A New Strategic Plan for the Lake Livingston Friends of Reservoir Restoration Project – Adding a Better Science Approach to Ensure Success and Provide Accountability

By

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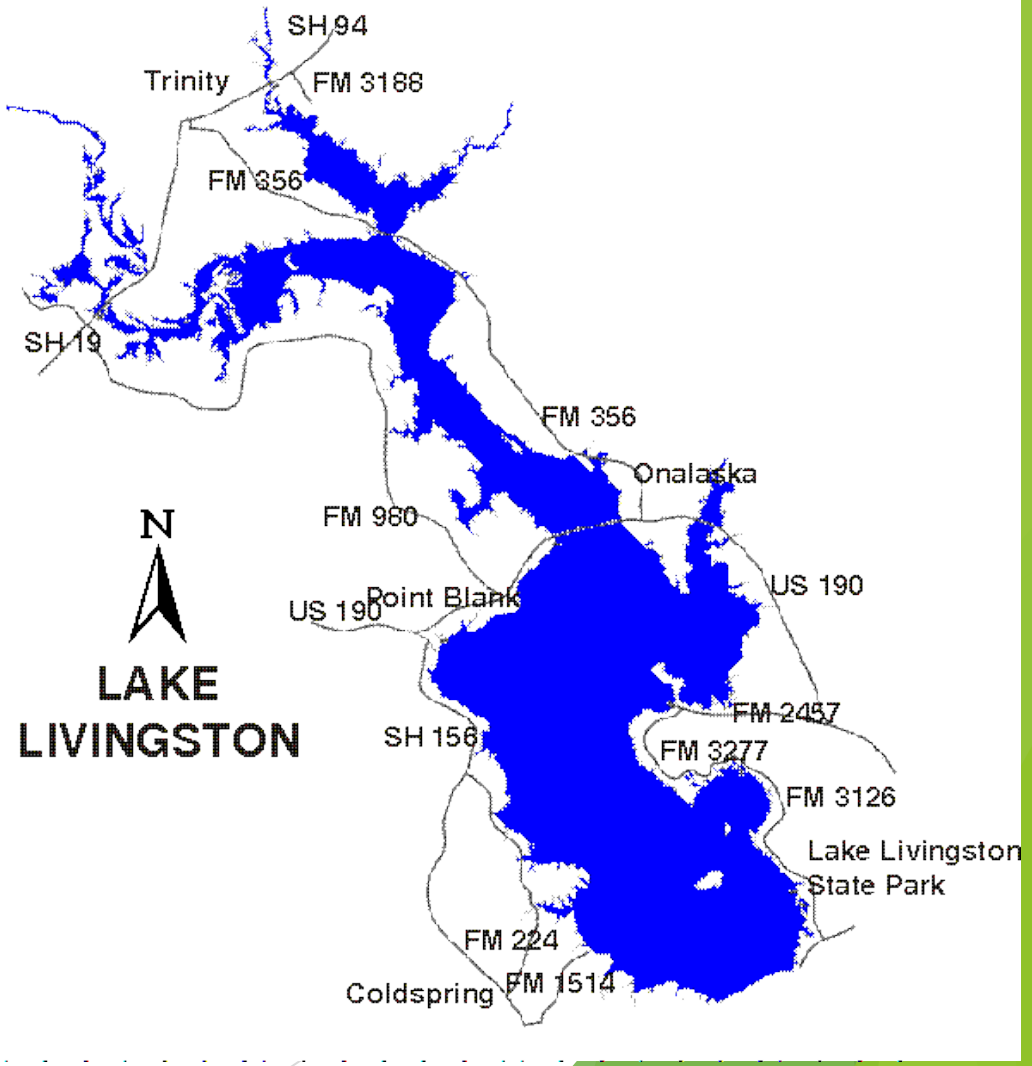
Revitalizing Lake Livingston

Where Are We After Year 5?

Lake Livingston Today

- 85,000-acre lake nearly devoid of native aquatic plant life
- Bulkheads line much of 450 mile shoreline
- Siltation and loss of standing timber increases turbidity
- Local economy hurt by loss of large bass fishing tournaments



01

Restore habitat with American Water-willow on shorelines, islands, and shallow water flats

02

Reduce erosion, improve water filtration and quality, and provide habitat for juvenile fish, reptiles and birds

03

Reestablish Lake Livingston as a prime destination for anglers and outdoor recreationists

04

Enlist local high schools to grow, propagate, and plant

Project Goals

Developments Since 2013

- New Board of Directors (2016)
- TDC Ellis Unit Horticulture program was added - lead research group
- Added more high schools (now 9) for ecology outreach and propagation
- Established a new science approach to the process
- Currently – 200+ Multi-Generational volunteer team – 16 to 80+
- Surveyed previously planted sites for success rate

American Water-Willow

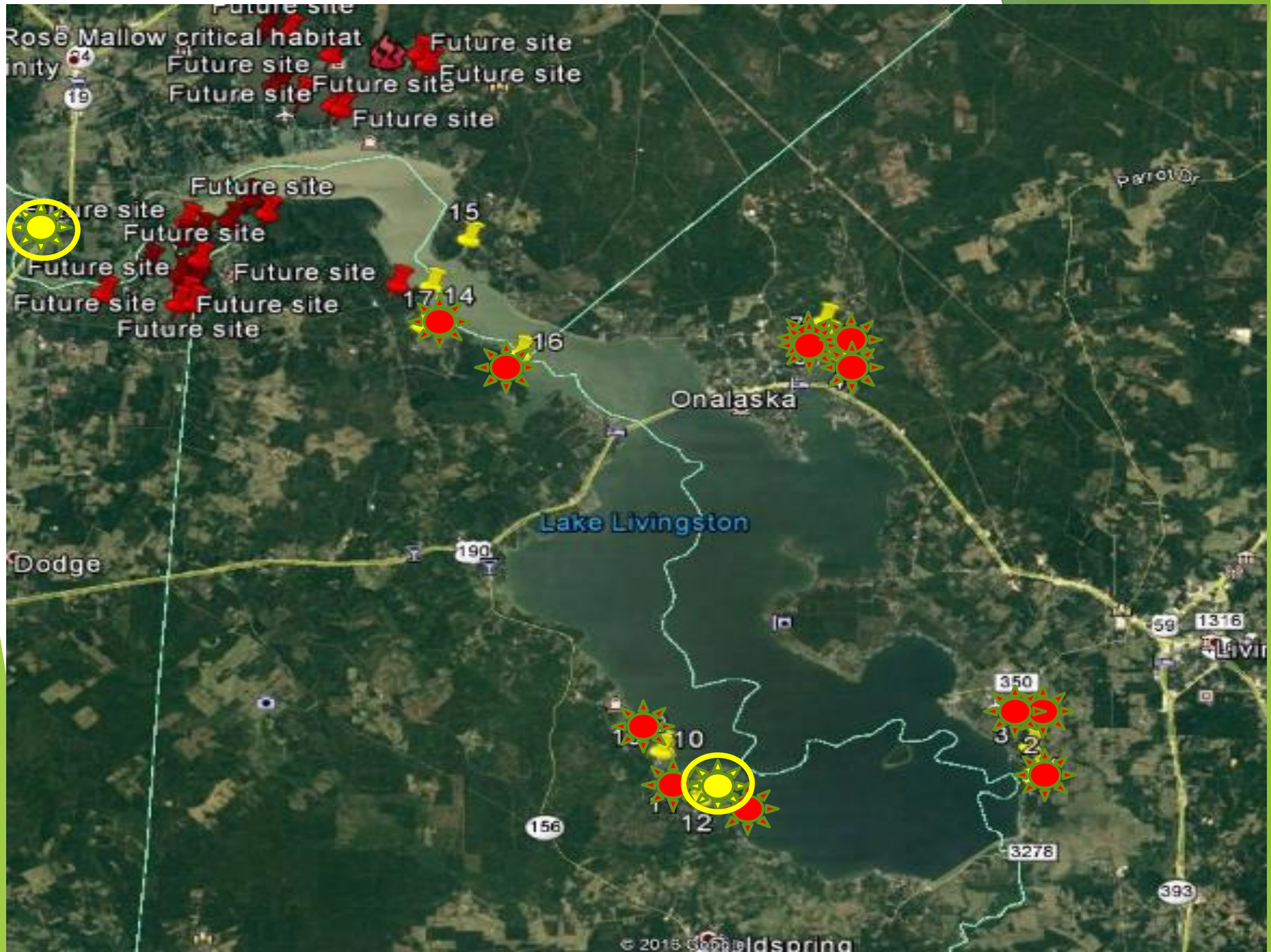
Non-invasive Rhizome Fast Growing

Grass Carp Hate It Hearty Easy Colonization

- 18 Sites
- Protected Creek Plantings Thrive
- Plants Prefer Shallow Water
- North End Offers Greatest Opportunity

2017 Survey Showed

4100/8900 = 46%


Rose Mallow critical habitat
Future site
Future site
Future site
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Future site
Future site
15
17
14
16
Onalaska
Lake Livingston
Dodge
190
156
10
12
350
3
2
3278
393
1316
59
Parrot Dr

Specific Site Selection
Wolf Creek Plantings

Solicitation of Science Input

- LAERF – Lewisville Aquatic Research Facility (Corps of Engineers)
- Meadows Center for Water & Environment (San Marcos, Stream Team HQ)
- Texas A&M AgriLife – College Station – Dr. Todd Sink
- Texas A&M Forest Service – Todd Thomas/John Warner
- Reservoir Fisheries Habitat Partnership (US Fish & Wildlife) – Friends of Reservoir
- Texas Parks & Wildlife
- Trinity River Authority

Problems Identified by new board in 2016

- Scattered Planting Around the Lake
- Site Selection Issues
- Lack of Monitoring to measure success and progress
- Mono-Culture Establishment
- Wind-Wave Action on plants
- Bulk-heading
- Lack of Riparian Area around the lake (mostly timberland and pasture)
- Multiple Entities with jurisdiction over Lake Livingston and watershed
  - TRA, TPWD, TCEQ, TWDB
- Lack of an overall lake conservation plan
  - (There is a fisheries management plan – TPWD)

- **TPWD advises we need 5% coverage for success (85,000 acres = 4,250 acres)**

Strategic Plan - 2018

- Apply Technical Input
  - **Founder Colony Strategy**
  - **Plant Species Diversification**
  - **FOCUS on a few specific sites!!**
  - **Survey Planted sites**
- Measuring Success & Accountability
  1. **Water Quality Assessment**
  2. **Measure Invertebrate Population**
  3. **Riparian Area Assessment**

School Planting May 2018

BearKat Camp – May 2018

BearKat Camp
Aug - 2018

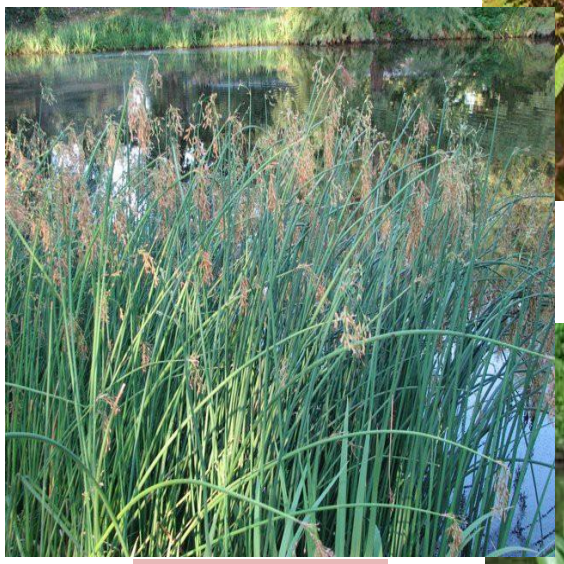
Founder Colony Concepts

BearKat Camp – Aug 2018
Founder Colonies

Experimenting with Varieties of Aquatic Plants

- Water Willow
- Bulrush (Three Square)
- Wild Celery (Eel Grass)
- Bull Tongue
  - Delta Arrowhead
- Pickerelweed
- American Pondweed
  - American, Variable Leaf, Illinois

American Pondweed



Softstem Bulrush

Pickerel Weed

Siltation – Sandy Creek

Oct - 2014

Aug - 2018

Riparian Restoration for a Lake?

- High quality habitat benefits both aquatic and riparian species
- Reducing sediment erosion in the floodplain stabilizes and maintains downstream reservoir capacity, longer
- Debris and nutrient use and filtering in the floodplain improves water quality and dissolved oxygen levels in the entire aquatic system

Before

After

Expanded School Participation

- (9 Schools) Big Sandy, Coldspring-Oakhurst, Corrigan-Camden, Goodrich, Livingston, Onalaska, Leggett, Shephard ISDs, Livingston Montessori
- Propagating, growing, planting
- Competitions to incentivize
- Increase year round involvement
  - Ecology, Site Monitoring
- 23 Propagation tanks
  - 6 tanks @ Ellis Unit
  - New Greenhouse @ Ellis Unit

Things That Cause Me Metaphysical Anguish

- Can we make a difference?
- Should we be looking bigger than just Lake Livingston (i.e. the Trinity Watershed?)
- Should we be partnering with other groups?
- Should we add Riparian Restoration?
- Should we limit planting sites?
- Can we optimize plant species in relation to specific planting sites
- Should we expand the founder colony concept and how?
- Who can change policy in the watershed?

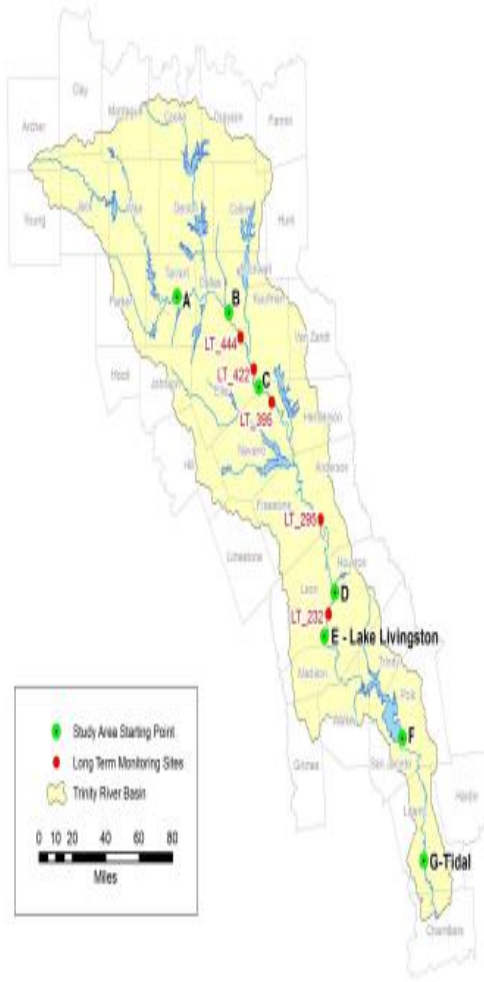


Figure 1. Basin map and area segmentation