1st Kinder Morgan planting - HSC T.R.E.E.S Program

HOUSTON WILDERNESS ANNUAL REPORT 2022

HOUSTON WILDERNESS
It's Our Nature

HOUSTON WILDERNESS

MISSION

Houston Wilderness works with a variety of business, environmental and government interests to protect and promote the 10 diverse ecoregions of the 13+ county area around Greater Houston, Galveston Bay, and the Gulf of Mexico, including coastal prairies, forests, wetlands, and waterways.

Houston Wilderness connects people to the 10 ecoregions in multiple counties around Greater Houston through large-scale environmental policy initiatives, including facilitation of key programs including: 1) an 8-county Regional Conservation Plan, 2) a Texas Monarch Flyway Strategy, 3) a Port of Houston TREES Program and 4) a Collaborative Grant Organizing Program – all which ensure that relevant stakeholders are at the table and collaborative solutions are supported and implemented.

Convening various groups to promote, protect and preserve the biodiversity in our 10 ecoregions

• Collaborative Grant Organizing Program • The Texas Monarch Flyway Strategy • Network Partner Access and Advocacy • Houston Wilderness Pollinator Primer

Providing collaborative **Problem Solving** opportunities on critical environmental issues

• Gulf-Houston Regional Conservation Plan
• Port of Houston Trees & Riparian Enhancement of Ecosystem Services (PoH TREES Program)

Educating the public on the many exciting outdoor opportunities in the Greater Houston Region and the health benefits associated with nature

• Great Green Quest • Wilderness Passport • "Careers in Conservation" Scholarship
• Ecosystem Services Primer • Carbon Policy Paper

TABLE OF CONTENTS

2022 Recap

from Chairperson, Matt Stahman

I grew up enjoying our unique corner of Texas, an area where 10 ecoregions converge in a way unlike any other place on the planet. From bayous to forests to prairies to marshes, I've come to appreciate how special this 15-county area is that we all call home. As chairperson of Houston Wilderness in 2022, I've also come to appreciate this awesome organization whose mission it is protect and promote our incredible natural diversity; an organization known for passionately connecting people with nature.

In 2022, our programs continued to grow and serve our local communities. These programs include planning and advocacy of the Gulf-Houston Regional Conservation Plan (RCP) which now promotes protecting and preserving 15.6% of land within our 15-county region, up from 15% in 2021. They also include facilitating state-wide efforts, like the Texas Monarch Butterfly Flyway Strategy, now up to 80 partner locations for monarch habitat around our great State of Texas (including one on my own family farm). More local, but no less exciting, is our Regional Assessments of Wildlife Along Riparian Corridors (RAWARC), an effort with multiple NGO partners to use remote game cameras throughout urban Houston and surrounding suburban areas to capture wildlife images, helping us appreciate how much we share the landscape with our not-so-often-seen neighbors (my favorite so far is the otter family; check them out on the Houston Wilderness website under Resources). In addition, our ever-popular Great Green Quest program continued distribution of over 30,000 of our Wilderness Passports to schools, YMCA centers, community centers, libraries and various groups, promoting kids and their families to learn more about, and to visit in person, each of our 10 ecoregions.

But my absolute favorite programs, where people and passion connect on the ground and in the dirt, are our Riverine Targeted-Use-of-Buyouts (TUBs) and the Houston Ship Channel TREES efforts. Born out of a desire to help City of Houston's Resilient Houston Goal of planting 4.6 million new native trees by 2030, these programs mobilize volunteers to plant "super" trees (those native species with the highest environmental benefits) in our industrialized areas and in neighborhoods along our bayous to improve the quality of life for all Houstonians, enhancing valuable greenspace for wildlife and our own outdoor enjoyment.

But I think it goes even deeper than even that. The Greeks said, "when people plant trees under which they will never sit, then you know civilization has come to that land." I witnessed that firsthand in 2022 at several of our volunteer tree planting events, watching children, moms, dads, grandparents, students, teachers, scout leaders, nurses, etc. from all walks of life enjoy the simple of planting a tree. I watched them connect with nature in a win-win scenario, simultaneously helping the land and helping one another. And Houston Wilderness' passionate staff, accompanied by our new mascot Hoppi, were there to help them along the way, enabling over 10,000 new trees to be planted in 2022 alone.

This next year looks to be even more exciting! Houston Wilderness' Collaborative Grant Funding program, which helps fund these programs and the efforts of many other local non-profit organizations, continues to be successful and expand, thanks to our dedicated and hard-working staff.

I am truly proud of Houston Wilderness and what it has become. The year 2022 was a watershed year for this organization and I can't wait to see what 2023 has in store. Many thanks for your continued support!

2022 Recap

from President & CEO, Deborah January-Bevers

The word “protect” has become an important word in environmental circles – from biodiversity to biosphere – there is a growing awareness of the need to protect our natural world. For Houston Wilderness, “protect” has been a part of our mission statement for over 20 years. It’s a big part of what HW was created to do – supporting protection of natural areas for the animals, plants and people that call the Gulf-Houston Region home, for the health of our water and soil and for the enjoyment of those who keep nature close to their hearts. In 2022, as Houston Wilderness (HW) was preparing to celebrate its 20th Anniversary in 2023, the HW Board and staff highlighted the 10 distinct ecoregion during the 2022 Annual Luncheon, and we continued to collaborate on pioneering environmental issues for our region, and regional resilience efforts in the 15+ county region in and around Houston/Harris County. Some highlights of the 2022 year include:

A. Access & Advocacy Program - 1) ***HCFCD Native Seed Mix Project*** (begun in 2020) – HW is working with partners to finalize development and promotion of a commercially-available and regionally-adapted native seed mixture options for use within floodwater conveyance channel, stormwater detention basin, and roadway rights-of-way where mowing is not required on a frequent basis; and 2) ***Regional Assessments of Wildlife Along Riparian Corridors (RAWARC) Program*** - HW worked with Board members & NGO partners around the region to assess wildlife species through camera monitoring along riparian corridors in the region, including species presence, absence and distribution, relative population abundance, and natural/man-made factors that influence population trends and dynamics. A Regional Wildlife Fact Sheet is being widely distributed in late 2022 through 2023.

B. ***Gulf-Houston Regional Conservation Plan (RCP)*** (created & begun in 2014) - HW continues to work with a network of environmental, governmental, and business groups in the 8-county region to facilitate the implementation of three key goals: (1) Increasing the current 15.6% in protected/preserved land in the eight-county region to 24% by 2040, (2) Increasing and supporting the region-wide land management efforts to install nature-based stabilization techniques on 50% of land coverage by 2040, and (3) providing research and advocacy for an increase of 4‰ annually in carbon sequestration in native soils through planting of native trees, grasses and oyster reefs. (https://houstonwilderness.org/gulf-houston-regional-conservation-plan)

C. ***Houston Ship Channel T.R.E.E.S Program*** (created & begun in 2018) –a multi-year, collaborative program by HW, Houston Health Department, Buffalo Bayou Partnership, and multiple private/public landowners along the HSC that focuses on enhanced ecosystem services through targeted large-scale tree plantings using 14 scientifically-chosen native Super Tree species that are ranked in priority based on their respective levels of air pollution and water absorption, carbon sequestration, and canopy benefits.

D. ***Collaborative Grant-Organizing (CGO) Program*** (created in 2013) – HW works with multiple stakeholders and federal/state agencies on collaborative grant proposals and funded projects, often in “pioneering” areas of environmental planning and resilience in the Greater Gulf-Houston Region. To date, HW and a variety of different regional partners have received funding from multiple CGO grant proposals totaling over $2.9 million in additional funds to the region for land and water conservation efforts. Sometimes these awarded proposals become established programs at HW. (https://houstonwilderness.org/cgo-program)

E. ***Regional Riverine Targeted Use of Buyouts (Regional Riverine TUBs) Program*** (created & begun in 2020) – In partnership with the Institute for a Disaster Resilient Texas (IDRT), and Texas A&M University-Galveston, the TUBS Program creates riverine resilience by installing nature-based stabilization techniques on county/city buyout properties that are adjacent to parks and other public open space. HW is excited about the interest and involvement of multiple partners in this important pioneering program. (https://houstonwilderness.org/riverinetubs)

Houston Wilderness Accomplishments
2013-2022

I.Eco-Region Advocacy through Convening & Problem-Solving

Creation of the Vision of the Major Eco-regions of Greater Houston and surrounding counties *(2003)*

Houston Wilderness (HW) led the creation and facilitation of the first-ever recognition of ten (10) connective eco-regions in the multi-county area surrounding Houston. http://houstonwilderness.org/about-ecoregions/

Houston Atlas of Biodiversity (published in 2007)

Written and Produced by HW, the Houston Atlas of Biodiversity is a major publication that focuses on the ten major eco-regions of the greater Houston area including Big Thicket, Coastal Marshes, Coastal Prairies, Columbia Bottomlands, Piney Woods, Post Oak Savannah, Trinity Bottomlands, Bays, Estuaries and Bayou Wilderness. The Atlas continues to serve as a regional resource. (http://www.greatgreenquest.org/resources/HW%20Biodiversity%20Atlas.pdf)

Gulf-Houston Regional Conservation Plan (Gulf-Houston RCP) (created & begun in 2014)

HW works with a network of environmental, governmental, and business groups in the 8-county region to facilitate the implementation of three key goals: (1) Increasing the current 15.25% in protected/preserved land in the eight-county region to 24% by 2040, (2) Increasing and supporting the region-wide land management efforts to install nature-based stabilization techniques on 50% of land coverage by 2040, and (3) providing research and advocacy for an increase of 4‰ annually in carbon sequestration in native soils through planting of native trees, grasses and oyster reefs. (www.GulfHoustonRCP.org)

Texas Monarch Flyway Strategy (Texas MFS) (created & begun in 2016)

A statewide effort by HW to restore, increase and enhance Monarch habitat across the state, as critical link in the Monarch's journey along the Central Flyway from Canada to Mexico and back every year. The MFS is facilitated by HW with over 100 public/private partner/landowners. The Texas MFS also serves to protect habitat for other pollinators that are crucial to local ecosystems and agriculture.(http://houstonwilderness.org/mfs)

Network Partner Access & Advocacy Program (begun in 2013)

Over the years, HW has expanded its network of private/public partners to over 175 in the region, working with them to preserve, protect and promote sustainable land, water and wildlife by providing problem-solving assistance and facilitation of various environmental policy issues that benefit various parts of 10 diverse ecoregions. These projects generally last between 1-3 years:

Lower Trinity River Project (2017-19) – Actively spearheaded by the five county judges of the counties that make up the Lower Trinity River, this group meets, as needed, to work on advocacy needs of the Lower Trinity River. HW facilitates the meetings and agendas for these meetings and related actions.

Facilitation of Tree Strategy Implementation Group (TSIG) (2020-21) to assist in City of Houston's Resilient Houston Plan's 4.6 Million Trees by 2030 Goal. Comprised of all the major large-scale native tree planters in the region, the TSIG created and published a strategy to reach the CoH Goal by 1) maintaining an average of 400,000 native trees planted annually, 2) creating of a TSIG Regional Native Tree Planting Policy & Procedures Manual and associated v-Forums, 3) tracking where major native tree removals are taking place and encouraging alternatives to deforestation, and 4) supporting regulatory improvements (https://houstonwilderness.org/46-million-trees-by-2030-goal)

Regional Assessments of Wildlife Along Riparian Corridors (RAWARC) Program in Greater Houston (2019-23) – HW worked with Board members & NGO partners around the region to assess wildlife species through camera monitoring along riparian corridors in the region, including species presence, absence and distribution, relative population abundance, and natural/man-made factors that influence population trends and dynamics. A Regional Wildlife Fact Sheet will be widely distributed in late 2022 through 2023.

Master Planned Community (MPC E3) - The MPC Ecoregion Experiences Events were a collaboration between HW, MPCs and other MUDs to showcase the many benefits of greenspace and nature-based infrastructure. (https://houstonwilderness.org/mpc-e3-videos)

***Collaborative Grant-Organizing (CGO)* Program** (created in 2013)

HW works with multiple stakeholders and federal/state agencies on collaborative grant proposals and funded projects, often in "pioneering" areas of environmental planning and resilience in the Greater Gulf-Houston Region. To date, HW and a variety of different regional partners have received funding from multiple CGO grant proposals totaling over $1.7 million in additional funds to the region for land and water conservation efforts. Sometimes these awarded proposals become established programs at HW. (https://houstonwilderness.org/cgo-program)

Regional River and Waterway Targeted Use of Buyouts (Regional River & Waterway TUBs) Program (created & begun in 2020) — In partnership with the Institute for a Disaster Resilient Texas (IDRT), and Texas A&M University-Galveston, the TUBS Program creates riverine resilience by installing nature-based stabilization techniques on county/city buyout properties that are adjacent to parks and other public open space.

HCFCD Native Seed Mix Project (begun in 2020) — developing commercially-available and regionally-adapted native seed mixture options for use within floodwater conveyance channel, stormwater detention basin, and roadway rights-of-way where mowing is not required on a frequent basis for the Harris County Flood Control District (HCFCD).

***Carbon Credit in Trees & Riparian Enhancements of Ecosystem Services (TREES)* Program** (created in 2021, projected to begin in 2023) — Under HW's CGO Program, allowing HW to serve as: a) a "Local Applicant/Operator" to obtain carbon credits for large-scale tree plantings that HW and other entities are doing in collaboration with various partners and with use of various grant funds, and b) as an carbon credit broker, as needed, for public entities to find buyers for carbon credits related to large-scale tree plantings.

Houston Ship Channel Trees & Riparian Enhancement of Ecosystem Services (HSC TREES) Program (created & begun in 2018)

a multi-year, collaborative program by HW, Houston Health Department, Buffalo Bayou Partnership, and multiple private/public landowners along the HSC that focuses on enhanced ecosystem services through targeted large-scale tree plantings using 14 scientifically-chosen native Super Tree species that are ranked in priority based on their respective levels of air pollution and water absorption, carbon sequestration, and canopy benefits. (http://houstonwilderness.org/port-of-houston-trees-program)

II. Eco-Region Advocacy through Education

Creation & Distribution of Environmental Resources

A Six-Step guide for making nature-based infrastructure decisions based on the benefits of multiple ecosystem services (2nd Edition, 2019), provides both analysis and policy goals for protecting and increasing ecosystem services in the Greater Houston Region (http://houstonwilderness.org/ecosystem-services).

Texas MFS Pollinator Step-by-Step Guide, created to help landowners build and maintain pollinator habitat through a consistent, easily replicated process (revised edition published in 2022)

Policy Paper on Increasing Carbon Sequestration in the Gulf-Houston Region Through Targeted Large-Scale Planting of Native Trees and Flora Species *(Summer 2019)*

TSIG Regional Native Tree Planting Policy & Procedures Manual *(July 2021)*

Scientific Journal Paper: Hopkins, L. P., January-Bevers, D. J.,Caton, E. K., & Campos, L. A. (2021). A Simple Tree Planting Framework to Improve Climate, Air Pollution, Health, and Urban Heat in Vulnerable Locations using Non-traditional Partners. *Plants, People, Planet, 1–15.*

Great Green Quest (GGQ)

With the Wilderness Passport as a guide to the 10 diverse ecoregions found in the 13+ county region surrounding Greater Houston, Great Green Quest distributes over 35,000 of these passports to schools, YMCA centers, park community centers, and region-wide libraries and interested community groups. (http://houstonwilderness.org/passport).

HW Annual Wild Life Luncheon (begun in 2008)

For the first 6 years of HW annual luncheons, the annual event highlighted environmental aspects of the 10 diverse ecoregions. In 2014, the annual luncheon highlights Wild Life legacy award recipients and Wild Partner awards. (https://houstonwilderness.org/luncheon)

Implementation of 3 Key Goals

A Regional Land-Use Strategy Enhanced Air, Water and Soil & Long-term Resilience

8-County Region: Brazoria • Chambers • Fort Bend • Galveston • Harris • Liberty • Montgomery • Waller

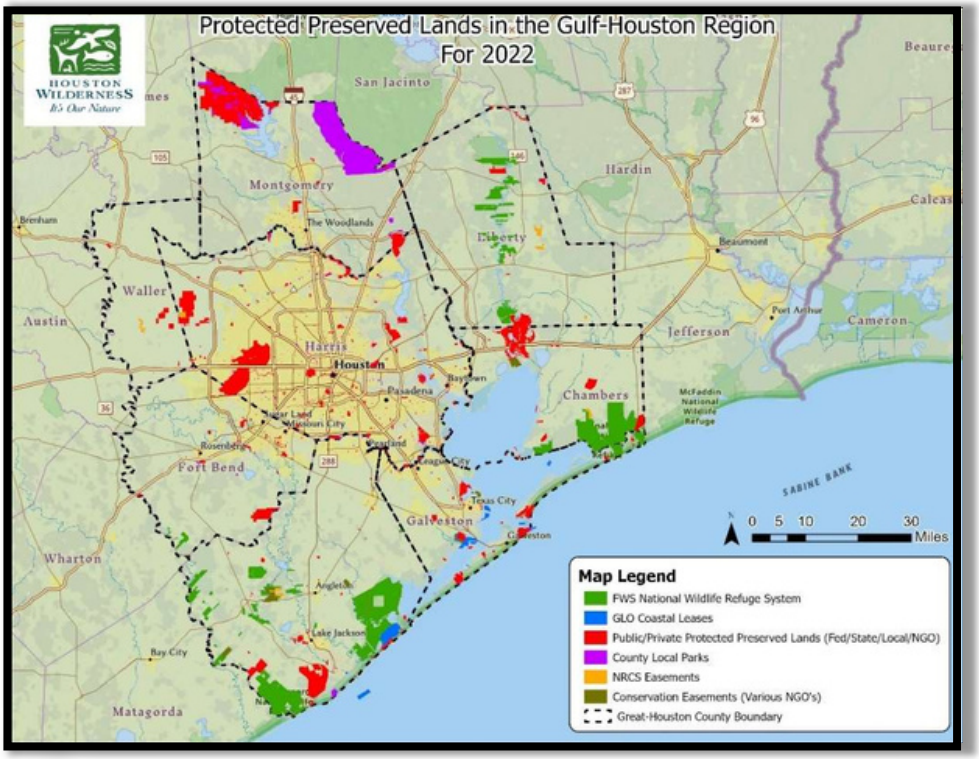
Facilitated by Houston Wilderness, the Gulf-Houston Regional Conservation Plan is a long-term collaborative of 100+ environmental, business, and governmental entities working together to implement an ecosystem continuity and connectivity plan for the Gulf-Houston region through implementation of three (3) Key Goals for enhanced resilience throughout the 8-county region. Progress is tracked through regional projects and initiatives that increase protected lands provide more nature-based infrastructure and contribute to increased carbon sequestration throughout the 8-county region.

THREE KEY GOALS

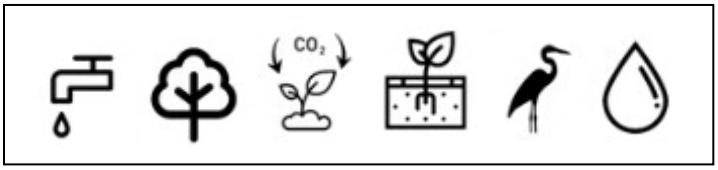
(1) Reaching **24% by 2040** in protected/preserved nature-based infrastructure in the 8-county region
(2) Providing **50% by 2040** in nature-based stabilization techniques on riparian, developed & undeveloped, agricultural and coastal lands in the region, and
(**3)** Working toward a **.4% annual increase** in organic carbon offsets on regional lands through enhancements in native soils, plants and tree species throughout the region

PROGRESS ON 1ST KEY GOAL

27% is currently developed land-use
15.6% is currently preserved nature-based infrastructure
40% is available undeveloped land



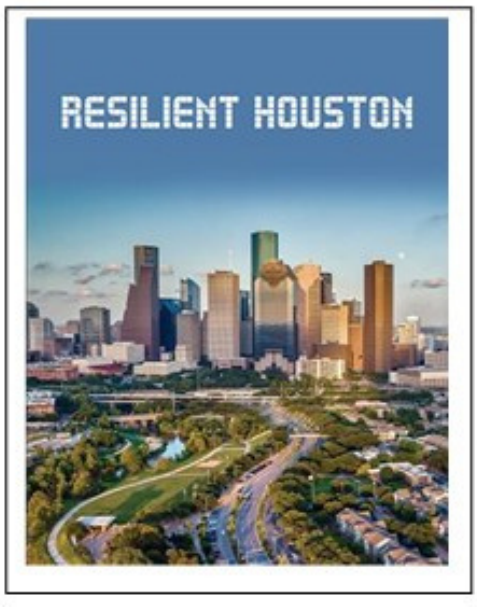
BENEFITS & CURRENT METRICS OF THREE KEY GOALS



- **Economic:** Investing in long-term undeveloped nature-based infrastructure (NBI) is a critical part of long-term protection of the region's residents, businesses and wildlife. Over $185 million in land acquisition projects have been funded since 2013, mainly from RESTORE funds, federal/state agency grants and public bonds. Miles of marsh and living shorelines reduce inland storm surge. Nature-based stabilization techniques provide space for flood control, better air/water quality, green space, large-scale tree planting and carbon sequestration.
- **Ecological:** Increasing protected/preserved NBI enhances ecosystem services critical to our region's resilience like flood mitigation and carbon sequestration. Annual increases in carbon sequestration could provide offsets of as much as 27 million tons of carbon annually from the atmosphere in our region.
- **Social:** Large parts of our region's conserved lands serve multiple purposes as flood control and riparian buffer areas with parks, beaches, hike & bike trails, eco-tourism, fishing, kayaking and other outdoor activities. Protecting 24% in targeted nature-based infrastructure provides as much as 700,000 acres in additional green space in our region.

As the global community commits to bolder action on abating biodiversity loss, placement of future Protected Areas (PAs) will be critical, as will an increased focus on landscape-scale habitat retention and restoration efforts to ensure those important areas set aside for conservation outcomes will remain (or become) connected. **Ward, M., Saura, S., Williams, B. *et al.* Just ten percent of the global terrestrial protected area network is structurally connected via intact land. *Nat Commun* 11, 4563 (2020). https://doi.org/10.1038/s41467-020-18457-x**

Gulf-Houston RCP's OVERLAP WITH *RESILIENT HOUSTON PLAN*



In early 2020, the City of Houston initiated its Resilient Houston Plan - a framework for collective action that links existing efforts with new ones to protect Houston against future disasters—from hurricanes and flooding to extreme heat waves—and chronic stresses such as aging infrastructure, poor air quality, and climate change. *Resilient Houston* was forged during an 18-month process in collaboration with local stakeholders and regional, national and global partners and the Gulf-Houston RCP's three key goals overlaps with three key goals of the Resilient Houston Plan:

Chapter 2: Safe & Equitable Neighborhoods – Goal 6: Plant 4.6 million new native trees by 2030. A Tree Strategy Implementation Group (TSIG) has come together to create a large-scale native tree planting strategy and related *Regional Native Tree Planting Policy Manual*. See information and upcoming TSIG Forums at https://www.gulfhoustonrcp.org/

Chapter 4: Accessible & Adaptive City – Goal 11: 100 new green stormwater infrastructure projects by 2025

Chapter 5: Innovative & Integrated Region – Goal 16: Conserve 24% of undeveloped regional lands as natural spaces by 2040

1st Key Goal Action Items
Increase in Protected/Preserved Land1

Goal: Reaching **24% by 2040** in protected/preserved nature-based infrastructure in the 8-county region (see county breakdown below).

27% is currently developed land-use
15.6% is currently preserved nature-based infrastructure
8.4% is agricultural land
49% is available undeveloped land

24% nature-based infrastructure is needed by 2040

Tools in the Resilience Toolbox

- RCP Working List of Projects
- Resilient Houston Plan
- Floodplain Regulations
- Setbacks/Buffers
- Rebuilding Restrictions
- Capital Improvement Programs
- Acquisitions and Buyout Programs
- Conservation Easements
- Green Bonds and MUD Recreational Bonds and Development Incentives
- Texas Flood Infrastructure Fund
- Public/Private and Land Trust Partnerships

The Gulf-Houston Regional Conservation Plan (RCP) prioritizes the environmental projects in the region that are in need of full or partial funding, called the Working List of Projects, and tracks the funded projects bi-annually. By doing so, HW is able to measure the progress being made in the region toward achieving the 3 key goals. RCP will create a roadmap for land conservation across the 8-county region now and for years to come.

The RCP provides an "interactive map" of the Working List of Projects which currently includes over 731,000 acres of additional land acquisition and conservation easements to be acquired once the respective projects are funded. For projects funded over the last 5 years, more than 31,000 acres of protected/preserved land has been acquired and approximately $400 million of funding has received. The RCP maps are designed to be regularly updated bi-annually as new projects are added to the Working List of Projects and funded projects are tracked. Phase 1 includes land acquisition and conservation easement projects and Phase 2 include restoration-based projects. In 2021, the U.S. joined the international goal to conserve 30% of U.S. lands and freshwater by 2030, called the 30x30 America the Beautiful Initiative. The Gulf-Houston RCP Goals overlap with these efforts.

To help advance the RCP 3 Key Goals, these activities/approaches are followed:
•Engage with federal, state and local grant programs to place emphasis on funding projects to reach the 1st Key Goal.
•Partner with HGAC to provide counties and cities with tools to add protected/preserved lands in their jurisdictions.
•Support new and existing funding sources and provide tools to advance the 3 Key Goals.
•Provide ecosystem services research on benefits of nature-based infrastructure, stabilization techniques and carbon sequestration.

[1] August 2022

2nd Key Goal Action Items
Nature-Based Stabilization Techniques[1]

Goal: Increasing and supporting the region-wide land management efforts to install nature-based stabilization techniques (NBST), see examples below, to 50% of land coverage, waterways, and shorelines by 2040. Striving for all protected/preserved land (currently 15%) and at least 30% of developed land in the region.

Tools in the Resilience Toolbox

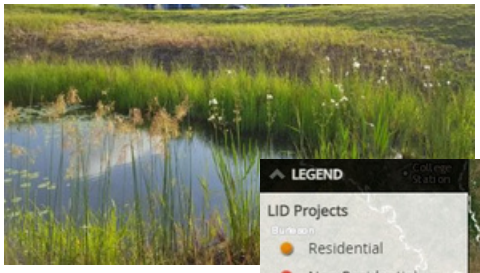
(1) HGAC's Regional Conservation Initiative (https://h-gac.com/regional-conservation)
(2) user-driven watershed investments,
(3) water quality and trading offsets, and
(4) buybacks and water rights programs.

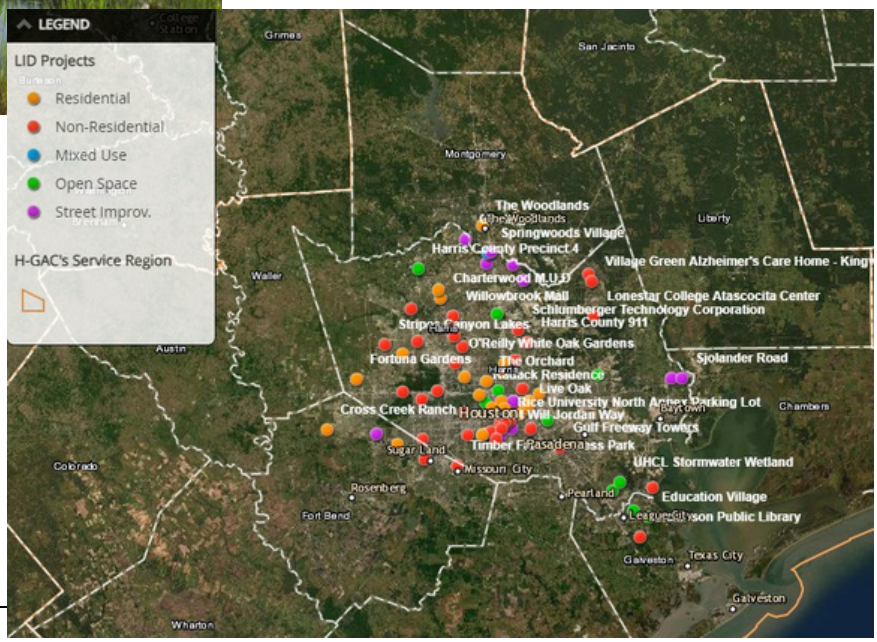
- **Public & Private Ecological Restoration Projects**: a) Coastal Texas Study ER Projects, b) Gulf-Houston RCP (Working List of Projects, Phase 2), c) Wetland Mitigation Banks
- **Houston's** Incentives for Green Development
- **Identifying desired green infrastructure strategies:** NOAA's Green Infrastructure Options to Reduce Flooding and FEMA's Building Community Resilience with Nature-based Solutions
- **Capital Improvement Plan (CIP) Process**
- **Stormwater Utility Fees**
- **Clean Water State Revolving Fund (CWSRF)**

Targeted Areas for NBST:

- **Private & Public Lawn replacements**: converting lawns/open spaces to native grasslands and trees
- **Native Roadsides**: abundant, yet overlooked, areas for native grasslands and trees
- **Riparian & Utility rights-of-way**: creating connectivity for nature-based infrastructure
- **Landfills & Brownfields**: managing native grassland on capped waste material
- **Ranches and pastures**: rotational grazing and cover crops

RCP Working List of Projects: Houston Wilderness tracks current projects that focus on ecological restoration, rehabilitation and BMPs on current land and future land development. Data is collected from federal, state, county, cities, municipal utility districts (MUD), private & public entities, landscaping, construction and engineering companies to determine the current stabilization techniques being used in the region. Not only can future land developments integrate NBSTs into the land-use designs/changes, but current developed lands can also adopt NBSTs and find multiple resilience benefits ranging from flood reduction, erosion control and other stormwater management benefits.





Types of Nature-based Stabilization Techniques:

- Bioswales & Rain Gardens
- Cisterns and Rain Barrels
- Coastal Wetlands & Dunes
- Green Infrastructure & LIDs
- Green Roofs
- Natural Infrastructure
- Large-scale Tree Plantings
- Living Shorelines
- Oyster Reefs
- Permeable Pavement
- Stormwater Planter Box
- Stormwater Wetlands
- Underground Storage
- Vegetated Filter Strips & Swales

[1] July 12, 2021

Houston Wilderness Carbon Sequestration Scenario

Background: The 3rd Key Goal of the 8-County *Gulf-Houston Regional Conservation Plan* is to provide research and advocacy toward an annual increase of carbon sequestration in the region by 4‰ in native soils, plants, trees, and oyster reefs. The 4‰ increase was chosen for its overlap with the global 4per1000 Initiative established in 2015 at COP21. In the figures below, Houston Wilderness demonstrates a scenario below in which current carbon stocks in the 8-county region could be increased to meet the 3rd key goal of the HW RCP.

HOUSTON WILDERNESS
It's Our Nature

Baseline Estimates of Carbon Sequestration:

Current Carbon Stock in 8-County RCP land cover: 28-33 tons/acre (8-county region x 30 tons/acre = 148,765,710 tons)[1]
Amount of Carbon Sequestration/Stock Needed to Meet 4‰ Annual Increase: 600,000 tons/year
Maximum Carbon Stock Possible in RCP Region: 64-77 tons/acre – **will take 10+ years to reach high stocks** [2]

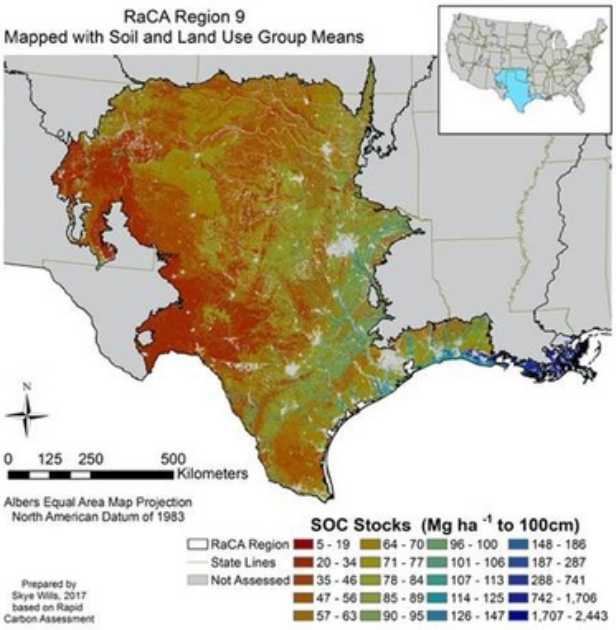
Example Scenario of Large-Scale Native Tree Planting to Meet 3rd Key Annual Goal: [3]

Species of Native Tree[3&6]	Number of Trees Planted (in 1 year)	Amount of Carbon Sequestered per Tree (lbs./year) [3]	Total Carbon Sequestered After Planting (lbs./year)
Live Oak	150,000	268	40,200,000
River Birch	50,000	215	10,750,000
Green Ash	10,000	200	2,000,000
Willow Oak	10,000	142	1,420,000
Laurel Oak	75,000	194	14,550,000
Water Oak	20,000	173	3,460,000
Boxelder	20,000	159	3,180,000
Sweetgum	30,000	150	4,500,000
Red Maple	50,000	139	6,950,000
White Ash	10,000	118	1,180,000
American Elm	25,000	114	2,850,000
American Sycamore	20,000	111	2,220,000
Loblolly Pine	50,000	106	5,300,000
Total	**520,000**		98,560,000
Total in tons (trees only)			**50,000 tons**[3, 6]
Carbon Added to Soil (mulch, composting, OM) [4] [5]			400,000 tons
No till" ag lands			45,000 tons
Native grasses[7] & oyster reefs[8]			105,000 tons
Existing carbon seq. with forestation in region	90 million		+
Total in tons			**600,000 tons**
Percent Carbon Sequestration Increase			4‰

Houston Wilderness Carbon Sequestration Scenario

Tools in the Resilience Toolbox

(1) Targeting Native Tree Species based on Ecosystem Services abilities
(2) *Resilient Houston Plan* Goal of 4.6 Million Native Trees Planted by 2030
(3) Research on large-scale use of native grasses
(4) Major soil enhancements – compost and mulch
(5) Carbon Credits Trading (public and private)



Discussion of Methodology:

Baseline of current carbon stocks in the RCP Region was determined by the SoilGrids and NRCS Soil databases**[1, 2]** and baseline estimates of "Super Tree" prevalence in the Greater Houston provided by CUFR Carbon Calculator (CTCC). The number of each "Super Tree" species that will be planted is determined by the annual average needed to meet 4.6 million trees planted by 2030 and their respective carbon sequestration per tree per year is calculated by pre-existing research from Houston Wilderness' Regional Native Tree Ranking Chart.**[3]** Additionally, the amount of carbon added to the soil by mulch, composting, native grasses, "no till" ag lands and oyster reefs was calculated by averaging findings from comprehensive studies under as similar a condition as possible to the RCP Region. **[4, 5, 7, 8]** Finally, all of the carbon sequestration calculations are converted into tons and then used as the numerator in the fraction of amount of carbon added to soil over the current carbon stock in the soil (Carbon added to soil by above-listed items/Current Carbon Stock).

References:

1. SoilGrids Data (2019) – current carbon stock based on 95% of disturbed lands across the region (https://soilgrids.org/); 8-County Gulf-Houston Region's total acreage = **4,958,857 acres**
2. NRCS Soil Data (2019) – based on carbon sequestration capacity of the region's clay and sandy loam soils (https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053179.pdf)
3. HW Regional Native Tree Ranking Charts – 10 year (2019) (https://houstonwilderness.org/46-million-trees-by-2030-goal) – highlights 14 Super Trees with high ecosystem services benefits
4. Jianling Fan, Weixin Ding, Jian Xiang, Shenwu Qin, Jiabao Zhang, Noura Ziadi, Carbon sequestration in an intensively cultivated sandy loam soil in the North China Plain as affected by compost and inorganic fertilizer application, Geoderma, Volumes 230–231, 2014, p. 22-28 Gulab Singh Yadav, Anup Das, Rattan Lal, Subhash Babu, Mrinmoy Datta, Ram Swaroop Meena, Somanagouda B. Patil, Raghavendra
5. Singh, Impact of no-till and mulching on soil carbon sequestration under rice (Oryza sativa L.)-rapeseed (Brassica campestris L. var. rapeseed) cropping system in hilly agro-ecosystem of the Eastern Himalayas, India, Agriculture, Ecosystems & Environment, Volume 275, 2019, p. 81-92
6. Calculation for total tons of carbon sequestered by planting of "Super Tree" species (sum of all carbon sequestered by each "Super Tree" species
7. Hungate BA, Barbier EB, Ando AW, et al. The economic value of grassland species for carbon storage. *Sci Adv*. 2017;3(4):e1601880. Published 2017 Apr 5. doi:10.1126/sciadv.1601880
8. Fodrie FJ, Rodriguez AB, Gittman RK, Grabowski JH, Lindquist NL, Peterson CH, Piehler MF, Ridge JT. 2017 Oyster reefs as carbon sources and sinks. Proc. R. Soc. B 284: 20170891.

COLLOBRATIVE GRANT ORGANIZING PROGRAM

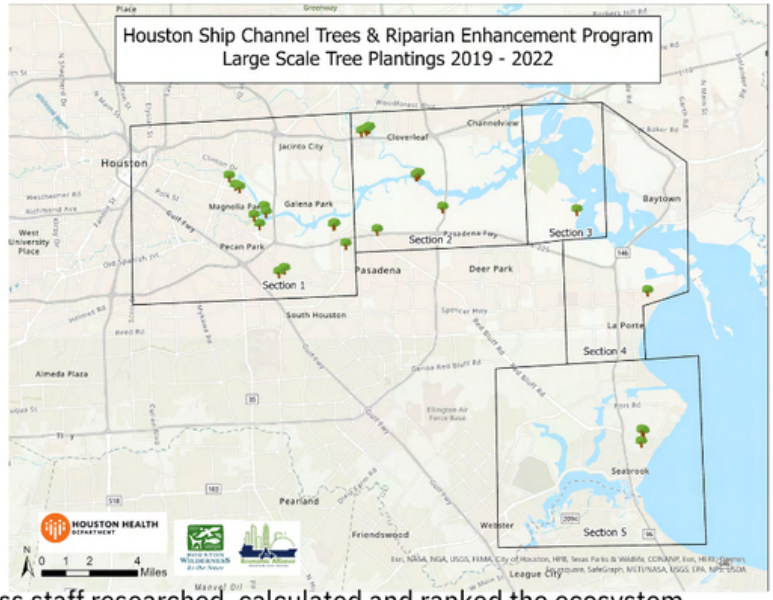
BUF Planting

The *Collaborative Grant Organizing* (*CGO*) Program serves a fundamental role to the environmental community as a regional initiative targeted at coordinating multiple organizations as they seek funding for large-scale projects to leverage resources and magnify the effect of their efforts through collaboration. Under the *CGO* Program, Houston Wilderness convenes a multitude of regional stakeholders to discuss opportunities for coordinating the submission of large federal and state funding proposals to bring such funding to the Gulf-Houston region. The *CGO* Program concentrates on priority pioneering programs that, in order to be fully realized and implemented, require the support and collaborative efforts of numerous various entities. Many of the pioneering initiatives funded through the *CGO* Program address environmental justice issues and benefit underserved communities who are disproportionately impacted by extreme weather events and climate change. In Fiscal Year 2021-2022, Houston Wilderness, with its *CGO* program partners, submitted 12 collaborative proposals requesting a total of over $3.9 million in potential funding to the region from numerous governmental entities, corporations, and foundations. Since the beginning of the *CGO* Program, 30 grants totaling $3,160,520.00 have been awarded through the *CGO* Program. Projects span all ecoregions and focus on large-scale native reforestation efforts, coastal wetlands and shorelines, prairie restoration, bayous, and pollinator habitat.

Houston Ship Channel TREES Program

Trees & Riparian Enhancement of Ecosystem Services (TREES)

Background: ***Houston Ship Channel TREES Program*** *(formerly Port of Houston TREES program)* is a multi-year, multi-partners collaborative program by Houston Wilderness, Port Houston, Houston Health Department, Buffalo Bayou Partnership, and multiple municipalities and private business along the Houston Ship Channel and Galveston Bay that is focused on enhanced ecosystem services through targeted large-scale tree plantings. The HSC TREES Program is accomplished through a comprehensive tree inventory and installation of thousands of native trees along Lower East Buffalo Bayou, and 25 miles of the Houston Ship Channel, using targeted native tree species, GIS-based data mapping, and avian analysis.



Goals & Impacts: The Port of Houston landscape is distributed over a 25-mile long chain of land areas that are utilized for storage and active port operations but still provide significant green spaces. The HSC TREES Program identified the number and species of trees that already existed and now targets locations along the Ship Channel where additional native trees can be planted. The ability to conduct a comprehensive inventory of a large-scale riparian corridor allowed the program partners to analyze and value this riparian ecosystem more effectively and gain valuable insight into the impacts of the ecosystem services and how to enhance them.

A GIS-based database tracks the trees inventoried, and the number and tree species planted. Houston Wilderness staff researched, calculated and ranked the ecosystem services values associated with native tree species in our region. Based on these rankings, the top 17 "Super Tree" species are targeted for large-scale plantings along the riparian corridor. These native *Super Tree* species were ranked in priority based on their respective levels of air pollution absorption (GHGs), water absorption and carbon sequestration. Large-scale native *Super Tree* plantings provide a multitude of ecosystem services - increased air & water quality, erosion control, phytoremediation and habitat enhancement. For more information, please see Houston Wilderness website: https://houstonwilderness.org/houston-ship-channel-trees-program

Project Breakdown: Phase 1, 2 and 3 are divided into 5 different sections throughout the 25 miles Houston Ship Channel riparian corridor. To date, over 30,904 native trees have been planted under this Program with many more planned in 2021-2025. The *Houston Ship Channel TREES* program will be particularly impactful to the natural environment and human health and welfare in the industrial and residential areas along the Houston Ship Channel.

Phase 1: Port Houston-owned properties

Phase 2: Private landowners along Port Houston

Phase 3: Public properties along the Houston Ship Channel

HOUSTON WILDERNESS *It's Our Nature* · Economic Alliance HOUSTON PORT REGION · HOUSTON HEALTH DEPARTMENT · BUFFALO BAYOU PARTNERSHIP

(Updated Nov 2022)

Contact: ana@houstonwilderess.org

Tel: 713-524-7330

Ecosystem Services of Regional Native Tree Species

HOUSTON WILDERNESS
It's Our Nature

Tree species	Total CO_2 Stored (lbs.) DBH = 10 years*	CO_2 sequestrated (lbs./tree/year) DBH = 10 years*	Tree species	Flood mitigation (gal./year) DBH = 10 years*	Tree Species	Air pollutants removal w PM2.5 (lbs./year) DBH.= 10 years*	Tree Species	Canopy width (ft) DBH.= 10 years*	Tree Species	Mycorrhiza Fungi Relationship AM or EM**
Live Oak	1023	268	Tulip Tree	3006	American Sycamore	1.9	American Sycamore	17	Live Oak	AM/EM
Black Cherry	971	101	Water Oak	2879	Live Oak	1.9	American Elm	16	Black Cherry	AM
River Birch	925	215	American Sycamore	2747	Tulip Tree	1.9	River Birch	15	River Birch	AM/EM
Boxelder	898	159	Live Oak	2656	Black Walnut	1.9	Tulip Tree	14	Boxelder	AM
Laurel Oak	875	194	River Birch	2646	Red Maple	1.6	Black Walnut	14	Laurel Oak	AM/EM
Water Oak	869	173	Red Maple	2592	Slippery Elm	1.5	Red Maple	14	Water Oak	AM/EM
Red Maple	859	139	Black Walnut	2528	Sweetgum	1.5	Sweetgum	14	Red Maple	AM
Willow Oak	739	142	Laurel Oak	2518	Water Oak	1.4	White Ash	14	Willow Oak	AM/EM
Sweetgum	719	150	Sweetgum	2395	American Elm	1.4	Live Oak	13	Sweetgum	AM
Slippery Elm	669	197	American Elm	2364	Laurel Oak	1.3	Water Oak	13	Slippery Elm	AM
American Elm	667	114	Willow Oak	2316	Boxelder	1.3	Black Cherry	11	American Elm	AM
Tulip Tree	659	81	Slippery Elm	2199	River Birch	1.3	Green Ash	11	Tulip Tree	AM
American Sycamore	652	111	Black Cherry	2095	Green Ash	1.3	Laurel Oak	11	American Sycamore	AM
Green Ash	624	200	Boxelder	2051	White Ash	1.3	Loblolly Pine	11	Green Ash	AM/EM
Loblolly Pine	479	106	Green Ash	1977	Willow Oak	1.1	Willow Oak	11	Loblolly Pine	AM/EM
White Ash	447	118	White Ash	1839	Black Cherry	1.1	Slippery Elm	9	White Ash	AM/EM
Black Walnut	386	76	Loblolly Pine	1480	Loblolly Pine	1.1	Boxelder	9	Black Walnut	AM/EM
Eastern Cottonwood	591	176	Hickory	1907	Southern Magnolia	1.3	Southern red Oak	17	Eastern Cottonwood	AM/EM
Black Willow	590	169	Red Mulberry	1878	Black Tupelo	1.2	Swamp chestnut Oak	16	Black Willow	AM/EM
Washington Hawthorn	448	68	Black Tupelo	1858	Eastern Cottonwood	1.1	Pecan	16	Washington Hawthorn	AM
Southern Crabapple	445	27	Southern red Oak	1858	Red Mulberry	1	Red Mulberry	14	Southern Crabapple	AM
Plum	445	139	Eastern Cottonwood	1791	Hickory	1	Black Willow	14	Plum	AM
Baldcypress	443	146	Oak	1740	Redbay	1	Willow	14	Baldcypress	AM
Longleaf Pine	425	85	Swamp chestnut Oak	1729	Flowering Dogwood	0.9	Southern Magnolia	13	Longleaf Pine	AM/EM
Southern red Oak	416	121	Flowering Dogwood	1639	Black Willow	0.9	Sugarberry/Hackberry	13	Southern red Oak	AM/EM
Shumard Oak	413	90	Plum	1493	Sugarberry/Hackberry	0.9	Hickory	12	Shumard Oak	AM/EM
Swamp chestnut Oak	412	114	Shumard Oak	1492	Shumard Oak	0.9	Shumard Oak	12	Swamp chestnut Oak	AM/EM
Oak	407	94	Black Willow	1466	Elm	0.9	Oak	11	Oak	AM/EM
Shortleaf Pine	374	91	Southern Magnolia	1458	Southern red Oak	0.9	Shortleaf Pine	11	Shortleaf Pine	AM/EM
Hickory	355	75	Redbay	1368	Oak	0.9	Southern Crabapple	11	Hickory	EM
Black Tupelo	354	46	Southern Crabapple	1359	Shortleaf Pine	0.9	Eastern Redbud	11	Black Tupelo	AM
Flowering Dogwood	338	46	Shortleaf Pine	1332	Carolina cherry Laurel	0.9	Sugar Maple	11	Flowering Dogwood	AM
Holly	337	59	Elm	1323	Southern Crabapple	0.8	American Hornbeam	11	Holly	AM
Winged Elm	327	179	Carolina cherry Laurel	1312	Swamp chestnut Oak	0.8	Common Persimmon	11	Winged Elm	AM
Elm	326	151	Pecan	1283	Plum	0.8	White Oak	11	Elm	AM
Southern Magnolia	322	55	Winged Elm	1267	American Basswood	0.8	Black Tupelo	9	Southern Magnolia	AM
Redbay	322	64	Eastern Redbud	1238	Eastern Redbud	0.8	Flowering Dogwood	9	Redbay	AM
Willow	281	79	American Basswood	1199	Winged Elm	0.7	Baldcypress	9	Willow	AM/EM
American Basswood	261	76	Sugarberry/Hackberry	1157	Sugar Maple	0.7	Washington Hawthorn	9	American Basswood	EM
Carolina cherry Laurel	232	2	Mockernu Hickory	1145	Mockernu Hickory	0.7	Savannah Holly	7	Carolina cherry Laurel	AM
Red Mulberry	219	44	Willow	1114	Longleaf Pine	0.7	American Holly	6	Red Mulberry	AM
Savannah Holly	192	63	Bitternut Hickory	1098	American Hornbeam	0.6	Holly	5	Savannah Holly	AM
Sugar Maple	191	71	Longleaf Pine	1094	Common Persimmon	0.6	Eastern red Cedar	4	Sugar Maple	AM
Common Persimmon	164	38	Common Persimmon	1093	Willow	0.6	American Basswood	7	Common Persimmon	AM
Mockernu Hickory	140	44	Baldcypress	1078	Baldcypress	0.6	Bitternut Hickory	9	Mockernu Hickory	EM
Post Oak	139	55	American Hornbeam	1037	Holly	0.6	Carolina cherry Laurel	7	Post Oak	AM/EM
Bitternut Hickory	138	54	White Oak	907	Savannah Holly	0.6	Eastern Cottonwood	17	Bitternut Hickory	EM
White Oak	136	54	Sugar Maple	891	Bitternut Hickory	0.5	Elm	16	White Oak	AM/EM
Pecan	135	44	Washington Hawthorn	790	Pecan	0.5	Longleaf Pine	11	Pecan	EM
American Hornbeam	133	31	Post Oak	691	White Oak	0.5	Mockernu Hickory	9	American Hornbeam	AM/EM
American Holly	127	33	Holly	665	American Holly	0.3	Plum	7	American Holly	AM
Sugarberry/Hackberry	111	58	Savannah Holly	629	Post Oak	0.3	Post Oak	13	Sugarberry/Hackberry	AM
Eastern Redbud	72	19	American Holly	525	Washington Hawthorn	0.2	Redbay	7	Eastern Redbud	AM
Eastern red Cedar	45	17	Eastern red Cedar	324	Eastern red Cedar	0.2	Winged Elm	16	Eastern red Cedar	AM/EM

References:

Native tree species selected from City of Houston tree ordinance

* Total CO2 stored and CO2 sequestration Calculated with CUFR Carbon Calculator (CTCC)
* Flood mitigation, Air pollutants removal calculated with i- Tree planting tool
  Annual value calculated = total 10 year - total 9 year
  Flood mitigation = Rainfall interception + avoided runoff
  Air pollutants include O_3 + NO_2 + SO_2 + small particulate matter ($PM_{2.5}$)
* Biogenic VOC emission rate includes Isoprene and Monoterpenes volatile organic compounds
* Diameter at breast height (DBH) - calculated for each tree species whenapproximately 10 years old
* The references of the arbuscular mycorrhizal (AM) and ectomycorrhizal (EM) structural characteristics:

** Teste, François P., et al. "Dual-mycorrhizal Plants: Their Ecology and Relevance." *The New Phytologist*, vol. 225, no. 5, 2020, pp. 1835–51, https://doi.org/10.1111/nph.16190.

** Heklau, Heike, et al. "Mixing Tree Species Associated with Arbuscular or Ectotrophic Mycorrhizae Reveals Dual Mycorrhization and Interactive Effects on the Fungal Partners." *Ecology and Evolution*, vol. 11, no. 10, Wiley, 2021, pp. 5424–40, https://doi.org/10.1002/ece3.7437.

** https://planting.itreetools.org/
** https://extension.okstate.edu/fact-sheets/mycorrhizal-fungi.html
** https://www.lebanonturf.com/education-center/tree-shrub-and-flower-care/mycorrhizal-types-on-important-plants
** https://www.arboristnow.com/news/mycorrhizae-my-favorite-kind-of-fungi

Texas Forest Service, Community Forestry Award - Gold Leaf for Outstanding Landscape Improvement under the Houston Ship Channel TREES Program by Houston Wilderness

October 2022

Tree Strategy Implementation Group

Strategy for 4.6 million trees by 2030

Key Objectives in the TSIG Strategy to reach 4.6M Trees by 2030

1. **Maintaining an average of 400,000 native trees per year through 2030 -** using three main actions: a) continue large-scale native tree planting with multiple native species by TSIG members, b) create an educational campaign to encourage residential involvement in large-scale native tree plantings, and c) provide data and tracking of the planting of millions of native trees through 2030. See Actual & Projected Tree Plantings below, and City of Houston **4.6M Trees Scoreboard** created.

2. **Creation of a Regional Native Tree Planting Policy & Procedures Manual -** educating decision-makers and the general public on the Best Management Practices of why, how and where to do large-scale native tree plantings, targeting specific native tree species based on location and ecosystem services needed. See Large-Scale Tree Planting Manual www.houstonwilderness.org/46-million-trees-by-2030-goal.

3. **Tracking locations of major native tree removals -** See Large-Scale Tree Planting Manual above.

4. **Supporting regulatory improvements** that will assist in reaching the 4.6 million goal, such as updating county/city native tree lists, and allowing additional green space locations for large-scale tree plantings.

Tree Strategy Implementation Group - TSIG

CoH Resilience (Priya Zachariah & Laura Patino)
Harris Co. & Harris Co. Flood Control District (Nicolas Griffin)
Harris County, Prec. 2 (Jorge Bustamante)
Harris County Tollroad Authority - HCTRA (Doug Emery)
H-GAC (Justin Bower & Cheryl Mergo)
Houston Parks & Recreation Dept (Kelli Ondracek)
Houston Parks Board (Marissa Llosa & Alexis Overdiek)
Houston Wilderness (Deborah January-Bevers)
Landscape Architects: Keiji Asakura (Asakura Robinson), Matt Baumgarten & Rachel Wilkins (SWA), and Sheila Condon (Clark Condon)
Engineering Industry Rep. Matthew Smith (ALJ Lindsey)
Master-Planned Communities & MUDs (Alia Vinson)
Nature's Way Resources (John Ferguson)
TxDOT - Houston District (Ethan Beeson)
Texas A&M Forest Service (Mickey Merritt & Mac Martin)
Mitigation Bank Industry Rep. (Matt Stahman, RES)

COMPREHENSIVE LIST OF ACTUAL PROJECTED REGIONAL TREE PLANTINGS - annually (starting in 2019)
Tree Strategy Implementation Group

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1						Current	Projection	Projection	Projection	Projection	Projection	Projection	Projection	Projection	
2	**Large-Scale Native Tree Planters**	**Native Tree Plan/Projects**	**2019 Season**	**2020 Season**	**2021 Season**	**2022 Season**	**2023 Season**	**2024 Season**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	
3	TxDOT-Houston Dist. Native Trees [2]	Green Ribbon Program	100,000	100,000	100,000	100,000	100,000	100,000	80,000	50,000	50,000	40,000	30,000	25,000	
4	City of Houston [1]	Resilient Houston Plan & Climate Action Plan													
5	HPARD - City parks and medians	Riparian Restoration Project	20,000	10,000	15,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	
6	Houston PWD	Varied	1,500	1,500	10,000	10,000	10,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	
7	Harris County	HC Flood & Infra. Resilience Plan													
8	HCFCD Row & Detentions	HCFCD Tree Planting Program	15,000	20,000	20,000	20,000	25,000	25,000	20,000	20,000	20,000	15,000	15,000	15,000	
9	HCTRA Row	Varied	8,000	8,000	8,000	8,000	10,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	
10	Harris County, Precinct 1	Varied	250	250	250	1,250	250	250	250	250	250	250	250	250	
11	Harris County, Precinct 2	Varied	250	250	5,000	4,000	5,000	250	250	250	250	250	250	250	
12	Harris County, Precinct 3	Varied	250	250	250	250	250	250	250	250	250	250	250	250	
13	Harris County, Precinct 4	Varied	250	250	250	250	250	250	250	250	250	250	250	250	
14	U.S. Army Corps of Engineers (ACE)	Ecosystem Restoration Projects	2,500	2,500	5,000	10,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	
15	Trees for Houston[3]	Varied	9,100	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	
16	Houston Parks Board	Bayou Greenways 2020	600	1,500	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	
17	Buffalo Bayou Partnership	BBP Master Plan	801	204	1,500	1500	1500	1500	1500	1500	1500	1500	1500	1500	
18	Memorial Park Conservancy	MP Master Plan	1070	1200	1,500	1,500	5000	5000	5000	2500	2500	2500	2500	2500	
19	Hermann Park Conservancy	HP Master Plan	250	250	1000	1000	500	250	250	250	250	250	250	250	
20	Exploration Green	Multi-phase projects	300	100	250	50	50	50	50	50	50	50	50	50	
21	Houston Botanic Garden	Multi-phase projects	0	342	350	100	50	15	15	50	10	10	10	10	
22	Houston Wilderness (CGO projects)	HSC TREES & TUBs Program	2,500	4,500	7,500	18,000	20,000	30,000	35,000	25,000	20,000	20,000	15,000	10,000	
23	Local commercial nursery sale of trees – average	Varied tree species sales	3,000	3,000	3,000	2,500	5000	5000	5000	5000	5000	5000	5000	5000	
24	American Forests/HGAC	Regional Urban Forestry Program	500	500	500	500	500	500	500	500	500	500	500	500	
25	Texas Forest Service	Varied projects/plans	NA	NA	1,000	1500	2000	2000	2000	2000	2000	2000	2000	2000	
26	Landscape Architects	Varied projects/plans	1,000	1,000	8,000	15,000	15000	15000	15000	15000	15000	15000	15000	15000	
27	Mitigation Banks (private companies)[2]	Mitigation Bank restoration plans	75,000	210,000	225,000	110,000	200,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	
28	Developers for Master Planned Communities, MUDs & Smaller Developments (TOTAL)	Nature-based Infrastructure Projects	40,000	52,000	50,000	40,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
29	Residential/NGO/Neighborhood/Commercial Tree-Plantings	Varied projects/plans	NA	5,000	10,000	10,000	10,000	10,000	10,000	5,000	5,000	5,000	5,000	5,000	
30	**Estimated TOTAL**		282,121	432,596	493,350	400,400	510,350	454,315	434,315	386,850	381,810	366,810	351,810	341,810	**4,836,537**
31	**Estimated tree removals & loss**		25,000	25,000	25,000	100,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	**375,000**
32	**Estimate TOTAL after annual tree loses**														**4,461,537**
33	1. Inter-departmental planting plans/projects														
34	2. Includes in Harris County area														
35	3. Trees not already listed by other tree planters														
36															

Facilated by Houston Wilderness

The Riverine Targeted use of Buyouts Program

Background on Regional Frequently-flooded Property Buyouts: The impact of recent flood events, such as Hurricane Harvey and other frequent repetitive flood events that impact rivers and waterways both upstream and downstream in respective regional counties, compounded from tropical storms originating in the Gulf of Mexico, has sparked new proposals for buying out damaged properties to reduce flood risk and return them to natural open space.

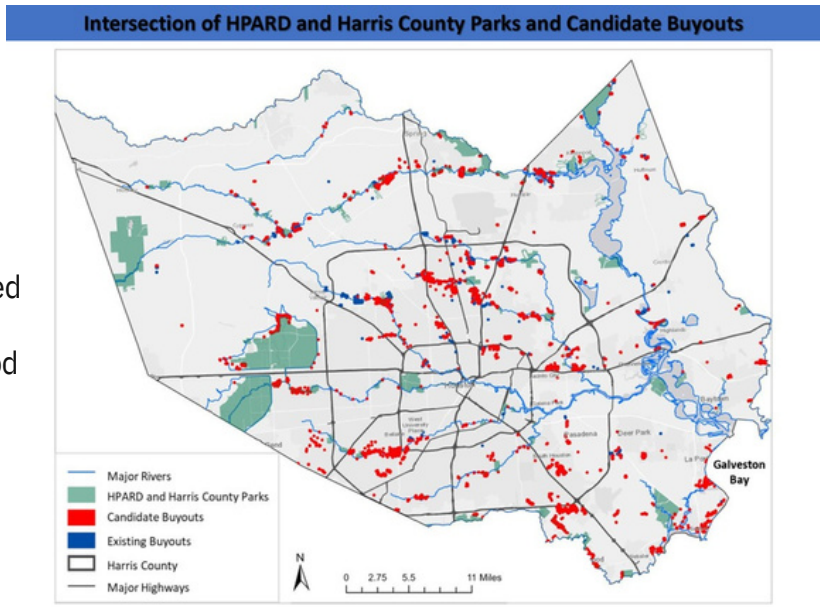
Example of Greens Bayou buyout property

In conjunction with Houston Wilderness, Harris County Flood Control District, the City of Houston, and local NRCS staff, the *Institute for a Disaster Resilient Texas* (IDRT) at Texas A&M University-Galveston plays a key role in the *Regional River & Waterways TUBS* Program by providing analysis, research, and technical support on property buyouts and acquisition in relation to Green Stormwater Infrastructure (GSI) techniques.

Strategic property buyouts to enhance flood resilience:

A 2020 study by Dr. Brody and the IDRT at Texas A&M University Galveston found that implementing nature-based infrastructure onto contiguous buyout properties, as the Riverine TUBs Program is doing, substantially reduced flood risks to surrounding communities and "statistically and spatially demonstrates the feasibility of incorporating additional ecological and proximity criteria into the flood buyout selection process without compromising strong economic benefits" (Atoba et al., 2020 - https://doi.org/10.1080/17477891.2020.1771251).

The pioneering Riverine Targeted Use of Buyouts (Riverine TUBs) Program is an innovative approach to coastal resilience and hazard mitigation through a long-term strategy for habitually flooded properties to be 1) purchased by respective regional counties or municipalities, 2) held by the county or municipality - with maintenance/enhancements MOUs with community partners or transferred to a state agency or NGO for fee-simple ownership, and 3) enhanced with native bioswales, large-scale native trees/plants, replaced coastal wetlands, and other types of nature-based infrastructure techniques (also called Green Stormwater Infrastructure - GSI). In addition, the Riverine TUBs Program partners are working together to create Best Management Practices (BMPs) for GSI techniques, especially bioswales, that NRCS staff can use to advise application of GSI techniques along other riparian corridors and the Texas coast. GSI enhancements and monitoring activities conducted through the Program will help mitigate flooding, improve water and air quality, restore natural habitats, and benefit at-risk communities.



Beneficial Results: Working with state legislators and regional stakeholders to implement the *Riverine TUBs*

Program in 2022-2023 will help mitigate the impacts of future large rain events on Greater Gulf-Houston Region's key community assets, such as essential infrastructure, and provide critical connectivity along riparian corridors. Planting numerous additional native tree and grass species in strategic buyout locations on both private and public protected/preserved lands, as well as other public/private locations will increase resilience and recovery from shocks and stressors by 1) protecting, restoring and improving the water/air quality, carbon absorption, riparian erosion rates and habitat of multiple watersheds, and 2) reducing Urban Heat Islands.

[1] July, 2022

FOR IMMEDIATE RELEASE

December 19, 2022

Contact:
Deborah January-Bevers,
President & CEO, Houston Wilderness
Deborah@houstonwilderness.org,
713-524-7330

HOUSTON WILDERNESS *RIVERINE TARGETED-USE-OF-BUYOUTS* PROGRAM RECEIVES $1.1 MILLION NFWF COASTAL RESILIENCE GRANT

HOUSTON (December 19, 2022) – NOAA and the National Fish and Wildlife Foundation (NFWF) recently announced a record investment in projects that will help communities prepare for increasing coastal flooding and more intense storms, while improving thousands of acres of coastal habitats. The funding, in collaboration with the Department of Defense and private sector partners, provides more than $136 million to support 88 natural infrastructure projects in 29 states and U.S. territories. Texas received 4 grants out of the 88 projects, with 2 projects in the Gulf-Houston Region.

For Greater Houston NFWF awarded Houston Wilderness a $1,141,500 grant to support nature- based infrastructure projects in the Greater Houston region under the Riverine Targeted Use of Buyouts (Riverine TUBs) program. The Riverine TUBs program is implementing green stormwater infrastructure to revitalize riparian corridors that lead to Galveston Bay and the Gulf of Mexico - targeting 17 properties that were voluntarily bought out with hazard mitigation funding to implement restoration, including large-scale planting of native trees, installing bioswales and rain gardens that will improve water quality, enhance habitat, and mitigate flood risk for at-risk communities.
"This funding allows communities to invest in keeping their coasts healthy for generations to come and helps build a Climate-Ready Nation," said NOAA administrator, Rick Spinrad, Ph.D. "NOAA values the contributions of our partners to scale up efforts to help communities address climate-related risks."

Established in 2018, the National Coastal Resilience Fund (NCRF) invests in conservation projects that restore or expand natural features such as coastal marshes and wetlands, dune and beach systems, oyster and coral reefs, coastal forests and rivers, floodplains, and barrier islands that minimize the impacts of storms, sea-level rise and other coastal hazards on nearby communities. The NCRF funds across four project categories: 1)community capacity building and planning; 2) project site assessment and preliminary design; 3) final project design and permitting; and 4) restoration implementation.

“Many people in the region are excited about this much-needed funding,” Deborah January-Bevers, President and CEO of Houston Wilderness remarked. “Houston Wilderness regularly collaborates on pioneering environmental projects with multiple partners in the 15+ county region. The multi-county Riverine TUBs program is a vital link between assisting high risk environmental justice communities with flood control and other sustainability needs and working towards best management practices for the region related to nature-based infrastructure that increase climate resilience from flooding, windstorms, drought conditions and major freeze events.”

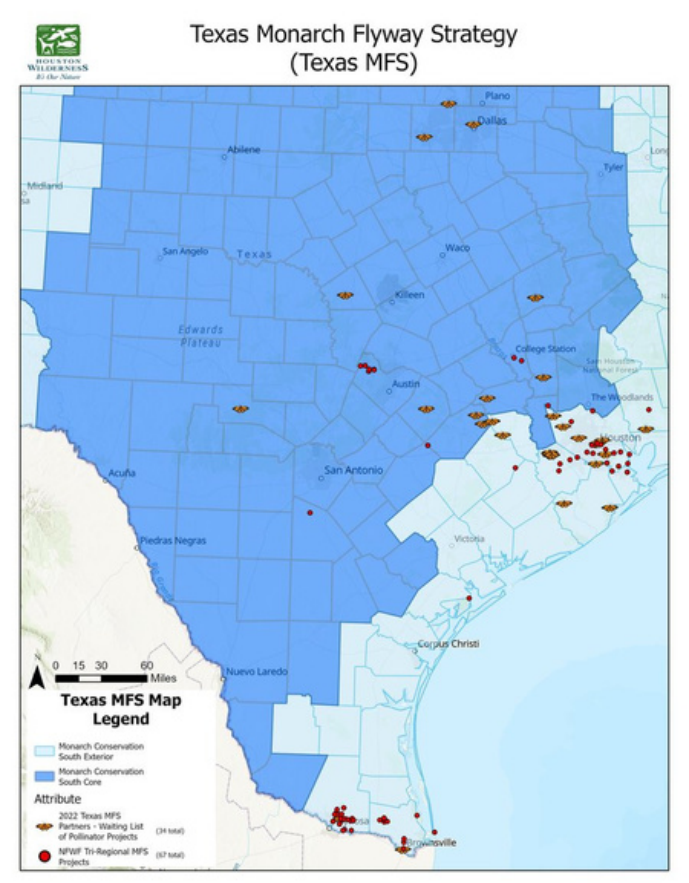
###

Texas Monarch Flyway Strategy
(TEXAS MFS)

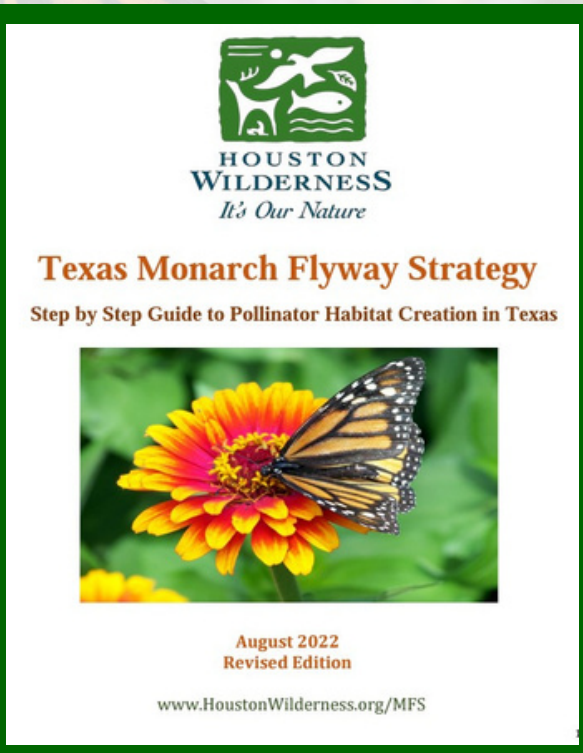
Facilitated by Houston Wilderness, the *Texas Monarch Flyway Strategy (Texas MFS)* is an outgrowth of the *Gulf Houston Monarch Flyway Strategy* & *Tri-Regional Monarch Flyways Strategy*, which is a collaborative effort modeled after Texas Parks & Wildlife Department's Monarch & Native Pollinator Conservation Plan. The *Texas MFS* Program includes three phases, which include the restoration and enhancement of:

A) Grass and riparian lands in urban areas (implemented from 2016 – 2019)
B) Rural/Suburban Areas (implemented from 2019 – 2020)
C) Sustainability and long term maintenance of these areas (ongoing)

Utilizing funding from various federal, state and regional sources, Houston Wilderness is working with Texas biologists, multiple municipalities, private and public landowners, schools and environmental nonprofits to enhance or restore over 25,000 acres of habitat for monarch butterflies within the monarch's migratory flight path through Texas.



Get an up close and personal look into the various pollinator habitat locations using our interactive map
Visit: www.houstonwilderness.org/mfs



TxMFS Step-by-Step Guide to Pollinator Habitat Creation in Texas Revised Edition

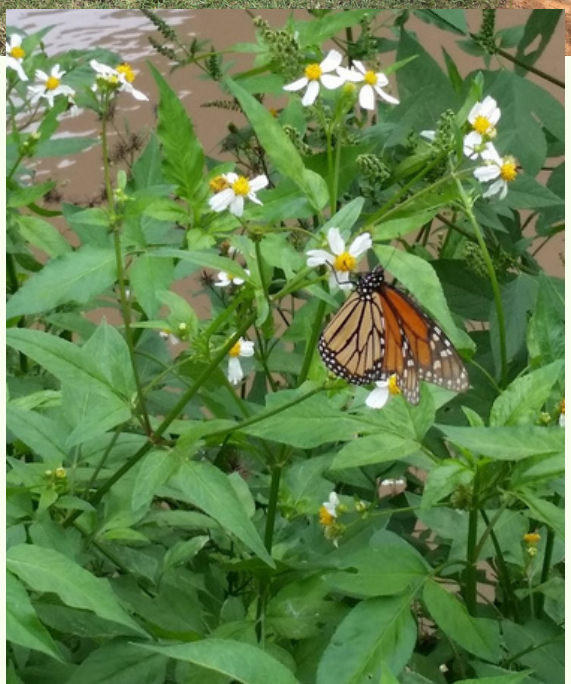
•Not recommending to plant tropical milkweed – not native to Texas (OE too strong)

2022

TEXAS MONARCH FLYWAY METRIC TOTALS

	Acres	Patches	# of Sites	Pollinator Seeds (lbs)	Nectar (lbs)	Milkweed (lbs)	Live Plants	Live Nectar
GULF-HOUSTON MFS	290.19	7	20	35	31.5	3.95	263,572	263,188
TRI-REGIONAL MFS	216.05	32	47	154.232	196	2.477	44,405	26,165
ADDITIONAL PROJECT SITES	1.2	4	3	2.1	.1	2	20	14
TEXAS MFS	128.25	0	16	110.25	0	4.95	0	0
ALL MFS TOTALS	635.69	43	86					

Pollinator garden at the
Houston Health Department



Collaborative Native Seed Mix (NSM) Development Project

HARRIS COUNTY

Native Seed Mix Development sites for Harris County Flood Control District

Figure 1. Site selection for the Native Seed Mix Development Project for the Harris County Flood Control District.

Background: Native Seed Mix (NSM) Development is a multi-year collaborative program facilitated by Houston Wilderness, Harris County Flood Control District (HCFCD), and Texas A&M University – Kingsville focused on development of an available and affordable regional **native grass seed mix(es)** to provide valuable ecosystem services and increased ecological resilience along riparian corridors in Harris County. Structurally mature and floristically complex native plant communities along riparian corridors will increase ecological resilience by 1) decreasing erosion, 2) decreasing sedimentation in rivers and waterways, 3) increasing streambank productivity, 4) improving local water quality and supply characteristics, and 5) enhancing overall environmental functions and processes.

NSM Project Breakdown: The NSM partners are now 1 year and 5 months into the process of testing the survivability of various native seed mixes – first through the use of 10' by 10' plots on two half-acre sites – one in North Harris County and one in South Harris County - to determine species survivability rates, and then through the planting of viable seed mixes in a ½ acre area in the North site and 10' x 10' plots in the South site to evaluate seed performance on slope conditions. Plots of one native species and mixed native species were tested to compare effects of increased biodiversity on survivability and growth rates. Sections at each site were prepped with hydro mulch to mimic current HCFCD protocol for soil stabilization following planting, the other plots were left untreated for comparison analysis.

The North site shows resilience to invasive species like KR Bluestem because of the time of year of planting and demonstrates a native seed mix planting in an established basin-style site. The South slope plots were treated with herbicide to reduce the invasive KR Bluestem that began establishing.

North HCFCD Site – half-acre plot

South HCFCD Site– plots and slope area

Future Steps: Benefit relevant indicators of the change in ecosystem services will be monitored throughout the project. An on-site workshop with interested stakeholders facilitated by Houston Wilderness in November 2022 highlighted the progress of the NSM project:

1. The Gulf Coast and East Texas are the only regions without a native seed mix
2. Based on the success of the North NSM demo site, early successional, annual species can be used to close the gaps between native grasses and avoid invasive species take over
3. Timing of the NSM plantings is a key to avoiding invasive species like KR (Old World) Bluestem
4. TNS seed development is a 4–7-year process and accessibility of targeted NSM species varies based on commercial availability of seed.

[1] November 2022

Regional Wildlife Assessment & Informational Fact Sheet For Greater Gulf-Houston Region (1st Edition – 2022)

(RAWARC)

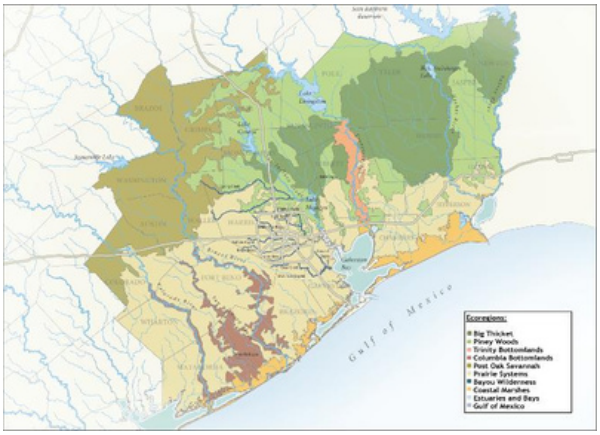
The 8-County Greater Houston Region is rapidly growing with both people and wildlife! The Greater Houston Region's diverse ecoregions – from prairie wetlands and wooded oak and cypress bottomlands to pine forests and coastal marshes – are flanked by 40 major waterways, allowing for over 700 miles of riparian corridors running through the highly-populated region. Diverse wildlife species – from coyotes and bobcats to alligators and otters – traverse these corridors every day. With the impact of a growing number of large rain/flood events over the last few years and increasing pressures from sea level rise and warming temperatures, a collaborative of interested stakeholders spent three years using wildlife cameras to identify and access these diverse wildlife species. This Wildlife Fact Sheet is a compilation of this collaborative effort, providing information and tools for human coexistence with the region's wildlife and their natural habitats.

What regional wildlife do we have:

Wildlife Viewed along riparian corridors in Gulf-Houston Region (2020-2022)			
Armadillos	Bats	Black Bear[1]	Beavers
Alligator Gar	Gray Fox	Nutria	Alligator Snapping Turtle
Coyotes	Feral Hogs (non-native)	White-tailed Deer	Turtles
Squirrels, Snakes	Bobcats	Raccoons & Opossums	Resident & Migratory Birds
River Otters	Swamp Rabbits	Eastern Cottontails	Alligators

Where they are found:

- Riparian corridors – widespread use of "riparian zones" on all the waterways in the region (mainly at night)
- Detention basins, reservoirs and parks that as part of waterways (daytime and nighttime use)
- Wooded areas – urban and suburban forests



What regional wildlife do: Hunt, Eat, Seek and Nest

All Wildlife Eating Habitats – Herbivore, Carnivore or Omnivorous diet			
Armadillos	Bats	Black Bears[2]	Beavers
Alligator Gars	Gray Foxes	Nutria	Alligator Snapping Turtles
Coyotes	Feral Hogs (non-native)	Opossums	Turtles
Squirrels & Snakes	Bobcats	Raccoons	White-tailed Deer
River Otters	Swamp Rabbits	Eastern Cottontails	Alligators

Impacts to Habitat of regional wildlife:

- Floods and varying water levels along the waterways3
- Drought
- Interactions with humans & domestic pets

[1] Only a few regional sightings, to date; See educational resources at Texas Black Bear Alliance

[2] Roughly 90% of the LA Black Bear's diet is vegetative, with the remaining 10% composed of protein from insects and grubs.

[3] Residential and commercial areas can become the "Riparian Zone" during flood events and hurricanes

Improving riparian habitats as part of sustainability planning in Gulf-Houston Region:

- For humans
  - o Save mature trees and Replace sections of lawn with more native trees, shrubs, grasses and perennials
  - o Enhance all soils with leaves, mulch & compost
  - o Avoid rat and other poisons – they harm all wildlife
- For wildlife
  - o Protect slopes of riparian corridors and tributaries with native trees and grasses
  - o Plant more habitat – for herbivores and carnivores


Coyotes

Human interactions with regional wildlife

- If wildlife found in your yard, leave them be if possible
- If wildlife found other than your yard, leave them be (even if they looked injured)
- In public spaces, more signage planned to aid visitors on regional wildlife in the area (Look out for it!)

Federal, state & local policies for regional wildlife

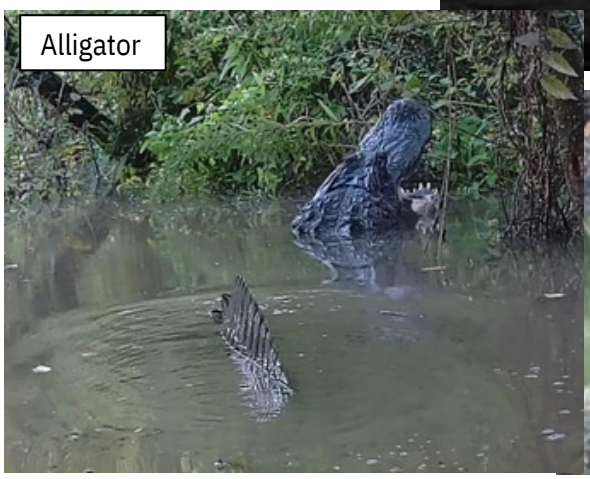
Feral Hogs Protected Wildlife Species Migratory Birds

Special Feature: Coyotes

- Formerly called the "Prairie Wolf"
- A part of the Greater Gulf-Houston Region for hundreds of years
- Use culverts as dens – usually along waterways
- Alpha Male & Female pair have up to 10-mile radius territory for themselves and their cubs Coyote population stays balanced because of territorial behavior within 10-mile radius
- During extreme events, coyotes will move within existing 10-mile territory to seek shelter
- Coyotes may wander neighborhoods during extreme events for food but instinctively will avoid humans
- Killing of domestic cats is unusual, more interested in rabbits, raccoons, rodents and various plants


Feral Hog


River Otters


Alligator


Bobcat

Wildlife Cameras & Fact Sheet Contributors

- Asakura Robinson
- Bayou Land Conservancy
- Buffalo Bayou Partnership
- Harris County
- Harris County Flood Control District
- Houston Audubon
- Houston Arboretum & Nature Center
- Houston Botanic Garden
- Houston Parks Board
- Houston Wilderness
- Mercer Arboretum
- Montgomery County
- Texas Parks & Wildlife Dept
- University of Houston
- U.S. Corps of Engineers – Galveston

For questions, contact info@houstonwilderness.org

GREAT GREEN QUEST
WILDERNESS PASSPORT

Houston Wilderness created the *Great Green Quest (GGQ)* to provide children and families the opportunity to spend quality time together and better understand the importance of natural systems in their lives.

The *Great Green Quest (GGQ)* is an interactive educational experience that gets kids interested and involved in their natural surroundings during the summer months. The *GGQ* helps meet the essential need that our region's natural areas are visited, enjoyed, and valued. The *GGQ's* Wilderness Passport is an outdoor nature resource guide detailing the 10 ecoregions that make up the Houston Wilderness coverage area. The passport has information on over 50 parks, preserves, nature centers and refuges that boast countless wildlife viewing opportunities, outdoor recreation and beautiful landscapes.

The 2022 *Great Green Quest* connected children, students, and families to their natural world via the distribution of over 37,000 Wilderness Passports to area school districts, Houston Parks and Recreation Department's community centers, area libraries, youth organizations, and children's museums. Over 30 urban and suburban schools and libraries received passports at the end of the spring semester, as did multiple YMCAs and municipal community centers.

The *Great Green Quest* also includes a "*Careers in Conservation*" scholarship program open to graduate and undergraduate students who are pursuing an environmental science or related degree, and who have worked with at least one environmental NGO in the region. In 2022, Houston Wilderness provided five $1,000 scholarships to deserving students seeking careers in environmental science. Recipients were announced in late May.

2022 "*CAREERS IN CONSERVATION*" SCHOLARSHIP RECEPIENTS

Mei Ling Valdes - Texas A&M Galveston
Anne-Elisabeth Baker - Duke Univ.
Loren Horn - Texas A&M
Marissa Palmer - Texas A&M Galveston
Ashley Juliette Trujillo - Texas A&M

Scan the QR code to download your wilderness passport!

Hoppi the Frog!

Hoppi is a frog from the Houston who loves living in the piney woods and post oak savannah ecoregions! The beautiful bayous, native grasslands and tall pine forests of Houston are the perfect habitat for frogs like Hoppi, but rapid development of riparian habitat is threatening wildlife! That's why Hoppi represents all frogs of Houston and works to promote environmental education and stewardship in the Greater Houston region. Hoppi is the Houston Wilderness Guide to the 10 ecoregions of the Greater Houston area and he's very curious about nature. Oh, and his favorite Super Tree is the loblolly pine

For more information visit:
www.houstonwilderness.org/ggq
www.houstonwilderness.org/passport

Houston Wilderness Published Resources

1

Ecosystem Services (ES) Primer, 2nd Edition

The HW ES Primer for Greater Gulf-Houston Region, A Six-Step Guide for making nature-based infrastructure decisions based on the benefits and values of multiple Ecosystem Services, and related slide presentation, discusses ways for decision-makers to determine ES benefits and values using different established study/valuation methods depending on targeted infrastructure/project goals. HW staff speak regularly at environmental conferences on the region's ecological assets and regional ES case studies.

2

Wilderness Passport

Houston Wilderness has created three specialized versions of its Wilderness Passport: a Family Passport designed for parents and children to explore the outdoors together, an Ecotourism Passport for visitors to the Houston Area and other adults, and a Careers in Conservation Wilderness Passport in both English and Spanish, which includes information on careers in environmental science and conservation.

3

Texas Monarch Flyway Strategy Step-by-Step Guide

Designed by HW for use by anyone interested in creating and maintaining pollinator habitat in Texas, the Guide provides users with an easy to follow pollinator habitat creation process and resource guide for obtaining plants and other materials, based on regional locations around the State of Texas.

4

Houston Wilderness Atlas of Biodiversity

The Houston Atlas of Biodiversity is about the 10 ecoregions of the 13+ County Greater Houston region. People enjoy the Atlas because it provides a comprehensive history and in-depth information on the various ecoregions in our region.

5

Resources for Native Super Trees and HSC TREES Program

Provides published journal articles, news articles, policy papers and Super Trees data and information for use in research, development and implementation of large-scale native tree planting projects and initiatives by communities around the world.

6

HW Policy Paper on Increasing Carbon Sequestration in the Gulf-Houston Region Through Targeted Large-Scale Planting of Native Trees and Flora Species

Part of HW's work on the 3rd key goal of the *Gulf-Houston RCP* to provide research, opportunities and information to help the 8-county region increase its organic carbon sequestration to .4% annually in organic soil content through large-scale native tree planting and use of native grasses throughout the region.

7

Regional Wildlife Assessment and Informational Fact Sheet

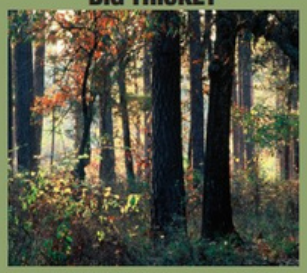
A compilation of the HW-facilitated collaborative of interested stakeholders who spent three years using wildlife cameras to identify and access the diverse wildlife species in the 8-County Greater Houston Region. Provides information and tools for human coexistence with the region's wildlife and their natural habitats.

2022 ANNUAL LUNCHEON

On Wednesday, February 16, 2022, Houston Wilderness celebrated the 10 distinct ecoregions in our 15-county area - highlighting the critical roles that they play in making the Gulf-Houston Region an ecological wonderland while also providing much-needed ecosystem services to residents, visitors and wildlife.

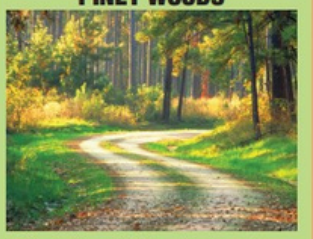
Over 40 elected officials participated in the interactive program as luncheon attendees took a "Walk Through the Ecoregions" - including multiple county judges, city mayors, council members and other elected leaders from around the region.

BIG THICKET



The original Big Thicket of Texas covered between 2 million and 3 million acres in what is now mapped as the Piney Woods and Coastal Marsh ecoregions of the state. It is a transition zone where southeastern swamps, eastern deciduous forests, central plains, pine savannas, and dry sandhills meet. This diverse habitat allows an impressive array of species to coexist, including approximately 1,320 species of trees, shrubs, vines, and grasses (vascular plants), 60 mammal species, 86 reptile & amphibian species, 34 species of freshwater mussels, nearly 1,800 invertebrate species just in the Lepidoptera Family (butterflies, moths, skippers), 97 fish species, at least 300 bird species, and 660 species of mushrooms.

PINEY WOODS

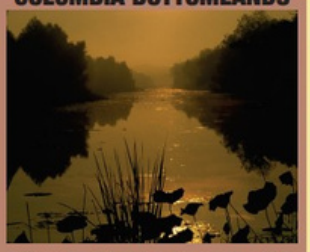


The Piney Woods ecoregion is the southwestern-most remnant of what was once a huge contiguous pine forest that ran from East Texas through the Mississippi lowland forests. The dominant plants include Loblolly Pine, Shortleaf Pine, Longleaf Pine, Bluejack Oak and mixed hardwoods. The forest gets nourishment from fallen trees that decompose – the fungi provide food for spiders and insects, which are the main food source for birds in the area. In the understory of the forest, Blackberries, Dewberries, Wild Plums and Persimmons provide food for wildlife. In addition to the benefits the Piney Woods provide to wildlife, this ecoregion serves as Houston's top recreational area – campers, anglers, horseback riders and hikers all enjoy this diverse forest.

TRINITY BOTTOMLANDS

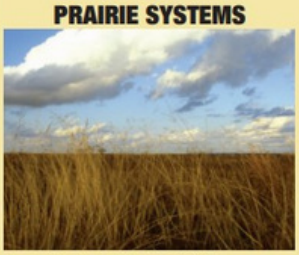
The Trinity Bottomlands lie along the Trinity River and the lower reaches of major tributaries. Originating north of Dallas, the Trinity River flows along the Texas landscape reaching Galveston Bay 550 river miles later. Many reservoirs in the Trinity River Basin have greatly reduced the historical magnitude and frequency of floods in the Bottomlands. Home to River Otters, Songbirds and Alligators, the low-lying Trinity Bottomlands support a wealth of plant and animal life. Here among the Tupelo and Cypress trees, half of all the bird species identified in the United States can be found throughout the year. Sustaining its own rich biodiversity while providing fuel for the equally rich Galveston Bay system, the Trinity Bottomlands ecoregion helps make the Houston Wilderness one of the nation's unique ecological treasures.

COLUMBIA BOTTOMLANDS



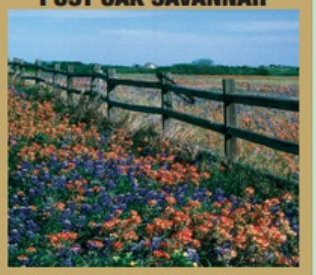
The Columbia Bottomlands ecoregion is an important stopover habitat for numerous species of migrating birds. Common residents of the Columbia Bottomlands include Swamp Rabbits, Bull Frogs, Red-Eared Slider Turtles, the Black-Bellied Whistling Duck and White-Tailed Deer. Many species of trees call the Columbia Bottomlands home, including Green Ash, Hackberry, Honey Locust, Pignut, Hickory, Cherry Laurel, American Beech, Magnolia and Pecan Trees. Brazos Bend State Park, one of the most heavily used state parks in the region, boasts over 5,000 acres and is located on one of the bottomland's coastal prairies, the floodplains of the Brazoria River. Hudson Woods, another beautiful and accessible area of the Columbia Bottomlands, is open to the public year-round, offering an oxbow lake and a two-mile walking trail for recreation.

PRAIRIE SYSTEMS



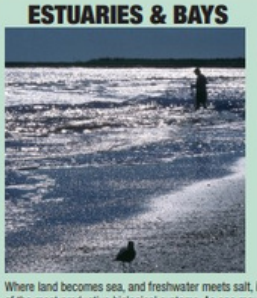
The prairie lands provide important habitat for many migratory species, including geese, waterfowl and songbirds. It is also the final battleground for the struggling Attwater's Prairie Chicken, whose numbers today is less than 60. Once lost, the prairie will never be replaced. And the loss of prairie lands, coastal prairie more broadly – threatens the well-being of both people and wildlife in the Houston region. The prairie filters stormwater run-off, sequesters carbon, and is one of the last strongholds for wildlife in the region. Last, but certainly not least, the protection and restoration of these lands plays an important role in regional flood control by absorbing and holding floodwaters from downstream Houston. When restored coastal prairie holds water, it slows water traveling downstream.

POST OAK SAVANNAH



The Post Oak Savannah is a transition zone between the Blackland Prairies to the west and the Piney Woods to the east. This ecosystem is part of a historic oak belt, which travels south from Canada towards Central America. The Post Oak Savannah is dominated by native bunch grasses and forbs with scattered Post Oaks and some Plateau Live Oak, Black Hickory, and Blackjack Oak. Birders search for nesting Pileated Woodpeckers, as well as many other species such as Barred Owls, Warblers, Yellow-Billed Cuckoos, White-Eyed Vireos, Mississippi Kites and Northern Parulas. Visitors are likely to see White-Tailed Deer, Raccoons, Opossums, Armadillos, Rabbits and Squirrels.

ESTUARIES & BAYS

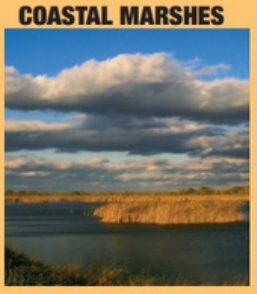


Where land becomes sea, and freshwater meets salt, is one of the most productive biological systems. As one moves toward the coast, marshes, bayous and rivers give way to flats and open water. The mixing of these waters, salt and fresh, is what sustains many varieties of Finfish, Oyster reefs, and other shellfish, including Shrimp and Blue Crabs. As transition zones between land and ocean, barrier islands support a mosaic of coastal habitats, including beaches, prairies and wetlands. Beaches protect the mainland from storms, while the lagoons, bay and salt marshes provide crucial habitat for the life cycles of many ocean species. Anglers enjoy beach or surf fishing for Spotted Seatrout, Sandtrout, Redfish, Black Drum, Croaker and Flounder.

BAYOU WILDERNESS

Wild and winding ribbons of water weave their way across landscapes, through neighborhoods, passing skyscrapers. These bayous within our communities not only provide opportunities to enjoy the outdoors, but they are also habitat to many species. Our wild neighbors – birds, bats, butterflies, bees and multiple wildlife species – eat tons of mosquitoes and other noxious insects. They pollinate flowers and crops and help maintain the health of our parks and communities. The habitat these various species call home helps mitigate damage from floods and recharge underground water supplies. And, it provides humans a respite from the concrete jungle. Enjoy the hiking and canoe trails of the Bayou Wilderness: they are an excellent way to meet some of your wild neighbors!

COASTAL MARSHES



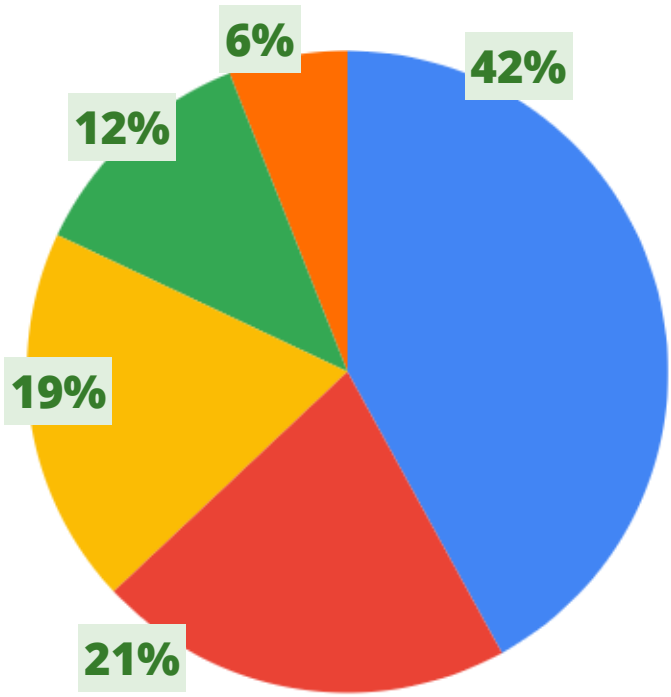
Beneath layers of Marsh Hay, hidden in strands of Olney Bulrush, and drifting among American Lotus, lies a layer of life, often unseen but exciting to the chance witness, and vital to residents, both human and wild. In this transitional zone, upland prairies give way to freshwater sloughs that wind their way through salt marshes ending on the shores of the Gulf of Mexico's many bays. In addition, coastal marshes serve as nurseries for fish and shellfish. The tiny animals that thrive in the mud and muck provide a feast for many bird and aquatic species. Marshes also serve as buffer zones that help slow and absorb storm surges that might otherwise do greater damage farther inland.

GULF OF MEXICO

Surrounded by the United States, Mexico and Cuba, the Gulf of Mexico is 600,000 square miles of warm, sunlit waters and a steady food supply for an array of fish, wildlife and humans alike. Approximately two-thirds of the continental United States drains into the Gulf, including states as far away as Montana and New York. Wetlands of the Gulf comprise nearly 50 percent of the nation's total coastal wetlands. There are important and unique coral reef ecosystems, such as the Flower Garden Banks National Marine Sanctuary. From the deep oceanic systems to the shores of the Bolivar Peninsula, the Gulf of Mexico is a vast and productive system that sustains us as individuals and communities, both above and below its clear blue waters.

FISCAL YEAR 2021 - 2022

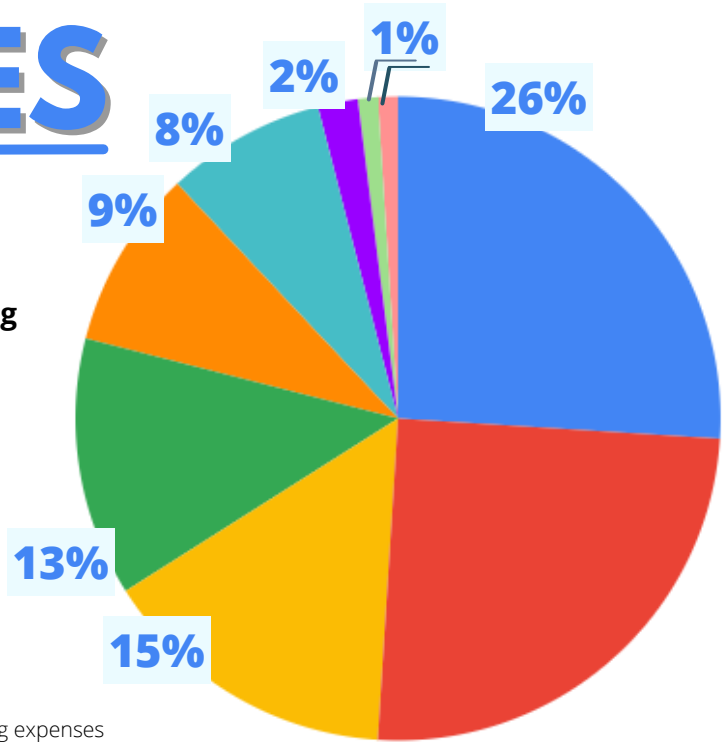
REVENUE



- Corporate Contributions
- Luncheon and other Special Events, net
- Collaborative Grant Organizing
- Foundation Contributions
- Other

EXPENSES

- Houston Ship Channel TREES Program*
- Regional Conservation Plan
- Other Collaborative Grant Organizing
- Fundraising
- Management and General
- Great Green Quest
- Access and Advocacy
- Texas Monarch Flyway Strategy*
- Eco-System Services



*Includes costs for Collaborative Grant Organizing expenses

Thank you to our 2021-2022 Donors

Houston Wilderness gratefully acknowledges the generous support from the following foundations, corporations, and individual donors

$50,000 +

Shell Oil Company
Conoco Phillips

$25,000 +

Beth Robertson Family Fund
Harris County Flood Control District

$10,000 +

Albert and Margaret Alkek Foundation
Pierce Runnells Foundation
Resource Environmental Solutions (RES)
Clean Water Person
Gin City Mitigation Bank
George and Mary Josephine Hamman Foundation
Huffington Foundation
John P. McGovern Foundation
Jim and Susan Boone

$5,000 +

Ann Lents and J. David Heaney
Bank of Texas
H-E-B
Albert & Ethel Herzstein Foundation
Allen Boone Humphries Robinson LLP
Clayton Erikson
Helen and Joe B. Allen
Katherine & Chris Amandes
LJA Engineering & Surveying, Inc.
Millis Development & Construction, LLC
Friendswood Development
Kelley Drye & Warren LLP
Newland
NRG
Richard W. Weekley Family Fund
The Howard Hughes Corporation
The Tapeats Fund
Robert W. Baird & Co.

$3,000 +

Carol and Dan Price
Costello, Inc.
EHRA Engineering
Si Environmental
Johnson Development Corp.
Friendswood Development Company
Newland
Clark Condon
Kirksey Architecture
Sienna by Johnson Development
LJA Engineering
Raba Kistner, Inc.
Schwartz, Page & Harding, L.L.P.
RES
SWA group

$1,000 +

SK Foundation
Knobloch Family Foundation
Regina Rogers
Bob Graham
Evan Hofmann
BGE, Inc.
Inframark LLC
Julie Peak
Talley Landscape Architects, Inc.
Albert and Ethel Herzstein Foundation
Black United Fund of Texas
NBG Constructors
TC Energy

$500 +

D/G Studios Inc
Joy Horak-Brown
Russell Poppe
Susan and Glenn Buckley
Amazon Smile
Apache Corporation
Benevity Community Impact Fund
Walmart
Bette and Ralph Thomas
Chavonne Slovak
Cheryl Mergo
Lina Knowles
Ramsay Elder
Rex Lindberg
The Ottinger Donor Advised Fund
Cece and Mack Fowler
Claire Caudill
ALJ Lindsey
Christopher Cortinas
Lars Zetterstrom
Steve Gilbreath

2022 Board of Directors

Officers

Matt Stahman *Board Chair*
Graciela Gilardoni *Vice Chair*
Bill Prout *Secretary/Treasurer*
Deborah January-Bevers *President and CEO*
Chavonne Slovak *GGQ/Passport Committee Chair*
Jason Fuller *Board Affairs Committee Chair*
Chris Amandes *Development Committee Chair*

Board of Directors

Christopher Amandes
Keiji Asakura
Leslie Berardo
Jim Boone
Tricia Brasseaux
Dr. Sam Brody
Glenn Buckley
Collin Cox
Ed Emmett
Bill Evans
Jason Fuller
Graciela Gilardoni
Phillip Goodwin
Evan Hofmann
Dr. Loren Hopkins
Deborah January-Bevers
Cheryl Mergo
Sydney Murphy
Russ Poppe
Dr. Daniel Price
Bill Prout
Beth Robertson
Mike Rome
Jennifer Ronk
Chavonne Slovak
Matt Stahman
Allan Traicoff
Lars N. Zetterstrom

Advisory Board

Dr. Anna Armitage
Scott Ball
Fred Bauhof
Julie Ann Brown
Sanford Criner
John Daugherty, Jr.
Sid Evans
Dr. Cullen Geiselman
Bill Jackson
Andy Jones, Texas Director
Elizabeth Winston Jones
John Kirksey, Sr.
Stephen L. Klineberg
Ann Lents
Mary Anne Ottinger
Ben Patton
Ramona Ridge
Laurie Roddy
Andrew Sansom
Carter Smith
Andrew Stepanian
Merrie Talley
Richard Torres

HOUSTON WILDERNESS STAFF

Deborah January-Bevers, *President & CEO*
Rachel Kestenbaum, *Director of Biological Services*
Minyue Hu, *Director of Geotechnical & Environmental Sciences*
Karla Gorostieta, *Associate Director of HW Programming*
Ana Tapia, *Senior Director of Environmental Programs*
Sabine Meyer-Hill, *Associate Director of Environmental Programs*
Kim Philippi, *HW CGO & Development Director*
Camilla Smith, *HW CGO & Development Director*
Jazmin Navarro, *Environmental Programs Intern*
Dylan Kipp, *Environmental Programs Intern*

HOUSTON WILDERNESS

Facilitating opportunities to preserve 10 ecoregions by convening, problem-solving and educating

STAY CONNECTED

@houwilderness

www.houstonwilderness.org

2022 Web Analytics

Unique Visitors: 22,319

Page Views: 22,469