



AQUATIC INVASIVE SPECIES

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What are Invasive Species

- *a species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health ([Executive Order 13112](#))*
- *Grows/reproduces and spreads rapidly over large areas*
- *Usually take advantage of favorable conditions:*
 - *No predators*
 - *Lack of disease*
 - *Limited competition*

Environmental Impacts

- *Decrease ecosystem diversity*
- *Out-competes native species to form monocultures*
- *Grows/reproduces and spreads rapidly over large areas*
- *Exploit favorable conditions:*
 - *No/very few predators*
 - *Lack of disease*
 - *Limited competition*



Economic Impacts

- *Nation-wide, \$137 billion spent annually to fight invasives*
- *Estimated 100 million acres impacted by invasive species*
- *Can totally kill business related to an impacted resource*



**HELLO
INVASIVE
SPECIES.
GOODBYE
TEXAS LAKES.**

Zebra mussels kill fishing, clog pipes that supply drinking water, and have sharp edges that make water recreation hazardous. They cling to boat hulls, piers and docks, and you can spread them when you enter other lakes.

**SO CLEAN YOUR
BOAT, TRAILER
AND GEAR!**



**STOP AQUATIC
HITCHHIKERS!**



www.texasinvasives.org

Worst of the Worst



**HELLO GIANT SALVINIA.
GOODBYE FISHING HOLE.**

Once giant salvinia invades, it chokes lakes and ruins fishing, boating and water recreation. When introduced, it can double in size every seven days and completely cover the lake.

Giant salvinia travels to different Texas lakes attached to boats and trailers. It can survive for days out of water, so clean even the smallest pieces off your boat, trailer and gear.

Because if giant salvinia is allowed to take over Texas lakes, it won't be our Texas anymore.

Learn to identify and report harmful invasive species.
www.texasinvasives.org



Giant Salvinia

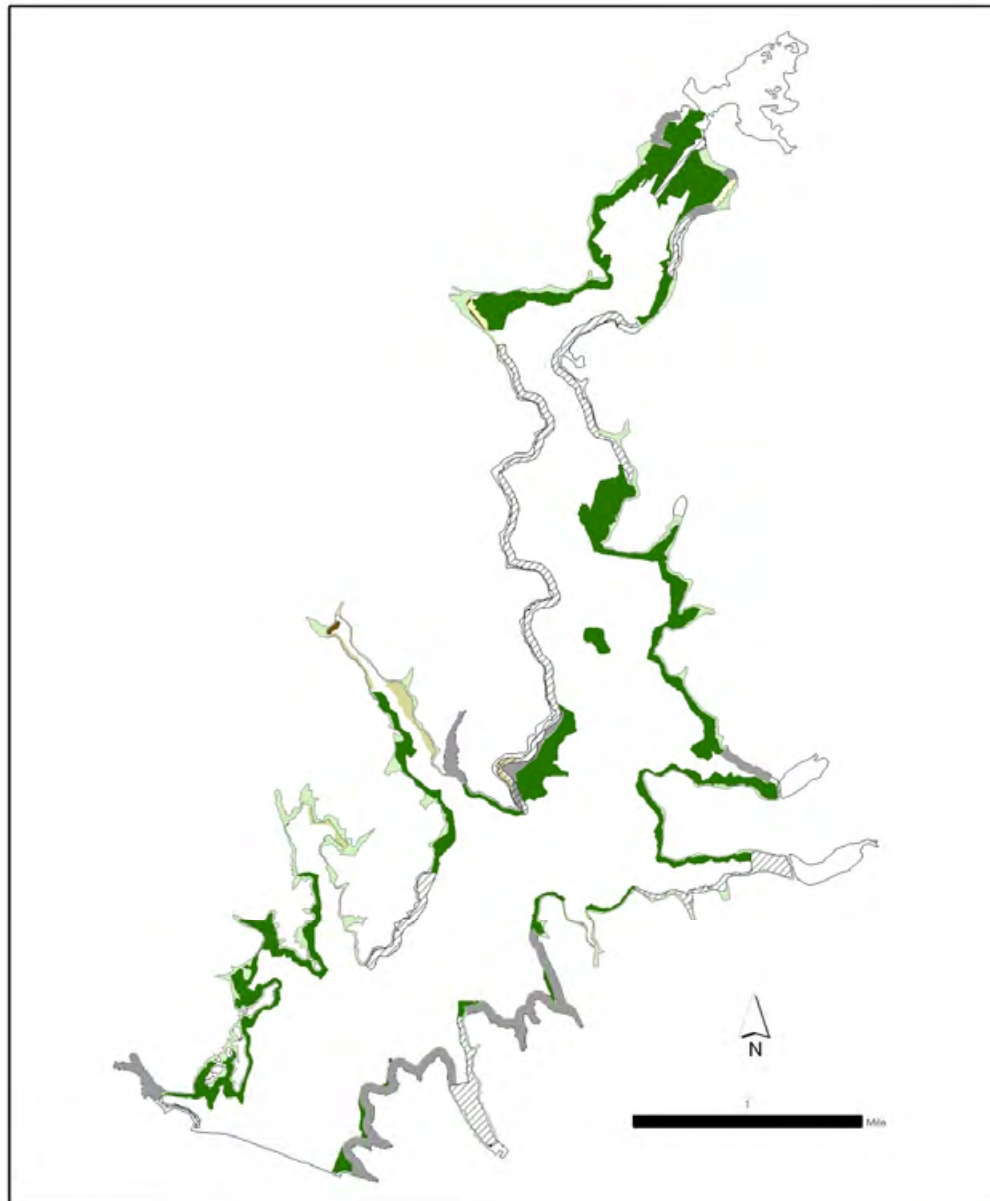
- *Floating fern from South America*
- *Plant can double in size in 4 to 10 days*
- *Can form dense mats several feet thick*
- *Prefers calm waters*



Angelina Neches Basin Impacts

| Lake | Species | Date | Action |
|--------------------|--------------------------|-------------|---------------------------------------|
| Athens | Hydrilla | Fall 2010 | Spring Survey to determine action |
| Palestine | Giant Salvinia | 2009 | Contained, removed, no longer present |
| Tyler - Tyler East | Hydrilla | historic | numerous treatments |
| | Hydrilla, alligator weed | 2010 | see Map |
| Jacksonville | Hydrilla | historic | Treated w/ chemical and grass carp |
| Striker | no vegetation issues | | |
| Nacogdoches | Hydrilla | | not at problematic levels |
| Pinkston | Hydrilla | | not at problematic levels |
| | Giant Salvinia | 2006 & 2008 | Contained & removed both times |





Inland Fisheries Division
Texas Parks and Wildlife Department
Prepared by: Dan Bennett & Richard Ott
Texas Parks and Wildlife, Inland Fisheries Division
Projection: NAD 83 UTM Zone 15N
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Lake Tyler Vegetation Survey 8.5.2010

| | |
|---|--|
| Hydrilla verticillata (untreated) ~ 315 acres | Ceratophyllum demersum (Coontail) ~ 14 acres |
| Pondweed ~ 132 acres | Spring treatment zone |
| Nitella spp. (Stonewort) ~ 16 acres | Summer treatment zone |



Lake Sam Rayburn

- Hydrilla present at non-problematic levels
- Giant salvinia threats reduced by cold in 2009 & 2010
- Chemical treatments being conducted by cooperative efforts: USACE buys herbicide, LNRA hires contractor
- 550 acres treated in 2010: \$63,150
- Currently isolated pockets are present in landlocked pools and being treated with Galleon SC[®]

B.A. Steinhagen Reservoir

- Hydrilla, common salvinia, giant salvinia & water hyacinth problematic
- Chemical treatments being conducted by cooperative efforts: USACE buys herbicide, LNRA hires contractor
- 2009 = 2,670 acres treated, Total Cost \$256,251.55
- 2010 = 2,185 acres treated, Total Cost \$221,074.95
- Giant salvinia and water hyacinth are primary targets, 2011 treatments are underway

**B.A. Steinhagen (Dam B)
Vegetation Survey September, 2009**



Species

| | |
|--|-----------------------------------|
| | American lotus ~ 2600 acres |
| | waterhyacinth >50% ~ 281 acres |
| | waterhyacinth >20% ~ 318 acres |
| | Torpedo grass ~ 0.83 acres |
| | Hydrilla verticillata ~ 500 acres |
| | Common salvinia ~ 2249 acres |
| | Giant salvinia ~ 96 acres |
| | Alligatorweed ~ 937 acres |
| | Primrose ~ 937 acres |

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Texas Parks and Wildlife Department**

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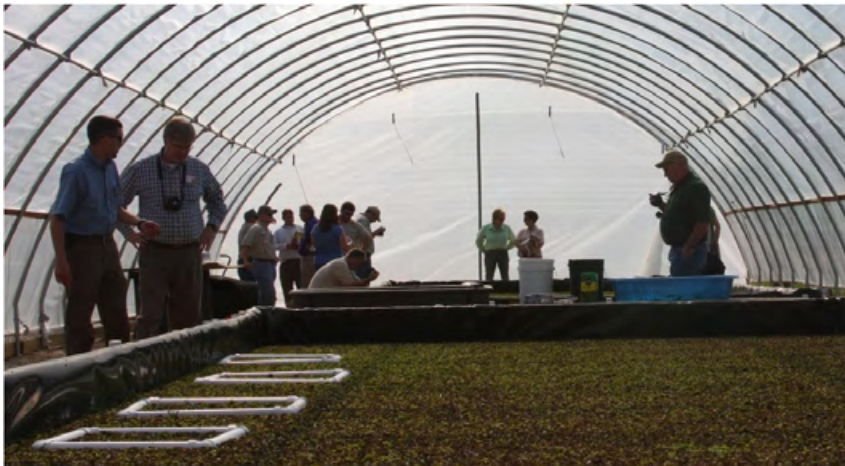
Center for Invasive Species Eradication

Caddo Lake Giant Salvinia Eradication Project

- *Learn more about giant salvinia and control mechanisms*
- *Evaluate control practices to determine cost effectiveness*
- *Establish, operate and maintain weevil rearing facility @ Caddo Lake*
- *Develop treatment recommendations for private landowners*
- *Assist in efforts to control giant salvinia on Caddo Lake*
- *Evaluate impacts of treatment on native species*
- *Deliver educational programming*
- *Collaborate with TPWD & other agencies to expand efforts*

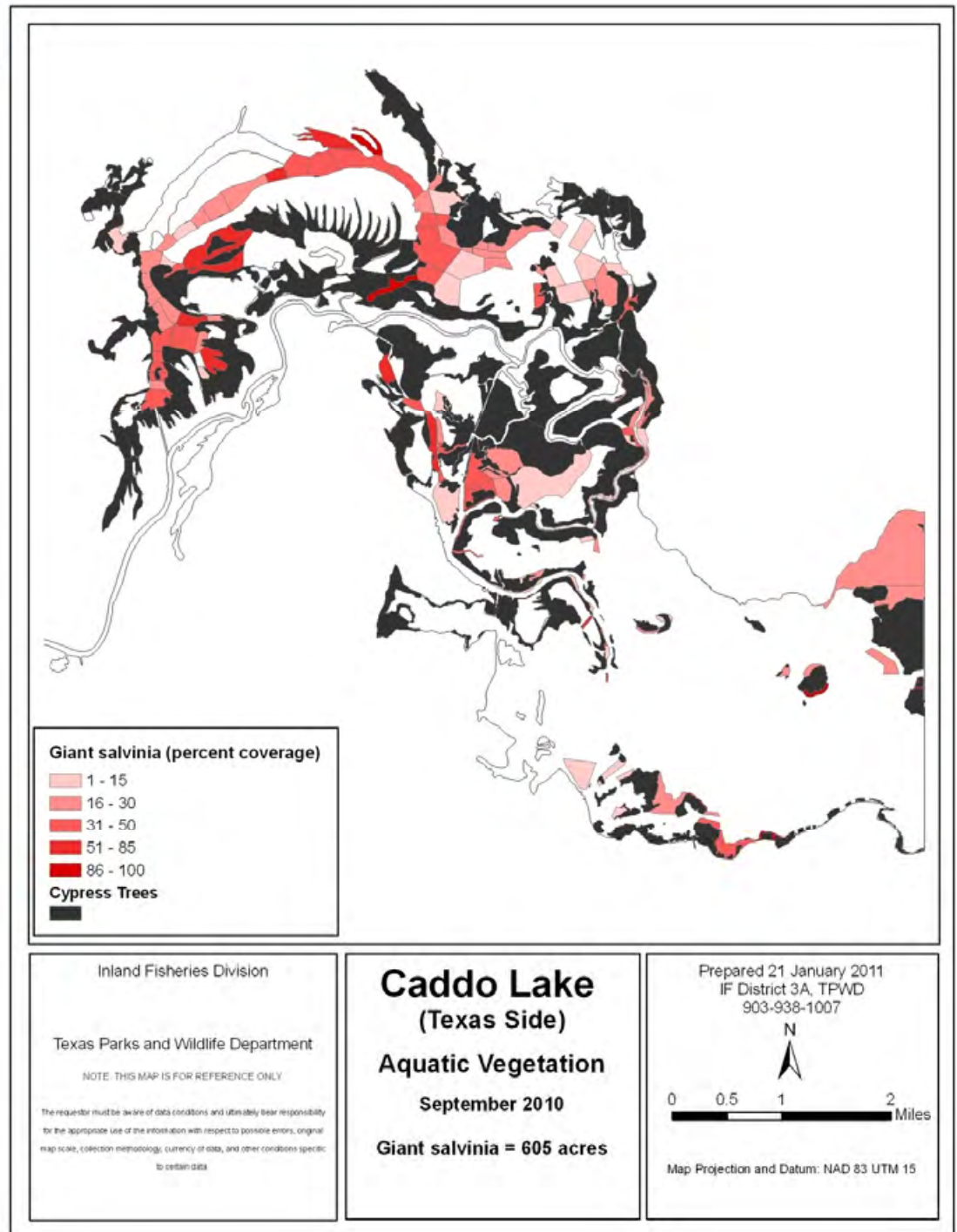


Caddo Lake Salvinia Eradication



Caddo Lake

- *First infested in 2006*
- *By 2008, over 1,000 acres covered*
- *Ideal environment for giant salvinia*
- *Coordinated effort to control giant salvinia*









Biological Control

Salvinia weevils (*Cyrtobagous salviniae*)

- *Feed on leaves and stems of plant*
- *Lay eggs in the stems*
- *Larvae burrow out of stems causing fatal plant damage*
- *Weevils haven't been able to tolerate the cold at Caddo; fair better farther south*



Biological Control Continued



Difference after 1 month



Chemical Control

Foliar Treatment

Per Acre Dosing:

- 1 gal. Glyphosate (AquaNeat)
- 1 pint Diquat (Reward)
- 1 quart Non-ionic surfactant (AquaKing)
- 1 pint Silicone surfactant (Thoroughbred)
- 100 gal. water

Systemic Treatment

- Galleon SC
- Flumioxazin



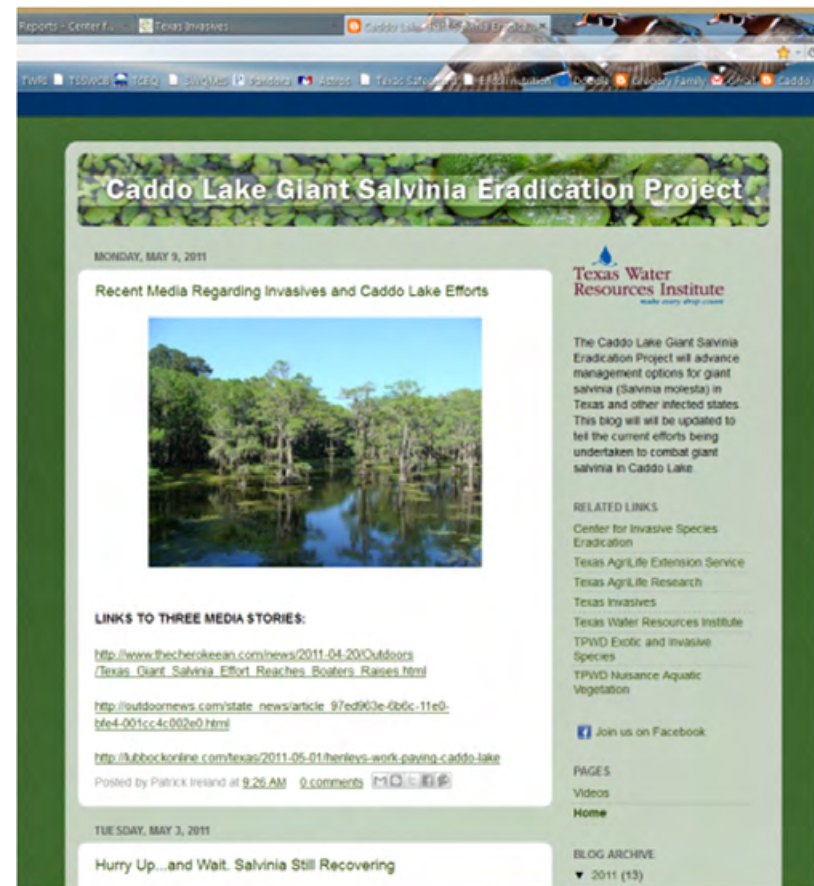
Courtesy of JEC

Education: The Critical Component

texasinvasives.org



caddosalvinia.blogspot.com/



Educational Media

Video:

Youtube.com: search giant salvinia



facebook.com/caddo.salvinia



For More Information

- Center for Invasive Species Eradication
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QUESTIONS?

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