

GREENTREE RESERVIORS

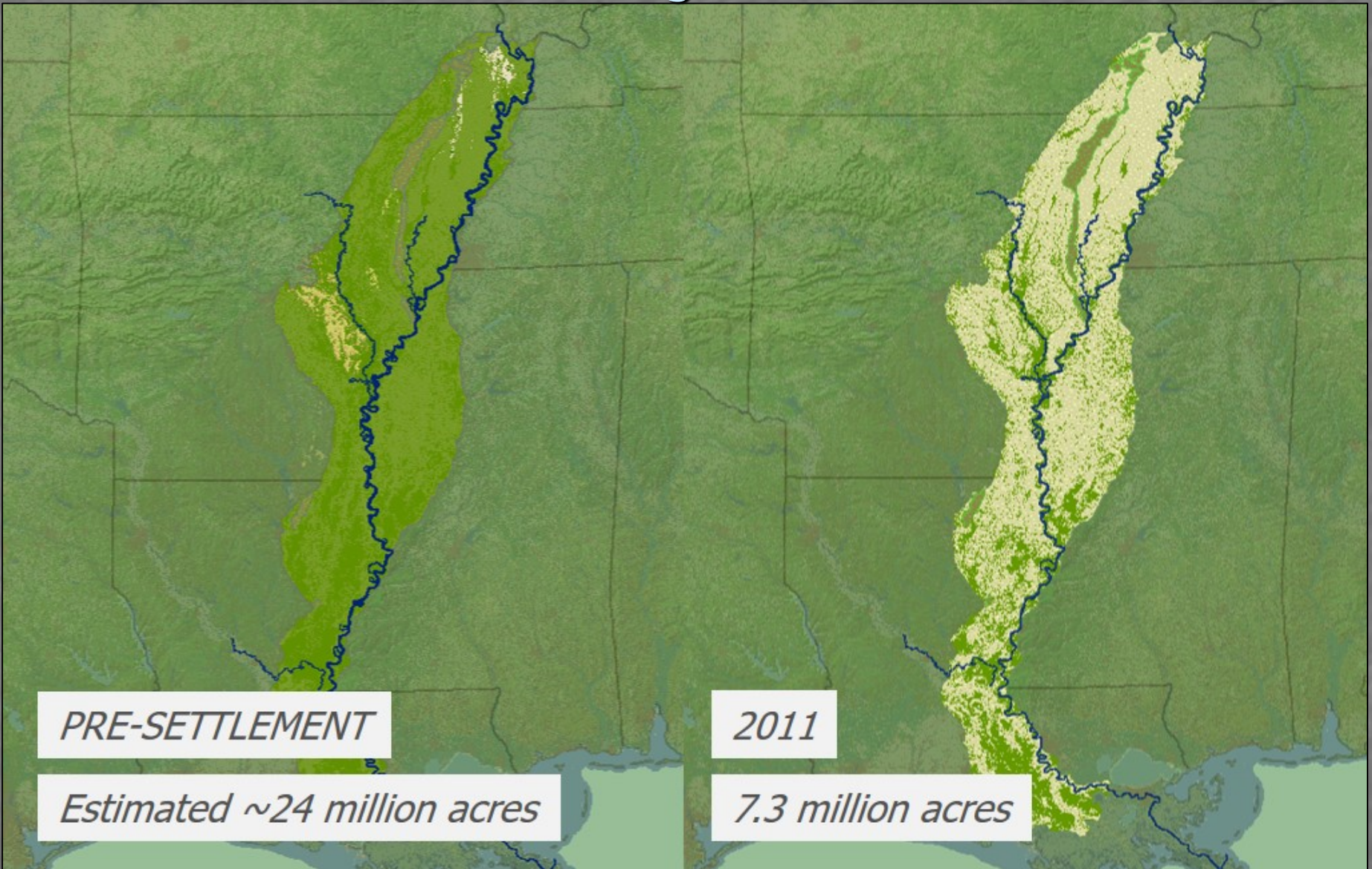
Management, Evaluation and Planning





Widespread Habitat Loss

Value of Remaining Habitat Increased



PRE-SETTLEMENT

Estimated ~24 million acres

2011

7.3 million acres



Background Information

- 49 GTRs totaling 51,000 acres on 19 WMA's. Over 300 miles of levee and 400 WCS
- Most GTRs were built in 1960 – 70's in response to waterfowl habitat loss in the MAV. Infrastructure is now reaching 50-60 years old and is not adequate to efficiently move water during the growing season.
- Initial Forest Health Assessment was conducted in 2014. Results indicated 40% of all willow oak had reached critical stages and another 42% were showing damage.
- 7 public meetings held since 2016 and brochures mailed to 100,000 waterfowl hunters to discuss management and long term goals

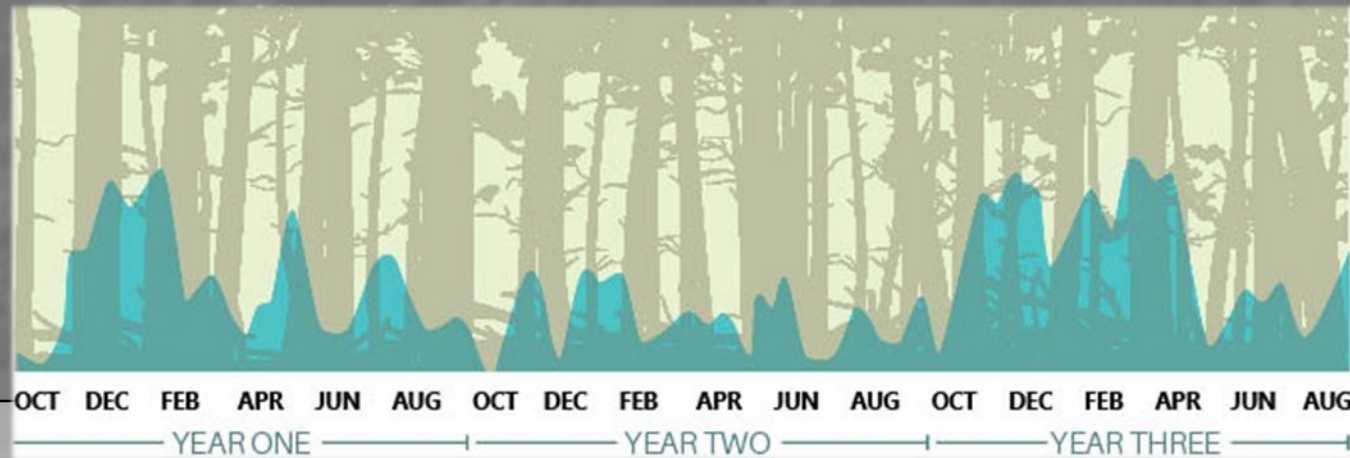




GTR Management

Long-term Commitment: Objectives

- To support sustainable bottomland hardwood forests that provide quality foraging opportunities on mast and invertebrates for waterfowl.
- To provide long-term waterfowl hunting opportunity.

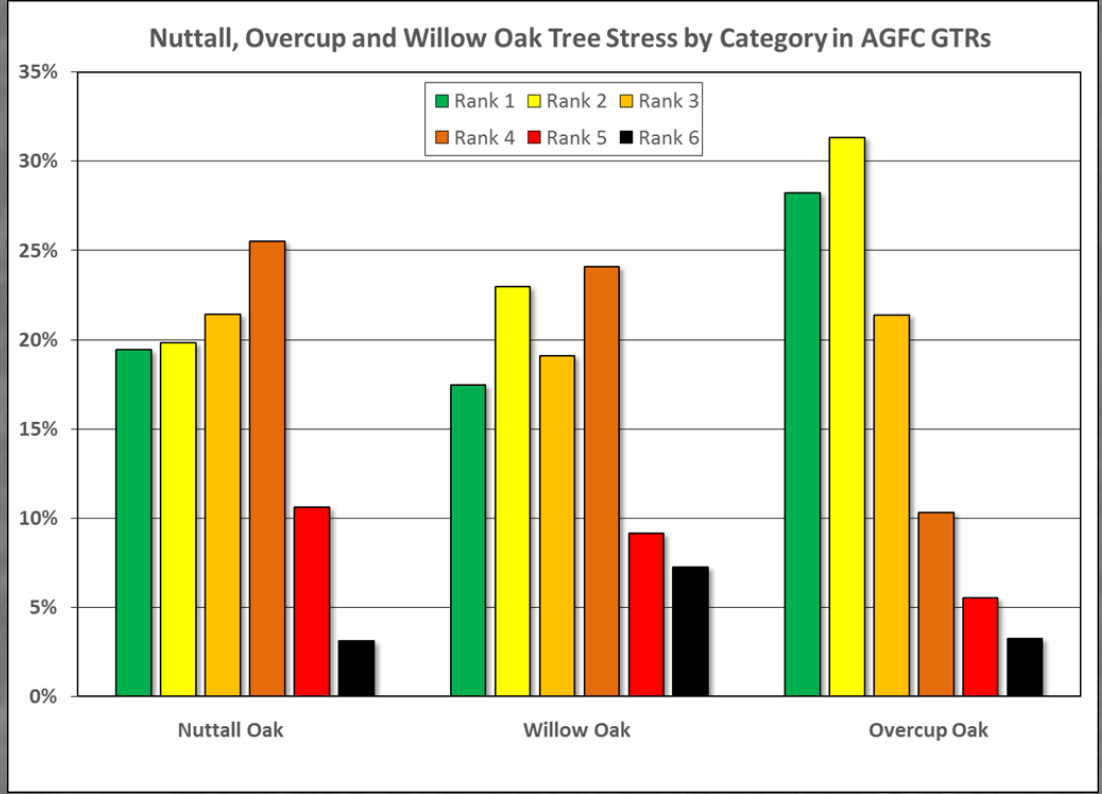
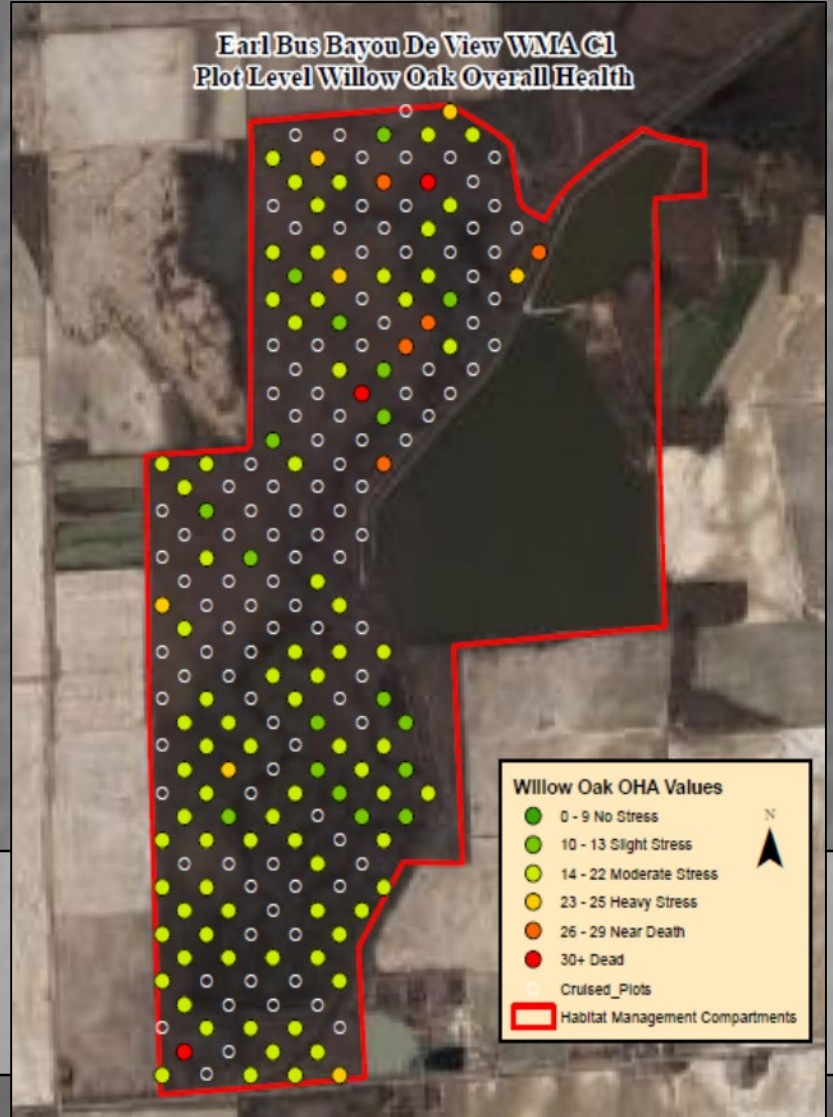


Long-term opportunity requires sustainability



GTR Management

Long-term Habitat Degradation



Beneficial species in poor health – reevaluations ongoing



GTR Management

Food Value for Ducks Likely Reduced



Overcup Oak



Willow Oak



Nuttall Oak

An illustration of a mallard duck's head in profile, facing right. Below the head are three acorns of different sizes and cap types, labeled with lines pointing to them. The largest acorn is labeled 'OVERCUP OAK ACORN', the medium one 'NUTTALL OAK ACORN', and the smallest one 'WILLOW OAK ACORN'.

Smaller acorns with small caps are preferred by ducks, and the most preferred by mallards tend to be Nuttall and willow oak acorns.

OVERCUP OAK ACORN

NUTTALL OAK ACORN

WILLOW OAK ACORN

Illustration by Greta James

Not all acorns provide food for ducks



GTR Management

Shift Management Focus from *Holding Water* to *Moving Water*



- 10 of the top 25 historical crests on the White River near HGHL WMA occurred in the last 11 years

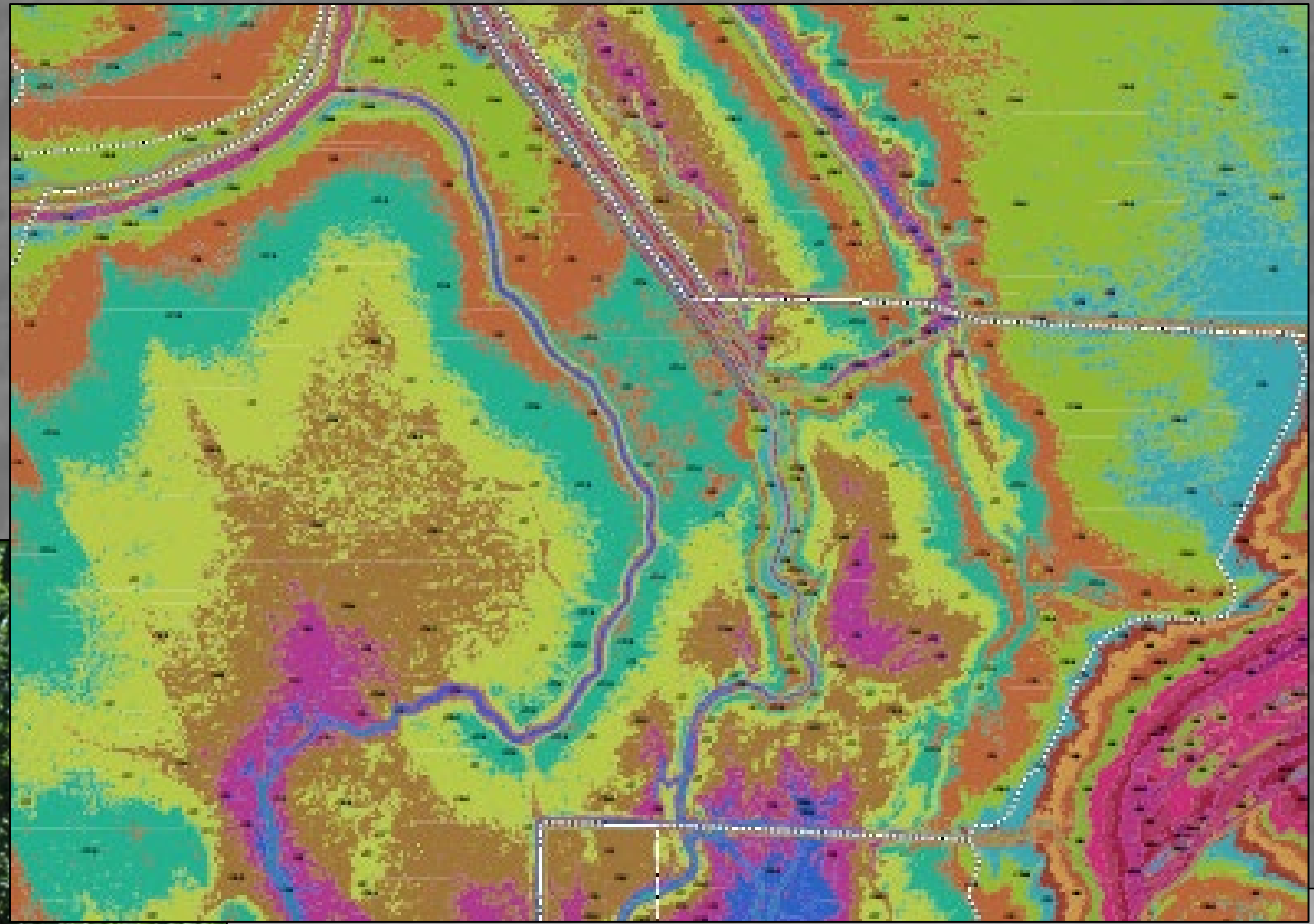
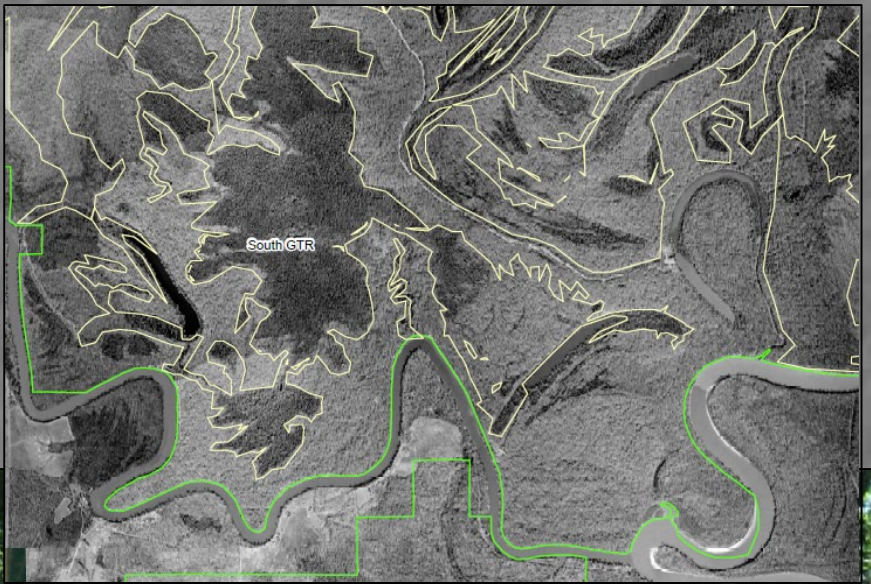


Apparent increased growing season stressors



GTR Management

Review Teams Evaluate all GTRs



AGFC and non-AGFC experts



GTR Management

Develop Initial Restoration Objectives

Cost Estimates for Initial Infrastructure Enhancements at Harris Brake WMA		
Upper GTR	Quantity	Estimated Cost
Frame out Upper Langemann Gates	1	\$160,000
Langemann Gates, 14'	1	\$100,000
Spillway Construction (2-5)	300 ft.	\$24,000
Lower GTR		
Frame out Water Control Structure for Overshot Gates	2	\$310,000
Overshot Gates, 14'	2	\$200,000
Spillway Construction (2-5)	300 ft.	\$24,000
Flatcar Bridge	1	\$100,000
Throughout WMA		
Drainage Clean-out/Restoration	60 ac.	\$160,000.00
build small reservoir at outlet of Lake (2 overshots, flatcar, and dam)	2	\$550,000.00
TOTAL		\$1,628,000

Draft renovation concepts for each WMA



GTR Management

Develop Initial Restoration Objectives

Estimated Cost to Renovate GTRs in 11 WMAs			
Ranking	WMA	Cost	Notes
1	Earl Buss Bayou Deview	\$ 1,650,100	2 NAWCA proposals submitted in FY20 - no word on status of proposals
1	Henry Gray Hurricane Lake	\$ 3,632,000	Engineering/Design/Permitting work contracted in FY20
1 and 4	George H. Dunklin Jr. Bayou Meto	\$ 15,500,000	NOTE: This DOES include funding for the BM Irrigation Project (non-federal matching portion of the clean-out of Little Bayou Meto to lower pump station and repairs to Cannon Brake infrastructure) - \$5.5 (Priority 1). GTR infrastructure renovations on the WMA will be extensive but information is unavailable at this time - estimate \$10 million (Priority 4 to allow time gather necessary data/information).
2	Bell Slough	\$ 780,000	
2	Bois D'Arc	\$ 1,555,000	
2	Cut Off Creek WMA	\$ 1,350,000	
2	Petit Jean River WMA	\$ 1,550,000	
3	Big Lake	\$ 5,052,500	
3	Shirey Bay Rainey Brake	\$ 3,700,000	
4	Dave Donaldson Black River WMA	\$ 3,000,000	NOTE: This does not include the existing \$13.5 M currently in the AGFC's account.
5	Harris Brake WMA	\$ 1,700,000	
TOTAL ESTIMATED COST		\$ 39,469,600	

Statewide priorities



GTR Management

Research to Understand Red Oak Dormancy

- **Installed dataloggers to collect air and soil temperatures, and soil moisture at 10 and 30 cm depth**
- **Initial root respiration measurements from willow oak and overcup oak in the field**
- **¹⁵N-Nitrate uptake assay with field-collected willow oak and overcup oak**
- **Willow oak seedling controlled-soil temperature experiment in progress**

Highlights to date



GTR Management

Key Research Questions



- When do soil temperatures decline at AGFC GTRs?
- How do soil temperatures relate to air temperatures?
- How does flooding impact soil temperature?
- MDC collaborators develop soil temperature prediction formula that requires input of air temperatures.

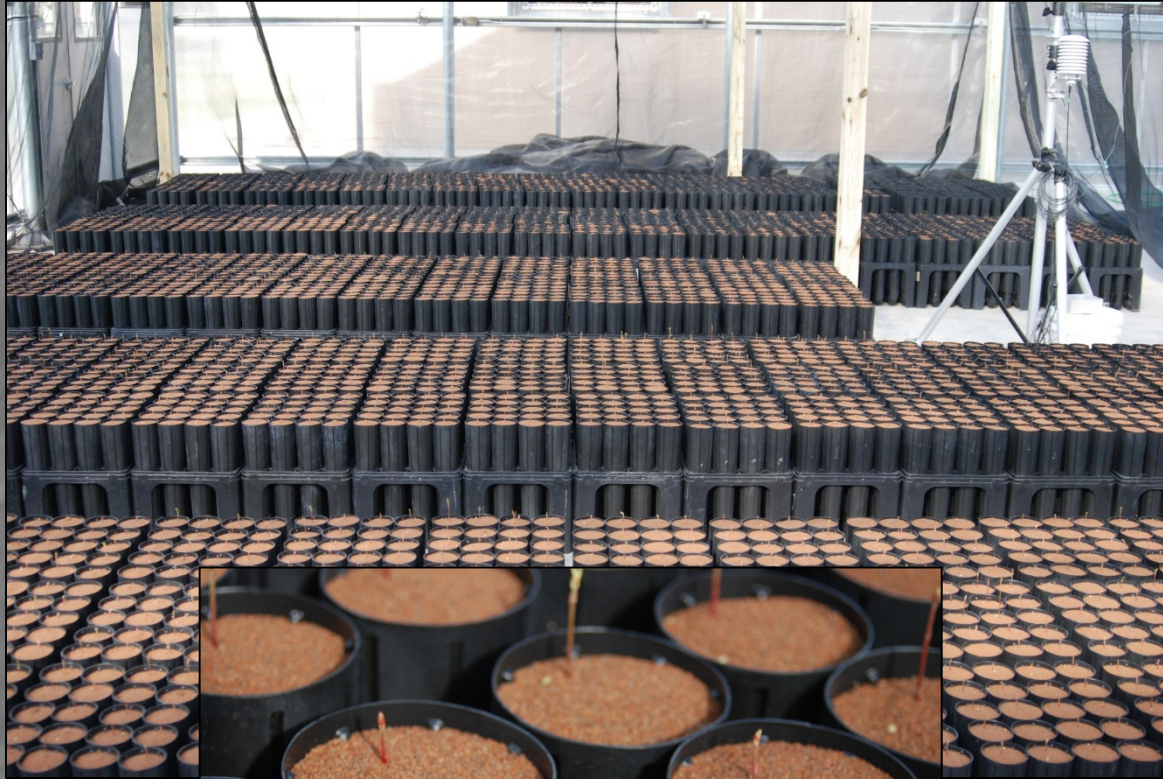


Assumes soil temp. will predict dormancy



GTR Management

Controlled Soil Temperature Experiments



- Discern whether root activity responds to soil temperature or above ground cues
- See if flood imposed after leaf fall, and removed before bud break, negatively impacts seedlings

5,000 willow oak acorns from Cut Off Creek



Outcomes

- Support for delaying flood-up on all GTRs across the state from Oct. 1-15 to Nov. 15. Implemented in 2017 as a stop gap until infrastructure is improved and more data is collected on red oak dormancy
- Support for not initiating board up in HGHL WMA South GTR due to 200 acre deadening that has grown to over 400 acres this summer and on Dagmar WMA due to timber sale in 2016 and red oak regeneration occurring within the GTR following timber harvest. 600 seedlings/acre in 2018 and 800/acre in 2019
- NFWF Grant, two NAWCA proposals submitted for Bayou DeView WMA and Engineering Contracts
- Comprehensive management plans for long term sustainability
- New Forest Inventory Database
 - Three levels of data collection associated with each plot. At the plot level we are collecting forest parameters such as forest type, canopy closure, mid story density and under-story cover. This data is used to quantify forest structure and assess habitat quality. Second is plot center where we are collecting individual tree level data such as species, diameter, forest product and merchantable height determinations, crown class position, and assessing tree health. At the third level we are recording all reproduction.



Bayou De View WMA Compartment 1
Index of Red Oak Regeneration Density



Bayou De View WMA Compartment 1
Index of Willow Oak Density



WILLOW OAK
ALL CROWN CLASSES COMBINED
TREE STRESS INDICATORS

