

Lucas Soil and Water Conservation District Pond Management Handbook

An Informational Guide to Managing Ponds



The Lucas SWCD:

*Promoting conservation of our soil, water,
and other natural resources through educa-
tional programs, information services, and
technical assistance.*

Please contact our office if you need further information or assistance.

130-A West Dudley Street

Maumee, OH 43537

(419) 893-1966 or 1-800-547-0272

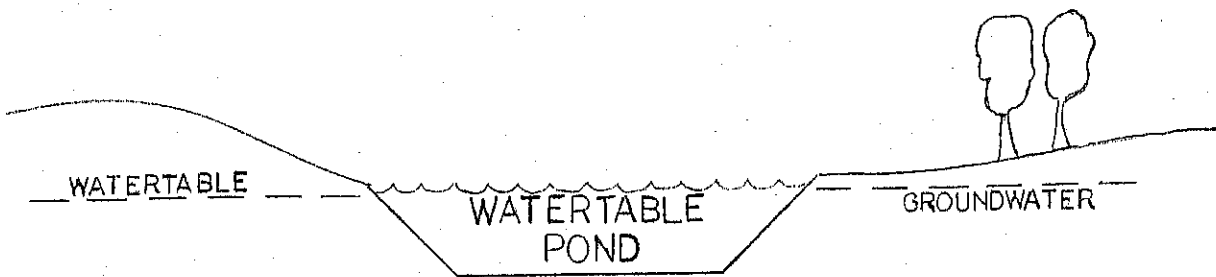
LUCAS SOIL AND WATER CONSERVATION DISTRICT

POND MANAGEMENT NOTES (Rev. 6/89)

POND DESIGN I

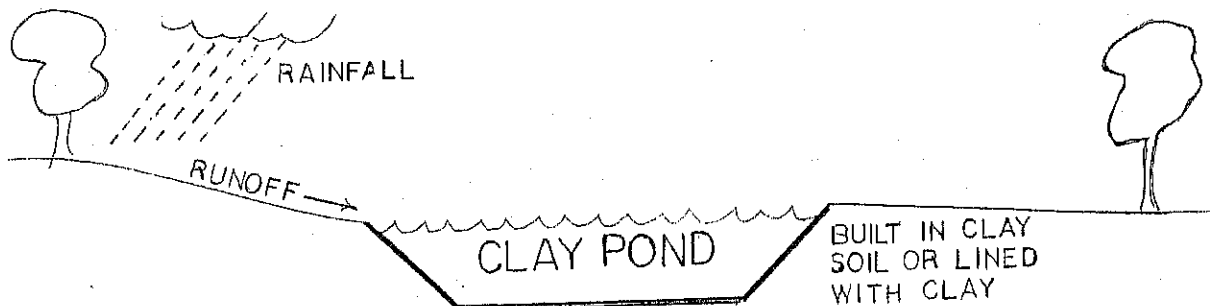
Site Selection: Proper pond construction is one of the most important parts in the development of a good fish pond. Many potential problems can be avoided through careful site selection and proper design. There are many things to consider before construction begins. The Soil Conservation Service (SCS) and the Lucas Soil and Water Conservation District (LSWCD) staff will assist you on all aspects of design. The following is a guide to help you plan your pond.

Excavated pond: The type of pond commonly constructed in Lucas County is an Excavated Pond. The water area and depth result from excavating a hole. The soil can be spread or piled and vegetated. The excavated pond may be one of two types, a watertable pond or a clay lined pond.



Common characteristics of a watertable pond:

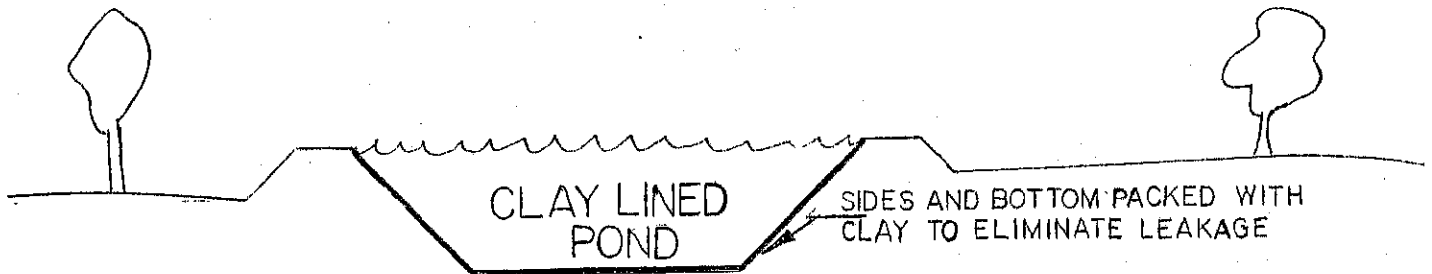
1. Initial filling is not necessary.
2. Built in soils with rapid permeability (sandy soils).
3. Seasonal water level variation (High water level in spring -low in summer).
4. Water is constantly being exchanged with ground water.



Common characteristics of a clay pond:

1. Initial filling from an outside source is necessary.
2. Usually built in soils with slow permeability and high clay content.
3. Water level is fairly constant from rainfall and evaporation.
4. No water exchange with groundwater.
5. When constructed within a watershed, an overflow system is necessary.

Embankment Pond: Water is impounded on all sides by an earthen dam or embankment. The initial filling of water is pumped in from an outside source. This type of pond may be constructed when total control of incoming and outgoing water is desired. Soil type is very important for success in construction of the embankment.



Common characteristics of embankment ponds:

1. Pond must be pumped from an outside source. (See section on water sources for ponds)
2. Improper construction of clay liner can result in leakage of pond.
3. Trees planted near the pond can damage clay liner.
4. This type of pond generally is the least expensive to construct.
5. Appearance does not blend easily with landscape.

All successful ponds need to be filled with water after construction is complete. The source of water for filling the pond should be considered long before construction begins.

Water sources for Clay Lined Ponds:

1. City Water - generally not too expensive - if available.
2. Lift station from tile - slow but generally steady source of good water.
3. Building roof water - limited quantity - helpful in maintaining level.
4. Pumping from ditch or stream. Possible drawbacks:
 - a. Streams have high nutrients levels that may accelerate weed growth.
 - b. Trash fish have to be killed before stocking. Rotenone treatment - expensive and care required.
5. Rain falling on pond - only averages 32"/yr. Evaporation almost offsets rainfall.
6. Shallow wells - possible but unlikely - only in sandy soils not generally available near lined pond.
7. Deep wells - generally not recommended - may ruin well and affect neighbor's wells.
8. Other possibilities may be available in certain areas.

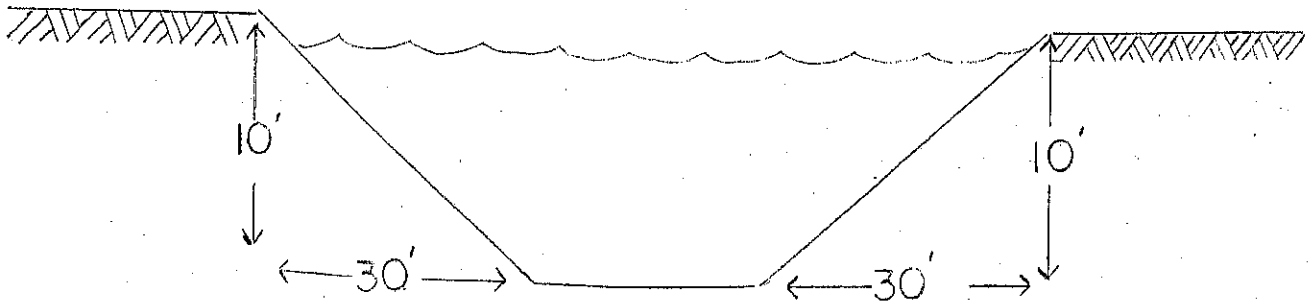
POND DESIGN II

Landowners planning to construct a pond on their property must take into consideration the relationship of depth versus size of a completed pond. A better understanding of this relationship will help eliminate possible problems during and after construction.

The following recommendations should be used to insure a successful pond:

1. Pond depth should range between 8 - 15 feet. Water deeper than 15 feet is not normally utilized by fish.
2. Side slopes of the pond should be 3:1.
3. Minimum surface area - 1/4 acre - with at least 25 percent of the pond bottom 8 feet or deeper.

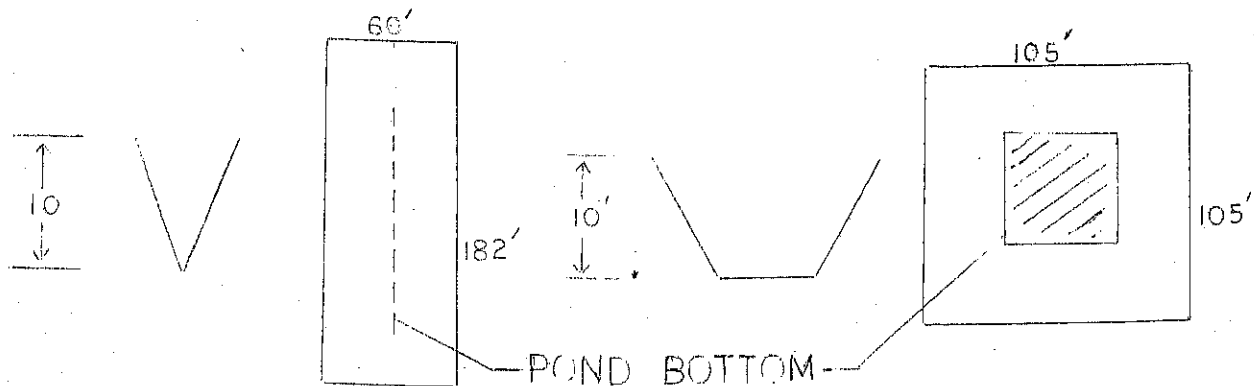
DEPTH / SLOPE RELATIONSHIP



The above drawing indicates the relationship using a 3:1 slope on the pond banks. Notice each side uses 30 feet for every 10 feet of depth.

DESIGN / DEPTH RELATIONSHIP

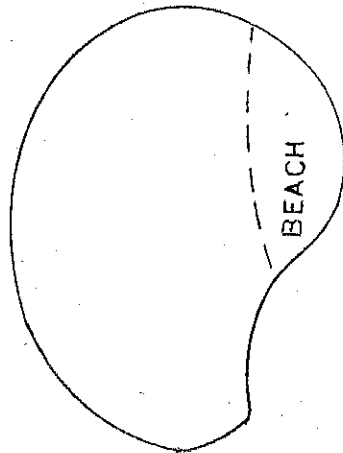
Design of a pond can affect the amount of deep water contained in the pond. If space is restrictive, pond location may have to be relocated to accommodate a pond with sufficient depth.



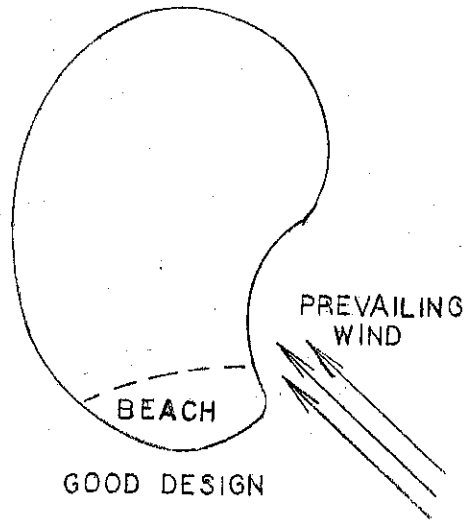
Each drawing represents 1/4 acre surface area, 10 feet depth and 3:1 bank slope.

BEACH LOCATION

If you desire a beach area in your pond, it should be located in the narrowest portion of the pond. This will not limit depth in the deepest part of the pond. Beach areas are usually at a 10:1 or 8:1 slope to a depth of 5 feet. Use in beach areas declines (usually) after the first year. Keeping the beach area as small as possible is a good idea because of the difficulty in maintaining them.



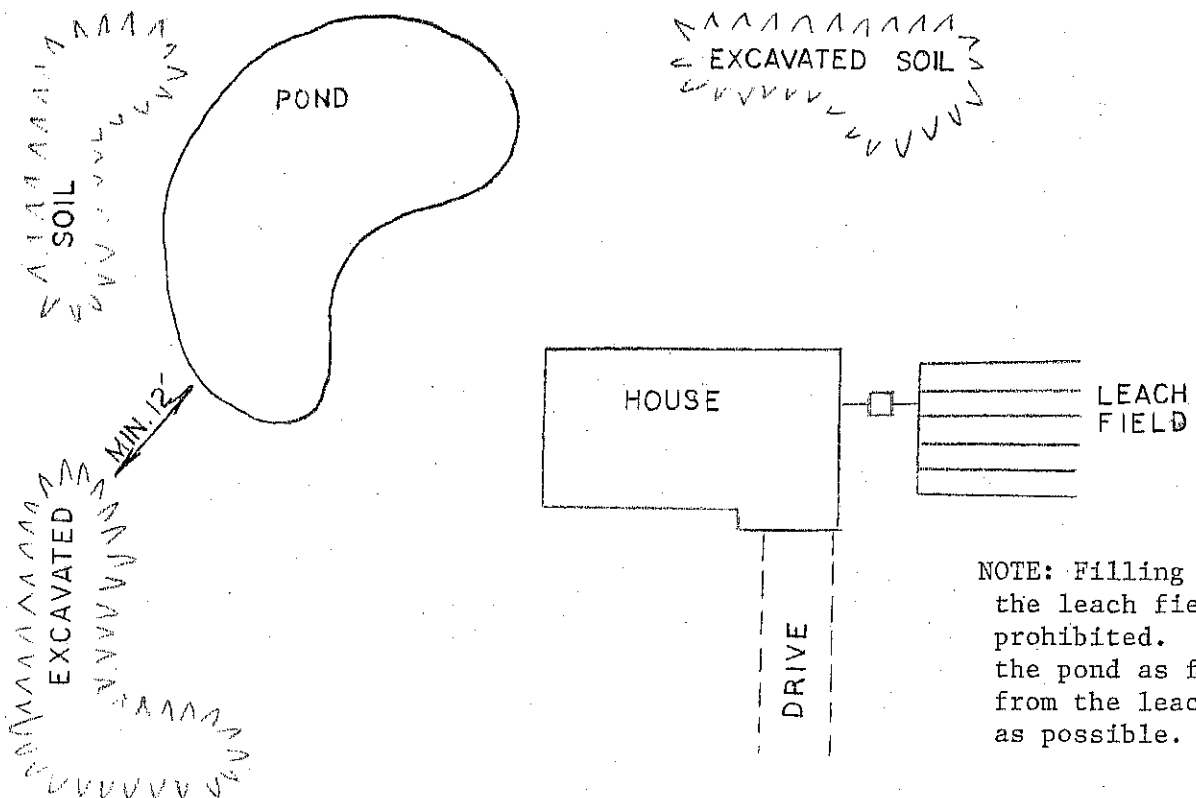
POOR DESIGN



GOOD DESIGN

The beach area should be located on the side of prevailing winds. Prevailing winds allow debris to collect on the pond banks. When the winds hit the beach area first it helps keep the beach area free of debris because it will collect on the other side of the pond.

A pond can provide many hours of recreation and lend aesthetic beauty to an area if planned and constructed properly. Be sure there is adequate space available for a pond, plus the excavated soil. Check local ordinances for restrictions such as size, setbacks, distance from leach field, etc.



LUCAS SOIL AND WATER CONSERVATION DISTRICT

POND MANAGEMENT NOTES

Pond Construction Information Sheet and Checklist (Rev. 6/89)

<u>Ponds in Clay Soil or Lined with clay</u>	<u>Watertable Ponds</u>
Soil Type (Soil Survey) _____	Soil Type _____
Watershed ____ Ac. Spillways Required _____	
Side Slopes _____	Side Slopes _____
Minimum depth of water--8 ft.	(Fluctuation requires min 12' excavation)
Availability of clay _____ Test hole _____	Bleeder drain (Reduces fluctuation)
Recommended _____	Outlet for _____ ditch.
<u>Water sources for filling ponds</u>	Watertable ponds fill to the level of the watertable.
1. Watershed	* * * * *
2. Wells - not recommended	Notes: Rainfall & evaporation are usually equal.
3. Tile drainage water	Water with contaminants should be avoided.
4. Pumping from ditch or stream	Ponds do not improve drainage.
5. City water	All ponds require maintenance.
6. Roof water	

USES OF PONDS

1. Recreation
2. Fishing and wildlife
3. Water for farm use
4. Source of fill for homesite
5. Other _____

Note: Ponds are no longer prohibited as a source of water for home use if:

- a: the site is 60,000 sq. ft. or larger and
- b: there has been a valid attempt to put in a traditional well. (The Lucas County Health Dept. will work closely with individuals in determining filtering equipment needed.)

Ponds do not reduce fire insurance rates.

Ponds for commercial recreational swimming must be 3 acres or larger.

POND - SIZE - SHAPE - DEPTH

Construction depth _____ (10 - 15 feet recommended)

Size _____ (1/4 Ac. minimum - 105 ft. X 105 ft.)

Beach area desired _____ Size _____ Location _____

8 : 1 side slopes are recommended to 5 ft. depth.

Area for spoil placement: _____

1. Soil will be a hill greater than the size and depth of the pond.
2. High hills should be more than 12 ft. from the pond edge.
3. Soil may be spread to a eight of 3 ft. with the top graded away from the pond.
4. Considerations should be made for revegetation and maintenance.

Yardage Estimate: Typical 1/4 Ac. = 2400 cu. yds.
Typical 1/3 Ac. = 3000 cu. yds.
Typical 1/2 Ac. = 5000 cu. yds.

Note: Yardage changes with side slope, depth and size of pond.

Stone for erosion control - #4 stone placed -
6 in. thick 1 ft. above & 2 ft. below normal water line.
Quantity = .055 cu/yd per foot of bank _____

Potential sources of pollution:

1. Septic system leach fields (100 ft. recommended)
2. Sedimentation from unprotected land (filter strip 30' around pond recommended).
3. Flooding from nearby streams (diking required)
4. Leaves from trees (30' from pond required)
5. Others _____

Restrictions in Pond Construction:

1. Township zoning laws, check with your zoning inspector.
2. Utilities--call OUPS (!-800-362-2764) at least 2 days before beginning construction.
3. Ohio Strip Mine Law--Permit required if a significant amount is removed.
Contact: ODNR, Div of Reclamation, 725 Haskins Rd.
Bowling Green, Ohio 43402 c/o Bill Boyle Ph: 352-6322
4. Ohio Dam Law--Ponds with a dam 10 ft. in height or greater

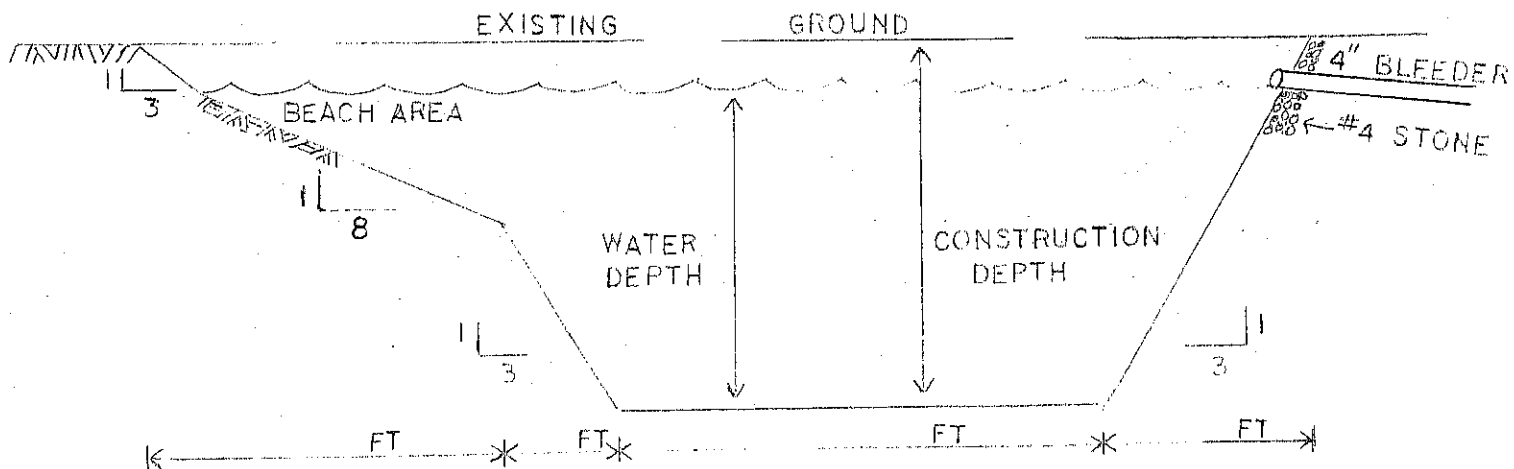
Information and services available from the Lucas Soil and Water Conservation District:

1. Fish stocking information--Annual fall fish sale through SWCD
2. Aquatic weed control information
3. Pond safety kits
4. Pond ownership liability information
5. Planning for wildlife plantings
6. Annual Pond Clinic
7. Control of undesirable fish information
8. Contractors list

Establish Vegetation around the Pond as soon as possible:

1. Replace topsoil as much as possible
2. Add fertilizer: 25 lbs./1000 sq. ft. use 12-12-12
3. Seed from March - May, August - Sept, @ 1 lb./1000 sq. ft.
Critical Erosion Areas--Tall Fescue
Non-Critical Erosion Areas--Kentucky Bluegrass or other as desired
4. Mulch area with small grain straw 2-3 bales/1000 sq. ft.

TYPICAL CROSS-SECTION



4. What will be done with the excess soil from the pond? Remember, it will be a pile larger and higher than the excavation since this material is not compacted. Note: some townships zoning prohibits removal of fill from the property.
 - A. Distance fill material is to be moved.
 - B. Is there enough room for spreading the spoil.
 - C. If it is to be hauled away, this expense is usually prohibitive.
5. Clearing the area of trees and rocks, if applicable.
6. Weather delays can be excessive in some wet seasons of the year and may add expense to construction.
7. Erosion Controls
 - A. Lining bank with rock rip rap to reduce wave erosion. Geotextile fabrics may be used to reduce undermining.
 - B. Seeding (Grass seed, fertilizer, & mulch) the area.
 - C. An overflow pipe to remove excess water in wet periods.
8. Beach areas, if desired. Our experience has usually been to keep these areas as small as possible since they generally go unused and require a lot of weed control and maintenance. Construction of a ridge to keep sand from slipping into the deep part of the pond should be considered.
9. Extent of landscaping, top soiling, and finish grading.
10. Who is responsible if something goes wrong?
 - A. A problem soil is encountered that was not found in the test hole.
 - B. A utility line is cut during construction.
 - C. Not enough clay is found for lining the pond.
 - D. A tile drainage line is found and needs to be relocated.
11. How will you get the water to fill the pond and how much will it cost?
 - A. Pumping water from a ditch or creek with an irrigation system
 - B. City water from a hydrant
 - C. Other sources.
12. Does your pond need an overflow pipe to stabilize the waterline?
13. Miscellaneous expenses such as a pond safety kit, dock and/or raft, landscaping trees or shrubs and any other special items you desire.

The Lucas SWCD does have a contractors list if you need to get names of companies to contact. Ask to see the work that any contractor that you are considering has done recently to see if his work meets your standards.

How Much Does It Cost to Build a Pond?

Evaluating the estimates or bids of different contractors can vary greatly and can have a big impact on the cost and quality of your pond. Discussing some of these factors before construction starts can be very helpful in allowing the project to go smoothly.

Contractors charge for pond excavation in various ways:

- \$'s per hour of work
- Per Cubic yard of excavation
- Bid price for the entire job.

The method that gives you the pond you want for the least amount of money is anyone's guess!

1. Surface area of the pond is usually the biggest factor most people consider in evaluating a bid. Be sure you have a good design that includes: minimum 1/4 acre size with 25% 8' or deeper, 3 to 1 side slopes, and 8' of water depth or more during dry weather conditions.

2. Soil conditions have a great impact on the cost of a pond. Check the Soil Survey for soil information. Digging test holes before construction may also be necessary. All tile lines encountered must be capped off to avoid leakage.

Ponds in clay soil - Disturb soil to a depth of about 3 feet or to solid clay around the edge of the pond and compact it to assure water does not leak out thru soil horizons.

Ponds in partially clay soil - Lining a pond with clay or other material generally adds greatly to the cost of a pond. Estimating the amount of clay available and the amount necessary is difficult. Most people think the solution simply lies in going deeper; however, as you go deeper the amount of material decreases greatly and may vary in quality. The thickness of the clay liner also may vary with different contractors. It is usually best for you to get a written guarantee from your contractor that the pond will hold water. Other types of lining materials; such as, plastic or bentonite are available but are even more expensive and the risk of leakage usually increases.

Ponds in sand or watertable ponds - This type of pond is usually the most difficult to dig since water must be pumped to lower the water table as you go. Digging during a dry time of the year is usually best. With this type of pond, as with all the others, you should see or be assured that the contractor has the proper type of equipment for the job. These ponds fill by themselves but the water level will fluctuate. Dig in an area with a high watertable year round!

3. Top soil should be removed from the entire construction area and stockpiled for later spreading over the completed landscape area.

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LUCAS SWCD

POND WEED CONTROL

(Rev. 6-89)

All ponds eventually have weed problems. The extent of your weed problems are affected by:

1. Proper pond construction
2. Fertility of the water in the pond
3. Pollution entering the pond
4. Pond management

Generally speaking, people manage ponds for two uses:

"Swimming Ponds"

Water clear - no algae

Few fish can be maintained because of lack of food

"Fishing Ponds"

Water dark in color from algae

Pond can support a large quantity of fish

NOTE: You can swim in a fish pond but you can't expect many fish in a swimming pond. Anyone who wants a crystal clear pond should strongly consider a pool.

Problems associated with large quantities of weeds:

1. Water area is reduced
2. Desirability of area for swimming and fishing is reduced
3. Fish populations are upset - small size fish are encouraged
4. Oxygen levels are upset when large quantities die off and may cause a fish kill
5. Some weeds have a bad odor and give the water a bad taste

Types of weeds - Identification is necessary for good control

	<u>Examples</u>
1. Algae	Blue green algae
2. Floating plants	Duckweed
3. Submersed plants	Leafy pond weed
4. Emergent plants	Cattails

Many booklets are available to help in this identification.

Pond Weed Control Methods

1. Mechanical
2. Biological
3. Chemical

Mechanical

Emersed weeds such as cattails are best controlled by pulling. Barges have been equipped with cutter bars to cut off weeds below the waterline. Generally this is only a temporary solution.

Biological - sunlight regulators

1. Blueing agents - Aqua Shade
2. Algae - encouraged by fertility
3. Aqua Screen
4. Black Plastic

Plant eating fish -

1. Grass Carp - Sterile species available through Lucas SWCD.

Aerators - Increased oxygen levels tent to increase organic matter breakdown. They are expensive to purchase and run but may be useful in certain cases.

Chemical Weed Control - Always follow label directions in using any chemicals. Consider the effects of the chemicals on all the uses of the pond. We do not reccomend specific chemicals. Contact a reputable dealer or consultant.

Properties of the water that influence chemical effectiveness:

1. Temperature - most chemicals are effective when the water is above 60° F and plants are actively growing
2. (ph) Hydrogen Ion Concentration
3. Hardness of the water
4. Dissolved oxygen - affects fish kills

Summary of Restrictions and Waiting Periods

	WAITING PERIOD BEFORE USE OF WATER FOR:							Bio-degrad-able	Toxic to Fish? (As Recom-mended)	Use in Muddy Water?	Corrosive to Metal
	Swim-ming	Fishing	Drinking Water	Turf	Irrigation Food Crops	Lactating Animals	Animals Being Finished for Slaughter				
Aqua-Kleen	0	0	Not Cleared	Not Cleared	Not Cleared	Not Cleared	0	Yes	Yes	Yes	No
Aquashade	0	0	Not Cleared	0	0	0	0	Yes	No	Yes	No
Aquathol Gr.	24 hrs.	3 days	7 days	7 days	7 days	7 days	7 days	Yes	No	Yes	No
Aquathol K Liq.	24 hrs.	3 days	7-25 days**	7-25 days**	7-25 days**	7-25 days**	7-25 days**	Yes	No	Yes	No
Aquazine	4 hrs.	0	12 mo.	12 mo.	12 mo.	12 mo.	12 mo.	Yes	May Be	Yes	No
Hydrothol 191	24 hrs.	3 days	14 days	Not Cleared	Not Cleared	7-25 days**	7-25 days**	Tied-up	No	No	No
Diquat	14 days	0	14 days	14 days	14 days	14 days	14 days	No	May Be	Yes	Yes
Copper Sulfate	0	0	0*	0	0	0	0	Part	May Be	Yes	Yes
Cutrlne	0	0	0*	0	0	0	0	Yes	No	No	No
Pondmaster	0	0	0 (4)	0	0	0	0				

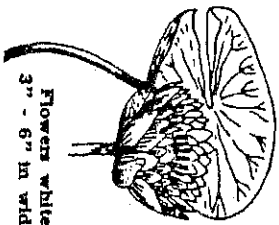
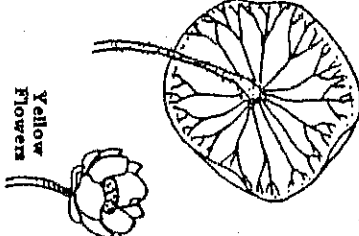
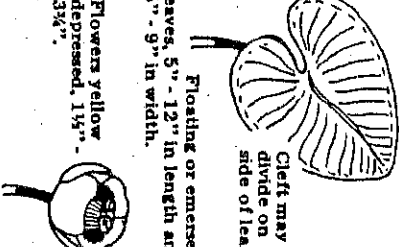
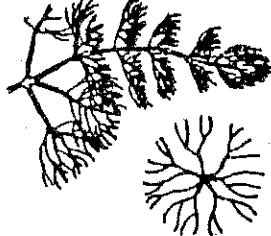
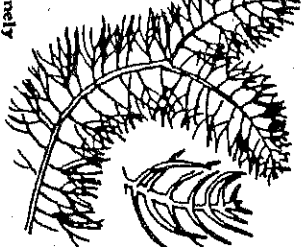
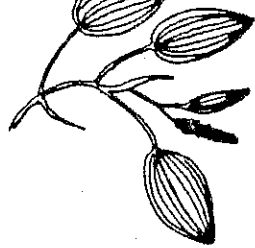

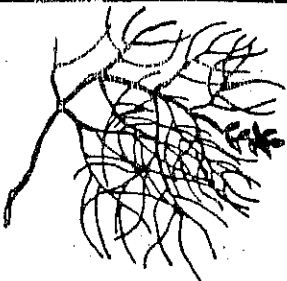

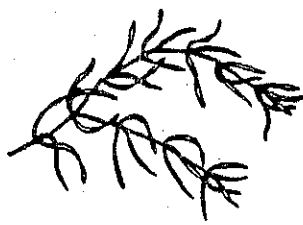
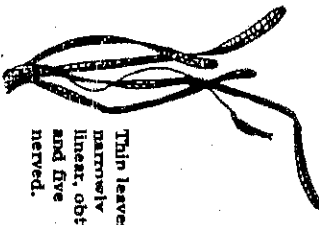
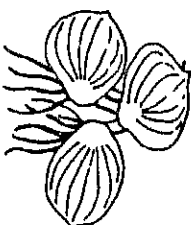
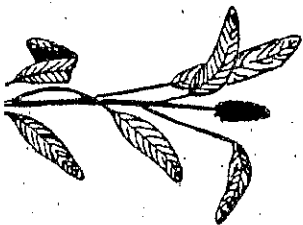

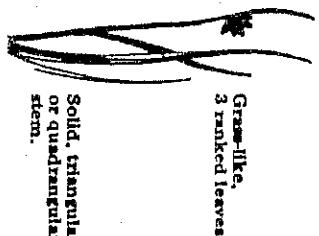
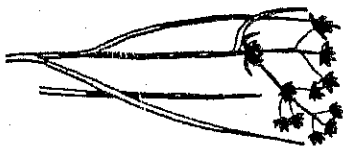
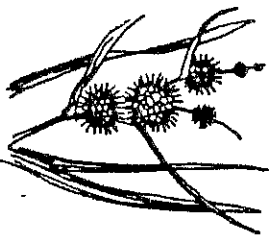
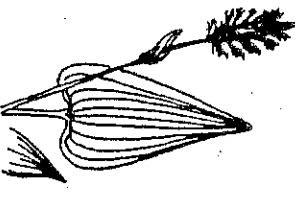
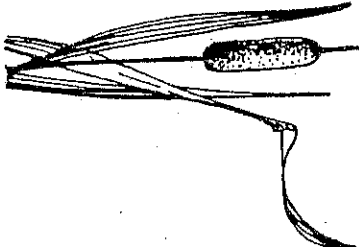


*Up to 1 ppm copper ion (4 ppm copper sulfate) **Varies by rate - See Label

Restriction information is taken from Countrymark Pond Weed Control Guide and is subject to change.

Rules for Chemical Use:

1. Select only chemicals with a label for use in ponds.
2. All approved chemicals used at the proper rate will not kill fish but dying plants may lower the dissolved oxygen content of the water enough to cause a fish kill.
3. Some chemicals will kill vegetation and trees around the pond.
4. Some chemicals will impart a taste to the fish.
5. To reduce potential fish kills:
 - A. Treat the pond early in the spring when oxygen levels are higher.
 - B. If weed growth is excessive, treat one-half the pond at a time and the other part 10-14 days later.
6. Some chemicals affect spawning of fish.
7. Identify the type of weed problem you have and apply the chemical recommended by a trained or reputable chemical sales person.

APPLICATION OF CHEMICALS IS A VEPY SERIOUS MATTER !! ALWAYS FOLLOW LABEL DIRECTIONS. CONTACT THE LUCAS SOIL AND WATER CONSERVATION DISTRICT IF YOU HAVE SPECIFIC QUESTIONS NOT COVERED ON THIS INFORMATION SHEET.

<p>WHITE WATER LILY</p>  <p>Leaves floating and circular, 4" - 12" in diameter.</p> <p>Flowers white, 3" - 6" in width.</p>	<p>AMERICAN LOTUS</p>  <p>Emerged leaves over 12" in diameter.</p> <p>Yellow flowers</p>	<p>YELLOW WATER LILY</p>  <p>Cleft may divide on side of leaf.</p> <p>Floating or emerged leaves, 5" - 12" in length and 5" - 9" in width.</p> <p>Flowers yellow depressed, 1 1/2" - 3 3/4".</p>	<p>WATER MILFOIL</p>  <p>Three forked, brittle leaves in whorls around stem.</p> <p>No true roots.</p>	<p>COONTAIL</p>  <p>General appearance of hornwort, except leaves are longer.</p> <p>Finely divided, submerged leaves in a feather arrangement.</p>	<p>FLOATING PONDWEED</p>  <p>Flat, floating, ovate leaves, dissected thin and submerged leaves.</p>	<p>CURLY PONDWEED</p>  <p>Curly, crinkly, lanceolate leaves, 1/2" - 4" in length and 1/4" - 1/2" in width.</p>
<p>GRASSY PONDWEED</p>  <p>Grass-like submerged leaves, 1" - 6" in length. Stems are many branched.</p>	<p>COMMON ELODEA</p>  <p>Opposite or whorled, crinkly leaves less than 1/2" in length.</p>	<p>BUSHY PONDWEED</p>  <p>Ribbon-like linear leaves with toothed margins and flexible stout stems.</p>	<p>WILD CELERY</p>  <p>Thin leaves, narrowly linear, obtuse and five nerved.</p>	<p>BIG DUCKWEED</p>  <p>Usually 3 floating leaves up to 1/4" in diameter with inch long trailing roots.</p>	<p>SMARTWEED</p>  <p>Jointed stems with conspicuous stipules located at the joints. Oblong leaves are approximately 4" in length.</p>	<p>SPIKE RUSH</p>  <p>Simple, flattened, triangular or quadrangular stems. Leaves are reduced to sheathing spikelets, solitary, terminal and erect.</p>
<p>BULRUSH</p>  <p>Grass-like, 3 ranked leaves.</p> <p>Solid, triangular or quadrangular stem.</p>	<p>RUSH</p>  <p>Densely tufted soft stem, 1/4" - 4" in height.</p>	<p>BUR-REED</p>  <p>Large linear flat leaves 3" - 5" in length. Fruits is bur-like.</p>	<p>PICKEREL WEED</p>  <p>Leaves ovate to truncate lanceolate (cheek Sagittaria).</p>	<p>CATTAIL</p>  <p>Herbs with large sheathing linear leaves.</p>	<p>ARROWHEAD</p>  <p>Arrowhead shaped leaves, 4" - 4 1/2" in length. Basal lobes, 1/4" - 1/2" as long as blades.</p>	<p>WATER WILLOW</p>  <p>Leaves lanceolate, 3" - 6" in length and up to 1/2" in width.</p> <p>Stems are grooved, slender and usually single plants 1" - 6" in height.</p>

LUCAS SWCD

POND MANAGEMENT NOTES

POND ALGAE CONTROL

The most common type of floating weed in Ohio ponds is filamentous algae ("moss" or "pond scum"). This weed, which looks like a dense mat of hair-like fibers, starts to grow on the bottom and on submerged vegetation. It floats to the surface, frequently covering large areas of the pond surface.

Most species of this plant group can be controlled with very low concentrations of copper sulfate. The recommended rate for applying this chemical is 2.7 pounds per acre foot of water. For very hard waters (over 12 grains or 200 parts per million of hardness) this rate should be doubled.

Determine the size of the area to be treated and then determine the amount of chemical needed. The application method to be used will determine what grade of copper sulfate to purchase. For best results, dissolve copper sulfate in water and spray it on the surface of the algal mat or on the water surface over the algae. Finely ground, "snow grade" copper sulfate is best for this method as it dissolves most easily. Mix the desired amount of copper sulfate with enough water to cover the area treated.

Copper sulfate is corrosive to galvanized containers. The solution should be mixed in wooden, earthenware, plastic, stainless steel or copper-lined containers. If a copper-lined, plastic or stainless steel sprayer is not available, you may broadcast the solution with a bucket and dipper. Strive to treat the weeds directly. Contact is important.

In large ponds and when spray equipment is not available, it may be easier to treat with copper sulfate for algae control by placing the larger crystals of this chemical in a burlap bag and towing the bag through the water in the area to be treated until all of the crystals are dissolved.

If the algae is so abundant that it covers more than half of the total pond surface, a complete treatment may result in an oxygen deficiency and a fish kill. This hazard is greatest during very hot, overcast weather. When conditions such as this exist, treat only one half of the pond and wait 10 days to two weeks before treating the other half.

When copper sulfate is applied at the recommended rate, it will be so diluted or inactivated after 12 hours that it will not present a hazard to livestock or swimmers. Caution - do not apply copper sulfate when fish are spawning unless you wish to kill the new hatch of fish.

Copper sulfate is also available in a buffered form. This material contains complete instructions on the label for use in the control of filamentous algae. Several other herbicides which are recommended for the control of other weed problems will also control algae. Where a mixed problem of algae and submerged weeds exist, the chemical suitable for control of the submerged weed may also kill algae. Do not mix different chemicals or apply different chemicals at the same time. Such combinations may be completely ineffective or may be toxic to fish.

(Taken from the Ohio Pond Management book, Cooperative Extension Service / The Ohio State University)

LUCAS SOIL AND WATER CONSERVATION DISTRICT

POND MANAGEMENT NOTES (Rev. 6/89)

Fishpond Stocking

Stocking a pond with the correct size, species, and number of fish is very important. If the pond is new, be sure the water is free of undesirable fish, contamination, and has a source of food for the fish to be stocked. Plan on making one complete stocking rather than adding other fish later. After the initial stocking many things determine the quality of fishing.

A chart is attached that specifies the desired stocking recommendations for ponds. Generally speaking, if you aren't going to fish for a species of fish, don't stock it. Each fish has characteristics that may make it desirable or undesirable to people.

If you already have a stocked pond, generally adding additional fish is not very beneficial. Keep in mind that a fish can eat another fish that is one-half its size. So if you stock fingerlings with other fish, you may have fed your fish some expensive food.

There is no optimum time for stocking your pond. I have known fish to be stocked in the winter thru ice and about any season with relatively good results. Probably the worst time is in extremely hot weather because of the difficulty of maintaining temperatures in transportation.

For Ohio, a combination of Largemouth Bass, Bluegill and (Catfish ponds greader than 1/2 acre) seems to work best. If the 3 sp cies are stocked together, then the Bass should be no longer than twice the length of Catfish or 3 times the length of Bluegill. Minnows provide best results when stocked simultaneously with Largemouth Bass.

Spawning - Bluegill - will spawn when 4 - 5 " long (1-2 years after stocking 1 - 2" fingerlings); spawn several times during spring and summer after water temperatures rise above 68° F (20 C), generally June into August.

Largemouth Bass - will spawn when 9 - 12" long (2 -3 years after stocking 1 -3" fingerlings); spawn only once after water temperature is above 64° F (18° C), generally early May to mid-June.

Channel Catfish - will generally not spawn in small ponds (stocking Catfish in ponds smaller than 1/2 acre is not recommended) - - except in containers such as described in OH-C-106.

Fathead and Golden Shiner Minnows - will spawn readily in ponds, require vegetation or structures such as clay tile, concrete blocks or picket fence within the waters edge.

Detailed Life History Notes are available for Largemouth Bass, Bluegill, Channel Catfish, Golden Shiner, Chub, Bluntnose, and Fathead Minnows. These sheets are printed by the Ohio Department of Natural Resources (ODNR) and are available there or through our office.

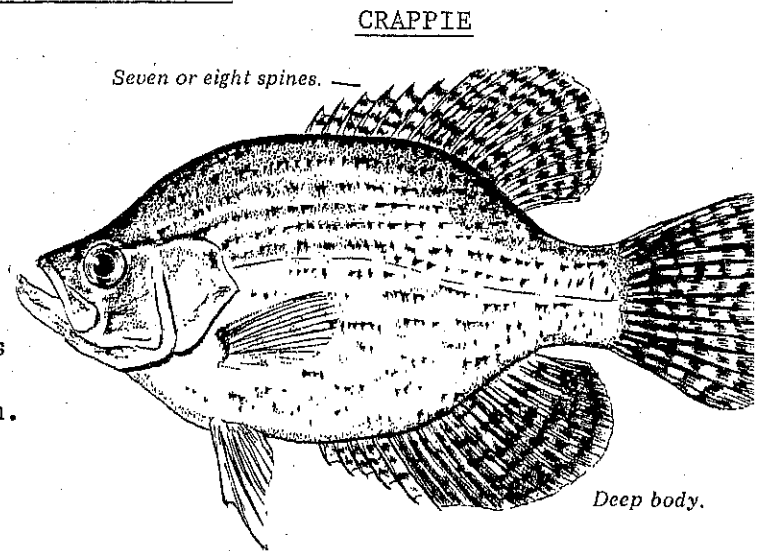
TABLE I - STOCKING

<u>Combination</u>	<u>Species</u>	<u>Number/ Acre *</u>	<u>in. Size</u>
Bass-Sunfish (Bream)	Bluegills	500	1/2 - 1 1/4"
	---or---		
	Bluegills & Redear or Hybrid Green	400	1/2 - 1 1/4"
		100	1/2 - 1 1/4"
	Largemouth Bass	100	1" +
Bass-Sunfish (Bream) - Catfish	Bluegills	500	1/2 - 1 1/4"
	---or---		
	Bluegills & Redear or Hybrid Green	400	1/2 - 1 1/4"
		100	1/2 - 1 1/4"
	Channel Catfish	100	4" - 6"
	Largemouth Bass	100	1" +
Bass-Minnow or Golden Shiner	Fathead Minnow	1000	2 1/2 - 4"
	Largemouth Bass	100	1" +
Bass-Minnow Catfish	Fathead Minnow or Golden Shiner	1000	2 1/2 - 4"
	Channel Catfish	100	4" - 6"
	Largemouth Bass	100	1 +
Bass-Minnow Catfish	Fathead Minnow or Golden Shiner	1000	2 1/2 - 4"
FEEDING (Commercial fish ration)	Channel Catfish	500-1000	4" - 8"
	Largemouth Bass	100	1" +

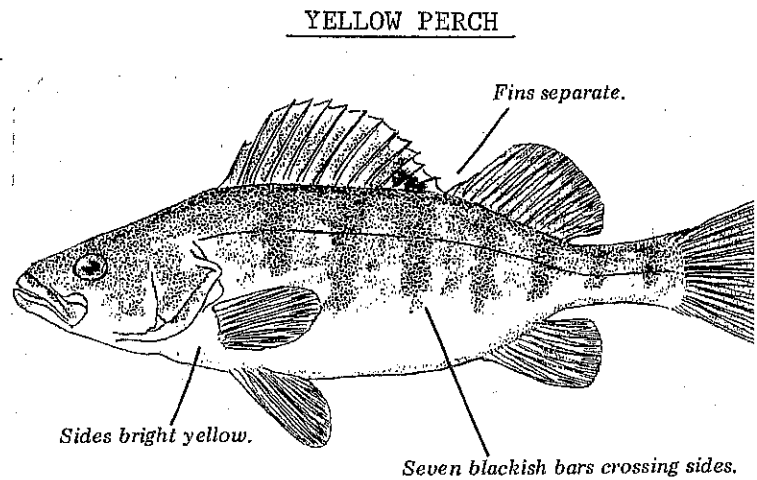
* These rates are the maximum recommended stocking rates for most situations involving one surface acre. Increase or reduce numbers to be stocked by percent of area, e.g. 1/2 acre pond reduce by 50 percent, 1 1/2 acre pond increase by 50 percent. Successful pond fisheries can be produced using approximately 1/2 the recommended rate and stocking larger sunfish (Bream) (2" - 4") and Bass (3" -4"). Rates can be increased under exceptionally good management and written recommendations of a state or federal biologist.

LUCAS SWCD
POND MANAGEMENT NOTES
FISH THAT CAN RUIN FISHING

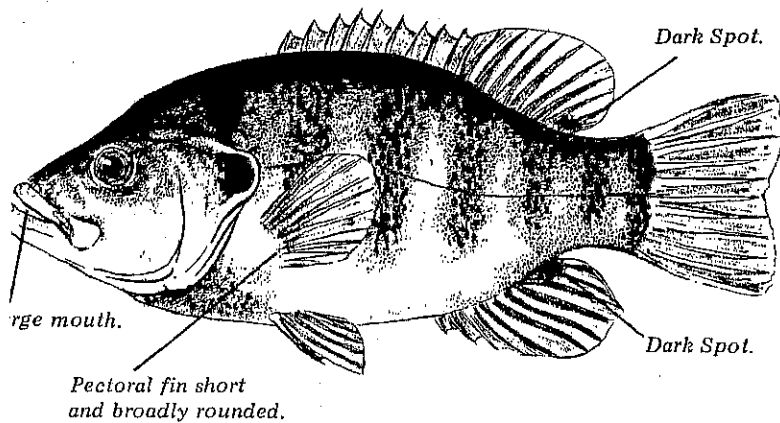
CRAPPIE - Two species of crappies (Black and white) occur in most large rivers, river lakes, and the larger natural inland lakes which are their favorite habitat. Crappies, however, are not recommended for stocking in ponds. They reproduce about the same time as the largemouth bass, causing large numbers of young crappie in the pond to compete with the young bass for food. To make matters worse, the crappie often preys on small bass and reduces the total bass population. As a result, crappie have a tendency to overpopulate. When this occurs, the only recourse is to drain the pond or chemically eradicate the entire fish population.



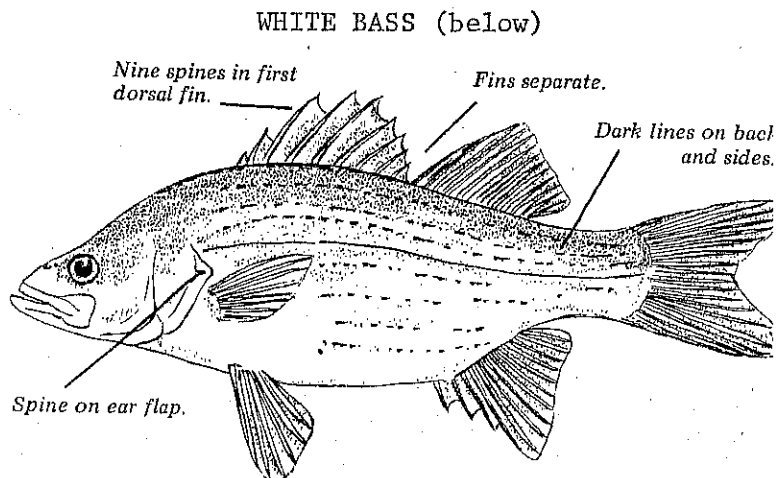
YELLOW PERCH - Perch are not successful spawners in farm ponds. They require a sand and gravel bottom and cool water temperatures. If yellow perch do reproduce, they usually overpopulate.



GREEN SUNFISH



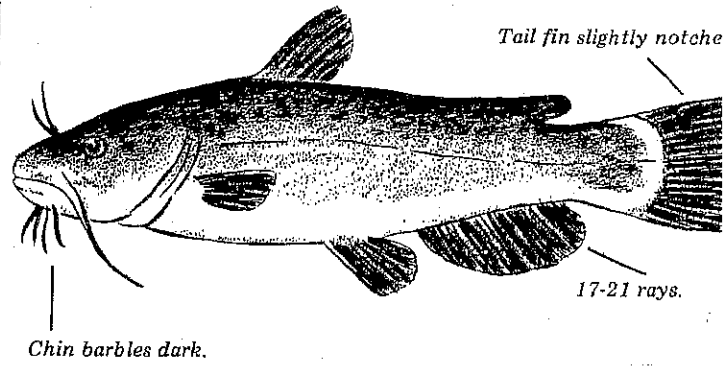
GREEN SUNFISH - Green sunfish or "rubbertails" are commonly found in stream and lakes. In a pond they readily become overabundant. They compete intensely with small bass and bluegill for food and space. The casual fisherman often mistakes the green sunfish for the bluegill, but the green sunfish has a mouth larger than the bluegill's and has no markings on the sides of the body. The ventral fins of the green sunfish are bordered with white and yellow.



White Bass - White bass are not successful pond spawners and suffer high fishing mortality.

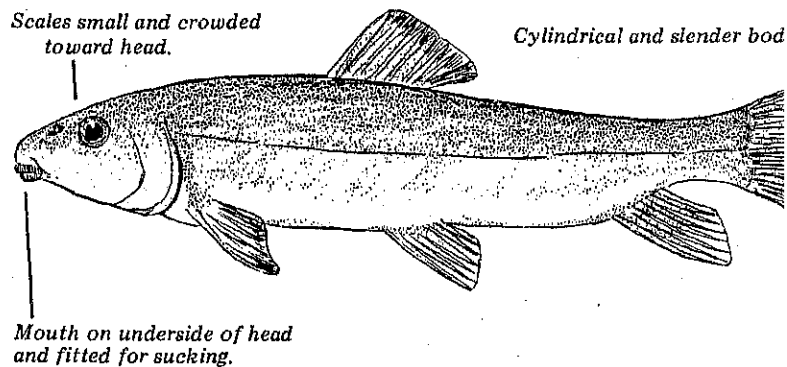
BULLHEADS - Ohio has three species of bullheads, black, brown and yellow. Of the three, the black bullhead is the most common. Bullheads are not recommended for pond stocking because they have a high reproductive potential which generally results in an overpopulation. Since they are bottom feeders, large populations of bullheads cause the pond waters to become roily, a phenomenon similar to that produced by a carp population.

BLACK BULLHEAD

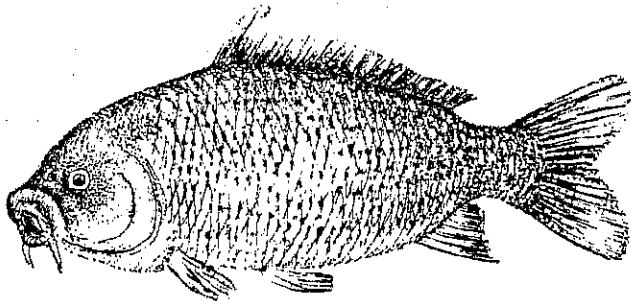


WHITE SUCKER - Suckers are found primarily in rivers and river lakes. When stocked in ponds, they compete directly with bluegill and small bass for food.

WHITE SUCKER

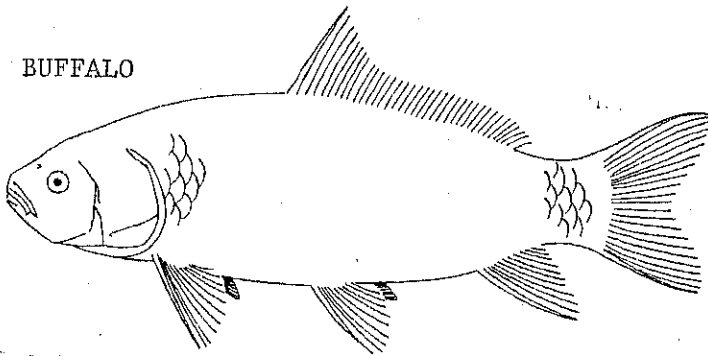


COMMON CARP (below)

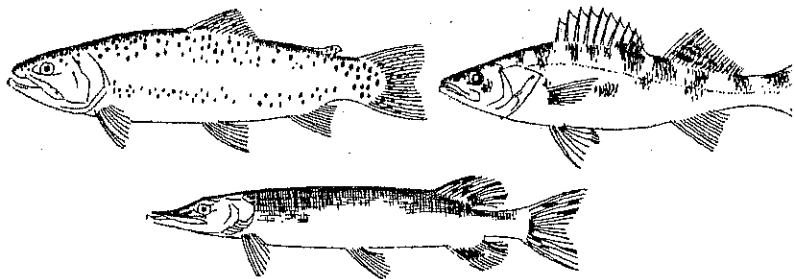


CARP - BUFFALO - Carp and Buffalo are found in rivers and river lakes. When stocked in ponds they compete directly with bluegill and small bass for food. Large numbers of carp cause the water to become extremely turbid. Buffalo feed on microscopic food and are nearly impossible to catch on pole and line.

BUFFALO



OTHER FISH (below)



OTHER FISH - Northern pike, walleye, trout and various other species have been stocked in Ohio ponds with limited success. These fish will not reproduce in ponds and because of high water temperatures and low dissolved oxygen, they seldom survive. Booklets describing requirements for trout ponds are available through the Lucas SWCD office.

Lucas SWCD Annual Fish Sale

The Lucas Soil and Water Conservation District is offering new and established pond owners the opportunity to stock their ponds more conveniently and at a low cost. Anyone considering stocking their pond in the near future should take advantage of this opportunity.

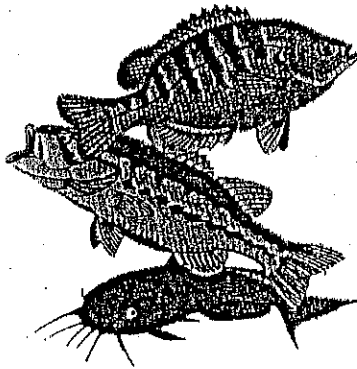
An aerator tank truck from Fender's Fish Hatchery in Baltic, Ohio will distribute fish fingerlings on **THURSDAY, SEPTEMBER 23, 1999 from 10 AM until Noon at our office in Maumee.**

Bring your own container filled with pond water. Your container should be filled as close to pick up time as possible to prevent drastic changes in temperature in the water which can cause shock to your fish during transportation. A 5-10 gallon can is adequate for 100 fish. *(TIP-a bucket lined with a clean trash can bag can easily be tied shut to prevent spillage)*

Fish are guaranteed to be delivered in good condition, however, we can not guarantee survival after stock in your pond. **DEADLINE FOR ORDERING IS: FRIDAY, SEPTEMBER 17TH.**

Fish Species Available Are:

Bluegill
Channel Catfish
Largemouth Bass
Yellow Perch
Fathead Minnows
White Amur



Stocking Rates Recommended For NEW Ponds:

<u>Species</u>	<u>Number/Acres</u>
Bluegill	500
Channel Catfish	100
Largemouth Bass	100
Yellow Perch	100
Fathead Minnows	1,000

**Make Check Payable To: Lucas SWCD
130-A West Dudley Street
Maumee, OH 43537**

NAME _____

DAY PHONE _____

ADDRESS _____

COUNTY _____

CITY _____ STATE _____

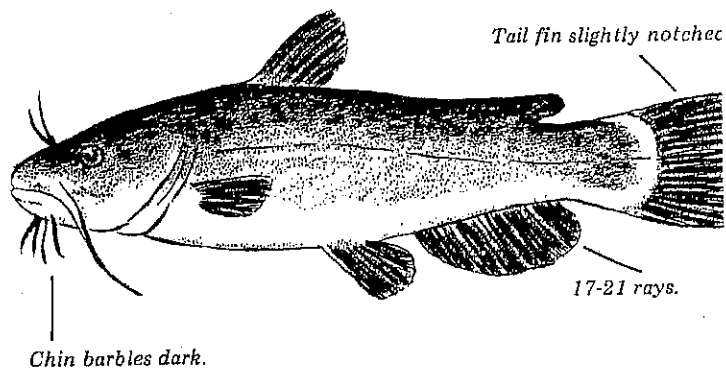
ZIP _____

<u>Species</u>	<u>Size</u>	<u>Price Per Fish</u>	<u># Purchasing</u>	<u>Total Cost</u>
Bluegill	3"-5"	\$ 0.60	_____	\$ _____
Channel Catfish	4"-6"	\$ 0.60	_____	\$ _____
Largemouth Bass	2"-4"	\$ 0.60	_____	\$ _____
Yellow Perch	3"-5"	\$ 0.60	_____	\$ _____
Fathead Minnows	1"-3"	\$ 0.05	_____	\$ _____
White Amur	10"-12"	\$ 10.50	_____	\$ _____
			TOTAL	\$ _____

Do Not Add Sales Tax!

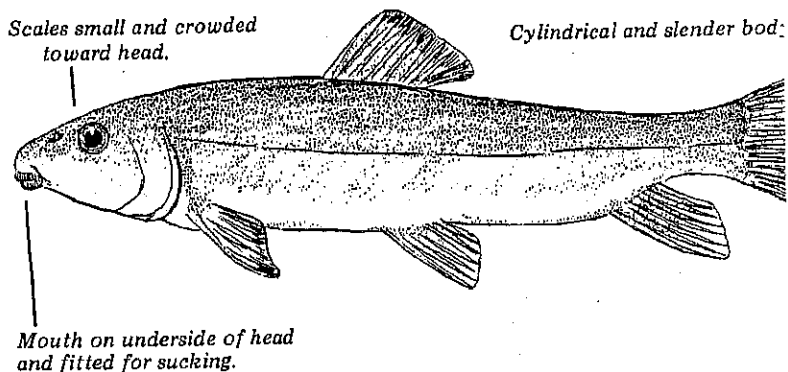
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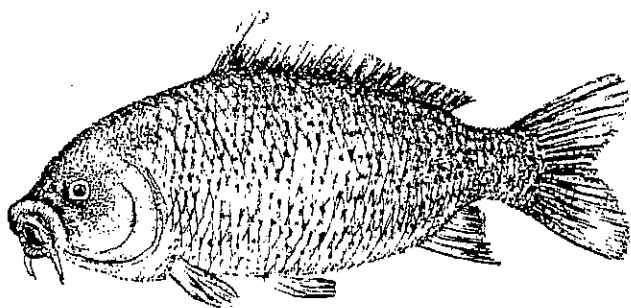


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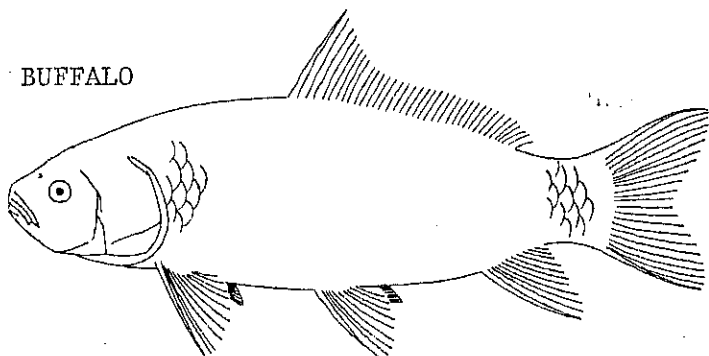


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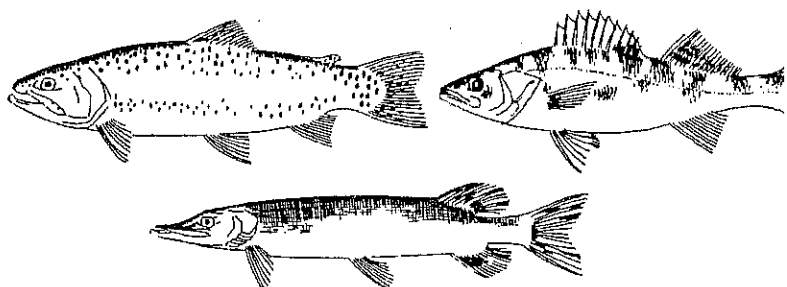


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