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

**Types of water fished by respondents**

- Large lakes or reservoirs
- Small public lakes
- Warmwater rivers and streams
- Public coldwater rivers and streams
- Private lakes and ponds

Percent

0 20 40 60 80 100
Ponds are great for introducing kid’s to fishing
Basic Pond Limnology

Stratification Of Layers

Epilimnion Layer
(upper Layer)

Metalimnion Layer
(Middle Layer)

Hypolimnion Layer
(Bottom Layer)

8’ Max. Depth
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)

<table>
<thead>
<tr>
<th>Species</th>
<th># Per Acre</th>
<th>Size</th>
<th>When Stocked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluegill</td>
<td>500</td>
<td>1”</td>
<td>Aug.-Sept.</td>
</tr>
<tr>
<td>Largemouth Bass</td>
<td>50</td>
<td>2”</td>
<td>June of next year</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>2”</td>
<td>One year later</td>
</tr>
<tr>
<td>Channel Catfish</td>
<td>50</td>
<td>2”</td>
<td>Aug.-Sept.</td>
</tr>
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</table>
Redear Sunfish

“Shellcracker”

Can be stocked in-place of 1/3 of the Bluegill to add diversity.
**Stocking “Trout Only” Ponds**

<table>
<thead>
<tr>
<th>Rainbow Trout</th>
<th># Per Acre</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>&gt; 8”</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>&lt; 8”</td>
</tr>
</tbody>
</table>

Only stock trout greater than 8” if the pond contains adult largemouth bass.
Stocking **New Ponds** *(Adult size fish)*

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<th># Per Acre</th>
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<th>When Stocked</th>
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</thead>
<tbody>
<tr>
<td><strong>Bluegill</strong></td>
<td>100</td>
<td>3”</td>
<td>April</td>
</tr>
<tr>
<td><strong>Largemouth Bass</strong></td>
<td>20</td>
<td>12”</td>
<td>April</td>
</tr>
<tr>
<td><strong>Channel Catfish</strong></td>
<td>50</td>
<td>10”</td>
<td>Oct.</td>
</tr>
<tr>
<td><strong>Fathead Minnow</strong></td>
<td>500</td>
<td>1”</td>
<td>April</td>
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</table>
The “Channel Catfish Only” Option

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<th># Per Acre</th>
<th>Size</th>
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<tr>
<td>50 /ac or 500/pond</td>
<td>7-8”</td>
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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
How do I check the fish population in my pond?

• Hire a consultant to electrofish the pond
• Seine the pond yourself
• Angling
Electrofishing
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

<table>
<thead>
<tr>
<th>Type of Fish Caught</th>
<th>Population Condition</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small and medium size bluegill and YOY bass</td>
<td>Balanced fish population</td>
<td>No management needed</td>
</tr>
<tr>
<td>Numerous 3-5 inch bluegill and few or no YOY bass</td>
<td>Unbalanced population; bluegill crowded</td>
<td>Allow no bass harvest; stock 20-30 adult bass (&gt;12”) per acre</td>
</tr>
<tr>
<td>Few 3-5 inch bluegill; many recently hatched bluegill; YOY bass present</td>
<td>Balanced; but bass crowded</td>
<td>Increase harvest of bass less than 12 inches; stock 200 bluegill 3-5 inch per acre</td>
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## Evaluation of Pond Balance Using Seine Data

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<tr>
<td>No recent hatch of bluegills; few medium-size bluegill; numerous undesirable species (crappie, carp, green sunfish etc.)</td>
<td>Unbalanced population; unwanted species competing with bluegill</td>
<td>Rotenone or drain and start over</td>
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</table>
Rotenone (Fish Toxicant) used to renovate ponds

Must be a licensed pesticide applicator to use Rotenone
Angling
<table>
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<th>Type of Fish Caught</th>
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<tbody>
<tr>
<td>Bass and bluegills of all sizes</td>
<td>Balanced fish population</td>
<td>No management needed</td>
</tr>
<tr>
<td>Bluegills small (3-5&quot;) few bass caught, bass average 2 pounds and larger.</td>
<td>Unbalanced population with bluegill overcrowded</td>
<td>Allow no bass harvest, stock 20-30 adult bass (&gt;12&quot;) per acre</td>
</tr>
<tr>
<td>Numerous bass less than 1 pound average; few bluegill, bluegill average 1/3 pounds or more</td>
<td>Unbalanced populations with bass overcrowded</td>
<td>Increase harvest of bass less than 12 inches; stock 200 bluegill 3-5 inch per acre</td>
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## Evaluation of Pond Balance Using Angler Catch Data

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<tr>
<td>Few adult bluegill; numerous undesirable species (crappie, carp, bullhead etc.)</td>
<td>Unbalanced population; unwanted species competing with bluegill</td>
<td>Rotenone or drain and start over</td>
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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
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
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***
Copper sulfate pentahydrate

2-4-D

Fluridone

Diquat

Concentrated bacteria

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.