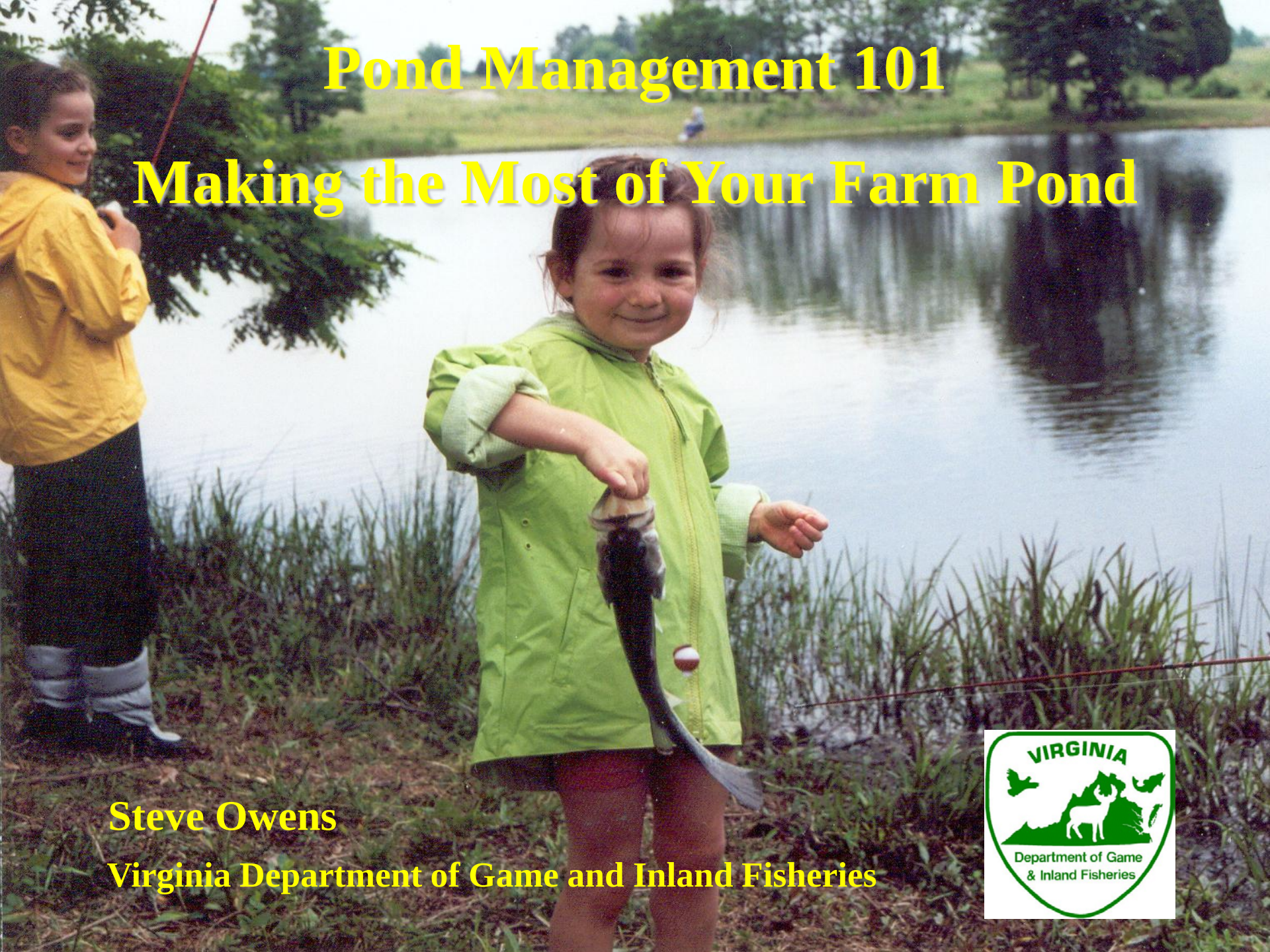
Pond Management 101

Making the Most of Your Farm Pond

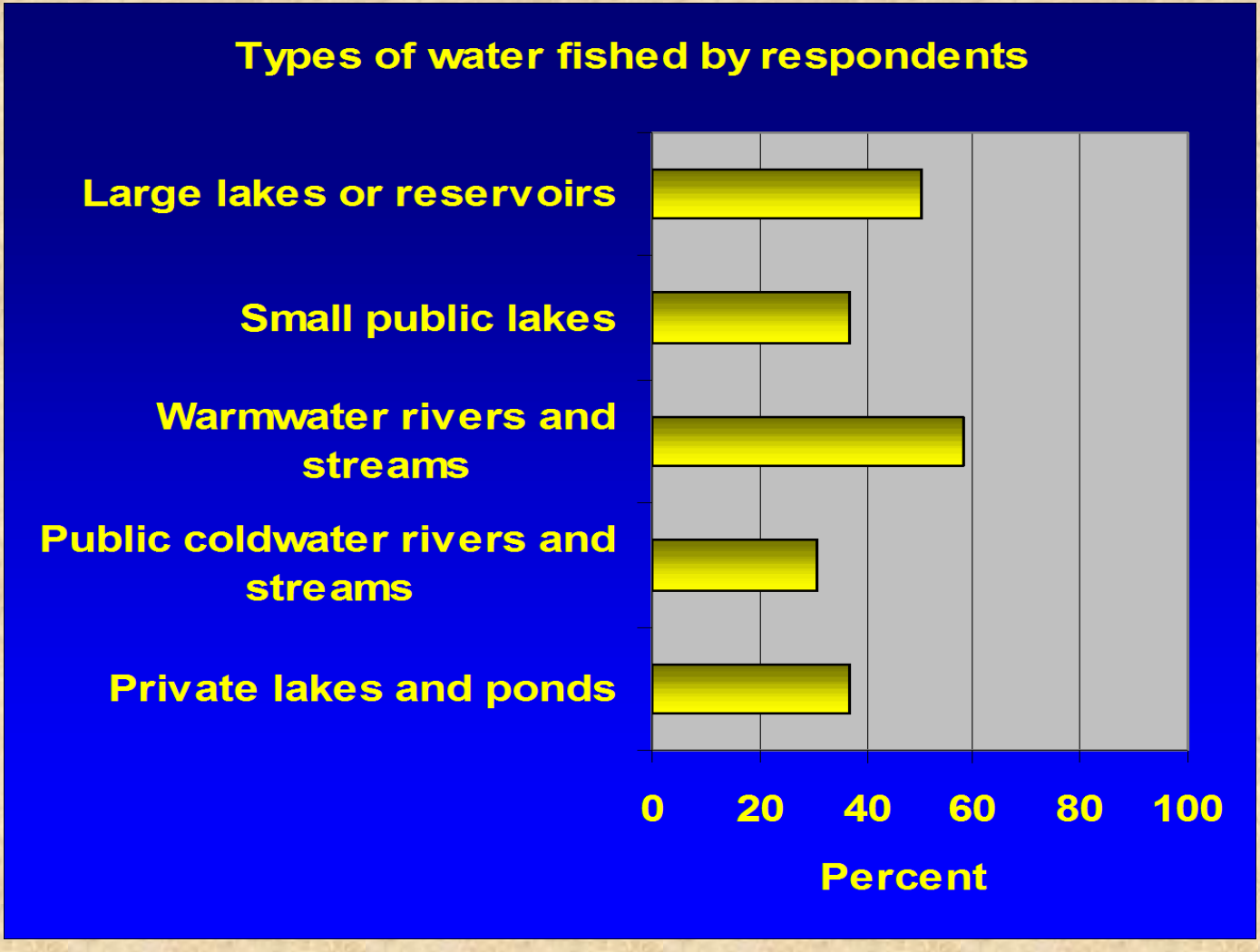


Steve Owens

Virginia Department of Game and Inland Fisheries

Small Impoundment Management

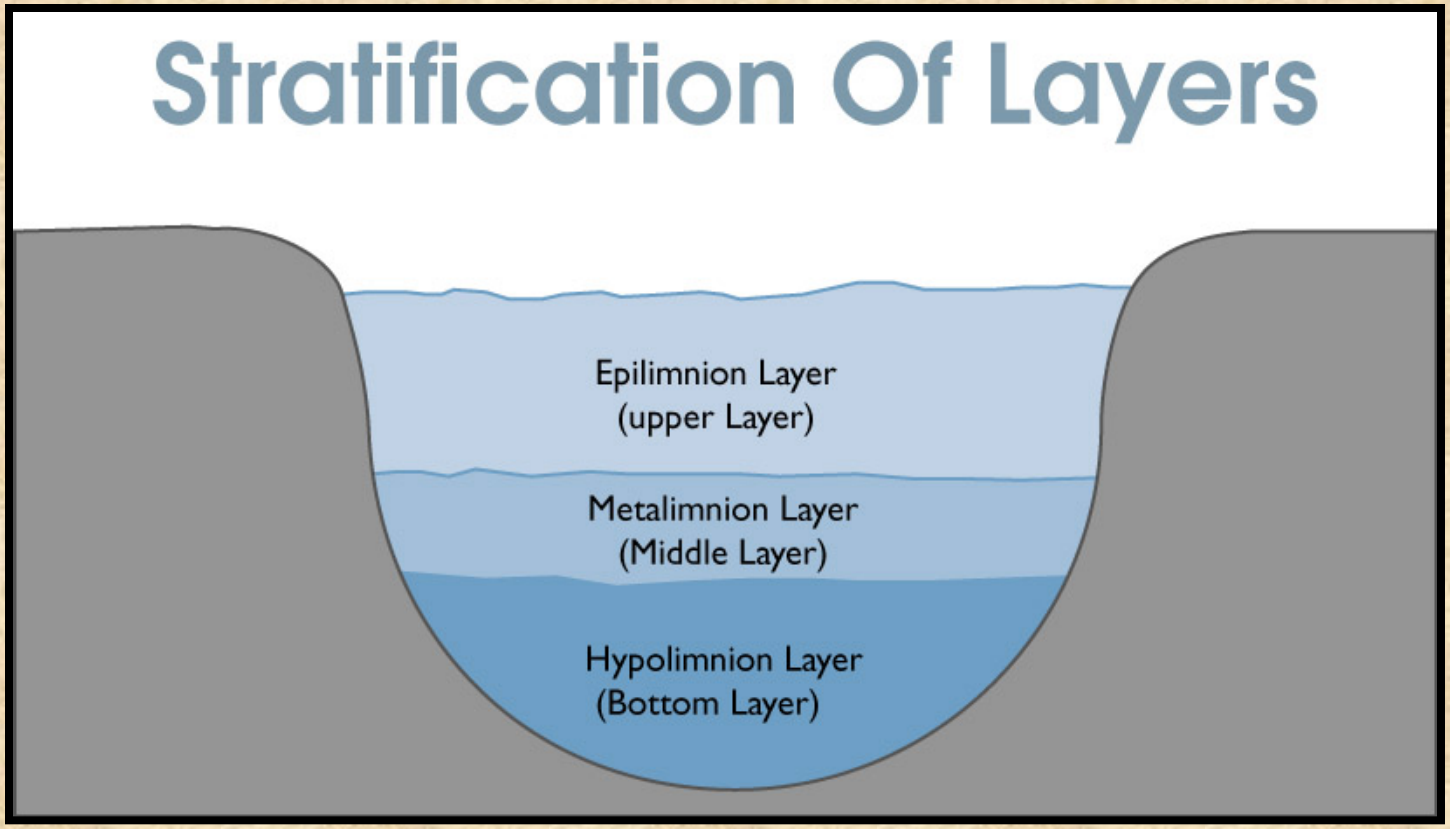
– VA – 2000 Angler Survey by O'Neill and McMullin



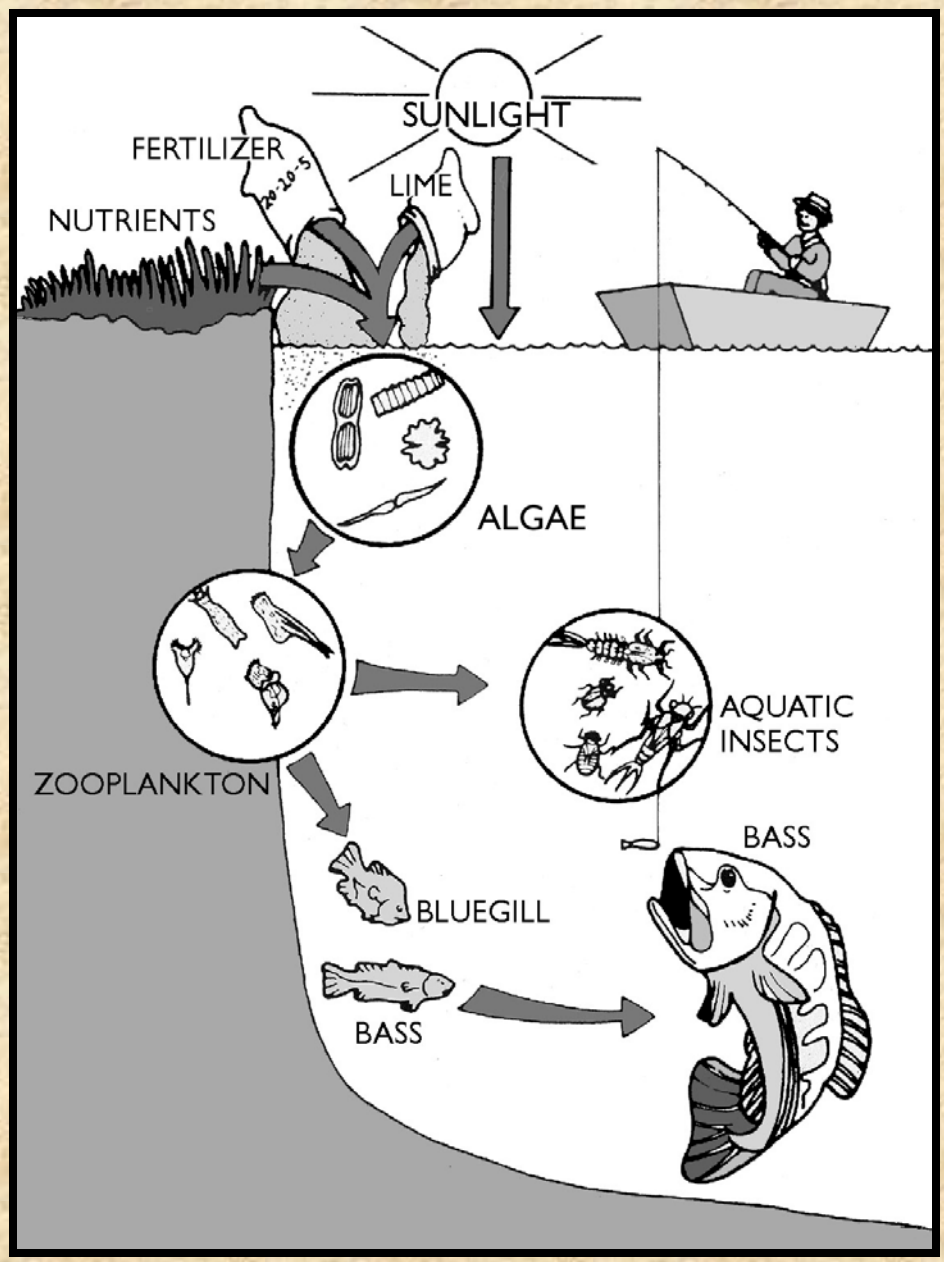
Ponds are great for introducing kid's to fishing

Basic Pond Limnology

8’ Max. Depth



Food Web


SUNLIGHT
FERTILIZER
20-20-5
LIME
NUTRIENTS
ALGAE
ZOOPLANKTON
AQUATIC INSECTS
BASS
BLUEGILL
BASS

Water Quality

pH	**6 - 8.5**
Dissolved Oxygen	**>5 mg/l**
Temperature	**(< 70° for Trout)**

Fertilization

-Fertilized ponds can support 10 times the biomass of unfertilized ponds

-Once a fertilization program has begun, it should not be stopped

-Ponds can be fertilized once water temp reaches 60F (April-Sept) and stop when temp drops below 65F

-Fertilizer is applied to produce an algae bloom (microscopic fish food). Fertilization may be necessary every 2 weeks until an algae bloom is established. After that fertilization is done about every 3-4 weeks to maintain water clarity <18".

-Liquid 10-34-0 can be applied at 1 gallon/acre

-Granular fertilizers can also be used (ie. 40 lbs/ac of 20-20-5 or Perfect Pond Plus™ 12-48-8 at 5lbs/ac)

Liming

Alkalinity <20mg/L apply 1-2 tons of ag. Dolomitic lime/surface acre

May need to re-lime every 3-4 years

Problems with Muddy Water

Caused by suspended clay particles:

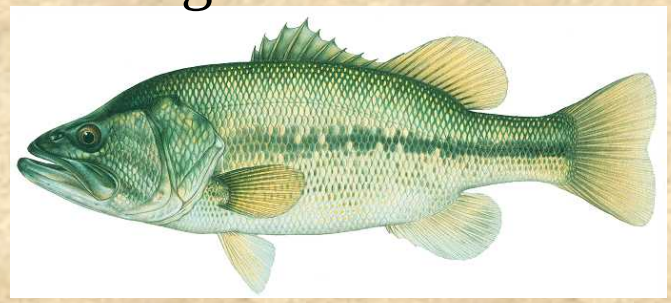
Clear water by spreading 50 pounds per acre of agricultural lime

or

Scatter 2 bales of hay per acre of water

Fish Stocking

Stocking **New Ponds** (fingerling size fish)

Species	# Per Acre	Size	When Stocked
Bluegill			
	**500**	**1”**	**Aug.-Sept.**
Largemouth Bass	**50**	**2”**	**June of next year**
	**50**	**2”**	**One year later**
Channel Catfish			
	**50**	**2”**	**Aug.-Sept.**

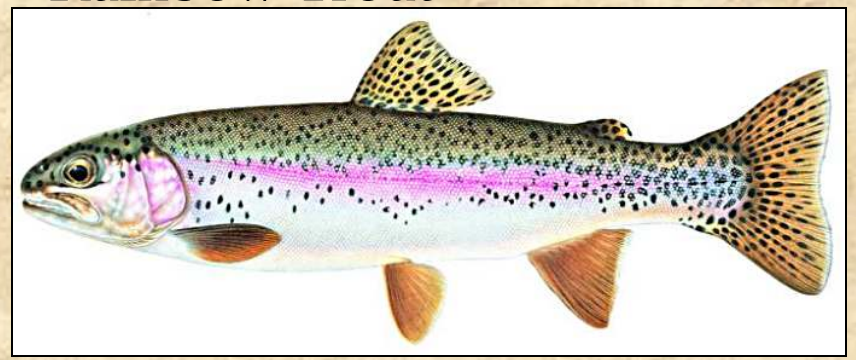
Redear Sunfish

"Shellcracker"

Can be stocked in-place of 1/3 of the Bluegill to add diversity.

Stocking “Trout Only” Ponds

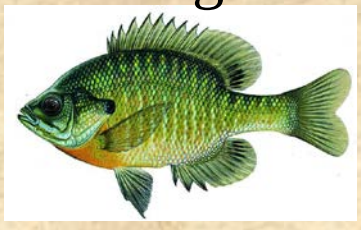
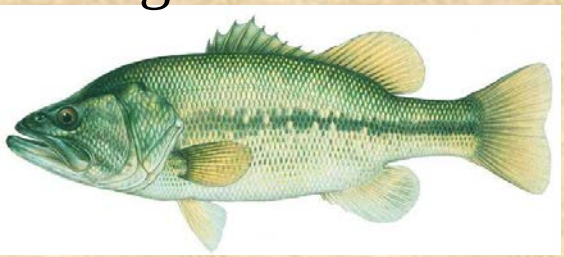
Rainbow Trout



# Per Acre	Size
100	> 8”
200	< 8”

Only stock trout greater than 8” if the pond contains adult largemouth bass.

Stocking **New Ponds** (**Adult** size fish)

Species	# Per Acre	Size	When Stocked
Bluegill 	**100**	**3”**	**April**
Largemouth Bass 	**20**	**12”**	**April**
Channel Catfish 	**50**	**10”**	**Oct.**
Fathead Minnow 	**500**	**1”**	**April**

The “Channel Catfish Only” Option

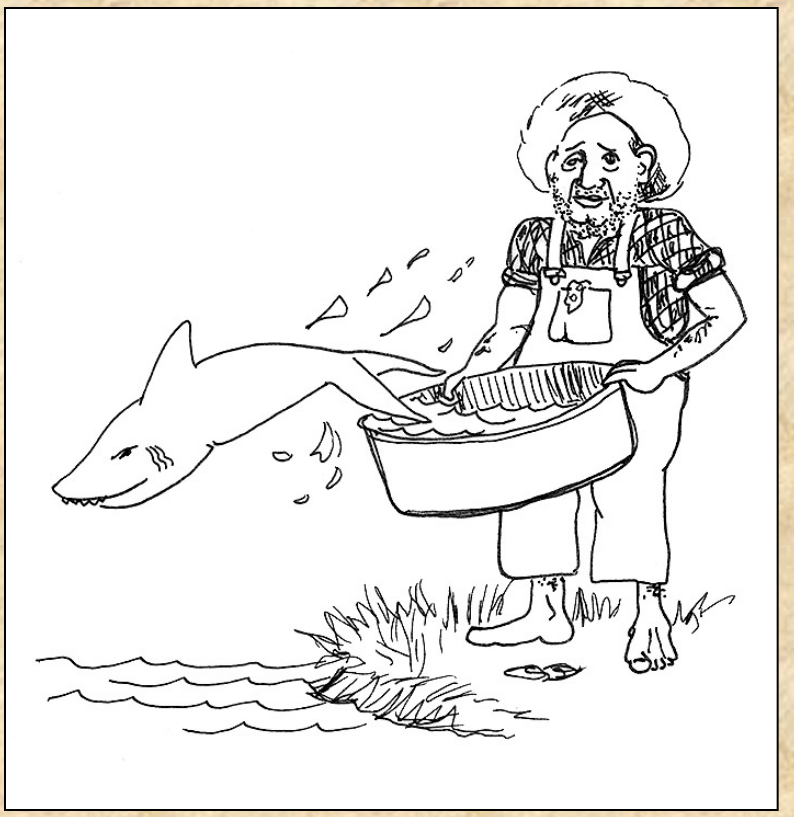
# Per Acre	Size
50 /ac or 500/pond	7-8”

Whichever is greater

Stocking adult fish may require supplemental feeding.

Small Impoundment Management

Stocking:



Fish to avoid:

- Crappie
- Bullheads
- Yellow perch
- Pumpkinseed
- Green sunfish
- Carp
- Israeli carp
- Suckers
- Flathead and blue catfish
- Threadfin and gizzard shad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Largemouth Bass

Bluegill

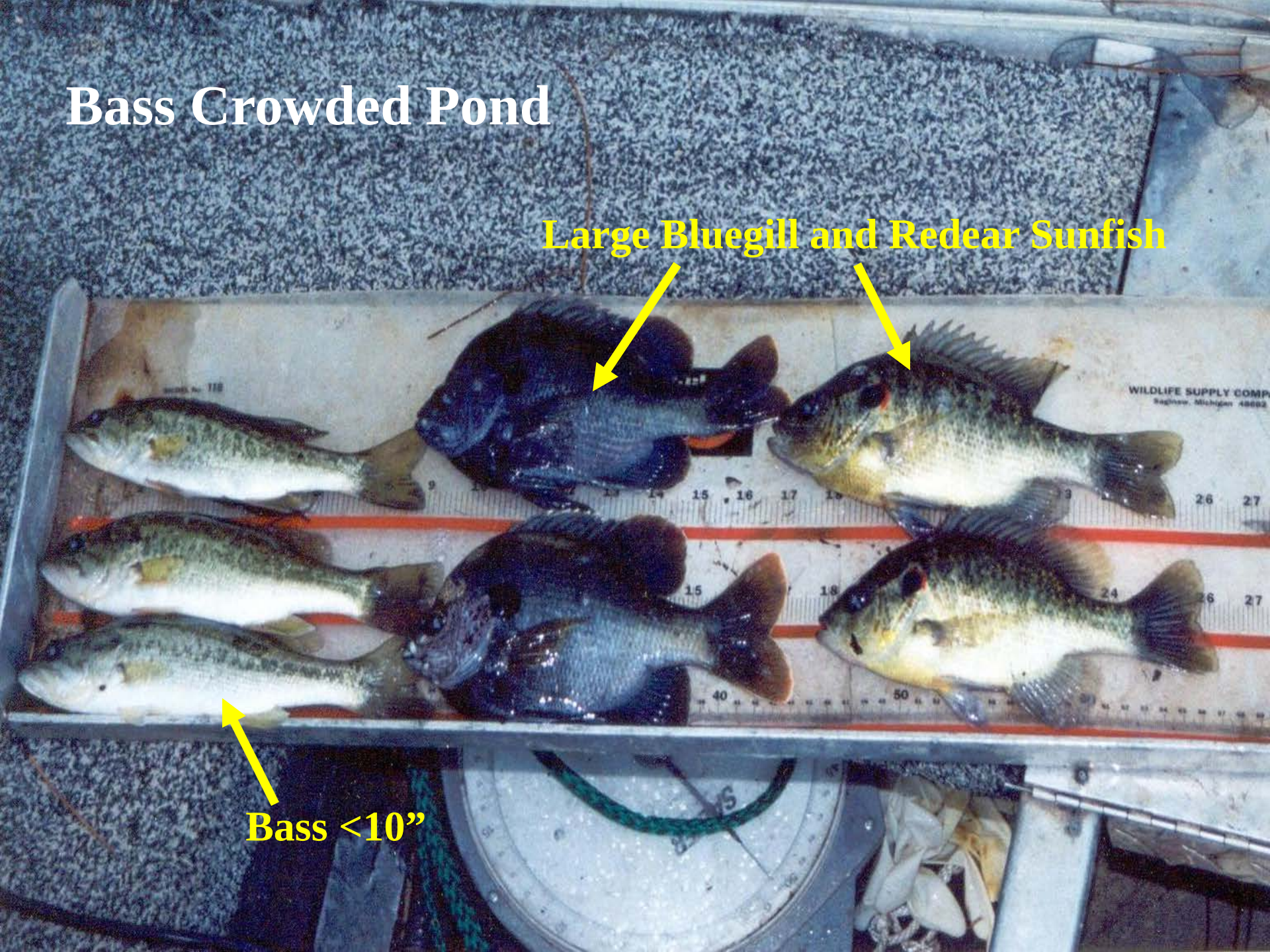
Channel Catfish

Redear Sunfish

How do I check the fish population in my pond?

- Hire a consultant to electrofish the pond
- Seine the pond yourself
- Angling

Electrofishing


Bass Crowded Pond
Large Bluegill and Redear Sunfish
Bass <10”


Seining
- Easy to Do
- Need 2 people

Balanced Population

-small/med bluegill

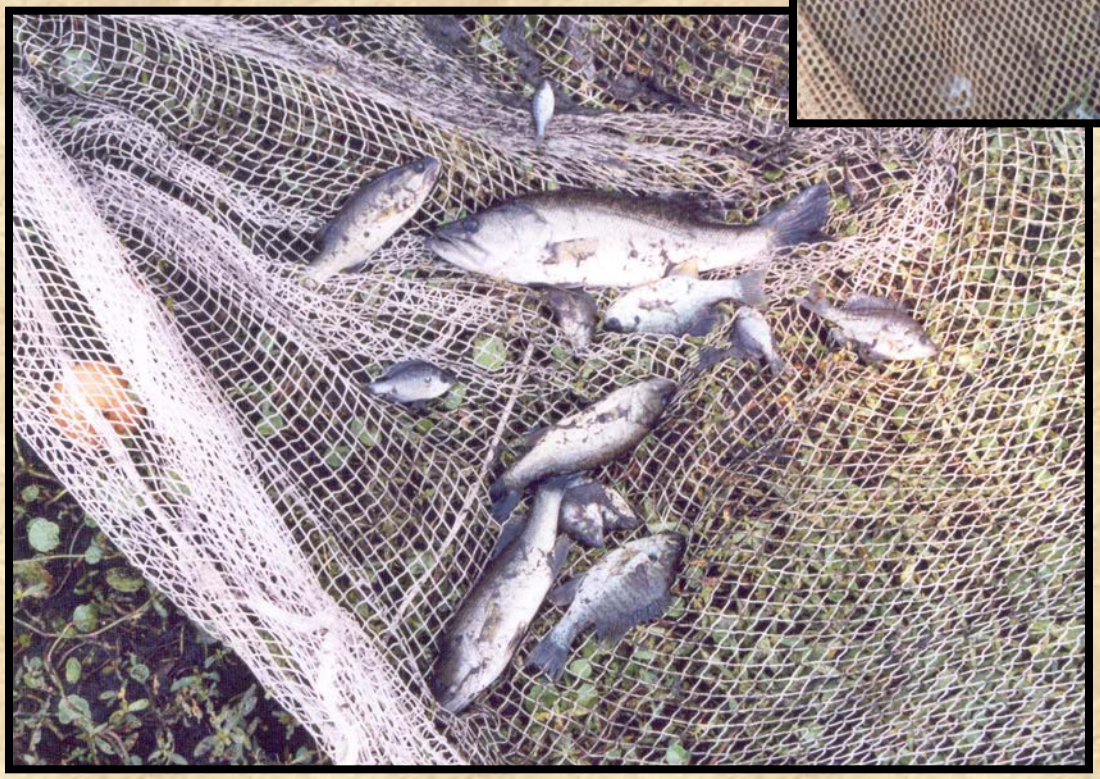
-Young of Year bass

Bass Crowded

-few 3-5” bluegills

-Mostly newly hatched bluegills

-Lots of YOY/juvenile bass



Unbalanced Population – undesirable species present

-Crappie present

-few 3-5” bluegills

-Mostly newly hatched bluegills

-Few YOY bass

Evaluation of Pond Balance Using Seine Data

Type of Fish Caught	Population Condition	Recommendations
Small and medium size bluegill and YOY bass	Balanced fish population	No management needed
Numerous 3-5 inch bluegill and few or no YOY bass	Unbalanced population; bluegill crowded	Allow no bass harvest; stock 20-30 adult bass (>12”) per acre
Few 3-5 inch bluegill; many recently hatched bluegill; YOY bass present	Balanced; but bass crowded	Increase harvest of bass less than 12 inches; stock 200 bluegill 3-5 inch per acre

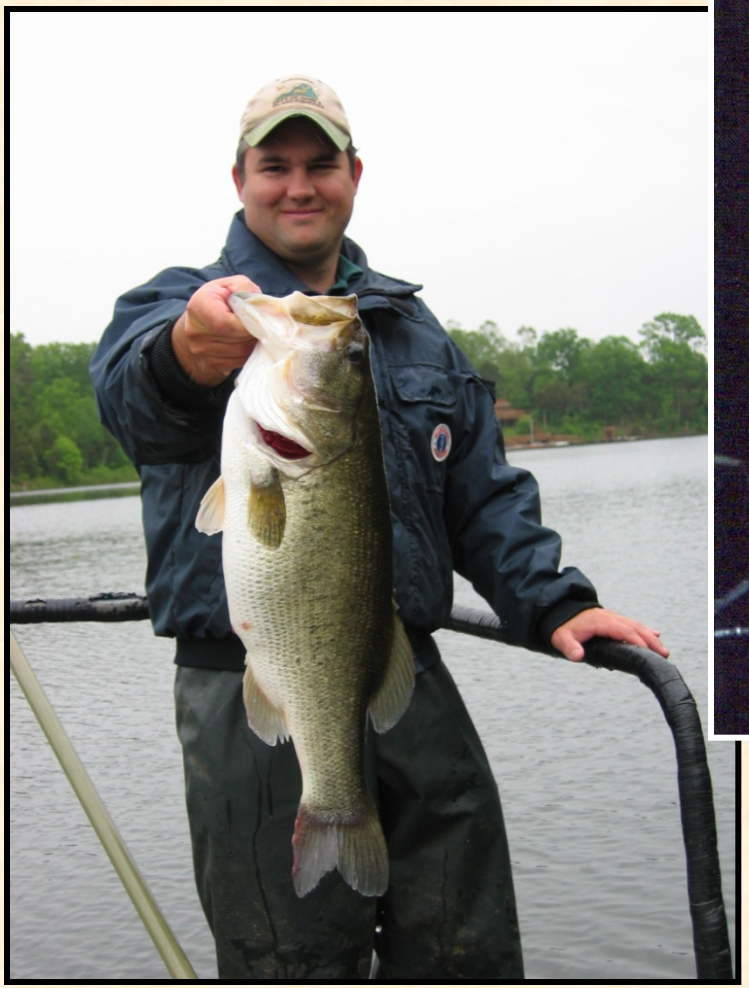
Evaluation of Pond Balance Using Seine Data

Type of Fish Caught	Population Condition	Recommendations
No recent hatch of bluegills; few medium-size bluegill; numerous undesirable species (crappie, carp, green sunfish etc.)	Unbalanced population; unwanted species competing with bluegill	Rotenone or drain and start over

Rotenone (Fish Toxicant) used to renovate ponds

Must be a licensed pesticide applicator to use Rotenone

Angling



Evaluation of Pond Balance Using Angler Catch Data

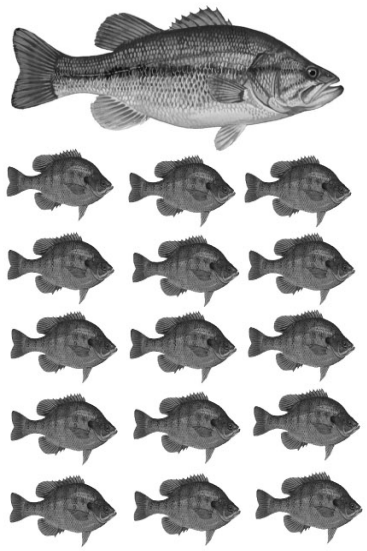
Type of Fish Caught	Population Condition	Recommendations
Bass and bluegills of all sizes	Balanced fish population	No management needed
Bluegills small (3-5”) few bass caught, bass average 2 pounds and larger.	Unbalanced population with bluegill overcrowded	Allow no bass harvest, stock 20-30 adult bass (>12”) per acre
Numerous bass less than 1 pound average; few bluegill, bluegill average 1/3 pounds or more	Unbalanced populations with bass overcrowded	Increase harvest of bass less than 12 inches; stock 200 bluegill 3-5 inch per acre

Evaluation of Pond Balance Using Angler Catch Data

Type of Fish Caught	Population Condition	Recommendations
Few adult bluegill; numerous undesirable species (crappie, carp, bullhead etc.)	Unbalanced population; unwanted species competing with bluegill	Rotenone or drain and start over

Small Impoundment Management

- **Management of Ponds**
  - **Adequate predation is the key to balance**
    - **Watch out for turbidity**
    - **LMB will migrate over spillways in high water**
    - **Too much aquatic vegetation inhibits predation**
      - » **rule of thumb = 20-30%**
  - **Harvest Regulation**
    - **Primary concern is LMB overharvest**
    - **Restrict harvest or access to ponds**



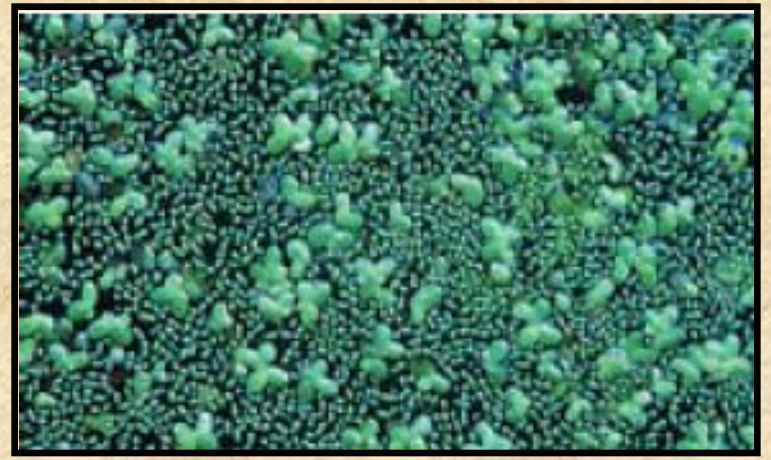
Harvesting Fish From Your Pond

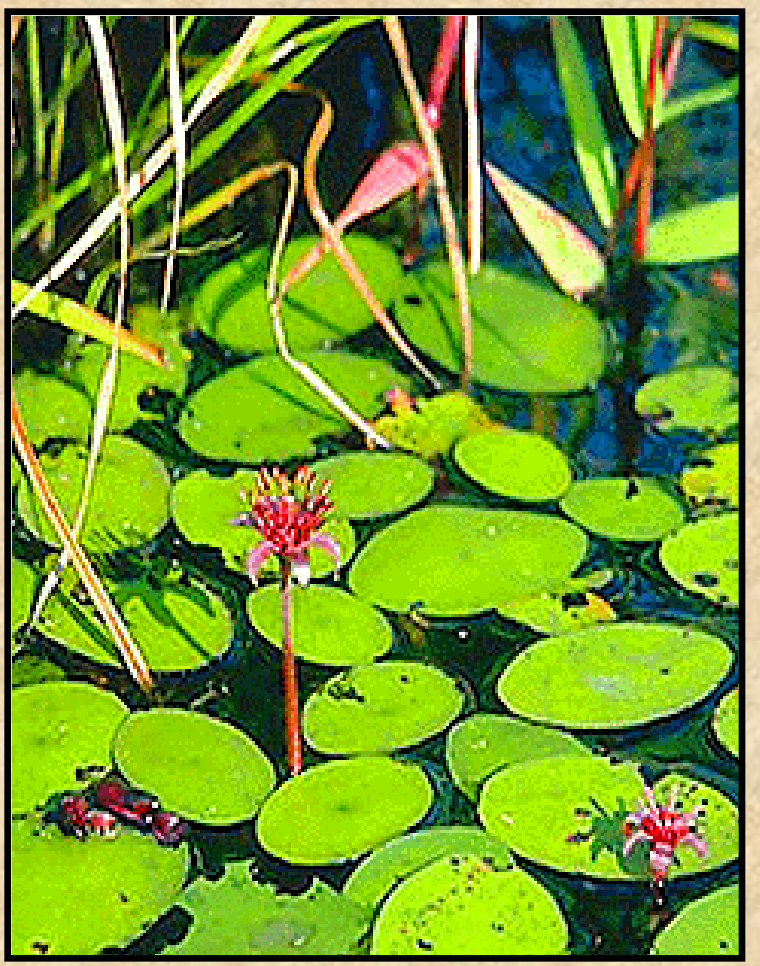
Remove 5 pounds of bluegill

for each pound of bass removed


Controlling Aquatic Weeds and Algae
JUL 15 2005

Floating Vegetation





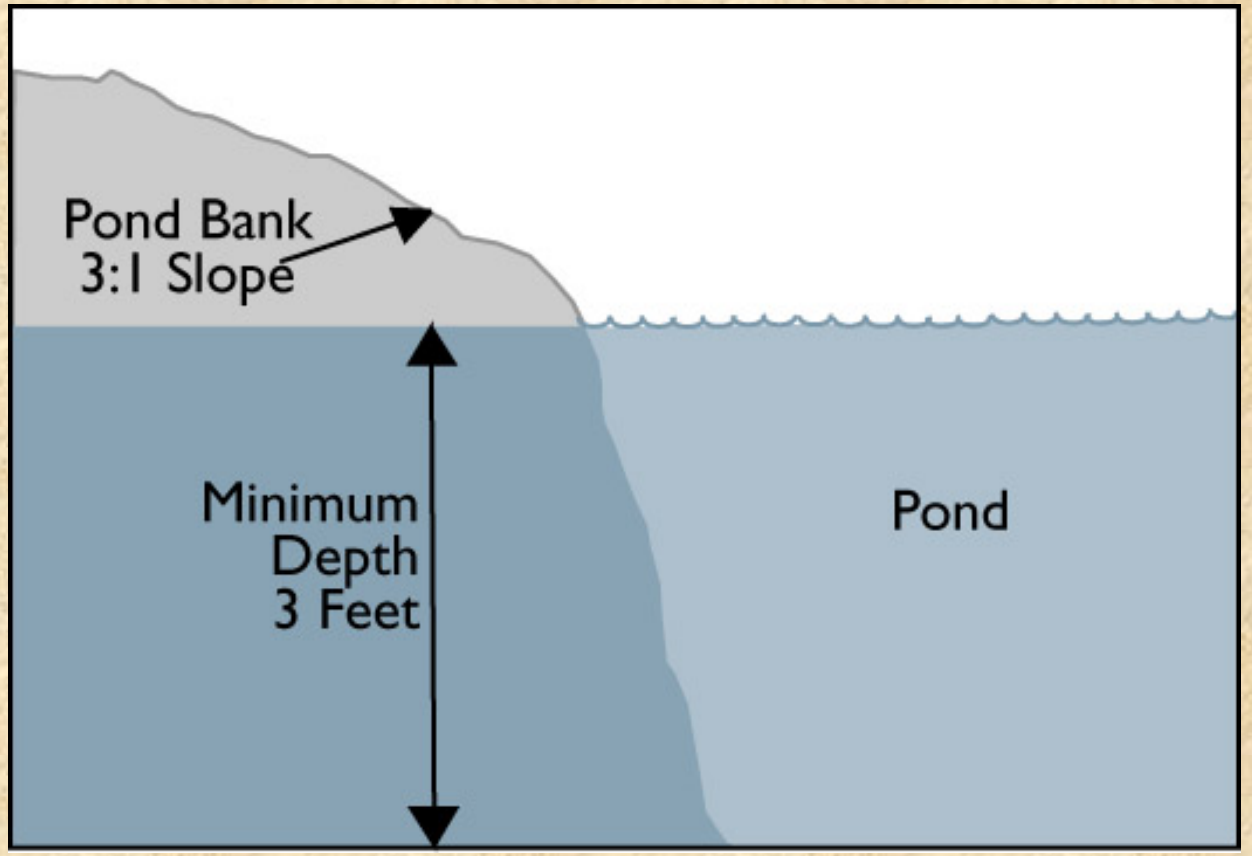
Emergent Plants

Submergent Vegetation

Nutrients + Sunlight = Aquatic Plants and Algae

Small Impoundment Management

- Construction Principles
  - Adequate depth at shoreline
    - Prevents excessive plant growth
    - 3:1 slope (1 meter depth at 3 meters from shore)




Reduce nutrient inputs by increasing vegetated riparian buffers around the pond

Methods of Vegetation Control

- **Manual Removal**
- **Biological**
- **Chemical**
- **Integrated Approach (Biological + Chemical)**


Manual Removal
-Labor Intensive
-Never Get Control

Biological Control

Triploid Grass Carp (White Amur)

- stock fish 10-12” in length
- stocking rate will vary depending upon %weed coverage
- <30% weeds = 2 fish/acre
- 30-60% weeds = 5 fish/acre
- >60% weeds = 10 fish/acre
- Need permit from DGIF
- Constant feeding action usually controls weed growth

CUTRINE-PLUS LIQUID
ALGAECIDE / HERBICIDE

WEEDTRINE-D
AQUATIC HERBICIDE

Navigate

Know what type of vegetation you are trying to control.

Follow the directions on the label (Federal Law).

Follow the Rule of 1/3's

Several applications might be necessary.

copper sulfate solutions are toxic to trout

CUTRINE-PLUS LIQUID
ALGAECIDE / HERBICIDE

Copper sulfate pentahydrate

Navigate

2-4-D

Sonar* A.S. Aquatic Herbicide

Fluridone

WEEDTRINE-D
AQUATIC HERBICIDE

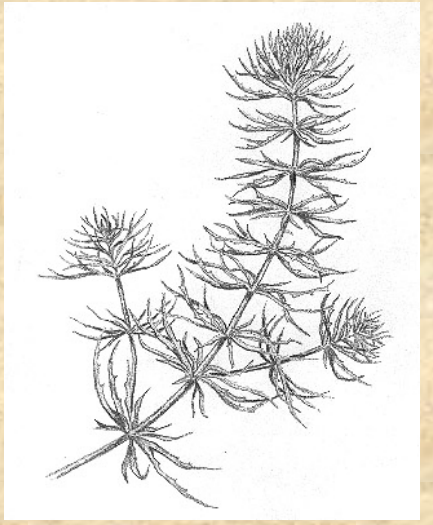
Diquat

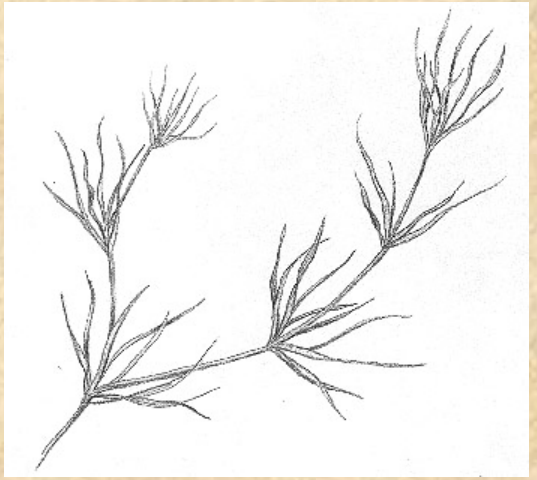
Concentrated bacteria

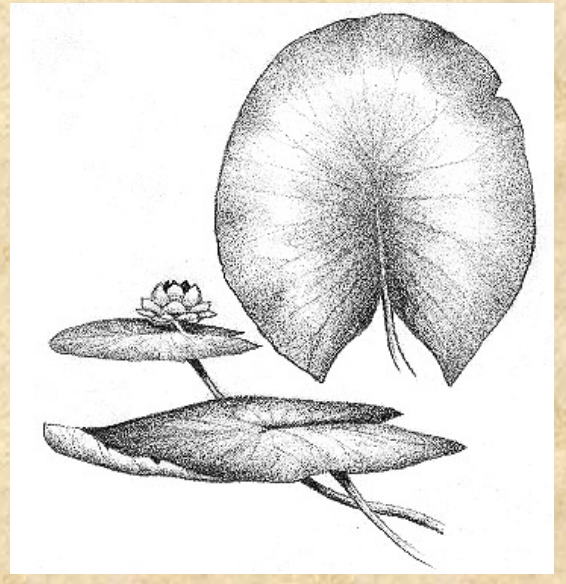
AQUASHADE®
AQUATIC PLANT GROWTH CONTROL

Blue dye

Proper weed identification is necessary prior to treatment







Controlling vegetation and algae should be done before the plants become excessive:

After the herbicide or algaecide is applied, the plants die and as they breakdown bacteria, naturally found in the water, helps decompose them which depletes the dissolved oxygen in the water and could cause a fish kill.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