

The background image shows a reservoir with a dense layer of lily pads on the water's surface. A wire mesh fence runs across the foreground, partially obscuring the view. The water is dark, and the surrounding area is lush with green vegetation.

Habitat Enhancement Projects in Two Urban Reservoirs: Successes and Lessons Learned

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Reservoirs



- Lake Austin

- ~20 miles long
- Lakeshore primarily private residences
- Watershed drains sub-urban development

- Lady Bird Lake

- ~8 miles long
- Shoreline/riparian primarily public parkland
- Drains dense, old urban watersheds

Longhorn Dam

Challenges

- Invasive species
 - Submerged vs riparian
- Habitat loss and modifications
- Erosion
- Ability to address each affected by ownership



Collaborating and Contracting to Combat the Problems

- UNT/LAERF/USACoE
- Trail Foundation
- AmeriCorp
- Environmental Systems Corp (ESC)



Riparian Restoration

- Arundo – Aggressive along LBL riparian; forms massive monocultures
- Herbicides, biocontrol, physical removal
- Replanting with natives



<https://cns.utexas.edu/news/little-wasp-that-could>

Shoreline Restoration

- Taro – Aggressive along shoreline of LBL, forms monocultures
- Herbicides, physical removal
- Replanting with natives

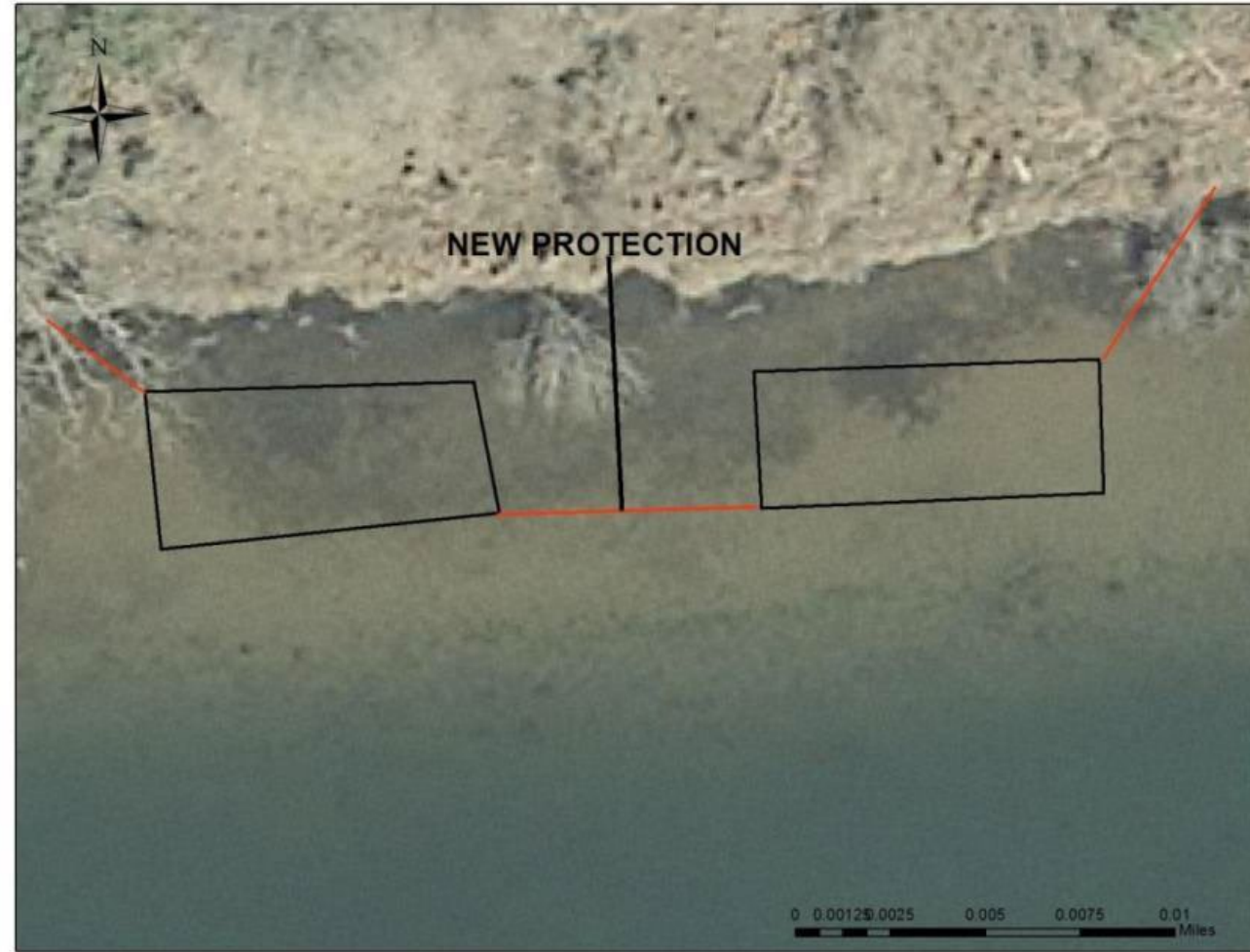


Littoral Restoration

- Primarily in Lake Austin; some pens in Lady Bird
- Protection from abundant herbivores in each reservoir
 - Triploid grass carp, turtles, waterfowl
- Promote native species as hydrilla is managed
- Shoreline protection from wave energy
- Design and size modifications through time to improve success
 - Taller, flanged, smaller mesh size



“Combined” pens to increase size



- Survivorship can be 100%, with 100% coverage within pens in less than a year if no breaching/over-topping occurs

- Closing off pens has enabled plant spread to occur in newly protected areas

- Species shifts within pens within and between years

- Chara, hydrilla, water celery, water stargrass, pondweeds, cattail, periphyton



Year 0



Year 1



Year 2

Development Code and Criteria Changes

- Specific to lakeshore modifications (primarily Lake Austin)
- Can no longer install sheet pile; instead, non-vertical with plantings
 - Riparian, shoreline, littoral
- This is what we would like!
- New construction is close....



Other Activities

- Supplemental means of providing ecosystem benefits
- Installed Coir Logs along highly erodible shorelines
- Provided bays that protect emergent vegetation as well
- Timing, location of installation critical to allow saturation of material, colonization by plants (also, don't buy old logs)



- Brush bundles, fish attractors
- Short-term solutions to deal with declines of abundant SAV and littoral/shoreline course woody habitat in Lake Austin
- Don't really have WQ benefits, but are for sport fisherman
- Stop-gap as other management efforts are fully realized



Successes and Lessons

- Constant maintenance needed at Arundo/Taro sites due to re-growth
 - Easier to contract/get volunteers for restoration projects on public lands along Lady Bird Lake
- Control of Arundo/taro slow and laborious
 - Biocontrol takes time, chemical control plots require repeated treatment and maintenance
 - Patience!
- Lake Austin stakeholder involvement
 - Neighborhood association has installed their own vegetation cages along their shoreline
 - We have been focusing on public shorelines to minimize homeowner removal
- Homeowners have not embraced fully functioning shoreline
 - Want bare minimum, need more education about “snake habitat”
 - Looking at modifying code further to further enhance riparian, shoreline, littoral
- Herbivore pressure still preventing plant spread beyond cages in Lake Austin, but spread is occurring in Lady Bird
 - Patience!

Future Projects

- Continued riparian and shoreline plantings
 - Engage additional trail/reservoir user groups for removing invasive species, replanting native species
- Continued installation of cages
 - Quantifying ecosystem benefits of restoration projects
 - Vegetative biomass and diversity
 - Invertebrate species diversity and composition
- Evaluating code required shoreline habitat protection and restoration
 - How can we increase abundances of desired habitats?

Questions?

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