Giant Salvinia Overview & History

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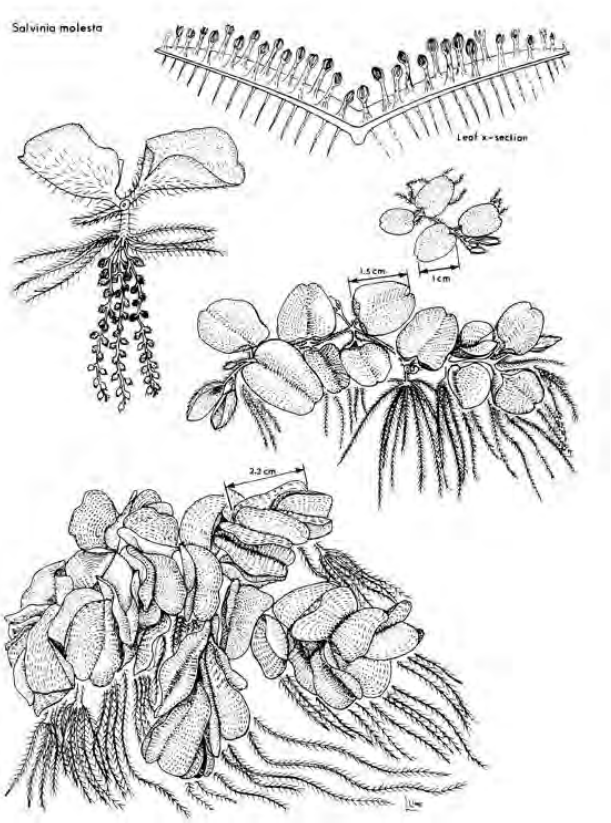
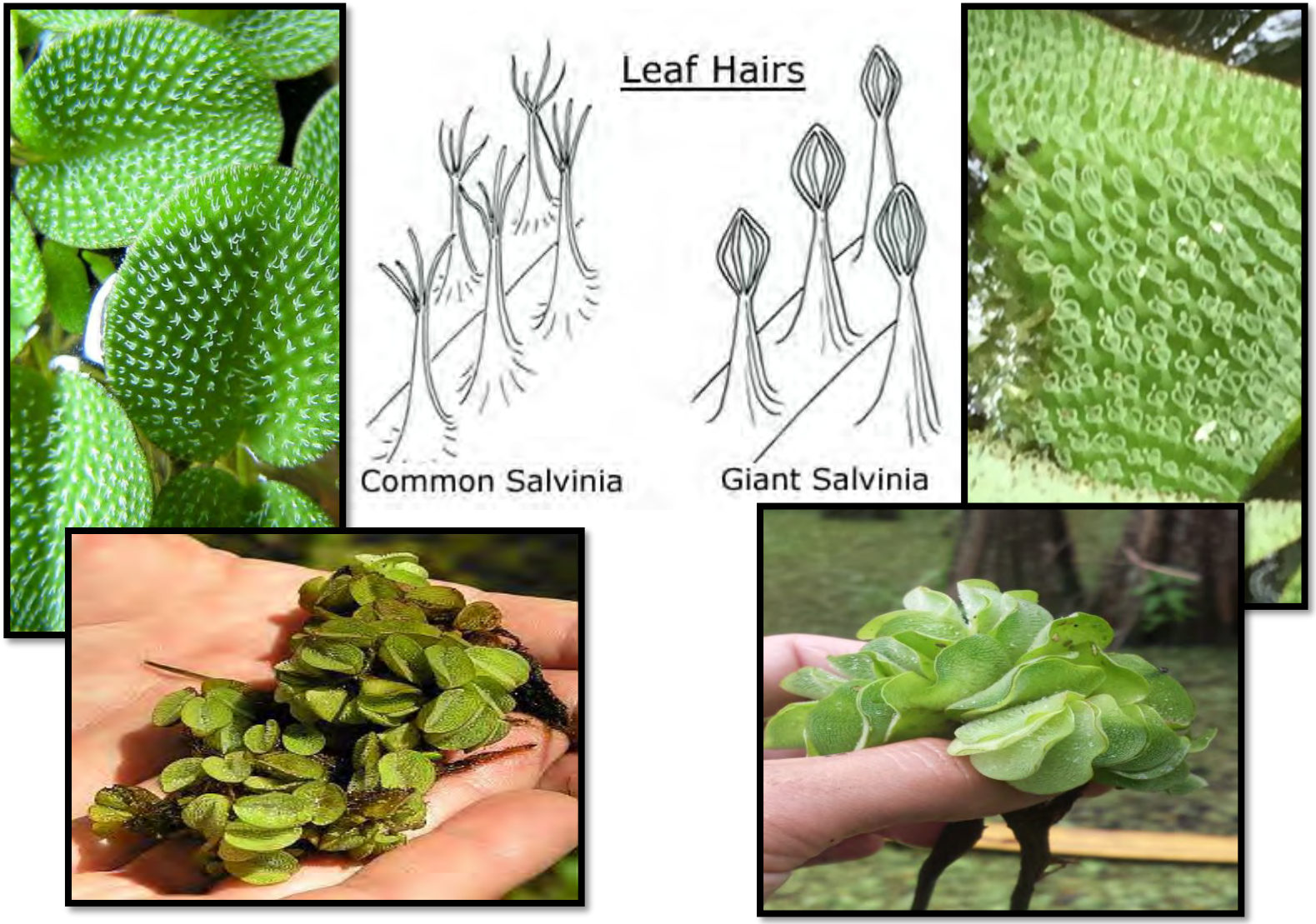
Giant Salvinia



- Native to Southeastern Brazil
- Problem in Australia, Africa, Asia, and US
- Spreads by fragmentation
- Rapid establishment
- Probably entered US in water garden trade

Common Salvinia VS Giant Salvinia



Ecology

- **Reproduction is strictly vegetative as spores are sterile** (Mitchell 1979)
- **Under favorable natural conditions, biomass can double in about one week to 10 days** (Mitchell and Tur 1975; Mitchell 1979)
- ***Salvinia molesta* is strictly a freshwater species, not tolerating brackish or marine environments**

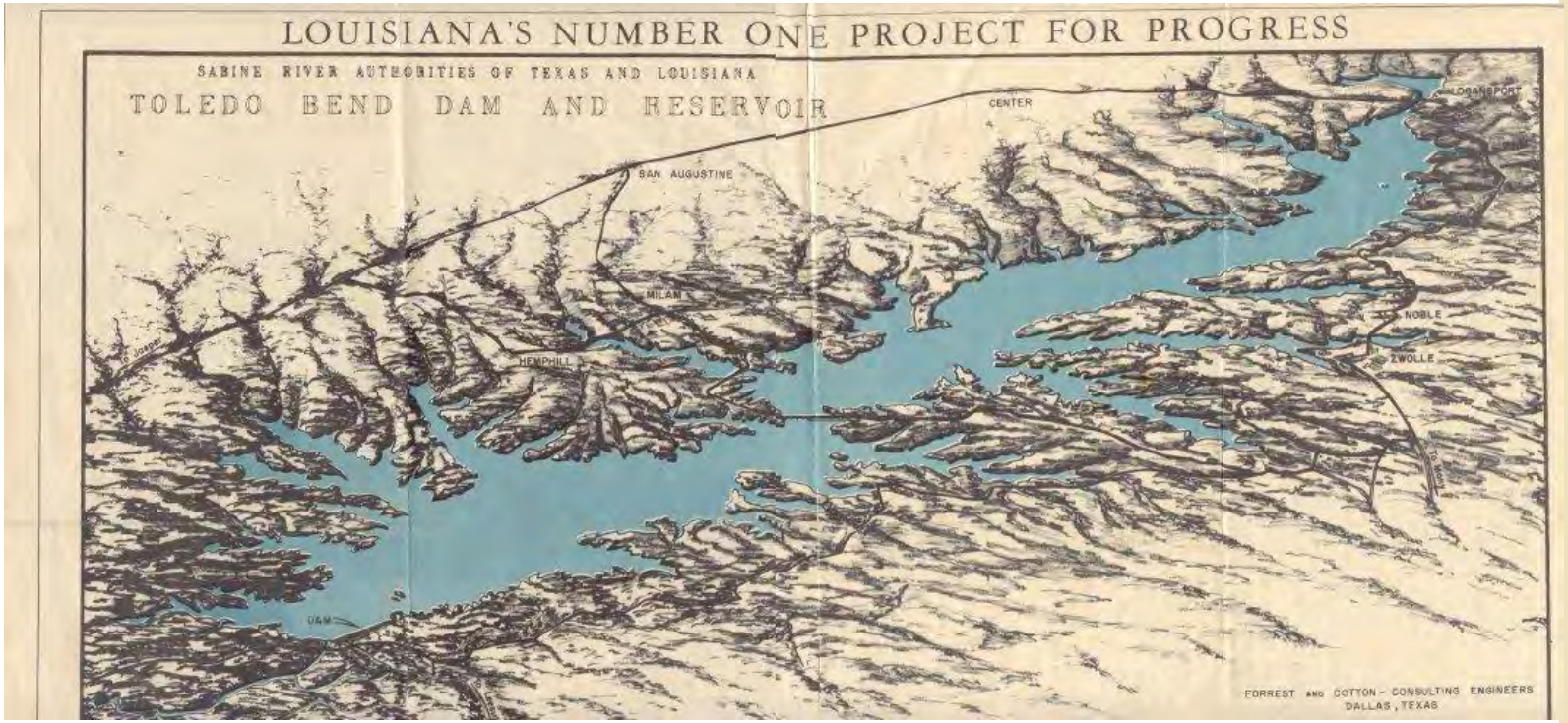
Federally Regulated

- Noxious Weeds Program
  USDA. APHIS. Plant Protection and Quarantine.
  Includes species listed as a Federal Noxious Weed under the Plant Protection Act, which makes it illegal in the U.S. to import or transport between States without a permit.

State Regulated

- Prohibited Invasive Noxious Aquatic Plant. Importation and Transportation of Invasive Noxious Aquatic Plants; Permit Required

Giant Salvinia in Louisiana



- Discovered in Toledo Bend Reservoir in 1998
- Initial infestation estimated to be less than 400 acres

Mechanisms of Dispersal

Education

PROTECT YOUR BOAT AND LOUISIANA'S WATERS

Slow the spread of non-native aquatic invaders that:

- Choke waterways
- Foul boats and engines
- Clog intake pipes

These plants become nuisances when they multiply in Louisiana's waters. Avoid accidentally spreading them to other lakes and streams by taking the following precautions after boating:

INSPECT boat and trailer carefully for any living matter, **REMOVE** all plants or other living organisms. Discard in the trash, not in the water.

DRAIN all water from boat, including bilge, live well, and cooling system to avoid transporting small seeds or spores.

DRY boat and trailer in the sun for at least two days to kill plants **OR RINSE** off boat and trailer, anchor, anchor chain – all boat parts – with tap water.

Common Salvinia

Hydrilla

Water Hyacinth

Giant Salvinia

Sea Grant LOUISIANA

LSU AgCenter Research & Extension

PROTECT YOUR WATERS FROM THE GREEN MONSTER

GIANT SALVINIA – exotic plant that can:

- Clog waterways
- Foul boats and engines
- Eliminate recreational activities
- Cover the surface of the water harming fish and wildlife

LOOK OUT FOR THIS INVADER

- Report new infestations to the proper authority

HELP PREVENT THE SPREAD – protect your waters:

- Remove all plants from your boat, trailer, prop, tackle, decoys, live well any place that giant salvinia could potentially hide before launching in another waterbody.

SPREAD THE WORD

- Let others know about the dangers and how they can help.

For more information on giant salvinia and other aquatic invasive species please contact Louisiana Department of Wildlife and Fisheries

LOUISIANA

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

Economic Impact

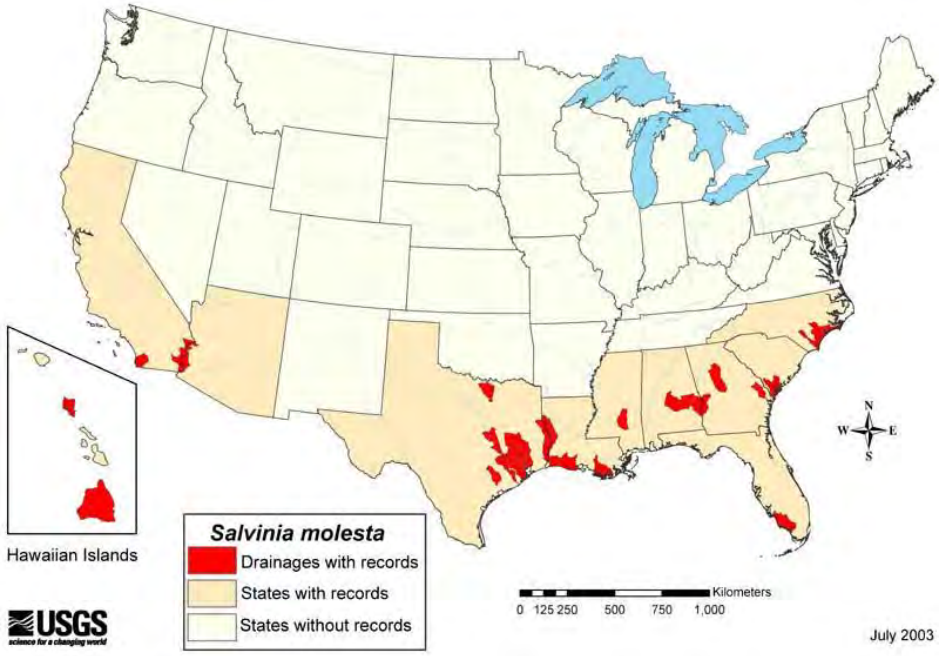
- Limits boating access (hunting, fishing, and recreational activities)
- Decreases property value
- Reduces tourism (swamp tours, aesthetic appearance of BOW)
- Cost associated with control efforts

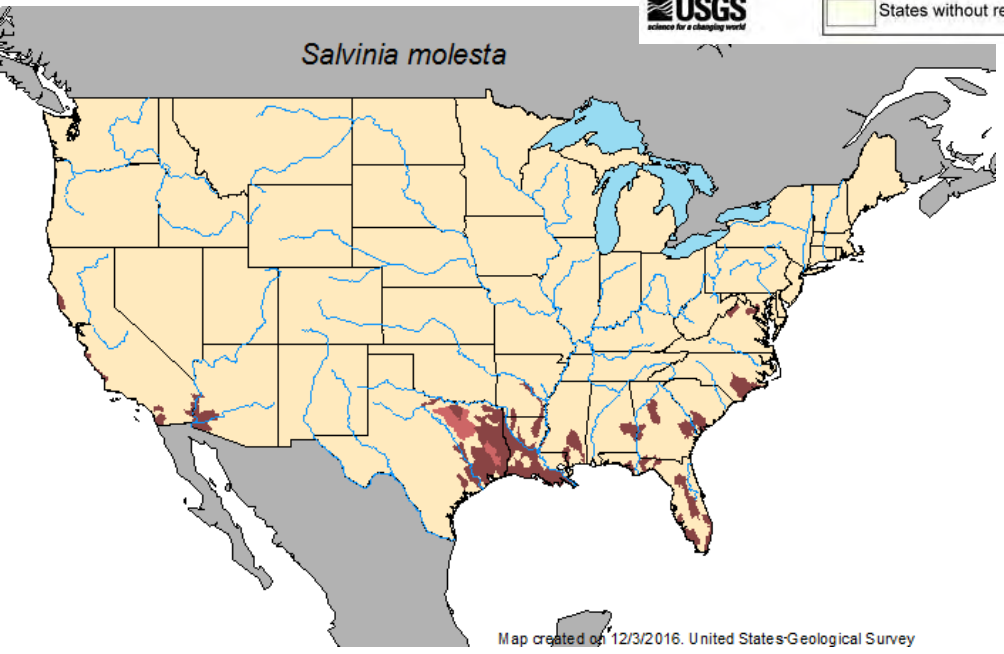
Environmental Impact

- Displaces all other floating vegetation, native and nonnative.
- Once dense mats are formed, virtually all sunlight is blocked, killing all the submerged vegetation.
- As the submerged plants and older salvinia die and decay, dissolved oxygen levels in the water are depleted, forcing fish and other aquatic animals to flee or die

The Spread of Giant Salvinia

2003 →





← 2016

Issues for Louisiana

- Large number of freshwater systems
- Swamps/flooded timber
- Connected waterbodies
- Large number of boaters

Bodies of Water with Giant Salvinia

Invasive Aquatic Plants in Louisiana

Floating, Emergent, Submerged

Invasive Aquatic Plants in Louisiana

Plant	1st Year	Acres of Infestation					
		2011	2012	2013	2014	2015	2016
Water Hyacinth	1884	**96,130**	**65,275**	**89,810**	**98,047**	**81,361**	**81,198**
Hydrilla	1975	**62,800**	**37,725**	**47,618**	**43,563**	**30,240**	**29,885**
Common Salvinia	1980	**44,310**	**46,410**	**33,960**	**29,440**	**27,884**	**29,438**
Giant Salvinia	1998	**38,805**	**52,400**	**45,354**	**52,496**	**57,877**	**57,138**

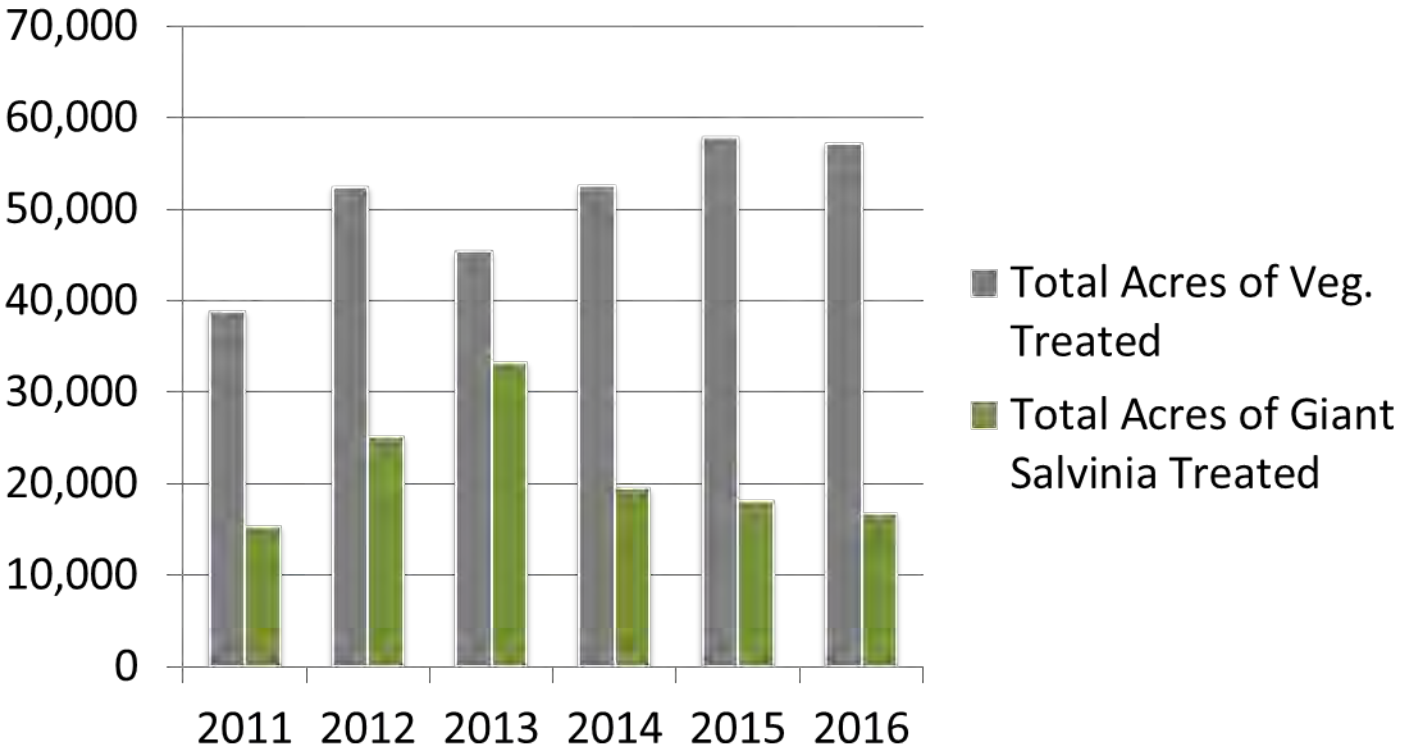
Acreage of Aquatic Plants Treated by LDWF

Fiscal Year	Acres
2006/2007	30,653
2007/2008	61,000
2008/2009	67,951
2009/2010	75,021
2010/2011	55,609
2011/2012	66,944
2012/2013	89,324
2013/2014	79,791
2014/2015	52,082
2015/2016	56,970

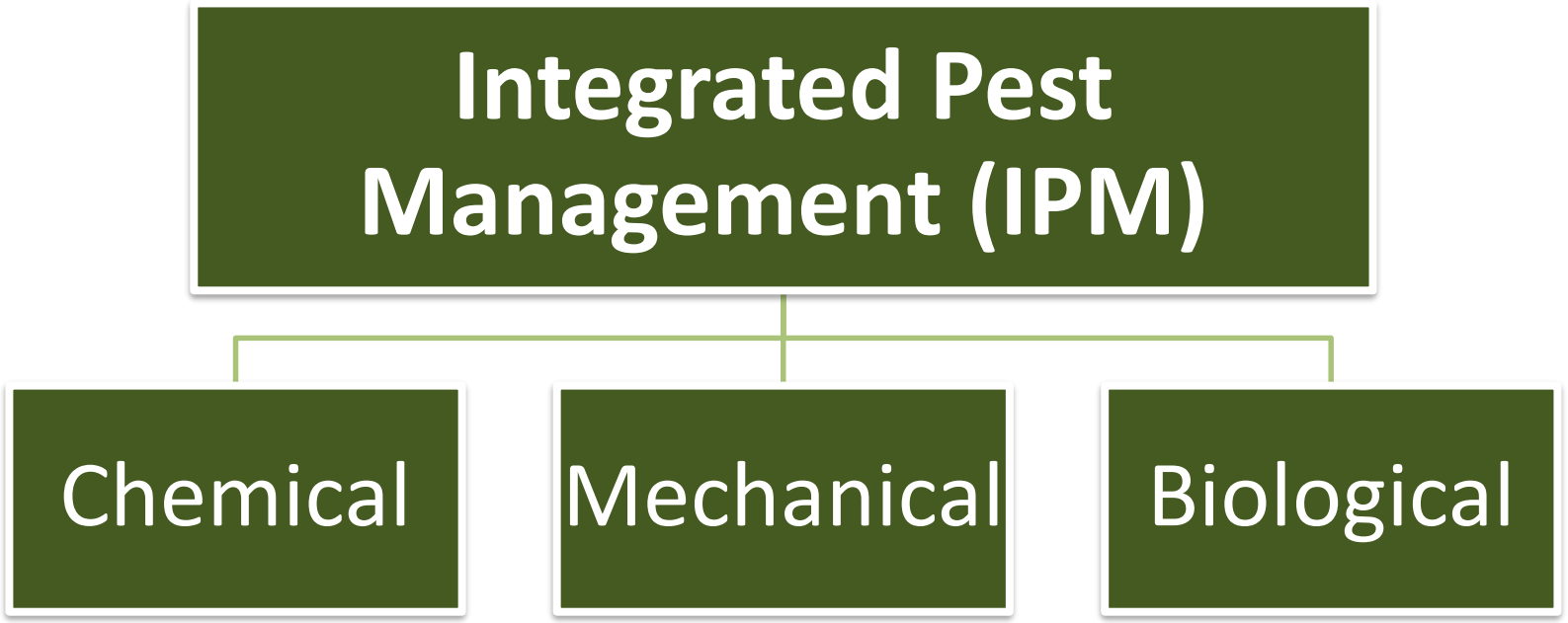
Acres of Giant Salvinia Treated in Louisiana by LDWF

Year	Acres
2011	15,309
2012	25,115
2013	33,235
2014	19,461
2015	18,076
2016	16,654

Total Acres of Vegetation Treated vs. Total Acres of Giant Salvinia Treated



Control Methods



(IPM) Chemical Control

LDWF Spray Crews

- Maintenance/Small Areas

Contract Applications

- Boats
- Aerial

(IPM) Mechanical Controls

Containment Boom

- Limits plant movement
- Containment for herbicide application

(IPM) Mechanical Controls

Drawdown

- Targets shoreline plants
- Affects entire waterbody
- Can remove large quantities at low cost

Mechanical Controls

- Not efficient or effective on large areas
- Expensive
- Labor intensive
- Material disposal

Giant and Common Salvinia

- **Glyphosate** (0.75 gal/acre) + **Diquat** (0.25 gal/acre)
  - From April 1 – October 31
- **Diquat** (0.75 gal/acre)
  - From November 1 – March 31
- **Fluridone** – 20-45 ppb

Obstacles with Herbicide Application

- Egg beater shaped hairs on the surface of the leaves act as a barrier.
- Surfactant needed to brake surface tension of the herbicide mixture allowing it to coat the plant and stick to it long enough to work.

Surfactant Trials

- Evaluation of various surfactants for compatibility with current aquatic herbicides used to manage giant salvinia.
- Non-ionic surfactants, methylated seed/vegetable oils, and buffering agents have been evaluated.

(IPM) Biological Control

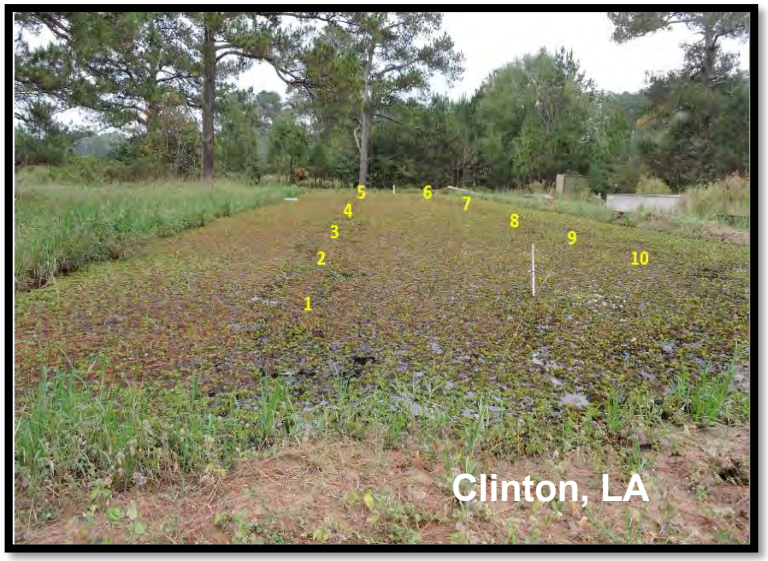
Species-specific Control

– Giant Salvinia Weevil

Giant Salvinia Weevil Rearing Ponds

LSU AgCenter

- Three sites established on LSU AgCenter property
- New site at University of Louisiana



- **Clinton, LA**
- **St. Gabriel, LA**
- **New Iberia, LA**
- **University of Louisiana**

Giant Salvinia Weevil Rearing Ponds

Breaking ground on new ponds

- designed for easier maintenance and easier collection

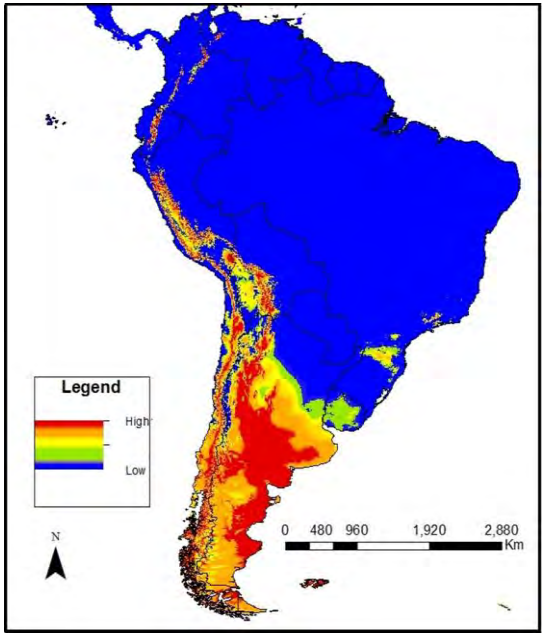
Giant Salvinia Weevil Harvest

Giant Salvinia Weevil

Giant salvinia weevil stocking

- Transplanting since 2008
- Low winter survival in northern Louisiana

LSU Weevil Research



- **Failure to establish in temperate regions**
  - High winter mortality of adults due to freezing temperatures
  - Failure to establish north of 32° N in US

- **Cold tolerant weevils**
  - Weevils populations from temperate distribution of native range possibly more cold tolerant than populations from LA?

Changes in Giant Salvinia Coverage in Cameron Parish 2016

Recent Control Efforts

- 2016 weevil stocking (145,986 weevils)
- 952 acres – helicopter herbicide applications (open-water areas)
- 1,964 acres – boat herbicide applications
  - 50 day contract in progress
- Drawdown (Aug. 15th – Nov. 30th)

Current and Future Research

- LSU AgCenter
  - Cold tolerant weevil
  - Giant salvinia herbicide/surfactant trials
  - Giant salvinia weevil production
- Army Corps of Engineers
  - Giant salvinia weevil production

Acknowledgements

Questions?

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