

Aquatic Vegetation Management

Brittany Chesser, M.S.

**Aquatic Vegetation Management Program
Specialist**

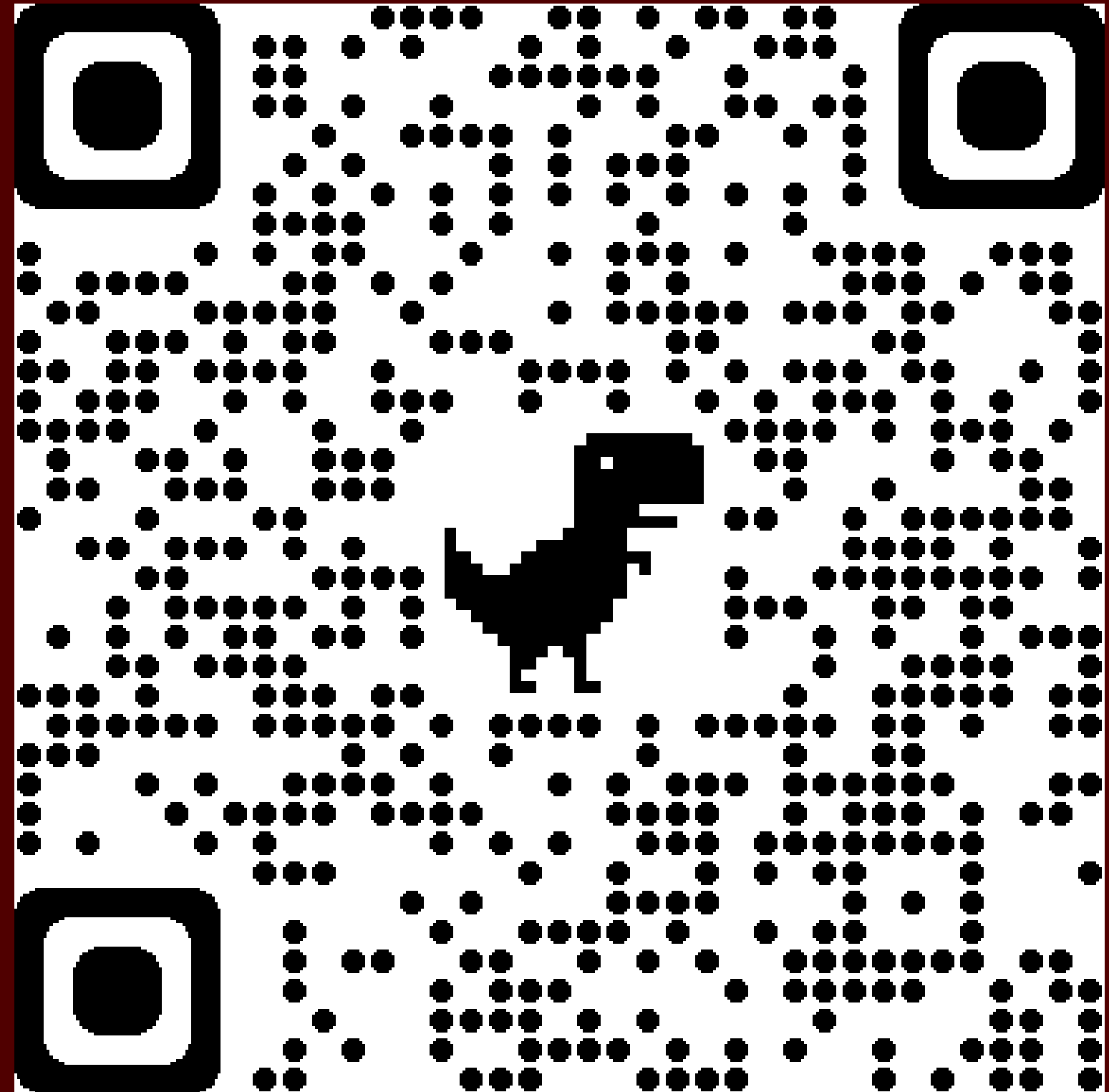
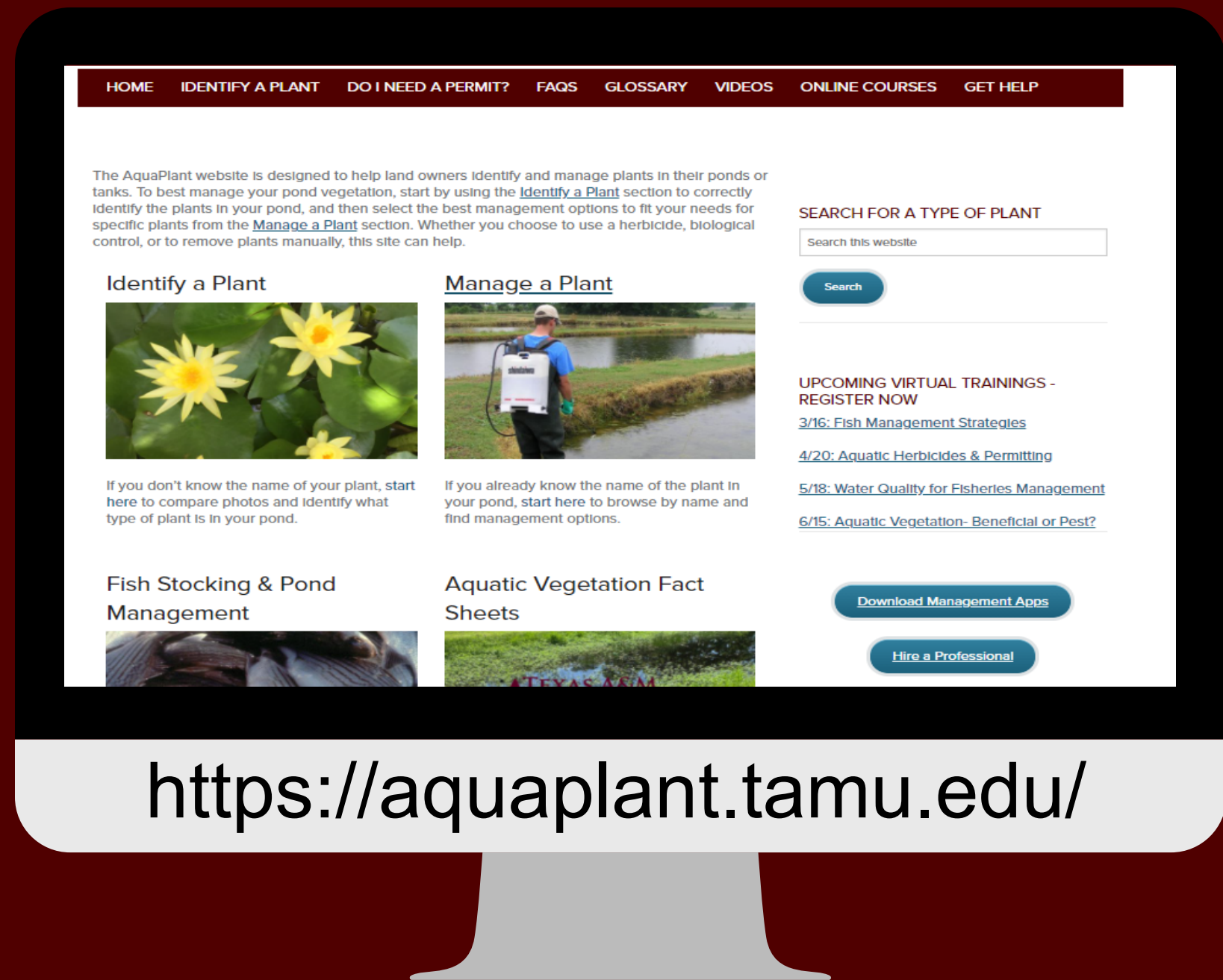
**Department of Rangeland, Wildlife, & Fisheries
Management**

- Determination of beneficial or pest depends on the pond owner and their overall management goals
- All aquatic plants are well adapted to an aquatic environment and can take over
- Overall goal is a wide diversity



1. How do you currently identify unknown aquatic vegetation?

- a. Online Resources
- b. ID app
- c. Field guide
- d. I don't!



MANAGEMENT OF PRIVATE WATER BODIES

- Freshwater
- Multitude of uses
- Many varying opinions



PREVENTION

- Preventing introduction
- Deepen edges - 2.5 to 3 feet
- Fertilization - prevent rooted plants from establishing by shading bottom & creates strong food chain
- Dyes - shades like fertilization, but no food chain enhancement
- Drawdowns ?



PREVENTION

- Preventing introduction
- Deepen edges - 2.5 to 3 feet
- Fertilization - prevent rooted plants from establishing by shading bottom & creates stable food chain
- Dyes - shades like fertilization, but no food enhancement
- Drawdowns ?

TEXAS A&M
AGRI LIFE
EXTENSION

EW-110 03/21

AQUATIC VEGETATION PREVENTION

Brittany Chesser¹ and Todd Sink²

Many species of aquatic vegetation can over-populate very quickly after entering a fertile body of water (Fig. 1). Ponds are nutrient sinks—a place where incoming nutrients from the watershed accumulate over time. This makes ponds the perfect place for aquatic vegetation to grow, often negatively impacting evaporation rates, recreation, aesthetic value, fish, and wildlife habitat. An aquatic vegetation issue is further amplified because most ponds in Texas are used as livestock watering “tanks,” which continuously accumulate nutrients from livestock waste.

Quick Fact: Drawdowns during colder months (November through March) are sometimes used as a preventative measure by killing over-wintering fragments, roots, or dormant plants. However, drawdowns can worsen issues, particularly with over-wintering seeds or buds stored in the sediment, as seen in duckweed and hydrilla. Regardless, if freezing and dry conditions do not occur, there will be little to no benefit in terms of aquatic vegetation prevention.

PREVENTING INTRODUCTION

The number one way to prevent an aquatic vegetation infestation is to reduce the possibility of introducing a pond or body of water. Besides reproduction, aquatic vegetation can also spread with other physical means, whether intentional or unintentional.

Domestic animals (e.g., farm dogs) and wildlife can unknowingly transfer vegetation from nearby water bodies in their fur, feathers, antlers, and horns (Fig. 2). Completely eliminating wildlife or domestic animal access may not be feasible or desired. Therefore, physical barriers such as fences or levees are often the best preventative action for animal access—but rarely provide an exclusion from all types of animals such as waterfowl or burrowing animals.

Beyond animals, vegetation may be introduced by human activity. Similar to accidental or intentional fish introductions, bait bucket and aquarium dumping can contribute to aquatic plant establishment. Some of the




Figure 1. Over-populated aquatic vegetation.

Once established, aquatic vegetation can thrive due to its unique adaptations. Most aquatic vegetation species are adapted to tolerate varying environmental conditions caused by water level changes, temperature, sunlight, and nutrient availability. Most species can also reproduce in multiple ways for populations to persist and spread, including seeds, fragments, roots or tubers, and offshoots.

The most cost-effective type of aquatic vegetation management is prevention. Reactive management options are often expensive, involving herbicides and requiring large equipment and technical expertise.

Preventing aquatic vegetation from entering or becoming established in a pond can save time and money in the future. All strategies mentioned in this publication work toward the common goal of limiting aquatic vegetation establishment—primarily through limiting sunlight. Multiple methods should be used when possible.



Figure 2. A nutria carrying giant salvinia on its fur.

¹ Aquatic Vegetation Management Program Specialist, Texas A&M AgriLife Extension Service
² Associate Professor and Aquaculture Extension Specialist, Texas A&M AgriLife Extension Service

COMMON MANAGEMENT MISTAKE

- Adding fertilizer too early
- Adding pond dyes or fertilization too late



MECHANICAL CONTROL CONSIDERATIONS

- Frequent cutting
- Requires removal of cut vegetation
- Only cuts & does not eliminate
- Can make problem worse if done incorrectly
- Expensive
- Can really disturb benthic organisms and the surrounding ecosystem!



2. _____ is a biological control tool and will control all aquatic vegetation below the water column.

- a. Mozambique tilapia
- b. Triploid grass carp
- c. Neither

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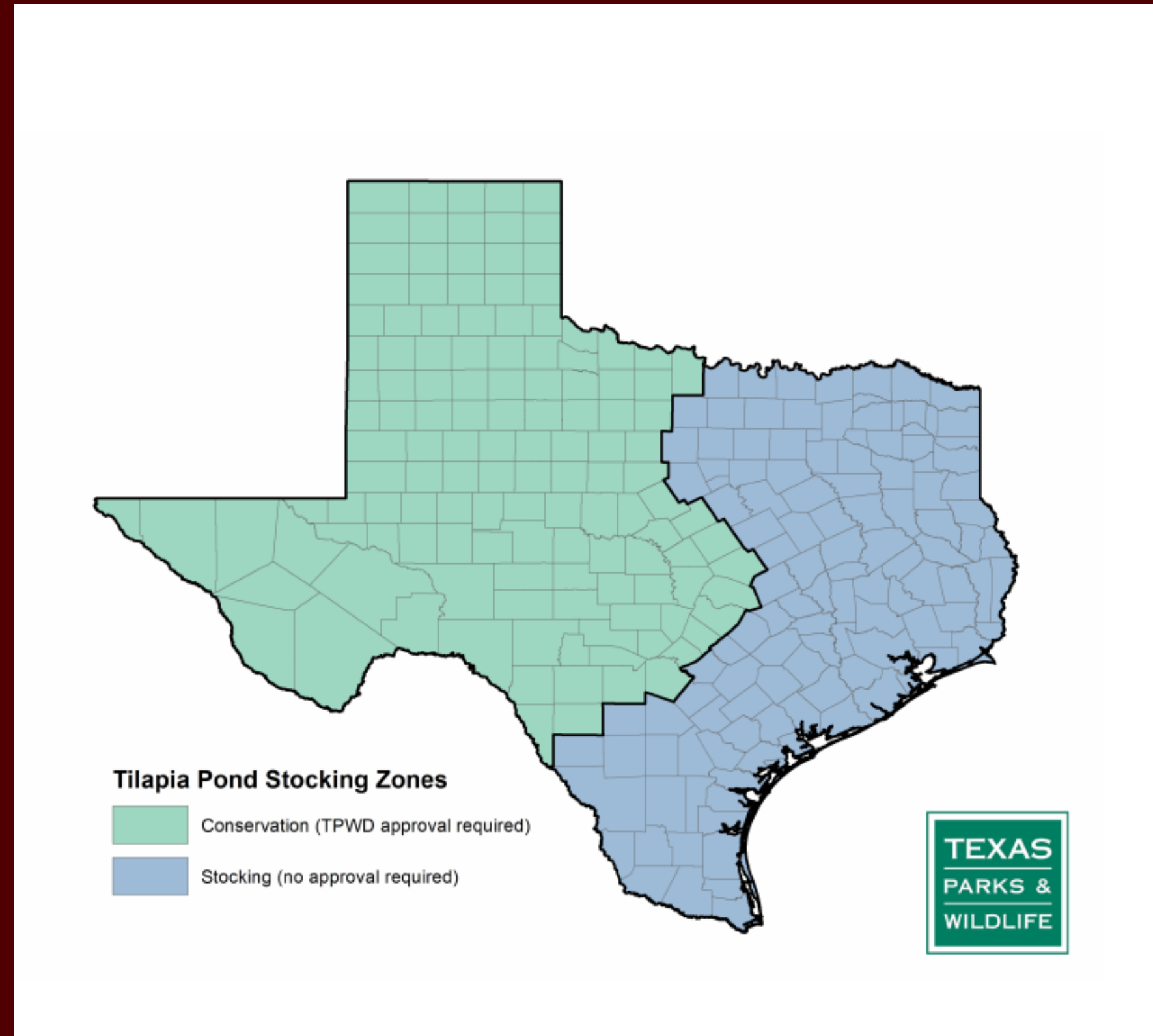
BIOLOGICAL CONTROL CONSIDERATIONS



- Not produced commercially or readily available to the public
- Die during winter
- *2021 Update*
- New allowance will be added for purchase/possession/transport of controlled exotic plants for the purposes of introducing biological control organisms to manage that species in private ponds
- Contingent on TPWD identification of plant to be managed and obtaining host plants from a permitted source

Triploid Grass Carp	Mozambique Tilapia
TPWD permit Escapement barrier	Look for your zone
Effective control for 5 -7 years	Stock yearly (die off when water temperature < 55 °F)
7- 15 per acre recommended Max 10/acre/year	15-20 lbs. mixed sex recommended
Hydrilla Bushy pondweed American pondweed Illinois pondweed	Filamentous algae Duckweed Azolla

HERBIVOROUS FISH- 2021 Update



3. Most herbicides used in terrestrial habitats can be used in aquatic habitats?

- a. True
- b. False

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- a. True
- b. False

CHEMICAL: HERBICIDES

- Copper & complexes of copper
- Carfentrazone
- 2,4-D
- Diquat
- Endothall
- Fluridone
- Imazamox
- Flumioxazin
- Sodium carbonate peroxyhydrate
- Triclopyr
- Imazapyr
- Bispyribac
- Glyphosate
- Penoxsulam
- Florpyrauxifen -benzyl

CONSIDERATION



Imazapyr

HERBICIDES CLASSIFICATIONS

Contact

- Immediate cell damage at point of contact
- Fast acting
- Above ground tissue death
- Use on annual species
- Copper, Diquat , SCP, Endothall , & Flumioxazin

Systemic

- Translocated throughout plant
- Slow acting
- Total plant mortality
- Used to control perennial and woody species
- Fluridone , Glyphosate, Triclopyr , Imazapyr , Imazamox , Bispyribac , floryrauxifen - benzyl & 2,4 -D

WATER QUALITY



TEXAS A&M
AGRI LIFE
EXTENSION

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AQUATIC DIAGNOSTICS LABORATORY

DEPARTMENT OF RANGELAND, WILDLIFE, & FISHERIES MANAGEMENT

Case # Client name

Basic Water Chemistry Report	Result	Acceptable*	Optimal*
Hardness (ppm)			
Calcium (ppm)			
Alkalinity (ppm)			
pH			
Total dissolved salts (salinity; ppt)			
Nitrite (ppm)			
Total ammonia nitrogen (TAN; ppm)			
Un-ionized ammonia (ppm)			
Chlorides (ppm)			
Temperature at time of analysis			
Other requested analysis			
Other requested analysis			
Other requested analysis			
Other requested analysis			
Other requested analysis			
Other requested analysis			

Basic water quality analysis

*The designations of acceptable and optimal are based upon the water quality parameters required to support most fresh, warmwater fish populations commonly found in ponds.
** Values for freshwater fish.
*** TAN values presented are generally considered safe, although at pH above 8.5 or at temperatures above 85F, the toxicity to fish increases dramatically.

Comments:

WATER QUALITY

Basic Water Chemistry Report		Result
Hardness (ppm)		
Calcium (ppm)		
Alkalinity (ppm)		
pH		
Total dissolved salts (salinity; ppt)		
Nitrite (ppm)		
Total ammonia nitrogen (TAN; ppm)		
Un-ionized ammonia (ppm)		
Chlorides (ppm)		

- ✓ A single pH measurement alone will NOT give you the full picture
- ✓ Important in order to maintain a stable pH
 - ✓ Rapid or large shifts in pH can stress fish and even lead to death in extreme circumstances
- ✓ Planktonic algae production that forms the basis of a pond's food chain, becomes limited when the total alkalinity falls below 30 ppm

Identification



1



2



3



4



IDENTIFICATION



Algae
primitive,
non-seed bearing plants &
no roots, stems, or true
leaves

FILAMENTOUS ALGAE



Photo by Janet Barr

- Single algae cells that form long, visible chains, threads or filaments that resemble wool



TREATING WITH COPPER



Copper Sulfate:

- Contact
- Metallic
- Active up to 1 hour

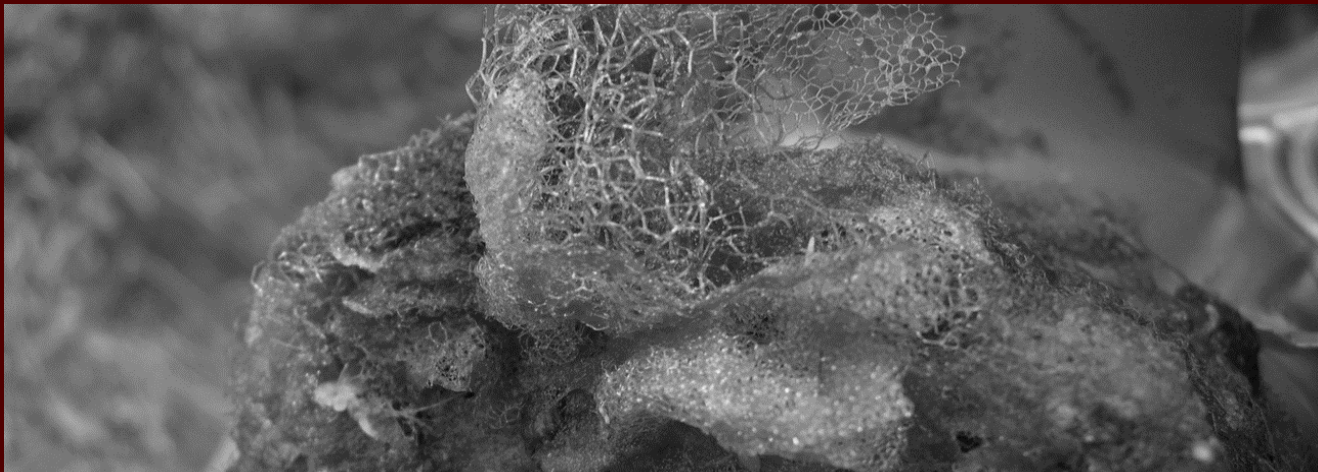


Copper Chelate:

- Contact
- Metallic
- Active 4-6 hours
- Less toxic



IDENTIFICATION



Floating
all parts of plant floats
(including roots)



COMMON MANAGEMENT MISTAKE

- Not properly identifying



COMMON MANAGEMENT MISTAKE

- Not properly identifying





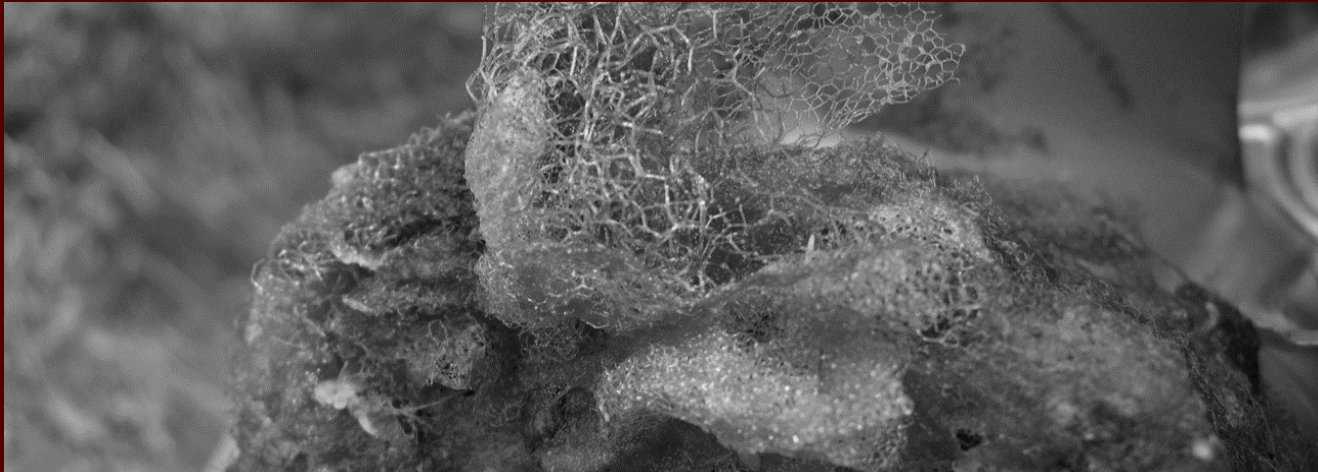
Photo by Peggy Romfh



Photo by Peggy Romfh

Usually mixed in/confused with

IDENTIFICATION



Submerged
mostly underwater,
rooted with
flaccid (limp) stems



COMMON MANAGEMENT MISTAKE

- Not properly identifying (again)





Coontail



Chara

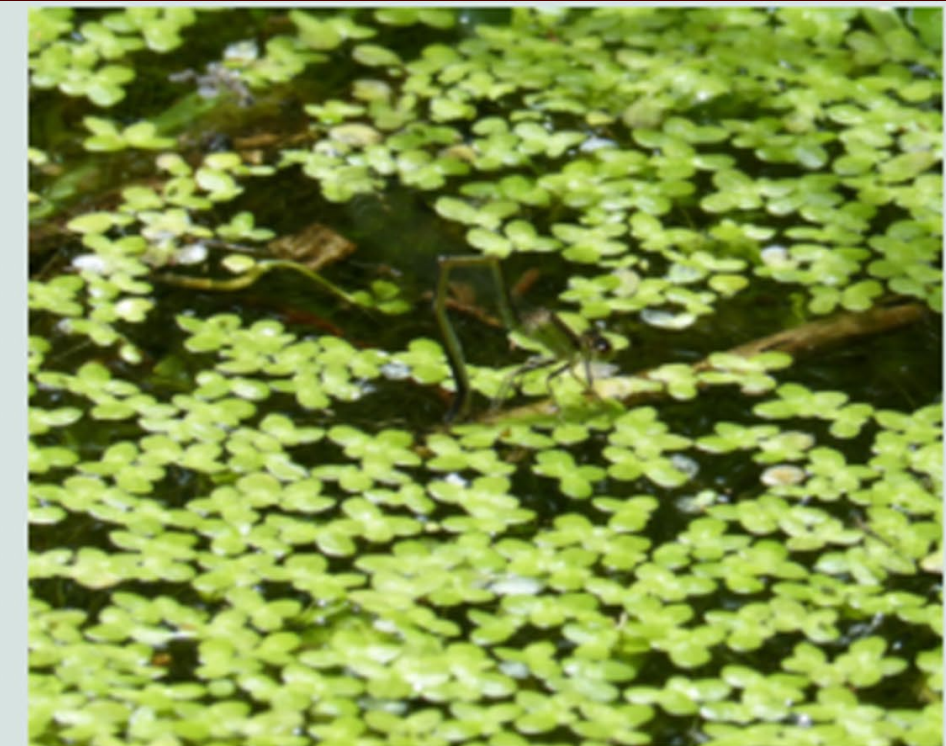
Common Mistake

- Treating too much at once (contact herbicides)
- Treating when it is too hot
- Treating when it is too cold



Contact Herbicide

When using a contact herbicide, treat in sections of 1/4 to 1/3 of the pond at one time, wait 10-14 days, then treat the next section.



Repeat Treatment

Follow-up spot treatments are typically necessary.

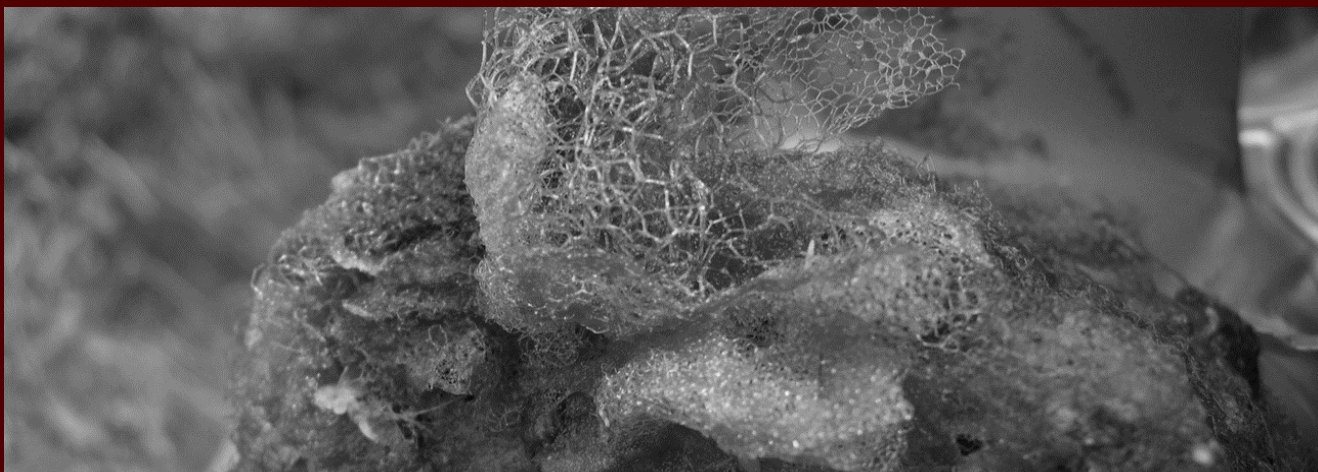
TREATMENT TIMING

The best to treat algae, floating, & submerged aquatic vegetation is in spring before large biomass build up

Water temperature between 65 – 88 F



IDENTIFICATION



Emergent

rooted with stiff or rigid
stems with all or parts
standing above surface



Photo by Betty Saenz



TREATMENT TIMING

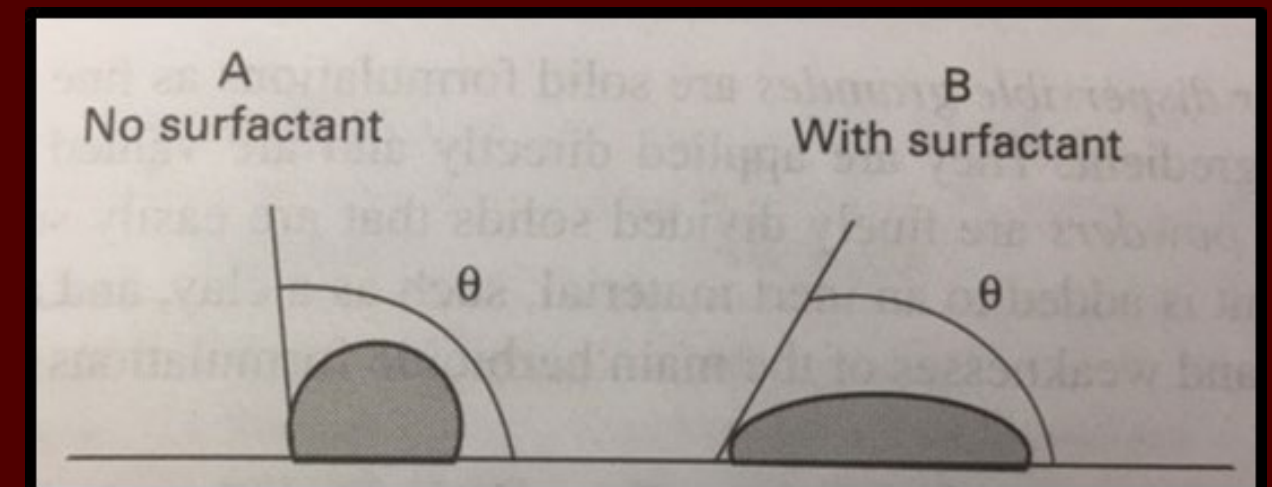
Emergent/shoreline treatment is often best in fall before the first freeze when plant is storing food for winter



Photo by David McGriffy

Repeated treatments typically necessary

Use good, quality, non-ionic surfactant



4. Which aquatic plant is NOT legally classified as exotic, harmful, or potentially harmful in Texas?

- a. Dotted duckweed (*Landoltia punctata*)
- b. Crested floating heart (*Nymphoides cristata*)
- c. Southern cut grass (*Leersia hexandra*)
- d. Yellow floating heart (*Nymphoides peltata*)

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IDENTIFIED HARMFUL PLANTS OF TEXAS

- Submerged:
 - Hydrilla
 - Eurasian watermilfoil (not variable-leaf or northern)
 - Lagarsiphon (African Elodea)
 - Ambulia
- Floating:
 - Any water hyacinth (floating or rooted)
 - Water lettuce
 - Any salvinia (giant & common)
 - Dotted duckweed
- Emergent
 - Alligatorweed
 - Torpedograss
 - Water spinach or swamp morning glory
 - Narrowleaf & heartshaped false pickerelweeds
 - Duck lettuce
 - Wetland nightshade
 - Exotic burr -reed
 - Brazilian peppertree
 - Purple loosestrife
 - Crested floating heart*
 - Yellow floating heart*

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 - Alligatorweed
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