

Texas A&M System

Stocking and Managing Private Ponds

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Improving Lives. Improving Texas.





Common Misunderstandings

- Clear water is productive/good.
- Fish need rooted vegetation. (cover/shade/habitat)
- Fish need deep water (cool/sanctuary).
- Crappie and Hybrid sunfish (bream) are OK to stock in a bass pond.
- I need to add bass and other fish to my pond ever few years.
- I should practice "catch and release".

What are we growing?





Herbivores?

We are growing...



Carnivores/Predators!

Reality Check v

Fish are cold-blooded Temperature of their environment –Low energy needs – Do not have to grow (will stunt) Fish do not chew their food Basically swallow their food whole Mouth size determines prey size -Little food = little or no growth

Must shallow prey (forage) whole



Food Chains

Land (terrestrial) Plants – Herbivore – Carnivore Grass – Rabbit – Coyote Water (aquatic) Plants – Herbivore – Carnivore Algae – Zooplankton – Fish fry Plants – Detritus – Detritivore – Carnivore – Carnivore Algae – Detritus – Worms/insects – Sunfish -Bass

So the question is how to develop a strong food chain?

Microscopic Algae – "green water"



Zooplankton

Tiny floating protozoans, insects and crustaceans



Aquatic Herbivores

1 mm



Detritus

Detritus and Periphyton

Invertebrates = crustaceans, insects, mollusks, and worms.

Pond Food Chain



Zooplankton, Worms, Insects, 100 lbs Crustaceans, etc.

Plants – Algae and Macrophytes 1,000 lbs

Detritus - periphyton

Fertilization

Limiting nutrient in ponds – Phosphorous - precipitates to pond bottom and is trapped in the mud... -that is why rooted plants do so well, they have access to the phosphorous Nitrogen usually present but needs some supplementation

Fertilizers



Fertilizers

Increase fish production by 4-6 times -unfertilized = 75-100 lbs/acre -fertilized = 250-600 lbs/acre 20-20-5 granular □ 10-34-9 liquid □ 10-52-0 powered 10-50-0 time-release Do not fertilize rooted vegetation Do not over-fertilize

Secchi Disk

18-24 inches = good bloom

>24 inches = fertilize
12-15 inches = to dense
<12 inches = oxygen
depletion</pre>

Automatic feeders

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Rooted vegetation Little direct consumption Slow to decompose To dense Prey avoidance **Oxygen deletions** Often leads to stunted populations

How can a bass catch prey in this mess?

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Bushy Pondweed Control Study

Comparison Mean Weight Largemouth Bass



Treatment

Stocking



Stocking (per surface acre)

Ponds 1 acre and greater
 Largemouth Bass and Sunfish
 Catfish ?

 Ponds less than 1 acre
 Catfish and Fathead Minnows (not bluegill !!!)

Stocking (per surface acre)

Fertilized

- 100 largemouth bass (2-4 inches)
- 1000 sunfish
 - 1000 bluegill or
 - 800 bluegill and 200 redear
 - 100+ catfish

Unfertilized

- 50 largemouth bass
- 500 bluegill or 400 bluegill + 100 redear

Bluegill sunfish

Redear Sunfish or Shellcracker

Catfish?

Will you fish for them?

- Catfish reduce food available to bass and sunfish
- will not reproduce successfully in bass and sunfish pond!

Stock 50 per acre if not fertilizing or feeding
 - 100 - 200 per acre if fertilizing or occasional feeding (once or twice a week)

Stocking Catfish Only Ponds

Fertilized - 100 to 200 per acre – fathead minnows - 5 to 15 pounds per acre Feeding - 200 to 500 per acre fathead minnows - 5 to 15 pounds per acre commercial feeds – < 15 pounds per acre per day</p> – < 35 pounds per acre per day with</p> aeration

Maybe you have too many!

Other Species

Compete for food/prey
 Affect spawning - eat eggs
 Prey on young bass



Unwanted Species Crappie - high reproduction and competitor/predator Shiner minnows - eat eggs and fast Gizzard shad - become to large, competitor Bullheads/mud cats - competitor/predator Common carp - eat eggs and competitor Green sunfish - competitor/predator Hybrid sunfish - low reproduction (no prey) and production of green sunfish

Crappie = over-reproduction

3 years old!

So what usually goes wrong with the fish population?

Overpopulation!

Bass Condition

Enlarged tail and eye

Skinny body

Stunted Bass

Bass do not choose to be anorexic – they will consume prey of the proper size if it is available!

ALT I Selective harvest of bass is a primary management technique!

Common Pond Problems

Oxygen depletions Aquatic vegetation Predators and pests **Competitive species of fish** -Birds, otters, raccoons, etc.

Dissolved Oxygen Range 0 to 20 ppm (mg/L) –Optimum = 60% of saturation Saturation increase with decreasing temperature lowest in summer and at night below 3ppm in summer stressful Driven by photosynthesis (70-90%) and wind action (10-30%)



Dissolved Oxygen Cycle





When do D.O. problems occur?

Nights in summer

- Heavy aquatic weed infestation
- Too many fish
- Over feeding
- Decomposition of plants, manure, etc.
 - Aquatic plant treatments
 - Manure/vegetation after heavy rainfall

Turn-over

Following cool wind and rain

PTO aerators

Electrical aerators

Why does aquatic vegetation become a problem in small impoundments?

What do plants need for growth?

- Water
- Sunlight
- Nutrients

Ponds are nutrient sinks – accumulate nutrients from watershed and groundwater over time!

Why aquatic plants are so invasive?

Propagate by:
Seeds
Fragments
Roots
Vegetative offshoots

I Tolerate flooding and drought





The AquaPlant site is designed to help land owners identify and manage plants in their ponds or tanks. To best manage your pond vegetation, start by using the Identify a Plant section to correctly identify the plants in your pond, and then select the best management options to fit your needs for specific plants from the Manage a Plant section. Whether you choose to use a herbicide, biological control, or to remove plants manually, this site can help.

SEARCH FOR A TYPE OF PLANT



If you don't know the name of your plant, start here to compare photos and identify what type of plant is in your pond.

Manage a Plant



If you already know the name of the plant in your pond, start here to browse by name and find management options.





Submerged Plants

Submerged plants are rooted plants with flaccid or limp stems and most of their vegetative mass is below the water surface, although small portions may stick above the water.

American Pondweed



Asian Marshweed



Baby Pondweed



Brittle Naiad, Marine Naiad

Brittle Waternymph

Bushy Pondweed, Southern Naiad







How to Control Hygrophila (Miramar Weed)

Non-Native



Hygrophila polysperma

More Info & Photos of Hygrophila

Non-Herbicide Management Options

1. Physical Management Options

Hygrophila can be removed by raking or seining it from the pond, but it will re-establish from any remaining fragments and roots.

Non-toxic dyes or colorants prevent or reduce aquatic plant growth by limiting sunlight penetration, similar to fertilization. *However, dyes do not enhance the natural food chain and*



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← → C ☆ ③ Not secure www.aces.edu/dept/	/tisheries/rec_fishing/documents/navigate_label.pdf	☆ 🏭
Apps 🦲 Agencies 🦲 Aquaculture 🧕 AquaticPL 🗋) BCS Single Sign On 🗉 🧧 CommercialCo 🧧 Favorites 💪 Google 🧧 NGOs 🧧 Organizations 🧧 Other Extension 🧧 Personal 🚦 Radio Station Guide 🧕 TAMU	»
	INAVIGATE	
	A SELECTIVE HERBICIDE FOR CONTROLLING CERTAIN UNWANTED AQUATIC PLANTS	
	ACTIVE INGREDIENTS: Butowethyl ester 2 4-Dichlorophenoxyacetic acid 27 6%	
	INERT INGREDIENTS:	
	*Isomer specific by AOAC Method, Equivalent to 2,4-Dichlorophenoxyacetic Acid 19% EPA Reg. No. 228-378-8959 EPA Est. No. 228-IL-1	
	KEEP OUT OF REACH OF CHILDREN	
	CAUTION	
	For Chemical Emergency, Spill, Leak, Fire, Exposure or Accident call Chemtrec Day or Night 1-800-424-9300	
	PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION	
	Harmful if swallowed, absorbed through skin, or inhaled. Causes eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing dust. When handling this product, wear chemical resistant gloves. Wash thoroughly with soap and water after handling. When mixing, loading, or applying this	
	product or repairing or cleaning equipment used with this product, wear eye protection (face shield or safety glasses), chemical resistant gloves, long- sleeved shirt, long pants, socks and shoes. It is recommended that safety glasses include front, brow and temple protection. Wash hands, face and	
	arms with soap and water as soon as possible after mixing, loading, or applying this product. Wash hands, face and hands with soap and water before eating, smoking or drinking. Wash hands and arms before using toilet. After work, remove all clothing and shower using soap and water. Do not reuse althing was during the service days mixing and leading a capacitation of this product. Wash hands face and water and water and water and leading a service and water and water and water and water and water and water and leading at the service at the service and leading at the service and leading at the service at the serv	
	separately from other household laundry. Remove saturated clothing as soon as possible and shower.	
	STATEMENT OF PRACTICAL TREATMENT IF SWALLOWED: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. If	
	IF ON SKIN: Wash with plenty of soap and water. Get medical attention. IF INHALED: Remove vicin to fresh air if not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.	
	IF IN EYES: Flush eyes with plenty of water. Call a physician if irritation persists.	
	This product is toxic to fish. Drift or runoff may adversely affect fish and non-target plants. Do not apply to water except as specified on this label. Do not contaminate water when disposing of equipment washwaters. Unless an approved assay indicates the 2.4-D concentration is 100 opb (0.1 ppm) or less.	
	or, only growing crops and non-crop areas labeled for direct treatment with 2,4-D will be affected, do not use water from treated areas for irrigating plants or mixing sprays for agricultural or ornamental plants. Unless an approved assay indicates the 2,4-D concentration is 70 ppb (0.07 ppm) or less, do not	
	use water from treated areas for potable water (drinking water). Clean spreader equipment thoroughly before using it for any other purposes. Vapors from this product may injure susceptible plants.	
	Most cases of ground water contamination involving phenoxy herbicides such as 2,4-D have been associated with mixing/loading and disposal sites.	
	mixing or transferring this pesticide will reduce the probability of spills. Placement of the mixing/loading equipment on an impervious pad to contain spills will help orevent ground water contamination.	

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