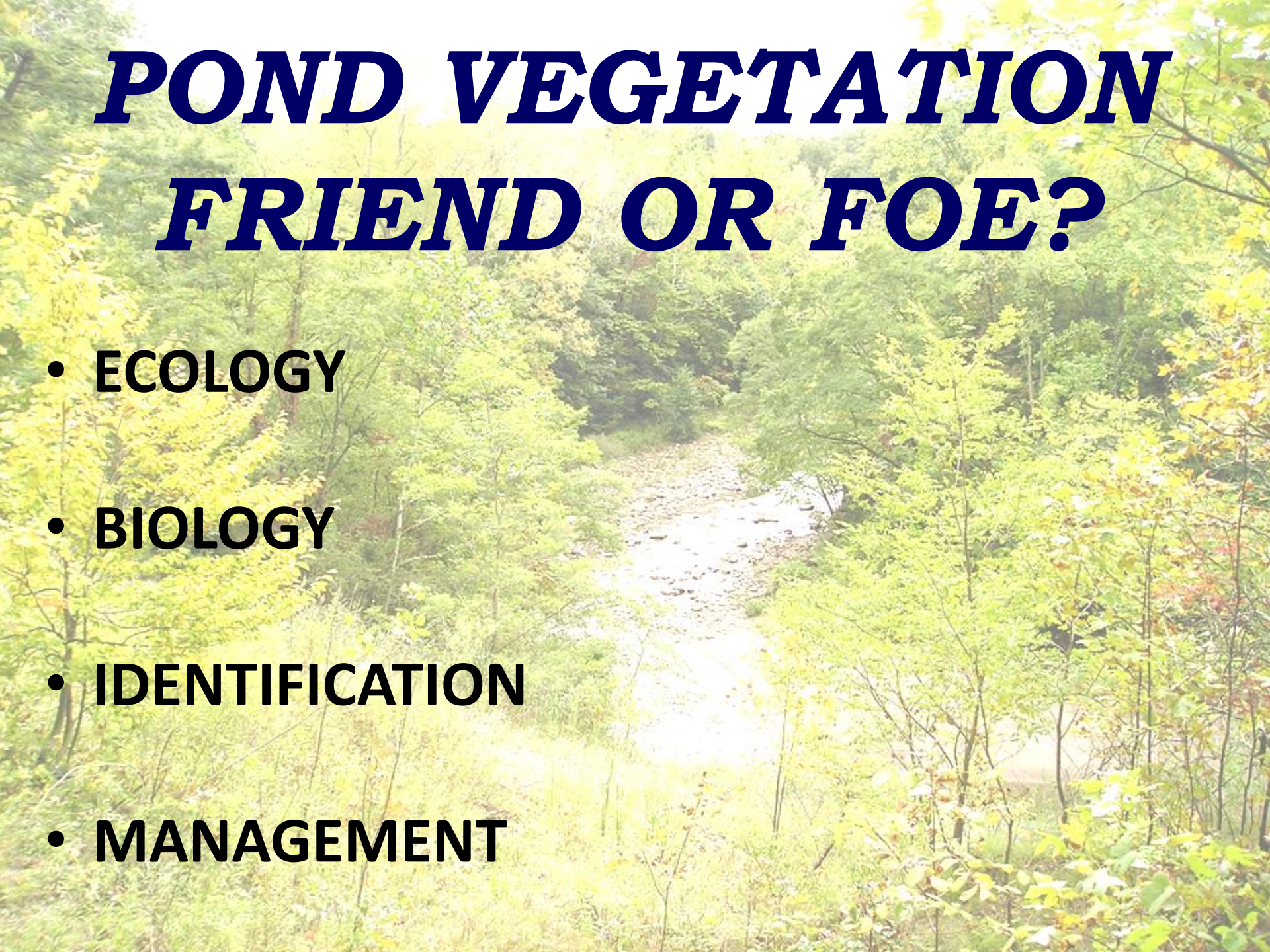


POND VEGETATION FRIEND OR FOE?

- **ECOLOGY**
- **BIOLOGY**
- **IDENTIFICATION**
- **MANAGEMENT**





WHAT BENEFITS OR FUNCTIONS TO BE DERIVED FROM POND?

FISHING AND RECREATION

LANDSCAPE FEATURE

WILDLIFE HABITAT

IRRIGATION OR LIVESTOCK



HOW MUCH TIME,

ENERGY, MONEY

WILLING TO INVEST?

POND SUCCESSION

Ponds are shallow holes filled with water; nature will fill them with soil, debris, and plant biomass

Stage 1- animals, plants, and seeds arrive

Stage 2- pond becomes shallow due animal and plant accumulation

Stage 3- emergent plants occupy shoreline grow, reproduce, decay...

Stage 4- emergents create marsh

Trees convert marsh into swamp



SUCCESSING?

AESTHETIC?

FUNCTIONAL?



Aquatic Vegetation

WHERE AND HOW DOES IT GROW?

Floating



Emergent



Submerged



POND VEGETATION ROLES +/-

Floating

Planktonic algae is the foundation of food chain and affects insect, frog, and fish populations

Emergents provide shoreline habitat and nesting sites

Submerged plants provide aquatic habitat and refuge

15-20% pond surface area 24-30 inches of water clarity

sunlight = photosynthesis

Floating

Planktonic Algae

Filamentous Algae



Lotus

Duckweed

Watermeal *

Water Lily



FLOATING WEEDS



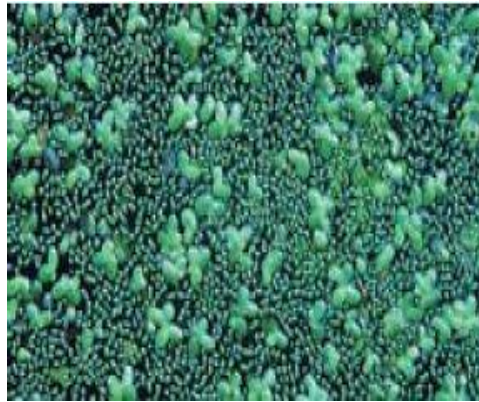
SPATTERDOCK



WATER-SHIELD



FILAMENTOUS ALGAE



DUCKWEED



WATERMEAL



Emergent – grow in shallow water or saturated soils (wetland)

Cattails

flowering rush

Irises

hard rush

Rushes

Pickerelweed

Sedges



EMERGENT



CATTAIL

BULRUSH



YELLOW FLAG
IRIS



ARROWHEAD



SPIKE-RUSH



SMARTWEED



PICKERELWEED



LOOSESTRIFE



**Submerged – live underwater,
often rooted to bottom**

Chara, Najas, Nitella algae

Pondweeds

Elodea

Coontail

Milfoils



Hydrilla



**Illinois
pondweed**



Musk-grass
Chara spp.
Photo by A. Murray
Copyright 2002 Univ. Florida

Chara



Bladderwort



Najad



Coontail
Ceratophyllum demersum
Photo by V. Ramey
Copyright 2002 Univ. Florida

Coontail

Milfoils

Myriophyllum spicatum
© Paul Skawinski 2010

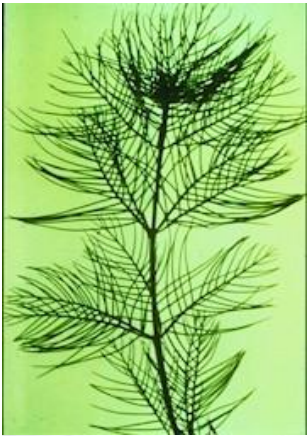


courtesy M Hassler, www.knoch1.de

Elodea



LAKE AND POND SOLUTIONS CO.



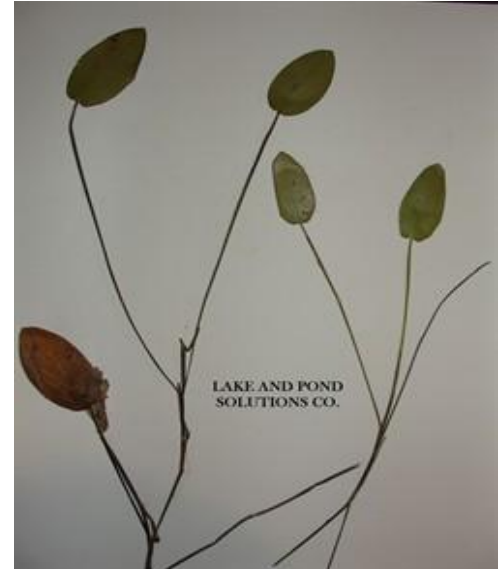
Long Leaf / American



Curly Leaf



Floating



Leafy or Small



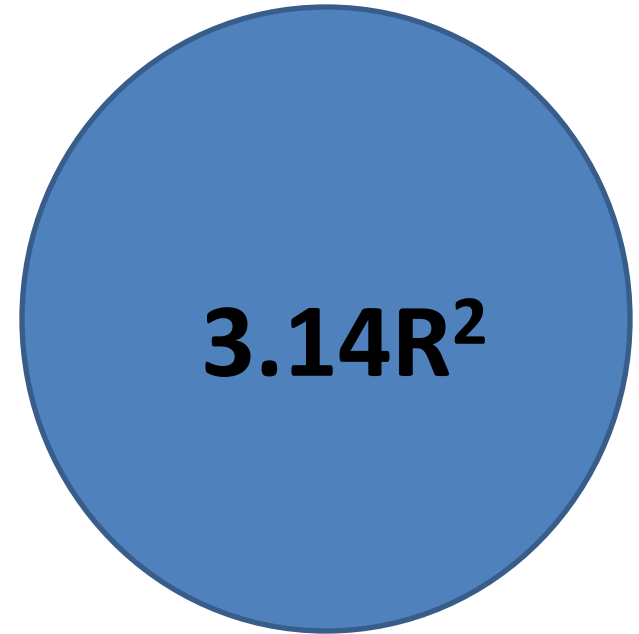
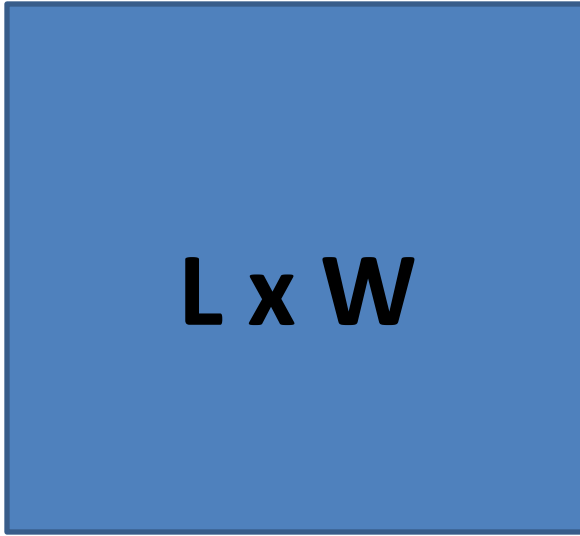
Large Leaf



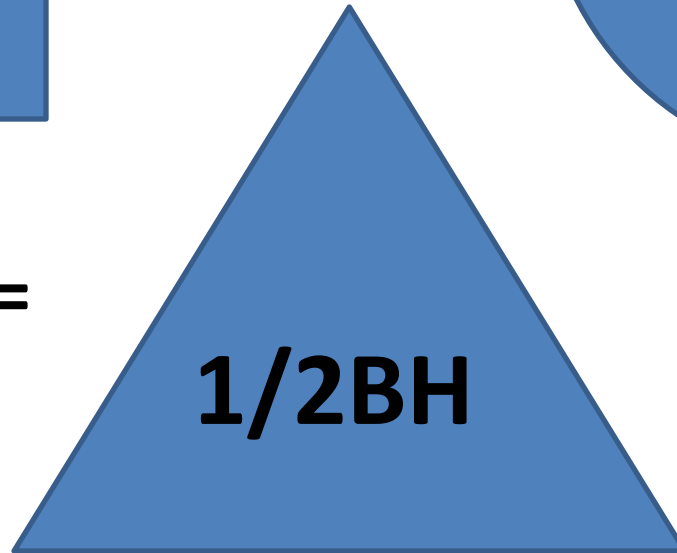
Sago



REMEMBER YOUR GEOMETRY?



**POND VOLUME =
SURFACE AREA
x AVG DEPTH**





Circumference (C)

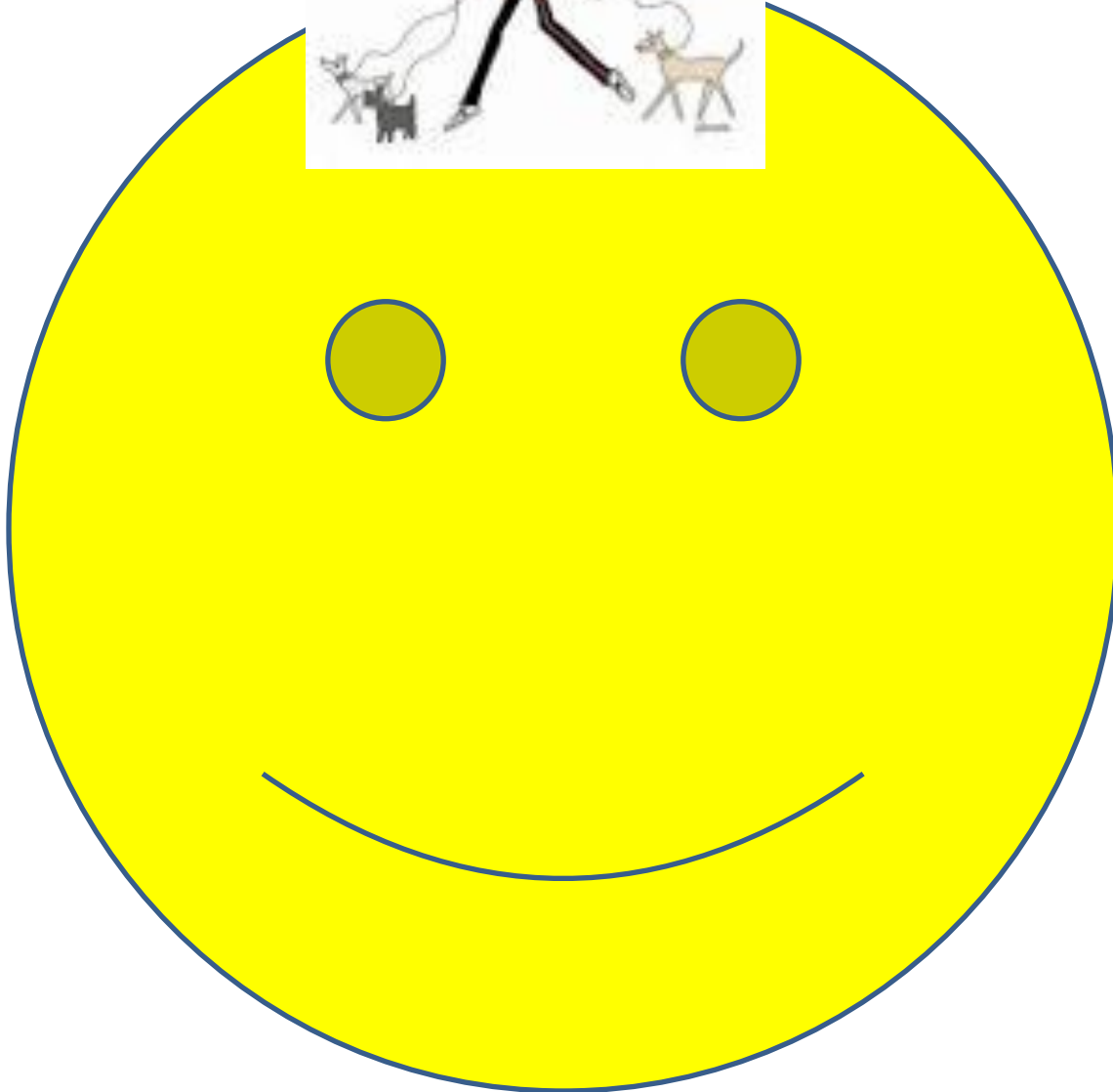
$$\underline{C \times C}$$

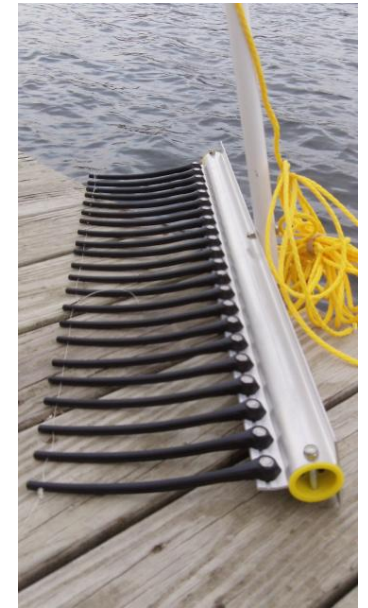
547,390

370' ~ 0.25 A

520' ~ 0.5 A

738' ~ 1.0 A







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Algae Control with Barley Straw

Filamentous algae only. Does not control existing vegetation but suppresses new cell development. Apply in early spring. Biomass accumulation?

Barley straw leaches chemical inhibitors into water. Research originated in England, but is unconfirmed in U.S.



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Cattail Management Water Level Control

1. Summer – mechanical removal
Winter – exposure lethal freezing temperatures
2. Drowning – cutting 2” below water surface
3. Repetitive cutting



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POND DYES

Blue color reduces light penetration ↓ photosynthesis
Apply early in spring before plants start to grow

Control of submerged vegetation, not floating or emergent

Pour directly into pond and record color 48 hours later.
Monitor and re-apply as needed

Suitable for irrigation, livestock, fishing, and swimming

Best in ponds with small watersheds or low exchange rates

POND AERATION

***Introduces oxygen
into the water***



WINTER prevents snow and ice, but
creates dangerous thin ice conditions!

SUMMER adds oxygen to warm water

***Bottom aerators prevent pond stratification and
decompose bottom sediments***

The White Amur grass carp (*Ctenopharyngodon idella*) is member of minnow family.



More importantly, they may be steamed, pan-fried, broiled, or baked!





FactSheet

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White Amur Vegetation Preferences

HIGH

Naiad S

Elodea S

Pondweeds S

Curly, Sago, and Leafy

Muskgrass (Chara) A

Bladderwort S

Stoneworts (Nitella) A

Watercress S

MODERATE

coontail S

Large pondweed S

Long pondweed S

milfoils S

duckweed F

WEAK

lotus F

arrowhead E

lily F

filamentous algae

rushes E

smartweeds E

watermeal F



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<u>Recommended</u>	Stocking No. / Acre
Largemouth Bass	100
Bluegill*	500
Redear sunfish* (snails)	500
Channel catfish	100
Fathead minnow	1000
White Amur	5
250 Bluegill + 250 sunfish	

WHITE AMUR WARNING

Submerged aquatic plants provide critical nursery areas for fry and small fish...

grass carp can eliminate or reduce that amount of suitable nursery habitat...

... and therefore may affect fish reproduction and population dynamics



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Aquatic Herbicide Chart

32 species of emergent, algae, floating, and submerged
12 herbicides

Restrictions / Exclusion Chart (waiting periods)

Human drinking, swimming, fish consumption

Animal drinking

Irrigation of turf, forage, and food crops

License purchase or apply / Storage unused product

	2,4-D	Cu chelate	Cu sulfate	Diquat	Endothall	Fluridone	glyphosate	Imazamox	Imazapyr	Peroxyhydrate	Triclopyr
EMERGENT											
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		
ALGAE											
filamentous		X	X	P	amine 191					X	
planktonic		X	X		amine 191					X	
Chara (muskgrass)		X	X		amine 191						
FLOATING											
lotus	X			X	K salt		X	X			X
duckweed						X			X		
watermeal						X					
water-shield	P					X	X	X	X		X
lily	P					X	X	X	X		X
SUBMERGED											
bladderwort	X			X			X	X			
naiad				X	X	X	X				
coontail	X			X	X	X	X				
eelgrass				X	X						
Elodea				X			X				
E watermilfoil	X			X	X	X	X	X			X
pondweed				X	X	X	X	X			
american				X	X	X	X	X			
curly				X	X	X	X	X			
floating				X	X	X	X	X			
large				X	X	X	X	X			
leafy				X	X	X	X	X			
Sago				X	X	X	X	X			
small				X	X	X	X	X			
Trade Names	Navigate AquaKleen Aquacide	Cutrine + Ultra Clearigate		Reward Weedtrine-D	Hydro 191 Aquatrol K Super K	Sonar Avast!	Rodeo Accord AquaPro	Clearcast	Habitat	GreenClean Phycomycin	Renovate Garlon 3A

Use restrictions; waiting periods in days

CHEMICAL	HUMAN			ANIMAL	IRRIGATION		
	Drinking	Swimming	Fish Ingestion	Drinking	Turf	Forage	Food Crop
2,4-D	prohibited	1	0	prohibited	prohibited	prohibited	prohibited
copper chelate	0	0	0	0	0	0	0
copper sulfate	0 note 2	0 note 2	0	0 note 2	0	0	0
Diquat	1-5	0	0	1	1-5	5	5
Endothall amine	7-25	1	0	7-25	7-25	7-25	7-25
Endothall K salt	7-25	1	0	7-25	7-25	7-25	7-25
Fluridone	note 6	0	0	0	30	30	30
Glyphosate	note 7	0	0	0	0	0	0
Imazamox	note 6	0	0	0	note 8	note 8	note 8
Imazapyr	note 7	0	0	0	120	120	120
Peroxyhydrate	0	0	0	0	0	0	0
Triclopyr	note 9	0	0	0 note 10	120	120	120

Note 2

no waiting period; residual metallic odor

Note 6

pond with discharge; do not apply < 0.25 mile of potable intake

Note 7

pond with discharge; do not apply < 0.5 mile upstream of potable intake

Note 8

< 50 ppb to be suitable for irrigation; not suitable for greenhouse or nurseries

Note 9

label requires setbacks

Note 10

restrictions for lactating animals consuming treated forage

Ohio EPA Notification

Exemption

- Pond is less than 5 surface acres, and
- Pond is more than one mile upstream of the intake of a public water supply, and
- Water body is not a wetland, borrow pit, or quarry used for public swimming



A green thumb is good
A green brain is better

GreenClean

GreenClean algaecide is advertised as a copper free product

The label contains the signal word **Danger** (Caution, Warning, Danger) along with several safety, first aid, and environmental precautions. The active ingredients, sodium carbonate and hydrogen peroxide, are **strong oxidizing compounds**.

READ THE LABEL MAKE AN INFORMED DECISION



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Landowners
Ohio's New

Ponds and

Farm Pond Safety

...E? YES!

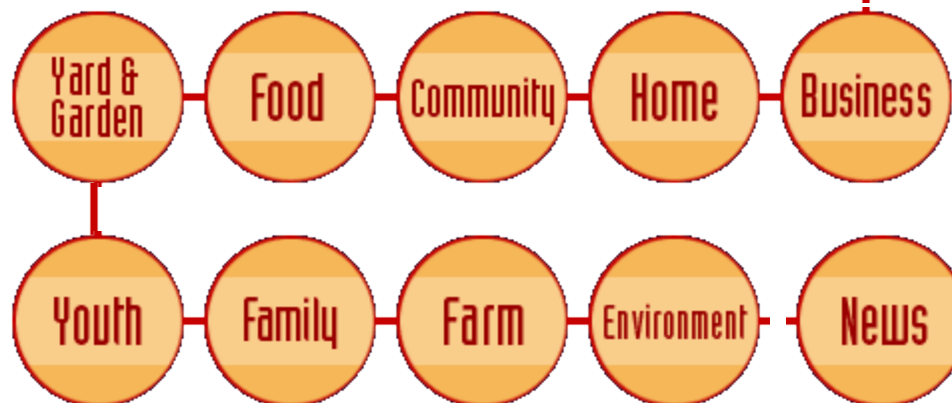
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Ohioline

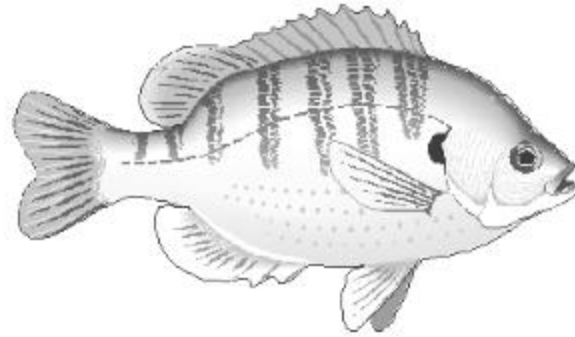


your **L**ink to **I**nformation, **N**ews, and **E**ducation

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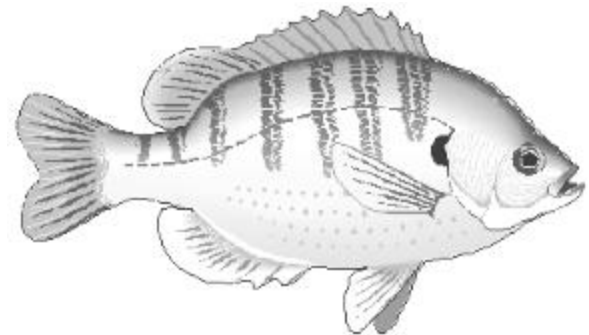
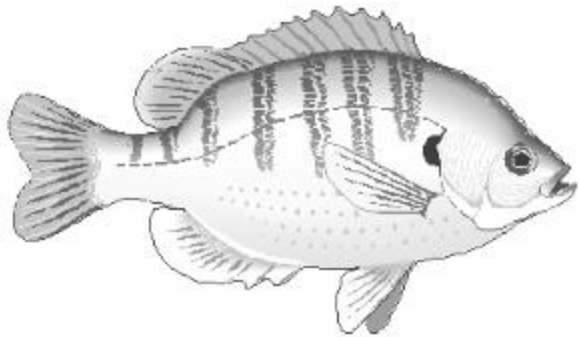
Bulletin 374 *Ohio Pond Management*

<http://ohioline.osu.edu>



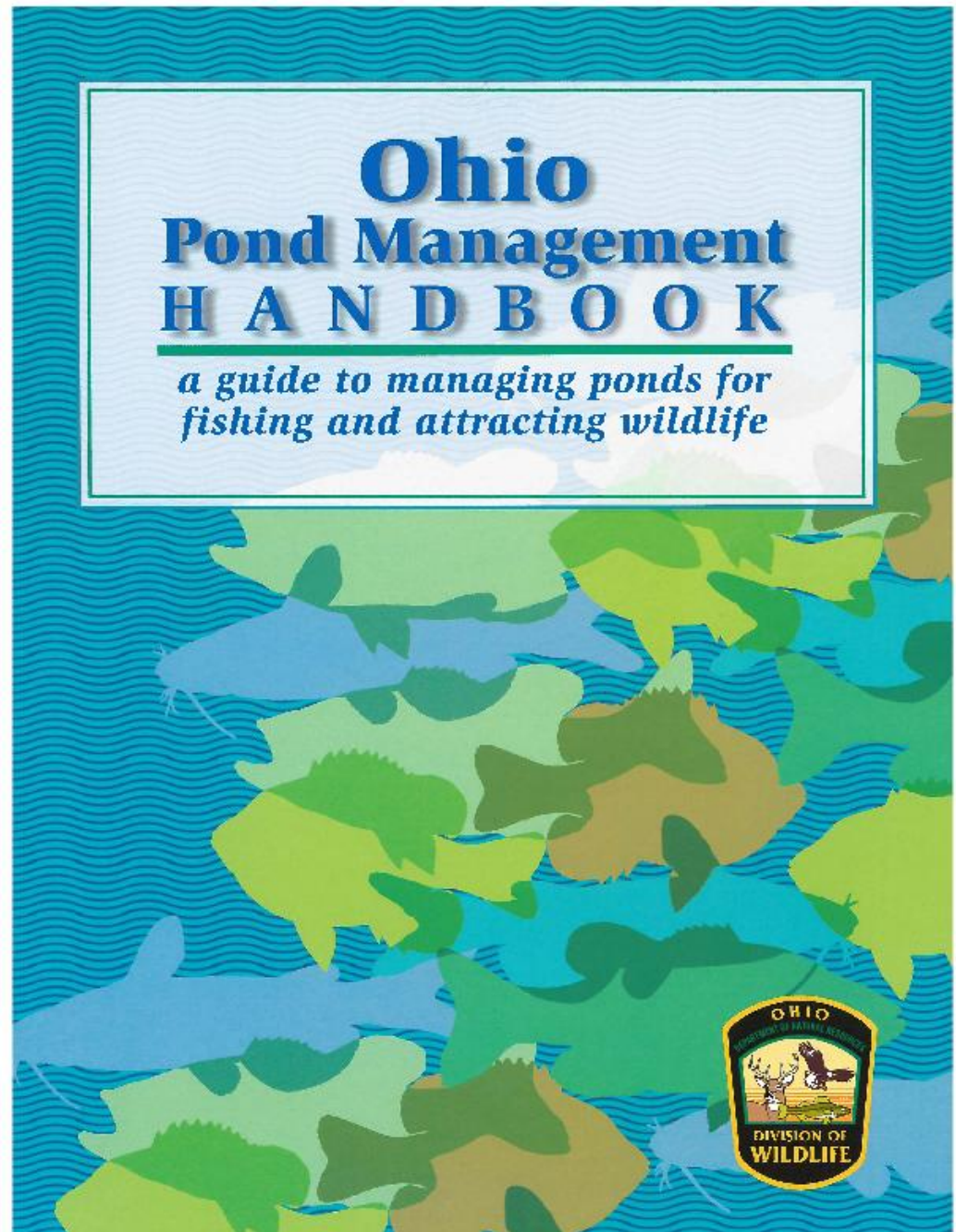
Ohio Pond News

newsletter / archives



**ODNR
OHIO
DEPARTMENT
NATURAL
RESOURCES**

***Division of
Wildlife***





**Geauga Soil and Water
Conservation District**

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