

# Welcome to the Environmental & Habitat Enhancement Workshop For Lake Dunlap

GBRA: Nathan Pence, Chad Norris, Lee Gudgell, and Elizabeth Edgerton TPWD: Melissa Woods Parker, Ryan McGillicuddy, Angela England, Dusty McDonald, and Greg Binion





# Why Habitat Matters to Fish.... and People Too

Fisheries and Reservoir Aquatic Habitats Best Management Practices Workshop Lake Dunlap Habitat Restoration and Enhancement Project October 16<sup>th</sup>, 2021

TPWD: Melissa Woods Parker, Ryan McGillicuddy, Angela England, Dusty McDonald, and Greg Binion GBRA: Nathan Pence, Chad Norris, Lee Gudgell, and Elizabeth Edgerton



## Overview



- General context
- What are fisheries and aquatic habitats (the What?)
- Importance of habitat (the Why?)
- Types of habitat
- Areas to "target" habitat initiatives (the Where?)
- Restoration and enhancement BMPs (the How?)
- Collective stewardship (how can You help?)



# Values and Benefits

Boating, fishing, swimming, wildlife and bird viewing, relaxing, natural beauty, fun with family and friends, reliable supply of water, clean source of renewable power







What is it that you enjoy about water recreation and Lakeside Living?



## Reservoir Systems



Reservoirs are vital part of America's infrastructure

Many have already lived or surpassed intended "lifespan"





#### Nationwide survey of reservoir impairments (Miranda et. al 2010)







stuctural habit

## Reservoir Impairments

Major reservoir impairments in TX (Miranda et. al 2010)

 Siltation, littoral and structural and habitat deficiencies, connectivity to streams, land use practices (e.g., excessive nutrients)













#### Siltation









#### Habitat Deficiencies















# Habitat Deficiencies Siltation Land Use Practices





# Reservoir Aquatic Habitats

- Aquatic habitats in reservoirs is finite, and just like most things is either lost, degraded, or breaks down over time
  - "Functional" habitat has its own "lifespan"
    - Examples: shallowing, degraded water quality, woody debris loss, etc.
- Require "maintenance" so to speak
- Collective stewardship (i.e., restoration, enhancement)
  - Must replenish aquatic habitat over time and address other problems like land use practices, water quality degradation, loss of structural habitats, etc.



## Habitat

The physical, chemical, and biological features of the environment needed to sustain life

The What?





#### Habitat

The places fish and other aquatic life live



# Fishery



#### Fish:

Recreationally and commercially important species (i.e., sport fish, prey species, species for food and subsidence)





# Fishery



#### Fish:

**Recreationally and** commercially important species (i.e., sport fish, prey species, species for food and subsidence)



#### **People:**

Users, waterfront landowners, stakeholders, constituency, agencies,

**Habitat:** 

Aquatic environments and ecosystems









#### Habitat matters to people's well-being

The Why?





Abundant and diverse habitat is critical to support a healthy and balanced ecosystem









Habitat is essential for reproductive success





Habitat is used as a resting or hiding place



Habitat provides feeding grounds

Habitat quality, complexity, and quantity  $\rightarrow$  direct impact on the numbers, sizes, species, and overall diversity that can be sustained in an area

TEXAS

WILDLIFE





#### HEALTH ADVISORY

E NU PAL

Keep away from this water

It contains blue-green algae that can harm humans and animals.

. DO NOT swim, bathe, canoe, or kayak.

DO NOT drink or cook with this water.

. DO NOT eat fish caught in this water.

For information call the Grand River Conservation Authority at 519-621-2763



No. of Concession, Name

Negative → poor water quality, poor habitat quality, low reproductive success, species extinction, reduced biodiversity, depleted stocks, > nutrient loading, reduced property value



Positive → increased biodiversity, improved water quality, more abundant and diverse habitats, eco-friendly stabilization practices, abundant and healthy fish and wildlife populations, > water quality, > property value











#### Habitat – Natural





#### Habitat – Artificial































TEXAS

WILDLIFE



What to do to help keep your waterfront clean and vibrant with fish and aquatic life



 Remove old, dilapidated bulkhead and consider a living shoreline to provide shoreline stabilization as well as numerous ecosystem services and benefit

# The How?




- Remove old, dilapidated bulkhead and consider a living shoreline to provide shoreline stabilization as well as numerous ecosystem services and benefit
- 2. Go NATIVE...plant native trees and riparian vegetation to create habitats for fish and wildlife





- Remove old, dilapidated bulkhead and consider a living shoreline to provide shoreline stabilization as well as numerous ecosystem services and benefit
- 2. Go NATIVE...plant native trees and riparian vegetation to create habitats for fish and wildlife
- 3. Be mindful of land management practices (e.g., fertilizer usage)





- Remove old, dilapidated bulkhead and consider a living shoreline to provide shoreline stabilization as well as numerous ecosystem services and benefit
- 2. Go NATIVE...plant native trees and riparian vegetation to create habitats for fish and wildlife
- 3. Be mindful of land management practices (e.g., fertilizer usage)
- 4. Leave native aquatic plants and woody debris alone





- Remove old, dilapidated bulkhead and consider a living shoreline to provide shoreline stabilization as well as numerous ecosystem services and benefit
- 2. Go NATIVE...plant native trees and riparian vegetation to create habitats for fish and wildlife
- 3. Be mindful of land management practices (e.g., fertilizer usage)
- 4. Leave native aquatic plants and woody debris alone
- 5. Be aware of prop wash and damage to sensitive habitats in shallow water





- Remove old, dilapidated bulkhead and consider a living shoreline to provide shoreline stabilization as well as numerous ecosystem services and benefit
- 2. Go NATIVE...plant native trees and riparian vegetation to create habitats for fish and wildlife
- 3. Be mindful of land management practices (e.g., fertilizer usage)
- 4. Leave native aquatic plants and woody debris alone
- 5. Be aware of prop wash and damage to sensitive habitats in shallow water
- 6. Please do not release aquarium fish or other potentially harmful non-native plant and wildlife (call you local biologist)





7. Notify controlling authority and local TPWD fisheries biologist if you detect non-native nuisance vegetation (e.g., water hyacinth)





- 7. Notify controlling authority and local TPWD fisheries biologist if you detect non-native nuisance vegetation (e.g., water hyacinth)
- 8. Remember to Clean, Drain, and Dry your vessel to limit transfer of non-native infestations (e.g., zebra mussels) to other waterbodies





- 7. Notify controlling authority and local TPWD fisheries biologist if you detect non-native nuisance vegetation (e.g., water hyacinth)
- 8. Remember to Clean, Drain, and Dry your vessel to limit transfer of non-native infestations (e.g., zebra mussels) to other waterbodies
- Consider localized littoral habitat enhancement at your waters edge – must consult local TPWD fisheries biologist and controlling authority\*





- 7. Notify controlling authority and local TPWD fisheries biologist if you detect non-native nuisance vegetation (e.g., water hyacinth)
- 8. Remember to Clean, Drain, and Dry your vessel to limit transfer of non-native infestations (e.g., zebra mussels) to other waterbodies
- Consider localized littoral habitat enhancement at your waters edge – must consult local TPWD fisheries biologist and controlling authority\*
- 10. Give to nature where you can, we are <u>*all*</u> stewards!



Collective Stewardship

Be proactive!

You can make a difference!

<u>**Together</u>** making ecologically-friendly choices for long-term stewardship for current and future generations!</u>



If you love fishing PASS IT ON





## Thank You!

Texas Parks and Wildlife Inland Fisheries Corpus Christi District 361.547.9712 greg.binion@tpwd.texas.gov

Guadalupe Blanco River Authority Environmental Sciences 830.379.5822 npence@gbra.org



## TEXAS PARKS & WILDLIFE

Loving Your Lakeside Land Management Practices that Contribute to Healthy Lake Habitat

GBRA: Nathan Pence, Chad Norris, Lee Gudgell, and Elizabeth Edgerton TPWD: Melissa Woods Parker, Ryan McGillicuddy, Angela England,

Dusty McDonald, and Greg Binion













### What do you appreciate about lakeside living?

- Swimming
- Boating
- Fishing
- Relaxing
- Enjoying time with family & friends
- Clean water
- Fish & wildlife viewing
- Natural beauty





Native landscaping attracts butterflies, hummingbirds, frogs, turtles, and birds and helps create excellent fish habitat





#### Traditional landscaping practices

- Large expanses of lawn
- Excessive mowing or weed-eating
  - Removal of aquatic plants
  - Bulkheading/retaining walls/riprap

Could be harming water quality & aquatic habitat

Did you know?





Maintain a natural shoreline (where possible)

- Wildlife need plants where they can feed, rest, and raise their young
- Turtles & frogs need easy access to move between land and water
- Clean water is crucial to support minnows, mayflies, & other







#### Simple steps you can take

- Keep lawns where you use them
  - Okay to mow grass near the house, paths, and play areas
- Along the shore, plant a border of native grass and wildflowers
  - Roots hold soil in place to prevent bank erosion
- Incorporate native trees
  - Let young trees grow
  - Fallen branches
    - On land contribute nutrients to soil, habitat for fireflies
    - In water provide habitat for fish and other animals
  - Shade keeps land and water cooler

# Native plants help replenish stream flow

- (water quantity) • Healthy riparian soil is fluffy like a sponge
- Water soaks into ground
  - Sustains base flow of the river



## Native plants reduce erosion (improve water quality)

During storms,

- Roots hold soil in place
- Stems and leaves slow overland flow, reducing flash



## Native plants filter pollutants (improve water quality)

- Roots filter contaminants such as lawn fertilizer and dog feces
- Water is cleaner when reaches stream
  - prevents overgrowth of algae and bacteria









### Targeted Access

Allows for recreation and aquatic & terrestrial wildlife habitat





#### Targeted Access Sites

No one-size-fits-all Establish manicured areas Give nature space too





*In some places with nearby infrastructure, artificial bulkheads may be appropriate, but...* 

#### Problems with Bulkheads



Normally, the energy of waves is dissipated as they lap against shoreline plants.

But when waves hit a bulkhead, 85% of the energy is reflected.

This causes a scouring, muddied current to flow "down lake" where it can erode neighboring areas.

**Bulkhead shoreline** 



### Bulkhead drawbacks

Seawalls deflect waves and cause scouring of the lake bottom.

Scouring of the lake bottom reduces water clarity.

Sediments that are churned up from the lake bottom often contain phosphorus that can cause nuisance algae growth.

> Excessive plant control reduces habitat, impairs water quality and is not healthy for the lake.

Seawalls do not provide habitat for fish or other aquatic life. The nuisance exotic plant Eurasian milfoil often invades disturbed lake bottoms, such as areas along seawalls.

progressive ae

#### **Shoreline Erosion**

- Hard walls
  - Shoreline loss when wave energy digs under & behind bulkheads





'Hard' infrastructure like retaining walls abruptly severs the ecological connection between the coast and water.

### Alternatives to Bulkheads

- Roots = nature's soil anchors
- Riparian plants evolved to withstand flooding
  - network of long, fine root hairs
- Turf grass is adapted to upland
  - shallower roots







#### Manage above, for function below

- Roots are stunted when
  - Mow too short
  - Mow too often









## Native plants well-suited for natural shorelines

- White-topped Sedge (*Rhynchospora colorata*)
- Emory Sedge (Carex emoryi)
- Spikerush (*Eleocharis sp.*)
- Water-willow (Justicia americana)

#### Softer alternatives to bulkheads • Coir (coconut) fiber or wood fiber logs

- Last about 1-2 years then biodegrade
- Install native plants behind (





#### Hill Country River **Restoration Design** Guidelines

 Encourage land management practices that accommodate recreational uses while also providing ecological functions

estoration design guidelines for

texas hill country riparian areas



https://tpwd.texas.gov/publications /nonpwdpubs/media/hill\_country\_ design\_guidelines.pdf

Keynote

 landscape berming () vegetated swale (1) wet meadow restoration ( upland meadow restoration (3) understory trees ( cattle guard / water crossing

(7) parking court w/ tube steel stops

(13) limestone check dams (16) water flume at dry creek bed (i) pedestrian foot bridge (ii) shortgrass meadow ( bioinfiltration zone (20) flagstone patio with fire feature (21) stone seat walls

By maintaining natural shorelines and native vegetation, we get these benefits:

- Dissipate energy
- Stabilize banks
- Reduce erosion
- Filter sediment & pollutants
- Aid floodplain resiliency
- Retain and store floodwater
- Recharge groundwater
- Sustain baseflow

- Increased water quality & quantity
- Enhanced fish and other aquatic habitat
- Enhanced wildlife habitat
- Improved recreational value
- Aesthetic beauty
- Resiliency from disturbance

#### **Physical Function**

Human Benefits

NOTE: Permits may be needed.

## Check your boxes... consultation is key

- U.S. Army Corps of Engineers
- Texas Parks and Wildlife Department
- Texas Commission on Environmental Quality
- Local Floodplain Administrator

Stop work orders waste time and money!





### Texas Parks and Wildlife Dept

- Dept. Introduce Fish, Shellfish, or Aquatic Plants into Public Waters
  - Sand, Gravel
  - Aquatic Vegetation Treatment




## U.S. Army Corps of Engineers

- Maintenance
- Boat Ramps and Minor Facilities
- Bank Stabilization
- Minor Discharges
- Minor Dredging

### Texas Commission on Environmental Quality Local Floodplain Administrator

Construction Permit









## Thank you!

Angela England

angela.england@tpwd.texas.gov







# Lake Dunlap Environmental Workshop

**Guadalupe-Blanco River Authority** 

GBRA: Nathan Pence, Chad Norris, Lee Gudgell, and Elizabeth Edgerton TPWD: Melissa Woods Parker, Ryan McGillicuddy, Angela England, Dusty McDonald, and Greg Binion







GUADALUPE-BLANCO

# Natural Unimproved Shoreline







# Modified Bulkhead Shoreline







Soft rush (Juncus effusus)

# Natural Shoreline Plants

Emory sedge (Carex emoryi)



White top sedge (*Rhynchospora colorata*)



Spike rush (Eleocharis montevidensis)



All Photos from Lady Bird Johnson Wildflower Center



# **Bulkhead Plants**



Vine mesquite (Panicum obtusum)



Cherokee sedge (*Carex cherokeensis*)





#### Blue mistflower (Chromolaena odorata)



Texas bluegrass (Poa arachnifera)



All Photos from Lady Bird Johnson Wildflower Center





# **Bulkhead Plants Continued**

Frogfruit (*Phyla nodifora*)

Halberdleaf hibiscus (*Hibiscus laevis*)



Vine mesquite (Panicum obtusum)

Blue mistflower (Chromolaena odorata)



#### All Photos from Lady Bird Johnson Wildflower Center



# **GBRA Plant Giveaway and Guidance**

- GBRA plant giveaway prior to refilling of lake
  - Check appropriate box on sign-in list
  - Distribution at a future PLDA meeting
- Guidance on plantings
- GBRA and TPWD are a resource for additional information and assistance



TEXAS

PARKS &

WILDLIFE









# Lake Dunlap Habitat Restoration and Enhancement Project

General Project Overview and Rebuilding the Fisheries Best Management Practices Workshop Lake Dunlap Habitat Restoration and Enhancement Project October 16<sup>th</sup>, 2021

TPWD: Melissa Woods Parker, Ryan McGillicuddy, Angela England, Dusty McDonald, and Greg Binion GBRA: Nathan Pence, Chad Norris, Lee Gudgell, and Elizabeth Edgerton







- General context
- Goals
- Approach
- Partners
- Resources
- Project initiatives (habitat restoration and access enhancement)
- Rebuilding the fisheries
- Collective stewardship









# Project Goals



- 1. Preserve, restore, and enhance riparian and aquatic habitats and rebuild the fisheries at Lake Dunlap
- 2. Provide guidance materials and best management practices (BMPs) to promote the long-term stewardship of Lake Dunlap
- 3. Improve water quality and accommodate diverse recreational use: skiing, fishing, wakeboarding, paddle craft, wildlife viewing, swimming, etc.
- 4. Promote safety and improve general site conditions and enhance shoreline angling access at the IH-35 public access location
- 5. Make a better Lake Dunlap for current and future generations



# Approach



- Technical expertise (natural resource, hydrology, engineering, etc.)
- Partnerships
- Leverage funding opportunities
  - Habitat and Angler Access Program (HAAP), partner contributions, grants
- Outreach
  - Environmental BMP workshops, guidance documents
- Landowner participation and assistance
  - Willingness/participation in implementing BMPs, access to restoration sites





# Partners

- Texas Parks and Wildlife (TPWD)
- Guadalupe-Blanco River Authority (GBRA)
- Preserve Lake Dunlap Association (PLDA)
- Texas Water Development Board (TWDB)
- Texas Department of Transportation (TxDOT)
- Texas B.A.S.S. Nation
- Canyon Bass Club Friends of Reservoirs (FOR) Chapter
- Local youth (Comal County 4H, Guadalupe County 4H, Canyon High School)
- Others?



# Resources



- Current cash base funding (\$71,000)
  - TPWD (\$50,000) Habitat and Angler Access Program (HAAP)
  - GBRA (\$20,000)
  - Canyon Bass Club FOR Chapter (\$1,000) Reservoir Fisheries Habitat Partnership (RFHP) Small Grant







- Current base funding (\$71,000)
  - TPWD (\$50,000) Habitat and Angler Access Program (HAAP)
  - GBRA (\$20,000)
  - Canyon Bass Club FOR Chapter (\$1,000) Reservoir Fisheries Habitat Partnership (RFHP) Small Grant
- Potential funding opportunities
  - RFHP large grant (75K), SARP (100K), Texas B.A.S.S. Nation grants (< 10K), CLP (< 10K), BAG (500K), other...







#### Considerable in-kind support

- TPWD technical expertise and manpower, boats and equipment, habitat barge, permitting guidance, artwork, promotions, fish stocking, monitoring
- GBRA bathymetry data, drone footage, excess habitat materials
- TWDB hydraulic and sediment remediation modeling
- TxDOT potential IH-35 boat ramp services
- Texas B.A.S.S. Nation volunteer labor
- Canyon Bass Club FOR Chapter volunteer labor
- Local youth (Comal County 4H, Guadalupe County 4H, Canyon High School) – volunteer labor, possible community project





# Project Ideas – Habitat Restoration

#### Native tree, riparian, and aquatic vegetation plantings











# Project Ideas – Habitat Restoration

# Restore and enhance fish and other aquatic habitats in littoral, transitional, and deep-water areas





# Project Ideas – Access Enhancements



#### General site improvements at the IH-35 public recreational access











# Project Ideas – Access Enhancements

#### Expand and enhance shoreline angler access at the IH-35 public access







- Objective-based sampling (OBS) monitoring, data analysis and interpretation, management recommendations, reporting
- Fish stockings
- Habitat restoration and enhancement
- Research (pilot studies, management evaluations, etc.)
- Non-native invasive vegetation management
- Expand or enhance public access







## **Applied management activities**

 Objective-based sampling (OBS) – monitoring, data analysis and interpretation, management recommendations, reporting, etc.

#### • Fish stockings

- Habitat restoration and enhancement
- Research (pilot studies, management evaluations, etc.)
- Non-native invasive vegetation management
- Expand or enhance public access









- Objective-based sampling (OBS) monitoring, data analysis and interpretation, management recommendations, reporting, etc.
- Fish stockings
- Habitat restoration and enhancement
- Research (pilot studies, management evaluations, etc.)
- Non-native invasive vegetation management
- Expand or enhance public access





- Objective-based sampling (OBS) monitoring, data analysis and interpretation, management recommendations, reporting, etc.
- Fish stockings
- Habitat enhancement
- Research (pilot studies, management evaluations, etc.)
- Non-native invasive vegetation management
- Expand or enhance public access





- Objective-based sampling (OBS) monitoring, data analysis and interpretation, management recommendations, reporting, etc.
- Fish stockings
- Habitat enhancement
- Research (pilot studies, management evaluations, etc.)
- Non-native invasive vegetation management
- Expand or enhance public access





- Objective-based sampling (OBS) monitoring, data analysis and interpretation, management recommendations, reporting, etc.
- Fish stockings
- Habitat enhancement
- Research (pilot studies, management evaluations, etc.)
- Non-native invasive vegetation management
- Expand or enhance public access







**Issue 1:** Substantial losses in littoral and other aquatic habitats occurred after reservoir dewatering in May 2019.

- Work w/GBRA and other project partners (e.g., PLDA, FOR chapter) to restore and enhance aquatic habitats through habitat restoration/enhancement actions.
- 2. Identify funding opportunities and leverage partnerships to implement habitat projects.
- 3. Provide guidance materials to property owners and local constituency regarding habitat best management practices.





**Issue 2:** Substantial reductions to important fish populations occurred after reservoir dewatering in May 2019. Further, Lake Dunlap is valued for its high-quality Largemouth Bass fishery and production of trophy fish (≥ 8 pounds).

- 1. Once reservoir refills to full pool (2023), TPWD will stock Florida Largemouth Bass (FLMB), Channel Catfish, and Bluegill to reestablish recreationally important sport fish and prey populations.
- 2. Request FLMB fingerlings annually (when water level and habitat conditions permit) for stocking to maintain a high-level Florida Bass genetic influence and thus maximize production potential of trophy fish.
- 3. Implement habitat enhancement measures to increase the performance and recruitment of stocked FLMB.





**Issue 3:** Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. The financial costs of controlling and/or eradicating invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

- 1. Continue to provide cost-share funding and cooperate w/GBRA on all vegetation control activities and monitor invasive vegetation w/vegetation surveys.
- 2. Work with GBRA and other local partners to post appropriate signage at access points around the reservoir.
- 3. Contact and educate marina owners about invasive species, and provide them with posters, literature, and other guidance materials so that they can in turn educate their customers.
- 4. Disseminate educational materials to the public about invasive species using media and the internet (press releases, social media).
- 5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.





**Issue 4:** General site amenities (i.e., lighting, signage) and shoreline angling access are limited at the IH-35 public access location. Additionally, flow conditions can create difficult and oftentimes unsafe boat launching and loading.

- 1. Coordinate w/TxDOT and other project partners to promote safety, improve general site conditions, and enhance access
- 2. Identify funding opportunities and leverage partnerships to implement access projects







# Collective Stewardship



Be proactive!

#### You can make a difference!

**Together** making ecologicallyfriendly choices the for longterm stewardship of Lake Dunlap for current and future generations!



#### **PROTECT THE LAKES YOU LOVE.** stop invasive species.







# Acknowledgements

- Partners GBRA, PLDA, TWDB, TxDOT, Texas B.A.S.S. Nation, Canyon Bass Club FOR Chapter, Comal County 4H, Guadalupe County 4H, Canyon High School Agriculture Science
- Want to also thank and acknowledge the PLDA board and its membership for participation and helping organize this workshop
- Other attendees, stakeholders, and constituents



David Ewald – Fishiding






# Thank you!

Texas Parks and Wildlife Inland Fisheries Corpus Christi District 361.547.9712 greg.binion@tpwd.texas.gov Guadalupe Blanco River Authority Environmental Sciences 830.379.5822 npence@gbra.org



# Lake Dunlap Habitat Enhancement

**Guadalupe-Blanco River Authority** 

GBRA: Nathan Pence, Chad Norris, Lee Gudgell, and Elizabeth Edgerton TPWD: Melissa Woods Parker, Ryan McGillicuddy, Angela England, Dusty McDonald, and Greg Binion





# Habitat Enhancements Proceeding Fill



- GBRA purchased **50 Structures to** giveaway to homeowners at a future
  PLDA meeting .
- Homeowners will assemble and install with their families at private docks prior to lake fill.
- Please sign up in back if interested







### Georgia Fish Sanctuary



- Attracts Largemouth bass and Crappie.
- Target for Sportfish Anglers
- Ideal for deeper pools 15+ feet.
- Angled & textured surfaces grow plant life.
- Plastic construction reduces line snagging.











### Concrete Culvert Fish Habitat

- Steel Reinforced Concrete
- ~18" wide \* 4 foot long
- Improves Fish Habitat Diversity
- Target for Sportfish Anglers.
- Ideal for deeper pools >5+ feet.
- Donations from AmeriTex Pipe & Products in Seguin.







## Habitat Enhancements Following Fill



- Multiple "deep hole" locations identified
- ~21 40 feet depths
- GBRA to place habitat from boats following lake fill.





# Lake Dunlap Environmental Workshop

**Guadalupe-Blanco River Authority** 

GBRA: Nathan Pence, Chad Norris, Lee Gudgell, and Elizabeth Edgerton TPWD: Melissa Woods Parker, Ryan McGillicuddy, Angela England, Dusty McDonald, and Greg Binion





#### Water Quality Monitoring – Clean Rivers Program





- One routine monitoring station on Lake Dunlap
  - Station 12596: off Lone Star Drive
- Aquatic Life Monitoring Events
  - Collecting data on fish populations, macroinvertebrates, habitat





## Watershed Protection Plans

- 5 WPPs in our basin
  - Geronimo & Alligator Creeks
  - Plum Creek
  - Upper San Marcos River
  - Cypress Creek
  - Comal/Dry Comal River
- WPPs monitor water quality in the basin
  - Added emphasis on BMPs and stakeholder involvement











## Invasive Species: Arundo donax

- Commonly called Giant reed
- Native to India, introduced in early 1800s
  - Ornamental purposes, roofing material, erosion control
- Highly invasive
  - Spreads using underground rhizomes
- Cutting down promotes growth/spread
- Most effective control is herbicide use
  - Licensed herbicide applicator



TEXAS

PARKS &

WILDLIFE



# Invasive Species: Hydrilla verticillata

- Native to Europe and Asia
- Probably introduced through aquarium trade
- Produces seeds, but most spread is vegetative
- Can grow at very deep depths
  - <1% light
- Forms dense mats, hinders recreation & boats



TEXAS

PARKS &

WILDLIFE



#### Invasive Species: *Pistia stratiotes*







- Water Lettuce
- Popular ornamental
- Floating Plant
  - Cover water surface in slow moving areas
- Physical removal possible
- Decrease DO in water
  - Can cause fish kills



## Invasive Species: Eichhornia crassipes



- Water Hyacinth
  - South America
- Popular ornamental
  - Introduced during Cotton States Expo in New Orleans, 1884
- Free floating
- Fast grower
  - Double in size in two weeks
  - Produce 1,000s of seeds
- Manual removal possible





# Invasive Species: Hygrophila polysperma

 Looks similar to native creeping primrose

GRRA

- But much faster growth
- Hays and Comal Counties
- Rooted, grows through water column
  - Can fill the water column
  - Impacts recreation



Native primrose



Hygrophila



# Invasive Species: Dreissena ploymorpha







- Zebra mussels
  - Native to Eurasia
  - Hitchhiker in ship ballast water
- Attach to almost any surface
  - Clog boat propellers
  - Cover underwater portion of docks and ladders
  - Shells are sharp
- Once established, focus on management rather than extermination





# Contacts



#### Nathan Pence

Executive Manager of Environmental Science – GBRA <u>npence@gbra.org</u>

#### **Chad Norris**

Deputy Executive Manager of Environmental Science – GBRA

cnorris@gbra.org

#### **Greg Binion**

District Supervisor, Inland Fisheries Division Texas Parks & Wildlife Department <u>Greg.Binion@tpwd.texas.gov</u>

**Dusty McDonald** 

Assistant Supervisor, Inland Fisheries Division Texas Parks & Wildlife Department <u>Dusty.Mcdonald@tpwd.texas.gov</u>

Angela England Natural Resource Specialist Texas Parks & Wildlife Department Angela.England@tpwd.texas.gov