

Sportfish Pond Management



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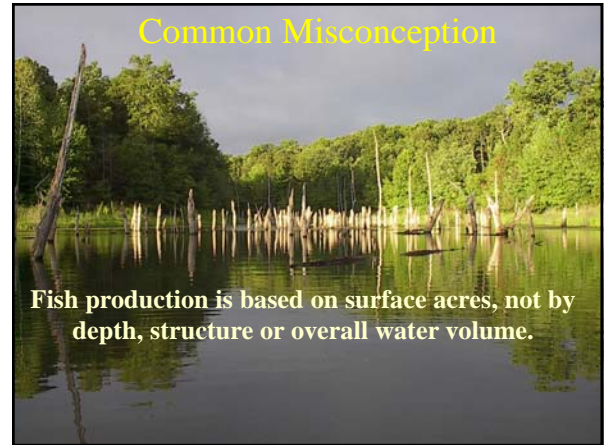


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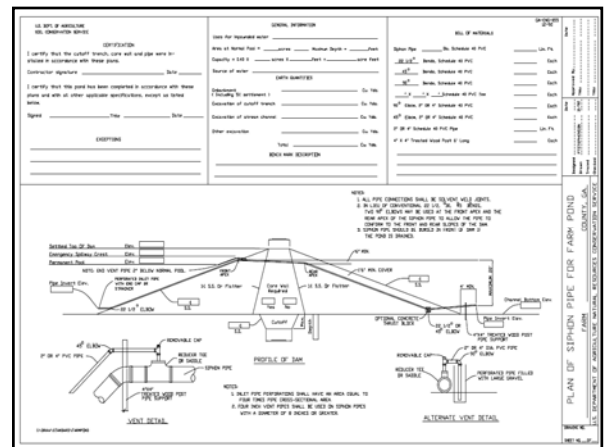
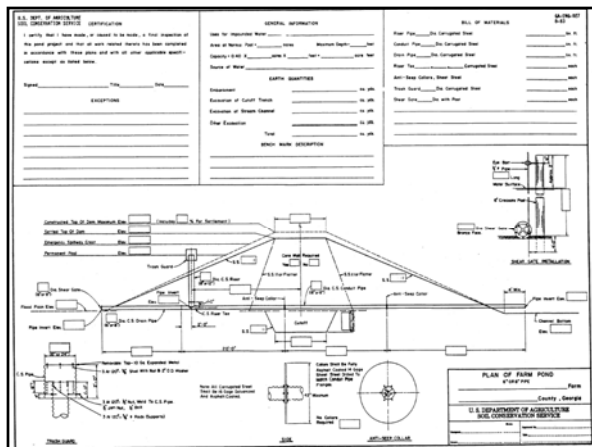
Ponds in Georgia

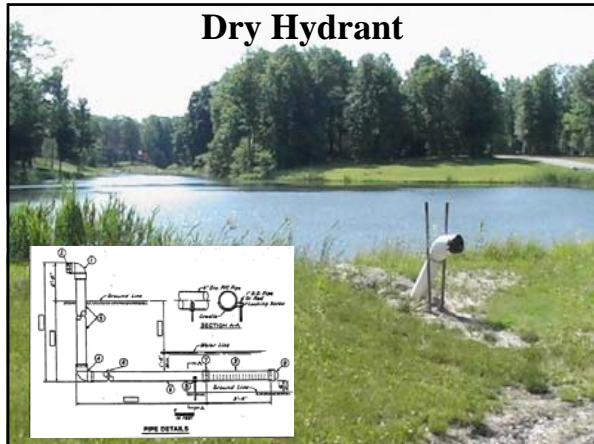
Few Natural Lakes
Most constructed to control
sediment or to irrigate
Most in need of renovation.



Common Misconception

Fish production is based on surface acres, not by
depth, structure or overall water volume.





Why the Bass & Bluegill Combo?

Dr. Homer Swingle
Auburn University
1930's – 1970's

Homer Swingle's Goals

1
Mosquito Control

2
Food for Farm Families

Swingle's Balanced Pond Approach

Satisfactory Fishing
Variety of Species
Variety of Sizes
Over a Period of Time

Changes in the 80's

- Swingle developed 10:1 ratio in late 1940s
- Replicated by state programs from 1950 to present
- Consistently produces crowded bass populations today

Pond Owner Profiles Have Changed

- Expectations are higher
- Fishing is for sport and not harvest
- Demand quality bass and bluegill



Dr. Claude Boyd Auburn University – Water Quality

- Developed methods for fertilizing and liming ponds in the 70's and 80's.



Management Techniques

- Liming
- Fertilization
- Population Balance
- Structure Enhancement
- Aquatic Vegetation Management
- Special Problems



Liming Ponds

Total Hardness > 20 ppm

Bulk Agricultural Lime

Broadcast Applications Best

Cover the Entire Pond Surface

Professional Liming Barges on Large Ponds Ideal

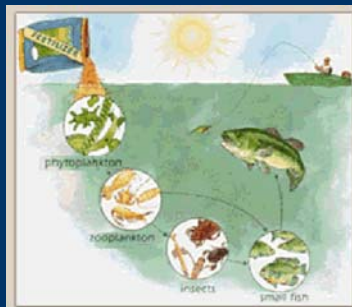


Fertilization Supplements the Food Chain

More Fish - Not Bigger Fish

Multiplies the Base of the Food Chain

Increases Carrying Capacity 4X



Unfertilized versus Fertilized



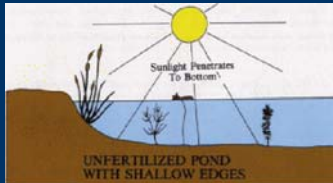
Proper Fertilization

Multiple Apps Per Year - Begin in Feb. March

Aquatic Weed Prevention

Once Started it Must be Done Annually

Improper Fertilization, # 1 Cause of Most Problems



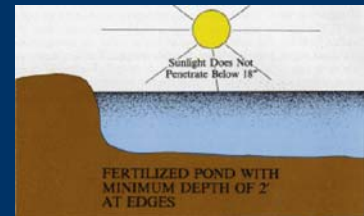
Proper Fertilization

5-10 Applications per year

Timing of applications determined using secchi disk

Shades out weeds

Improper Fertilization, # 1 Cause of Most Problems



Using the Secchi Disk

Professional Disk \$25

Measures visibility

Measure frequently

Pie pan, 5 gal bucket lid w/ weight.



SECCHI DISK MEASUREMENT	RECOMMENDED MANAGEMENT
24 inches or greater	Fertilize.
18-24 inches	Good Bloom. No Action.
12-18 inches	Dense Bloom. Watch.
6-12 inches	Bloom Too Dense. Find Cause. Prepare to Aerate.
6 inches or less	Likely Oxygen Depletion. Aerate at Night.

Comparison of Fish Pond Fertilizers

Auburn University tested the effectiveness of granular, liquid, powdered water-soluble (WSF), and controlled-release fertilizers (CRF). The following chart summarizes the results of fertilizer comparisons.

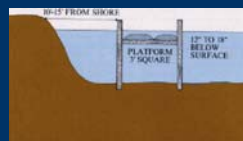
Fertilizer	Applications		Fish Production ¹ Lbs./Acre	Cost \$/Acre	Comments
	No./Year	Lbs./Acre/Year			
None	0	0	100	0	No cost involved but poor fish production.
Granular	10	12	335	\$56	Increased fish production three-fold. Disadvantage in application on platforms, slow to dissolve and higher costs.
Liquid	10	40	321	\$30	Increased fish production three-fold and instantly available in pond.
WSF	10	2	305	\$28	Increased fish production three-fold and rapidly dissolves in water.
CRF	1	69	317	\$32.50	Increased fish production three-fold, less applications, and constant rate of nutrients available.

Fertilization Tips

Use a platform with granular fertilizers.

Dilute liquid fertilizers and slowly disperse in propwash.

Water soluble seems expensive, but overall is most efficient.



Pond Dyes / Aquashade

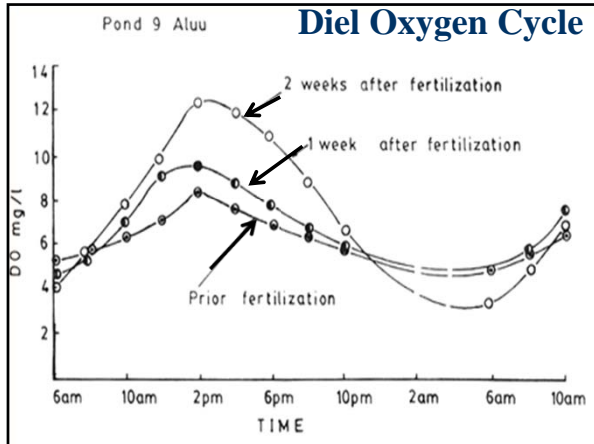
Turns Water Blue

Application Rates Based on Flow

Limits Productivity

Turnover Problems





Is Aeration Necessary?

- Commercial Production – Yes
- Homeowners - No
- Best for emergencies only.

Carrying Capacity

- Overstocked Ponds
- Fish Kills
- Algae Problems
- Balance Issues

Untimely Oxygen Depletion The Not-So Seasonal Turnover?

Symptoms	Root Causes
• Heavy Bloom	• Overfertilization
• Cloudy Days/ Heavy Rain	• Overstocking
• Extremely Windy Days	• Overfeeding

Feeding Fishes in Ponds

Typically feed what the fish normally consume in 15 minutes.

Floating feed easier to monitor.

Feeding during late fall/winter/early spring critical when water temp > 50 F.

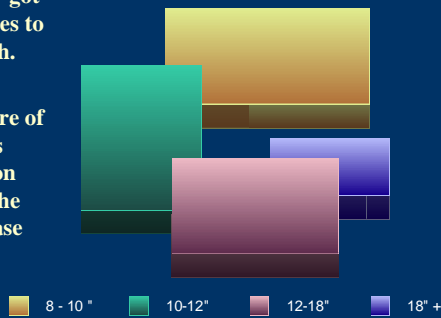
Population Structure

- Balanced
- Bass Heavy
- Bluegill Heavy
- Competing Species

Bubba's Bass Pie - A Balanced Pond

You've only got so many slices to work with.

The Structure of the Bass Population Dictates the Forage Base

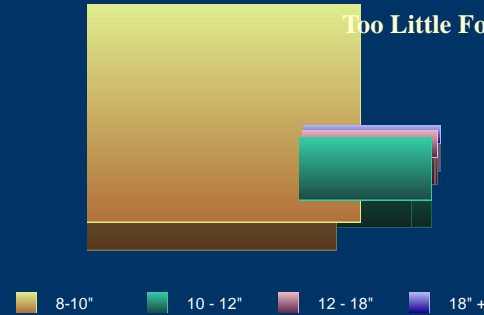


Bubba's Bass Pie - A Bass Heavy Pond

Typical Stunted Population

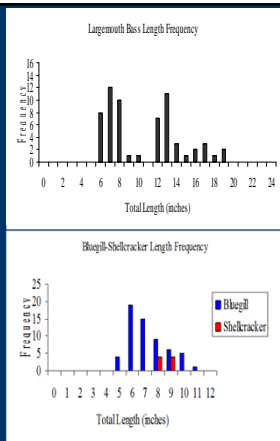
Too Many Bass

Too Little Food



Crowded Bass

- Bimodal distribution
- 85% of lakes electrofished are bass crowded
- Attributed to low harvest
- Where are the 3-5" gills?
- No food for quality bass is available?

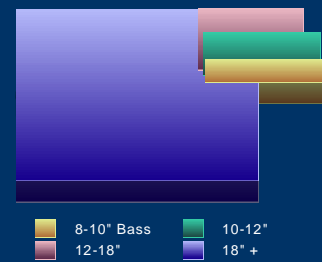


Bluegill Heavy or Competing Species

Poor Bass Reproduction

Forage is Too Large

Few Bass - Nobody's Hungry



Stocking Your Pond

What Type of Fishing Do You Desire?

Who Will Be Fishing?

How Many Anglers?

How Many Fish do You Eat?



Take a Kid Fishing

First Time Experiences

Quality Time

Appreciation for the Outdoors

DNR KFE Program Provides Free Catfish



Common Species to Georgia Largemouth Bass

Swingle Standard

Excellent Fishing
Value

Easily Managed
Using Harvest
Manipulation

50 Per Acre



Common Species to Georgia Bluegill & Coppernose Bluegill

Swingle Standard

Excellent Forage

Excellent Fishing

Excellent
Mosquito Control



500 Per Acre as only forage fish.

400 Per Acre if stocked with Redear

Threadfin Shad

Stocked at 200 – 500 per acre

Provide abundance of 2-3"
forage

Creates a situation where 3-5"
bluegill thrive

Gizzard Shad or Golden
Shiners in select situations

Other states use Tilapia as well
25-50 ½ pound fish per acre in
late May – Illegal in GA



Common Species to Georgia Fathead Minnows

Initial Pond Stocking

3-5 lbs per acre

Eliminated quickly

Get Bass off to Quick Start,
Protects the Bluegill



Common Species to Georgia Triploid Grass Carp

Stocked for
Vegetation Control

Greatest Impact at
12-24" in Length

Metabolism Slows
with Age

~ 7 Years of
Productivity



5 Per Acre Preventative
10-20 Per Acre Corrective



What do we do
about large grass
carp?

Common Species to Georgia Rainbow Trout

Special Situations in
NGA or Winter
Stockings

Active Feeders &
Easy Harvest in
Ponds During Cold
Months

Interesting
Alternative



Common Species to Georgia Hybrid Striped Bass or Sunshine Bass

Expensive

Maintained with
Trout Feed

Put & Take

Fingerlings \$0.50 ea

Adults \$3-5 / lb



500-1000 per acre

Common Species to Georgia Redear - Shellcracker

Swingle Standard

Stocked for Variety

Excellent Fishing



100 per acre in balanced pond

Along with 400 Bluegill

Common Species to Georgia Channel or Blue Catfish

Excellent Food Fish

Easy to Stock & Feed

50 per acre in balanced pond

Can become a problem when
not harvested?

Do not exceed 250 lb / acre to
avoid competition.



Undesirable Fishes for GA Ponds Crappie

Undesirable Fish Species
Typically Overpopulate in
Ponds

Need Large Bodies of
Water, Clear Water,
Structure & Vegetation

Bass Heavy Ponds?



Undesirable Fishes in GA Ponds Green Sunfish

Where there's
water there's Green
Sunfish.

Tend to
Overpopulate &
Stunt.

Poor Forage -
Competitive Species



Undesirable Fishes in GA Ponds Hybrid Bluegill – Georgia Giants

Bluegill x Green Sunfish
Poor Forage Species
Most of Reproduction Green Sunfish
OK in Special Situations



Undesirable Fishes in GA Ponds Carp, Speckled, Bullheads or Mud Cats

Muddy Water
Poor Fishing
Undesirable Species



Pond Renovation

Treat Puddles Not Ponds

- Chlorine – 38.8 pounds of the 70% calcium or sodium hypochlorite formulation per acre/ft of water.
- Rotenone - rule of thumb 1/2 Gal. 5% Rotenone / Acre Foot

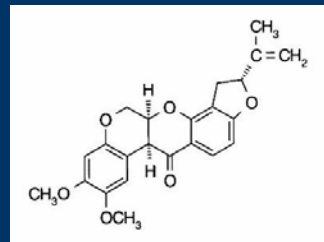


Prentiss = 478-552-1167

Rotenone Breakdown

Compound Breaks Down to CO₂, Safe Within 5-6 Weeks - Faster in Warmer Water. Test Using Fishes in a Cage for 2-3 Days.

Applicators Need a Pesticide License



Balanced Populations

A Variety of Fishes of a Variety of Sizes

Stock: 50 LMB
400 BG
100 RE
50 CC

Harvest Catfish as they reach 1 lb in size.

Harvest 10-15 lbs of 8-10" Bass in year 3



Managing For Trophy Bluegill

Management Goal for Hand-Sized Bluegills

Stock: 400 BG
100 RE
50 - 100 LMB

Restrict all LMB Harvest
Excellent Lake for #'s & BG or RE



Managing For Trophy Bass

Stock: 25-50 LMB
 2-3 lbs Fatheads
 500 Blugill
 500 Threadfin
 Liming
 Fertilization
 Intensive Bass Harvest



Harvest Manipulation for "Bucketmouth Bass"

Begin intensive harvest at year # 3
 Harvest based on relative weight calculations
 Every pond is different based on it's natural productivity



Fish Stocking

We stocked this lake at a 44:1 ratio compared to the typical 10:1 ratio.

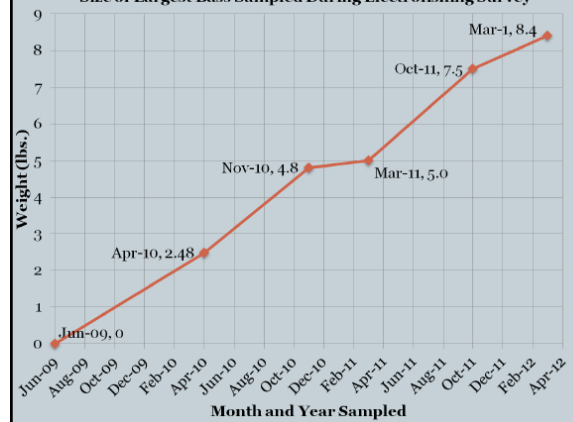
The bluegill, redear sunfish, fathead minnows, and grass carp were stocked in March of 2009.

The threadfin shad, golden shiners, and crayfish were stocked in April of 2009.

The bass were stocked in June of 2009 and hybrid striped bass July of 2009 and advanced largemouth bass were stocked in August 2009.

Species	Size	Per Acre Rate	Total
Coppernose Bluegill	1-2"	2,000	62,000
Redear Sunfish	1-2"	200	6,200
Fathead Minnows	Adults	2,000	62,000
Threadfin Shad	Adults	-	2 Loads (8,000)
Golden Shiner Fry	Fry	100,000	Three Million
Crayfish	-	40 lbs.	1,240 lbs.
Grass Carp	8-10"	1	31
Largemouth Bass (Florida, Northern, F1)	2"	40	1,240
Largemouth Bass (Advanced F1's)	3-4"	10	310
Hybrid Striped Bass	1-2"	10	310

Size of Largest Bass Sampled During Electrofishing Survey



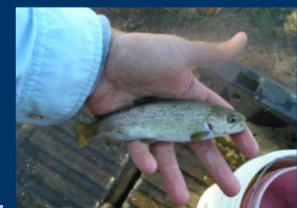
Florida Strain Largemouth

Less Aggressive
 FL Strain Doesn't Replace Harvest Manipulation
 Current Research in F1 Hybrid = Tiger Bass
 Research suggests stocking 20-30 FL Strain every 3 years for genetic improvement & F1's



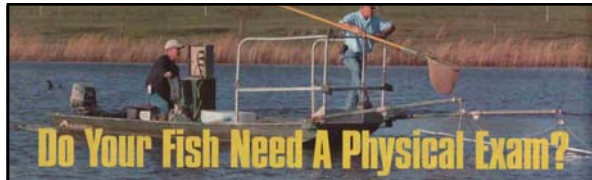
Additional Forage Options

- Fall/Winter Trout
- Summer Tilapia
- Golden Shiners
- Blueback Herring
- Gizzard Shad
- Crawfish



Harvesting Male Bass

- Prespawn - Males
 - Preparing Beds
 - Worn Tails
- Spawn
 - Clean, white, no genital papilla.
- Postspawn
 - Guarding Fry



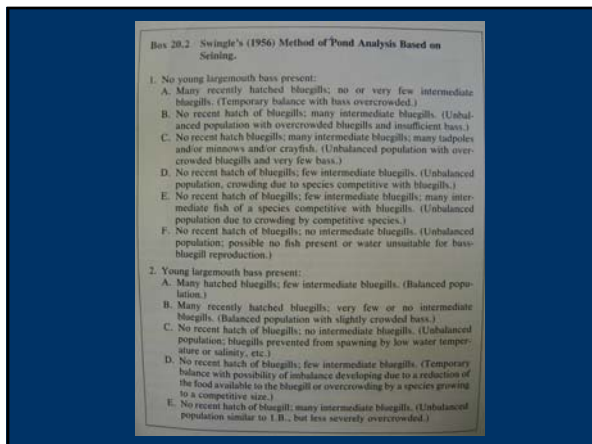
Swingle Seine Haul Analysis
 Angler Catch Records
 Electrofishing Surveys
 Relative Weight Calculations
 Proportional Stock Density

Swingle Seine Haul Analysis

Inexpensive to conduct

Monitors YOY

Best applied June - Sept



Electrofishing

Method to Assess Adult Fish Population for Balance & Structure.



Wedge & Anderson's Relative Weight Equation

A length/weight relationship.

How fat/skinny a fish is when compared to a standard fish of a given length.



RELATIVE WEIGHT (RW) TABLE			
• Largemouth Bass		• Bluegill	
Length	Std. Wt.	Length	Std. Wt.
10	0.6	6	0.2
10.5	0.6	6.5	0.2
11	0.7	7	0.2
11.5	0.8	7.5	0.3
12	0.9	8	0.4
12.5	1.0	8.5	0.4
13	1.1	9	0.6
13.5	1.3	9.5	0.7
14	1.5	10	0.9
14.5	1.6	10.5	1.0
15	1.8	11	1.2
15.5	2.0	11.5	1.4
16	2.2	12	1.6
16.5	2.5	12.5	1.8
17	2.7	13	2.1
17.5	3.0	13.5	2.4
18	3.2	14	2.7
18.5	3.5	14.5	3.0
19	3.9	15	3.4
19.5	4.2		
20	4.5		
20.5	4.9		
21	5.3		
21.5	5.7		
22	6.2		
22.5	6.6		
23	7.1		
23.5	7.6		
24	8.1		
24.5	8.7		
25	9.3		
25.5	9.9		

Relative Weight Formulas

Table 20.2 Equations for calculating standard weight for a given length to be used in relative weight (W_r) computations.

Species	Equation*	Source
Largemouth bass	$\log W_s = -5.316 + 3.191 \log L$	Wege and Anderson (1979)
Smallmouth bass	$\log W_s = -4.983 + 3.055 \log L$	Anderson (1980)
Bluegill	$\log W_s = -5.374 + 3.316 \log L$	Anderson (1980)
Green sunfish	$\log W_s = -4.8139 + 3.0558 \log L$	Gabelhouse*
White crappie	$\log W_s = -5.642 + 3.332 \log L$	Neumann and Murphy (1991)
Black crappie	$\log W_s = -5.168 + 3.345 \log L$	Neumann and Murphy (1991)
Channel catfish	$\log W_s = -5.649 + 3.243 \log L$	Anderson (1980)
Rainbow trout	$\log W_s = -5.194 + 3.098 \log L$	Anderson (1980)

*Total length is in millimeters and weight is in grams.
 *D. W. Gabelhouse, Jr., Kansas Fish and Game Commission, personal communication.

Let's Try an Example

Glen just bought a pond & he'd like it to produce Trophy Bass.



While fishing he immediately catches a few 12" Bass that weigh 0.75 lbs.

What Can We Infer?

Calculating Glen's RW

Looking at the table we find the fish's "standard weight at 12" is 0.9 lbs.

Divide the actual weight by the standard weight and multiply by 100.

$$0.75 / 0.9 * 100\% = 83\%$$

Try to average 20-30 fish of each species for better accuracy.

Management Recommendations

Pond is balanced, but may be tending towards bass heavy.

Reduce #'s of bass by 10 lbs per acre in 10-12" class.

Preferably in early spring.

Consider fertilization & forage enhancement.



Structure & Habitat Improvements




Be Creative

Brush Piles, Trees, Tires, Junk Cars, etc.

Goal - Moderate Cover, Something Unique

Providing large structure items will provide ambush predators, such as largemouth bass, orientation and ambush points.

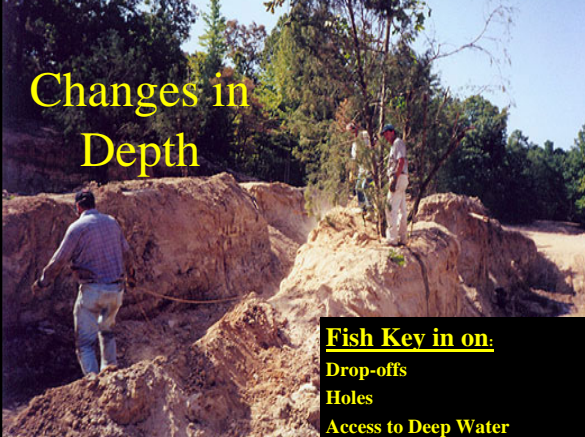
These areas were created using large material such as tree trunks and by reshaping the lake bottom to create points, drop-offs, ridges, etc.



**Design/Construction
(Orientation/Ambush Points)**



Changes in Depth



Fish Key in on:

- Drop-offs
- Holes
- Access to Deep Water


Spawning Area Enhancement

Great option for older ponds

Gravel piles

Sand flats

Inexpensive & Effective



Throughout the lake we created "spawning flats" by smoothing out the lake bottom along the shoreline.

These areas were created in water depths ranging from 2-4 feet.

After these areas were graded, they were covered with pea gravel to provide the fish with the ideal substrate to build their nest.



**Design/Construction
(Spawning Areas)**



Disease Problems & Fish Kills

Step # 1 - Assess the Situation, Numbers, % Infected

Step # 2 - Is it a Water Quality Problem?

Step # 3 - Is it a Carrying Capacity Problem?

Step # 4 - Will Fishes Accept Pelleted Feed?



Clearing Muddy Ponds

Find the Cause

Undesirable Species

Poor Watershed Management

Undesirable Water Source



Bryozoans

Colonial Bacteria

Common in Ponds

Sign of Good Water Quality



Turtles

No evidence of impact on fish populations

Easily trapped and removed



Control of Weeds

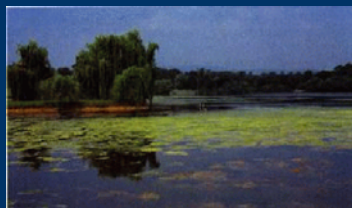
Identify the plant pest

Assess the acreage of infestation

Know total pond acreage, average depth, flow rates

Select labeled treatment

Timing of Applications is Critical!



Plant Identification

Weed Management Techniques

Herbicide Recommendations

Ornamental Propagation Techniques



<http://aquaplant.tamu.edu>

Common Species to Georgia Tripliod Grass Carp

Stocked for
Vegetation Control

Greatest Impact at
12-24" in Length

Metabolism Slows
with Age

~ 7 Years of
Productivity



5 Per Acre Preventative
10-20 Per Acre Corrective

Chemical Weed Control

Aquatic Label

Active Ingredient

Immediate Impact

of Applications

Potential Problems



Herbicide Modes of Action Systemic

Systemic herbicides are absorbed and move within the plant to the site of action. Systemic herbicides tend to act more slowly than contact herbicides.

Sonar and Avast = fluridone

Navigate and Aqua-Kleen = 2,4-D

Habitat = imazapyr.

Renovate = triclopyr

Rodeo, Aquamaster, Eraser AQ,
Touchdown Pro, and AquaNeat are =
glyphosate



Herbicide Modes of Action Contact

Contact herbicides act quickly and kill all plants cells that they contact.

Reward = diquat.

Aquathol, Aquathol K, and
Aquathol Super K =
dipotassium salts of
endothall.

Hydrothol 191 = alkylamine
salt of endothall.

Citrine Plus, K-Tea, Captain,
and Cleargate = chelated or
compound copper
herbicides.

Copper Sulfate or "blue stone"



Prices of Chemicals

Sonar AS - \$679 / qt

2, 4-D - \$65 / gal

Reward - \$150 / gal

Rodeo - \$120 / 2.5 gal

Aquathol - \$250 / 2.5gal

Habitat - \$520/ 2.5 gal

Renovate \$160/ acre

Navigate -2 4D granular \$209/50 lb

Quantity discounts?

Price of chemical often decides which
treatment alternative is best



Choosing a Pond Consultant

Bonded & Insured

Qualifications

References

Proper Equipment

Local



www.caes.uga.edu/commodities/animals/aquaculture/consultants.html

Algae – Planktonic & Filamentous

Step # 1 Prevention

Check Water
Hardness/Alkalinity

Slow/Filter Runoff

Fertilization Problems?

Overstocking/Overfeeding?



Algae – Planktonic & Filamentous

Copper sulfate - bluestone (avoid if hardness is under 50 ppm -extremely toxic to trout)

Citrine, Algae Pro, K-Tea - chelated copper - see label - 0.6 - 1.6 gal/ acre depending on product & hardness levels.

Endothal + Copper Sulfate (1 gal + 5 lbs / acre) - Do not irrigate or water livestock for 14 days. Also do not eat fish for 3 days.

Diquat, Reward plus copper sulfate (1 gal / acre)

Sodium Carbonate Peroxyhydrate – Green Clean Pro is a non-copper based alternative for algae.

Treat 1/3 pond each 7-10 days until control is achieved.



Alligator Weed

Grass Carp – low preference

EXCELLENT CONTROL

Habitat = imazapyr. Use Adjuvant

Renovate = triclopyr. Add surfactant

GOOD CONTROL

Navigate or Aqua-Kleen = 2 4-D

Rodeo, Aquamaster, Eraser AQ, Touchdown Pro, and AquaNeat = glyphosate. Add surfactant

Sonar, Whitecap or Avast = fluridone

Clipper = imazamox



American Lotus

EXCELLENT CONTROL

Navigate or Weedar 64 = 2 4-D

Renovate = triclopyr. Add surfactant

GOOD CONTROL

Clearcast = imazamox

Aquathol= dipotassium salts of endothal.

Hydrothol 191 = alkylamine salt of endothal.

Reward = diquat. Add surfactant



Bladderwort

Notice the small air bladders on this rootless plant. Generally submersed with finely dissected leaves.

GOOD CONTROL

Navigate or Weedar 64= 2 4-D

Reward = diquat.

Clearcast = imazamox

Sonar, Whitecap, or Avast = fluridone



Chara & Nitella

Common problem in ponds with low hardness and alkalinity that receive nitrogen from fertilizer or runoff.

Chara is crunchy & has a distinct odor

Copper sulfate - bluestone (avoid if hardness is under 50 ppm -extremely toxic to trout)

Citrine, Algae Pro, K-Tea - chelated copper


Endothal + Copper Sulfate (1 gal + 5 lbs / acre) -Do not irrigate or water livestock for 14 days. Also do not eat fish for 3 days.

Grass Carp - 6 - 10 / acre

Treat 1/3 pond each 7-10 days until control is achieved.



Cattails



Spread by creeping rootstalks & seeds.

EXCELLENT CONTROL
 Rodeo, Aquamaster, Eraser AQ, Touchdown Pro, and AquaNeat = glyphosate. Add surfactant

Habitat = imazapyr. Use Adjuvant

Clearcast = Imazamox

Duckweed

Complete irradiation critical. One patch can lead to reinfestation.

Diquat, Reward - 3/4 gallon plus 8 ounces of surfactant per 50 gallon tank mix.

Galleon – penoxsulam

Clipper – flumioxazin

Sonar, Whitecap, Avast - floridone




Egeria

Anachris in the tropical fish trade. Whorled oval leaves in 4's.

Grass Carp - High Preference

EXCELLENT CONTROL
 Reward & Copper = diquat plus copper

Aquathol, Aquathol K, and Aquathol Super K = dipotassium salts of endothall.

Hydrothol 191 = alkylamine salt of endothall.

GOOD CONTROL
 Galleon = Penoxsulam

Sonar, Whitecap or Avast = floridone




Eurasian Watermilfoil

Grass Carp – low preference

EXCELLENT CONTROL
 Navigate or Aqua-Kleen = 2 4-D



Reward & copper = diquat & copper mixed.

Aquathol, Aquathol K, and Aquathol Super K = dipotassium salts of endothall.

Hydrothol 191 = alkylamine salt of endothall.

Renovate = triclopyr.
 Galleon = penoxsulam

GOOD CONTROL
 Tradewind = bispyribac-sodium
 Clipper = flumioxazin
 Clearcast = imazamox
 Sonar, Whitecap or Avast = floridone

Fanwort – Cabomba


Grass Carp - Moderate Preference

EXCELLENT CONTROL
 Aquathol, Aquathol K, and Aquathol Super K = dipotassium salts of endothall.

Hydrothol 191 = alkylamine salt of endothall.

Sonar or Avast = floridone

GOOD CONTROL
 Reward = diquat. Add surfactant
 Clipper = flumioxazin
 Galleon = penoxsulam



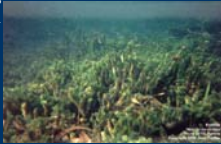

Hydrilla

Rooted plant or floating mat. Upper leaves whorls of 3 while lower leaves are small and opposite. Serrated leaf margins - underside leaf toothed.

Grass Carp - High Preference

EXCELLENT CONTROL
 Sonar, Whitecap or Avast = floridone
 Galleon = penoxsulam
 Tradewind = bispyribac-sodium

GOOD CONTROL
 Clearcast = imazamox
 Clipper = flumioxazin
 Reward plus copper = diquat. Add surfactant

Parrot's Feather

Grass Carp - Low Preference

EXCELLENT CONTROL

Navigate or Weedar 64 = 2,4-D

Sonar, Avast or Whitecap = fluridone

GOOD CONTROL

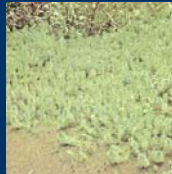
Clearcast = imazamox

Clipper = flumioxazin

Reward = diquat. Add surfactant

Habitat = imazapyr. Use Adjuvant

Renovate = triclopyr. Add surfactant



Pickerelweed

EXCELLENT CONTROL

Habitat = imazapyr. Use Adjuvant

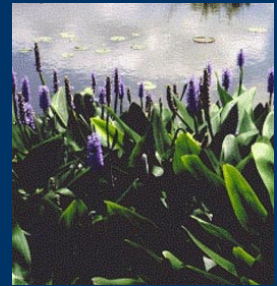
Renovate = triclopyr. Add surfactant

Clearcast = Imazamox

GOOD CONTROL

Navigate and Weedar 64 = 2,4-D

Reward = diquat. Add surfactant



Potamogeton Pond Weed

Grass Carp - Moderate Preference

EXCELLENT CONTROL

Clearcast = Imazamox

Aquathol = dipotassium salts of endothal.

Hydrothol 191 = alkylamine salt of endothal.

Sonar, Avast or Whitecap = fluridone

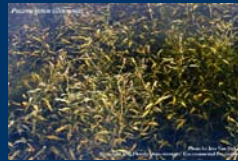
GOOD CONTROL

Clipper = flumioxazin

Tradewind = bispyribac-sodium

Reward = diquat. Add surfactant

Diquat plus copper



Giant Salvinia & Azollo

EXCELLENT CONTROL

• Sonar, Avast or Whitecap = fluridone (only good for azollo)

• Galleon = penoxsulum

GOOD CONTROL

Clipper = flumioxazin

Reward = diquat. Add surfactant



Smartweed

Excellent Control

Navigate & Weedar 64 = 2,4-D

Clearcast = imazamox

Rodeo, Aquamaster, Eraser AQ, Touchdown Pro, Aquaneat.

Good Control

Renovate = triclopyr

Imazamox = Clearcast



Spike Rush

Grass Carp – Moderate/Poor

Big problem when hardness/alkalinity are low

GOOD CONTROL

Reward = diquat.

Sonar, Whitecap or Avast = fluridone



Water Primrose

Excellent Control

Navigate and Weedar 64 = 2-4D

Renovate = triclopyr

Rodeo, Aquamaster, Eraser
AQ, Touchdown Pro, Aquaneat
= glyphosate

Clearcast = imazamox

Habitat = imazapyr



Watershield – Dollar Bonnet

Seeds & Leaves Highly Prized Forage of
Waterfowl.

Slimy stems, bottoms & large tuberous
root make control difficult.

EXCELLENT CONTROL

Navigate or Weedar 64 = 2-4-D

Habitat = imazapyr. Use Adjuvant

GOOD CONTROL

Rodeo, Aquamaster, Eraser AQ,
Touchdown Pro, and AquaNeat =
glyphosate. Add surfactant

Clearcast = imazamox

Sonar, Whitecap or Avast = fluridone



Any Questions?



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