Arboretum San Antonio

Branching Generations

2025 Master Plan

May, 2025

ARBORETUM
SAN ANTONIO

May, 2025

Dear Friends and Supporters,

It is with immense pride and gratitude that we share the unveiling of the Master Plan for Arboretum San Antonio—a vision shaped by our community, for our community.

Over the past year, we've engaged with residents, stakeholders, and national experts and local consultants and partners, to craft a plan that reflects the rich cultural tapestry and natural beauty of South Texas. Our 200-acre site, once the Republic Golf Course, is set to transform into a vibrant, accessible green space featuring heritage oak trees, Salado Creek, and connections to the city's extensive trail system.

The final master plan, ***Branching Generations***, combines ideas and suggestions from over 18,000 San Antonians guided by the Arboretum's commitment to Sustainable Stewardship, Culture, Engaged Partnership, Community Inclusivity, and Continuous Learning.

Our master plan isn't just a design; it is a commitment to inclusivity, education, and sustainability. It is our roadmap to ensure the Arboretum grows with the land and the community. Our goal is to create a sanctuary that honors the legacy of our land and serves as a beacon for future generations.

As we move forward, your continued support and engagement are vital. Together, we can cultivate a space where nature, heritage and community thrive in harmony.

Warm regards,

Adriana Quiñones
President & CEO
Arboretum San Antonio

ARBORETUM SAN ANTONIO

Adriana Quiñones, CEO

Thomas Corser, Founding CEO

Telesforo J. Pinales. Jr., Project Manager

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- Robb S. Garcia, Filmmaker, Photographer

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Local Firm *Women-owned Business Enterprise* *Minority-owned Business Enterprise* *Small Business Enterprise*

FOCUS GROUP MEMBERS

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SPECIAL THANKS TO

BEXAR COUNTY
Judge Peter Sakai
David Smith
Ken McGlammery
Tony Canez
County Commisioners
Tommy Calvert
Rebeca Clay-Flores
Grant Moody
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SAN ANTONIO RIVER AUTHORITY
Derek Boese
Kathleen Rubin

SAN ANTONIO PARKS & RECREATION
Brandon Ross
Bill Pennell
Sofia Martino

BROOKS

VIA METROPOLITAN TRANSIT
Manjiri Akalkotkar
Sandip Sen

PHOTOGRAPHY
Photos incorporated in this master plan are works of passionate Arboretum supporters: Oscar Williams and Liz Garza Williams, Photographing the USA and master plan team member, Robb S. Garcia

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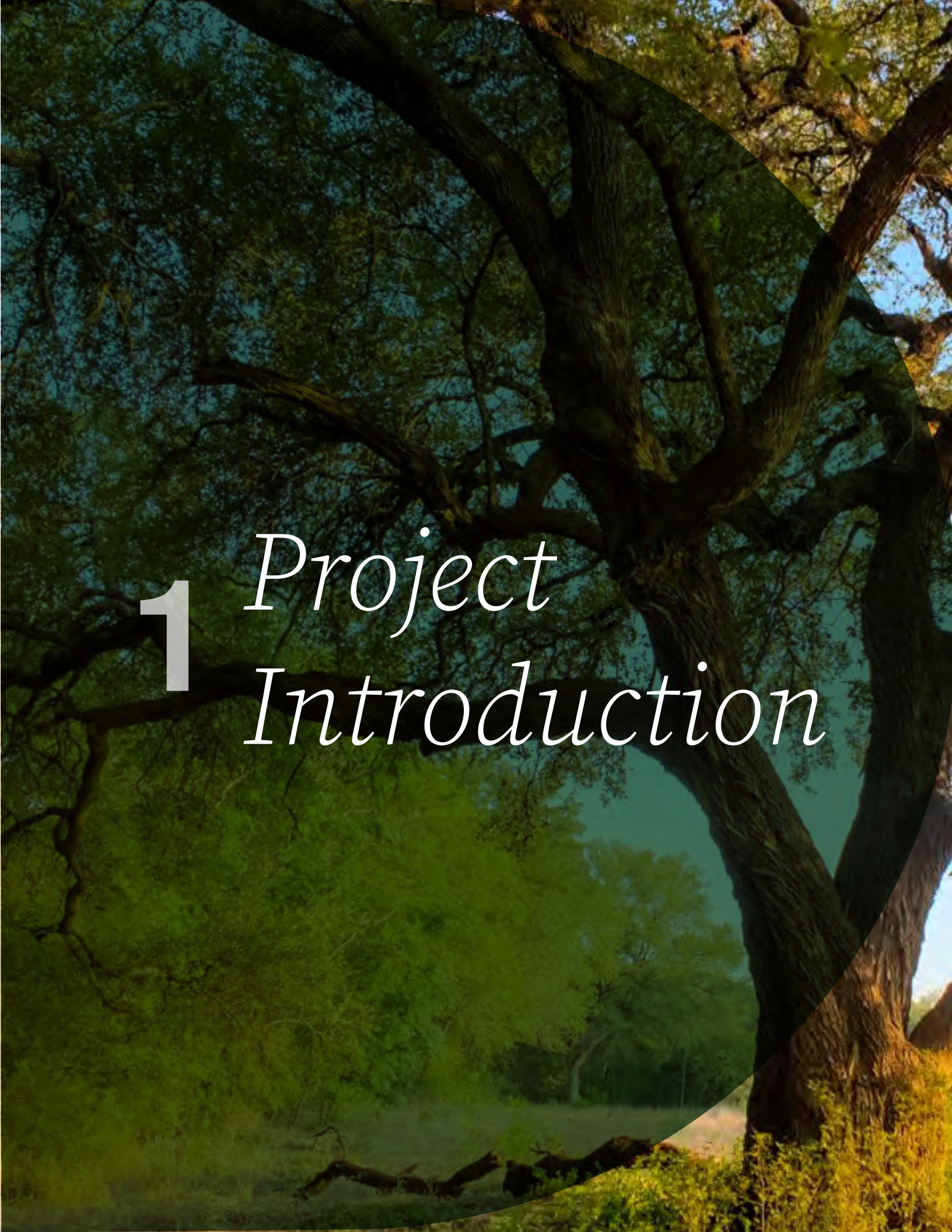


1 *Project Introduction*

The Vision

An Idea is Born

PLANTING THE SEED

In 2021, Founder Henry Cisneros, wrote an Op-Ed in the San Antonio Report making the case for an Arboretum on the South Side of San Antonio. As Henry describes it, “An arboretum is a special category of park featuring the trees that grow in a region. Trees are spaced along paths or encircle open meadows in ways that invite admiration, study, and repose”. One year later, he assembled a highly engaged board of directors and an informed set of subject matter expert advisors to guide our vision of a world-class Arboretum for San Antonio.

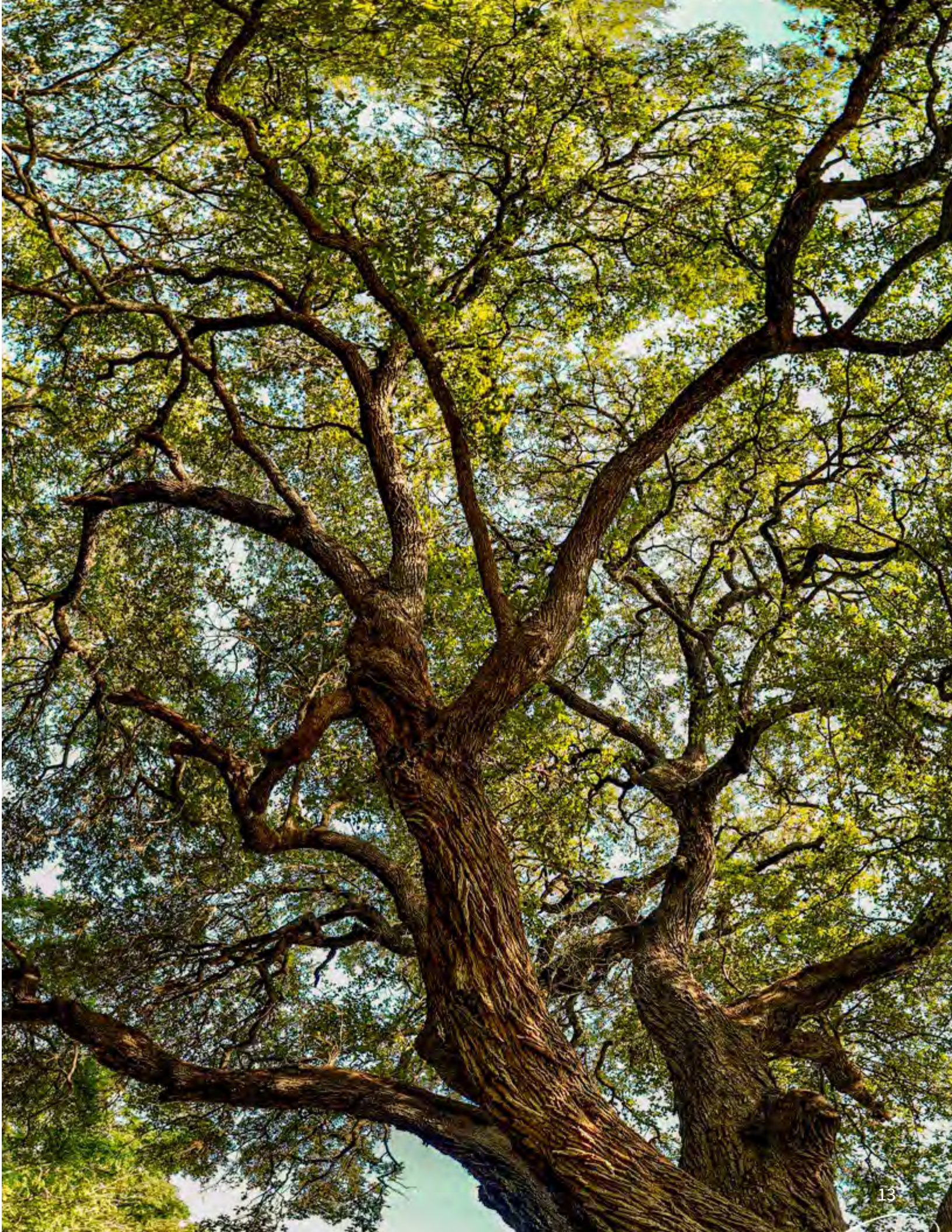
In the fall of 2023, the team embarked on a meticulous master planning firm selection process. We issued a Request for Qualification, followed by a Request for Proposal. After careful consideration of 18 highly qualified proposals, the Arboretum San Antonio Board of Directors chose [redacted] along with a robust local team of consultants.

The year-long master planning process has envisioned an arboretum that truly reflects the region’s rich and diverse heritage and culture.

MISSION

Arboretum San Antonio provides immersive nature-based experiences that are rooted in San Antonio’s vibrant culture and indigenous legacies. We offer welcoming places for retreat to support the well-being of people and the natural world, provide accessible programming that empowers and delights individuals and communities, and research critical connections between trees and the changing climate of South Texas.

Trees branching generations, *inspiring a deep love of nature, Arboretum San Antonio welcomes all to connect with our cultural heritage and collectively build an environmentally restorative future.*



Arboretum Timeline

2020

Republic Golf Course Closes due to financial struggles

2021

Henry Cisneros writes Op-ed for an Arboretum on the southside of San Antonio.

Arboretum San Antonio (ASA) formal vision is made public.

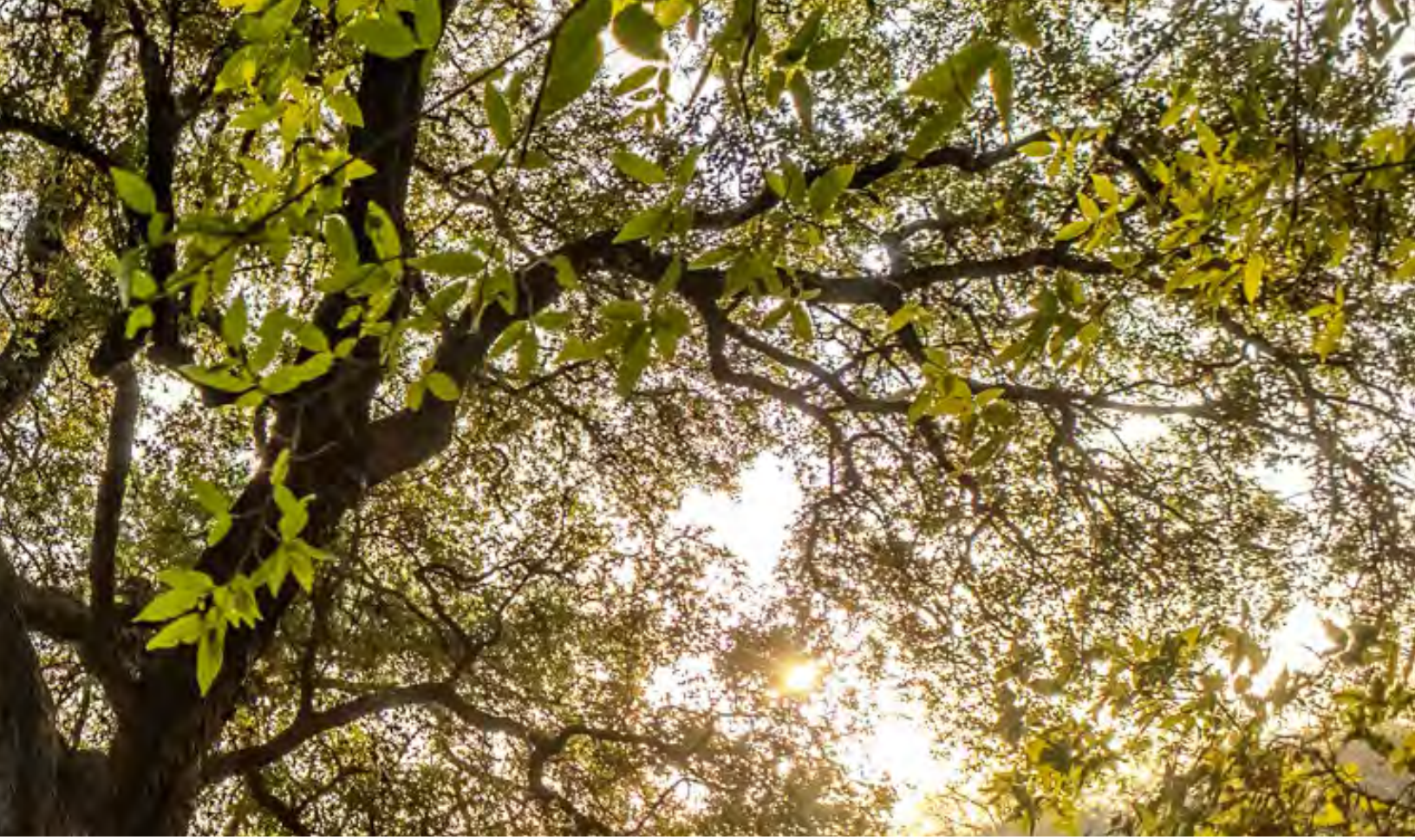
2022

ASA Board and Board of Advisors is formed.

The former Republic Golf Course site is selected for ASA.

Brooks Development donates $1M for land investment.

ASA earns nonprofit status.



2023

City of San Antonio makes $400K gift for a tree nursery on site.

Bexar county invests $7.3M in the project.

Former Republic Golf Course land purchased.

Master Planning Request for Qualifications launched.

2024

Three firms shortlisted to submit Master Plan Proposals.

[redacted] *is selected for Master Planning.*

Twelve-month Master Planning Process.

2025

Master Plan complete.

Arboretum

What and Why?

DEFINING AN ARBORETUM

An arboretum is a public garden specializing in trees. As an outdoor living museum, arboreta include a curated collection of species that are selected, planted, and stewarded to advance the knowledge and appreciation of trees within the ecosystem. Arboreta across the globe practice scientific research, promote conservation, and engage in public outreach and education to protect and preserve trees and other woody plants.

Arboreta are green spaces that provide similar community benefits as parks, but have a targeted ecological mission specifically linked to a collection of trees and plants. Arboreta are focused on the research, education, and preservation of trees with complementary programming. Proportionate to their size, arboreta most often have larger green spaces than parks and provide more ecosystem services to their surrounding community.

Why an Arboretum?

SAN ANTONIO LEGACY

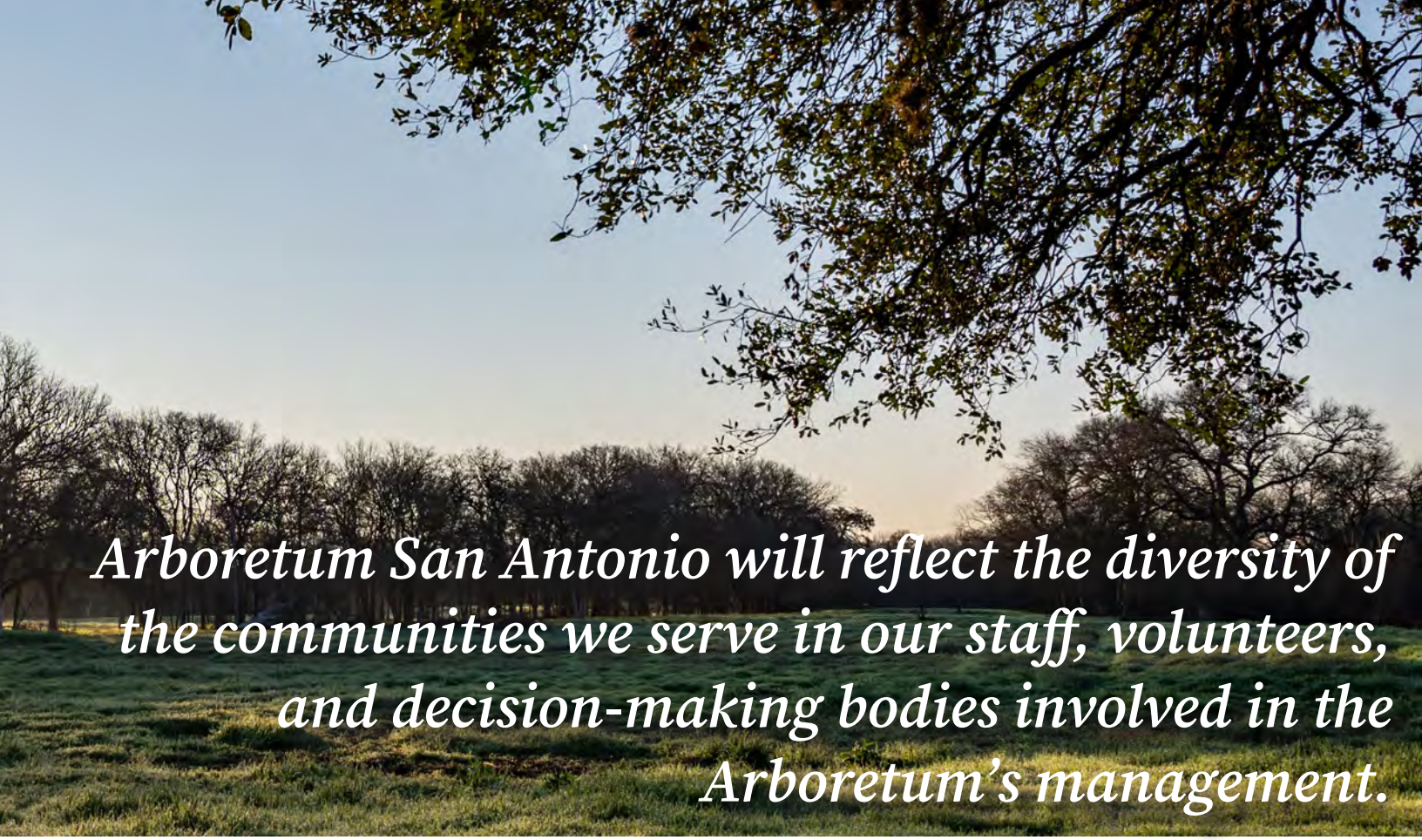
All organic species thrive under ideal conditions, just like the first pecan, elm, and oak trees that flourished and beautified our city centuries ago. Arboretum San Antonio celebrates this rich botanical heritage and, as a living museum of trees, will inspire a green future for everyone who calls our city home by reflecting on the stories of our deep cultural heritage that can be told through trees.

RESEARCH & EDUCATION

The Arboretum will be a valuable educational resource for San Antonio and beyond, offering hands-on opportunities to view and study a wide variety of species native to our region; gain greater understanding of the relationships between the trees, animals, and resources that make up our ecosystem.

WELLNESS

Arboretum San Antonio offers tranquil and beautiful settings for exercise, recreation and relaxation. Current research supports the link between time spent in nature and increased happiness, feelings of well-being, and positive social interactions. Evidence also suggests that walking in natural settings can enhance mental and physical well-being and motivate a sense of purpose and meaning, helping create a more positive overall quality of life.



Arboretum San Antonio will reflect the diversity of the communities we serve in our staff, volunteers, and decision-making bodies involved in the Arboretum's management.

SUSTAINABILITY

Trees absorb carbon emissions and filter air pollutants, which purify our breathing air. As San Antonio continues its rapid growth in population and development, it is important that we balance our numerous construction projects with green spaces to maintain a healthy environment in which all residents can live and thrive.

PUBLIC ART

Natural beauty from various tree species provides acres of recreational outdoor spaces for everyone to enjoy. The expansive 188 acres with a variety of different landscapes will afford spectacular venue for large public art.

EQUITY BALANCE

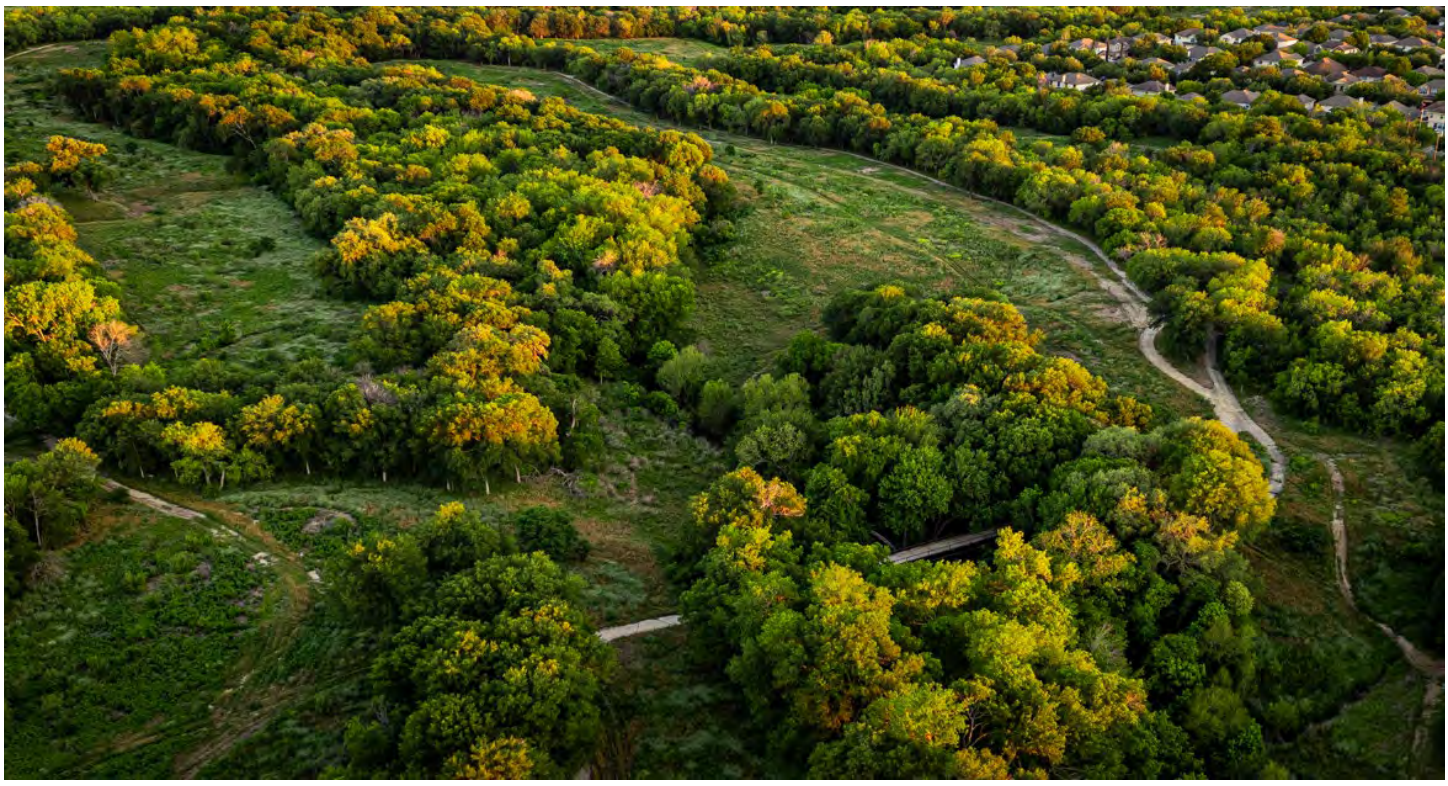
Arboretum San Antonio will strive to ensure equitable access for all members of the community. Locating an expansive natural area in the Southeast quadrant of San Antonio and one dedicated to increasing our tree canopy citywide will provide an appropriate investment balance as well as a green equity balance throughout the city.

The Site

Overview

A STUNNING SITE

Today's open fairways dotted by trees and gently rolling topography are an emblematic reminder that San Antonio lies within the unique Texas Blackland Prairie ecoregion, known for its deep fertile soils and historic sea of tall grasses and wildflowers. To the north, forests would have densified in the Crosstimbers. To the Northwest, Edwards's Plateau transforms this matrix of savannas and forests into a plant community as unique as the region's geology. No doubt you can see influences and species from all of these ecoregions represented at ASA. Pre-European settlement, the Arboretum site would appear similarly to today with open grasslands, open-grown oaks, thickets of mesquite, and floodplain woodland adjacent to Salado Creek. Evidence of how the land was shaped, grazed, and farmed is recorded in the trees. Many of the oldest and iconic trees have low branches with a wide-spreading crown, indicating that the landscape was once more open. Changes in tree age classes reveal which areas were logged and farmed at different periods. Remnant Blackland Prairie grassland species can still be found along fairways and forest margins, indicating that a native seed bank can still be found. Arboretum San Antonio has the opportunity to uncover this native biodiversity to reveal the site's ecological importance to all San Antonians.



ARBORETUM SAN ANTONIO


SE Military Drive
CITY OF SAN ANTONIO PARCEL
REPUBLIC OAKS
Emory Oaks Drive
WOODBRIDGE AT MONTE VIEJO
HWY 410
Legend
Property Line
Old Golf Cart Path
Salado Creek
Ephermal Creek
Existing Tree Drip Line
Existing Pond
Flood Plain
N
200 400 800 1,200


“Restoration of Sou
Texas wildlife is
desperately needed
- Community Member

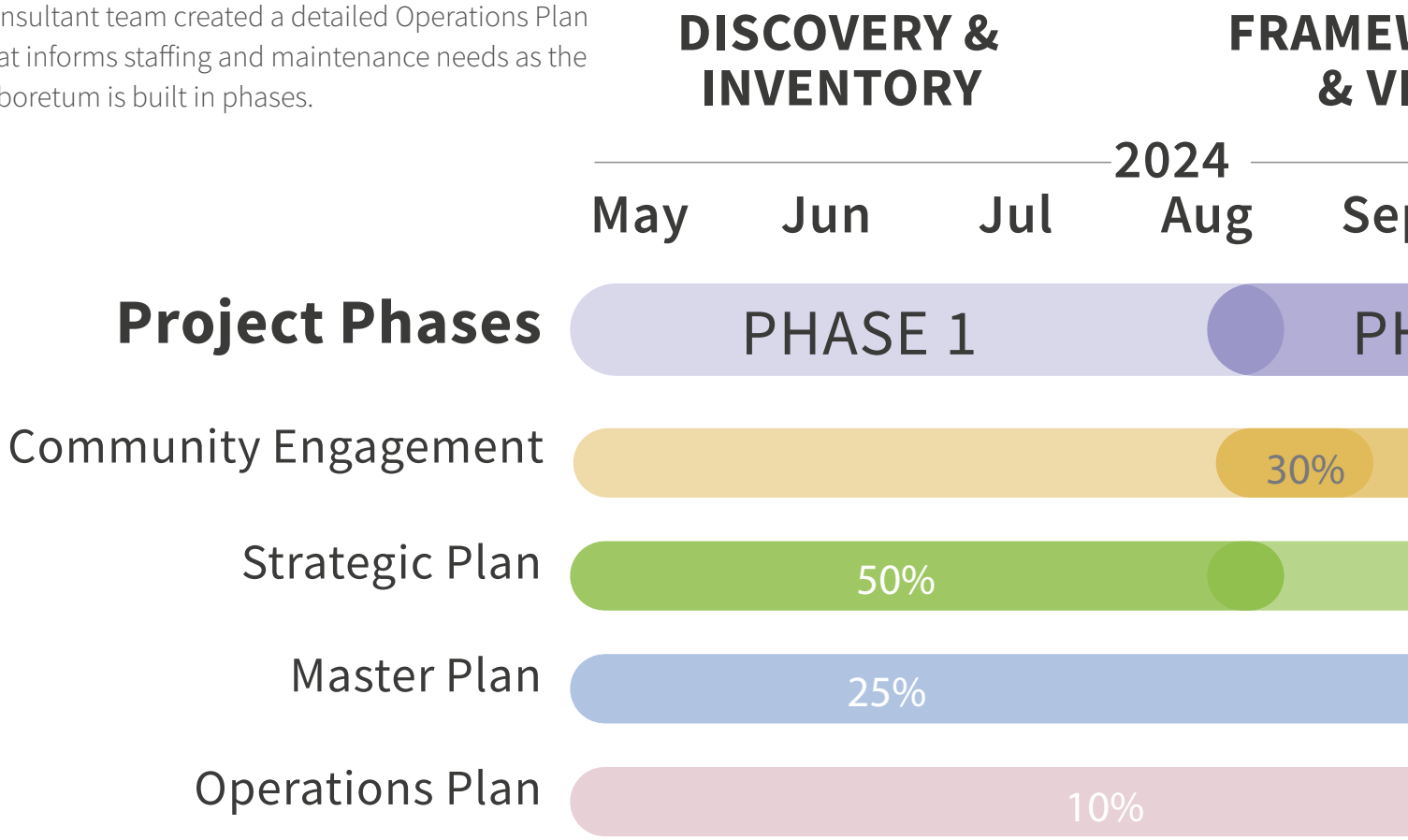

uth
.”

2 *Process & Engagement*

Project Phases

Multi-phased Approach

The master plan process involved a four-phased approach: Discovery and Inventory, Framework Plans and Visioning, Refined Plans, and finally the Action Plan. Throughout the process, the consultant team engaged the community through multiple avenues of outreach. The Strategic Plan was developed in congruence with the master plan. Lastly, the consultant team created a detailed Operations Plan that informs staffing and maintenance needs as the Arboretum is built in phases.

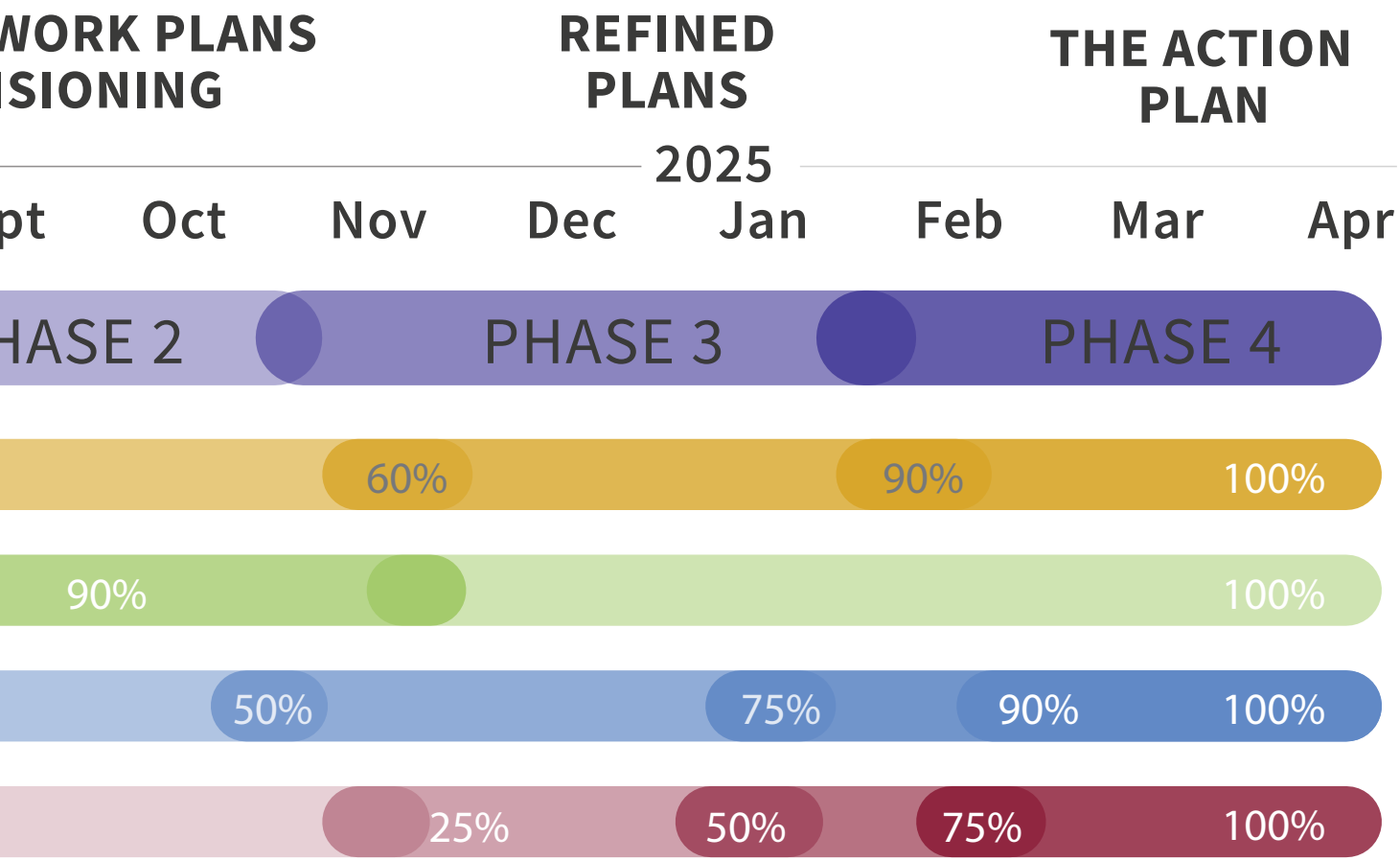


PHASE 1

The Discovery and Inventory phase analyzed the site through four distinct lenses: The Land, The Water, The Culture, and The Environment. Findings informed the site's opportunities and constraints, which created a framework for the three initial design concepts. The phase culminated in Community Meeting 1, where community members engaged with the site research and shared their visions for the site.

PHASE 2

The Framework Plans and Visioning Phase involved developing three distinct design concepts for the site. The concepts were informed by site findings from Phase 1 and by community engagement results. The phase culminated in Community Meeting 2, where community members voted on their favorite parts of each concept.



PHASE 3

The Refined Plans phase involved reviewing and distilling the community feedback on the three concepts, identifying themes, and pulling the strongest ideas from the design concepts while test-fitting for feasibility. This iterative process, informed by Focus Group and ASA Board feedback, resulted in a detailed plan.

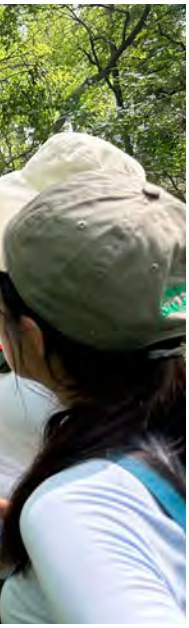
PHASE 4

The final phase of the master plan process focused on phasing and implementation to bring the master plan to life. The results include four distinct build out phases along with an interim Phase 0 to keep the momentum created by the master plan moving forward.

Process

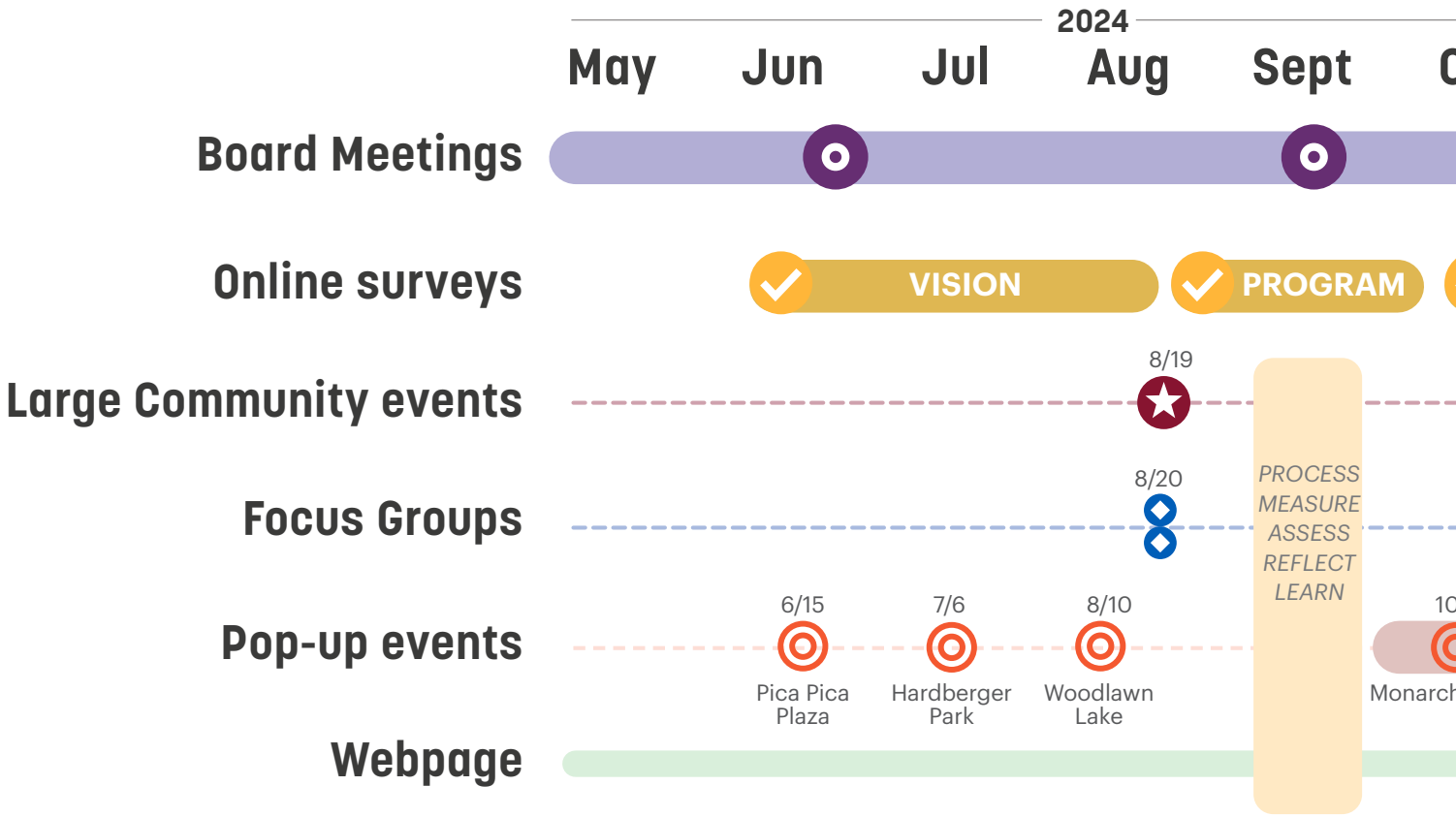
Discovery and Design

Phase 1 kicked off with multiple days of fieldwork on site where the design team collected soil, tagged trees, identified vegetation, measured sound levels, studied the creek geomorphology, and more. These findings guided and informed the design phases.



Engagement Schedule

A Layered Approach

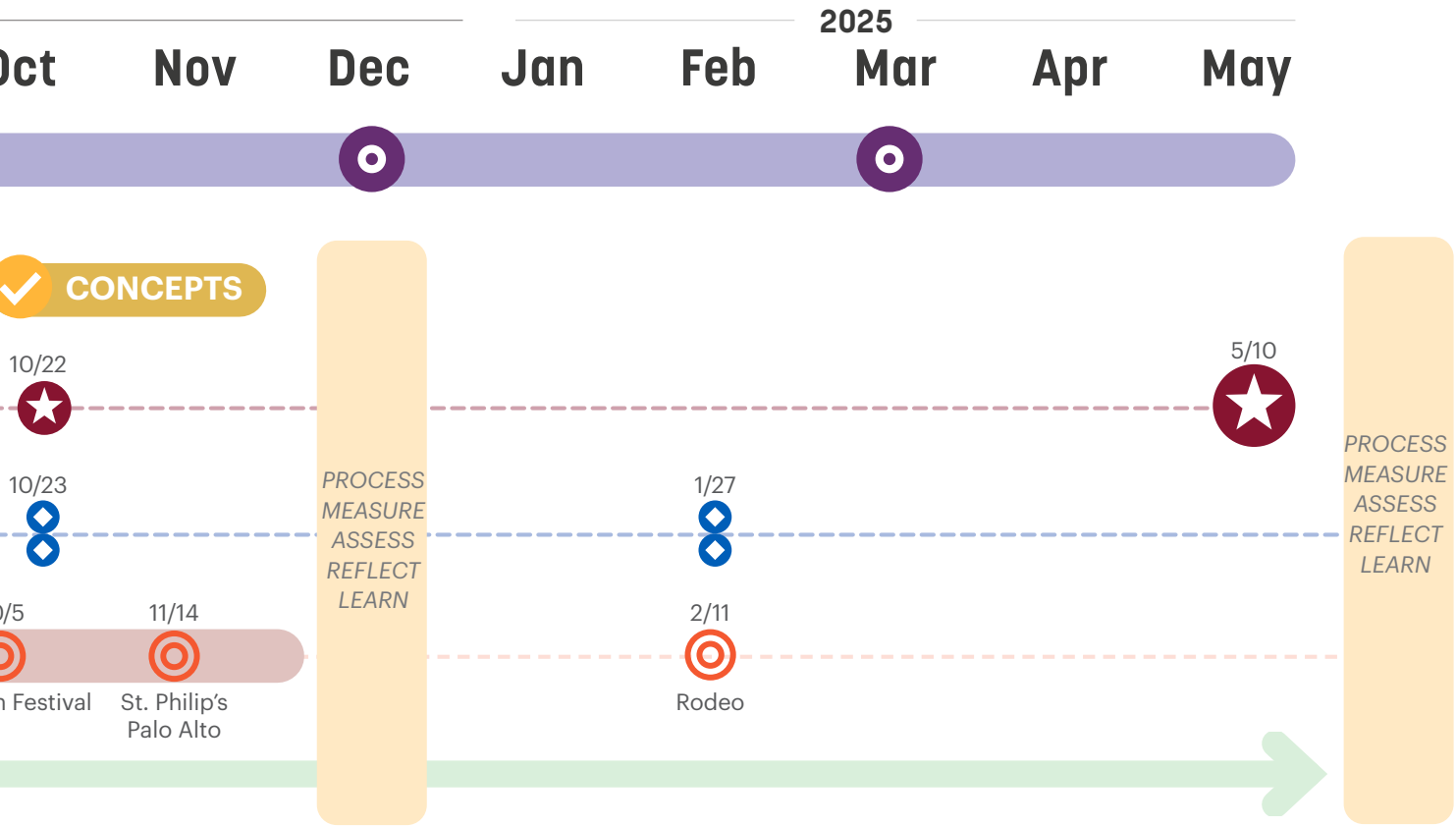


LARGE COMMUNITY EVENTS

The process included three large-scale community events. The first two drew about 150 people and were held in a community library and community center on the Southside of the city. Attendees shared their visions and preferences for the site design. The final community event was an on-site celebration of the master plan process where the final vision for the site was revealed.

ONLINE SURVEYS

Three Online surveys were offered in both English and Spanish throughout the process. The initial survey gathered community aspirations for the site. The second survey mirrored the in-person feedback activities offered at Community Event 1 and focused on programmatic opportunities on-site. The third survey mirrored the in-person feedback activities offered at Community Event 2, which included voting on the three concepts, listing favorite elements of each concept, and selecting images from a visual preference survey to inform the look and feel of the final design.



POPUP EVENTS

Six pop-up events were held throughout the city to reach community members in places where folks were already gathering. Venues ranged from the San Antonio Rodeo to the popular marketplace Pica Pica Plaza. Popups shared information about what an arboretum is and what the master plan process is. The consultant team also gathered in-person feedback and shared the surveys at these events.

FOCUS GROUPS

Focus groups were composed of community leaders whose work focuses on the natural environment or community culture within San Antonio. These individuals provided detailed feedback on the design and the community's needs. For the first two meeting rounds, the focus groups were split into their respective focus areas. At the final focus group meeting, the group members were all gathered and not divided by area of expertise.

Community Engagement

By the Numbers

The extensive number of community engagement methods allowed the consultant team to reach over 18,000 people throughout the master plan process. Voices both young and old were important in shaping this space that will serve the community for generations to come.

ROOTED IN COMMUNITY

5 *Pop Ups*

2 *Community Events*

6 *Focus Group Meetings*

3 *Online Surveys*

80+ *Site Tours*

18,000 *People Reached*


ASA Today!
¡ASA Hoy!


Takeaways

The Concepts

Shaping the Arboretum

THREE DISTINCT CONCEPTS

Informed by the Discovery and Inventory Phase, the team created three unique design concepts for the future of the arboretum. The first concept, Community Crossroads, highlighted community gathering spaces and hubs. The second concept, Wild San Antonio, focused on creating a deep nature escape experience for site visitors. The third concept, The Testing Grounds, highlighted opportunities for research on-site and partnership with academic institutions. The goal of presenting these three concepts to the community was to pull the best elements of each plan to form the final concept.

Community Crossroads

A place of convening and connecting people to each other and to nature

Wild San Antonio

Dedicated to ecological restoration, education, and exploring nature

The Testing Grounds

A landscape laboratory serving the community for education and research

COMMUNITY CROSSROADS

Community Crossroads organizes the Arboretum around four program hubs and creates a series of dynamic path loops that interconnect these hubs with a larger diversity of gardens and natural areas.

OUTDOOR AMPHITHEATER
El Anfiteatro al Aire Libre

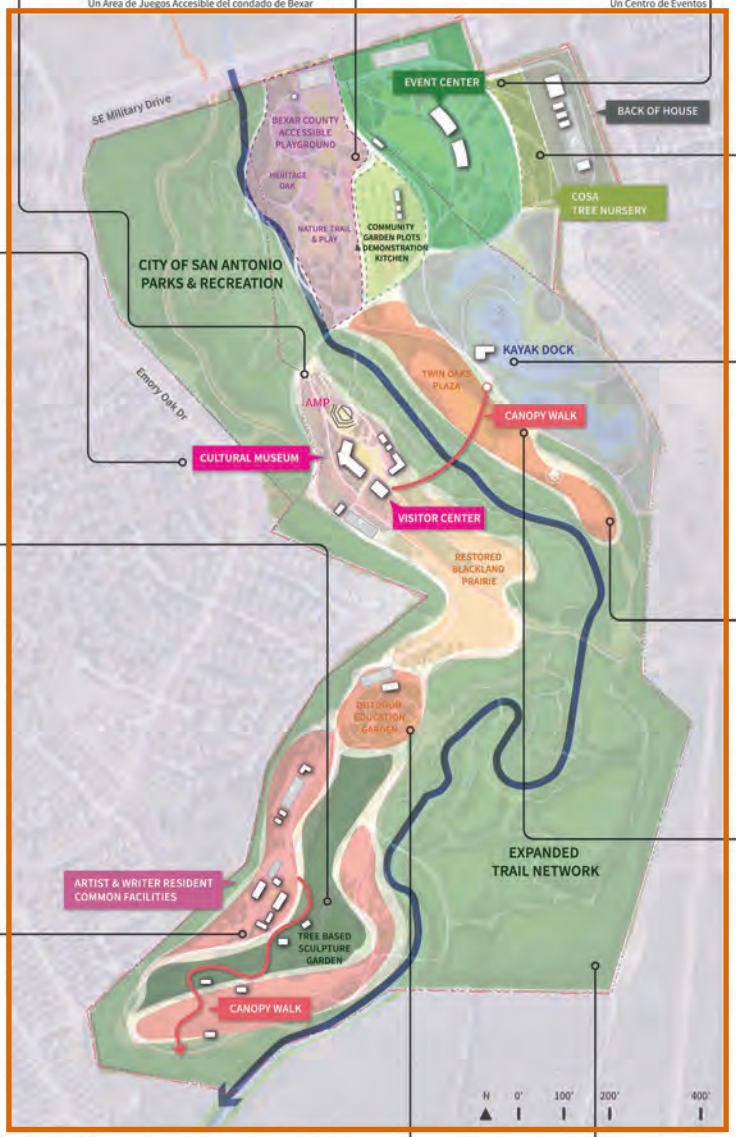
BEXAR COUNTY ACCESSIBLE PLAYGROUND
Un Área de Juegos Accesible del condado de Bexar

EVENT CENTER
Un Centro de Eventos

PARTNER MUSEUM
Asociación con un Museo Cultural

SCULPTURE GARDEN
Un Jardín de Esculturas

ARTIST AND WRITER STUDIOS
Unos Estudios para Artistas y Escritores



CITY OF SAN ANTONIO TREE NURSERY
Un Vivero de árboles de la ciudad de San Antonio

KAYAK DOCK
Un Muelle para Kayaks

RESTORED BLACKLAND PRAIRIE
Una Pradera de Blackland restaurada

CANOPY WALK
Un Paseo entre las Copas de los Árboles

OUTDOOR EDUCATION CENTER
Un Centro para la Educación al Aire Libre

HIKE & BIKE
Unos Senderos para Senderismo y Bicicleta

WILD SAN ANTONIO

Former fairways have been transformed into a varied network of restored landscapes where key program areas are defined with natural spaces to enrich the visitor experience.

RETAIL NATIVE PLANT NURSERY
Un Vivero de Plantas Nativas Para Venta

FOOD PRODUCTION LANDSCAPE
Un Paisaje de Producción de Alimentos

RESTAURANT & ECO-HOTEL
Un Restaurante y Eco-Hotel

SOUTH TEXAS RESTORATION FOREST
Un Bosque de Restauración

SALADO CREEK CANOPY WALK
Un Paseo Entre las Copas de los Árboles en Salado Creek

RESTORATION DEMO FIELDS
Los Campos de Demostración de Restauración

NATURE & VISITOR CENTER
Un Centro de Naturaleza y Visitantes

EVENT CENTER
Un Centro de Eventos

BOARD WALK & WETLAND DEMONSTRATION
Un Paseo Elevado y Demostración de Humedales

RETREAT CENTER
Un Centro para Retiros

RENTABLE CABINS AND CAMPING
Unas Cabañas y Campamentos para Rentar

BEXAR COUNTY ACCESSIBLE NATURE PLAY
Un Parque Infantil de la Naturaleza Accesible del Condado de Bexar

NATURE-BASED CHILDREN'S GARDEN
Un Jardín Infantil Enfocado en la Naturaleza

THE TESTING GROUNDS

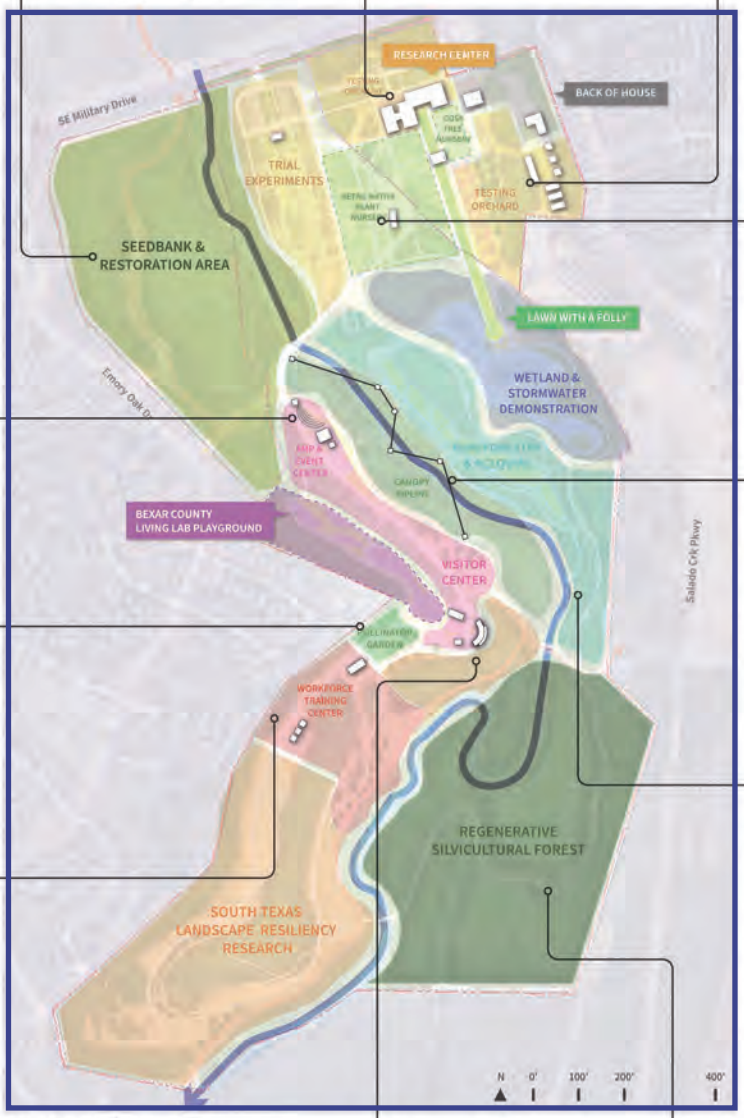
Areas of use and activity invite the community as participants in research, testing, learning, and recreation in the South Texas Ecology.

SEED BANK & RESTORATION AREA
Un Banco de Semillas y Área de Restauración

RESEARCH CENTER
Un Centro de Investigación

TESTING ORCHARD
Un Huerto de Pruebas

EVENT CENTER
Un Centro de Eventos



RETAIL NATIVE PLANT NURSERY
Un Vivero de Plantas Nativas Para Venta

BEXAR COUNTY ACCESSIBLE PLAYGROUND
Un Parque Infantil Accesible del Condado de Bexar

CANOPY ZIP LINE
Un Tirolesa en las Copas de los Árboles

POLLINATOR GARDEN
Un Jardín de Polinizadres

AGRO-FORESTRY & ACEQUIAS
La Agroforestería y Acequias

TRAINING CENTER & OUTDOOR LEARNING
Un Centro de Entrenamiento y Aprendizaje al Aire Libre

VISITOR CENTER
Un Centro de Visitantes

FIELD STATION
Un Estación de Campo

COMMUNITY FEEDBACK

"Education about foraging, native plants and species, and how this land was originally used by native communities."

"Research and education are the most valuable contribution to our future and that of future generations."

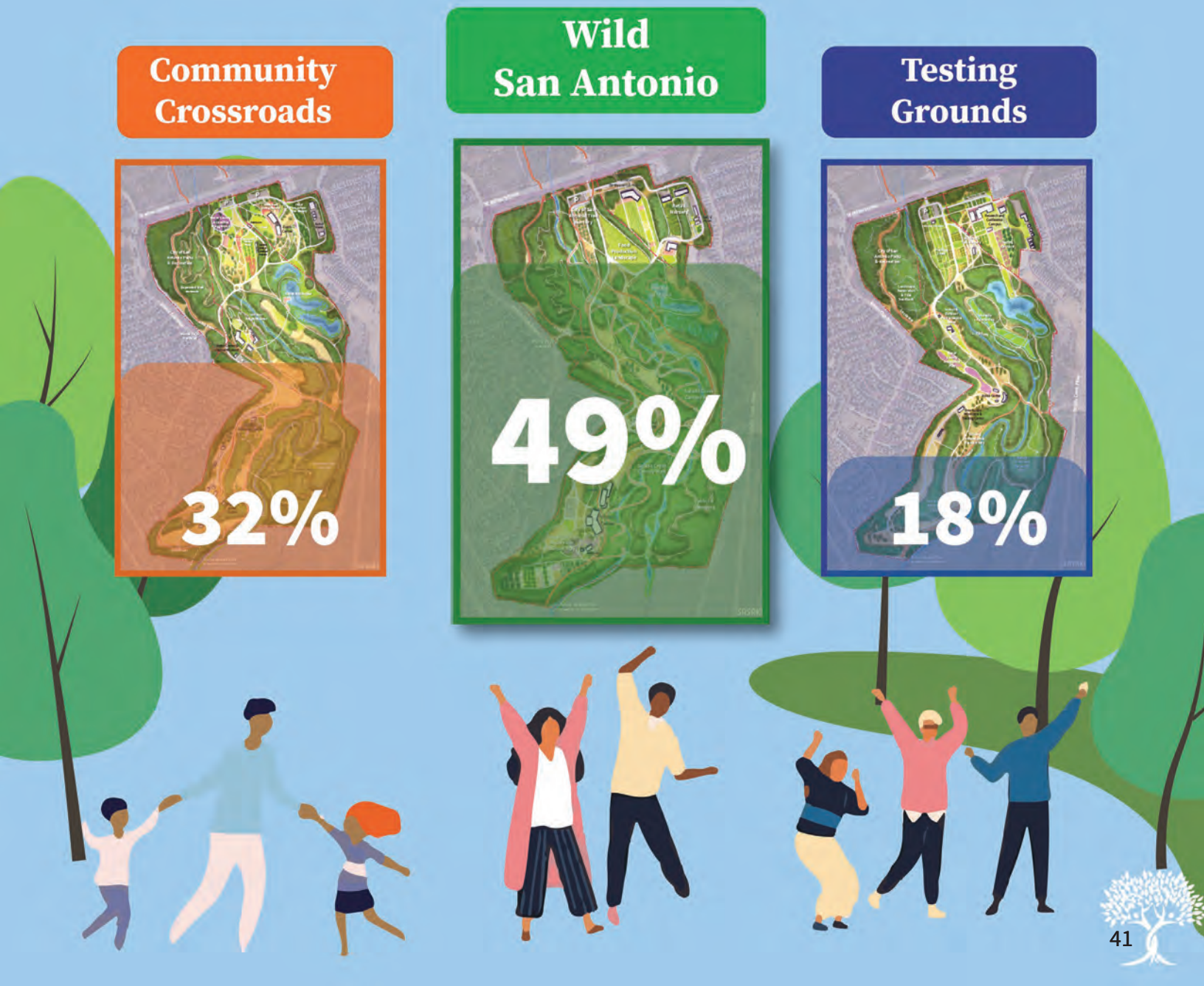
"Expand the concept to include not only the historic plants of the climate that has been, to include the climate-to-come.

"I want somewhere that my dogs can jump in the water without me having to worry if the water quality will make them sick."

"Host tree identification scavenger hunts!"

THE RESULTS

Community members were asked to note their favorite elements of each concept so that those elements could be incorporated into the final design. While the design process will incorporate the best ideas from each concept to inform the final design, community members were asked to choose the concept they loved the best. Wild San Antonio received the most votes, with important qualitative answers explaining why. Answers to additional questions will help tailor the overall design.



The Framework

Distilling the Feedback

Three Concepts

Community Crossroads

Wild San Antonio

Testing Grounds

Four Questions

Q1 WHICH CONCEPT IS YOUR FAVORITE, WHY?

Q2 WHAT WOULD YOU CHANGE ABOUT IT?

Q3 WHAT PART OF OTHER CONCEPTS DO YOU LIKE?

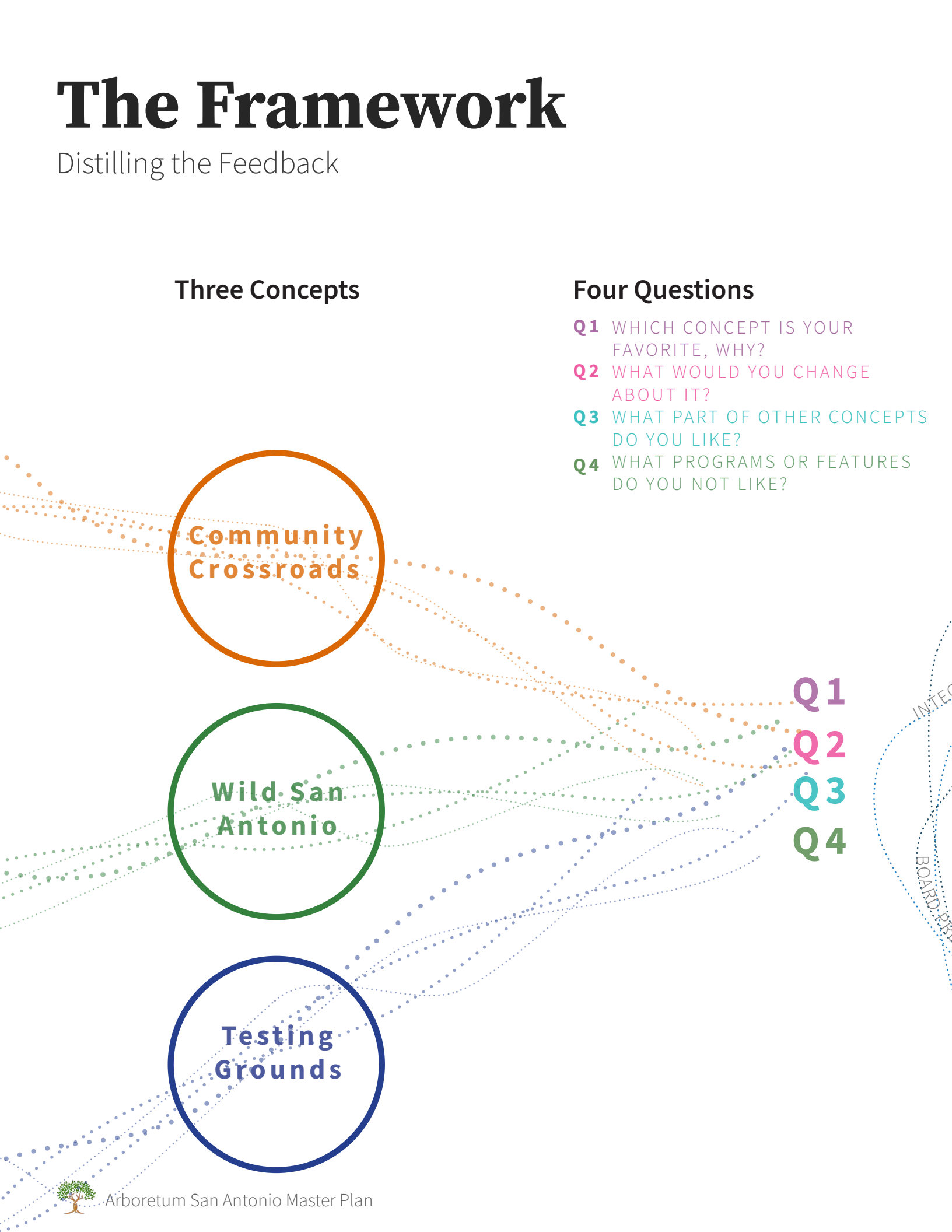
Q4 WHAT PROGRAMS OR FEATURES DO YOU NOT LIKE?

Q1

Q2

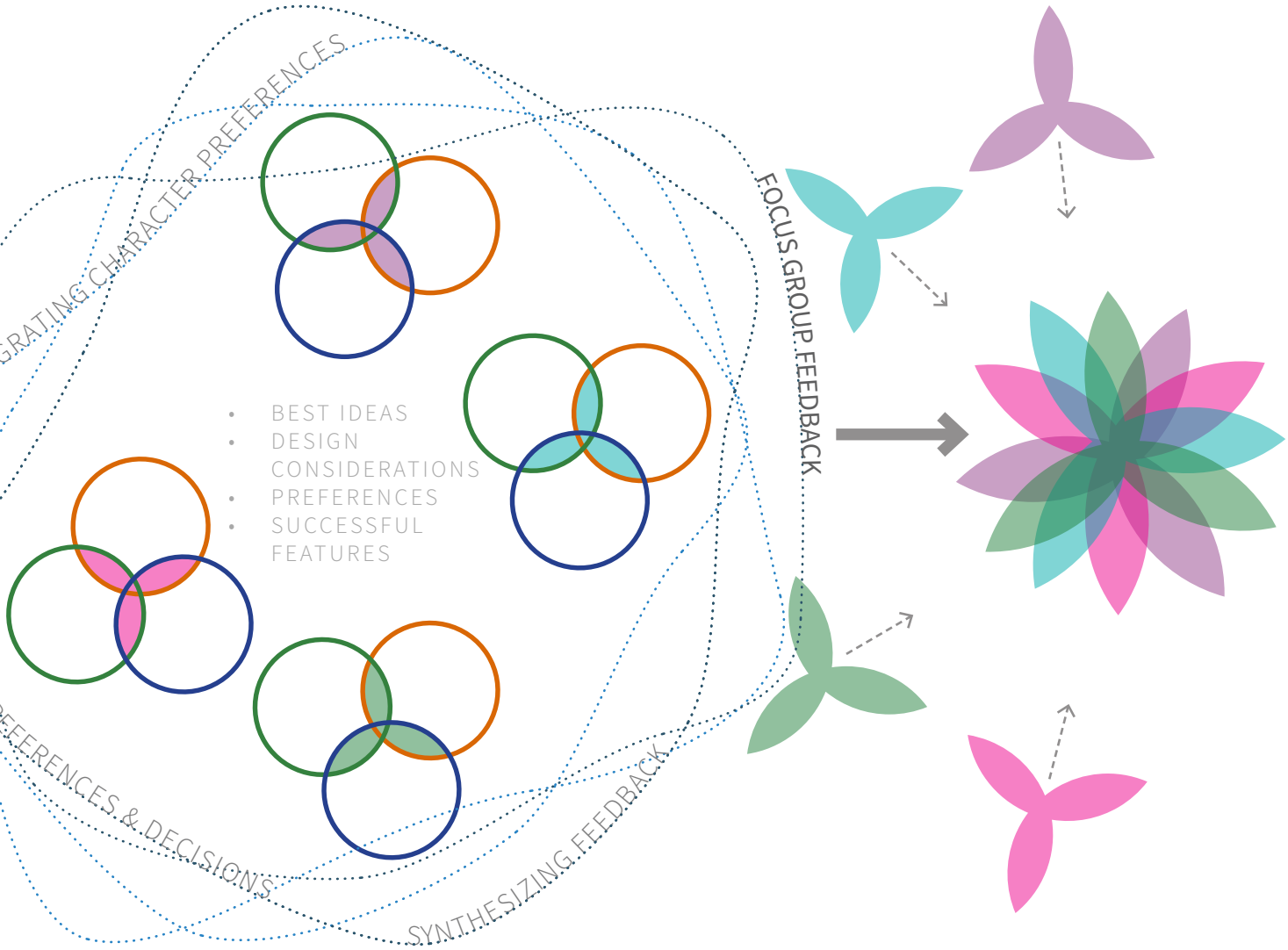
Q3

Q4



Identifying Common Themes from Questions

Final Concept

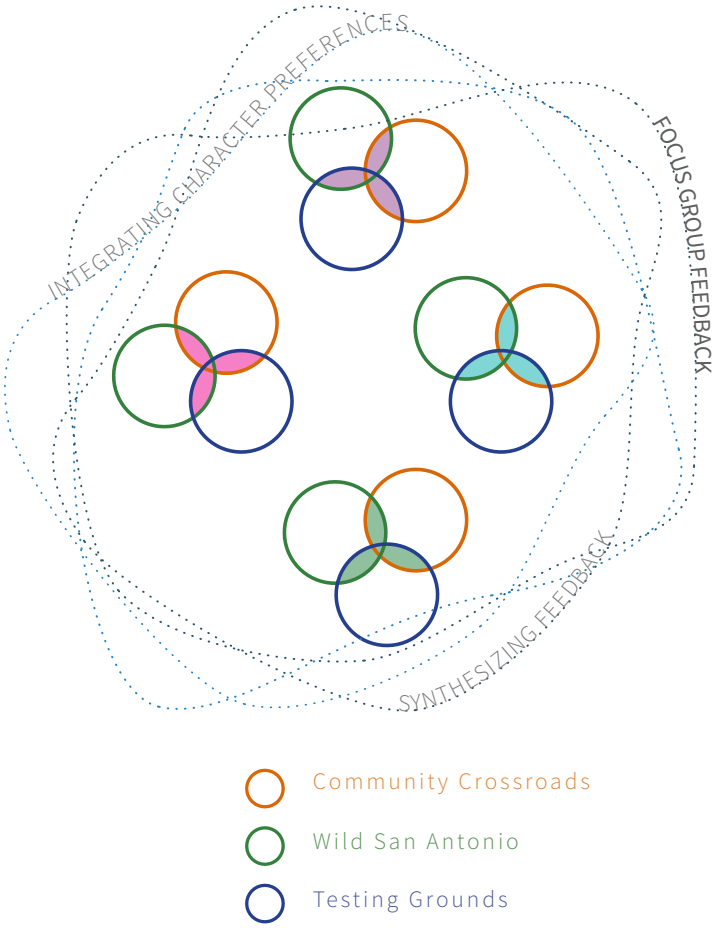


Design Themes

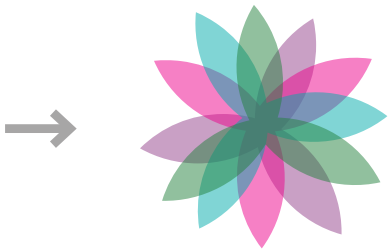
Guiding the Process

Design themes from each of the three concepts and detailed comments gathered from Phases 1 and 2 of engagement will inform the design of the fourth and final master plan concept.

Identify Common Themes from Questions



Synthesize into Final Preferred Concept




KEY THEMES FOR FINAL CONCEPT
Cultural & Environmental Education
Balance of Community & Nature
Environmental Stewardship
Indigenous Knowledge
Low Impact Design
Restoration
Climate Adaptation
Tree Research
Diverse Recreation Opportunities

Final Design Parti

Guiding the Process

Using the key themes from the community engagement, the design team distilled the information into a final design parti diagram, which guided the development of the ultimate design.

CANOPY WALK

RESEARCH PLOTS

AMPHITHEATER

EVENT CENTER


MAIN ENTRANCE
WELCOME GROVE
P
P
P
P
P
LAWN
BEXAR
COUNTY
PARK
RESTORATION
CITY OF SAN ANTONIO
PARKS & RECREATION
BUFFER GROVE
CANOPY WALK
AGRICULTURE
COLLECTIONS
AMP
LEARNING
LANDSCAPE
COSA TREE
NURSERY
EMERGENCY
ACCESS
HERO TREE
CORRIDOR
COLLECTIONS
THE WILDS
EMERGENCY
ACCESS
P
SOUTH TEXAS
RESTORATION
AGROFORESTRY
RESEARCH
BUFFER GROVE
EMERGENCY
ACCESS
EPHEMERAL
WETLAND


“I want a place where I can get lost in nature.”
- Community Member

3 *Existing Conditions*

The Context

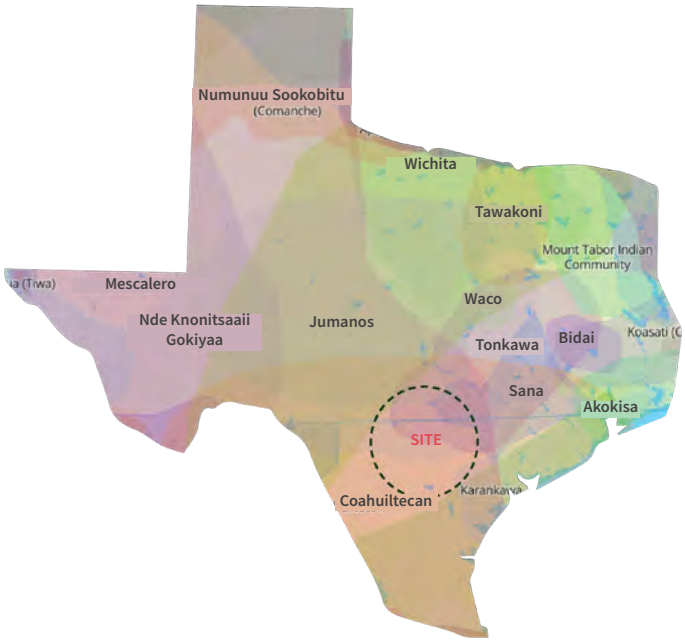
A Site for Texas

REGIONAL CONTEXT

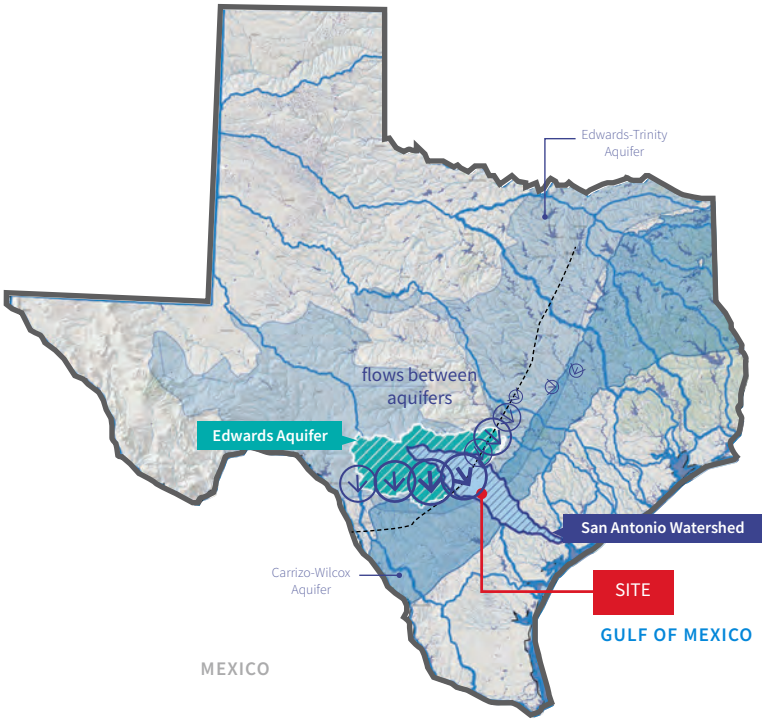
Arboretum San Antonio is a beautiful site located on a tributary of the San Antonio River, Salado Creek. The waterways and the land that surrounds it carry the history of the people who've called this place home. The Arboretum will honor the rich cultural and ecological history of this landscape.

The San Antonio Region, referred to as the Yanaguana by the Coahuiltecan-speaking People, was defined by the waterways. It was later renamed to San Antonio in 1691. In the pre-Contact era, the settlements and tributaries of the rivers, including Salado Creek, in the San Antonio Region were known as the River Yanaguana. The area was a crossroads between geologic and ecological systems as well as a critical hub of transportation and trade along the rivers.

The Arboretum is sited as a transitional zone below the Edwards Aquifer Discharge Zone and is located at the Carrizo-Wilcox Aquifer Recharge Zone, making it well-positioned to improve water quality downstream.



Indigenous territories of Texas. Source: Native Land Digital



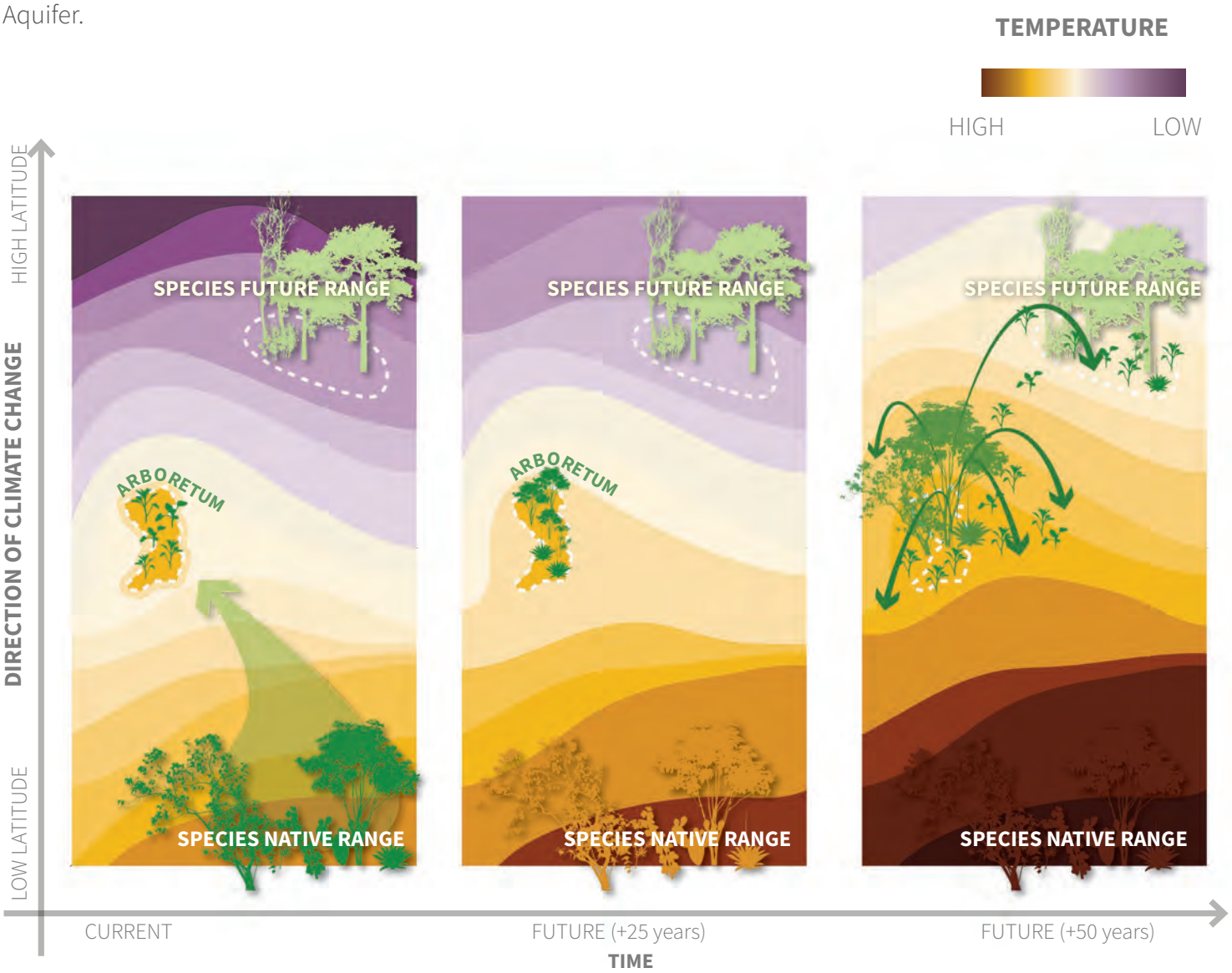
Texas Hydrology

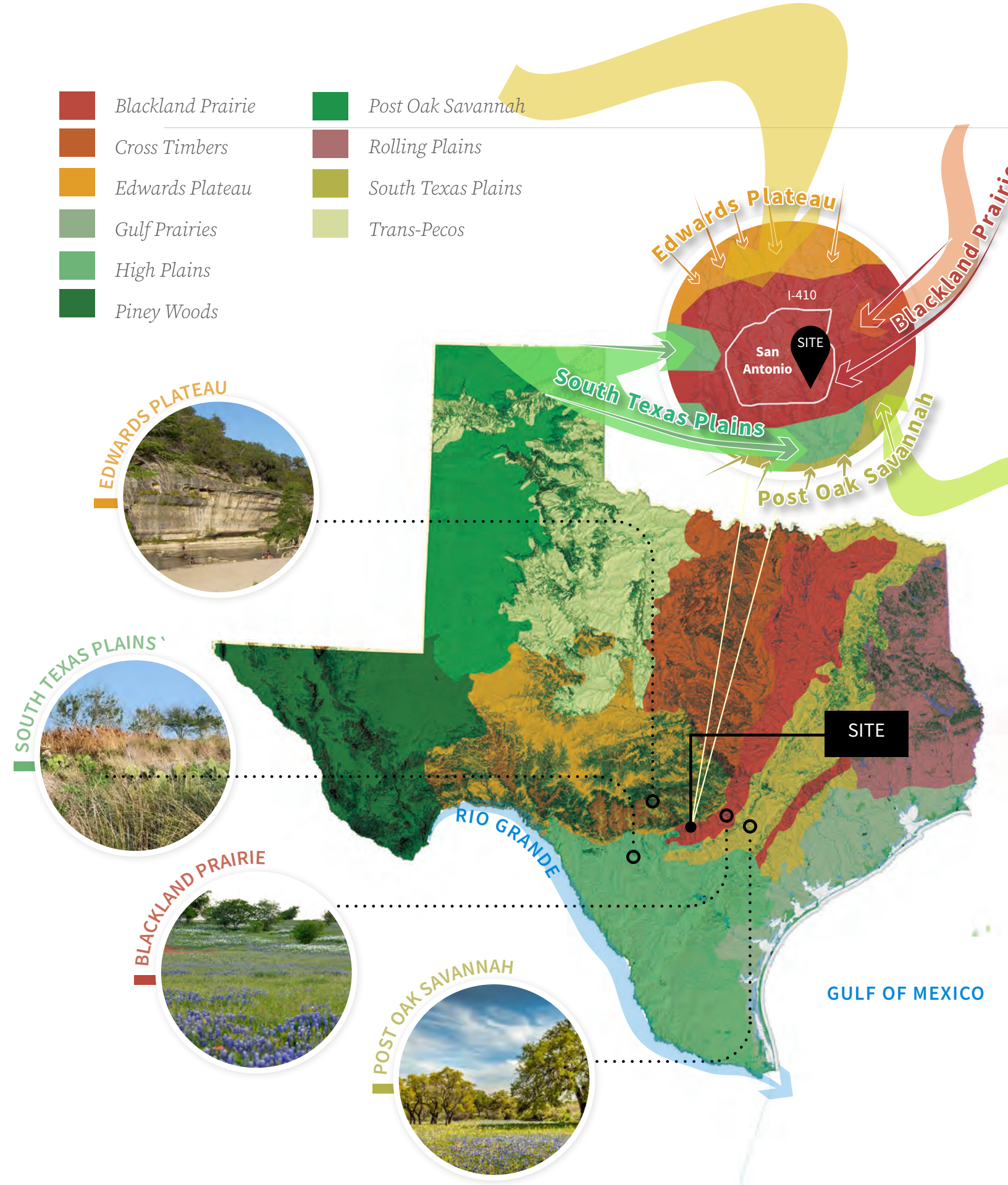
ECOLOGICAL CONTEXT

The Arboretum San Antonio site sits on the southeast side of the city of San Antonio. San Antonio is at the convergence of four ecoregions: Edwards Plateau, South Texas Plains, Blackland Prairie, and Post Oak Savannah. This geography is a unique opportunity to showcase ecology from across Texas.

San Antonio is located on a transitional space separated by a physiographic regions, such as the Balcones Escarpment Fault Line and the Edwards Aquifer. Moist air masses coming from the Gulf of Mexico sweep across the coastal plains and up the Balcones Escarpment, where they transform into torrential rainstorms, replenishing the Edwards Aquifer.

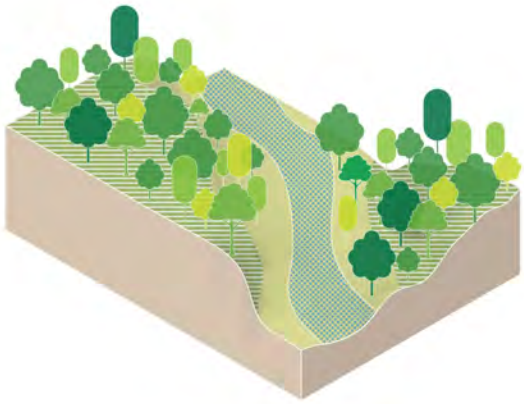
Given the Arboretum's geographic location between ecoregions and access to Salado Creek, the site holds great potential for preserving biodiversity in the wake of climate change. As species ranges shift due to rising daily temperatures, the Arboretum is an opportunity to be a stepping stone that allows species to adapt, acclimatize, and establish in novel environments.




Blackland Prairie
Cross Timbers
Edwards Plateau
Gulf Prairies
High Plains
Piney Woods
Post Oak Savannah
Rolling Plains
South Texas Plains
Trans-Pecos
Edwards Plateau
Blackland Prairie
I-410
San Antonio
SITE
South Texas Plains
Post Oak Savannah
EDWARDS PLATEAU
SOUTH TEXAS PLAINS
SITE
RIO GRANDE
BLACKLAND PRAIRIE
POST OAK SAVANNAH
GULF OF MEXICO

ECOLOGICAL DIVERSITY

The four ecoregions the site supports all for high species diversity and unique ecological experiences for all who visit. The following showcases just some of the plants and animals the ecoregions support.



Edwards Plateau

Also known as Texas Hill Country, it is **one of the most biologically diverse regions in the nation** and is renowned for its beautiful water-carved canyons and steep hillsides forested with oak and juniper. Caves of the Edward's Plateau are important habitats for wildlife and for many endemic species.

Representative Flora

Purple Threeawn

Aristida purpurea

Curly Mesquite

Hilaria belangeri

Lacey Oak

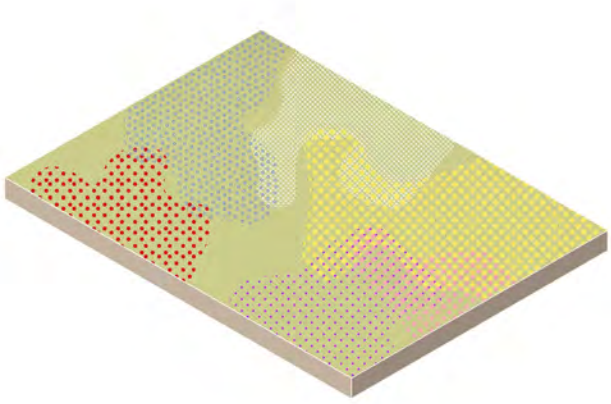
Quercus laceyi

Southern Live Oak

Quercus virginiana

Black Willow

Salix nigra



Blackland Prairie

A prairie grassland ecosystem that once thrived with a variety of perennial and annual grasses such as big bluestem, little bluestem, and switchgrass. The landscape, shaped by fires every 5 to 10 years and large herds of bison, **now retains less than 1% of its original Blackland Prairie.**

Big Bluestem

Andropogon gerardii

Switchgrass

Pancium virgatum

Little Bluestem

Schizachyrium scoparium

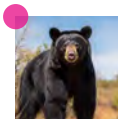
Sideoats Grama

Bouteloua curtipendula

Sycamore

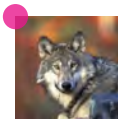
Sycamore platanus

Associated Fauna



Black Bear

Ursus americanus



Gray Wolf

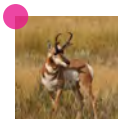
Canis lupus

Mountain Lion

Puma concolor

American Bison

Bison bison

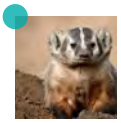


Pronghorn

Antilocapra americana

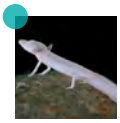
Javelina

Dicotyles tajacu



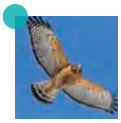
Badger

Meles meles



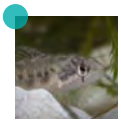
Blind Salamander

Eurycea rathbuni



Red-shouldered Hawk

Buteo lineatus

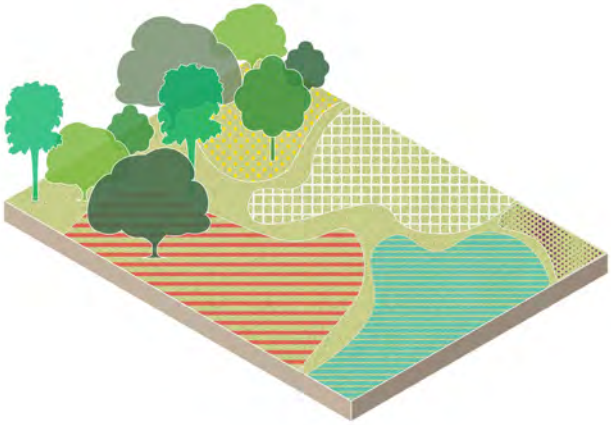


Fountain Darter

Etheostoma fonticola

● HISTORICAL - ABSENT

● HISTORICAL - PRESENT



Post Oak Savannah

Dominated by native bunch grasses and forbs with scattered post oaks, plateau live oak, black hickory, and blackjack oak. In recent years, historical species have been replaced with Yaupon Holly, Cedar Elm, Sugarberry, and Eastern Red Cedar.

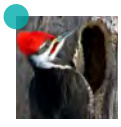
Silver Bluestem — *Bothriochloa laguroides*

Little Bluestem — *Schizachyrium scoparium*

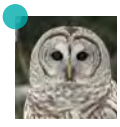
Iron Oak — *Quercus stellata*

Black Hickory — *Carya texana*

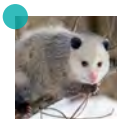
Blackjack Oak — *Quercus marilandica*



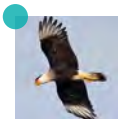
Red-bellied Woodpecker — *Melanerpes carolinus*



Barred Owl — *Strix varia*



Opossum — *Caluromysiops irrupta*



Crested Caracara — *Caracara plancus*

White-tailed deer — *Odocoileus virginianus*

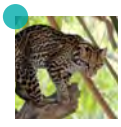
Prickly Pear — *Opuntia Spp.*

Spanish Dagger — *Yucca gloriosa*

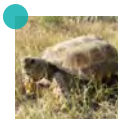
Honey mesquite — *Neltuma glandulosa*

Sweet Acacia — *Acacia smallii*

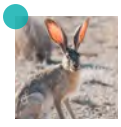
Blackbrush — *Coleogyne ramosissima*



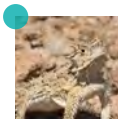
Ocelot — *Leopardus pardalis*



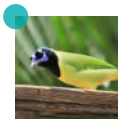
Texas Tortoise — *Gopherus berlandieri*



Jackrabbit — *Lepus californicus*



Horned Lizard — *Phrynosoma cornutum*



Green Jay — *Cyanocorax luxuosus*

South Texas Plains

Often known as the Tamaulipan Thornscrub or “brush country”, the South Texas Plains are known for shorter trees and numerous shrubs, most of which contain thorns.

City Timeline

Key Historical Moments

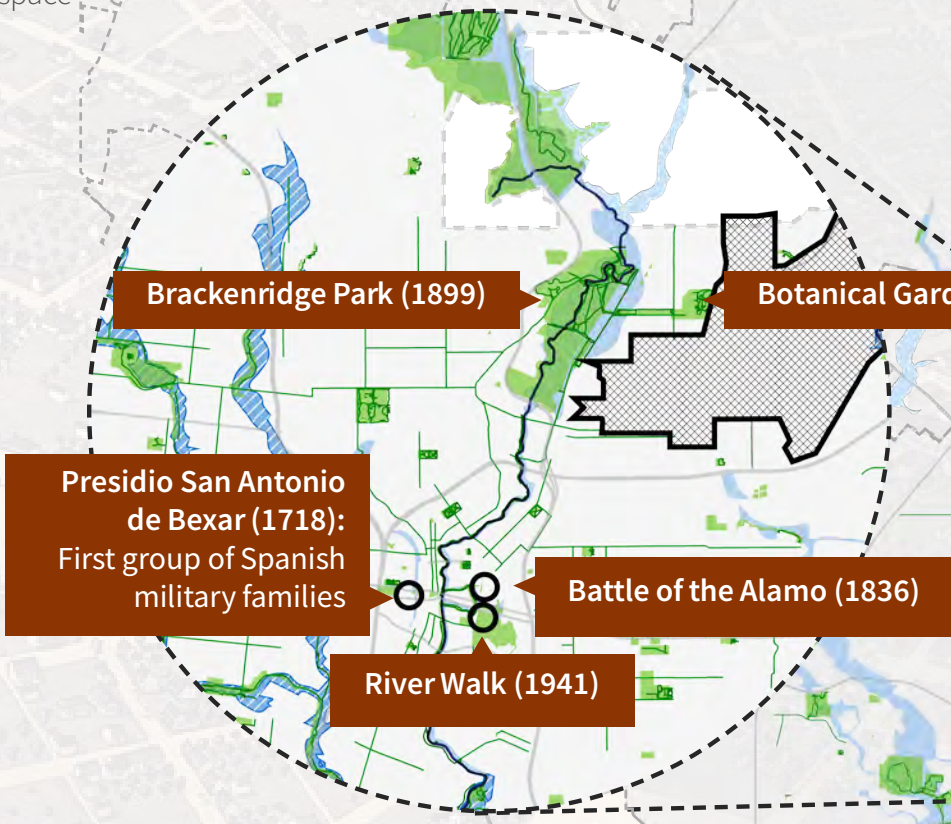
San Antonio has a rich and layered history that has made the city a melting pot of cultures. Arboretum San Antonio will become a cultural gathering space among the trees that welcomes this diversity.

Yanaguana (9,200 BCE - Today)

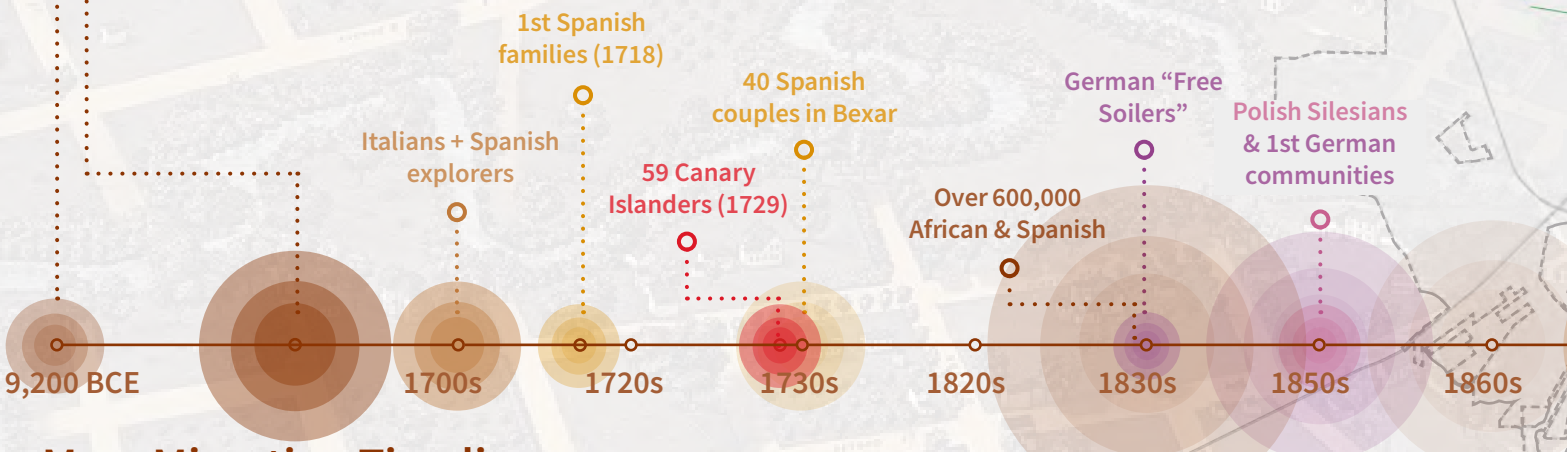
From early arrivals to the development of the Coahuiltecan tribes

African (1570 - Today)

The Slave Trade brought African Americans to Mexico and the US. The 1777 census shows that 15 slaves constituted less than 1% of population. By 1860s, there were over 600,000 people of mixed African and Spanish blood.



San Antonio joins State of Texas (1845)



Mass Migration Timeline

SALADO CREEK

SAN ANTONIO RIVER

den (1980)

Fort Sam Houston & Civil War (1865s)

Hemisfair (1968)

Mission Concepcion (1755)

Mission San Jose (1720)

Mission San Juan (1731)

Mission Espada (1731)

Calabria & Italian Silesians

Hemisfair Master Plan (2012)

Approved with a $30 million bond, the master plan redeveloped parks, historic sites, and streets. Civic Park, the final park, was completed in 2023.

San Antonio Missions National Historic Park (1978)

UNESCO World Heritage Site (2015):
Only UNESCO site in Texas, includes all 5 missions in San Antonio

Arboretum San Antonio (2023)

1880s

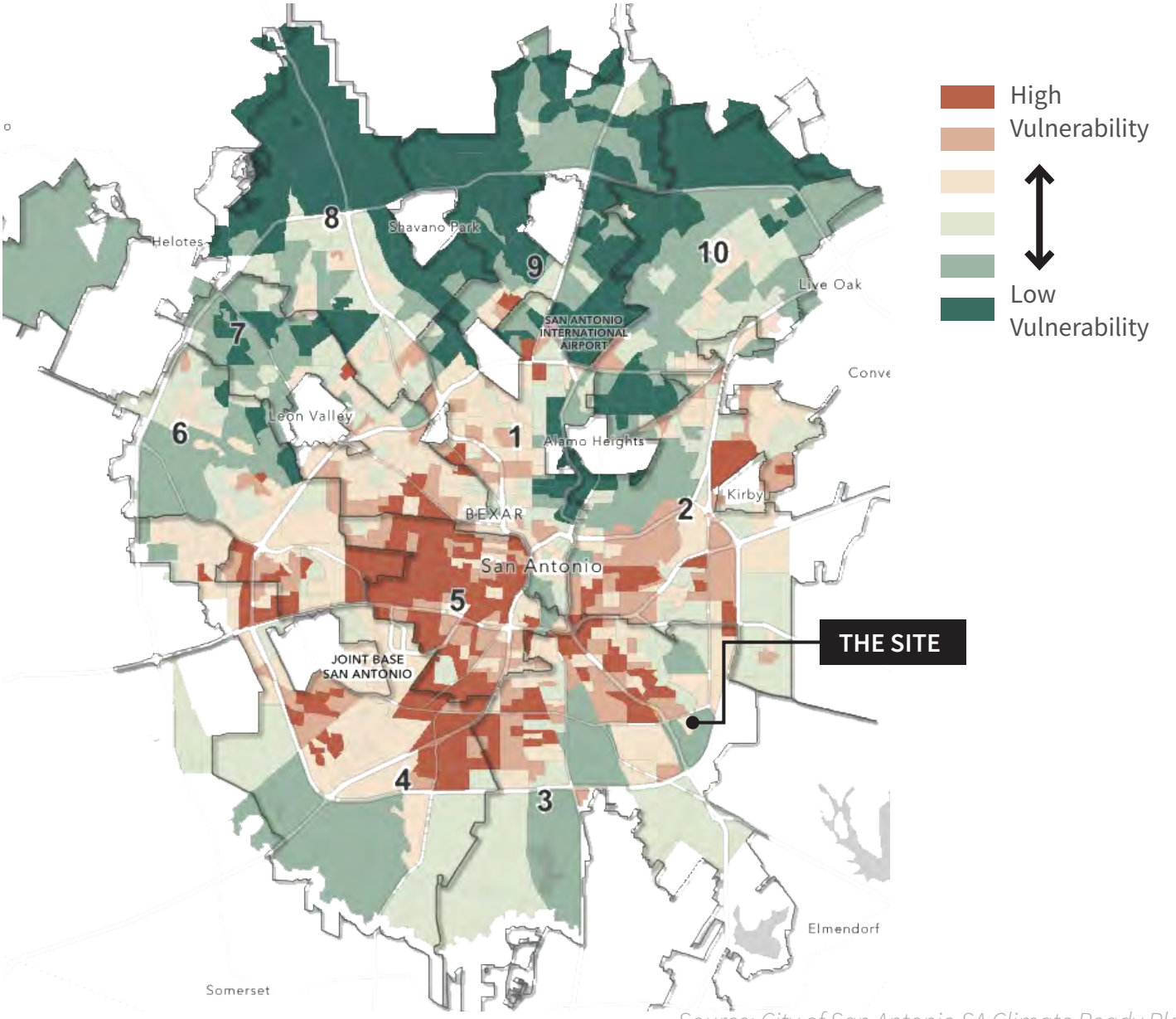
2010s

2024

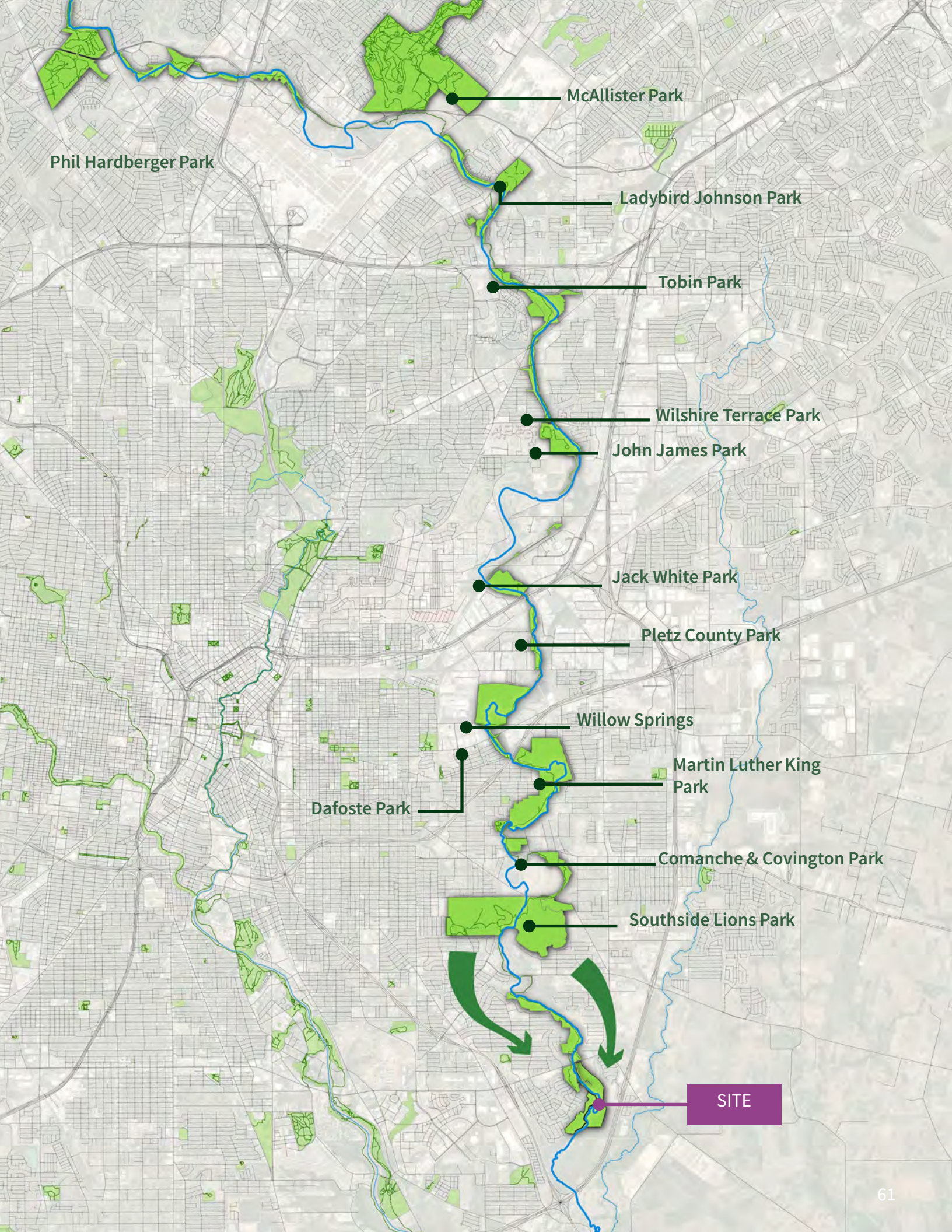
GREEN EQUITY

The site sits along the southeast side of San Antonio at the end of the chain of parks that dot the twenty-five mile Salado Creek Greenway. While the system appears to offer an equal distribution of parks green spaces, not all parks along the system are high quality. Many of the southside parks are lower quality and focus on recreational landscapes. The Arboretum will provide a nature escape for the southside and will extend the greenway connections.

The intersection of relative heat, income, and race influences the heat vulnerability of people throughout San Antonio. The south side of the city is significantly more vulnerable than the north side. These southside communities also experience higher levels of air pollution. Arboretum San Antonio offers the opportunity to serve as a free and accessible cool haven for the southeast community that is disproportionately suffering from increasing temperatures.



Source: City of San Antonio SA Climate Ready Plan


McAllister Park
Phil Hardberger Park
Ladybird Johnson Park
Tobin Park
Wilshire Terrace Park
John James Park
Jack White Park
Pletz County Park
Willow Springs
Martin Luther King Park
Dafoste Park
Comanche & Covington Park
Southside Lions Park
SITE

The Scale

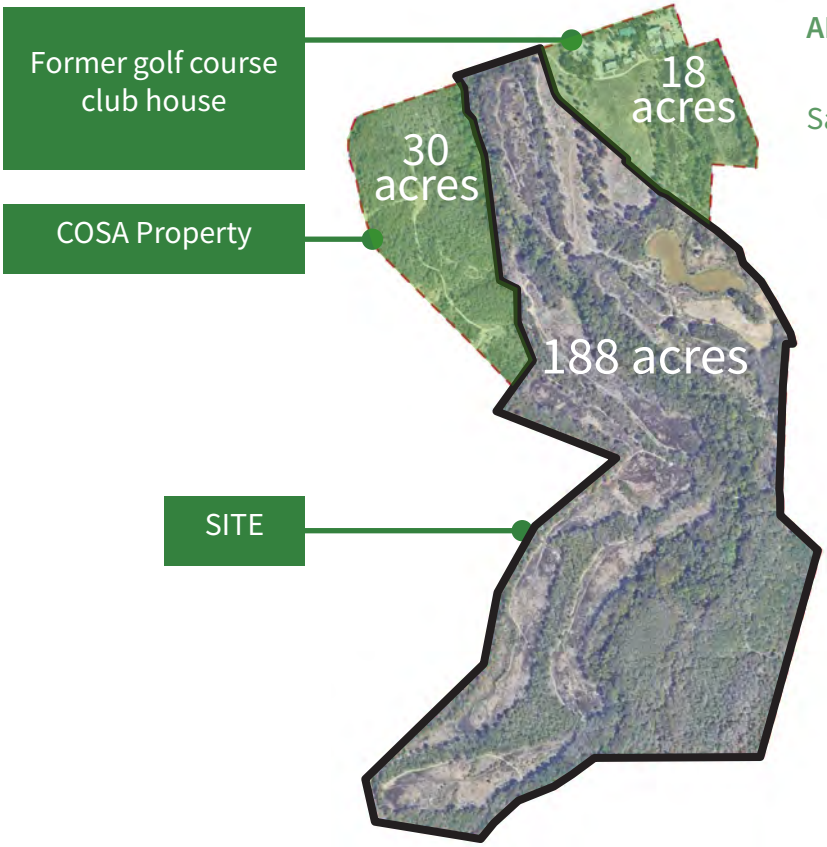
Texas Arboreta and Botanic Gardens

LARGEST IN SOUTH TEXAS

Arboretum San Antonio will be the second-largest arboretum/botanic garden in Texas and the largest in South Texas. The 238-acre site, which includes the City of San Antonio Parks and Recreation Parcel and the Bexar County Parks that sits within the arboretum, offers an expansive opportunity to highlight the rich ecology and beautiful trees of the region.

HOUSTON BOTANIC GARI

Houston (132 ac)



ARBORETUM SAN ANTONIO

San Antonio (238 ac)

LADYBIRD JOHNSON WILDFLOWER CENTER

Austin (284 ac)

DEN

FORT WORTH BOTANIC GARDEN

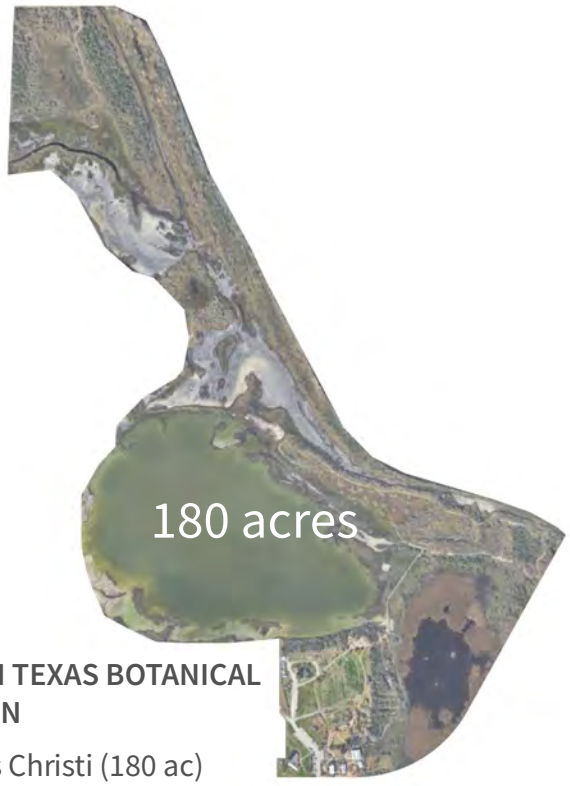
Fort Worth (120 ac)

DALLAS ARBORETUM & BOTANICAL GARDEN

Dallas (66 ac)

SAN ANTONIO BOTANICAL GARDEN

San Antonio (38 ac)



SOUTH TEXAS BOTANICAL GARDEN

Corpus Christi (180 ac)

HOUSTON ARBORETUM & NATURE CENTER

Houston (155 ac)

N 0’ 500’ 1000’

The Site

Habitat Zones & Ecology

EXISTING ECOLOGY

Habitat and ecological typologies inventoried by the field team during the May 2024 visit are noted here. Vegetation surveys were located in each significant habitat type on site. Both species and percent cover were recorded.

These surveys are critical to understanding the current distribution, abundance, and condition of flora on site.

HABITAT TYPES

- *Floodplain Hardwood Forest*
- *Floodplain Live Oak Forest*
- *Edwards Plateau Savannah Grassland*
- *Riparian Herbaceous*
- *Deciduous Woodland: Upland*
- *Deciduous Woodland: Disturbed*
- *Hardwood Motte Woodland*
- *Urban Low Intensity*
- *Floodplain Marsh*
- *Blackland Prairie: Disturbed/Tame Grassland*
- *Native Invasives: Huisache Woodland/*

- *Site Boundary*
- *COSA Bike ROW*
- *Salado Creek*
- *Stream Tributaries*
- *Vegetation Plot Locations*


FLOODPLAIN LIVE OAK FOREST
DECIDUOUS WOODLAND: UPLAND
FLOODPLAIN HARDWOOD FOREST
EDWARDS PLATEAU SAVANNAH GRASSLAND
RIPARIAN HERBACEOUS
HARDWOOD MOTTE WOODLAND
DECIDUOUS WOODLAND: DISTURBED
SITE
SE Military Dr
SW White Rd
REPUBLIC OAKS
WOODBRIDGE AT MONTE VIEJO
I-410
Salado Creek
Old Creek Channel
N
0'
50'
100'
200'

The Site

Distribution of Habitat Types

EXISTING ECOLOGY

Historically, 14 habitat types existed on site, representing biological diversity from each of the four converging eco-regions.

Today, after transformation from cropland to golf course, the site's habitat typologies have become increasingly homogenous. However, the presence of historical habitat types suggests there is great potential for habitat restoration and naturalization.

Floodplain Live Oak Forest

Characteri
floodplain
exhibiting
several inv

Floodplain Hardwood Forest

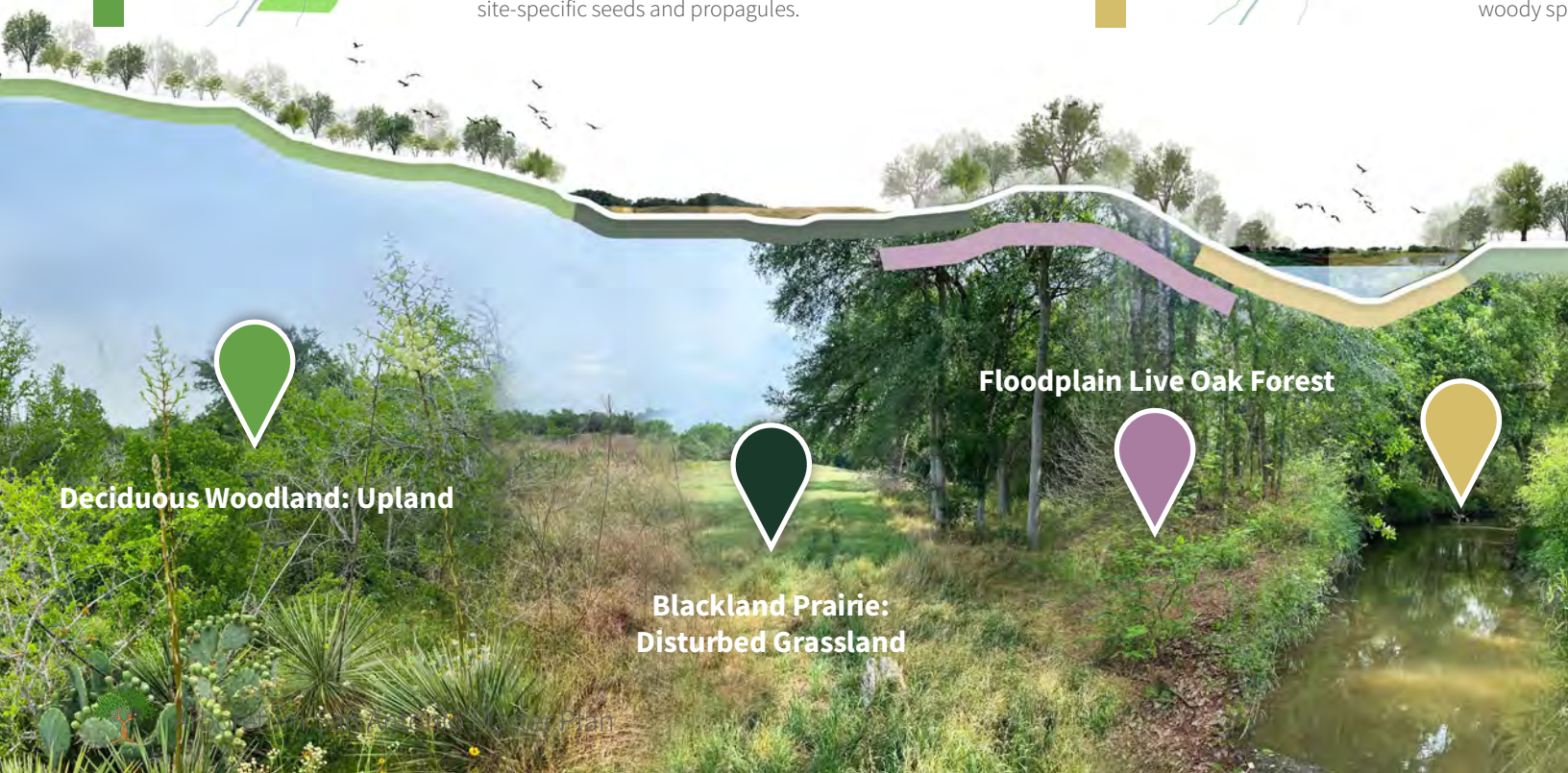
This habita
but is muc
hog distur
floodplain
stabilizing

Deciduous Woodland: Upland

Characterized by high biodiversity and a thick understory, this habitat type is the most intact on-site and will serve as an important reference ecosystem as well as a source site for site-specific seeds and propagules.

Riparian Herbaceous

This mois
lying area
and hydri
woody sp



Blackland Prairie: Disturbed Grassland



zed by low-lying bottomlands and open
s, this habitat is a biologically rich habitat
a scarce understory, flood-compacted soils, and
asive species.



These habitat types are homogenous across the fairways and consist of invasive Mediterranean perennial grasses such as rescue brome and emergent chinaberry trees. These areas are a priority for restoration.

Deciduous Woodland: Lowland, Disturbed


at type is similar to the floodplain live oak forest,
h more widespread on-site. It is characterized by
bance, its proximity to the creek, and the open
bank, which is home to several native slope-
species.



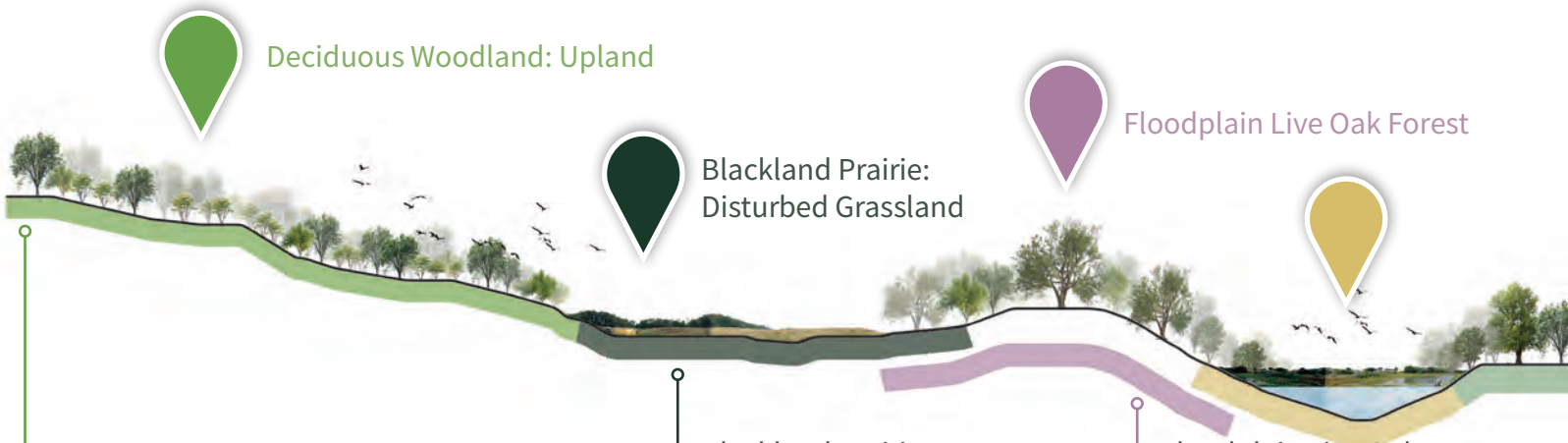
Characterized by hog disturbance and its adjacency to the creek, this lowland habitat type has a short understory canopy layer with cedar elm, hackberry, and mesquite.

Edwards Plateau Savannah Woodland / Motte


ture-rich habitat type is found adjacent to low-
s in the fairways. It is characterized by floodable
c species that are largely native and emergent
ecies such as black willow.


This transitional upland habitat type is characterized by hog disturbance, a low understory of small-to-medium-sized trees, and a species-rich understory.

Species Collection: Trees



Deciduous Woodland: Upland

Texas Persimmon
Diospyros texana

Cedar Elm
Ulmus crassifolia

Bluewood
Condalia
Condolia hookeri

Blackland Prairie: Disturbed Grassland

Honey Mesquite
Proposis glandulosa

Chinaberry
Melia azedarach

Floodplain Live Oak Forest

Privet
Ligustrum spp.

Cedar Elm
Ulmus crassifolia

Overstorey

Live Oak
Quercus virginiana

Across the arboretum's canopy, there are two main invasive species of trees. Chinaberry (*Melia azedarach*) and Privet (*Ligustrum* spp.) both colonize disturbed areas. Chinaberry is an early opportunist in the open fairways and along forest edges. Ligustrum is well-established in the floodplain forest.

Native

Endemic/indicator

Invasive

Dominant

Dominant

Dominant

Overstorey

Floodplain Hardwood Forest

Osage orange
Maclura pomifera

Honey Mesquite
Proposis glandulosa

Box Elder
Acer negundo

Green Ash
Fraxinus pennsylvanica

Pecan
Carya illinoinensis

Green Ash
Fraxinus pennsylvanica

Hackberry
Celtis occidentalis

Riparian Herbaceous

Black Willow
Salix nigra

Edwards Plateau Savannah Woodland

Texas Persimmon
Diospyros texana

Cedar Elm
Ulmus crassifolia

Honey Mesquite
Proposis glandulosa

Bluewood condalia
Condolia hookeri

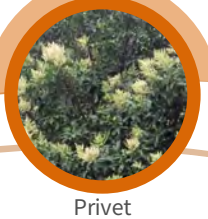
Deciduous Woodland: Disturbed

Honey Mesquite
Proposis glandulosa

Hackberry
Celtis occidentalis

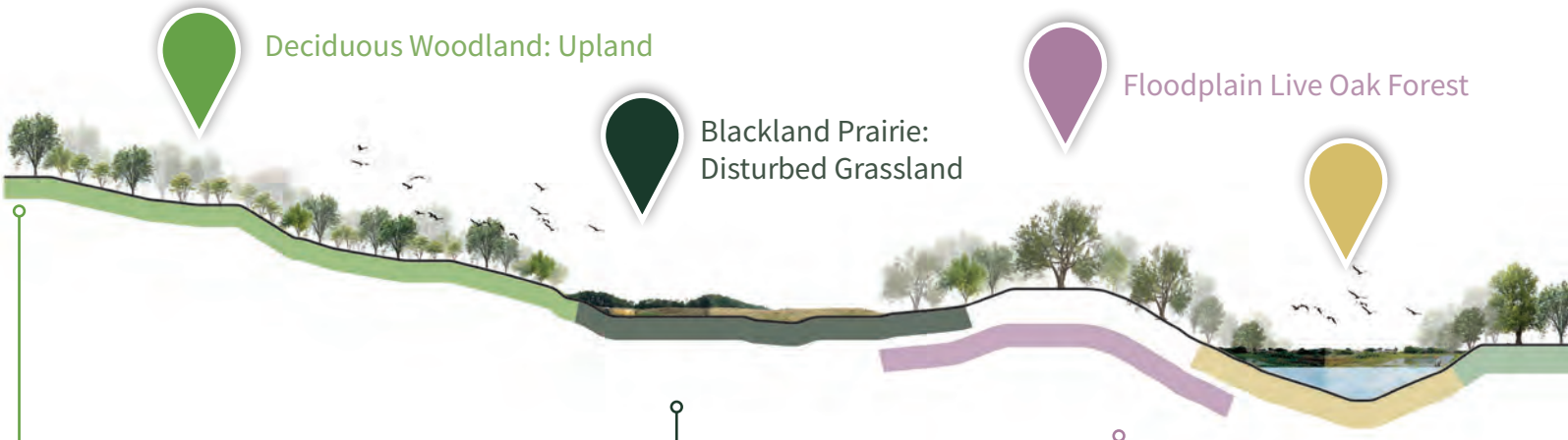
Cedar Elm
Ulmus crassifolia

Bluewood Condalia
Condolia hookeri



Privet
Ligustrum spp.

Species Collection: Groundc



Deciduous Woodland: Upland

Plain's Coreopsis
Coreopsis tinctoria

Firewheel
Gaillardia pulchella

Texas Creeping Oxeye
Wedelia hispida

Pennyroyal
Hedeoma spp.

Splitleaf Gilia
Giliastrum incisum

Flase aloe
Manfreda maculata

Firewheel
Matulea reticulata

Frostweed
Verbesina virginica

American WIldcarrot
Daucus pusillus

Common Ragweed
Ambrosia artemisiifolia

Silver Dwarf Morning-glory
Evolvus sericeus

Horseherb
Calyptocarpus vialis

Blackland Prairie: Disturbed Grassland

Rescue Brome
Bromus catharticus

Hedge Parsley
Torilis arvensis

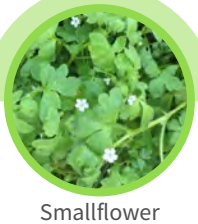
Creeping Cucumber
Melothria pendula

Kleingrass
Panicum coloratum

Johnson Grass
Sorghum halepense

Invasive species dominate many of the herbaceous habitats **across** the site.

Floodplain Live Oak Forest



Smallflower Baby Blue Eyes
Nemophila aphylla

False Dayflower
Tinantia anomala

Hedge Parsley
Torilis arvensis

Giant Ragweed
Ambrosia trifada

Horseherb
Calyptocarpus vialis

Aster
Symphotrichum spp.

Virginia Pepperweed
Lepidium viginicum

cover & Herbs

Deciduous Woodland: Disturbed

Floodplain Hardwood Forest

Riparian Herbaceous

Edwards Plateau Savannah Woodland

Floodplain Hardwood Forest

Inland Sea Oats
Chasmanthium latifolium

Giant Ragweed
Ambrosia trifida

Virginia wildrrye
Elymus virginicus

Saw Greenbrier
Smilax bona-nox

Hedge Parsley
Torilis arvensis

Texas Baby Blue Eyes
Nemophilia phaceloides

Dewberry
Rubus oklahomus

Riparian Herbaceous

Giant Ragweed
Ambrosia trifida

Virginia Wildrye
Elymus virginicus

Hedge Parsley
Torilis arvensis

Switchgrass
Panicum virgatum

Plains coreopsis
Coreopsis tinctoria

Yellow Sedge
Carex flava

Cedar Elm
Alternatha philoxeroides

Perennial Rye Grass
Lolium spp.

Knotweed
Persicaria glabra

Rescue Brome
Bromus catharticus

Sheep's Sorrel
Rumex acetosella

Goldenrods
Solidago spp.

Edwards Plateau Savannah Woodland

Rescue Brome
Bromus catherticus

Hedge Parsley
Torilis arvensis

Hogpeanut
Amphicarpaea bracteata

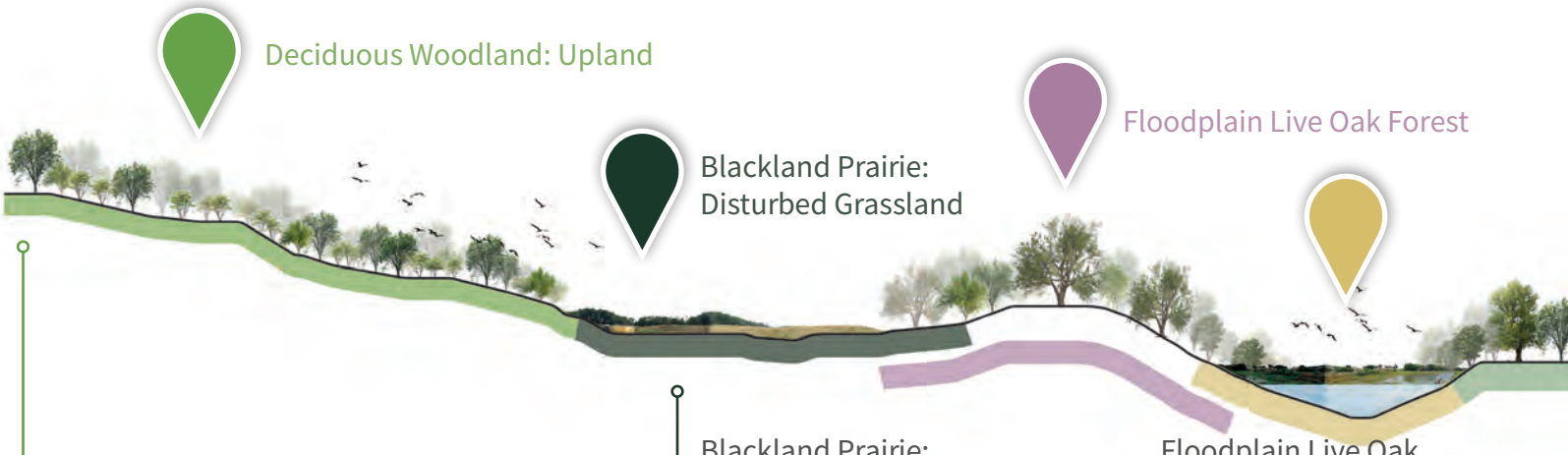
False Dayflower
Tinantia anomala

Bryonies
Bryonia spp.

Texas Nightshade
Solanum triquetrum

Species Collection: Shrubs

Across the arboretum's herbaceous (groundcover) layer, invasive species are particularly widespread. Both Hedge Parsley (*Torilis arvensis*) and Rescue Brome (*Bromus catharticus*) were found in the understory of almost every habitat typology.



Deciduous Woodland: Upland

Dagger Plant
Yucca aloifolia

Agarita
Mahonia trifoliata

Texas Prickly Pear
Opuntia linheimeri

Buckley's Yucca
Yucca constricta

Texas Hog Plum
Colubrina texensis

Desert Olive
Forestiera pubescens

Blackland Prairie: Disturbed Grassland

Floodplain Live Oak Forest

Floodplain Hardwood Forest

Riparian Herbaceous


False Dayflower
Tinantia anomala


Turnipweed
Rapistrum rugosum


Sunflower
Helianthus spp.


Black Willow
Salix nigra

Edwards Plateau Savannah Woodland


Chokecherry
Prunus virginiana

Indicator Species

Red Harvester Ants

COLONY LOCATIONS

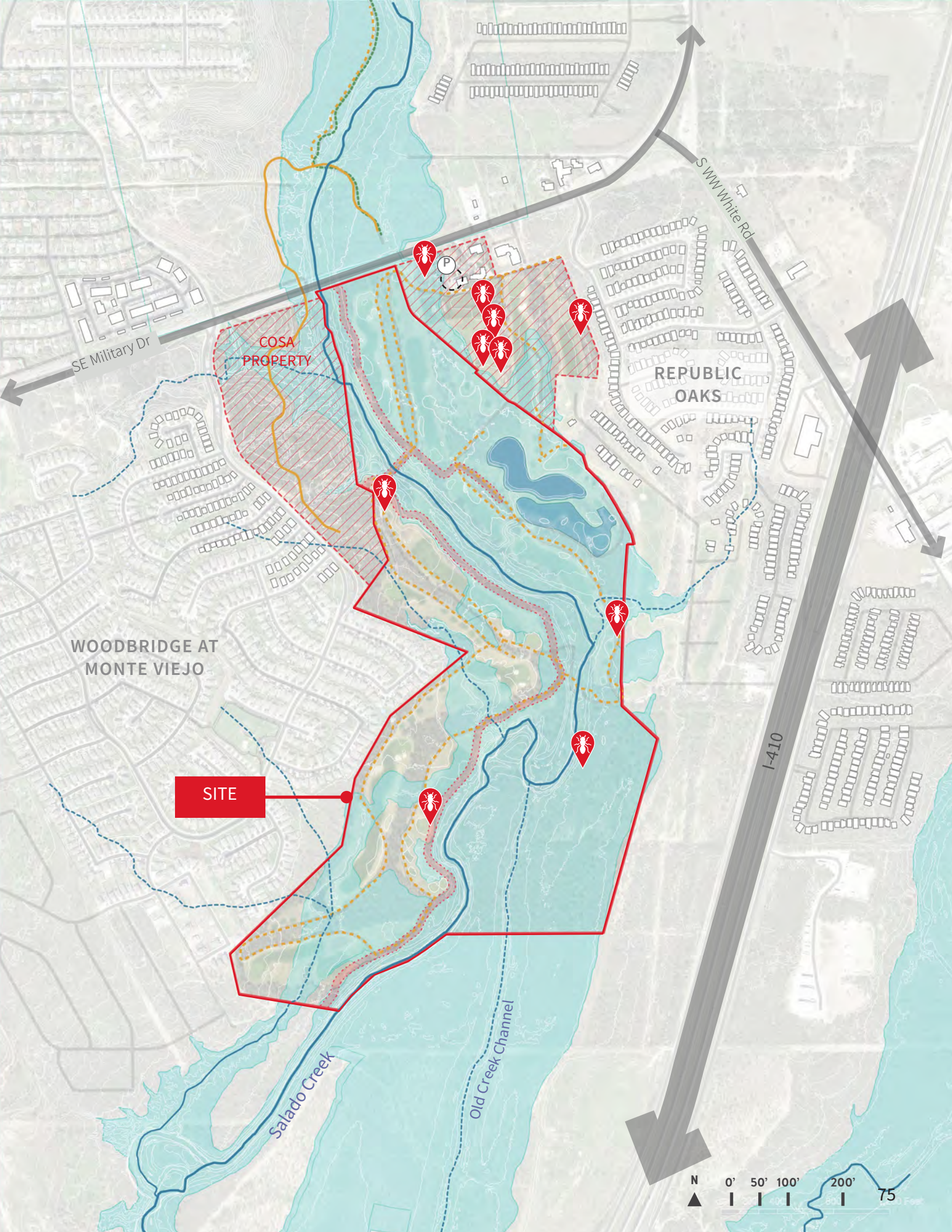
Red Harvest Ants are ecological indicator species, meaning that the locations of their colonies on-site are representative of low-disturbance, healthy, and high-integrity habitats. They are native to the southwestern U.S.

Understanding where these colonies are located on-site is critical for minimizing disturbance and maintaining intact populations of this important species.

9 Red Harvester Ant Colonies

LEGEND

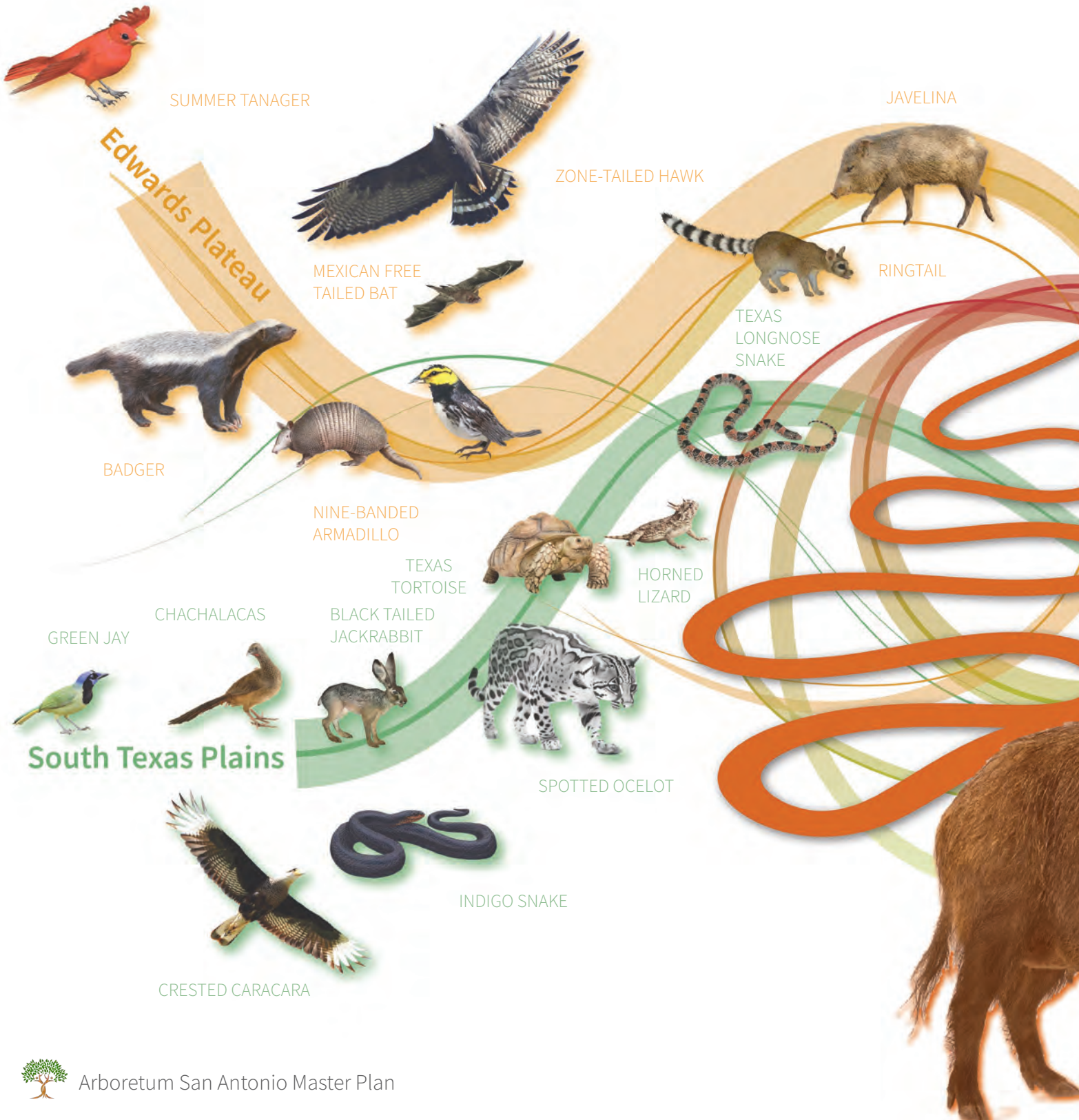
- *ASA Property*
- *Adjacent Property*
- *Vehicular*
- *COSA Bike Trail ROW*
- *COSA Bike Trail*
- *Existing Cart Path*
- *Park Trails*
- *Salado Creek*
- *Stream Tributaries*
- *500 Year Floodplain*
- *Red Ant Colony*


SE Military Dr
SW White Rd
COSA
PROPERTY
REPUBLIC
OAKS
WOODBRIDGE AT
MONTE VIEJO
SITE
I-410
Salado Creek
Old Creek Channel
N
0'
50'
100'
200'

Distribution of Habitat Type

DISPLACED ECOLOGY

Four animal communities have co-existed historically on the site. Today, feral hog activity has displaced much of the native fauna, impacting all habitats across the site.



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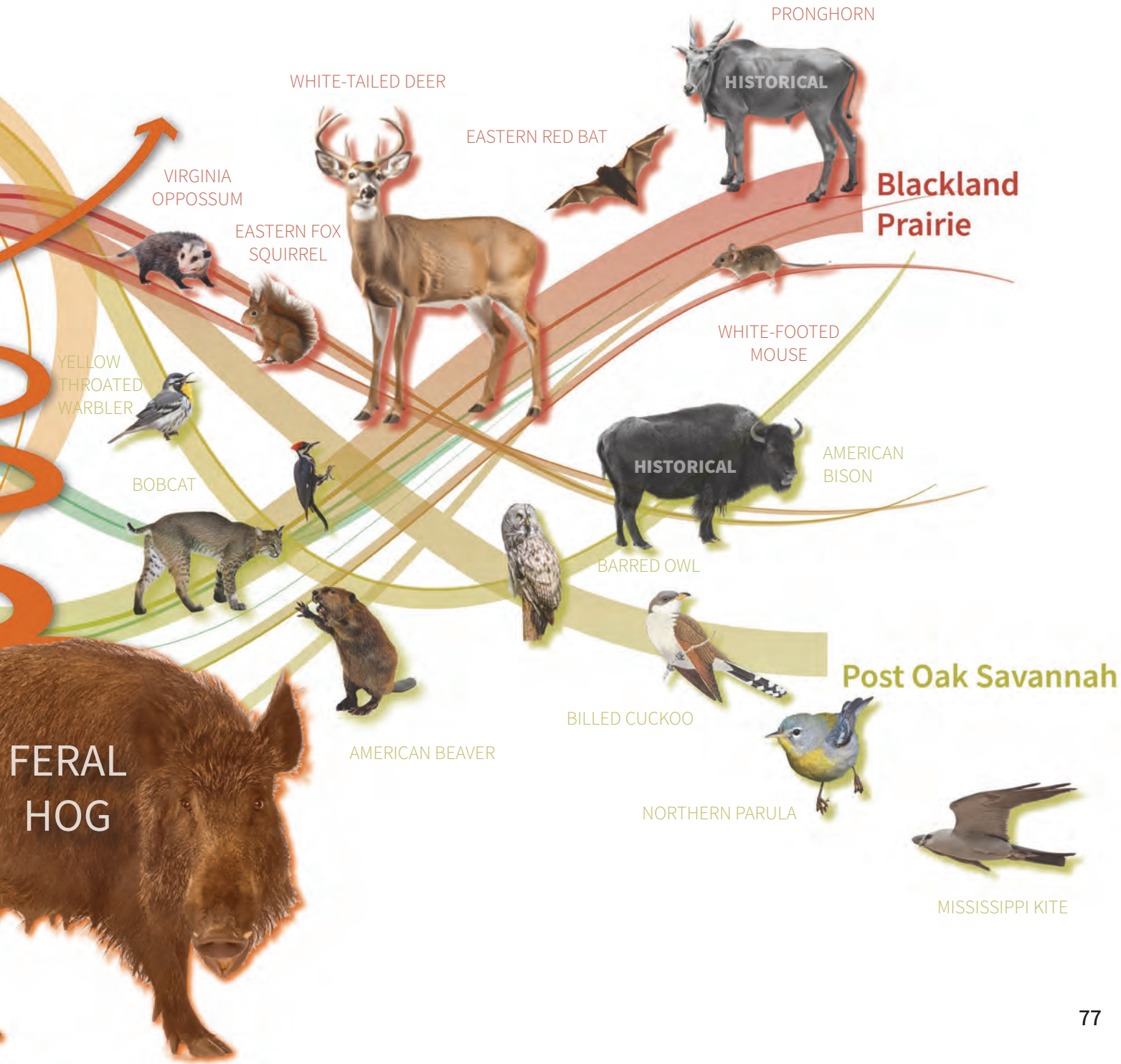
PRONGHORN
HISTORICAL
WHITE-TAILED DEER
EASTERN RED BAT
VIRGINIA OPPOSSUM
Blackland Prairie
EASTERN FOX SQUIRREL
WHITE-FOOTED MOUSE
YELLOW THROATED WARBLER
HISTORICAL
AMERICAN BISON
BOBCAT
BARRED OWL
Post Oak Savannah
BILLED CUCKOO
AMERICAN BEAVER
NORTHERN PARULA
MISSISSIPPI KITE
FERAL HOG

Design Framework

Site Factors to Consider

OPPORTUNITIES AND CONSTRAINTS

The Arboretum San Antonio's site and context present a distinctive mix of opportunities and constraints that will shape its future development and programming.

Bordered by residential neighborhoods, city parkland, and major thoroughfares such as Interstate 410 and SE Military Drive, the site offers both convenient access and challenges, including traffic noise. The planned Howard W. Peak Greenway easement will further integrate the arboretum into San Antonio's broader trail network, strengthening its regional significance. Salado Creek—whose extensive floodplain covers more than 80% of the site—is both a defining natural feature and a major constraint, requiring thoughtful planning to balance flood risk management with ecological restoration and recreational access.

Two existing bridges across the creek provide essential internal connectivity, while the site's mature woodlands—home to over 35 woody plant species and numerous old-growth specimens—offer unique opportunities for conservation, education, and immersive visitor experiences.

Sensitive features, including paleo-Indian archaeological sites and red harvester ant colonies, call for careful stewardship and protection. Multiple access points and existing utility hookups further support future infrastructure needs.

Together, these elements form a dynamic framework where ecological sensitivity, cultural heritage, and community connectivity must be thoughtfully balanced within the master plan.


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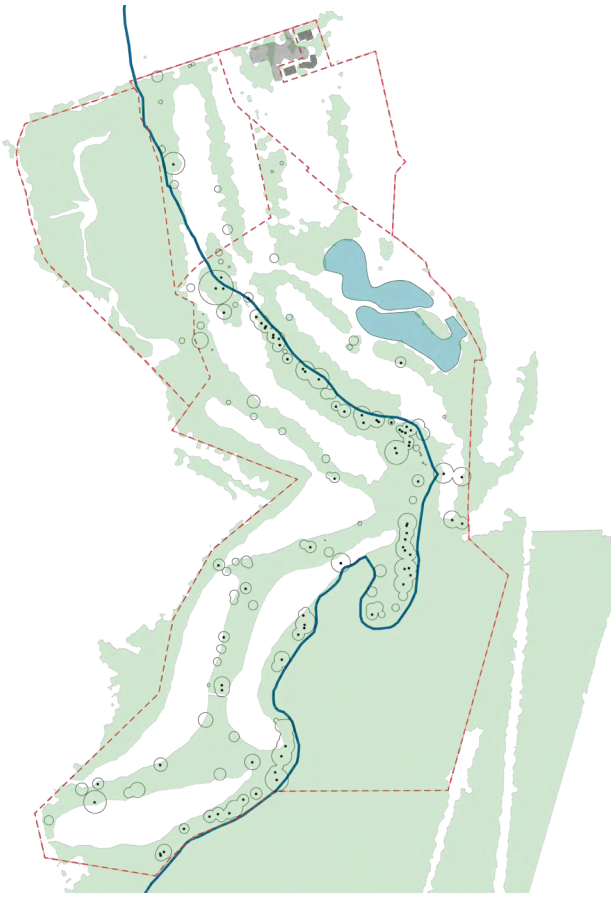
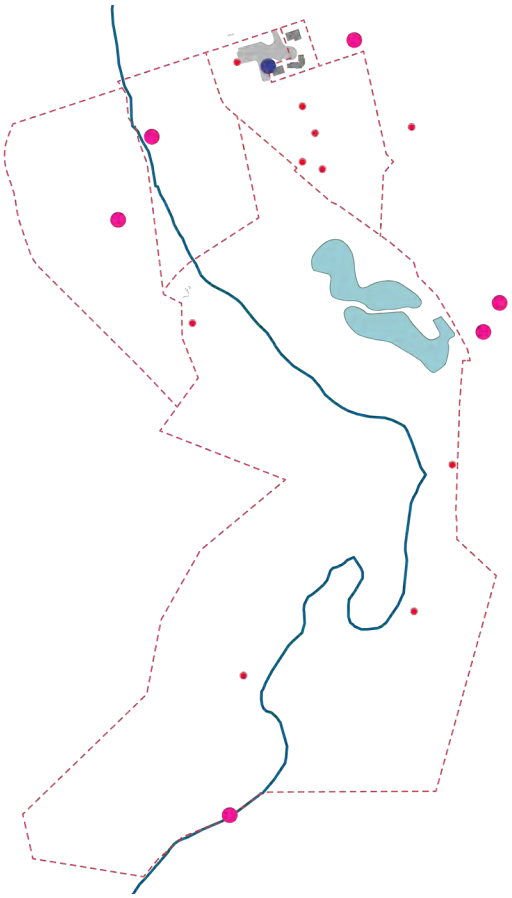


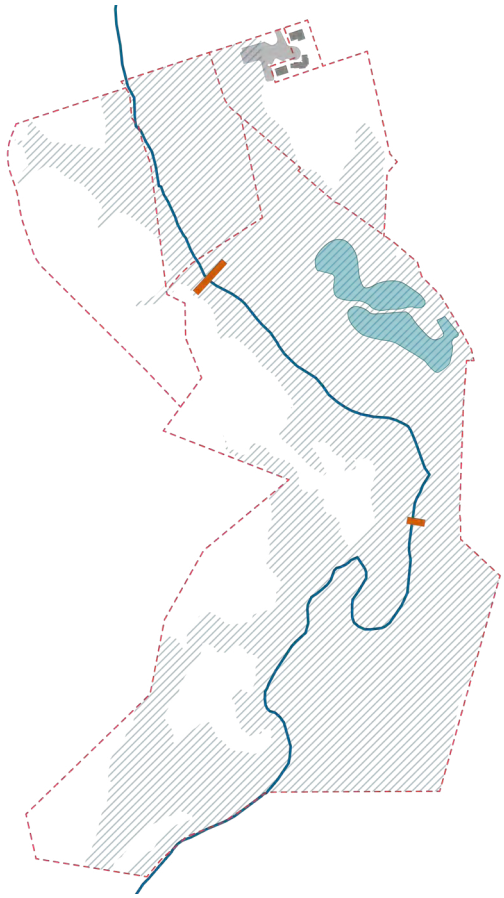


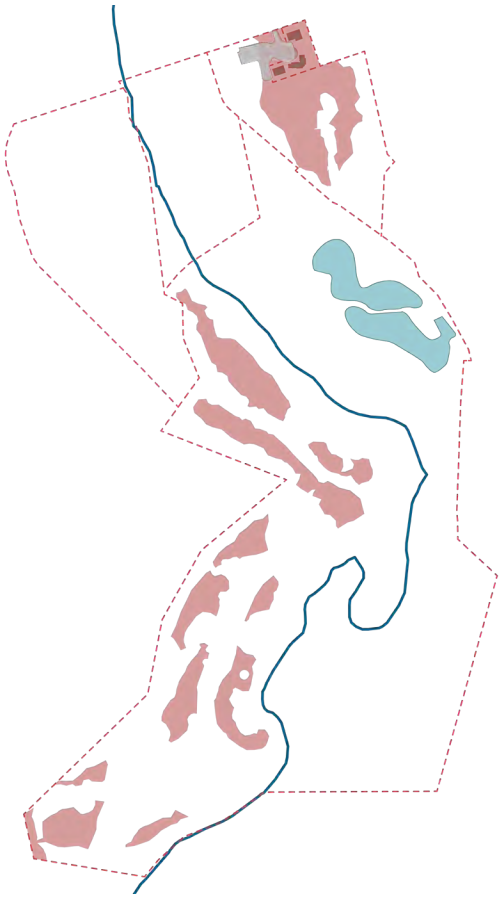
TREE CANOPY + HERO TREES

Over 70% of the Arboretum is forested with a dense canopy that frames former golf . The majority of the site's oldest and largest trees , or those we call "Heroes" are adjacent to Salado Creek and surrounding floodplain. Key within the design strategy is to minimize any disturbance to existing forested areas and highlight Hero trees through programed trails.

ANTS + ARCHEOLOGY

The Arboretum has many sensitive sites rooted in local ecology and cultural history that must be protected. Red harvester ants, *Pogonomyrmex barbatus* can be found in many of former fairways and are indicators of good quality soils. They are an essential food for many local species, including the threatened Texas horned lizard, *Phrynosoma cornutum*. Archaeological sites of paleo Indians can also be found in many areas which includes debris, burnpits, and remnants of old encampments. Development will be limited around these important resources.





HYDROLOGY

Over 80% of the Arboretum is within the Salado Creek's 500 and 100-year floodplain and serves as a major filter for stormwater originating from adjacent neighborhoods and commercial development. Design considerations will ensure development is outside of the floodplain and incorporates best management practices to store and treat stormwater before it enters Salado Creek.

NET USABLE LAND AREA

Landscape and development restrictions from dense forests, hero trees, sensitive sites, and the Salado Creek floodplain creates a framework for potential development - or NULA, net usable land area. These areas dictate where development is most suited and can be further refined by other criteria like distance from Military Drive, proximity to neighborhood homes, etc.


“It needs to be beautif
inspirational, someth
that draws people in a
celebrates the tree as t
incredible resource th


ful and
ing
and
the
at it is.”
- Community Member

4 *Project Vision*

Design Principles

Guiding Site Design

These design principles are rooted in community input, the Arboretum's strategic plan, and its mission and values. They serve to guide a cohesive, purposeful design that addresses the needs of future visitors while supporting the landscape's legacy.

CULTURAL COMMITMENT

The design honors indigenous land management practices, including prescribed fire and ethnobotanical collections, fostering a deeper understanding of regional history. A wide assortment of tree collections will showcase species that historically provided essential resources—food, medicine, fiber, and building materials to those of trees of San Antonio's Sister Cities. Storytelling is woven into the landscape through art installations, guided tours, and informational signage, connecting visitors to trees in Hispanic Culture or simply as a shady space for Veteran families to gather. Interpretive trails will highlight the significance of trees in San Antonio's history, fostering a meaningful connection to the region's cultural and ecological heritage.

INCLUSIVE COMMUNITY

Design efforts focus on creating distinct zones for active and passive experiences, accommodating diverse program uses while providing visitors with a tranquil escape into nature. The Arboretum will feature programs aimed at engaging diverse and inter-sectional populations—including veterans, K-12 students, and seniors—ensuring accessibility for all. The inclusion of rentable spaces aligns with city and county resources, offering accessible amenities that enhance the visitor experience without detracting from the natural environment.

CONTINUOUS LEARNING

The Arboretum will serve as an educational hub for visitors of all ages by incorporating a variety of interpretive and experiential spaces. Opportunities for ongoing research and phased enhancements will support continuous exploration and discovery. The design emphasizes nature play and hands-on interaction, fostering a deeper understanding and appreciation of the natural world through physical engagement and exploration.

SUSTAINABLE STEWARDSHIP

A core focus of the design is landscape restoration, emphasizing respectful, low-impact strategies that emphasize the landscape's existing resources and beauty. This approach integrates water, energy, and carbon conservation into both landscape and architectural elements. Opportunities for renewable energy generation—such as solar incorporated into building roof systems and geothermal systems under recreational lawns—are incorporated to help offset future energy demands. The plan also aims to improve watershed health through a strategic partnership with the San Antonio River Authority to help restore the Salado Creek and improve the arboretum's capacity to be a filter for stormwater runoff. Preserving existing trees is a priority, recognizing their vital role in providing community-wide ecosystem services while also celebrating their role as witnesses to San Antonio's unique history.

ENGAGED PARTNERSHIP

The Arboretum integrates with an adjacent City of San Antonio Parks parcel and an 18-acre Bexar County Parks site, expanding green space access for neighbors as well as all of San Antonio. As a host to a segment of the Howard W. Peak Greenway along Salado Creek, located on a VIA Metropolitan Transit bus route, the Arboretum is connected to Brooks and greater San Antonio for alternative transportation.

The plan emphasizes improving Salado Creek's water quality and restoring its corridor in partnership with the San Antonio River Authority. Collaborations with the San Antonio Water System support recycled water use and water conservation education, further enhancing the County and City's stance on watershed management.

Grand Vision

Spanning over 200 acres, Arboretum San Antonio offers a unique nature experience for residents of San Antonio and Bexar County. Located along Salado Creek and connected to City and County parks via the Howard W. Peak Greenway, the Arboretum features diverse tree collections that highlight our deep connection to the land. It serves as a sanctuary for learning, exploration, and reflection, offering visitors the chance to connect with nature


CITY OF SAN ANTONIO PARCEL
BEXAR COUNTY PARK
WELCOME CENTER & CAFE

Master Plan

Grand Vision

This vision for Arboretum San Antonio is inspired by community input and designed to honor the site's trees. By focusing on the existing canopy, adding new tree collections, minimizing development, and restoring habitat, the Arboretum becomes a haven for nature and discovery. Visitors can explore Texas ecoregions through representative trees, climate-resilient landscapes, and Indigenous heritage through curated collections and immersive experiences.

Whether enjoying a nature program in the nature center or hiking the Hero Tree Trail, Arboretum San Antonio invites all to connect, learn, and grow with San Antonio's trees.

1. *Main Entry*
2. *Welcome Center & Cafe*
3. *Event Center*
4. *Bexar County Park & Playground*
5. *City of San Antonio Parks & Recreation*
6. *Pond Plaza*
7. *Pond & Boardwalks*
8. *Twin Oaks Gathering*
9. *Ethnobotanical Grove*
10. *The Canopy Walk*
11. *Nature Center & Amphitheater*
12. *Salado Creek*
13. *Outdoor Classroom*
14. *Education & Training Center*
15. *Research Fields*
16. *Operations & Maintenance Yard*
17. *Ephemeral Wetlands*
18. *South Trailhead*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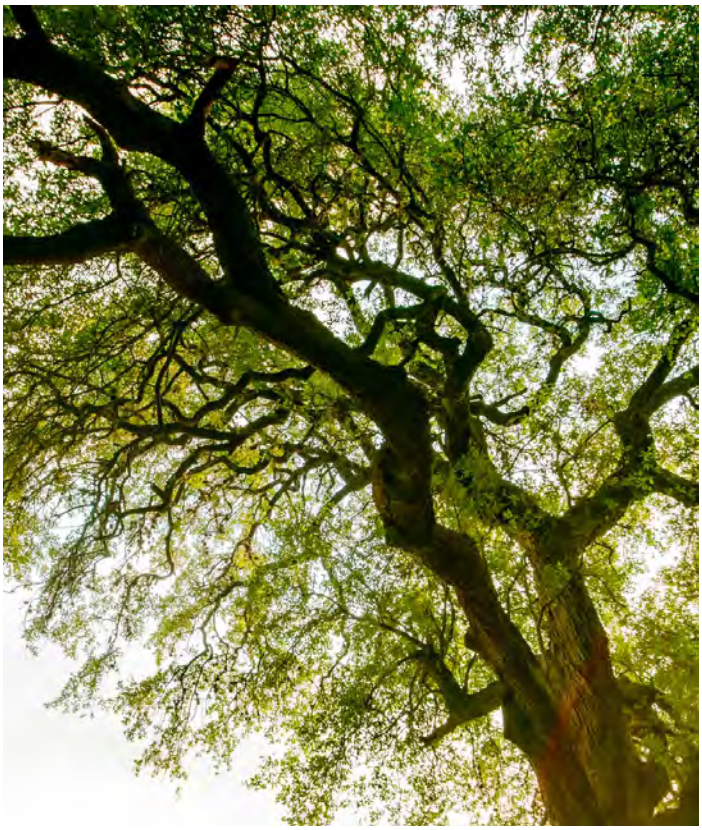
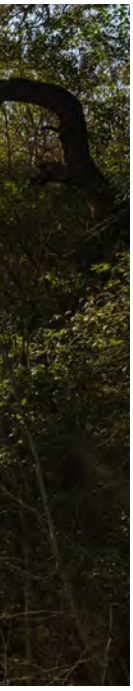
Mosaic of Landscapes

Unique Experiences

San Antonio is at the crossroads of four unique Texan ecoregions: The Edwards Plateau, Blackland Prairie, Post Oak Savanna, and South Texas Plains, bringing together iconic landscape characteristics sculpted by the San Antonio watershed. With its location on Salado Creek, Arboretum San Antonio is one of the best examples of where this mosaic of landscapes is witnessed firsthand.

A diverse canopy of nearly 40 species of trees and shrubs, accentuated by old-growth Texas persimmon, ash, pecan, and centennial live oak trees highlight a diversity of lowland and upland habitats. The Salado Creek corridor, ephemeral wetlands, and ponds showcase the importance of water and the species that depend on seasonal floods. Arboretum San Antonio showcases the beauty and fertility of the landscape that first attracted people to the region.






WELCOME CENTER
BEXAR COUNTY PARK
CITY OF SAN ANTONIO PARKS
EVENT CENTER
POND PLAZA
NATURE CENTER
CENTRAL VALLEY
EDUCATION + TRAINING
RESEARCH FIELDS
THE WILDS
SOUTH TRAILHEAD

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Welcome Center

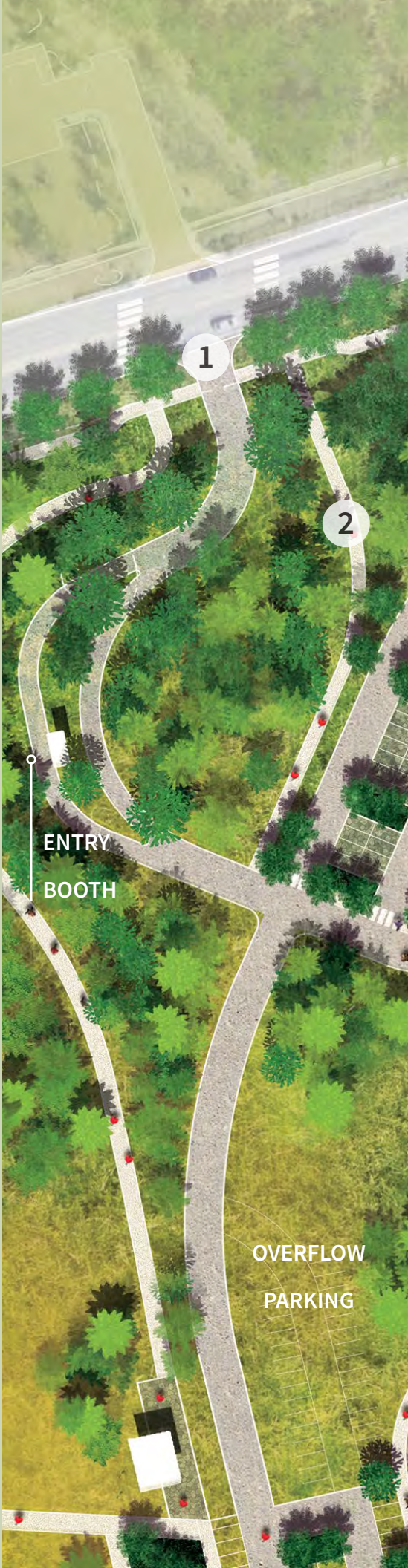
Welcoming Branches

At the heart of the Arboretum, the Core Campus welcomes visitors into a vibrant, living museum—a place where trees and community converge. As the primary entry point, this entry serves as a dynamic hub, guiding guests to a variety of immersive experiences. The Welcome Center anchors the space, offering not only essential visitor services but also a cultural museum, a destination restaurant, and offices for Arboretum staff. Just steps away, the gift shop and retail nursery invite guests to take a piece of the Arboretum home, with rare and regionally adapted trees, shrubs, and flowering plants.

Across the Oval Lawn, the Event Center provides a stunning venue for gatherings large and small, supported by a catering kitchen and beautifully designed outdoor rooms. A nearby maintenance yard discreetly supports daily operations, housing essential equipment and staff resources.

Surrounding these facilities, the landscape comes alive with interpretive tree collections, demonstration gardens, and spaces designed to teach and comfort. A grove of trees commemorates San Antonio's long-standing Military legacy, while a demonstration blackland prairie displays the beauty of native wildflowers and pollinators. Whether through kite festivals, live music, or hands-on learning, the Core Campus serves as a vibrant stage for connection between people and trees.

1. *Main Entry*
2. *Pedestrian Entry*
3. *Bus Parking*
4. *Bioswales*
5. *Retail Nursery*
6. *Welcome Center & Cafe*
7. *The Great Lawn*
8. *Texas Pollinator Garden*
9. *Veterans Grove*
10. *Operations & Maintenance Yard & Parking*
11. *Event Parking*




SAN ANTONIO SHADE TREES
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EL PASEO
FLOWERING CHERRY COLLECTION
SISTER CITY
COLLECTION
TEXAS OAK
COLLECTION
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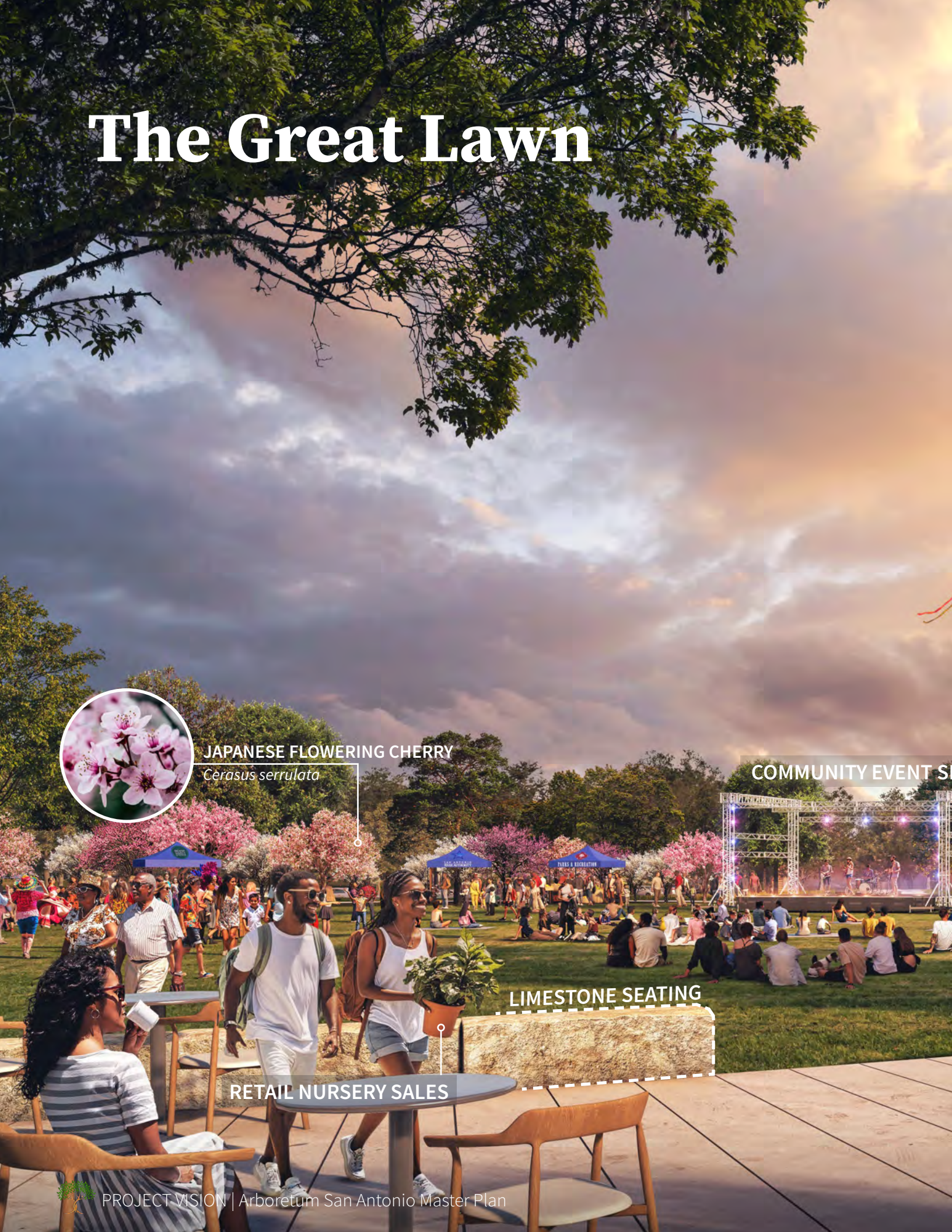
The Great Lawn

A Landscape for Community

The Great Lawn serves as the Arboretum's outdoor living room, connecting guests to trees and the mission of the Arboretum. Surrounded by tree collections that offer vibrant spring blooms and striking autumn colors, this formal open lawn is perfect for events, from live music performances to casual picnics and family photos. It provides a versatile backdrop for both everyday moments and special occasions, inviting visitors to engage with the natural world and the Arboretum's mission.

The Great Lawn




PACE
LIVE OAK
Quercus virginiana
TEXAS REDBUD
Cercis canadensis var. texensis
DAKOTA MOCK VERVAIN
Glandularia bipinnatifida

The Veterans Grove

A Landscape of Reflection

The Grove is a peaceful space for reflection and relaxation, offering visitors a quiet retreat close to parking and the Welcome Center. This area honors San Antonio's veterans, providing a gathering place for veterans, active-duty service members, and their families. Surrounded by a circle of enduring live oaks, the Grove is enhanced by plants like Turk's Cap and Scarlet Sage, evoking the iconic poppy mentioned in Lieutenant Colonel John McCrae's World War I poem, In Flanders Fields.

The Veterans Grove

AMERICAN SYCAMORE
Platanus occidentalis

SAVANNA RESTORATION

Prairie Rose
Rosa setigera

MILITARY HONORARY PLAQUES

PERVIOUS PAVEMENT


LIMESTONE SEATING
TURK'S CAP
Malvaviscus drummondii

Event Center

A Celebratory Landscape

The Event Center is the Arboretum's premier venue for both private and public events, providing a versatile space for gatherings of all sizes.

Outside, covered terraces and two outdoor event lawns are complemented by seasonal gardens, spring-flowering trees, and a tranquil pond, offering stunning photo opportunities. Whether hosting one event or multiple, the indoor and outdoor spaces ensure flexibility—rain or shine.

A dedicated parking area ensures easy access for guests while also serving as overflow parking during peak visitation times. As a key source of earned revenue, the Event Center plays an important role in supporting the Arboretum's growth and sustainability, all while offering a beautiful setting for unforgettable moments.

1. *Event Center*
2. *Event Parking*
3. *Prairie Room Lawn*
4. *Forest Room Lawn*
5. *Ornamental Native Gardens*
6. *Demonstration Blackland Prairie*
7. *Ornamental Native Trees*
8. *Pond Overlook Pavilion*


SISTER CITIES
COLLECTION
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EL PASEO
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The Event Center

A Landscape of Special Gatherings

Designed to minimize impact on regular visitors, the center offers multiple climate-controlled rooms, each supported by a large catering kitchen. With movable walls, the space can accommodate up to 500 guests, making it ideal for everything from intimate gatherings to large conferences or simultaneous events.

The event lawns frame the view to the Pond through the forest edge and to the expansive Prairie landscape, offering stunning backdrops for event goers.

The Pond Plaza

An Ecologically Rich Wetland

The Pond Plaza is a revitalization of the former golf course irrigation pond, transforming it into a key ecological feature that enhances water filtration and stormwater management. This space captures and purifies runoff from surrounding residential neighborhoods through a biofilter and fore bay, allowing sediment to settle before entering the pond. Planted wetlands, varied water depths, and riparian tree collections provide vital habitat for migratory shorebirds and waterfowl, creating a peaceful haven for wildlife.

Visitors can explore these sensitive areas via a network of boardwalks, offering opportunities for birdwatching and observing aquatic life. At the heart of the Pond Plaza is a picnic pavilion and terrace, providing essential amenities like restrooms, water, and an indoor cooling station for warmer days. An outdoor terrace, shaded by trees, offers a serene space for group picnics and school field trips, making this area an inviting destination for both relaxation and environmental education.

1. *Pond View Picnic Plaza*
2. *Weltand Boardwalk*
3. *Pond Overlook Pavilion*
4. *Pond Point Picnic Plaza*
5. *Cypress Island*
6. *Filtration Wet Meadow*
7. *Twin Oaks Gathering*
8. *Agroforestry Collections*
9. *Drainage Outfall*


EL PASEO
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HISPANIC CULTURE
TREE COLLECTION
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WETLAND TREE
COLLECTION
EL PASEO
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WETLAND
FOREBAY
ROSE
COLLECTION
PECAN
COLLECTION
OLIVE & LILAC
COLLECTION

The Pond Plaza

A Landscape of Water

As an ecological gem, the pond plaza enhances water filtration and provides recycled water for the irrigation of the Arboretum's collections. An enhanced wetland edge creates habitat for shorebirds and waterfowl, making it an ideal space for beginner-birders.

Accessible boardwalks allow visitors to explore these sensitive areas, learn about wetland ecosystems and the importance of water conservation in San Antonio.

The Pond Plaza


SPANISH DAGGER
Yucca gloriosa
MONARCH
Danaus plexippus
PICKERELWEED
Pontederia cordata

Central Valley

An Edible & Medicinal Collection

Nestled between Salado Creek and the Pond Plaza, the Central Valley offers a dynamic landscape focused on ethnobotany, Indigenous plant uses, and food production. Visitors can explore a variety of food-producing plants, including a grove of Texas- and San Antonio-specific pecan varietals. At the heart of the valley is the Twin Oaks Gathering, an outdoor meeting space shaded by two majestic, centennial live oaks. This space serves as both a living pantry and an educational opportunity, fostering a deeper connection to the land and trees.

1. *Twin Oaks Gathering*
2. *Low Flow Water Filter*
3. *Agroforestry Collections*
4. *Curator's Council Circle*
5. *Pecan Varietals Collection*
6. *The Canopy Walk*
7. *Rock Creek Crossing*
8. *Blackland Prairie Restoration*
9. *Teaching & Research Savanna*
10. *Teaching & Research Savanna*


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SALADO CREEK
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SALADO CREEK

The Canopy Walk

A Passage Through the Trees

The Canopy Walk offers visitors a unique opportunity to connect with nature by exploring the lush riparian forest along Salado Creek. Elevated viewing decks provide an immersive experience for birdwatching and tree identification while educational panels teach visitors about forest ecology and local wildlife. Landscape art made as large bird-nest inspired structures helps visitors experience life like a bird or an insect living in the forest canopy.

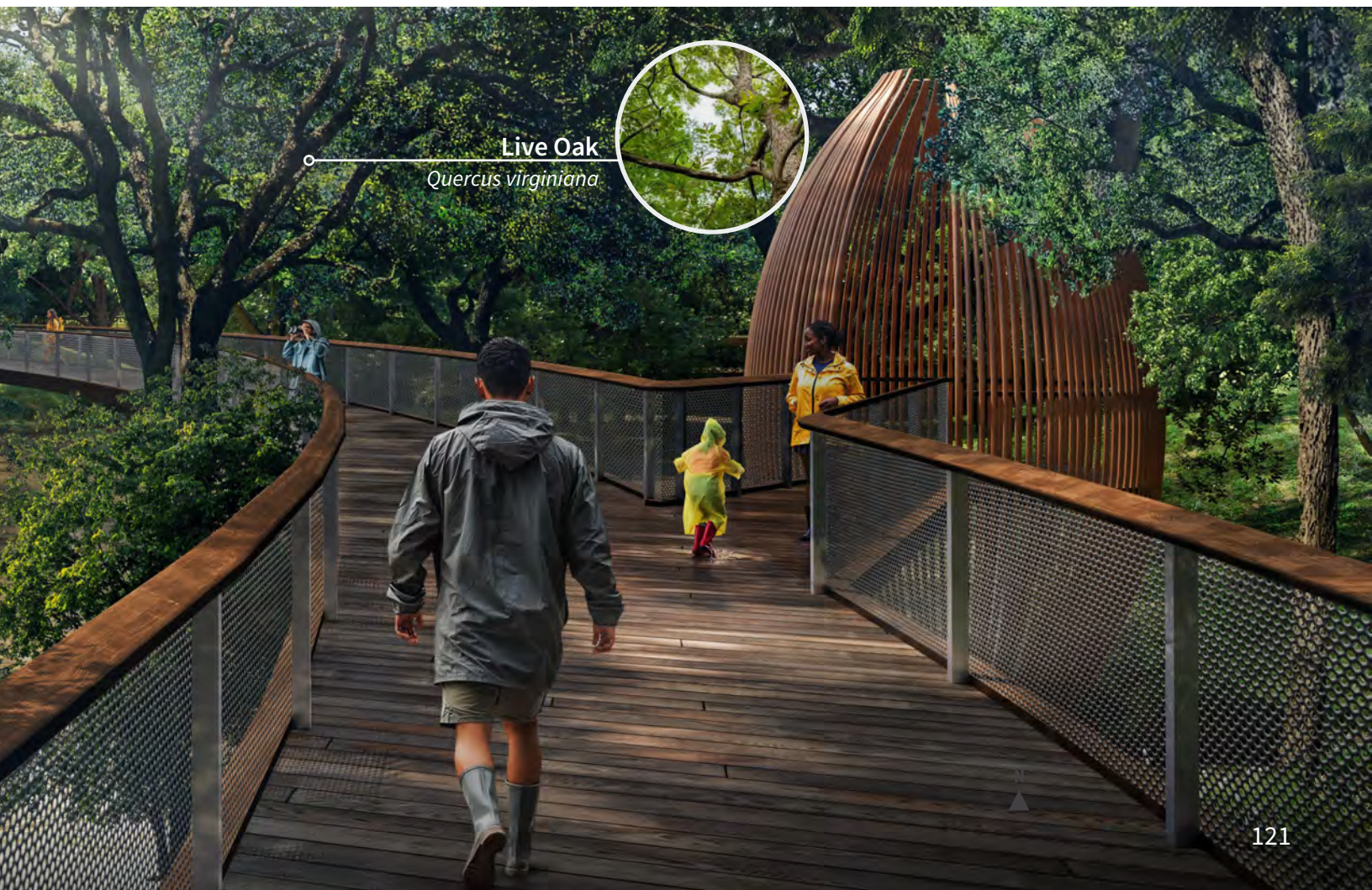
The Canopy Walk

A Dynamic Landscape

During intense storms, the canopy walk offers a safe vantage point to learn firsthand about the power of water, the role of trees in stormwater mitigation, and how we can better protect the San Antonio River watershed. The vantage point also allows visitors to see how the creek gathers and carries debris during floods from throughout the watershed. This understanding will help visitors understand how interconnected water systems throughout the region are.

The Canopy Walk


IMMERSIVE ART

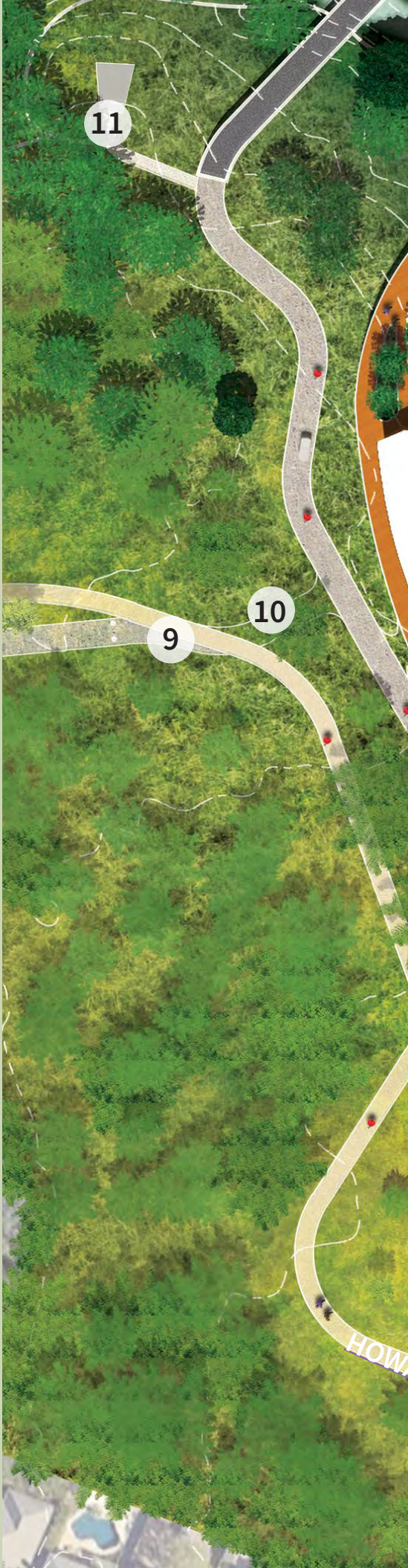

Live Oak
Quercus virginiana

Nature Center

A Gathering Space

The Nature Center enhances the Arboretum's educational offerings, serving as a unique venue for K-12 classes and groups like the Native Plant Society and Texas Audubon. Integrated into the hillside, the building features rentable classrooms, office space for education staff, and an interactive exhibit on San Antonio's ecoregions and the vital role of trees. Its accessible green roof, a pollinator garden, offers stunning views of the forest and blackland prairie. Visitors can also enjoy live performances and lectures in the hillside amphitheater.

1. *Nature Center*
2. *Accessible Green Roof*
3. *Amphitheater*
4. *The Canopy Walk*
5. *Rock Creek Crossing*
6. *Blackland Prairie Restoration*
7. *Staff & Specialty Parking*
8. *Mesquite Savanna*
9. *Emergency & O&M Access*
10. *Greenway Connection & Bike Parking*
11. *Park Overlook*

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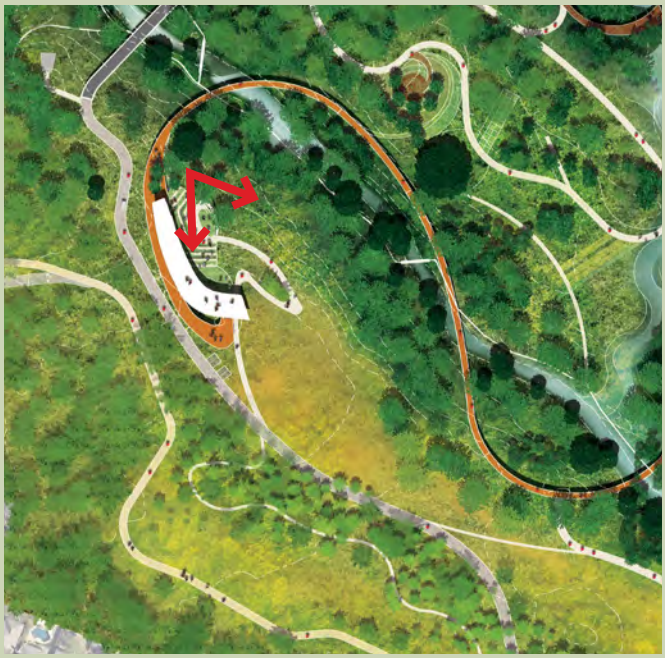
The Amphitheater

A Landscape for Cultural Celebration

The Amphitheater, nestled against Salado Creek and a lush forest backdrop, offers a unique space for performances, lectures, and community gatherings. Its tiered limestone seating provides an intimate setting for visitors to connect with trees while enjoying educational and cultural events. The Nature Center's green roof overlook further enhances the experience, offering breathtaking views of the canopy and restored blackland prairie.



The Amphitheater

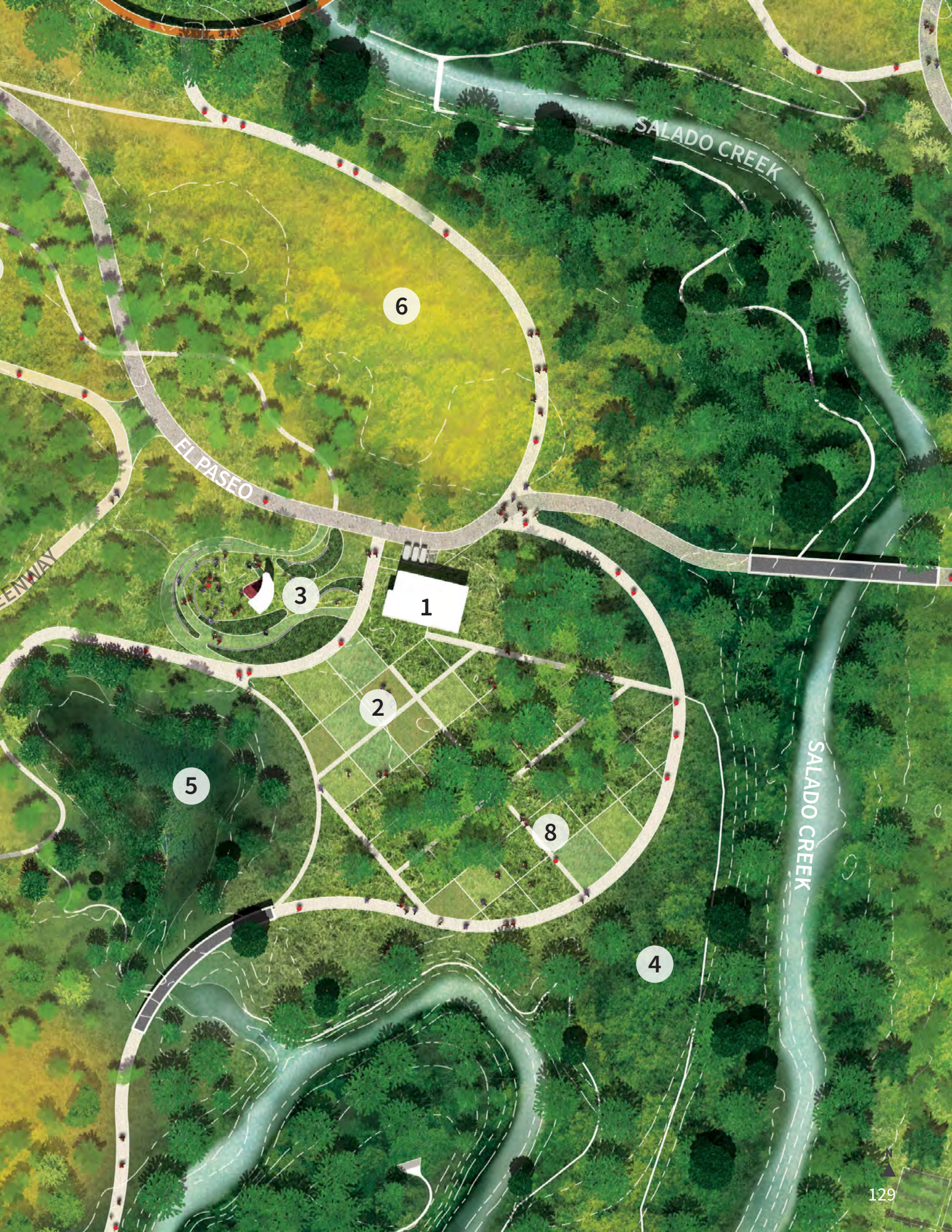

FIREWHEEL
Gaillardia pulchella

Education & Training Center

A Place for Discovery

The Education and Training Center serves as a meeting place for outdoor training and research, offering diverse spaces for study, including research plots, a field station, and an outdoor classroom. Located near habitats like an ephemeral wetland, riparian forest, blackland prairie, and Salado Creek, it supports college and university students and faculty with space to study and conduct field experiments. An existing canopy with diverse tree species will serve professional associations such as the San Antonio Arborist Association with field training and testing. The center features conditioned classrooms, restrooms, and equipment storage indoors, while shaded outdoor classrooms provide a setting for hands-on, field-based learning among trees.

1. *Training Center*
2. *Research & Testing Plots*
3. *Outdoor Classroom*
4. *Arborists' Woods*
5. *Teaching Wetland*
6. *Teaching Savanna*
7. *Legume Forest*
8. *Trees of San Antonio 2100*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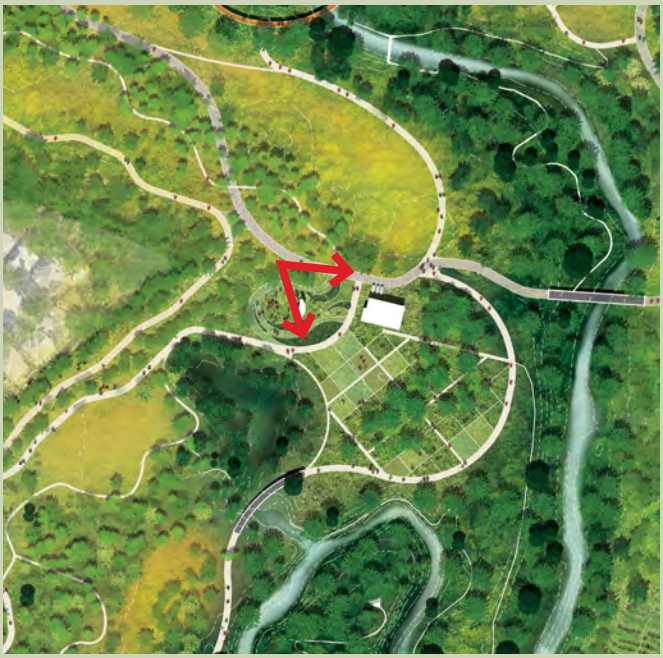
The Outdoor Classroom

A Landscape of Learning

The outdoor classroom is an accessible, shaded space designed for classes, tour groups, and summer camps. Nestled among native and adapted plants of San Antonio, it offers a unique setting for lectures and discussions. With views of the nearby Education and Training Center and tree research plots, the classroom provides an immersive environment for learning and exploration.



The Outdoor Classroom

BLACK DALEA
Dalea frutescens

PRAIRIE SUMAC
Rhus lanceolata

PASSIONFLOWER
Passiflora incarnata

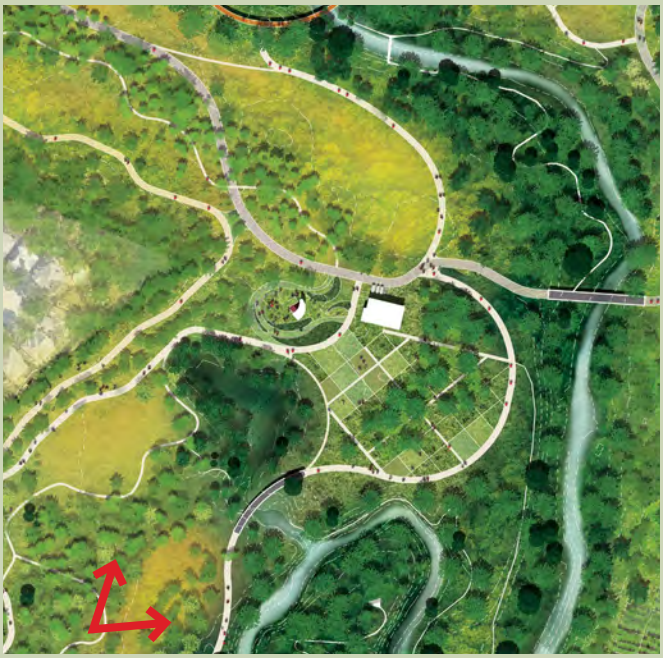
THREAD LEAF YUCCA
Yucca filamentosa

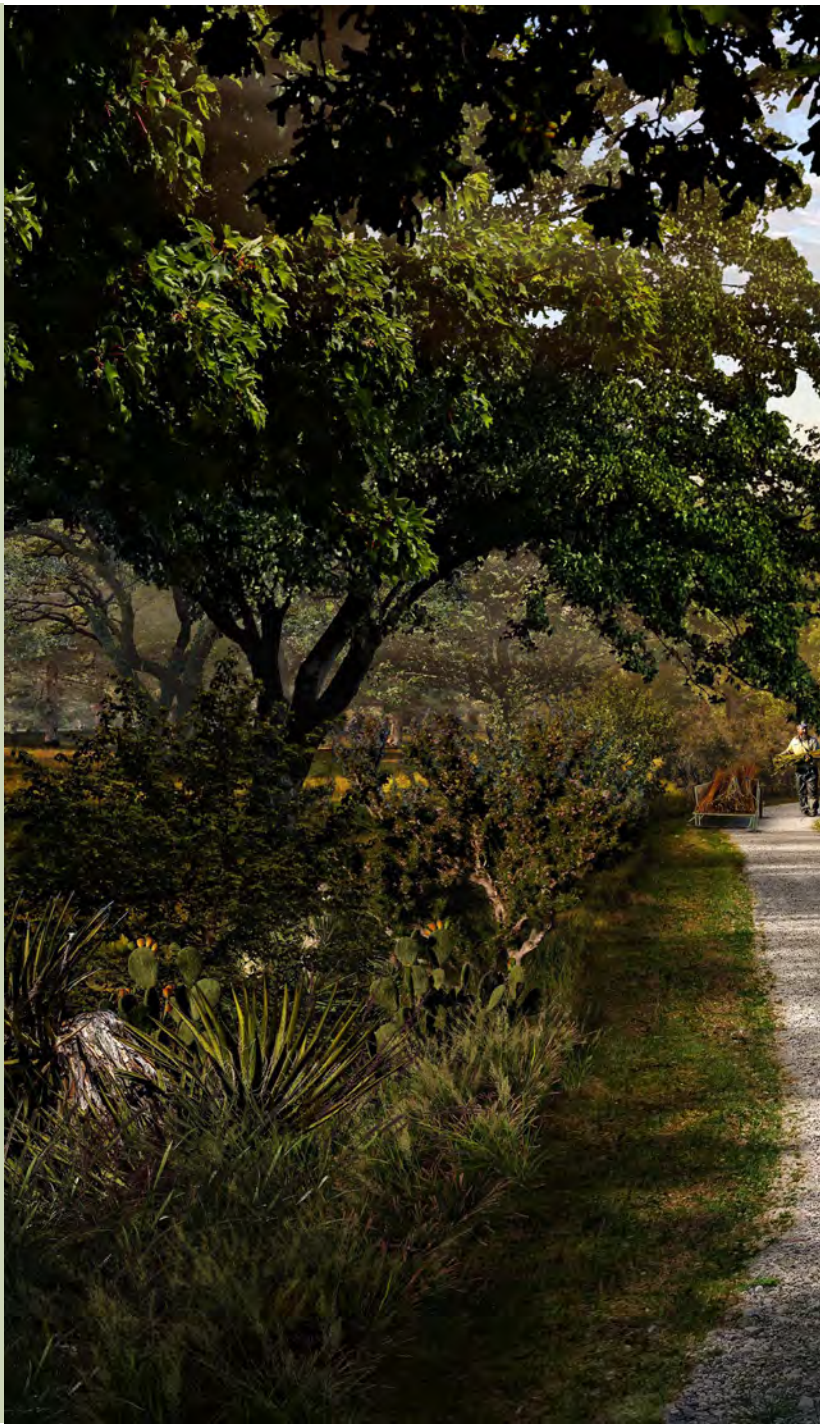

DEWBERRIES
Mahonia trifoliolata
AGARITA
Mahonia trifoliolata

The Savanna

A Landscape of Collections

As an interpretive tie between ecological restoration and ethnobotanical collections, The Savanna is a working and learning landscape, which highlights the importance of Indigenous practices in the landscape. These vast savannas, which served as bountiful hunting and gathering grounds for food and medicine, help to reconnect visitors to the trees and landscape through curated collections, Indigenous foods, and educational workshops.





The Savanna

TEXAS PERSIMMON
Diospyros texana

ECOLOGICAL MANAGEMENT

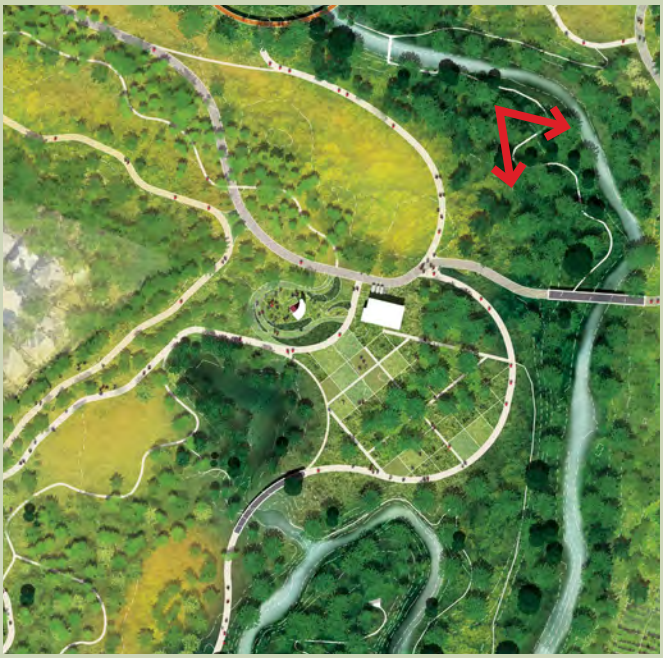
RED HARVESTER ANT
Pogonomyrmex barbatus


SPANISH DAGGER
Yucca gloriosa
ETHNOBOTANICAL SURVEYS
PRICKLY PEAR CACTUS
Opuntia basilaris
SAND DROPSEED
Sporobolus cryptandrus

The Trails

A Place to Breathe Deeply

This landscape offers the opportunity to be immersed in the “cathedral of trees” and “get lost in nature” on one of many trails that visit the Arboretum’s oldest tree specimens, educational tree collections, and habitat restoration areas. Early in the morning, one can hear a diverse array of migratory birds that stop by San Antonio on their annual migration. Early in the evening, one can forest bathe as a respite from the summer heat. The trails at Arboretum San Antonio reconnect us to the wilds of the landscape, its trees, and animals.



The Trails

OSAGE ORANGE
Maclura pomifera

WOOD FERN
Thelypteris kunthii


American Elm
Ulmus americana
BOX ELDER
Acer negundo
SAW GREENBRIAR
Smilax bona-nox
RIVER OATS
Chasmanthemum latifolium

Nursery Fields

A Testing Ground for Trees

Located on the southwestern side of the Arboretum, framed by a utility easement and Salado Creek, the tree nursery and research fields are a vital operational area. Accessible from the I-410 service road, this entrance allows researchers, employees, and tree deliveries to bypass the main visitor entrance. Equipped with shade frames, hoop houses, and a flood-resistant building, the nursery supports the growth, trial, and research of various tree species for municipal projects, commercial sale, and Arboretum collections, ensuring sustainability and innovation in plantings.

1. *East O & M Entrance*
2. *Nursery Service Barn & Offices*
3. *Propagation Hoop Houses*
4. *Sapling Shade Houses*
5. *Commercial Nursery Fields*
6. *Varietal Test Plots*
7. *Climate Adaptive Tree Test Plots*
8. *Service Drive*
9. *Material Yard*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The Research Plots

A Landscape for Investigation

The Production and Research Nursery provides ample space to phase in fields and testing plots to trial trees for introduction at the Arboretum, observe for environmental and pest resilience, or cultivate for the retail nursery. As a back-of-house Arboretum program, the Nursery provides amenities and access to staff and researchers that are easily separated from the regular visitor experience. In this area, cafe green waste can be composted, biomass chipped for use in trail dressings, and Arboretum supplies and materials securely stored. Spaces include an Operations Barn , Hoop and Shade Houses, Material Storage and Compost Yard, Tree Fields, and Research Plots.

South Trailhead

Connected to San Antonio & Beyond

The South Trailhead serves as the southern entry to the Arboretum, accessible via the Howard W. Peak Greenway. A service building provides restroom facilities, water, and a cooling space for visitors during hot weather. It also houses security and operational staff, along with landscape equipment storage. Adjacent to the outpost is a restored wetland that filters stormwater from the nearby Woodbridge at Monte Viejo neighborhood. A variety of paved and rustic trails offer walkers, runners, and bikers the chance to enjoy the restored landscape at their own pace, enhancing their connection to nature.

1. *Service & Security Outpost*
2. *Howard W. Peak Greenway South Entrance*
3. *Arboretum South O&M Entrance*
4. *The Wilderness Wetland Boardwalk*
5. *Restored Ephemeral Wetland*
6. *Bird Blinds*
7. *Rustic Trails*
8. *Dedicated Walking Trail*


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The Howard W. Peak Greenw

Running along Arboretum San Antonio's western and southern boundary is The Howard W. Peak Greenway, which connects a series of County and City parks along Salado Creek. Designed as a multimodal path, emphasizing accessibility and safety, the Greenway is designed for path redundancy, allowing walkers, runners, and bikers space to separate and experience the Arboretum's landscapes, whether on foot or by bike.

vay

The Greenway

TEXAS EBONY
Ebenopsis ebano

HONEY MESQUITE
Neltuma glandulosa

BLACK WILLOW
Salix nigra

RESTORED WETLAND


POST OAK
Quercus stellata
CEDAR ELM
Ulmus crassifolia
SEPARATED WALKING PATHS
LANDSCAPE RESTORATION
Arboretum San Antonio Restoration Ahead

7 *The Collections*

A Tapestry of Collections

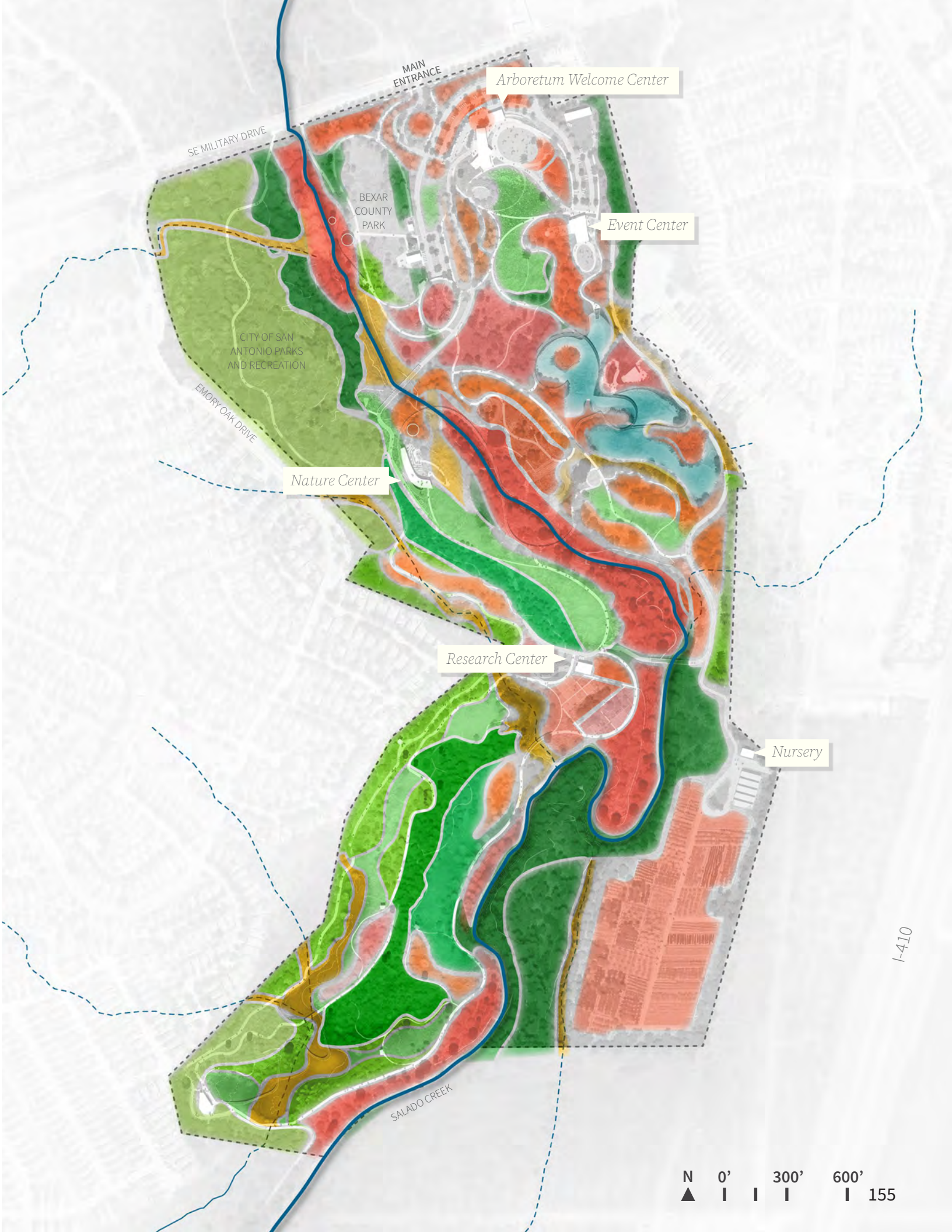
The Collections

TREES AS THE FOUNDATION

The collections at the arboretum are envisioned as a dynamic and living tapestry—woven from the remarkable diversity of trees and plant communities that shape both the region and our relationship to its land. The collections are thoughtfully organized to reflect a broad spectrum of ecological, cultural, scientific, and practical values and offer something beautiful to enjoy in every season.

From regional highlights that showcase the most resilient and iconic trees for San Antonio, to taxonomic groupings like the *Oaks of Texas*, the *Legume Grove*, and the *Pecan Forest*, each collection offers a different lens into the botanical richness of Texas, North America, and beyond. Cultural collections honor the deep connections between people and plants, exploring ethnobotanical traditions, Indigenous uses, Hispanic cultural landscapes, and the sensory and therapeutic power of trees. Agroforestry and research-focused areas support innovation in environmental stewardship and climate adaptation, including forward-looking collections like *San Antonio 2100*. At the heart of it all, the *Hero Tree collections* are enhanced by ecological restoration collections—featuring Prairie, Upland Forest, Savanna, and Riparian landscapes—reconnecting visitors with the historic trees and native habitats that once thrived here, offering a living classroom for restoration, resilience, and renewal.

Together, these collections tell the story trees from Texas and beyond in all their forms—scientific, cultural, and ecological.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Nature Center
Research Center
Nursery
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Tree Collections

The Collections

TREES AS THE INSPIRATION

The tree collections are envisioned as a vibrant and living library that celebrates the beauty, diversity, and cultural significance of trees, both native to Texas and globally connected. Organized across a series of thoughtfully curated categories, these collections highlight the many ways trees shape our environment, identity, and future.

From our Hero Trees—the largest and most majestic specimens on site—to selections of Great Trees for San Antonio that showcase resilience and performance in our local climate, each collection is designed to educate and inspire. Taxonomic collections delve into the biological richness of plant families such as oaks, legumes, walnuts, and roses, while cultural collections explore the deep-rooted relationships between people and plants, including trees significant to Indigenous traditions, Hispanic heritage, and therapeutic landscapes. Agroforestry collections demonstrate the intersection of ecological function and productive land use, and the Research and Teaching collections support hands-on learning for students, land managers, and scientists. Looking ahead, the San Antonio 2100 collection addresses the role of trees in adapting to a changing climate, featuring species selected for future resilience.

Together, these tree collections form a diverse and interconnected story—one that honors the past, engages the present, and prepares us for the landscapes of tomorrow.

1 **Hero Trees**

Great Trees for San Antonio
- 2.1 San Antonio Native Shade Trees
- 2.2 Ornamental Natives of San Antonio
- 2.3 Sister City Collection
- 2.4 Cherry Collection

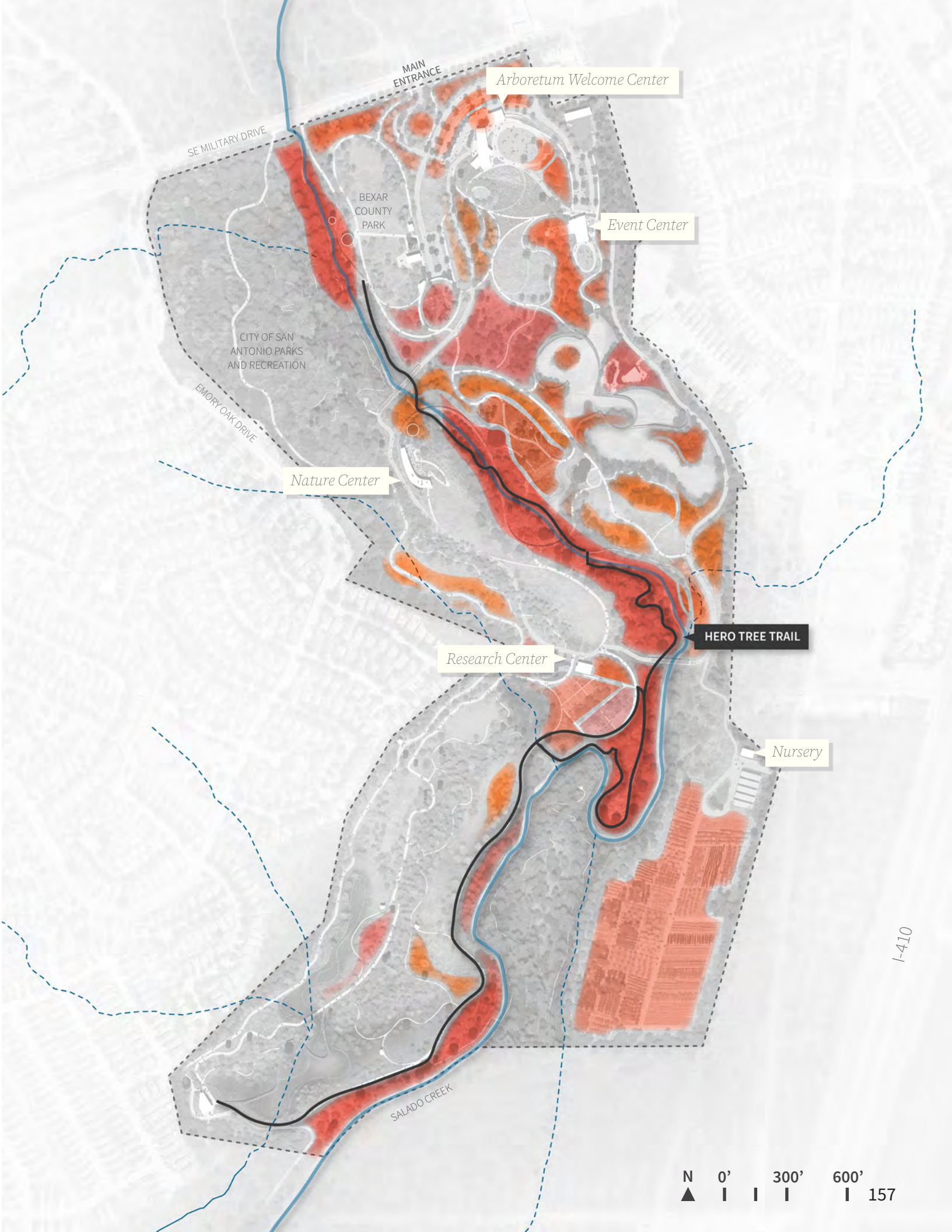
Taxonomic Collections
- 3.1 Oaks of Texas (Quercus)
- 3.2 The Roses (Rosaceae)
- 3.3 The Legumes (Fabaceae)
- 3.4 The Olives (Oleaceae)
- 3.5 The Walnuts (Juglandaceae)
- 3.6 The Elms (Ulmaceae)
- 3.7 The Cypresses (Cupressaceae)
- 3.8 The Pines (Pinaceae)
- 3.9 Pecan Varietals

Cultural Collections
- 4.1 Indigenous Ethnobotanical Collections
- 4.2 Sensory and Therapy Trees
- 4.3 Trees as Represented in Hispanic Culture
- 4.4 Trees for Small Spaces
- 4.5 Trees for Arid Environments
- 4.6 Threatened and Endangered Species
- 4.7 Wetland Tree Collection

Agroforestry
- 5.1 Food and Agroforestry (Native)
- 5.2 Food and Agroforestry (Adapted)

6 **Research and Teaching**

7 **San Antonio 2100**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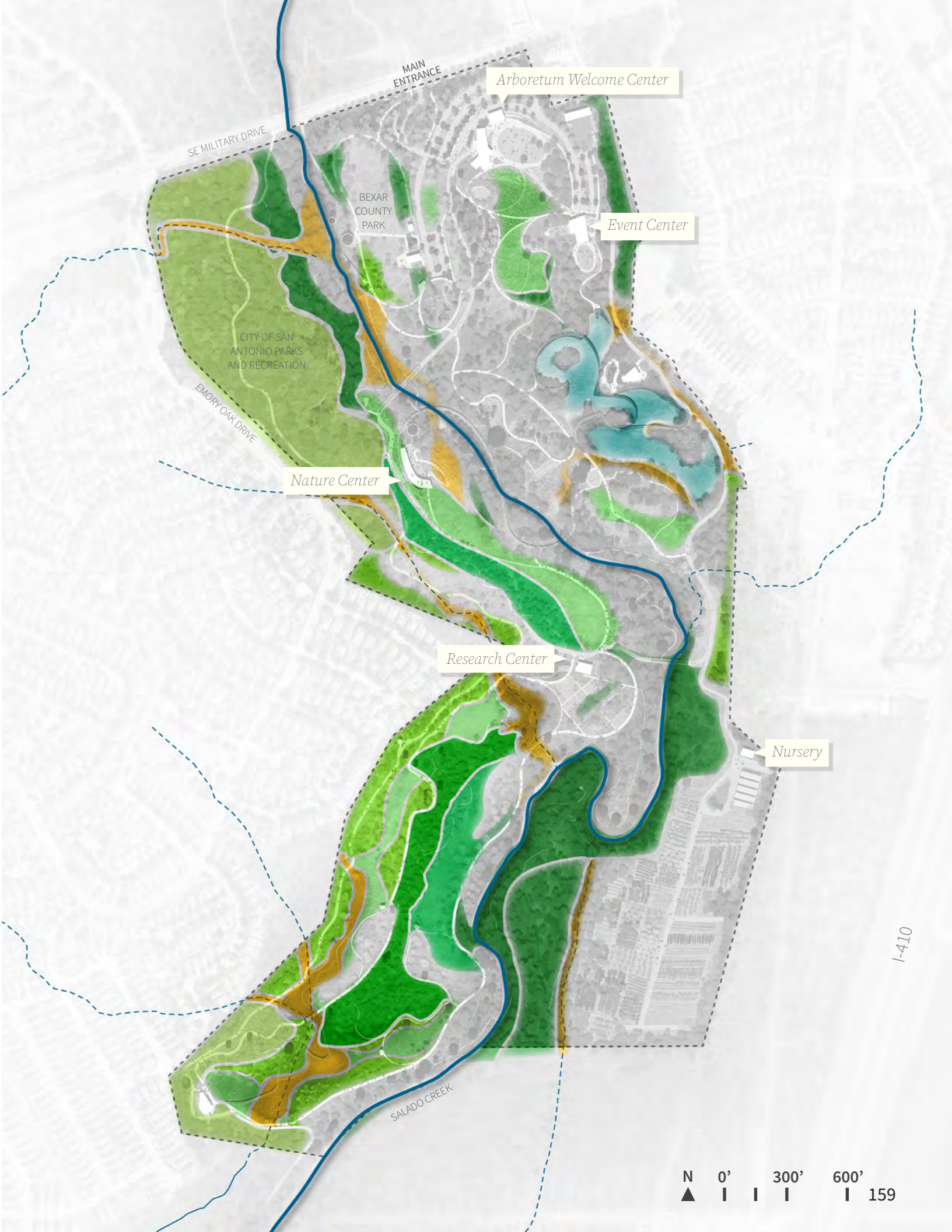
Ecological Collections

The Collections

COLLECTIONS AS RESTORATION

Deeply integrated into the geography, ecology, and hydrology of the site and southern Texas, the ecological collections focus on showcasing Texas trees in their natural plant communities. The goal of ecological collections is to highlight restored ecological complexity and diversity of the diverse landscapes and plant communities that exist or may have existed on the site historically. Through thoughtful restoration and habitat-based design, the arboretum will inspire a deeper understanding of native ecology, support conservation efforts, and serve as a dynamic resource for scientists, students, environmental stewards, and nature enthusiasts interested in restoring and sustaining Texas' natural heritage.

These collections serve as restoration models, showing how tree species interact with their broader plant communities in natural ecosystems.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Hero Tree Collection

Tree Collections

CELEBRATING THE ELDERS

The Hero Tree Collection preserves and celebrates the majestic old-growth trees that have stood for centuries at the arboretum. These living monuments, some over three hundred years old, embody the cultural history and ecological significance of San Antonio and Southern Texas. Through a thoughtfully curated trail system, visitors can experience these remarkable trees—including ancient Live Oaks, Black Willows, Cedar Elms, and Pecan trees—that honor the past, protect the present, and inspire for generations to come.

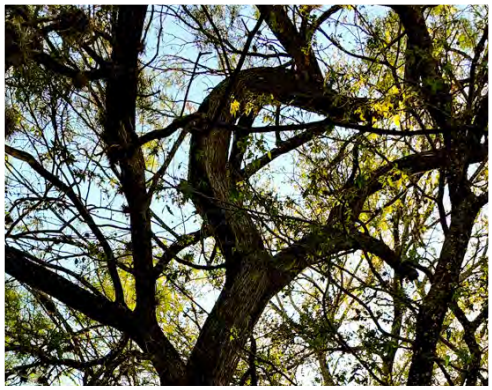
Each tree is a living legacy, telling a unique story of the site's ecology, hydrology, and community, who—together—allow these specimens to thrive.

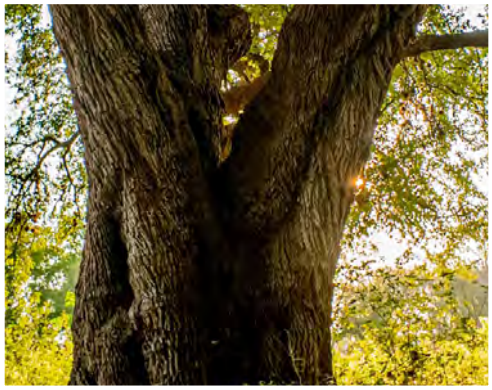
1 **Hero Trees**

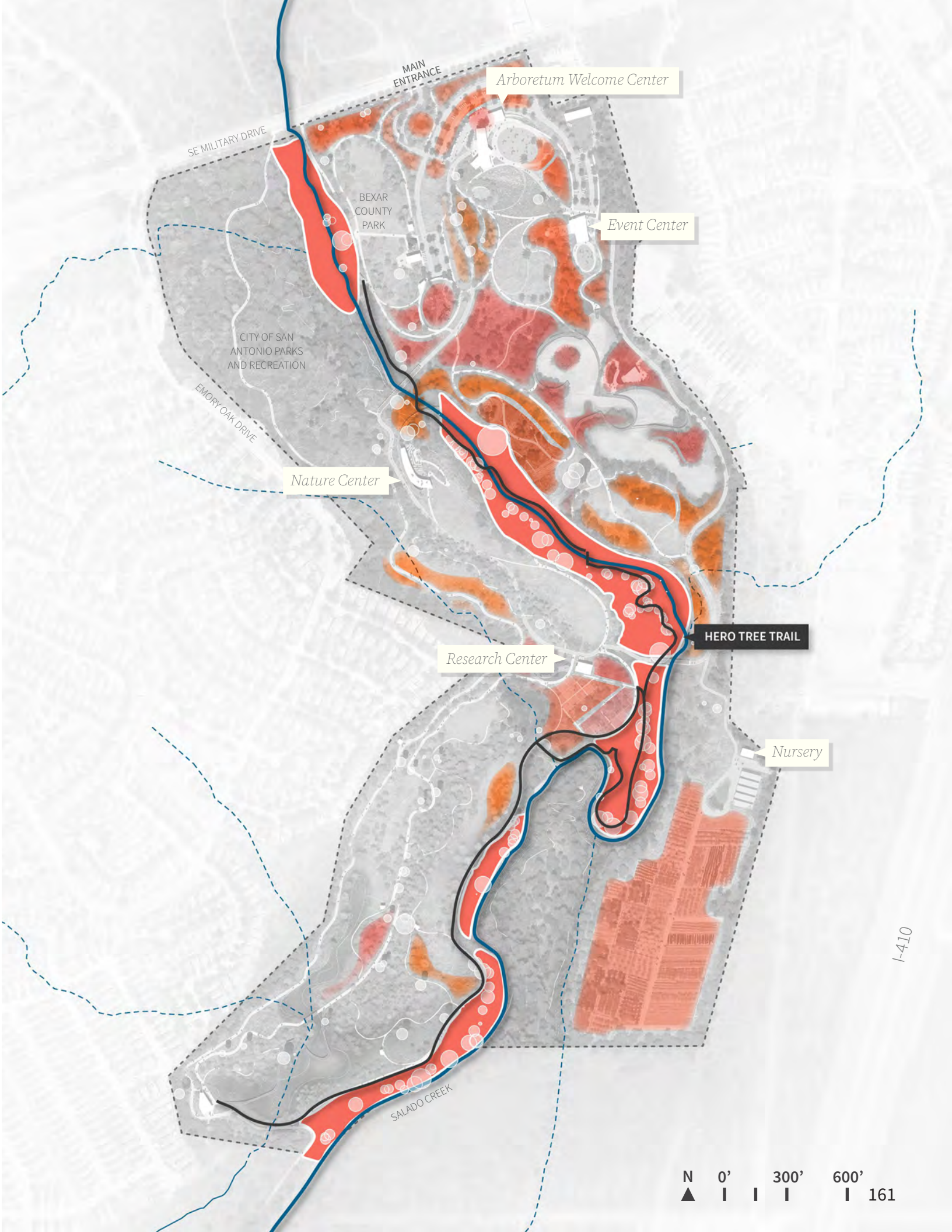
Surveyed Hero Trees

- **Black Willow**, *Salix nigra*
- **Boxelder**, *Acer negundo*
- **Cedar Elm**, *Ulmus crassifolius*
- **Green Ash**, *Fraxinus pennsylvanica*
- **Hackberry**, *Celtis laevigata*
- **Honey Mesquite**, *Proposis glandulosa*
- **Live Oak**, *Quercus virginiana*
- **Mulberry**, *Morus rubra*
- **Osage Orange**, *Maclura pomifera*
- **Pecan**, *Carya illinoinensis*
- **Western Soapberry**, *Sapindus saponaria*
- **Texas Persimmon**, *Diospyros texana*

**Refer to site tree survey for full details.*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Trees for San Antonio

Tree Collections

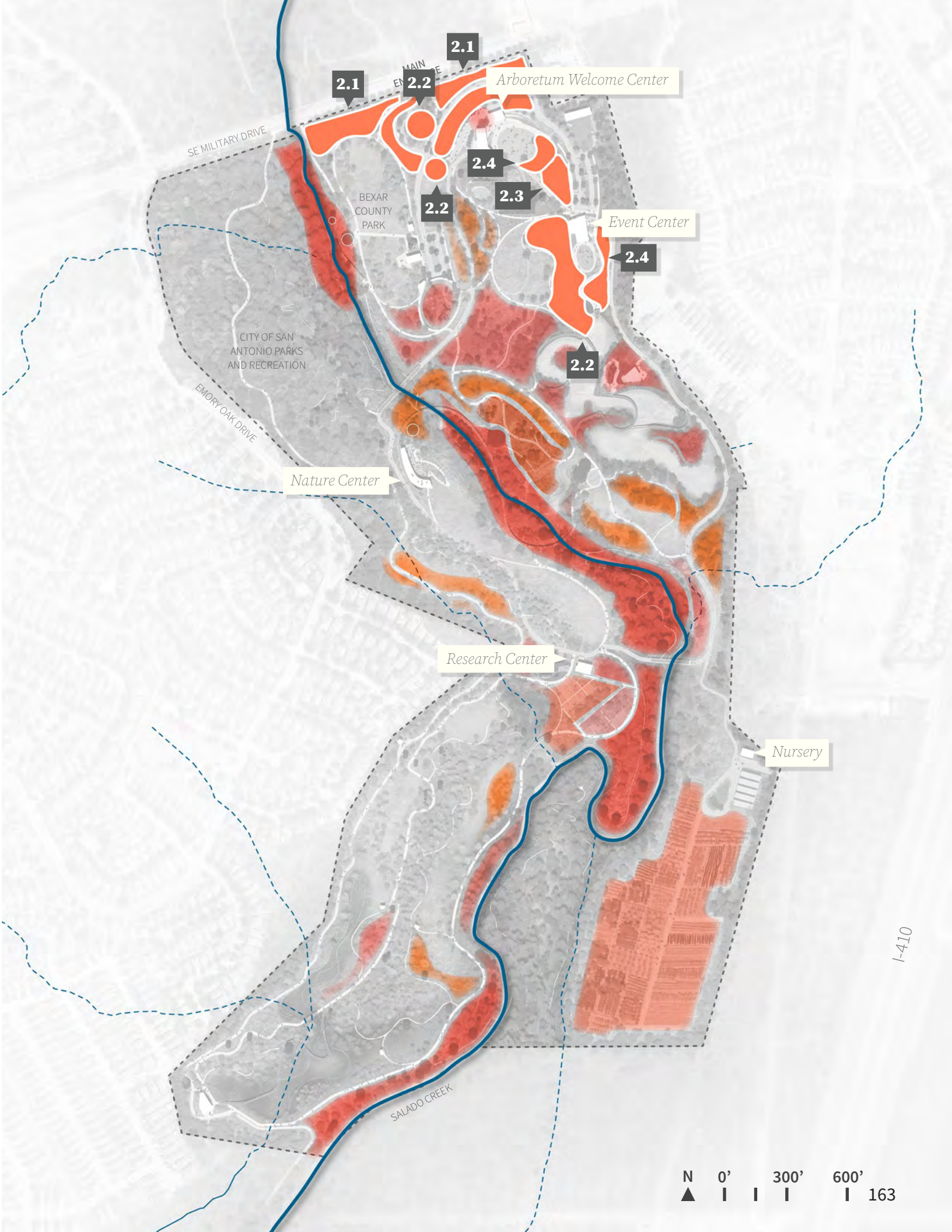
HONORING THE CITY

Explore over 30 native and adapted trees and shrubs that make up San Antonio's diverse urban forest and learn what to plant in your yard. From shade trees that help to cool our homes, to trees that produce foods and medicines to promote self-sustainability, learn about the many benefits trees provide in San Antonio and Bexar County.

San Antonio lies within the USDA 8B hardiness zone, which means plants adapted to this landscape tolerate extremely high temperatures in the summer, while also dealing with some amount of cold and frost in particularly cold winters. While our climate is generally changing, we're often seeing greater temperature changes, prolonged drought, and sudden, heavy storms. San Antonio is located at the convergence of two global eco-regions, desert shrublands and temperate grassland and savannas.

Great Trees for San Antonio

2.1 San Antonio Native Shade Trees
2.2 Ornamental Natives of San Antonio
2.3 Sister City Collection
2.4 Cherry Collection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2.1 Native Shade Trees

This collection at the arboretum celebrates iconic native shade trees that define the city's landscape. These shade trees are not only beautiful additions to any streetscape or garden but also reduce the urban heat island effect, creating greater levels of thermal comfort in your own backyard and across the city.

EXAMPLE SPECIES

Upland – Drier

- **Bur Oak**, *Quercus macrocarpa*
- **Monterrey Oak**, *Quercus polymorpha*
- **Texas Ash**, *Fraxinus albicans*
- **Bigtooth Maple**, *Acer grandidentatum*
- **Chinqapin Oak**, *Quercus muehlenbergii*
- **Cedar Elm**, *Ulmus crassifolia*

Lowland – Wetter

- **Anacua,** *Ehretia anacua*
- **Mexican Sycamore**, *Platanus mexicana*
- **Texas Red Oak**, *Quercus buckleyi*
- **Pecan**, *Carya illinoinensis*
- **Live Oak**, *Quercus virginiana*
- **Hackberry**, *Celtis occidentalis*

2.2 Ornamental Natives

The collection showcases a stunning array of species that enhance the region's natural beauty while supporting ecosystems. Highlights include the Mexican Buckeye (*Ungnadia speciosa*), known for its delicate pink flowers in spring, and the striking Desert Willow (*Chilopsis linearis*), with its elegant, trumpet-shaped blooms. The Evergreen Sumac (*Rhus virens*) adds year-round interest with its glossy foliage and small clusters of white flowers. All specimens are carefully selected for their ability to thrive in San Antonio's climate, adding both aesthetic appeal and environmental interest to the landscape.

EXAMPLE SPECIES

Upland – Drier

- **Desert Willow**, *Chilopsis linearis*
- **Evergreen Sumac**, *Rhus virens*
- **Mexican Buckeye**, *Ungnadia speciosa*
- **Eve's Necklace**, *Styphnolobium affine*
- **Texas Mountain Laurel**, *Sophora secundiflora*
- **Retama**, *Parkinsonia aculeata*

Lowland – Wetter

- **Anacua**, *Ehretia anacua*
- **Wafer Ash**, *Ptelea trifoliata*
- **Red Buckeye**, *Aesculus pavia*
- **Texas Red Bud**, *Cercis canadensis var. texensis*
- **Mexican Redbud**, *Cercis canadensis var. mexicana*
- **Eastern Redbud**, *Cercis canadensis*
- **Mexican Plum**, *Prunus mexicana*
- **Buttonbush**, *Chionanthus virginicus*






2.3 Cherry Collection

Nestled within the vibrant welcome landscape at the arboretum, the Japanese Cherry Tree Collection offers a captivating display of seasonal beauty, cultural heritage, and cherry diversity. This collection features a curated selection of ornamental cherry trees (Prunus spp.), with a focus on species and cultivars originating from Japan — renowned for their variety and historical significance.

Whether you're visiting during peak bloom or enjoying the canopy in summer shade, the Japanese Cherry Tree Collection invites guests to participate in Japan's hanami (flower viewing) culture.

EXAMPLE SPECIES

Upland – Drier

- **Sandhill Plum**, *Prunus angustifolia*
- **Carolina Cherry**, *Prunus caroliniana*
- **Western Sand Cherry**, *Prunus besseyi*
- **Nanking Cherry**, *Prunus tomentosa*
- **Black Cherry**, *Prunus serotina*
- **Mexican Plum**, *Prunus mexicana*
- **Chokecherry**, *Prunus virginiana*
- **Texas Wild Plum**, *Prunus texana*

Lowland – Wetter

- **Purpleleaf Sand Cherry**, *Prunus × cistena*
- **Kanzan Cherry**, *Prunus serrulata 'Kanzan'*
- **Yoshino Cherry**, *Prunus × yedoensis*
- **Amanogawa Cherry**, *Prunus serrulata 'Amanogawa'*
- **Weeping Higan Cherry**, *Prunus subhirtella 'Pendula'*
- **Sargent Cherry**, *Prunus sargentii*
- **Okame Cherry**, *Prunus × incamp 'Okame'*
- **Taiwan Cherry**, *Prunus campanulata*

2.4 Sister City Collection

Let's explore the world without leaving San Antonio! The Sister Cities Tree Collection celebrates the enduring relationships and cultural ties shared between San Antonio and its global sister cities, representing seven continents. This unique arboretum collection celebrates the beauty, biodiversity, and heritage of cities around the world through trees commonly found along their streets, plazas, and parks. Each species in this collection has been thoughtfully chosen not only for its ecological resilience in the Texas climate but also for its symbolic connection to its city of origin.

Through this international tree collection, visitors are invited to explore the cultural stories that connect San Antonio to cities around the globe. The Sister Cities Collection stands as a living mosaic —rooted in diversity, thriving in unity.

"+" Cultural Species, "" Ecological Species*

EXAMPLE SPECIES

Upland – Drier

- **Oleander**, *Nerium oleander (Guadalajara, Mexico) (*)*
- **Guayacan Trumpet Tree**, *Handroanthus guayacan (Guadalajara, Mexico) (+)*
- **Yellow Trumpet Bush**, *Tecoma stans (Monterrey, Mexico) (+)*
- **Palo verde**, *Parkinsonia aculeata (Monterrey, Mexico) (+)*
- **Black Locust**, *Robinia pseudoacacia (Wuxi, China) (*)*
- **Australian Flame Tree**, *Brachychiton acerifolius (Perth, Australia) (+)*

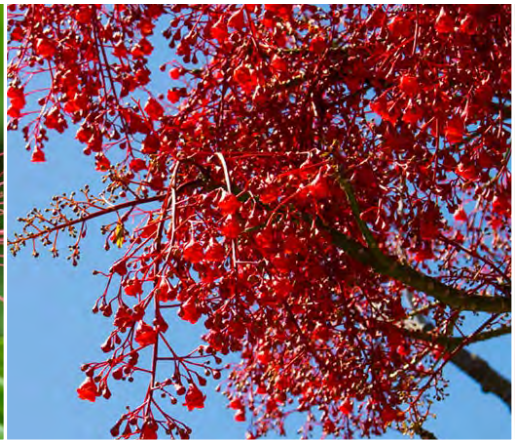
Lowland – Wetter

- **Ceibo Tree**, *Erythrina crista-galli* (Cordoba, Argentina) (+)(*)
- **Royal Poinciana**, *Delonix regia* (Las Palmas, Spain) (*)
- **Japanese Apricot**, *Prunus mume* (Wuxi, China) (*)
- **Tapa Cloth Tree**, *Broussonetia papyrifera* (Kaohsiung, Taiwan) (+)
- **Octopus Tree**, *Schlefflera actinophylla* (Perth, Australia) (+)

**These tree species should be trialed for hardiness and potential invasiveness in controlled settings.*

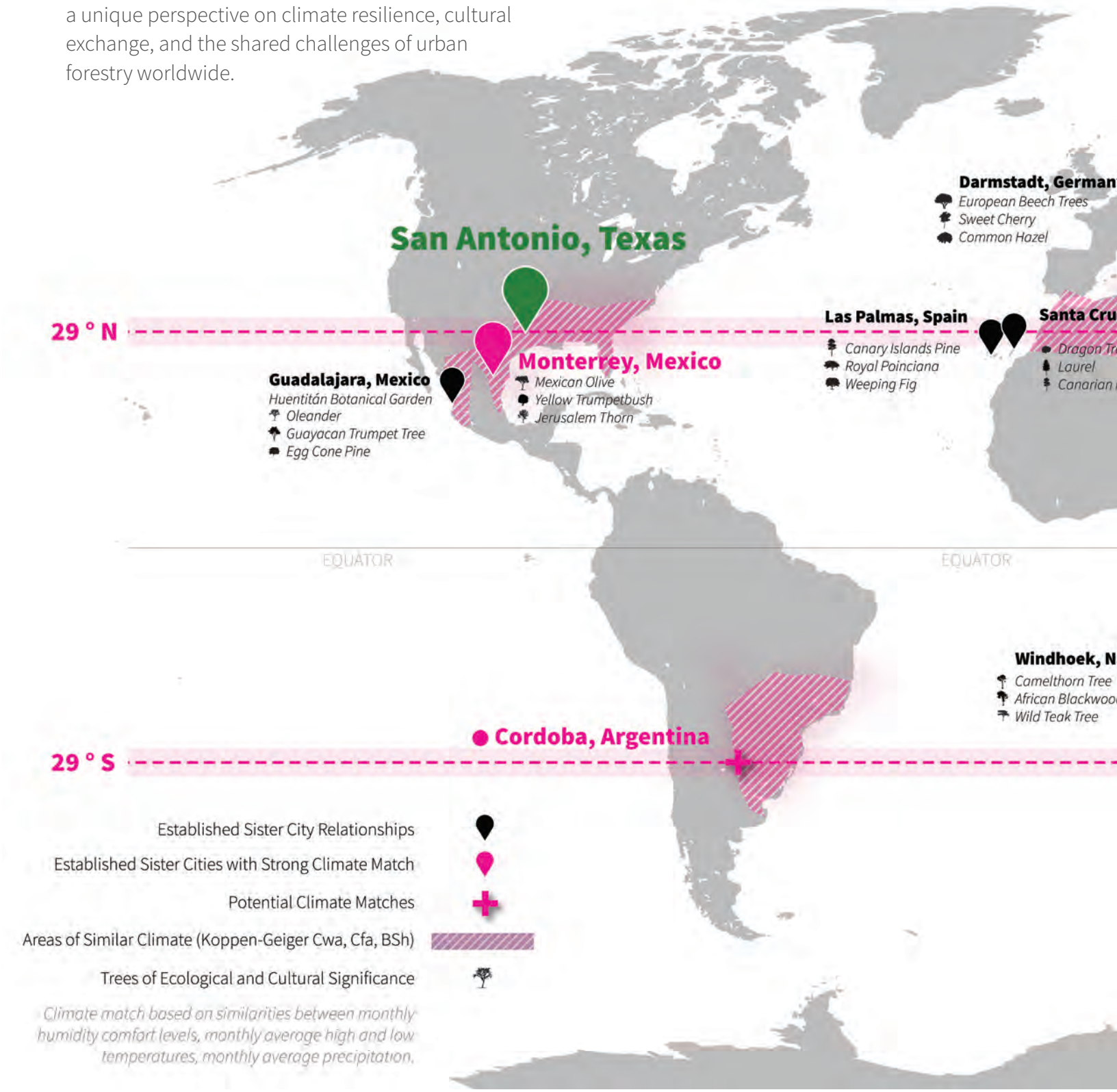


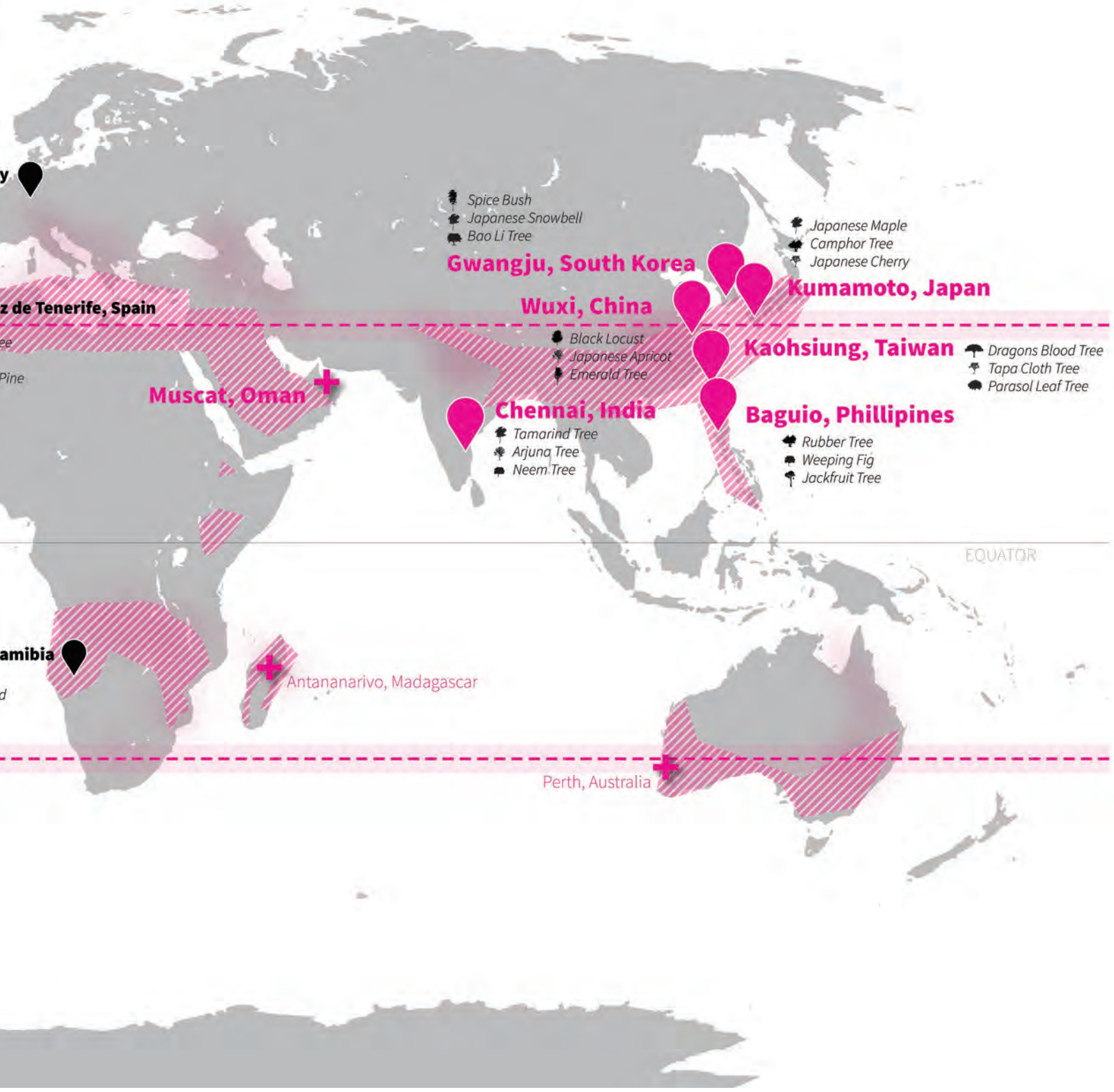





LATITUDINAL RELATIONSHIPS

The Sister City Collection features tree species from regions around the world that share San Antonio's climate and latitude. By showcasing global ecological counterparts, this collection highlights the adaptability of trees across Mediterranean, subtropical, and semi-arid environments. It offers a unique perspective on climate resilience, cultural exchange, and the shared challenges of urban forestry worldwide.




Spice Bush
Japanese Snowbell
Bao Li Tree
Gwangju, South Korea
Japanese Maple
Camphor Tree
Japanese Cherry
Kumamoto, Japan
Wuxi, China
Black Locust
Japanese Apricot
Emerald Tree
Kaohsiung, Taiwan
Dragons Blood Tree
Tapa Cloth Tree
Parasol Leaf Tree
Muscat, Oman
Chennai, India
Tamarind Tree
Arjuna Tree
Neem Tree
Baguio, Phillipines
Rubber Tree
Weeping Fig
Jackfruit Tree
EQUATOR
Antananarivo, Madagascar
Perth, Australia

Africa

Windhoek, Namibia

- *Camelthorn Tree*
- *African Blackwood*
- *Wild Teak Tree*

Camelthorn Tree
Acacia erioloba
Ecological

African Blackwood
Dalbergia melanoxylon
Ecological

Wild Teak Tree
Pterocarpus angolensis
Ecological

Asia

Wuxi, China

- *Black Locust*
- *Japanese Apricot*
- *Emerald Tree*

Black Locust
Robinia pseudoacacia
Cultural

Japanese Apricot
Prunus mume
Cultural

Emerald Tree
Radermachera sinica
Ecological

Gwangju, South Korea

- *Spice Bush*
- *Japanese Snowbell*
- *Bao Li Tree*

Spice Viburnum
Viburnum carlesii
Ecological

Japanese Snowbell
Styrax japonicus
Ecological

Bao Li Tree
Quercus serrata
Ecological

Europe

Las Palmas Spain

- *Canary Islands Pine*
- *Royal Poinciana*
- *Weeping Fig*

Canary Islands Pine
Pinus canariensis
Ecological

Royal Poinciana
Pinus canariensis
Cultural

Weeping Fig
Ficus benjamina
Cultural

Antananarivo, Madagascar

Tamarind
Tamarindus indica
Cultural

Royal Poinciana
Pinus canariensis
Ecological

Llala Palm
Hyphaene coriacea
Ecological

Taohsiung, Taiwan

- *Dragons Blood Tree*
- *Tapa Cloth Tree*
- *Parasol Leaf Tree*

Buddhist Pine
odocarpus macrophyllus
Cultural

Tapa Cloth Tree
Broussonetia papyrifera
Ecological

Parasol Leaf Tree
Macaranga tanarius
Ecological

North America

Guadalajara, Mexico

- *Guayacan Trumpet Tree*
- *Poinsettia*
- *Oleander*

Oleander
Nerium oleander
Cultural

Guayacan Trumpet Tree
Handroanthus guayacan
Ecological

Egg Cone Pine
Pinus oocarpa
Ecological

Monterrey, Mexico

- *Mexican Olive*
- *Yellow Trumpetbush*
- *Jerusalem Thorn*

Mexican Olive
Cordia boissieri
Ecological

Yellow Trumpet Bush
Tecoma stans
Ecological Cultural

Palo Verde
Parkinsonia aculeata
Ecological

Oceania

Perth, Australia

Western Australia Chritmas tree
Nuytsia floribunda
Cultural Ecological

Australian Flame Tree
Brachychiton acerifolius
Cultural Ecological

Octopus Tree
Schefflera actinophylla
Ecological

South America

Cordoba, Argentina

The Ceibo Tree
Erythrina crista-galli
Cultural Ecological

Tipuana
Tipuana tipu
Ecological

Potential to become invasive if not highly managed

Jacaranda
Jacaranda mimosifolia
Cultural Ecological

PHYTOGEOGRAPHIC COLLECTIONS

The Phytogeographic Sister Cities Collection highlights tree species that hold ecological or cultural significance in each of San Antonio's sister cities around the world. From the jacarandas of South America to the acacias of Windhoek, this collection celebrates global connections through the lens of trees.

Taxonomic Collections

Tree Collections

BOTANICAL GROUPING

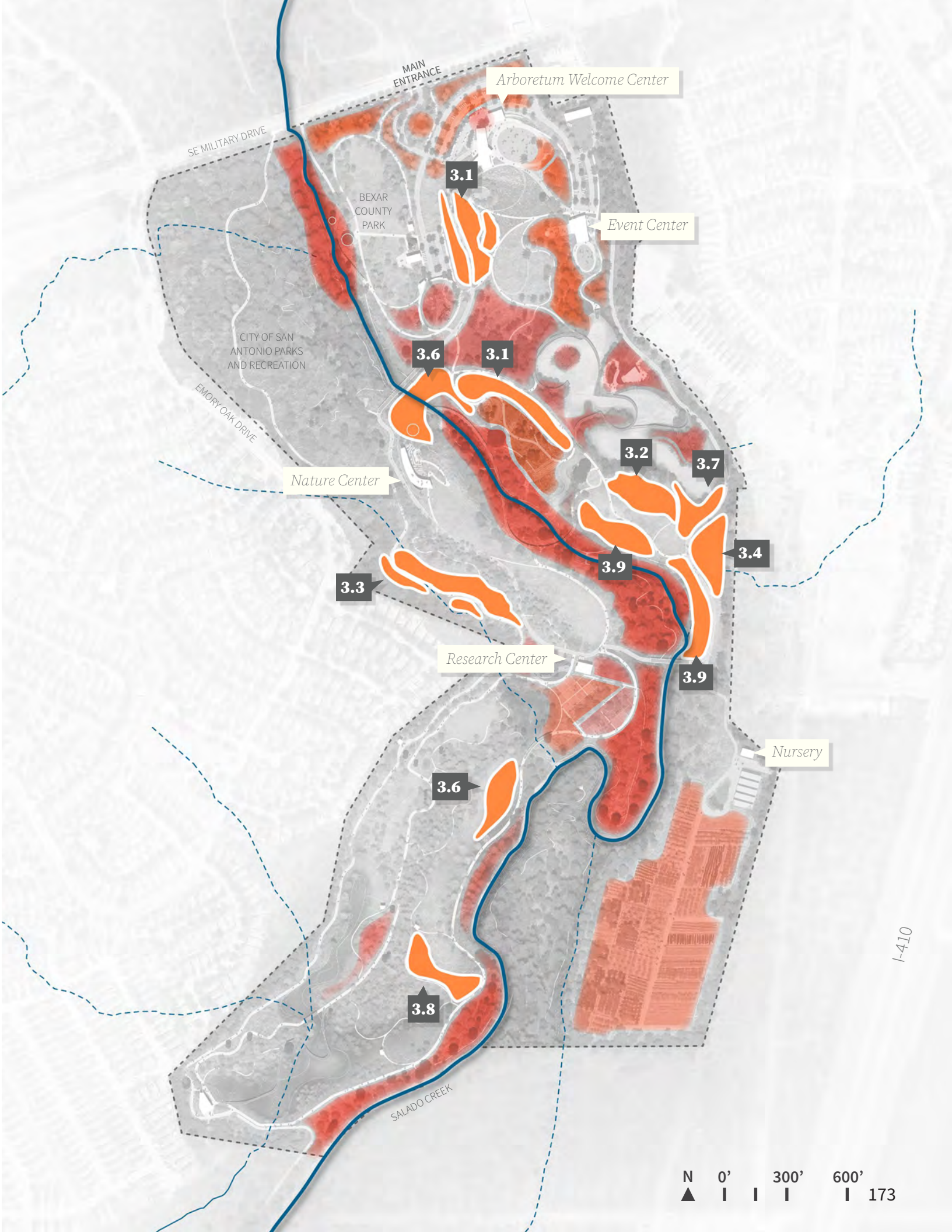
The Taxonomic Collections offer a deep dive into the evolutionary relationships and botanical diversity of trees, organized by plant family and genus. These collections serve as a living reference for the study and appreciation of tree lineages that are both ecologically important and culturally significant.

Visitors can explore the remarkable diversity of the Oaks of Texas (*Quercus* species), the ecological and ornamental members of the Rose Family (*Rosaceae*), and the nitrogen-fixing powerhouses of the Legume Family (*Fabaceae*). The collections continue with representatives from the Olive Family (*Oleaceae*), Walnut Family (*Juglandaceae*), Elm Family (*Ulmaceae)*, and the Cypress and Pine Families (*Cupressaceae* and *Pinaceae*, respectively), offering insight into form, function, and adaptation. A special focus on Pecan varietals, a signature tree of Texas, highlights its agricultural and cultural relevance.

Together, these groupings provide an engaging botanical framework for learning, research, and a deeper connection to the trees that shape our landscapes.

Taxonomic Collections

3.1 Oaks of Texas (Quercus)
3.2 The Roses (Rosaceae)
3.3 The Legumes (Fabaceae)
3.4 The Olives (Oleaceae)
3.5 The Walnuts (Juglandaceae)
3.6 The Elms (Ulmaceae)
3.7 The Cypresses (Cupressaceae)
3.8 The Pines (Pinaceae)
3.9 Pecan Varietals


MAIN ENTRANCE
Arboretum Welcome Center
SE MILITARY DRIVE
BEXAR COUNTY PARK
3.1
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
3.6
3.1
EMORY OAK DRIVE
3.2
3.7
Nature Center
3.4
3.9
3.3
Research Center
3.9
Nursery
3.6
I-410
3.8
SALADO CREEK
N
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300'
600'
173

3.1 Oaks of Texas

The arboretum's Quercus collection showcases the incredible diversity of oak trees native to Texas, offering a unique opportunity to explore the varied species that thrive across the state's different landscapes. Of the approximately sixty-four oak species in North America, forty-four are native to Texas. From the stately Live Oak (*Quercus virginiana*) in the coastal plains to the rugged Post Oak (*Quercus stellata*) in the central Texas hills, and the resilient Red Oak (*Quercus rubra*) in the higher elevations, the collection highlights the adaptability of these iconic trees. Visitors can learn about the ecological roles these oaks play, from providing habitat for wildlife to their significant contributions to the state's natural beauty and history.

EXAMPLE SPECIES

Upland – Drier

- **Post Oak**, *Quercus stellata*
- **Blackjack Oak**, *Quercus marilandica*
- **Plateau Live Oak**, *Quercus fusiformis*
- **Lacey Oak**, *Quercus laceyi*
- **Blue Oak**, *Quercus douglasii*
- **Chinkapin Oak**, *Quercus muehlenbergii*
- **Pecos Oak**, *Quercus grisea*
- **Mountain Laurel Oak**, *Quercus undulata*
- **Yaupon Oak**, *Quercus everecens*
- **Canby Oak**, *Quercus canbyi*

Lowland – Wetter

- **Live Oak**, *Quercus virginiana*
- **White Oak**, *Quercus alba*
- **Red Oak**, *Quercus texana (adaptable)*
- **Chinkapin Oak**, *Quercus muehlenbergii*
- **Texas Red Oak**, *Quercus buckleyi*
- **Southern Red Oak**, *Quercus falcata (adaptable)*

3.2 The Native Rose Grove

The Rose Grove showcases an extraordinary selection of trees from the rose family (Rosaceae) that are native to Texas and the southeastern United States. Rooted in the diverse landscapes of the South—from the limestone hills of Central Texas to the rich soils of the Gulf Coast—these species are a living celebration of the botanical heritage that shapes the region's identity. Rosaceae, a family known for its economic and ornamental significance, includes many beloved native trees that provide vital habitat, seasonal beauty, and ecological services. This curated grove highlights species that have long thrived in the Southern climate, forming deep connections with local wildlife, San Antonio culture, and the botanical rhythms of the land.

EXAMPLE SPECIES

Upland – Drier

- **Texas Persimmon**, *Diospyros texana*
- **Mexican Plum**, *Prunus mexicana*
- **Desert Sumac**, *Rhus lanceolata*

Lowland – Wetter

- **Chokecherry**, *Prunus virginiana*
- **Western Black Cherry**, *Prunus serotina*
- **Roughleaf Dogwood**, *Cornus drummondii*
- **Strawberrybush**, *Euonymus americanus*
- **Texas Wild Rose**, *Rosa setigera*
- **Western Mayhaw**, *Crataegus opaca*
- **Texas Crabapple**, *Malus ioensis*






3.3 The Legume Forest

The Legume Collection brings together a dynamic group of native and regionally adapted trees from the Fabaceae family—an extraordinary plant family known for its role in restoring soils, supporting pollinators, and enriching ecosystems across Texas and the American South.

Commonly called the legume, pea, or bean family, Fabaceae is the third largest plant family in the world, and includes a wide range of trees that have co-evolved with their environment, forming symbiotic relationships with nitrogen-fixing bacteria that naturally fertilize the soil. From agricultural crops to flowering ornamentals to pioneering re-foresters, these trees embody resilience and cooperation.

EXAMPLE SPECIES

Upland – Drier

- **Golden Ball Lead Tree**, *Leucaena retusa*
- **Honey Mesquite**, *Prosopis glandulosa*
- **Huisache**, *Acacia farnesiana*
- **Texas Ebony**, *Pithecellobium flexicaule*
- **Tenaza**, *Pithecellobium pallens*
- **Border Palo Verde**, *Cercidium macrum*
- **Texas Palo Verde**, *Cercidium texanum*
- **Honey Locust**, *Gleditsia triacanthos*

Lowland – Wetter

- **Catclaw Acacia**, *Acacia gregii*
- **Guajillo**, *Acacia berlandieri*
- **Black Locust**, *Robinia pseudoacacia*
- **Mimosa**, *Albizia julibrissin*
- **Tepeguaje**, *Leaucaena pulverulenta*
- **Eve's Necklace**, *Sophora affinis*
- **Texas Honey Locust**, *Gleditsia texana*

3.4 The Olive Grove

The Olive Grove celebrates the diversity and resilience of the Oleaceae family, featuring trees and shrubs native to Texas, such as the Texas Ash (*Fraxinus texensis*) and the native privets (*Forestiera* spp.). This collection highlights the often-overlooked beauty and ecological value of this plant family, known for its adaptability to drought and challenging soils. Through the Olive Grove, visitors can explore the role these trees play in Texas ecosystems, while appreciating their subtle textures, seasonal interest, and importance in both natural and cultivated landscapes.

EXAMPLE SPECIES

Upland – Drier

- **Berlander Ash**, *Fraxinus berlandieriana*
- **Velvet Ash**, *Fraxinus velutina*
- **Fragrant Ash**, *Fraxinus cuspidata*
- **Gregg Ash**, *Fraxinus greggii (ornamental)*
- **Elbow Bush**, *Forestiera angustifolia*

Lowland – Wetter

- **Fringe Tree**, *Chionanthus virginicus*
- **Swamp Privet**, *Forestiera acuminata*
- **White Ash**, *Fraxinus americana*
- **Texas Ash**, *Fraxinus texensis*
- **Green Ash**, *Fraxinus pennsylvanica*
- **Carolina Ash**, *Fraxinus caroliniana*
- **Mexican Ash**, *Fraxinus berlandieriana*






3.5 The Walnut Grove

The Walnut Grove showcases the rich heritage and ecological importance of the Juglandaceae family, featuring native Texas species such as black walnut (*Juglans nigra*), pecan (*Carya illinoinensis*), and hickories (*Carya* spp.). These trees are celebrated not only for their stately presence and valuable hardwoods but also for their role in supporting wildlife and traditional agricultural practices. As the heart of Texas' nut-bearing legacy, the Walnut Grove offers visitors a glimpse into the deep-rooted connections between these trees, the land, and the communities that have relied on them for generations. This collection invites exploration of the natural and cultural stories held within these iconic Texas species.

EXAMPLE SPECIES

Upland – Drier

- **Black Hickory**, *Carya texana*
- **Pignut Hickory**, *Carya glabra*

Lowland – Wetter

- **Eastern Black Walnut**, *Juglans nigra*
- **Arizona Walnut**, *Juglans major*
- **Texas Walnut**, *Juglans microcarpa*
- **Pecan**, *Carya illinoinensis*
- **Water Hickory**, *Carya aquatica*
- **Nutmeg Hickory**, *Carya myristicaeformis*
- **Bitternut Hickory**, *Carya cordiformis*
- **Shagbark Hickory**, *Carya ovata*
- **Swamp Hickory**, *Carya leiodermis*
- **Mockernut Hickory**, *Carya tomentosa*






3.6 The Elm Grove

The Elm Grove highlights the graceful beauty and ecological resilience of the Ulmaceae family, with a focus on Texas-native elms such as cedar elm (*Ulmus crassifolia*), winged elm (*Ulmus alata*), and American elm (*Ulmus americana*). Known for their arching canopies, textured bark, and adaptability to a range of soil and moisture conditions, these trees have long been a staple of Texas woodlands, streetscapes, and riparian corridors. The Elm Grove offers a space to appreciate the subtle elegance of elms, their value in urban and natural environments, and their potential role in restoration and climate-adapted landscapes.

EXAMPLE SPECIES

Upland – Drier

- **Winged Elm**, *Ulmus alata*
- **Hackberry**, *Celtis reticulata*
- **Netleaf Hackberry**, *Celtis reticulata*
- **Lindheimer Hackberry**, *Celtis lindheimeri*
- **Dwarf Hackberry**, *Celtis tenuifolia*
- **Granjeno**, *Celtis pallida*
- **Cedar Elm**, *Ulmus crassifolia (adaptable to both wet and dry conditions)*

Lowland – Wetter

- **American Elm**, *Ulmus americana*
- **Water Elm**, *Planera aquatica*
- **Slippery Elm**, *Ulmus rubra*
- **Sugarberry**, *Celtis occidentalis*
- **Cedar Elm**, *Ulmus crassifolia (adaptable to both wet and dry conditions)*






3.7 The Cypress Grove

The Cypress Grove honors the striking and diverse members of the Cupressaceae family, with a focus on Texas natives like Bald Cypress (*Taxodium distichum*) and Ashe Juniper (*Juniperus ashei*). These trees, ranging from towering river giants to rugged upland evergreens, embody the adaptability and ecological range of the cypress family across Texas landscapes. From the cool, shaded banks of Hill Country rivers to the dry, rocky slopes of the Edwards Plateau, the Cypress Grove highlights the vital role these species play in stabilizing soils, filtering water, providing wildlife habitat, and anchoring the visual character of Texas ecosystems. This collection invites visitors to explore the beauty, utility, and enduring presence of Cypress Family trees across the region.

EXAMPLE SPECIES

Upland – Drier

- **Pinchot Juniper**, *Juniperus pinchotii*
- **Weeping Juniper**, *Juniperus flaccida*
- **Ashe Juniper**, *Juniperus ashei*
- **One-Seed Juniper,** *Juniperus monosperma*
- **Alligator Juniper**, *Juniperus deppeana*
- **Arizona Cypress**, *Cupressus arizonica*
- **Rocky Mountain Juniper,** *Juniperus scopulorum*

Lowland – Wetter

- **Eastern Redcedar,** *Juniperus virginiana*
- **Bald Cypress,** *Taxodium distichum*
- **Montezuma Cypress,** *Taxodium mucronatum*

3.8 The Pine Woods

The Pine Woods collection celebrates the towering, resilient species of the Pinaceae family, with a focus on native Texas pines such as the longleaf pine (*Pinus palustris*), loblolly pine (*Pinus taeda*), and ponderosa pine (*Pinus ponderosa*). These iconic trees, known for their straight trunks, distinctive needles, and towering height, are integral to the forests of East and Central Texas. The Pine Woods collection highlights their ecological significance, from providing critical wildlife habitat to stabilizing soils and supporting fire-adapted ecosystems. Visitors will discover the unique role pines play in Texas landscapes, from coastal plains to upland forests, and learn about their importance in conservation, timber production, and ecological restoration.

EXAMPLE SPECIES

Upland – Drier

- **Two-Needle Pinyon**, *Pinus edulis*
- **Mexican Pine**, *Pinus cembroides*
- **Papershell Pinyon Pine**, *Pinus remota*
- **Ponderosa Pine**, *Pinus ponderosa*
- **Shortleaf Pine**, *Pinus echinata*

Lowland – Wetter

- **Loblolly Pine**, *Pinus taeda*
- **Longleaf Pine**, *Pinus palustris*
- **Southwestern White Pine**, *Pinus strobiformis*






3.9 The Pecan Grove

The arboretum's collection of pecan varietals from across Texas, including many local genetic varieties, offers a fascinating look at the diversity of this iconic tree. Visitors can explore how these pecan trees have been cultivated and improved over generations to thrive in Texas' varied landscapes, from the rich soils of East Texas to the arid conditions of the West. This collection not only highlights the agricultural significance of pecans but also showcases their role in Texas' heritage and economy.

EXAMPLE PECAN SELECTIONS

- **Desirable:** One of the most popular and widely grown varieties in Texas. It has large, high-quality nuts with a smooth shell and excellent flavor.
- **Pawnee:** A medium to large-sized pecan with a rich, sweet flavor. Known for its early harvest and adaptability to various climates.
- **Cheyenne:** This variety produces large, high-quality nuts with a smooth, thin shell.
- **Elliott:** A high-yielding, small to medium-sized nut with a hard shell, known for its excellent flavor.
- **Oklahoma:** Known for its excellent productivity and high-quality nuts, it is especially suited to drier climates and well-drained soils.
- **Sumner:** Known for reliably producing large, high-quality nuts with a thin shell and good flavor.
- **Kanza:** A newer variety that is prized for its large, flavorful nuts and good kernel quality. It has high productivity and strong resistance to disease.
- **Mahan:** Produced larged nuts with a thick shell and excellent taste. It is a hardy tree that can tolerate drought and harsh conditions, making it suitable for a range of Texas environments.
-

Cultural Collections

Tree Collections

CONNECTING PLANTS TO PEOPLE

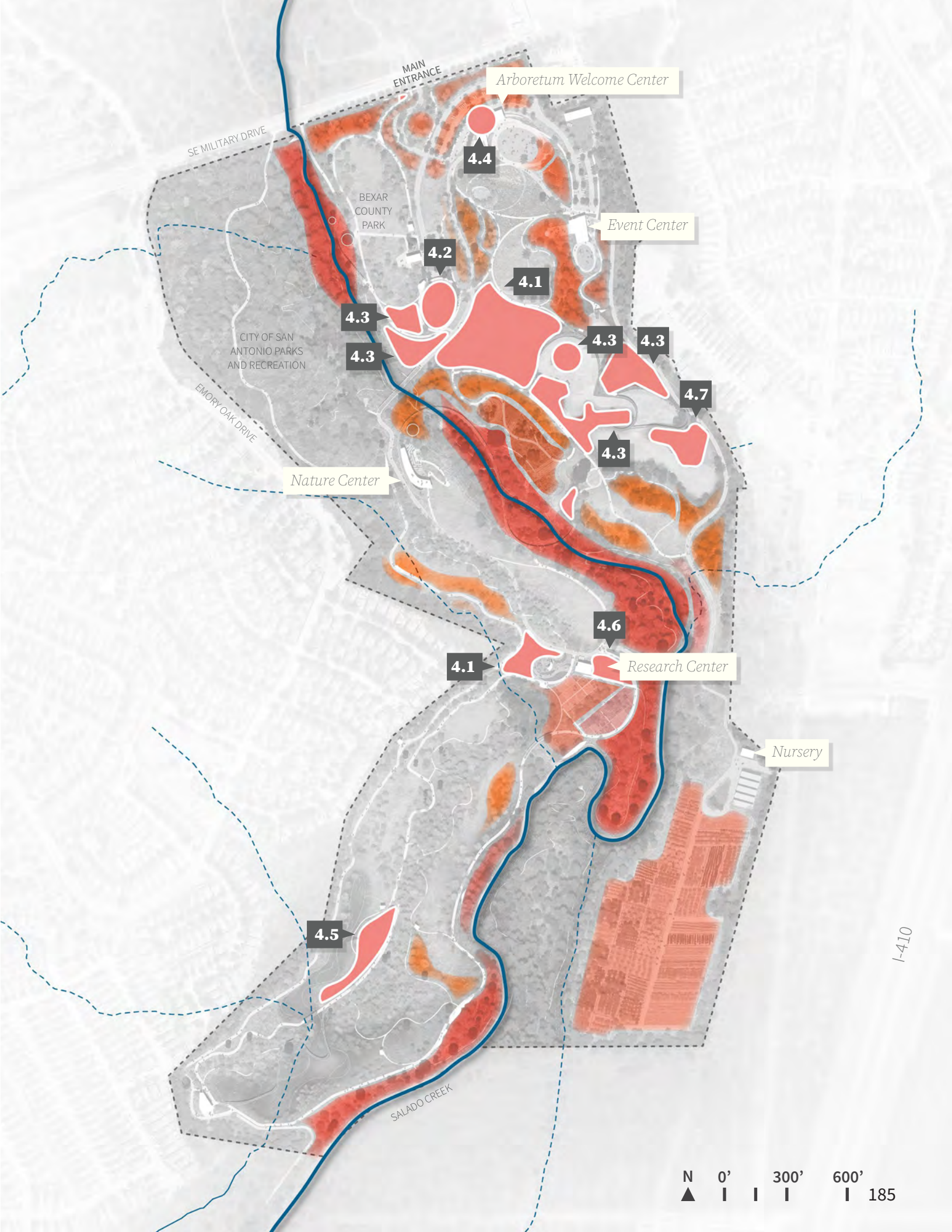
The Cultural Collections explore the deep and diverse ways in which trees intersect with human life, tradition, and well-being. These collections reflect cultural knowledge, practical uses, and emotional connections that have shaped how people relate to trees across time and place.

The Indigenous Ethnobotanical Collection honors the plant knowledge and stewardship practices of Native communities in Texas, while the Sensory and Therapy Trees collection invites reflection and healing through touch, scent, sound, and shade. Trees Represented in Hispanic Culture highlight species with cultural, culinary, and symbolic significance across Latin America and the Southwest. Practical themes are also explored, including Trees for Small Spaces, Trees for Arid Environments, and a curated selection of Wetland Trees, showing how species can be matched to diverse conditions and urban challenges. A dedicated area for Threatened and Endangered Species brings attention to conservation priorities and the importance of protecting biodiversity.

Together, these collections create a rich, inclusive narrative—where trees are not only ecological beings, but cultural companions, healers, and symbols of resilience.

Cultural Collections

4.1 Indigenous Ethnobotanical Collections
4.2 Sensory and Therapy Trees
4.3 Trees as Represented in Hispanic Culture
4.4 Trees for Small Spaces
4.5 Trees for Arid Environments
4.6 Threatened and Endangered Species
4.7 Wetland Tree Collection


MAIN ENTRANCE
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4.5
I-410
SALADO CREEK
N
0’
300’
600’
185

4.1 Indigenous Ethnobotanical Collections

The Indigenous tree collection highlights the deep cultural and ecological connections between native plants, the Coahuiltecan People, and other Indigenous groups of South Texas. This collection features trees that have been vital to these communities for centuries, providing materials for food, medicine, shelter, and ceremonial use. Some trees, like the Comanche marker trees were used for wayfinding, preserving directions in bencht branches and trunks. Each tree in the collection highlights an aspect of Traditional Ecological Knowledge and their reciprocal use of the landscape, providing visitors with a deeper understanding of the region's ethnobotanical relationships.

EXAMPLE SPECIES

- **Osage Orange**, *Maclura pomifera*
- *Indigenous peoples used Osage orange for crafting durable bows, creating natural fences, medicinal purposes, fruit for food, and occasionally in ceremonial practices.*

- **Texas Persimmon**, *Diospyros texana*
- *Used for its edible fruit, which was consumed raw or dried, and its wood, which was valued for crafting tools, handles, and other implements*

- **Cedar Elm**, *Ulmus crassifolia*
- *Used for crafting tools, weapons, and bows from its strong wood, and its bark was used for making ropes or cords. The tree's wood was also utilized for construction, and its leaves were sometimes used in medicinal practices.*






- **Anacua**, *Ehretia anacua*
- *Used for making tools, implements, and weapons, and sometimes using the fruit as food. The tree was also valued for its ability to provide shade and shelter in arid regions.*

- **Honey Mesquite**, *Prosopis glandulosa*
- *Used pods for food (the sweet, nutritious pulp was eaten raw or ground into flour), its strong wood for tools, weapons, and construction, and crafting bows. The tree's roots and pods were also used in medicinal practices for their various healing properties.*

- **Pecan**, *Carya illoinensis*
- *Used for its nutritious nuts, which were eaten raw, roasted, or used in cooking. They also utilized the wood for crafting tools, weapons, and building materials, and the bark for medicinal purposes, including remedies for various ailments.*

- **Black Willow**, *Salix nigra*
- *Used for a variety of purposes, including using its flexible wood to craft baskets, ropes, and fish traps. The bark was often used in medicinal practices, as it contains salicin, a compound similar to aspirin, which was used to treat pain, fevers, and inflammation.*

- **Agarita**, *Berberis trifoliata*
- *Used for its edible berries, which were eaten raw or made into jams and sauces. The plant's spiny branches were also used for crafting tools and as a natural fence. Additionally, agarita was sometimes used in medicinal practices, with its roots and other parts believed to have healing properties for various ailments.*

- **Mexican Plum**, *Prunus mexicana*
- *Used for its edible fruit, which was eaten fresh or dried, and its wood, which was used for making tools, implements, and sometimes bows. The bark and other parts of the tree were also used in traditional medicine for various remedies.*

- **Ponil**, *Fallugia paradoxa*
- *Used for medicinal purposes, including treating fevers and sore throats, as well as for crafting tools, cordage, and ceremonial items.*

- **Desert Willow**, *Chilopsis linearis*
- *Used for a variety of purposes, including using its bark and roots for medicinal treatments, such as for fevers, coughs, and as astringents, while its wood was used for crafting tools, bows, and baskets.*

- **Palo Verde**, *Parkinsonia aculeata*
- *Use its bark and pods for medicinal treatments, such as for fevers, stomach ailments, and infections, while its wood was often used for making tools, implements, and fire-starting materials*

- **Texas Mountain Laurel**, *Sophora secundiflora*
- *Ceremonial use of shiny red or orange seeds, called "Mescal Beans". Seeds were often ground and small amounts mixed*

4.2 Sensory and Therapy Plants

Rooted in the diverse landscapes of South Texas, the collection invites visitors to experience the unique sensory qualities of plants native to the San Antonio region. The collection includes fragrant trees whose aromatic flowers create soothing scents, and textured plants that invite tactile interaction. Designed with the local climate and ecology in mind, this collection highlights drought-tolerant species that thrive in the heat while offering richly textured foliage, fragrant blooms, and vibrant seasonal interest. Species such as Texas Sage (*Leucophyllum frutescens*), a Hill Country favorite, anchors the collection with its soft, silver-gray leaves and bursts of purple flowers that respond dramatically to summer rain. This space offers a calming, immersive environment where visitors can connect with nature for healing.

EXAMPLE SPECIES

- **Texas Mountain Laurel**, *Sophora secundiflora*
- **Desert Willow**, *Chilopsis linearis*
- **Sweet Acacia**, *Vachellia farnesiana*
- **Huisache**, *Vachellia farnesiana*
- **Anaqua**, *Ehretia anacua*
- **Palo Verde**, *Parkinsonia aculeata*
- **Blackbrush Acacia**, *Vachellia rigidula*
- **Fragrant Sumac**, *Rhus aromatica*

- **Texas Sage**, *Leucophyllum frutescens*
- **Feather Plume**, *Dalea formosa*
- **Black Dalea**, *Dalea frutescens*
- **Texas Mock Orange**, *Philadelphus texensis*
- **Texas Wisteria**, *Wisteria frutescens*
- **Maple Leaf Viburnum**, *Viburnum acerifolium*

4.3 Trees as Represented in Hispanic Culture

This collection celebrates iconic tree species represented in Hispanic art, literature, poetry, food and cultural celebrations. These trees are more than plants—they are memory keepers, story bearers, and symbols of identity. They have shaded plazas and mercados, appeared in murals and poetry, and stood quietly in the corners of your abuelita's backyard.

Rooted in the lived experiences of generations, this collection honors both the everyday and the sacred—where culture, ecology, and memory intersect. Inspired by muralism, folk medicine, proverbs, traditional food, and ancestral wisdom, visitors can walk among the familiar and the symbolic, reconnect with heritage, and celebrate the deep-rooted relationship between the Hispanic and Chicano communities and the trees that shaped their homes, histories, and families.

EXAMPLE SPECIES

- **Laurel Bay Leaf**, *Laurus nobilis*
- **Agave**, *Agave spp.*
- **Mango**, *Mangifera indica*
- **Pecan**, *Carya illinonesis*
- **Citrus**, *Citrus spp.*
- **Avocado**, *Persea americana*
- **Palm Tree**, *Sabal americana*
- **Basil**, *Ocimum basilicum*
- **Mesquite**, *Prosposis spp.*
- **Nopal / Prickly Pear,** *Opuntia spp.*
- **Guajillo**, *Senegalia berlandieri*
- **Huisache**, *Senegalia berlandieri*
- **Flor de Jamaica**, *Hibiscus sabdariffa*

Ceremonial Trees

- **Bald Cypress**, *Taxodium distichum*
- **Montezuma Cypress**, *Taxodium mucronatum*
- **Texas Palm**, *Sabal mexicana*
- **Texas Mountain Laurel,** *Sophora secundiflora*
- **Live Oak,** *Quercus virginiana*






4.4 Trees for Small Spaces

This collection highlights compact native trees and large shrubs that are perfectly suited for smaller urban spaces, layered hedgerows, and habitat-rich plantings in the San Antonio and South Texas region. Whether used as privacy screens, windbreaks, or wildlife corridors, these species provide structure, seasonal interest, and essential ecological services in compact forms.

Together, these trees exemplify the beauty and practicality of working with nature in small urban settings. This collection encourages visitors to rethink traditional hedges and ornamental trees by showcasing native alternatives that support local ecosystems while thriving in the heat and soils of South Texas.

EXAMPLE SPECIES

- **Possumhaw Holly**, *Ilex decidua*
- **Mexican Buckeye**, *Ungnadia speciosa*
- **Texas Mountain Laurel**, *Sophora secundiflora*
- **Desert Willow**, *Chilopsis linearis*
- **Redbud** *(Texas Redbud), Cercis canadensis var. texensis*
- **Anacacho Orchid Tree**, *Bauhinia lunarioides*
- **Jerusalem Thorn**, *Parkinsonia aculeata*
- **Texas Persimmon**, *Diospyros texana*
- **Eve's Necklace**, *Styphnolobium affine*
- **Yaupon Holly**, *Ilex vomitoria*
- **Condalia**, *Condalia hookeri*
- **Black Viburnum**, *Rusty Blackhaw Viburnum*
- **Southern Black Haw**, *Viburnum rufidulum*
- **Anacahuita** *(Mexican Olive), Cordia boissieri*

4.5 Trees for Arid Environments

The Trees for Arid and Low Water Environments collection showcases an array of drought-tolerant, low-water trees native to South Texas, each uniquely adapted to thrive in the region's hot, dry climate. These species are perfectly suited for xeriscaping, urban environments, and water-conservation landscapes, offering both aesthetic beauty and ecological function.

EXAMPLE SPECIES

Upland – Drier

- **Texas Persimmon**, *Diospyros texana*
- **Desert Willow**, *Chilopsis linearis*
- **Palo Verde**, *Parkinsonia aculeata*
- **Texas Mountain Laurel**, *Sophora secundiflora*
- **Honey Mesquite**, *Prosopis glandulosa*
- **Eve's Necklace,** *Styphnolobium affine*
- **Cedar Elm**, *Ulmus crassifolia*
- **Anacahuita (Mexican Olive)**, *Cordia boissieri*
- **Texas Ebony,** *Pithecellobium flexicaule*
- **Lotebush**, *Ziziphus obtusifolia*
- **Acacia**, *Acacia farnesiana*
- **Huisache**, *Vachellia farnesiana*
- **Blackbrush Acacia**, *Vachellia rigidula*
- **Mesquite (Tamarugo),** *Prosopis tamarugo*






4.6 Threatened and Endangered Species

The collection serves as a living reminder of the fragility and resilience of Texas's native ecosystems. Rooted in the mission of conservation and education, this curated assemblage of rare, threatened, and endangered plant species highlights the urgent need to protect biodiversity in the face of habitat loss, climate change, and human impact. Each species featured in this collection has a unique story—many are endemic to Texas, meaning they are found nowhere else on Earth. Some are limited to specific soil types or microclimates, such as those in the Edwards Plateau or South Texas Brush Country. Others are survivors of shrinking habitats due to development, agriculture, or altered hydrology. This exhibit is also a call to action: to protect the land, support habitat restoration, and integrate conservation practices into our landscapes. These species remind us that what is rare is also precious—and that our stewardship today shapes the biodiversity of tomorrow.

EXAMPLE SPECIES

Upland – Drier

- **Hinckley's Oak**, *Quercus hinckleyi*
- **Johnston's Frankenia**, *Frankenia johnsonii*
- **Walker's Manioc**, *Manihot walkerae*
- **Texas Poppymallow**, *Callirhoe scabriuscula*
- **Texabama Croton**, *Croton alabamensis var. Texensis*
- **Big Red Sage**, *Salvia penstemonoides*
- **Tobusch Fishhook Cacti**, *Ancistrocactus tobuschii*
- **Sand Dollar Cacti**, *Astrophytum asterias*
- **Living Rock Cacti**, *Ariocarpus fissuratus*

Lowland – Wetter

- **Texas Ayenia**, *Ayenia limitaris*
- **Texas Snowbells**, *Styrax platanifolius ssp. texanus*

4.7 Wetland Tree Collection

The Wetland Tree Collection showcases species adapted to saturated soils, periodic flooding, and waterlogged conditions found in Texas' marshes, swamps, and streambanks. Featuring trees like bald cypress, water tupelo, and black willow, this collection highlights the vital role wetlands play in water purification, flood control, and wildlife habitat. It demonstrates the resilience and ecological importance of wetland trees in both natural and urban landscapes.

EXAMPLE SPECIES

- **Bald Cypress**, *Taxodium distichum*
- **Water Locust**, *Gleditsia aquatica*
- **Water Tupelo**, *Nyssa aquatica*
- **Green Ash**, *Fraxinus pennsylvanica*
- **Black Willow**, *Salix nigra*
- **Wafer Ash**, *Ptelea trifoliata*
- **Swamp Privet**, *Forestiera acuminata*
- **Swamp Maple**, *Acer rubrum*
- **Box Elder**, *Acer negundo*
- **Carolina Ash**, *Fraxinus caroliniana*
- **Water Oak**, *Quercus nigra*
- **Water Hickory**, *Carya aquatica*
- **Water Elm**, *Planera aquatica*
- **Cottonwood**, *Populus deltoides*
- **Montezuma Cypress**, *Taxodium mucronatum*






Agroforestry Collections

Tree Collections

CONNECTING PLANTS TO PEOPLE

The Food Forest and Agroforestry collections highlight the diverse uses of trees for food and agroforestry, featuring locally and regionally native and adapted species that thrive in Texas. These trees demonstrate sustainable agroforestry practices, where tree crops are integrated with other land uses, promoting soil health, water conservation, and local food production. The collection emphasizes the value of native and adapted trees in supporting both food security and ecological balance at the arboretum.

Agroforestry

5.1 Food and Agroforestry (Native)

5.2 Food and Agroforestry (Adapted)

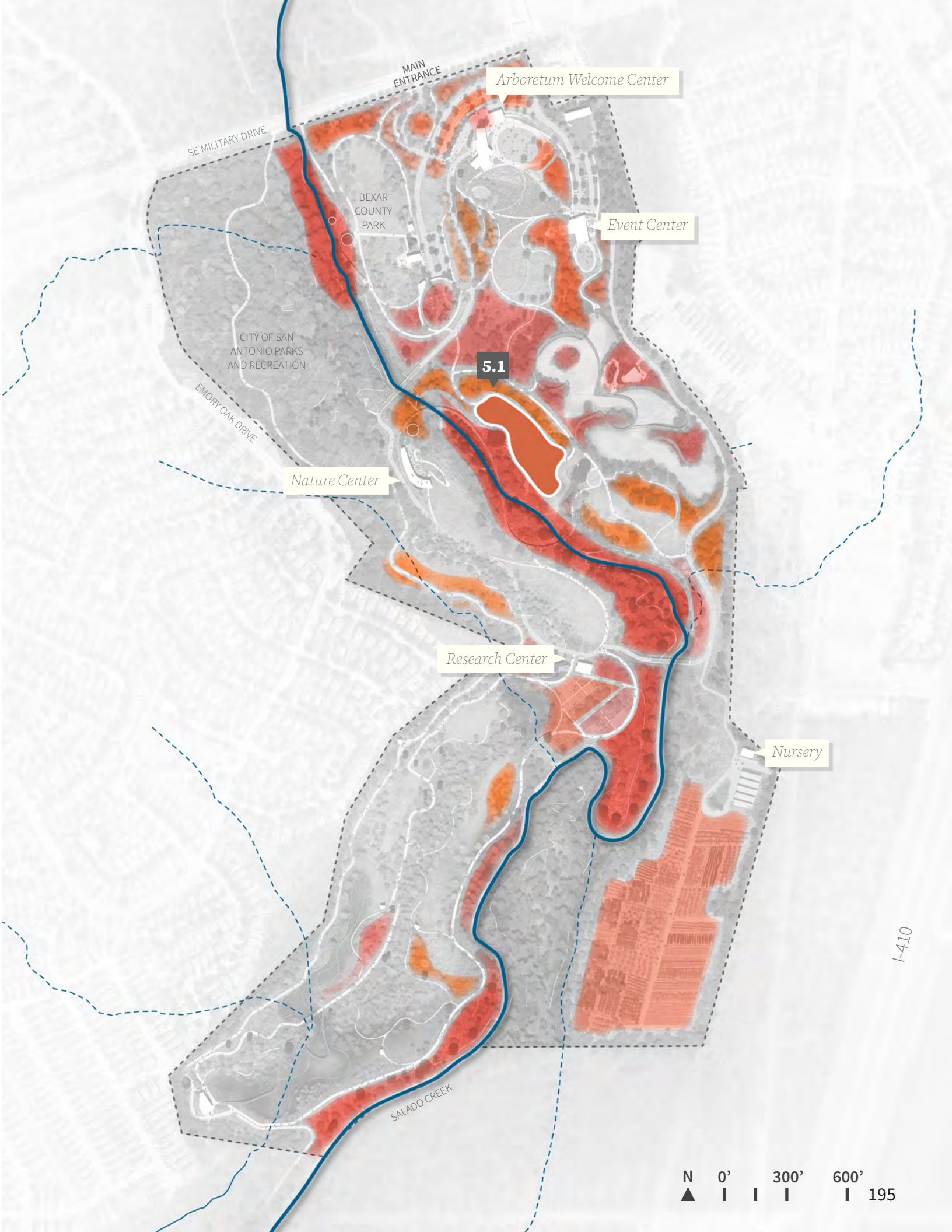
EXAMPLE SPECIES

Adapted

- **Jujube**, *Ziziphus jujuba*
- **Texas Peach Bush**, *Prunus texana*
- **Pawpaw**, *Asimina triloba*
- **Loquat**, *Eriobotrya japonica*
- **Citrus**, *Citrus spp.*

Locally Native

- **Pecan**, *Carya illinoinensis*
- **Persimmon**, *Diospyros texana, Diospyros virginiana*
- **Mexican Plum**, *Prunus mexicana*
- **Red Mulberry**, *Morus rubra*
- **Sumac species,** *Rhus aromatica, Rhus lanceolata, Rhus microphylla*
- **Anacua**, *Ehretia anacua*
- **Honey Mesquite**, *Proposis glandulosa*
- **Turks Cap**, *Malvaviscus arboreus*
- **Passion Flower**, *Passiflora incarnata*
- **Mustang Grape**, *Vitis mustangensis*

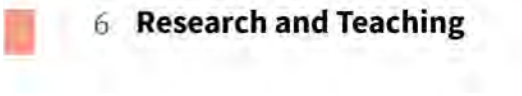

MAIN ENTRANCE
Arboretum Welcome Center
SE MILITARY DRIVE
BEXAR COUNTY PARK
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
5.1
EMORY OAK DRIVE
Nature Center
Research Center
Nursery
I-410
SALADO CREEK
N
0'
300'
600'
195

Research & Teaching

Tree Collections

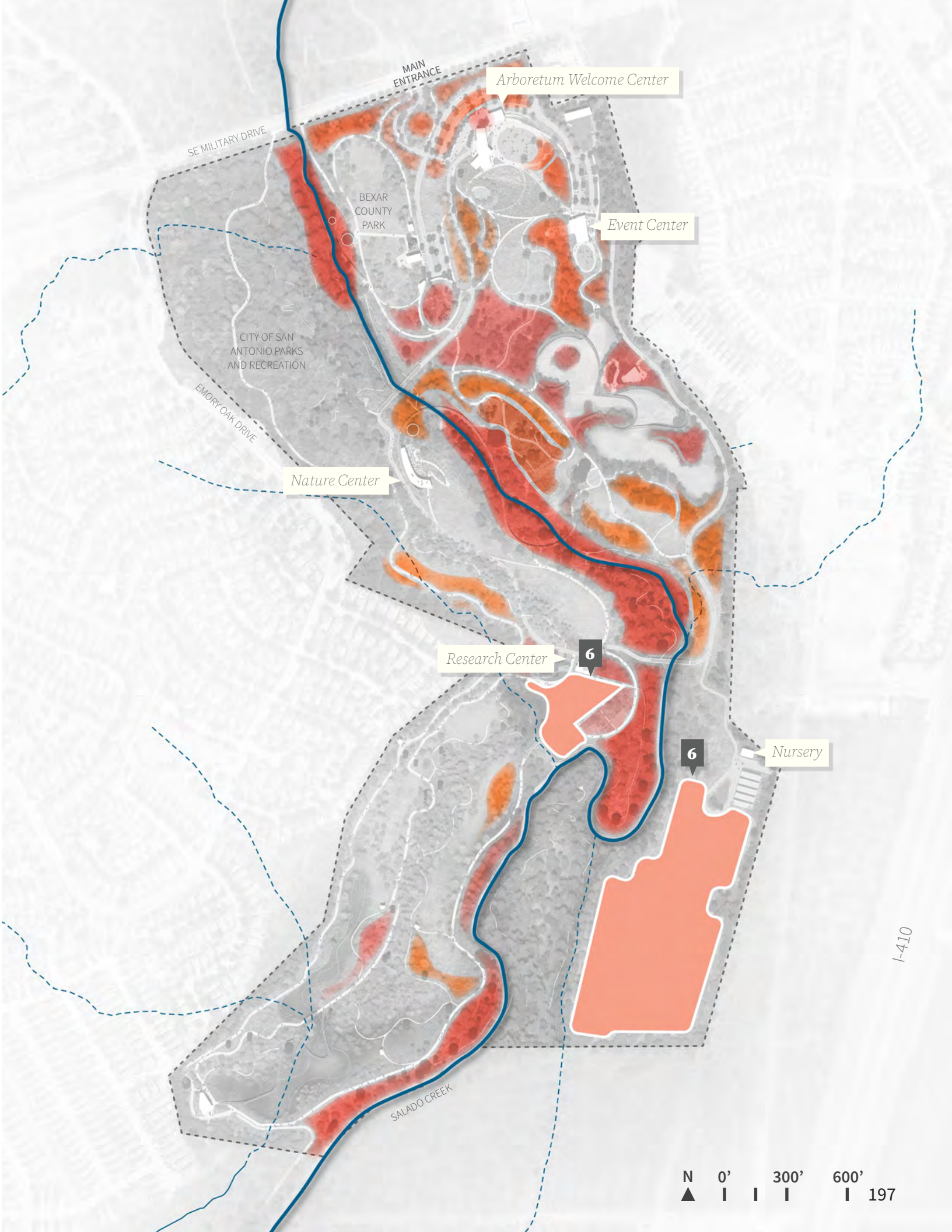
TREES FOR EDUCATION

The research and teaching collections provide access for researchers, practitioners, and students to study different topics in forestry and environmental sciences. It includes trees used for research on ecological succession, where researchers observe how different species establish and grow in disturbed environments over time. It also supports silviculture research, focusing on sustainable forest management practices, as well as climate-resilient tree research aimed at identifying species that can thrive in changing climatic conditions. The collection plays a crucial role in restoration research, helping understand the best approaches to restore degraded habitats at the arboretum and more broadly in South Texas.



EXAMPLE TOPICS

- *6.a Ecological Succession*
- *6.b Silviculture Research*
- *6.c Climate Resilient Tree Research*
- *6.d Restoration Research*
- *6.e Oak Wilt Research*


MAIN ENTRANCE
Arboretum Welcome Center
SE MILITARY DRIVE
BEXAR COUNTY PARK
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Nature Center
Research Center
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Nursery
I-410
SALADO CREEK
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San Antonio 2100

Tree Collections

TREES FOR RESEARCH

The San Antonio 2100 collection showcases trees that are well-suited to future climate scenarios, focusing on species that are resistant to prolonged drought and extreme heat. This collection features hardy, resilient, and highly adaptable trees capable of withstanding the variable climatic conditions that are anticipated over the next century. The collection serves as a forward-thinking model for resilient tree planting in the face of climate change, offering insights into how trees can adapt to ensure ecological stability and support biodiversity in the coming decades in San Antonio.

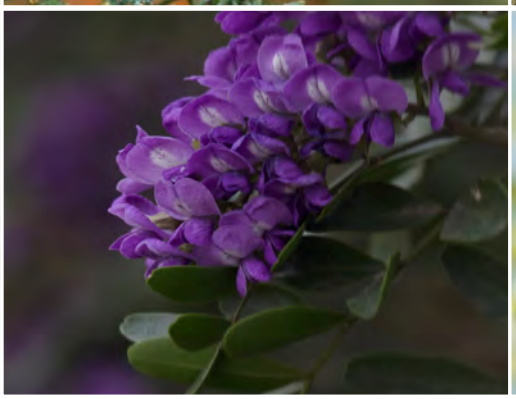
7 **San Antonio 2100**

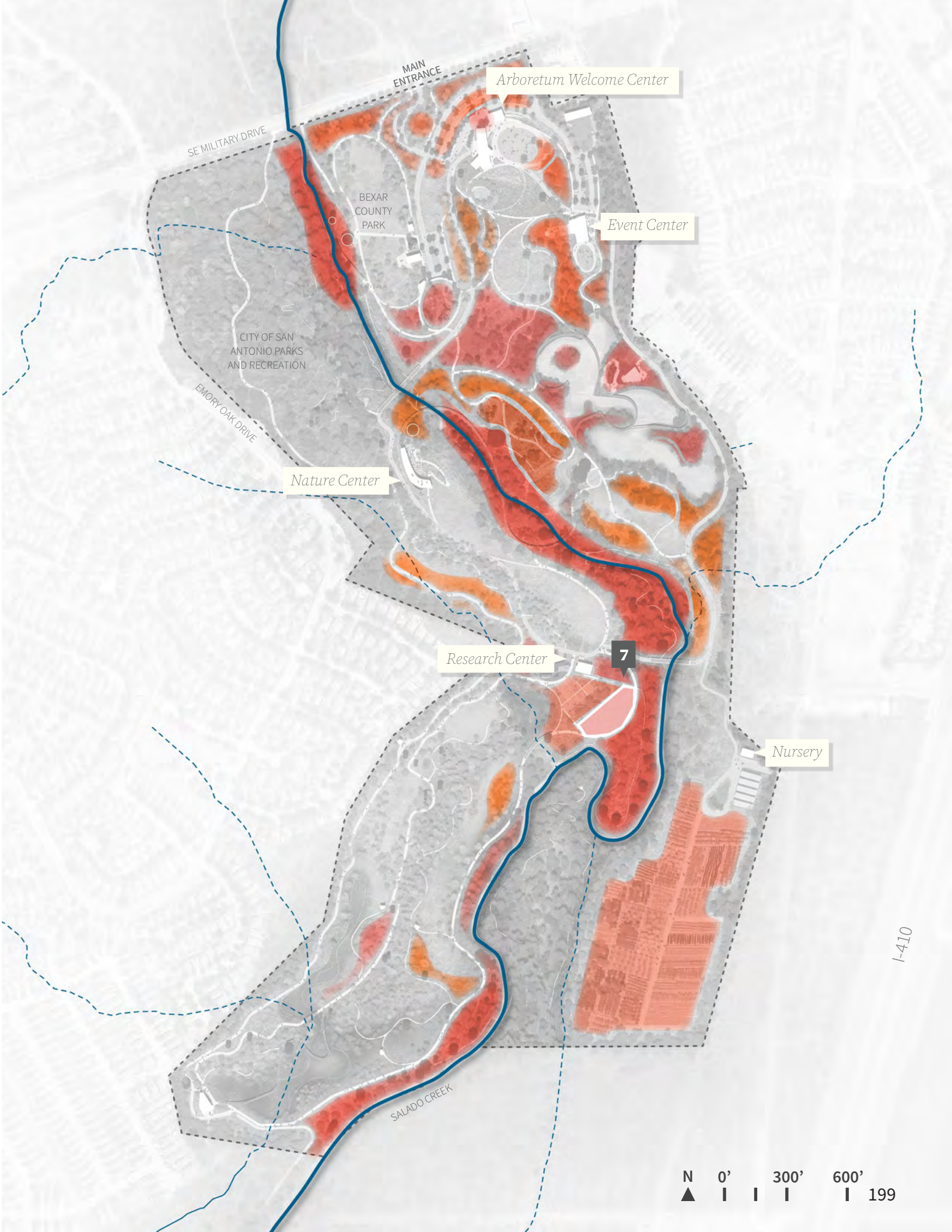
EXAMPLE SPECIES

- **Desert Willow**, *Chilopsis linearis*
- **Arizona Cypress**, *Hesperocyparis arizonica*
- **Mexican Olive**, *Cordia boissieri*
- **Mexican Poplar**, *Populus mexicana*
- **Mexican Sycamore**, *Platanus Mexicana*
- **Texas Kidneywood**, *Eysenhardtia texana*
- **Texas Mountain Laurel**, *Sophora secundiflora*
- **Texas Ebony**, *Ebenopsis ebano*
- **Palo Verde**, *Parkinsonia aculeata*
- **Catclaw Acacia**, *Senegalia greggii*
- **Guajillo**, *Acacia berlandieri*
- **Blackbrush Acacia**, *Vachellia rigidula*









MAIN ENTRANCE
Arboretum Welcome Center
SE MILITARY DRIVE
BEXAR COUNTY PARK
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Nature Center
Research Center
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Nursery
I-410
SALADO CREEK
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300’
600’
199

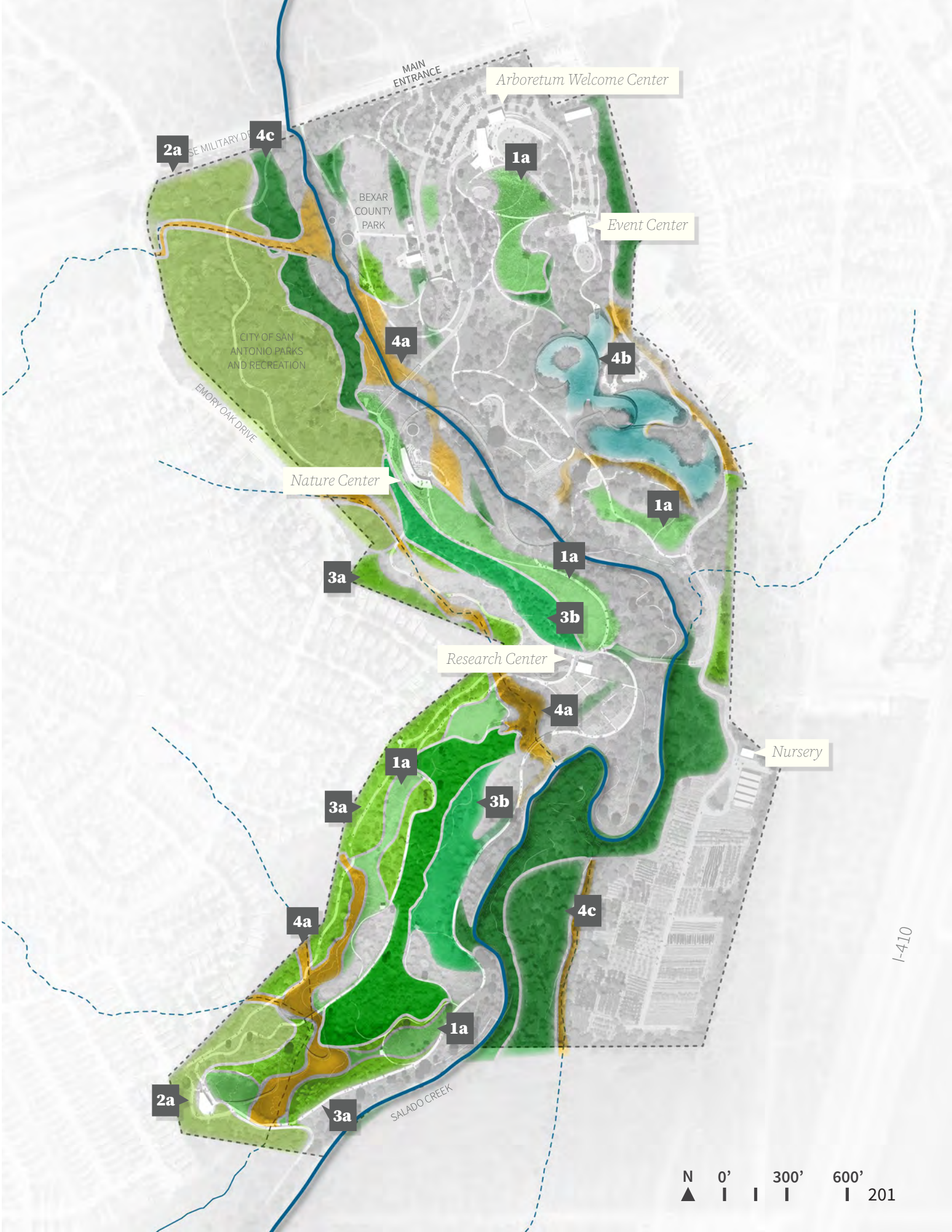
Ecological Collections

Restoration & Habitat Focused

LEVERAGING SITE ECOLOGY

The Ecological Collections serve as living models of Texas' native ecosystems, with a focus on restoration, resilience, and ecological literacy. These collections are designed to showcase trees within their natural plant communities, highlighting the complex relationships between species, soils, water, and wildlife. Organized into four key landscape types—Prairie, Savanna, Upland Forest, and Riparian—each collection offers a window into the dynamic systems that once defined the region and are essential to its ecological future.

By restoring and interpreting these habitats, the arboretum provides a powerful platform for education, research, and conservation, helping environmental stewards, students, and visitors understand the principles and practices of ecological restoration. These collections not only demonstrate the beauty and function of native landscapes, but also inspire a deeper commitment to restoring and protecting the natural heritage of Texas.


MAIN ENTRANCE
Arboretum Welcome Center
SE MILITARY DR
2a
4c
1a
BEXAR COUNTY PARK
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
4a
4b
EMORY OAK DRIVE
Nature Center
1a
1a
3a
3b
Research Center
4a
Nursery
1a
3a
3b
4c
4a
1a
2a
3a
SALADO CREEK
I-410
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300’
600’
201

5 *Site Systems & Details*

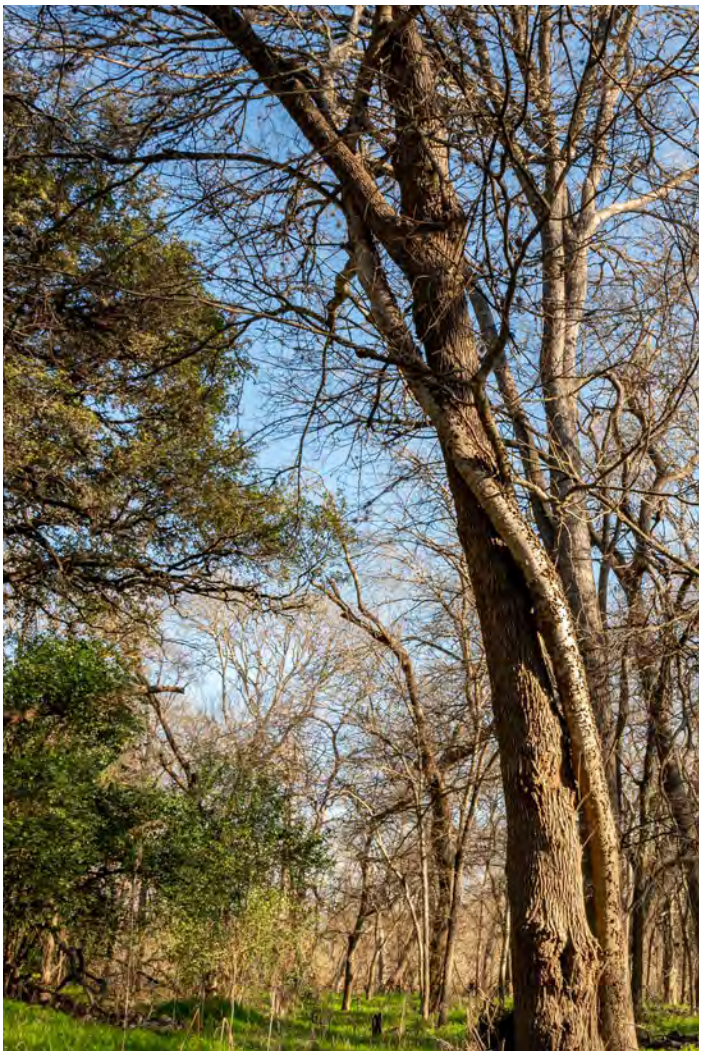
Hero Trees

Meet the Heroes

DESIGN CORNERSTONES

Arboretum San Antonio currently has 31 tree and woody shrub species on site, with 86 being classified as “hero” trees, or those with a Diameter at Break height (DBH) in the 90% of their average mature size, and unique species.

The site’s most charismatic trees are centrally-located along Salado Creek with distinct groupings of green ash, pecan, and cedar elm. The design connects visitors to this resource through trail systems with recurring educational experiences.




Arboretum Welcome Center
SE MILITARY DRIVE
BEXAR COUNTY PARK
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Nature Center
Research Center
Nursery
I-410
SALADO CREEK
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0’
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207

Program

Variety of Experiences

CURATED LOOPS

The site is large, with most of the hero trees and waterways located more than a 10-minute walk from the main entrance. The design offers unique and meaningful experiences for all visitors, no matter the amount of time they have for their visit. Waypoints and rest stops accommodate visitors traveling deeper into the site, especially during hot days.

1HR LOOP

Welcome Center | Event Lawn
Cafe | Retail Nursery

Veteran's Grove

Pond Plaza | Boardwalk

2HR LOOP

Nature Center
Amphitheater

Outdoor Class Room
Research Forest

Canopy Walk
Creek Play

3HR LOOP

Nature Escape

Restoration


MAIN ENTRANCE
Retail Nursery
Arboretum Welcome Center
SE MILITARY DRIVE
BEXAR COUNTY PARK
Event Center
Bexar County Park
CITY OF SAN ANTONIO PARKS AND RECREATION
Pond View Picnic Plaza
EMORY OAK DRIVE
Lookout Shelter
Nature Center
Average 1 hour Visit
Canopy Walk
Average 2 hour Visit
Research Center
Viewing & Interpretation Shelter
Nursery
Greenhouses
Viewing & Interpretation Shelter
Viewing & Interpretation Shelter
I-410
Bird Blinds
Service & Security Outpost
Average 3 hour Visit
SALADO CREEK
N
0’
300’
600’
209

Circulation

Framework & Plan

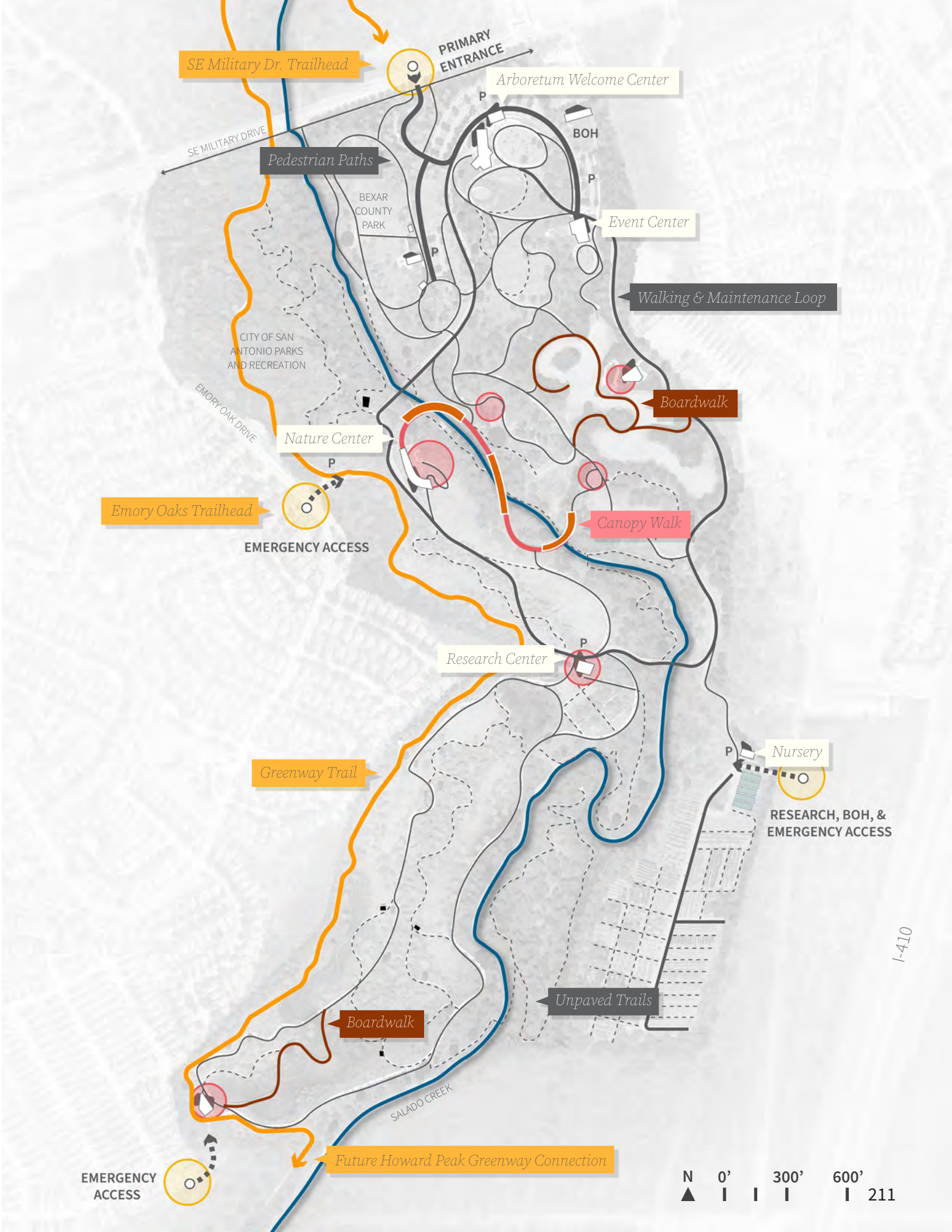
THE NETWORK

The Arboretum's road and path system is designed to provide accessible, enjoyable ways for visitors to explore its tree collections and amenities while preserving the site's natural character. Upon arrival at the main entrance on SE Military Drive, guests can choose from three strategically placed parking areas. These limit vehicular presence within the arboretum, enhancing the landscape's tranquility.

From the parking areas, visitors use "El Paseo," a central walking and maintenance loop that serves as the primary circulatory route. El Paseo connects a variety of formal paved pathways, scenic boardwalks, and rustic hiking trails, offering flexible options for visitors of all ages and abilities. The trail network is organized into loops designed for one-, two-, and three-hour visits, allowing guests to explore new areas on each visit without retracing their steps. This layout is ideal for returning visitors, walkers, joggers, and runners seeking variety and adventure.

As visitors move deeper into the arboretum, paved paths transition into accessible and rustic trails, immersing guests in the wilder, more ecologically diverse areas near the South Trailhead. While public vehicular access is limited to the main entrance, three additional emergency access points from neighboring communities ensure efficient emergency and maintenance response.

Overall, the circulation system at the Arboretum supports both ecological preservation and community engagement, seamlessly connecting to San Antonio's extensive greenway network and reinforcing the city's reputation as a leader in sustainable urban planning and outdoor recreation.


SE Military Dr. Trailhead
PRIMARY ENTRANCE
Arboretum Welcome Center
SE MILITARY DRIVE
Pedestrian Paths
BOH
P
BEXAR COUNTY PARK
Event Center
Walking & Maintenance Loop
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Boardwalk
Nature Center
Emory Oaks Trailhead
EMERGENCY ACCESS
Canopy Walk
Research Center
Nursery
RESEARCH, BOH, & EMERGENCY ACCESS
Greenway Trail
I-410
Unpaved Trails
Boardwalk
SALADO CREEK
Future Howard Peak Greenway Connection
EMERGENCY ACCESS
N
0'
300'
600'
211

Accessibility

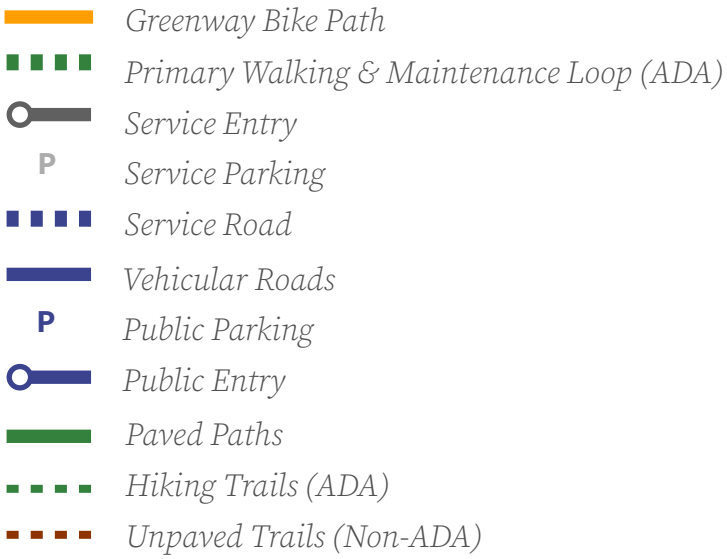
Framework & Plan

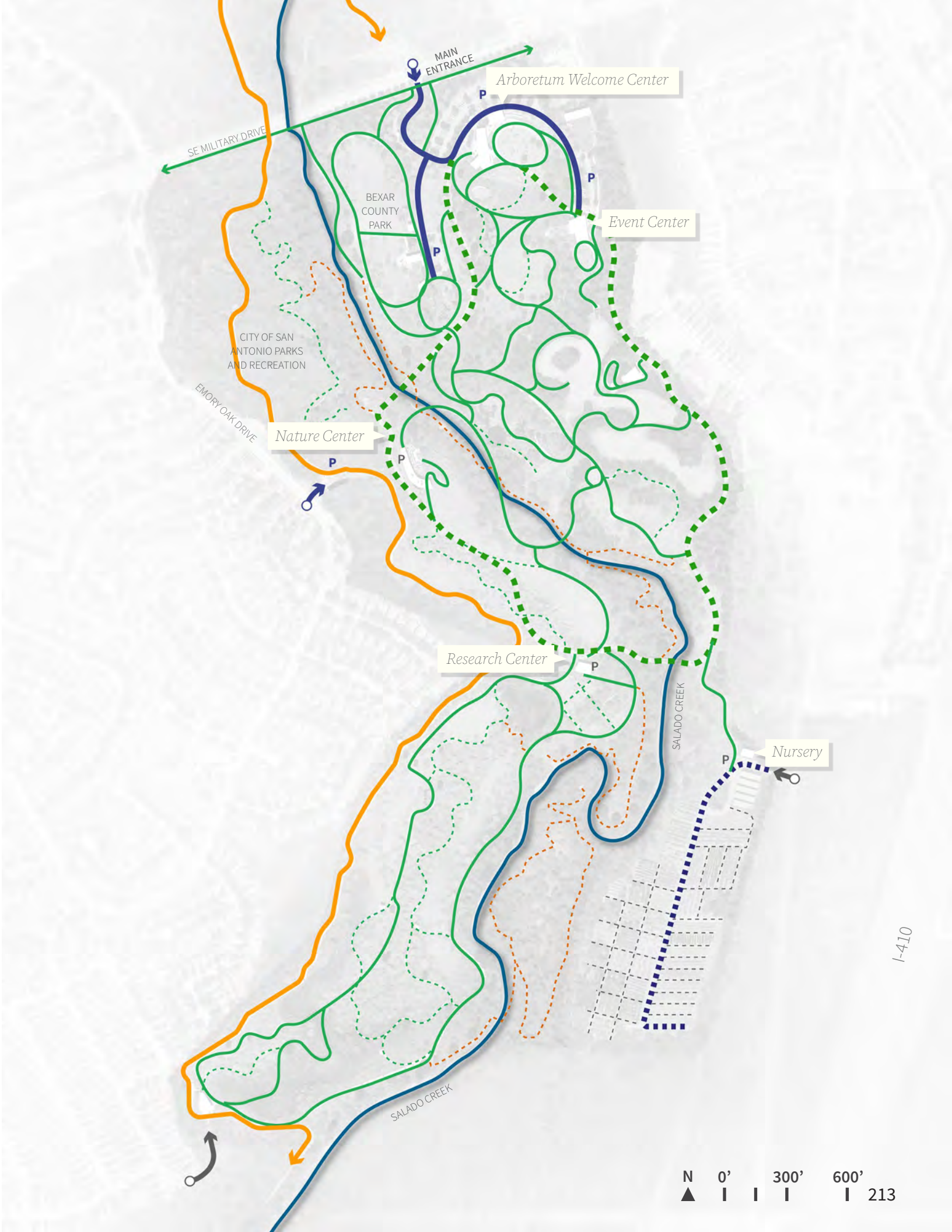
THE NETWORK

The Arboretum's trail and road network is designed to provide inclusive access while preserving the land's natural topography. Trails are aligned with existing contours to maintain gentle, accessible slopes, ensuring that visitors of all abilities can enjoy the landscape. A variety of trail sizes—from broad promenades to narrow rustic paths—invite a range of experiences, from casual strolls to more immersive nature hikes.

El Paseo, the central paved promenade, forms a one-hour visitation loop connecting key destinations such as the Nature Center, Research Center, and Pond Plaza. This wide, vehicle-free path supports walkers, runners, and the Arboretum's shuttle system. Strategic shuttle stops offer convenient access to amenities, including class venues and event spaces. For those with mobility needs, Arboretum shuttles and golf carts may be used for drop-offs at key locations.

Secondary paved loops extend access to compacted dirt trails and more rugged natural paths, which may be navigated with adaptive hiking equipment, such as all-terrain wheelchairs. To ensure comfort throughout the Arboretum, seating areas are placed every 200 meters, offering shaded spots for rest and reflection.




MAIN ENTRANCE
Arboretum Welcome Center
SE MILITARY DRIVE
BEXAR COUNTY PARK
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Nature Center
Research Center
SALADO CREEK
Nursery
SALADO CREEK
I-410
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213

Accessibility

Accessibility Programs

IDEAS & INNOVATIONS

The Arboretum's accessible circulation system is an opportune place to implement programs and services that increase accessibility across populations with differing abilities. These precedents from other US public gardens are just a few ways Arboretum San Antonio can be a welcoming place for all.

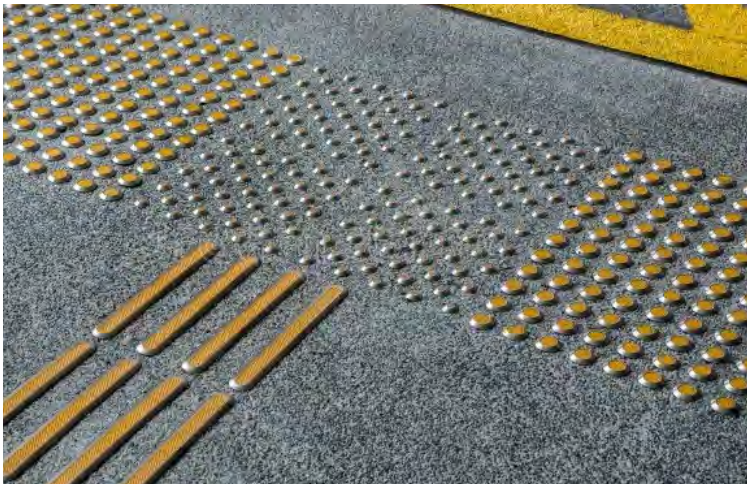
Some of these examples include people movers like the wheel chair accessible golf cart at Holden Arboretum and the tram train at the LA County Arboretum. Both of these examples could be used on El Paseo, the primary walking loop in Arboretum San Antonio.

To improve accessibility to nature trails on site, the Arboretum could offer all-terrain wheelchair rentals. This would allow visitors of different physical abilities to explore the deeper reaches of the site. Additionally, colache clay trails will provide a more stable ground for wheel chair navigation

Tactical paving designs such as detectable pavement bumps can improve site accessibility for those who are visually impaired. [redacted] Watertown Braille Trail at the Watertown park incorporated a cable guiding system that has differently shaped indicator beads to identify park features and seating opportunities. These are just a few design moves that can improve Arboretum San Antonio's Universal Accessibility.

COMPACTED ACCESSIBLE COLACHE CLAY TRAILS

GRIT ALL TERRAIN WHEELCHAIR RENTALS



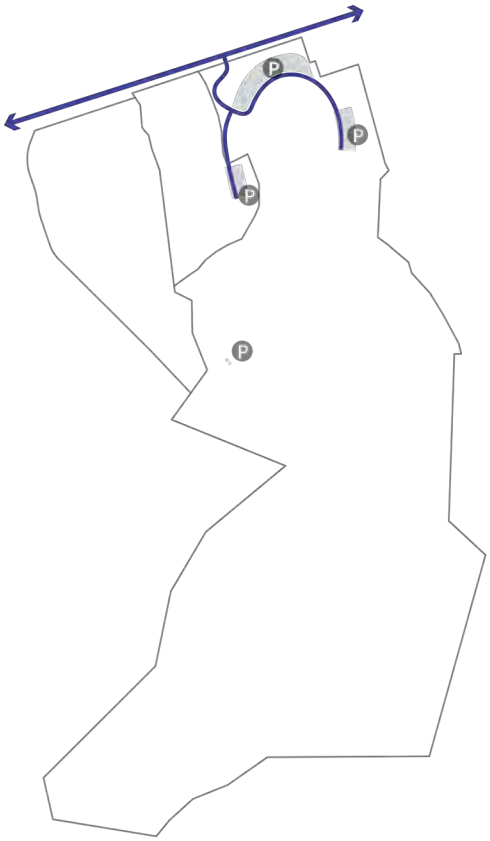
PAVING INDICATORS FOR THE BLIND

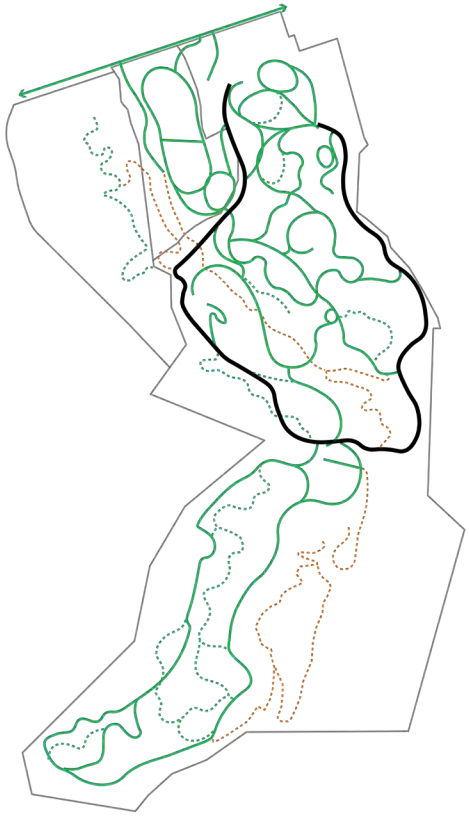
HOLDEN ARBORETUM WHEELCHAIR ACCESSIBLE GOLF CART

WATERTOWN PARK BRAILLE TRAIL BY [redacted]

MORTON ARBORETUM TRAM TRAIN

Layered System





VEHICULAR ROADS & PARKING

Public Access to the Arboretum will be from SE Military Drive. Driveways will be limited on site to the primary parking lots at the Welcome Center, Event Center, and Bexar County Park. The intent is to limit vehicles disrupting user experiences on the site and allow visitors to connect with trees and experience a revived natural environment.

Vehicular Roads

Parking

PEDESTRIAN PATHS

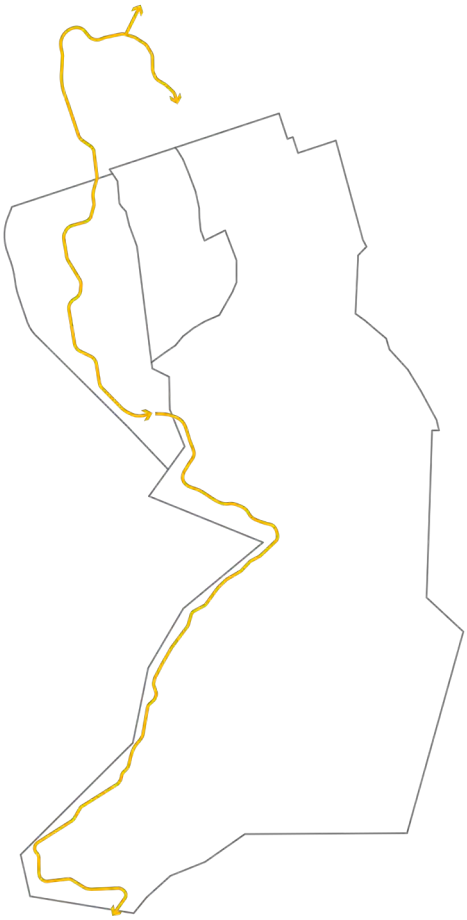
Pedestrian paths are a spectrum of highly maintained accessible routes to rugged hiking trails. These offers primarily provide access to the many tree collections and restored environments at the Arboretum. Secondly, pedestrian paths provide varied experiences to allow visitors to choose how they would like to connect with trees.

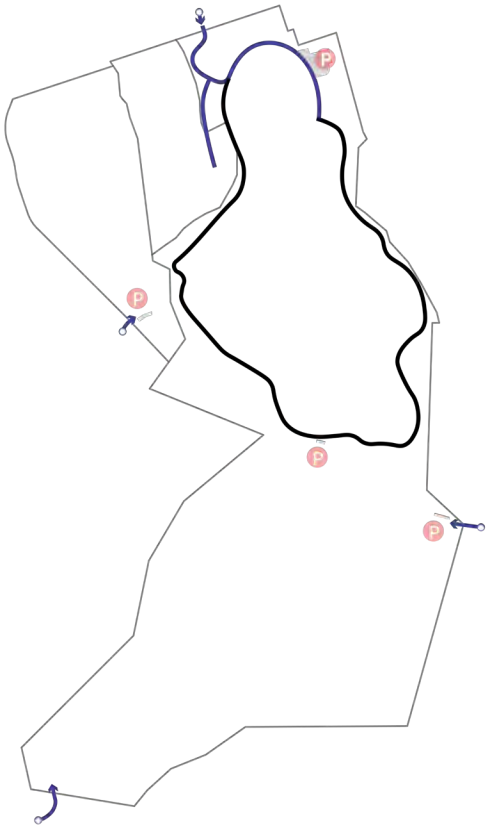
Paved Paths

Primary Loop

Unpaved Trails (ADA Accessible)

Unpaved Trails (Non-ADA)





BIKE ROUTES

The Environment is required to provide Right-of-Way for the Howard Peak Greenway system. The alignment provides bicycle access to and through ASA with connections to the Emory Oaks trailhead and future expansion south of the Arboretum. This route is separated from the primary paths of ASA to ensure conflict-free interaction between Greenway users and Aboretum visitors.

Greenway Bike Path

SERVICE ROADS

Maintenance to the Arboretum grounds is serviced by the shared primary loop that will prioritize pedestrians but allow authorized maintenance vehicles and emergency response vehicles to access the site. Secondary access points will connect the Arboretum with adjacent streets to provide ample access for emergency and maintenance vehicles.

Service Loop

Service Entry

Service Parking

ENTRY SEQUENCE

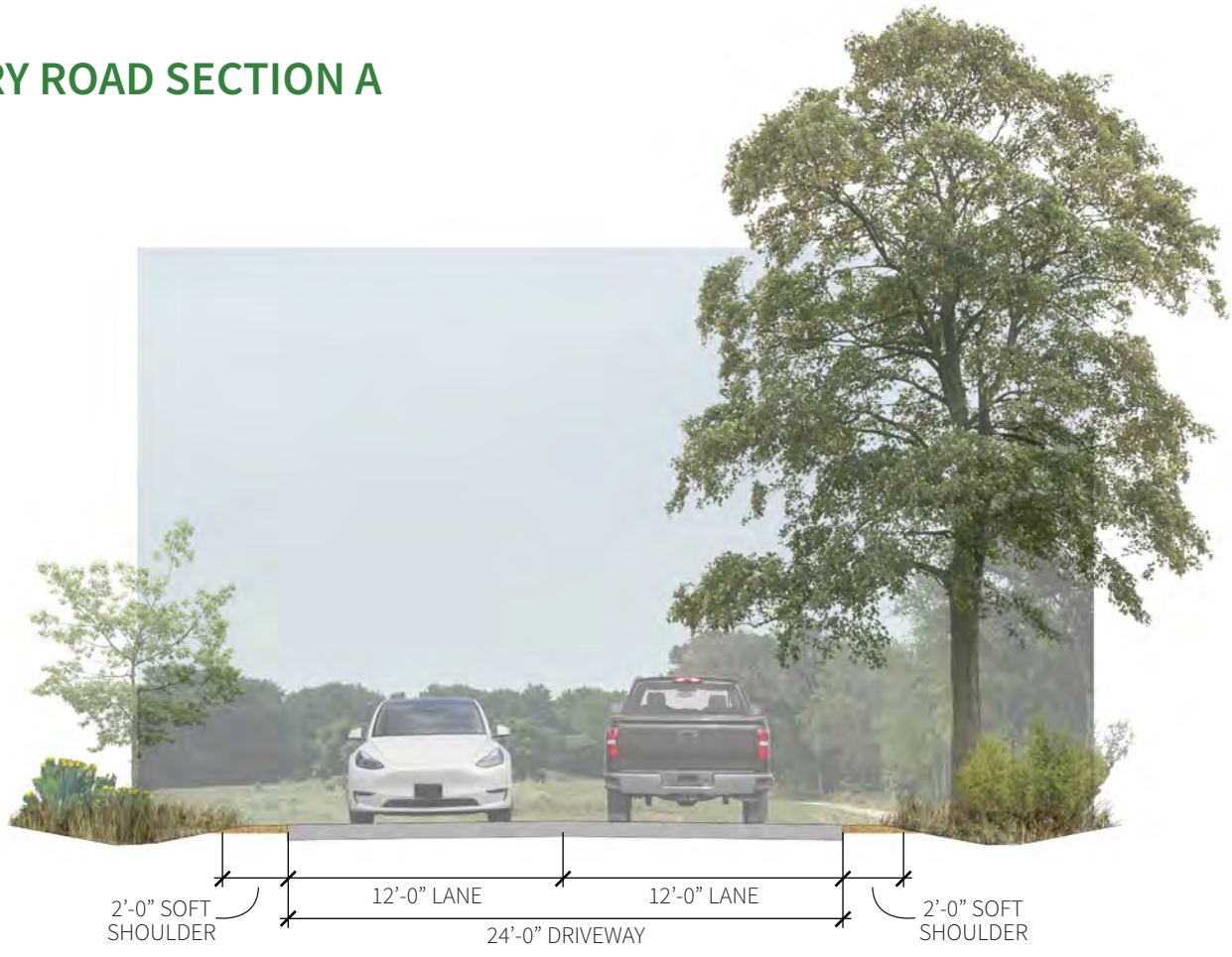
The Arboretum's main entrance is positioned directly across from the Salado Creek Trailhead and parking lot on SE Military Drive, presenting a future opportunity to improve traffic safety and visitor access. Potential upgrades—including dedicated left-turn lanes, pedestrian crosswalks, and a traffic signal—would enhance safety for vehicles, pedestrians, and VIA bus riders alike. During Phase 1 Schematic Design, coordination with TxDOT and VIA will refine the intersection design and timeline, with particular attention to creating a separate, safe entrance experience for public transit users.

The entry sequence is designed to create a strong sense of arrival, with views of iconic native trees—including a prominent grandmother oak in Bexar County Park—and sweeping glimpses of the demonstration Blackland Prairie framing the Welcome Center. As operational policies continue to be developed, the master plan anticipates an entry booth for orientation, admission, and parking guidance. From this point, visitors may choose between three main parking areas, with a combined capacity of approximately 400 vehicles.

A dedicated drop-off area supports smooth circulation, allowing tour and school buses to unload passengers without disrupting traffic. An adjacent area accommodates up to six standard 40-foot buses.

To enhance visitor convenience, key amenities—including a retail nursery and a café/restaurant—are located near the core drop-off area for quick access. The Arboretum's Event Center is positioned in a distinct part of the campus, allowing event attendees to bypass the general visitor sequence while maintaining ease of access.

ENTRY ROAD SECTION A

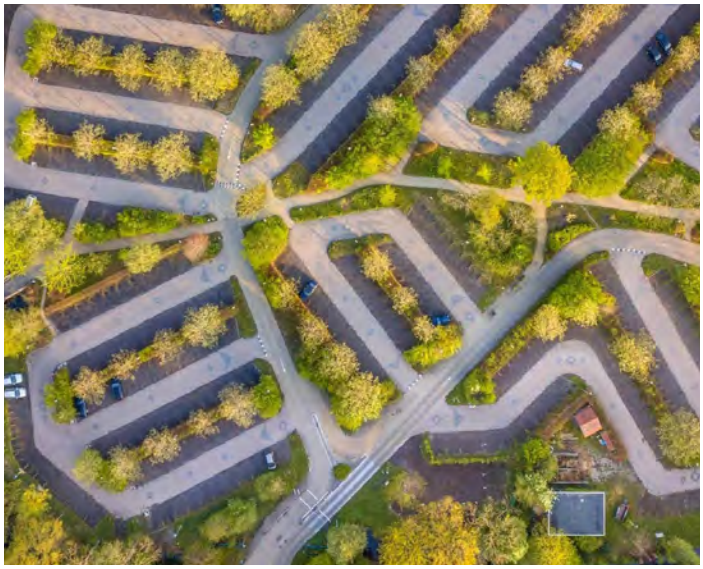



Pedestrian Crosswalk & Traffic Signal
Primary Parking (200 Spots)
Military Drive Trailhead
MAIN ENTRANCE
Bus Parking (6 Spots)
SE MILITARY DRIVE
A
B
Retail Nursery
Maintenance Yard
O&M Staff Parking (15 Spots)
Arboretum Welcome Center
Views to Grandmother Oak
C
Overflow Parking (50 Spots)
Event Center
Grandmother Oak
Event Parking (100 Spots)
County Park Parking (65 Spots)
BEXAR COUNTY PARK
N
0’
100’
200’
219

PARKING

Welcoming guests with trees is the guiding inspiration for the Arboretum's entry sequence and continues throughout the parking areas, where curated tree collections provide shade and create a sense of arrival. Permeable paving reduces stormwater runoff, and dense shade reduces heat island impacts, reinforcing the Arboretum's commitment to environmental stewardship. Designed as "parking gardens," these areas illustrate the Arboretum's mission of tree conservation while balancing the practical needs of visitors.

The master plan includes three primary parking areas and two overflow zones, accommodating approximately 400 vehicles and up to six standard 40-foot buses. Tree islands define and soften the parking layout, integrating each space into the Arboretum's teaching collection. Even on walks to and from their vehicles, visitors will experience tree species best suited for San Antonio, the city's streets, and home gardens. Adjacent areas near the County Park and Event Center offer potential for future parking expansion as needed in later phases.



GREEN INFRASTRUCTURE PARKING LOT

PRIMARY PARKING SECTION B

EL PASEO | PRIMARY LOOP

The Arboretum's primary loop, named El Paseo, is envisioned as a wide, welcoming promenade that offers visitors a holistic experience of the site in under an hour. Designed as a central spine, El Paseo connects key destinations including the Welcome Center, Event Center, Pond Plaza, Research Center, Nature Center, and Bexar Park, enhancing wayfinding and orienting visitors throughout their journey. Generously scaled to comfortably accommodate walkers, runners, and Arboretum shuttles or operations vehicles, the promenade will be fully accessible, adhering to ADA standards with a maximum 4.9% running slope and 1.9% cross slope. A network of trails and secondary paths will branch from the loop, inviting exploration and offering varied walking experiences.

Constructed in reinforced concrete and carefully aligned to preserve existing trees, the path will be shaded by strategic tree plantings and bordered by a mowed maintenance strip for safety. Thoughtfully spaced NightSky-certified lighting and Emergency Call Boxes will support evening use, while amenities such as benches, rest stations, litter bins, and interpretive signage will enrich the visitor experience at accessible intervals.

While pedestrian-focused, El Paseo is designed to accommodate occasional authorized vehicles, including shuttles, emergency services, and maintenance equipment. Serving as the "first day experience" of the Arboretum, all major destinations will be oriented to this loop, inviting guests to explore the landscape with comfort and ease.

EL PASEO LOOP SECTION C

PRIMARY PATHS

Concrete primary paths extend from the El Paseo loop, providing accessible circulation into key Arboretum zones beyond the central promenade. All routes comply with ADA standards (≤4.9% running slope, ≤1.9% cross slope) and traverse restored meadows and existing tree groves, with alignment strategies minimizing disturbance to root zones and sensitive habitat. Shade is provided through a combination of preserved canopy and targeted tree plantings.

Visitor amenities, including benches, rest areas, and interpretive signage, are integrated along these paths at reduced frequency, reflecting their distance from high-traffic zones such as El Paseo and limited after-hours use

CONCRETE PRIMARY PATH EXAMPLE

PRIMARY PATH SECTION

PATH TYPE 1

10’-wide concrete paths are designed for higher visitor volume and frequent interpretive engagement. May include low-level pedestrian lighting for limited evening access and occasional emergency call boxes.

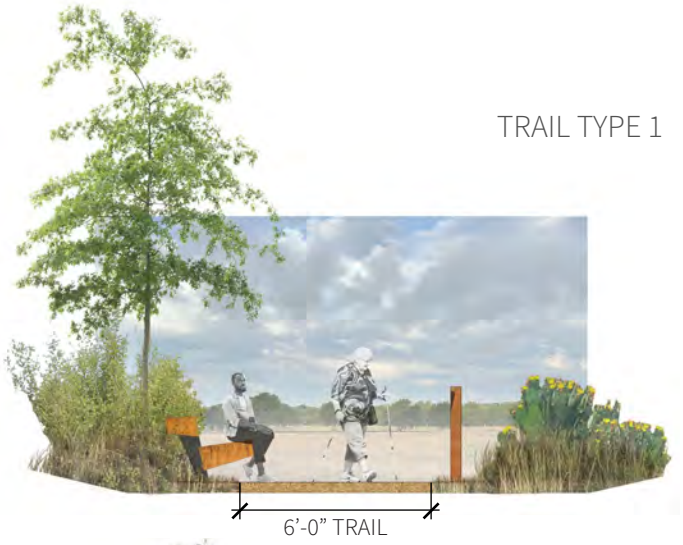
PATH TYPE 2

8’-wide concrete paths with tighter alignments for minimal environmental impact. No lighting provided; amenities limited to select interpretive areas.

NATURAL HIKING TRAILS

Natural hiking trails deviate from paved paths to reach the deepest collections of the arboretum. They offer the most naturalistic experience to immerse visitors in the beauty and intrigue of trees. Surface materials include aggregates and compacted soil. ADA accessibility varies with each trail type, and lighting is not provided to lessen impact on adjacent habitat

TRAIL TYPE 1



TRAIL TYPE 1 | Stabilized Aggregate (Accessible)

Accessible trails are stabilized aggregate paths that align with ADA slope standards. These trails will feature amenities like naturalistic benches and will only occur around the Welcome Center and Arboretum Core Campus. This trail provides visitors with an entry-level experience to hiking at the Arboretum.

TRAIL TYPE 2

TRAIL TYPE 2 | Compacted Soil (Accessible)

Trail Type 2 conforms to existing topography with little intervention to control slopes, beyond incorporation of trail stabilizing materials such as aggregates or compacted soils. These trail types will minimize the removal of native vegetation and will conform to protect existing trees and their critical root zones. Adhering to National First Hiking Trail Standards, seating and amenities will be limited to naturally found materials such as logs and large stones.

TRAIL TYPE 3

TRAIL TYPE 3 | Rugged (Non-ADA)

As the most rustic trail type, these trails minimize width and emphasize the natural characteristics of the environment they pass through. Roots, Stones, and other in-soil features will remain. Amenities such as seating will be made of found materials or fallen logs from demolished trees. Path materials will vary based on context, from wood chip dressings in upland areas to compacted clays in the floodplain.

CANOPY WALK

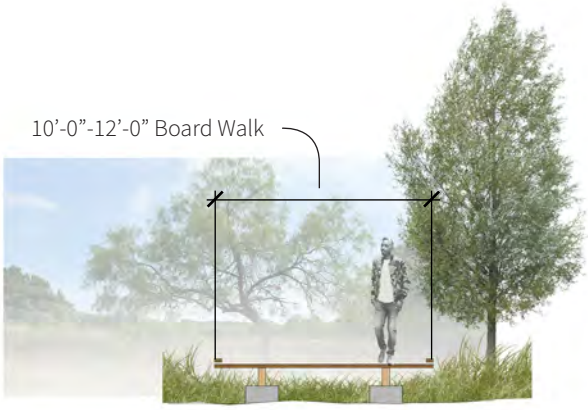
The Canopy Walk is a signature feature of the Arboretum, offering visitors a unique, immersive perspective through the tree canopy that rises above Salado Creek. Fully accessible, the walk will include at-grade landings and seamless connections to primary paths, the Nature Center, and El Paseo.

Integrated art, interpretive elements, and playful features will highlight the ecological and cultural value of the Arboretum's tree canopy. Structural supports will be carefully located to avoid disturbance to significant trees and in locations to ensure safety even when Salado Creek is flooded.

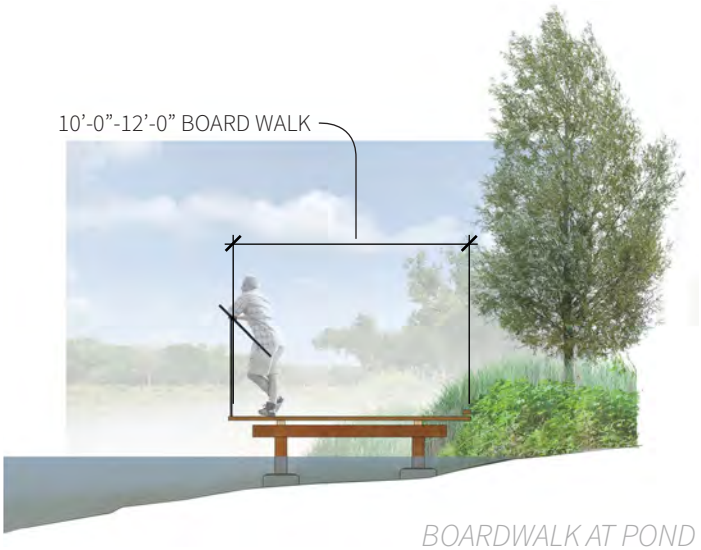
CANOPY WALK STRUCTURE

WETLAND BOARDWALK

Boardwalks throughout the Arboretum provide unique and ADA accessible visitor experiences through ephemeral wetlands and over established ponds to experience this unique ecosystem in South Texas. Interpretive signage, benches, and bird blinds will aid in educating the public about the Salado Creek watershed and migratory birds that use wetlands as stopovers on their journeys. Keeping with the naturalistic aesthetic of the Arboretum, Boardwalks will be made of contextual materials that resist rotting and moist environments. To enhance the Arboretum's commitment to sustainability, wood products are to be naturally rot-resistant or thermally modified to reduce reliance on exotic hardwoods or chemical treatments.



BOARDWALK AT EPHEMERAL WETLAND



BOARDWALK AT POND

CANOPY WALK

BOARDWALK

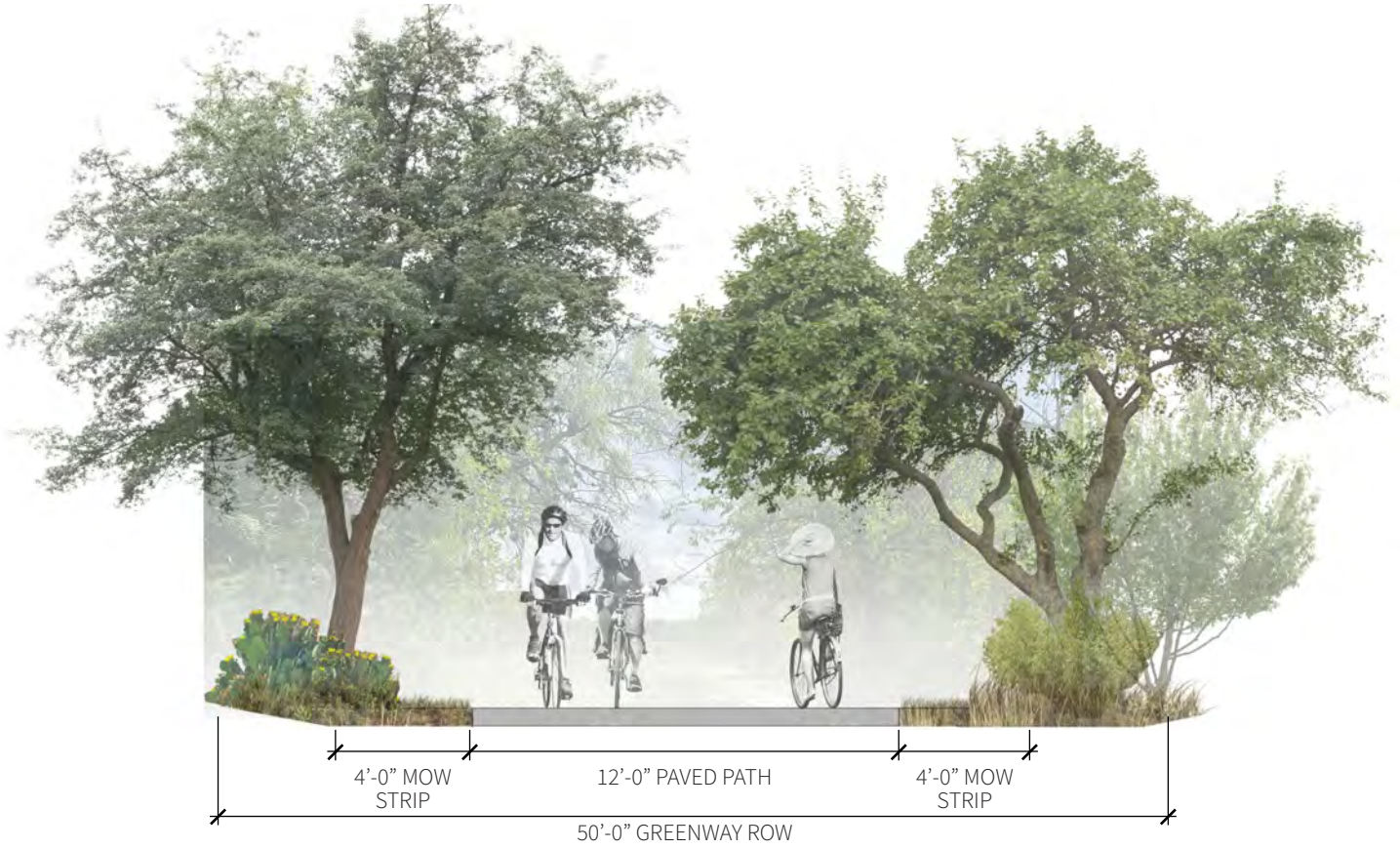
Greenway

OVERVIEW

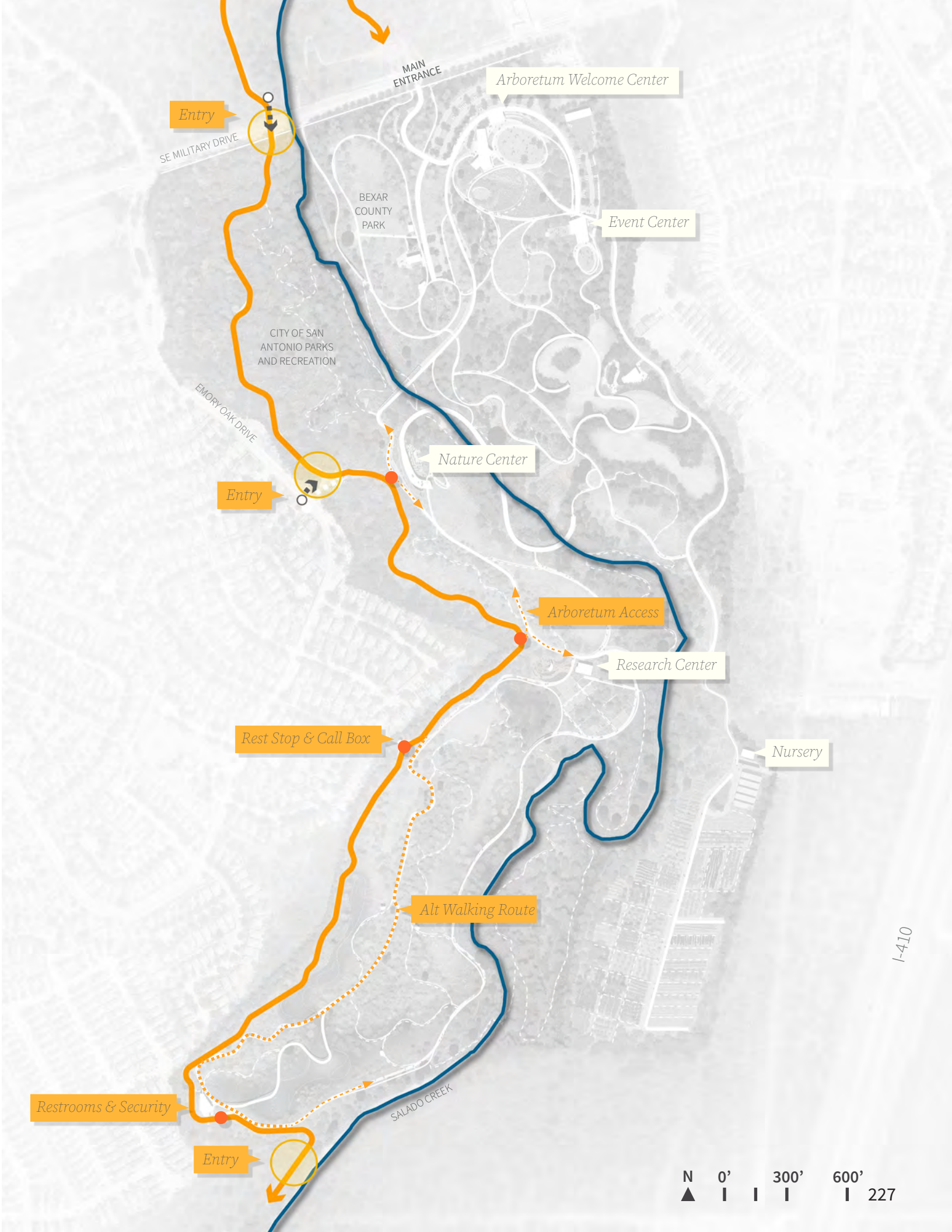
Arboretum San Antonio will be a significant landmark and activator along the Salado Creek Greenway and greater Howard W. Peak Greenway system around San Antonio. When completed, visitors will be able to access the Arboretum entirely by bike, traveling from places such as the Mission Reach, San Antonio Airport, or Brooks.

Approximately 1.5 miles of greenway trail system will be incorporated into the Arboretum and designed to allow separation of bicycles and walkers/runners through the Arboretum's trail system. The 50' Greenway right-of-way is designed to meet slope accessibility standards through shaded natural areas of the Arboretum. Greenway connections to the Arboretum trail network provide points for visitor amenities like bike repair stations, emergency call boxes, bike parking, and shaded seating.

Design of the Greenway system was conducted in collaboration with the City of San Antonio Parks and Recreation staff, Bexar County, and the San Antonio River Authority to determine a modified layout from the originally planned easement, connection points, widths, and shared amenities. The master plan considers established Greenway visions and technical guidelines through San Antonio's Trail Design Strategy, established in 2018. As the Greenway and Arboretum schematic design is developed, continued collaboration will be needed to define technical aspects of the Greenway, including policies, safety and security, as well as wayfinding and branding.



greenway trail section


MAIN ENTRANCE
Arboretum Welcome Center
Entry
SE MILITARY DRIVE
BEXAR COUNTY PARK
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Nature Center
Entry
Arboretum Access
Research Center
Rest Stop & Call Box
Nursery
Alt Walking Route
I-410
Restrooms & Security
SALADO CREEK
Entry
N
0’
300’
600’
227

Trail Design Considerations

MATERIALS AND BRANDING

The TDSSA established typical trail paving in concrete and Greenway markings for blind corners and hills. Due to existing site features like wetlands and drainages, small bridges or boardwalk crossings may be required. Signage and furnishings will blend the Greenway branding into the aesthetic and functionality of the Arboretum's wayfinding and amenity palette.

GREENWAY BOARDWALK

GREENWAY BRIDGE

HOWARD W. PEAK GREENWAY SIGNAGE

WIDTHS

The TDSSA establishes this reach of trail to be a minimum of 10'-0" wide, however, with the proposal of the Arboretum, City of San Antonio Parks and Recreation recommended a minimum of 12'-0" to accommodate increased usership with Arboretum traffic. 12'-0" is a minimum standard for multi-use trails and will accommodate both cyclists and pedestrian users.

CONCRETE GREENWAY

SECURITY AND ACCESS

Access and security will be incorporated in the management of the Greenway section. The Arboretum and City of San Antonio Parks and Recreation intend to limit access to official trailheads and the entrance to the Arboretum through timed gates. The alignment of the Greenway abuts the Arboretum's property line with adjacent private residences. Physical and planting barriers will be placed to ensure no unauthorized access to the Greenway and the Arboretum occurs. Trails are typically not lighted and operate from dusk to dawn. City security patrols are not expected to occur frequently, therefore, site security may be required to ensure safety along this stretch of the Greenway.

Access to the Greenway will be primarily through the Emory Oaks Trailhead and through a connection on the Arboretum's southern property boundary. Connections from the Arboretum will be allowed, but crossing gates and other control devices are recommended to ensure cyclists cannot freely enter the Arboretum trail and path networks.

ARBORETUM PROPOSED GREENWAY

PROPOSED HOWARD W. PEAK GREENWAY

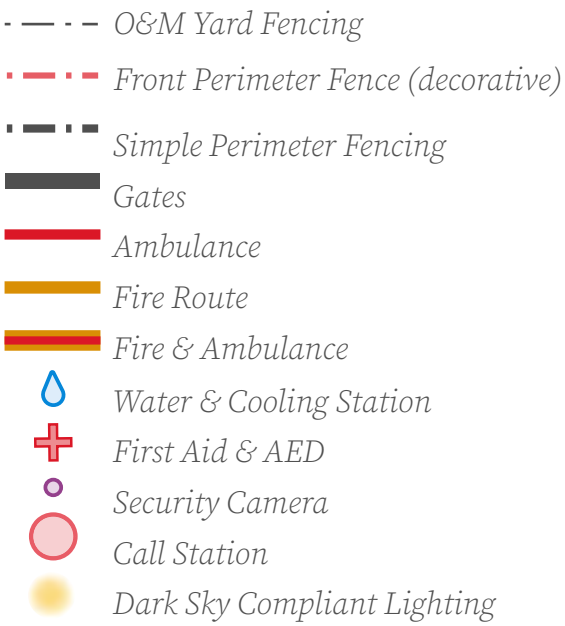
Site Safety & Security

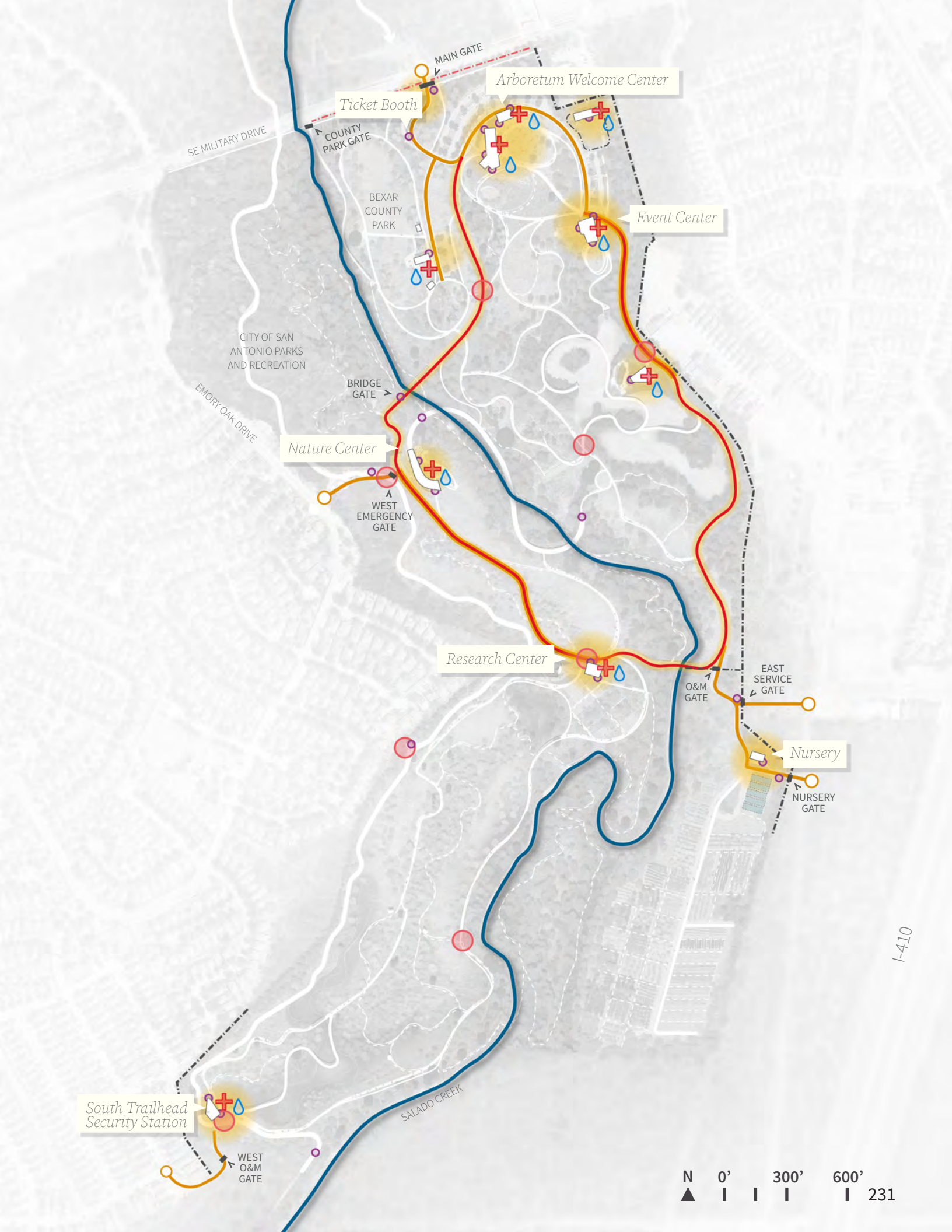
Tools + Management

ENTRY POINTS AND SECURITY

The Arboretum has four primary entry points, one main entrance and three controlled access points for emergency vehicles, staff, researchers, and construction deliveries. All access points adhere to the Arboretum's operating hours.

1. **The North Gate on Military Drive (Main Entry)**- Allows for regular visitor and staff use and can be gated and/or controlled with a ticket booth. This entry is directly connected to the Arboretum's primary parking areas and visitor amenity buildings.
2. **The East Gate on I-410 Service Drive**- Allows for staff and researcher access to the Tree Nursery and Research Fields on the Arboretum's Southeast side. This access point is a preferable destination for O&M deliveries.
3. **The South Gate at South Trailhead**- Allows for Emergency and O&M Access off Puente Drive in the Woodbridge neighborhood. Given the neighborhood context, this entrance is considered for emergencies only and will not allow regular visitors.
4. **The West Gate at Emory Oaks Drive & Trailhead**- Allows for O&M, Emergency, and staff and researcher access to the Arboretum's Nature Center and Research Center. This entry interfaces with the Greenway's existing trailhead and can provide visitor access to the Arboretum.




MAIN GATE
Arboretum Welcome Center
Ticket Booth
COUNTY PARK GATE
SE MILITARY DRIVE
BEXAR COUNTY PARK
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
BRIDGE GATE
EMORY OAK DRIVE
Nature Center
WEST EMERGENCY GATE
Research Center
O&M GATE
EAST SERVICE GATE
Nursery
NURSERY GATE
I-410
South Trailhead Security Station
SALADO CREEK
WEST O&M GATE
N
0'
300'
600'
231

SECURITY CAMERAS

Cameras are an essential tool in site security and should be employed early on, while staffing increases. Essential areas to secure with cameras are site entrances, porous boundaries, around site structures, important trees, and trail bottlenecks, like bridge crossings. In early phases when site electricity access is limited, cameras can be solar-powered or rely on batteries. In later phases, cameras should be centrally controlled from the O&M center and powered through the Arboretum-wide utility system.

EMERGENCY CALL BOXES

Call boxes, which should be provided for visitors without a personal cell phone, should be dispersed across the Arboretum, especially in areas outside of a 5-minute walk to a building. Recommended locations include trail intersections located between restroom/cooling stations and identified with corresponding signage and a light.

SECURITY CALL BOX

EMERGENCY CALL CENTERS

The Arboretum's design places a variety of Arboretum structures out of the floodplain to be places for information and visitor amenities. They include the Welcome Center, Nursery & Gift Shop, Event Center, Nature Center, Pond Plaza, Research Center, and South Trailhead Waypoint. In each location, an indoor air-conditioned space with restrooms and potable water serves as a cooling station during especially hot days. These areas also act as temporary shelters during hazardous weather events. Emergency phones and a First Aid center with AEDs are provided for medical emergencies.

SITE LIGHTING

The Arboretum's concept lighting layout considers visitor safety, energy conservation, as well as DarkSky International standards for reduced light pollution. Honoring the Arboretum's mission and intended operating hours, lighting is restricted to building and parking areas, evening program spaces, and the El Paseo main circulation loop. Security lighting should also be considered for Emergency Call Boxes and Arboretum access points. It it not advisable to include site lighting along rustic trails where it will have negative ecological impacts.

Site lighting should follow smart timing protocols and either linked to set hours or respond to ambient light levels. Photovoltaics mounted to Arboretum buildings is an ideal way to reduce energy consumption, provide power for lighting, and demonstrate the Arboretum's commitment to sustainability.

NEIGHBORHOOD ACCESS

Policies allowing direct neighborhood access should be carefully considered for Arboretum security and neighborhood privacy. In areas where neighborhood common areas interface with Arboretum property, fencing and/or access bollards should be applied in clear areas to eliminate ATV or vehicle access. Gate installation may be preferable to eliminate visitor access into adjacent neighborhoods and prohibit parking congestion on residential streets. In some public gardens, neighborhood memberships are sold with key fobs, which can provide access to those who desire the amenity, while also providing Arboretum security. Key fobs also help to ensure site security by logging access times and users.

8FT TALL METAL ENTRY FENCE

FENCING

Fencing the entire Arboretum will be a costly endeavor for initial construction and on-going maintenance. Fencing helps to secure the Arboretum, limit access to designated entry points, and can help prevent the movement of unwanted species such as white-tailed deer and wild pigs, which can damage Arboretum collections. Fencing within the floodplain is not permitted and not recommended for maintenance reasons. Fencing in densely wooded areas carries additional maintenance considerations due to falling branches and trees. If desired, fence construction should be phased to ensure critical areas are secured first and less important areas are left unfenced or constructed in later phases. Permanent fencing types can be broken down into two primary typologies:

1. **Formal Entry Fence:** Located along Military Drive, an 8-foot permeable entry fence allows easy access views into the arboretum and gives a formal frame to the Arboretum's core campus. The fence type may be preferable in residential entrance areas.

2. **Site Security Fence:** An 8-foot permeable fence, similar to traditional chain link, could secure the Arboretum property lines outside of the Salado Creek floodplain. This fence typology is essential in areas where ATV or vehicular access is possible. It is also critical on the south end of the property, where most feral hog paths are.

Hydrology

FRAMEWORK + PLAN

ENHANCING THE NETWORK

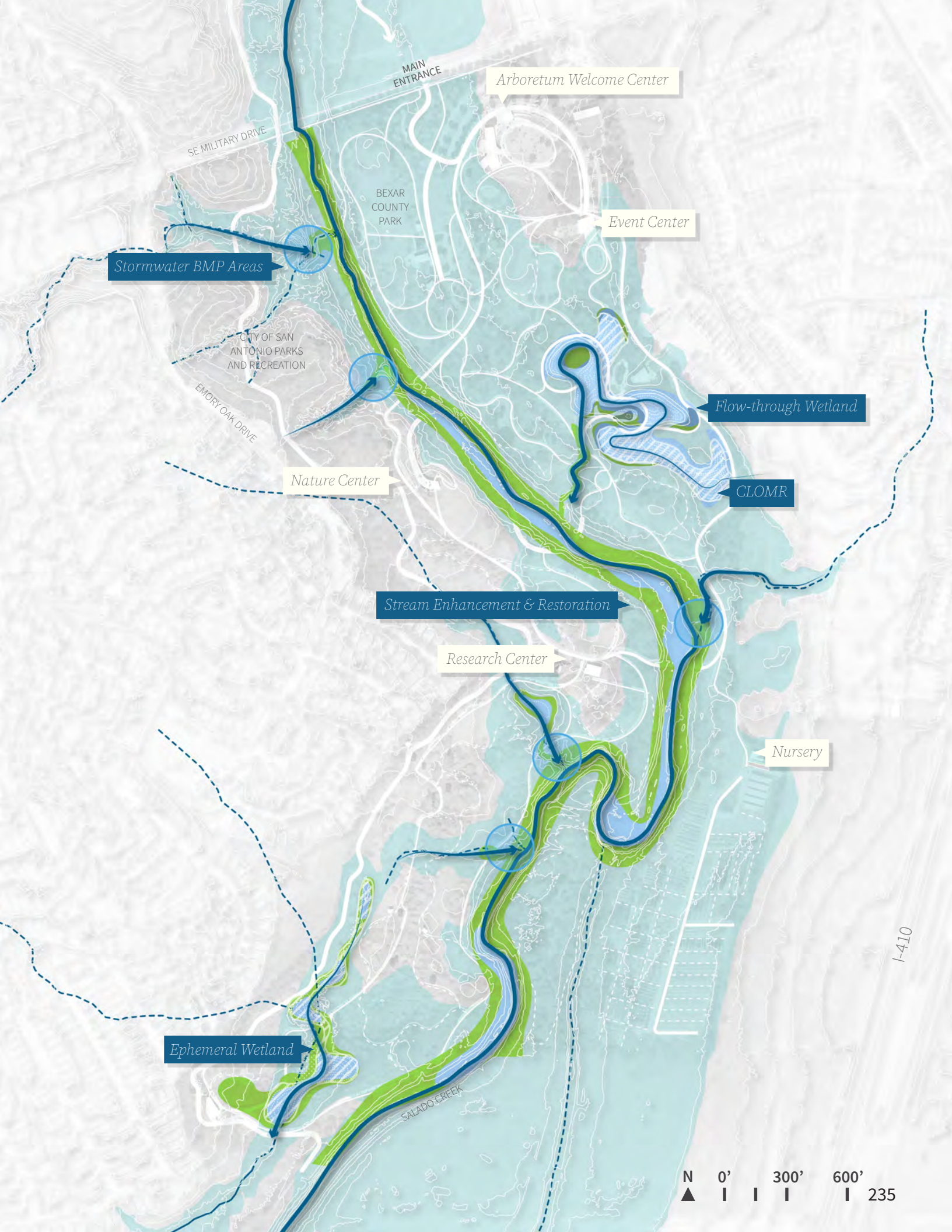
The Arboretum's design is rooted in responsible water stewardship, integrating best management practices for stormwater mitigation, flood protection, and water quality. Developed in collaboration with the San Antonio River Authority and San Antonio Water System (SAWS), the plan centers on the health of Salado Creek and the broader San Antonio watershed. Every design decision supports both water conservation and public education about the region's hydrology.

As the Arboretum evolves through its four-phase buildout, additional impervious surfaces, such as expanded parking and new structures, will be offset by a network of green infrastructure. Parking lot bioswales, rain gardens, cisterns, and green roofs are strategically integrated to capture, slow, cool, and filter stormwater. In some cases, collected water will be reused for irrigation or building systems, promoting a closed-loop approach to water use.

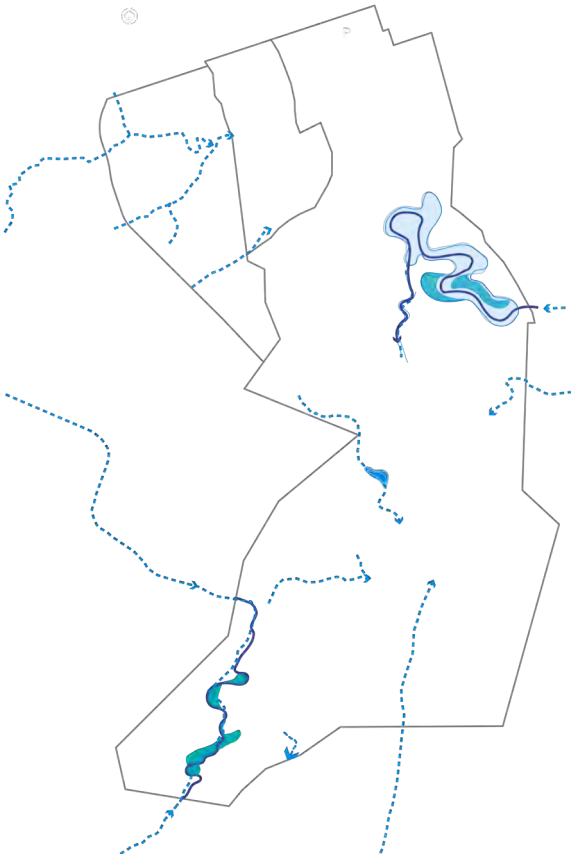
Serving as the final buffer between surrounding neighborhoods and Salado Creek, the Arboretum plays a critical role in filtering runoff from adjacent residential and commercial areas. Key drainage points have been identified for ecological restoration to help intercept and cleanse runoff before it enters the creek. One such example is the ephemeral wetland at the South Trailhead, where natural drainage patterns have been enhanced to improve water quality from upstream neighborhoods.

A reimagined irrigation pond—fed by a recycled water contract with SAWS—has been expanded and linked with a neighboring detention basin to create a larger system for filtration, detention, and irrigation reuse, reinforcing the Arboretum's commitment to sustainable water management.

Drainage Pathways
500-Year Floodplain
Wetland Filters
Bank Restoration
Salado Creek Entry Points


MAIN ENTRANCE
Arboretum Welcome Center
SE MILITARY DRIVE
BEXAR COUNTY PARK
Event Center
Stormwater BMP Areas
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Flow-through Wetland
Nature Center
CLOMR
Stream Enhancement & Restoration
Research Center
Nursery
I-410
Ephemeral Wetland
SALADO CREEK
N
0'
300'
600'
235

Hydrological Systems

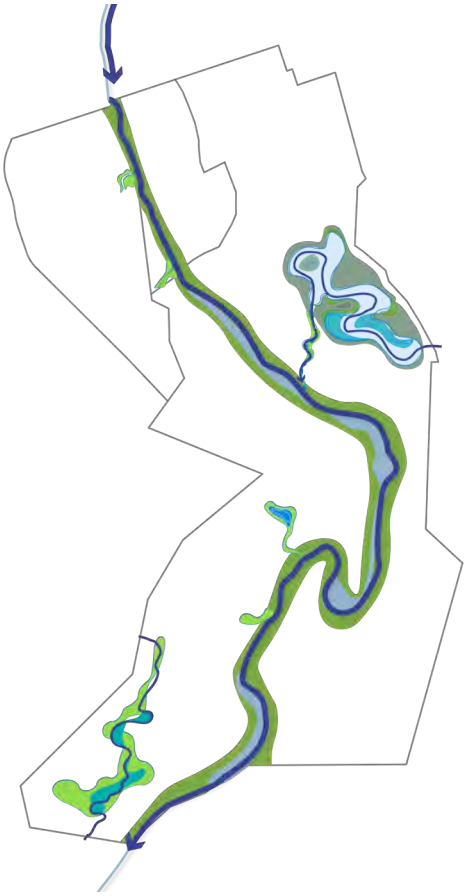


CONNECTOR

Nearly 1.5 miles of Salado Creek runs through the heart of the Arboretum. Restored banks and a hydrological profile with pool, ripple, and run components improve the creek's water quality. Scour pools decrease water temperature and provide a breeding ground for diverse aquatic species. Ripple areas created through in-stream rocks and woody debris aerate the water and increase dissolved oxygen levels, which supports greater aquatic biodiversity. The gently sloped glide section of the stream provides habitat for aquatic and amphibian life.

COLLECTOR

The pond and ephemeral wetlands capture and filter stormwater runoff from surrounding neighborhoods, creating wetland habitats and a stored water supply for reuse in irrigation. These multibenefit functional and beautiful landscapes provide visitors with a unique wetland experience, showcasing wetland tree species and the plants and animals they support.



FILTER

Densely vegetated riparian edges along the pond system, emergent wetlands, and restored creek banks filter water, improving the quality as it makes its way into Salado Creek. The pond's low-flow channels and the wetland's settlement ponds allow the water to naturally filter for longer periods of time, which supports groundwater recharge and resident aquatic species.

LEADER

The design of the Arboretum incorporates water quality best management practices through collaborative design with the San Antonio River Authority and San Antonio Water Authority. These practices not only help to improve stormwater runoff into Salado Creek, but also help to reduce water use across nearly 200 acres of Arboretum property. Demonstrations of these infrastructural strategies will be on public display, aiding the Arboretum's mission to educate visitors on sustainability.

CISTERNS

In architectural applications, cisterns (both above-ground and below-ground) are a practical approach for water collection and reuse for nearby irrigation. While above-ground cisterns are a visible and cost-effective way to demonstrate water conservation to the public, below-ground options under parking areas are space-saving and can be directly connected to bioswale overflow.

GREEN ROOFS

Architectural roofs not suitable for solar power generation are optimal candidates for green roof installations, especially if these spaces are visible to the public and can enhance their educational mission. Green roofs help to slow stormwater runoff, insulate buildings, and contribute to greater biodiversity.

BIOSWALES + RAIN GARDENS

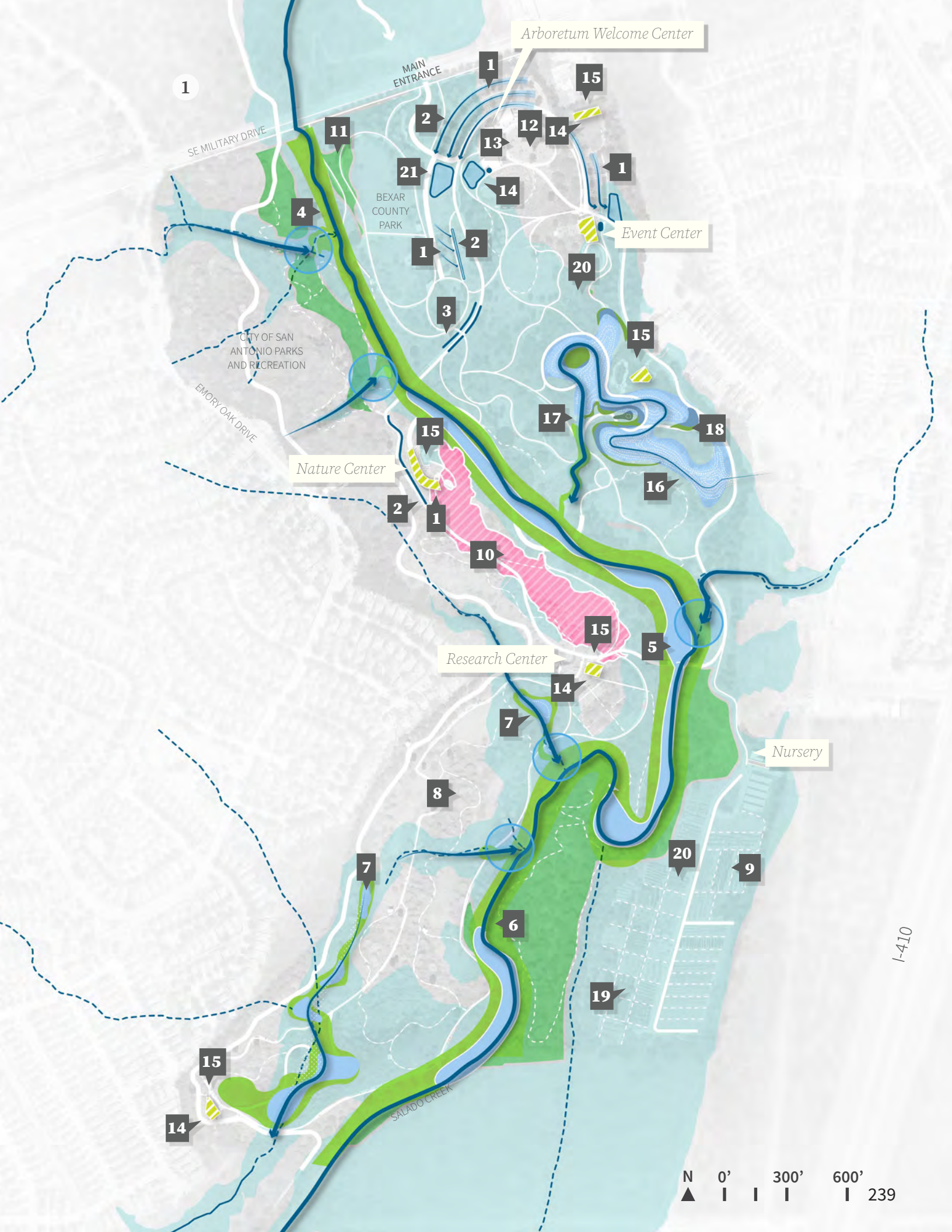
Located next to parking lots and large pavement areas, bioswales collect and filter stormwater runoff through specialized plantings equipped to endure periods of flood and drought. These functional garden spaces increase infiltration rates, replenishing groundwater reserves.

WETLAND RESTORATION

Grading, erosion protection, and plantings are used to restore two ephemeral wetlands at the Arboretum, along with a biofilter adjacent to the Pond Plaza. Using wetland plants native to the region, like species of Juncus, Iris, and Carex, create filters for pollutants and excess nutrients before flowing to Salado Creek.

1 *Permeable Parking Spaces*
2 *Parking Lot Bioswales*
3 *Trail & Road Bioswales*
4 *Flood Sensitive Development*
5 *Stabilized & Restored Creek Banks*
6 *Partnership with SARA for creek restoration & clean-up*
7 *Expanded and Restored Filtration Wetland*
8 *Increased Canopy Areas for Greater Water Filtration & Reduced Run-off*
9 *Irrigation &Tree Research for Future Climate Predictions*
10 *Restored Prairies for Increased Filtration and Reduced Runoff*
11 *Use of Native & Adapted Plants to Reduce Irrigation Needs*
12 *Minimal Lawns*
13 *Below Ground Cistern*
14 *Above Ground Cistern*
15 *Green Roof*
16 *Partnership with SAWS for Recycled Water*
17 *Pond Forebay & Biofilter for Improved Stormwater Quality*
18 *Wetland Edges for Water Filtration*
19 *Mulching & Smart Drip Irrigation*
20 *Recycled Water Irrigation: Gardens & Collections*
21 *Filtration Rain Garden*

500-year Floodplain


Arboretum Welcome Center
MAIN ENTRANCE
SE MILITARY DRIVE
BEXAR COUNTY PARK
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Nature Center
Research Center
Nursery
SALADO CREEK
I-410
N
0'
300'
600'
239

Architecture

SITE BUILDINGS

ARCHITECTURAL CODE OF ETHICS

1. *Architectural design direction should derive from architectural and natural precedents.*

2. *Building material and form choices should be founded on sustainability.*

3. *Site, rather than architecture, should be primary.*

Architecture supports the tree-focused mission of the arboretum by blending into the site in both visual and physical ways. The architectural design direction draws from architectural and natural precedents within San Antonio to further root the design in place.

Building forms, orientation, and materials prioritize sustainability. Local native materials should be used to the greatest extent possible, including visible and hidden components. The distribution of structures supports experiences with trees and nature while offering amenities that contribute to the safety and comfort of visitors.


MAIN ENTRANCE
Retail Nursery
Arboretum Welcome Center & Cafe
Maintenance Facilities
SE MILITARY DRIVE
Ticket Booth
BEXAR COUNTY PARK
Event Center
Pavillion
EMORY OAK DRIVE
CITY OF SAN ANTONIO PARKS AND RECREATION
Pond View Picnic Plaza
Lookout Shelter
Nature Center
Research Center
Viewing & Interpretation Shelter
Nursery
Greenhouses
Viewing & Interpretation Shelter
Viewing & Interpretation Shelter
I-410
Bird Blinds
Service & Security Outpost
SALADO CREEK
N
0’
300’
600’
241

ARCHITECTURAL TECHNIQUES

The following basic techniques are drawn from the architectural precedent study and are appropriate for incorporation into facility design at Arboretum San Antonio. Implemented thoughtfully, they are consistent with the "Architectural Code of Ethics" created for the master plan.

BUILDING FORM AND CONCEPT

1. Incorporate gabled and multi-sloped roof forms. Forms such as these reference vernacular roof forms. Gables typically are oriented to the sides of the structure, though this varies. The multi-sloped portion of this point refers to a lower-sloped portion of the roof, typically over a porch, which is seen in contrast to the main roof slope. *Jacales* are a traditional example of this technique.

TRADITIONAL JACALE ROOF

2. Construct buildings into grade with a heavy masonry presence and buttresses. Using natural topography to conceal building mass is a site-driven strategy to prioritize the site rather than giving building prominence. The San Antonio missions are the clearest precedent for masonry forms, including both loadbearing masonry walls and columns as well as buttresses.

MISSION SAN JOSE BUTTRESSES AND MASONRY

3. Incorporate lightly-built centrally-focused structures, potentially wood, with textured cladding. This form type recalls the wickiup, built of light materials easily obtained from the site itself, thereby referring to both natural and site precedent as well. The central focus of the wickiup lends itself well to teaching and performance spaces.

RECONSTRUCTION OF A TRADITIONAL WICKIUP

4. Embrace the beauty of imperfections, particularly those related to aging. Our experience of many historic structures is colored by those structures' age and the impacts of time. Using natural materials, rather than precisely manufactured modern synthetic materials, can enhance reference to this precedent.

BUILDING SURFACES

1. Incorporate vertical wood slats with variable openings. Wood should be one of the primary building materials used in arboretum structures. Combined with vertical forms (reminiscent of palisade construction), screening elements can be a strong component of building façades.

2. Walls with horizontal striations or structure, infilled with secondary material. A typical vernacular building technique is that of layering: using one material to form wall structure, a second to infill gaps, and (in some cases) a third to overlay both and create a weather barrier. This technique references that strategy.

3. Multi-material roofing and cladding in somewhat irregular patterns, incorporating wood. Many structures were built and maintained over long periods of time relative to the expected lifespan of their (natural and frequently wood-based) construction materials. This led to inclusion of multiple materials as techniques or material availability changed.

BUILDING STRUCTURE

1. Use branching and off-vertical structural elements. Using structural components to refer to forms typical of trees can integrate buildings – especially those which are in wooded settings – into the site.

2. Use (and articulate) corner posts, roof beams, intermediate posts, and horizontal poles in structural forms. Respectively *horcones, vigas, puntales*, and *testeras*, this traditional technique of building with wood is seen in the missions as well as vernacular construction.

3. Incorporate arched masonry forms. Loadbearing masonry, in the era of the missions, traditionally used arches to span larger distances. Using masonry arches both establishes a visual reference to that as well as incorporates natural, locally available materials.

PROPOSED SITE STRUCTURES

MULTI-SLOPED ROOF

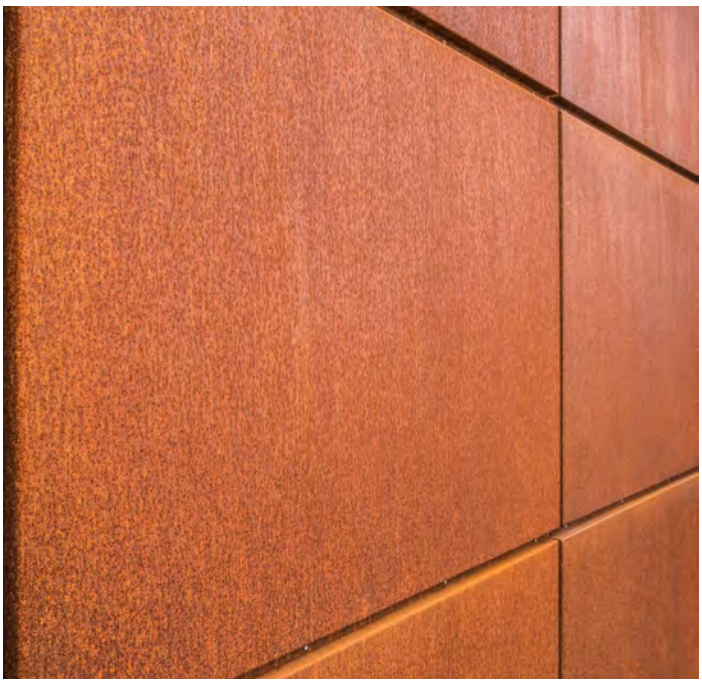
EARTH-CONCEALED BUILDING

LIGHTLY BUILT WOOD CLADDING

MATERIALITY | BUILDINGS

Local and historic precedents of San Antonio inform building materials. The emphasis on natural materials echoes the focus on the landscape. Corten steel embraces imperfections as it weathers. Vertical wooden slats serve as a screening facade that blends the indoors and outdoor environments. Limestone walls and seating reflect the geologic formations of the Edwards Aquifer. That has shaped the landscape. Stucco and architectural concrete finish facade treatment tie the structures to the historic mission masonry.

STUCCO TEXTURE



CORTEN STEEL

WOODEN SLAT FASCADE

LIMESTONE BLOCK SEAT WALLS

LIMESTONE LAYERED SEAT WALLS

MATERIALITY | COOLING STATIONS + BIRD BLINDS

Cooling stations and bird blinds are both critical structures for providing a pleasant visitor experience during the hot Texas months.

Bird blinds provide respite while offering the opportunity to view wildlife without disturbing them. Cooling stations offer reprieve from the heat in the deeper reaches of the site. Corten steel and wooden materials blend with the surrounding landscape and weather, with the environment.

BIRD BLIND - ARTISTS ASHLEY MIRELES + CADE BRADSHAW

WOODEN SHADE STRUCTURE - [redacted]

7 *Phasing & Implementation*

Phasing Vision

A FOUR PHASED APROACH

OVERVIEW

Phasing will be a dynamic, living process that will be reactive to opportunities with donations, partner organizations, and institutional needs. The phasing is recommended based on the cohesive set of complementary programs and services delivered at each step. Note that every phase includes 'touched' land uses in all project areas, with much of the site delegated to passive land use typologies as interim conditions. These passive land uses will still require attention for natural area management to avoid further degradation from invasive species and require effort for site security and waste management. Consolidated phases would reduce the design contingency and reduce redundant interim land use costs.

Phase 1

Phase 2

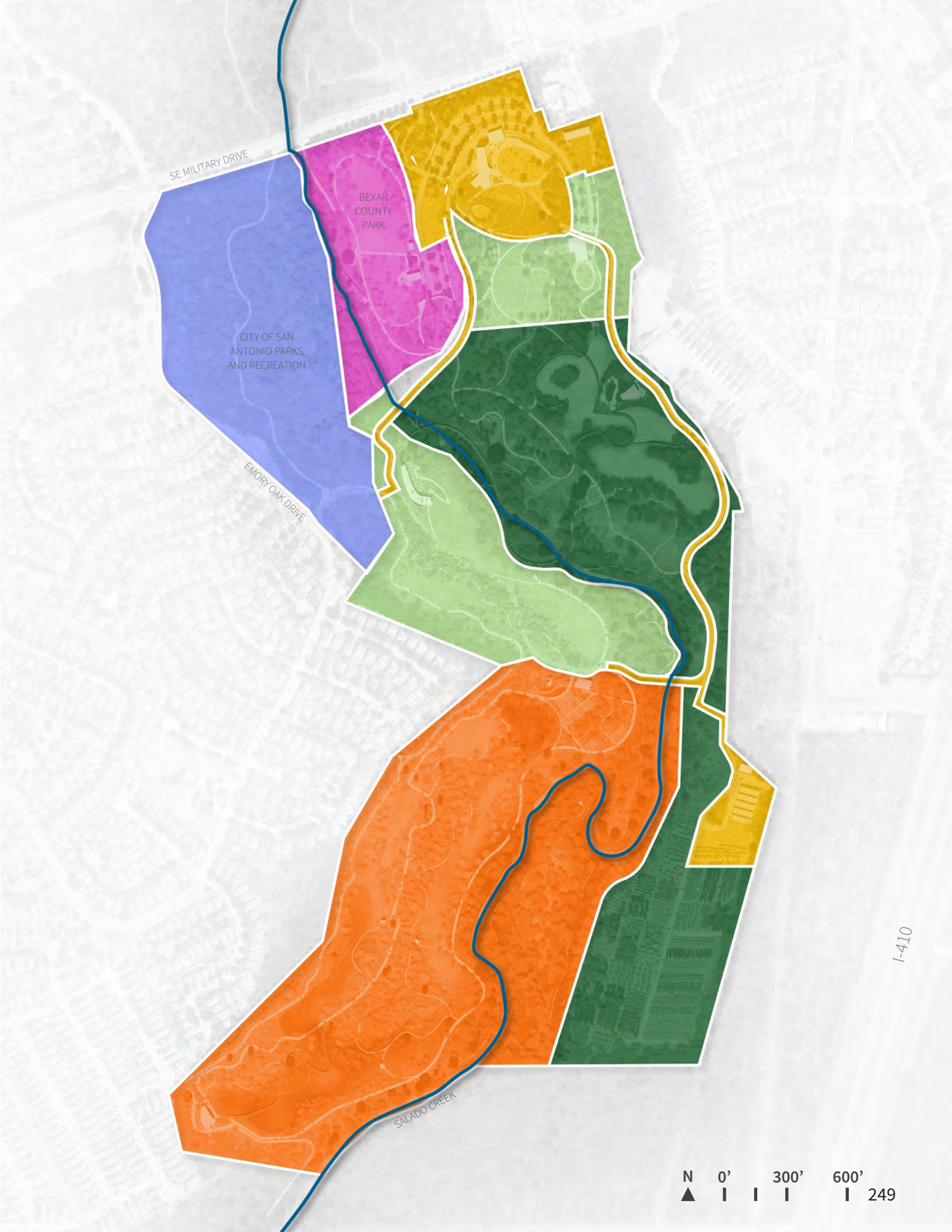
Phase 3

Phase 4

Bexar County Park

COSA Parcel

GRAND VISION


SE MILITARY DRIVE
BEXAR COUNTY PARK
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
SALADO CREEK
I-410
N
0’
300’
600’
249

Phase 0

0-2 YEARS

GOALS

Phase Zero is an immediate short-term phase focused on a coordinated philanthropic capital campaign, financing, and getting the word out. Key works include establishing a 'Base Camp' of operations on site through the adaptive reuse of the former Republic Golf Course Club House and maintenance shed. The building can serve as the temporary base of operations for the Arboretum administration, as well as a small exhibit and event space to educate the public about the future institution and host preliminary educational and donor events.

The focus for the landscape at Phase Zero is establishing site control, hazard mitigation, and providing viable access routes for guided tours. The site is not publicly accessible during Phase 0.

Laydown Yard Fencing

Vehicular Circulation

Nursery Fencing

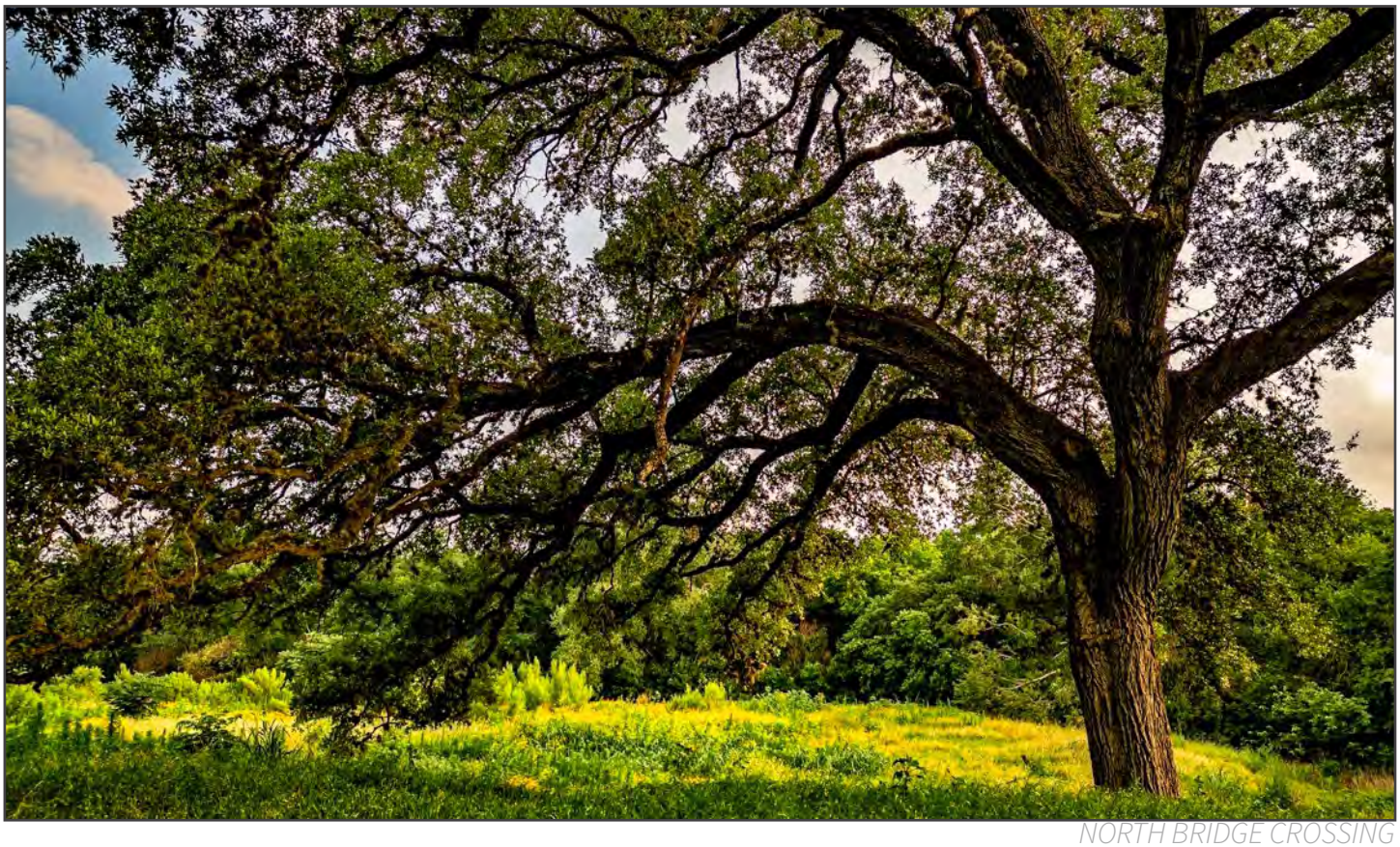
Pedestrian Circulation

Improved Sidewalks

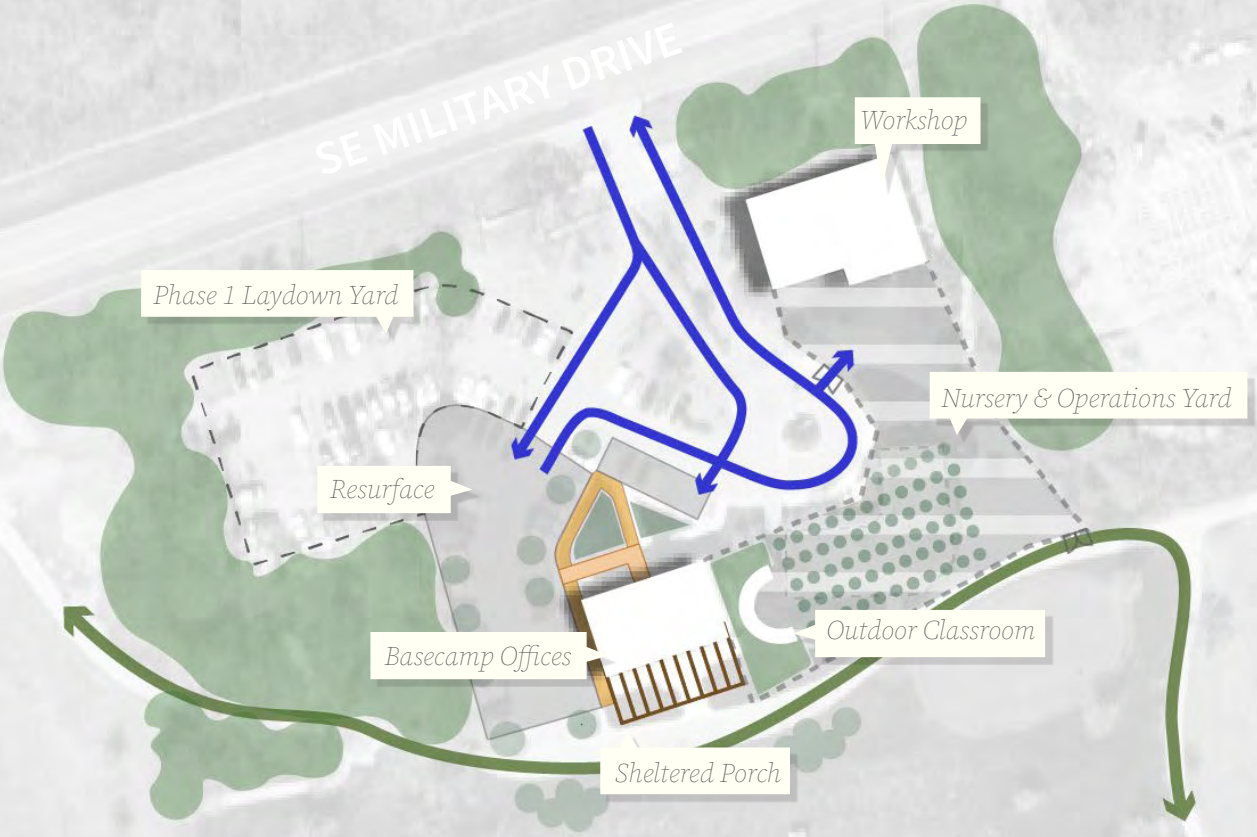
Accessible Entrance

Parking Resurface

Proposed Trees



NORTH BRIDGE CROSSING


SE MILITARY DRIVE
Workshop
Phase 1 Laydown Yard
Nursery & Operations Yard
Resurface
Outdoor Classroom
Basecamp Offices
Sheltered Porch

N 0’ 50’ 100’

251

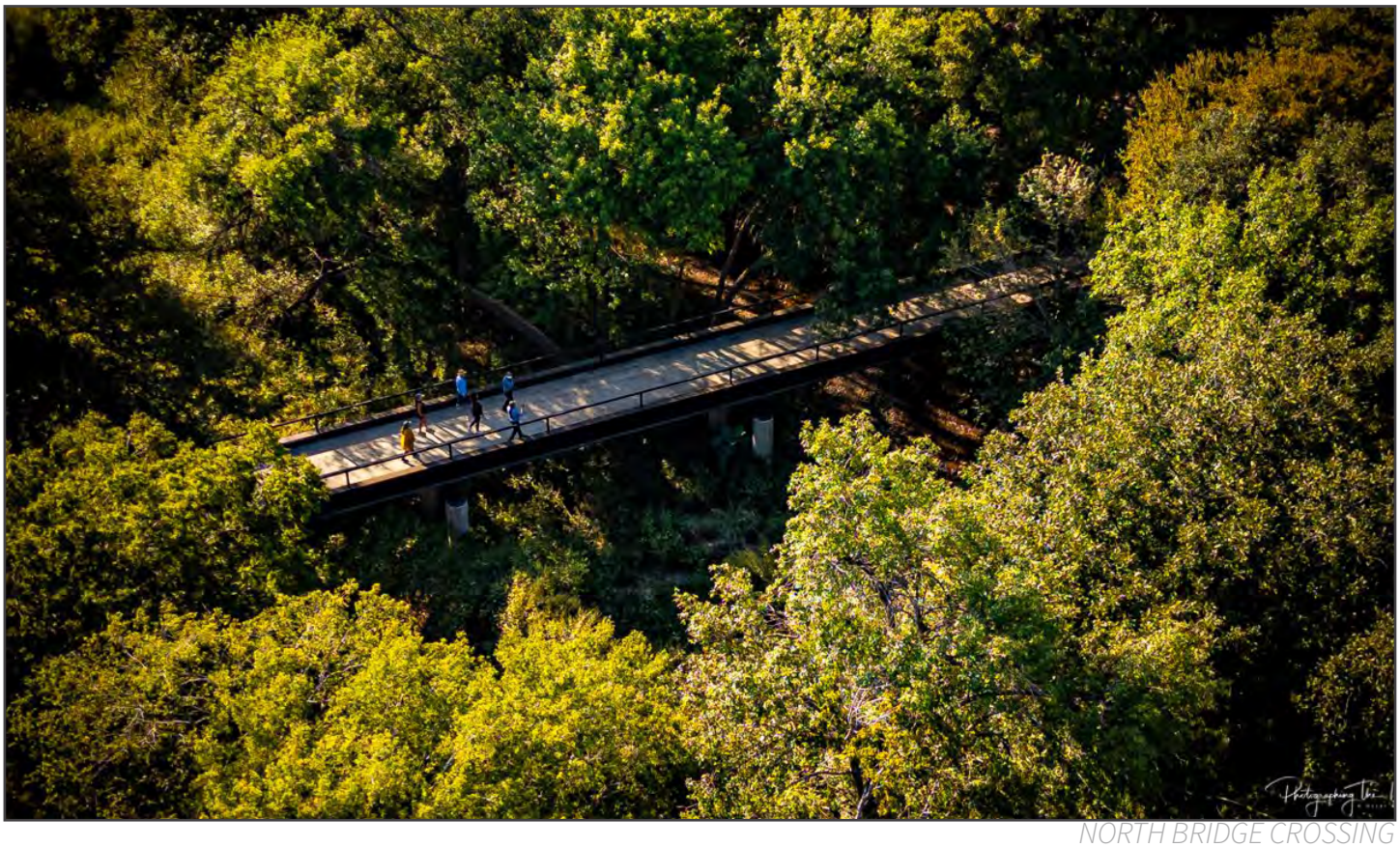
Phase 0

SECURING THE SITE

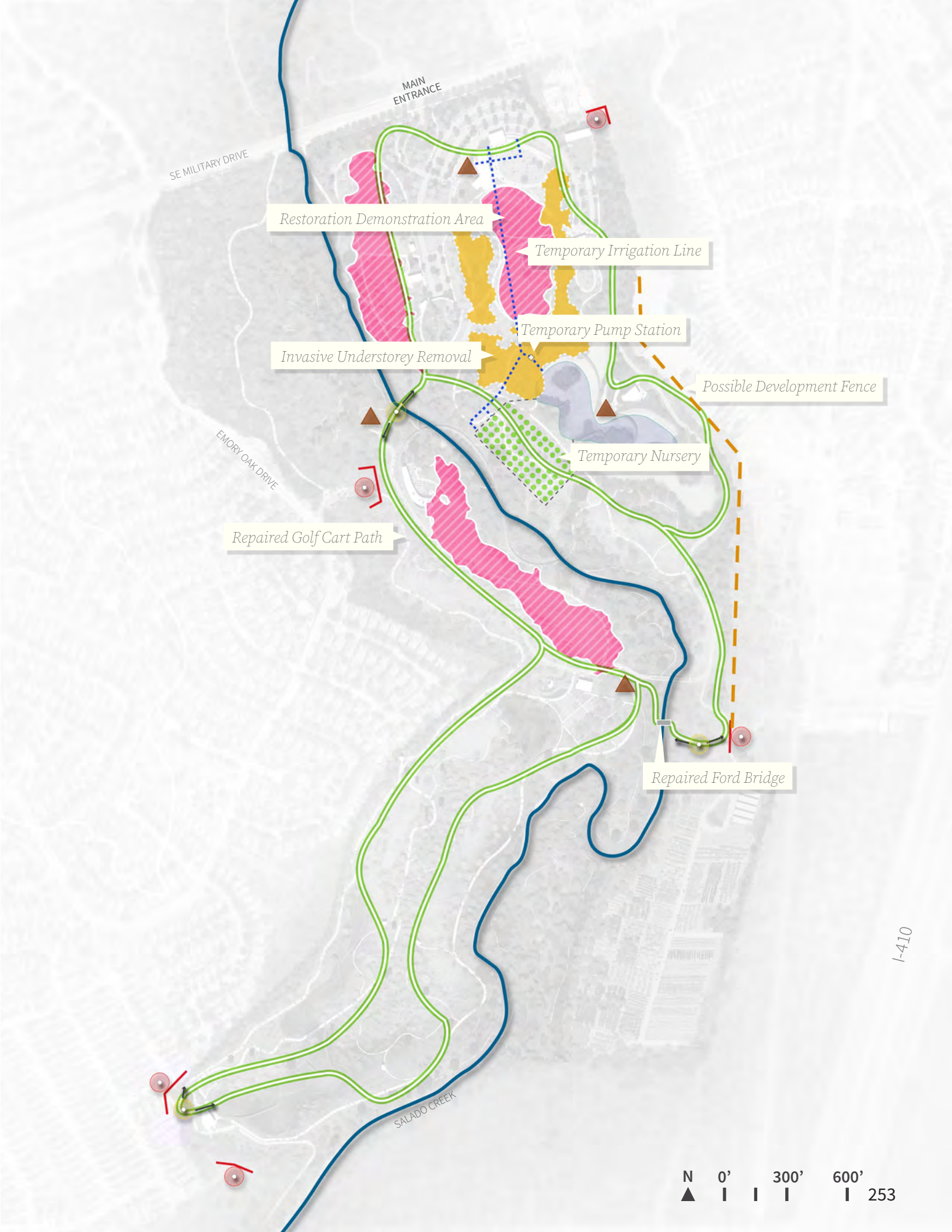
GOALS

While the site will not be publicly accessible, improving the existing walking paths for ongoing private site tours is important to site safety. This phase proposes improving the southernmost foot bridge, setting trail cameras and posted warnings throughout the site, and adding interpretive signage and tree tags for visitors. Phase Zero also involves laying a temporary irrigation line to irrigate the temporary nursery. This will require coordination with the San Antonio Water System (SAWS).

- *Interpretive Stops*
- *Trail Camera*
- *Posted Warnings*
- *Irrigation Line*
- *Nursery Fencing*
- *Golf Cart Path With Mown Strip*
- *Security Fencing*
- *Residential Fencing*



NORTH BRIDGE CROSSING


MAIN ENTRANCE
SE MILITARY DRIVE
Restoration Demonstration Area
Temporary Irrigation Line
Temporary Pump Station
Invasive Understorey Removal
Possible Development Fence
EMORY OAK DRIVE
Temporary Nursery
Repaired Golf Cart Path
Repaired Ford Bridge
I-410
SALADO CREEK
N
0’
300’
600’
253

Phase 1

~31 ACRES | 2-7 YEARS

GOALS

Phase 1 includes the construction of the first gardens, tree collections, parking area, and Visitor Center facilities. With the entry parcel focused on welcoming visitors, this phase includes the core entry hub of buildings. The temporary field office is converted into a gift shop and nursery center. The new Visitor Center includes the Arboretum Offices on the second floor, with the first floor including exhibits, classroom spaces, and restrooms. The main event lawn and memorial gardens are both included near the Visitor Center.

In addition, in Phase 1, the workshop is constructed along with the main maintenance yard, and the first half of the circulator path is constructed, providing access east of the pond down to the Field Station and growing plots. The Field Station serves as a secondary base of operations for maintenance of the overall Arboretum.

In addition to these areas, constructed to meet 'full build' fit and finish, the rest of the landscape is addressed through a large-scale clean up program as 'interim' landscapes. The interim forested areas continue the work happening to date and during Phase Zero to eliminate any hazards. The 'meadow' interim landscapes, the results of the fairways rewilding and colonization by invasive spaces, are mown annually.

Key existing golf-cart trails are patched and repaired for visitors to access the larger landscape, with temporary signage indicating areas that are closed or pose potential hazards to the public.

THE GREAT LAWN


Entrance Parking
MAIN ENTRANCE
Operations & Maintenance Yard
Arboretum Welcome Center & Cafe
SE MILITARY DRIVE
BEXAR COUNTY PARK
Veteran's Grove
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Paths
Field Station
I-410
SALADO CREEK
N
0'
300'
600'
255

Phase 2

~40 ACRES | 7-12 YEARS

GOALS

Phase 2 adds the additional high-impact and high-revenue-generating facilities to the Arboretum. Near the event lawn, the Event Center is added, a facility scaled to support leasable events for up to 500 attendees, with a commercial-grade catering facility, public restrooms, and a small cafe. The gardens and event fields around the event center are developed.

The Circulator is extended, including the replacement of the existing bridge, to connect the Visitor Center to the Amphitheater. The Amphitheater, with the performance support facility and Nature Center, is included in Phase 2. Phase 2 maintains the remaining interim landscapes, with an increased program and investment in invasive species management. This phase includes the majority of the revenue-generating land uses, supporting further landscape development.

THE NATURE CENTER AND AMPHITHEATER


MAIN ENTRANCE
SE MILITARY DRIVE
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Nature Center & Amphitheater
SALADO CREEK
I-410
N
0’
300’
600’
257

Phase 3

~ 47 ACRES | 12-15 YEARS

GOALS

Phase 3 includes the significant investment and expense in reimagining the existing irrigation pond into a complex lake and wetland restoration project. The boardwalk system and canopy walk are significant experiences that will be part of this phase and allow visitors close viewing of these landscapes. The work will require close collaboration with San Antonio Water Systems and San Antonio River Authority regarding the connection between the pond and Salado Creek. Conversations should occur around restoration efforts for the creek as well.

Phase 3 also includes the extension of the test plots and research gardens for the remainder of the southeastern portion of the property.

THE POND PLAZA


MAIN ENTRANCE
SE MILITARY DRIVE
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Pond Plaza
Canopy Walk
Research Grounds
I-410
SALADO CREEK
N
0’
300’
600’

Phase 4

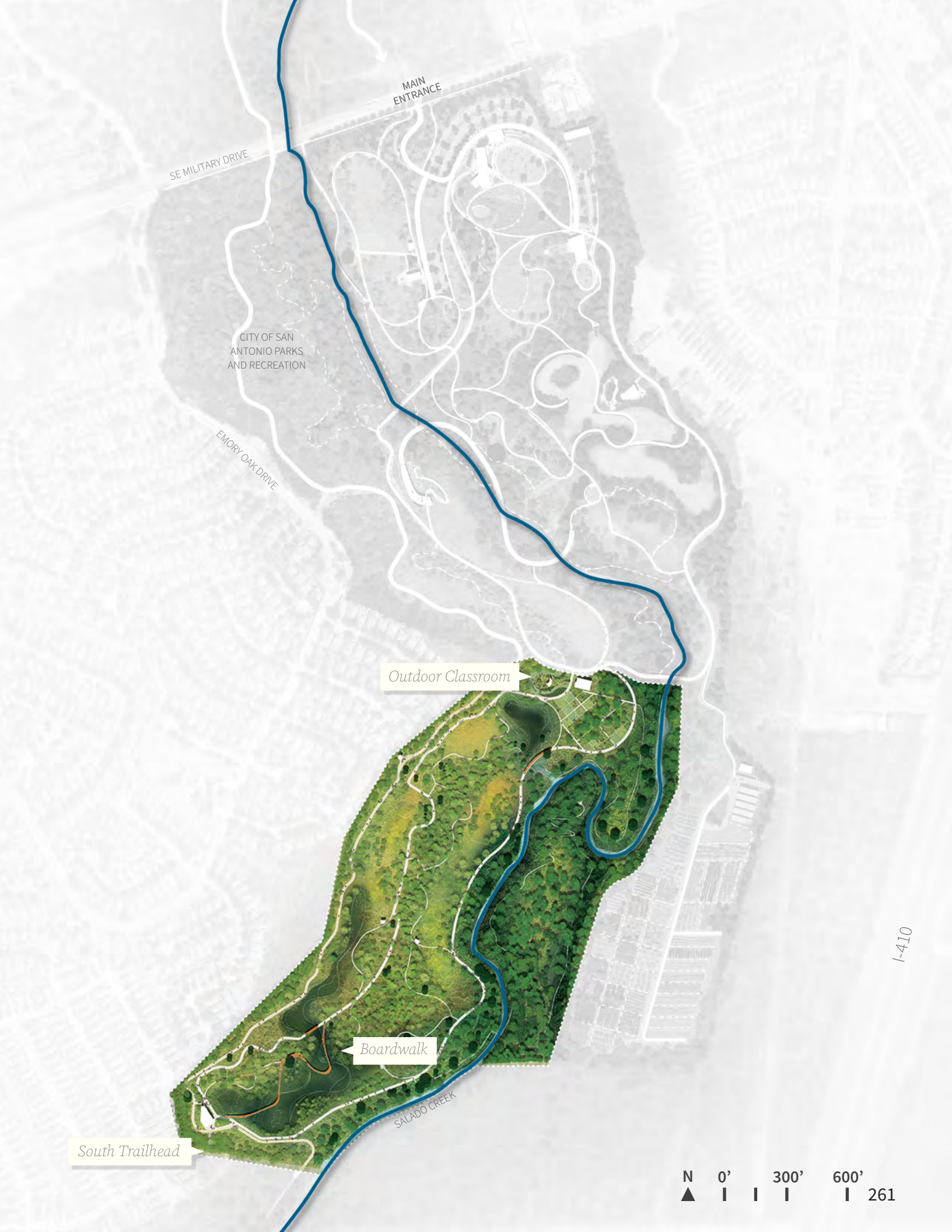
~37 ACRES | 15-20 YEARS

GOALS

Phase 4 completes the Arboretum, including the Research Center as the primary new architectural program. This will invite collaboration with local universities and schools for outdoor classroom sessions and research studies.

Phase 4 also includes the landscape improvements for the network of trails and mosaic of restored ecosystems and tree collections in the southwestern quadrant of the Arboretum. At the close of Phase 4, there are no interim landscapes left within the full property.

THE OUTDOOR CLASSROOM AND RESEARCH CENTER


MAIN ENTRANCE
SE MILITARY DRIVE
CITY OF SAN ANTONIO PARKS AND RECREATION
EMORY OAK DRIVE
Outdoor Classroom
Boardwalk
SALADO CREEK
South Trailhead
I-410
N
0’
300’
600’
261

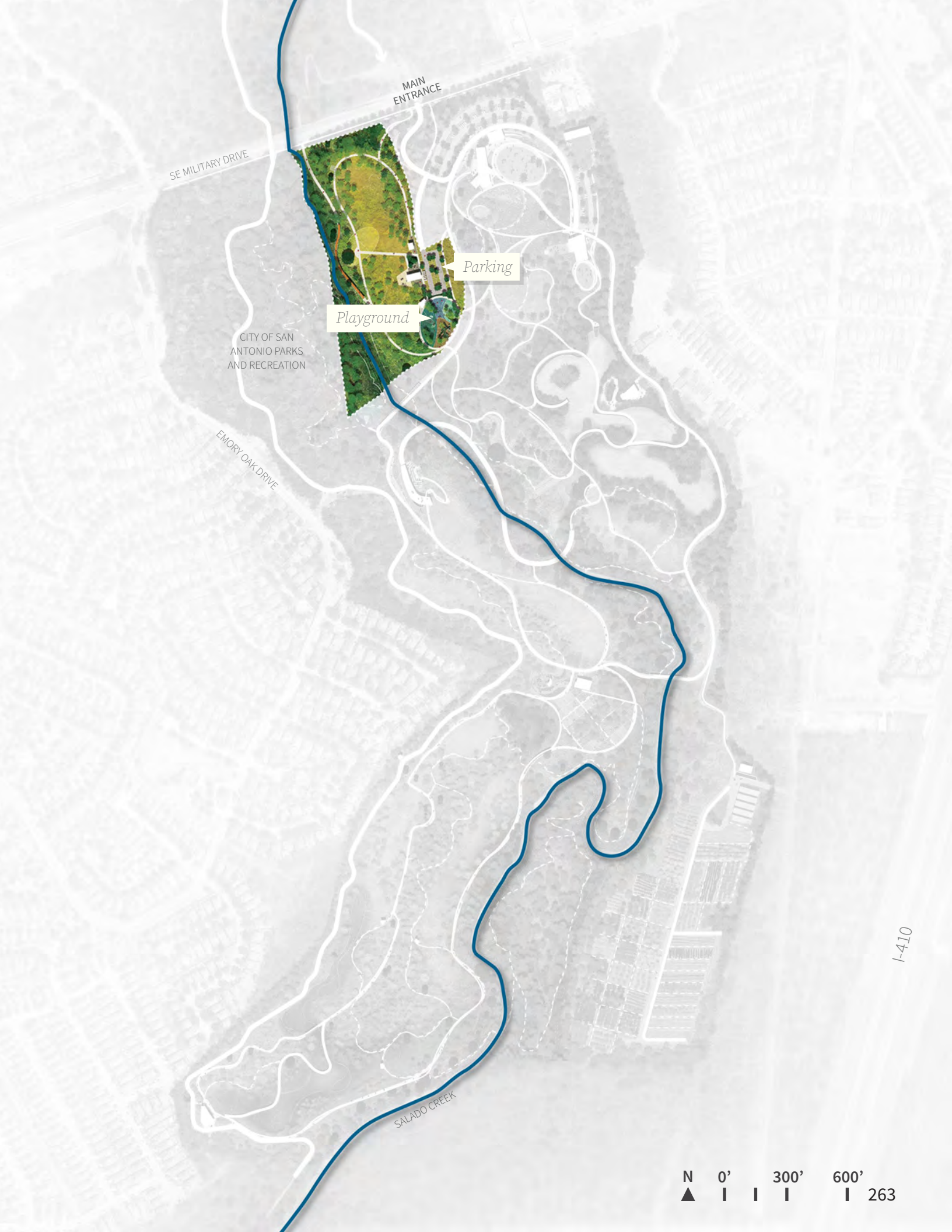
Bexar County Park

18 ACRES

OVERVIEW

Along SE Military Drive, the Bexar County Playground includes 18 acres of the Salado Creek Corridor and former fairways. This area is envisioned as a community-serving County Playground, themed on the idea of trees and native and indigenous landscapes and landscape traditions. This landscape may be built asynchronously with the Arboretum Phases, however, a parallel construction schedule with Phase 1 would make the most sense from a distribution perspective and have a complementary experience at completion.

BEXAR COUNTY PARK


MAIN
ENTRANCE
SE MILITARY DRIVE
Parking
Playground
CITY OF SAN
ANTONIO PARKS
AND RECREATION
EMORY OAK DRIVE
SALADO CREEK
I-410
N
0’
300’
600’
263

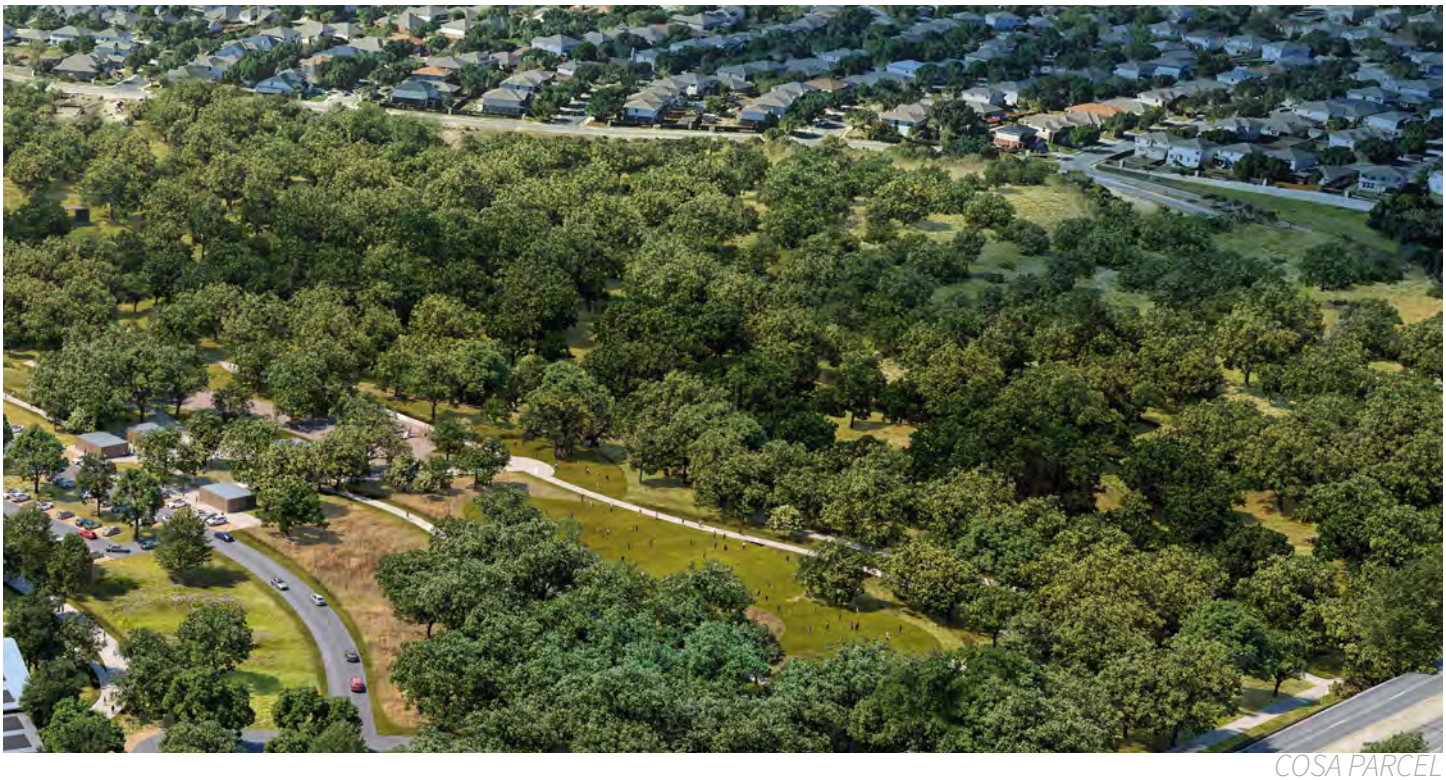
City of San Antonio Parks Parcel

18 ACRES

OVERVIEW

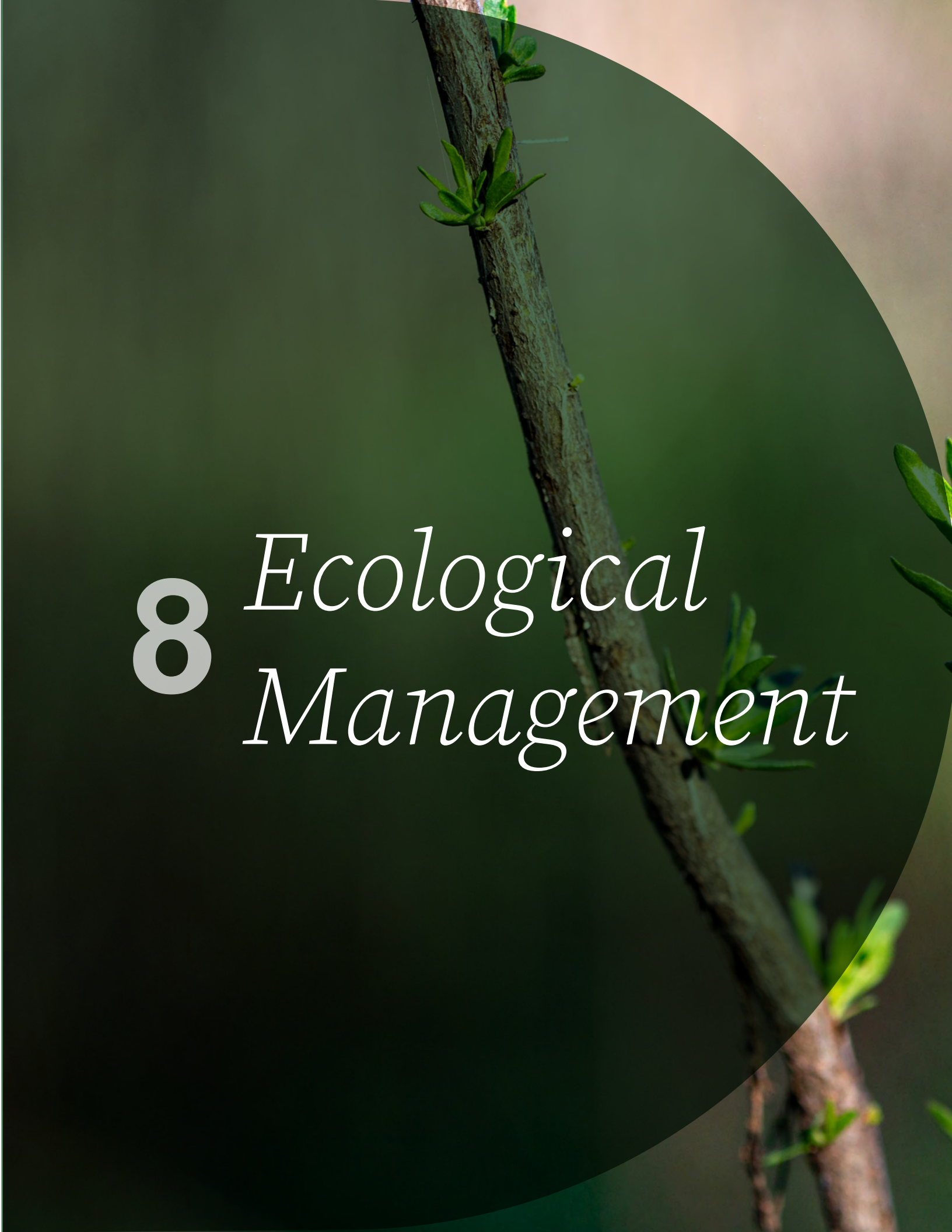
This area, abbreviated in project tables as the "COSA" Parcel, includes 32 acres of land in the northwestern corner of the site. This area is under the ownership and jurisdiction of the City of San Antonio and includes part of the Howard Peak Greenway. Through the field investigations during the Master Planning Process, the design team realized that this area has large patches of healthy, interesting plant communities and should be preserved and supported, serving as a local genotype seed bank for restoration elsewhere within the Arboretum.

The master plan proposes introducing an additional network of pedestrian trails in addition to removing invasives and key supplementary planting interventions. This parcel may also be enhanced asynchronously with the rest of the Arboretum, but it would make the most sense in parallel with Phase 2 improvements. The operations could be provided by the City or by the Arboretum through a maintenance agreement.



COSA PARCEL


MAIN ENTRANCE
SE MILITARY DRIVE
CITY OF SAN ANTONIO PARKS AND RECREATION
COSA Trail
EMORY OAK DRIVE
Bike Parking
SALADO CREEK
I-410
N
0’
300’
600’
265



8 *Ecological Management*

Restoration Issues

Existing Baseline Ecological Conditions

SITE INTRODUCTION

Historically, 14 habitat types existed on the Arboretum San Antonio (ASA) site, representing biological diversity from four converging Texas Ecoregions (South Texas Plains, Edwards Plateau, Blackland Prairie, and Post Oak Savanna). While historical land-use records are limited, it is assumed that the majority of the site has been disturbed at some point through agricultural purposes, including livestock grazing and traditional row crop farming. Historic aerial photographs dating back to 1930 have shown a consistent canopy cover along Salado Creek, suggesting that this area has seen the least amount of disturbance. In addition to historical records, many large caliper trees estimated at approximately 200 years old, especially live oaks *Quercus virginiana*, exhibit an open growth structure indicating that the landscape was much more open and savanna-like in the past. After the site was transformed into a golf course, the site's habitat typologies have become increasingly disturbed and degraded, resulting in ecological homogeneity. However, the presence of historical habitat types and remnant areas of native vegetation suggest there is great potential for habitat restoration and naturalization. Through observer accounts, the fairways were sculpted and amended with approximately 1' deep of agricultural manure (likely overseeded with non-native annual grasses), which would have destroyed any historic seed bank in the soil. Today, the site has little high-quality habitat, low structural diversity, moderate-to-poor wildlife diversity, and moderate native plant abundance. Most of the wildlife observed on site are "generalist" species.

Please reference Chapter 4: Existing Conditions and Analysis for additional background information and site analysis.

Pressures

Invasive Species

INVASIVE FAUNA

The largest threat to restoration on site is the high population density of feral hogs (*Sus scrofa*). Feral hogs are ecosystem engineers, meaning they change their environment – by altering water quality and runoff in wetlands, shifting plant composition and distribution in grasslands, and decreasing tree diversity in forests. While fauna from the four converging Texas Ecoregions existed on the site historically, the high-impact feral hog activity has displaced much of the native fauna. Their destructive foraging techniques and use of Salado Creek for wallowing have resulted in significant impacts along the riparian corridor and in adjacent floodplain forests. Soil disturbance along the riparian corridor has increased soil erosion rates, decreased slope stability, and negatively impacted water quality in the creek.

Compaction and soil disturbance are also present in upland forest habitats as evident in trails, bedding, and foraging areas. In upland areas of the site, hog foraging activities have created large-scale soil disturbances that have led to high rates of invasive species colonization. These small-scale soil disturbances are evident across many forested areas of the site.

FERAL HOG WALLOW

OBSERVED & LIKELY PRESENT

Terrestrial Fauna

- **Feral Hog**, *Sus scrofa*
- **Norway Rat**, *Rattus norvegicus*, native to Norway
- **Common Rat,** *Rattus rattus*, native to Europe
- **Feral Free-Roaming Cats**

Avian Fauna

- **Cattle egret,** *Bubulcus ibis*
- **Common Myna**, *Acridotheres tristis*
- **Common Sparrow**, *Passer domesticus*
- **Eurasian Collard Dove**, *Streptopelia decaocto*

Insect Fauna

- **Emerald Ash Borer**, *Agrilus planipennis*, native to northeastern Asia
- **Cactus moth**, *Cactoblastis cactorum*,native to Argentina – Anticipated
- **Brown Marmorated Stink Bug**, *Halyomorpha halys*, native to East Asia
- **Asian Longhorned Beetle**, *Anoplophora glabripennis*

Aquatic Fauna

- **Zebra Mussels**, *Dreissena polymorpha,* native to Russia and Ukraine
- **Apple Snail**, *Pomacea* sp., native to South America
- **Marbled Crayfish,** *Procambarus fallax forma virginalis*
- **Nutria**, *Myocastor coypus*, native to South America

INVASIVE FLORA

Invasive plant species are widespread across the Arboretum site, affecting all structural levels of existing vegetation. Invasive species have several negative impacts on the site today due to aggressive life history strategies (such as high reproductive rate, efficient dispersal mechanisms, generalist habits, allelopathic effects, etc.) that allow them to out-compete native species and spread rapidly.

Non-native and/or invasive species tend to be dominant across many of the habitat typologies. This trend is particularly evident in the open areas of the former fairways, which are often covered in aggressive Mediterranean perennial grasses, such as Johnson Grass (*Sorghum halepense*), and other invasives including Rescue Brome (*Bromus catharticus*), and Perennial Rye Grass (*Lolium perenne*).

Primary Non-Native, Invasive Woody Plant Species

Across the arboretum's canopy, there are two main invasive species of trees. Chinaberry *Melia azedarach* and two Privet species *Ligustrum lucidum, Ligustrum japonicum* both colonize disturbed areas and are distributed along the edge conditions of the floodplain forest. Chinaberry is an early opportunist in the open fairways and along forest edges, present as seedling, saplings and some mature tree specimens. Ligustrum spp. Is well-established in the floodplain forest and dominates the sub-canopy zone.

Primary Non-Native, Invasive Herbaceous Plant Species

Across the arboretum's herbaceous (groundcover) layer, invasive species are particularly widespread. Both Hedge Parsley *Torilis arvensis* and Rescue Brome *Bromus catharticus* are found in the understory of almost every habitat typology in various densities. The dominance of these two species reduces native plant seedling success and ecosystem succession.

OBSERVED & LIKELY PRESENT

- **Hedge Parsley**, *Torilis arvensis, native to Central and southern Europe*
- **Rescue Brome**, *Bromus catharticus, native to South America*
- *Lolium perenne (Rye Grass), native to Europe*
- **Johnson Grass**, *Sorghum halepense, native to Asia and northern Africa*
- **Japanese Privet**, *Ligustrum japonicum, native to Japan and Korea*
- **Glossy Privet**, *Ligustrum lucidum, native to China, Japan, and Korea*
- **Chinaberry**, *Melia azedarach*, native to Indomalaya and Australasia*
- **Bastard Cabbage**, *Rapistrum rugosum, native to Europe, the Azores, the Madeira Islands, Canary Islands, northern Africa, and western Asia*
- **King Ranch Bluestem**, *Bothriochloa ischaemum, native to Atlantic Coasts of Europe to Pacific Shore of Asia*
- **Kleberg Bluesetem**, *Andropogon annulatum, native to Africa, Asia, Papua New Guinea*
- **Buffelgrass**, *Cenchurus ciliaris, native to Africa, Indonesia, Asia, and the Middle East*
- **Alligatorweed**, *Alternanthera philoxeroides*, native to South America*
- **Sheep Sorrel**, *Rumex acetosella, native to Eurasia and the British Isles*
- **Denseflower Knotweed**, *Persicaria glabra, native to Eurasia*
- **Guineagrass**, *Megathyrus maximus, native to Africa*
- **Bermuda Grass**, *Cynodon dactylon, native to Old World*
- **Tall Perennial Cane**, *Arundo donax*
- **Golden Bamboo**, *Phyllostachys aurea*

**TDA Noxious and Invasive Plant List. Species with serious potential to cause economic or ecological harm to the state. Selling, distributing, or importing plants on this list is an offense under the Texas Agriculture Code §71.152.*

LOCAL AND REGIONAL PESTS & PATHOGENS

Oak Wilt

Oak wilt is a serious tree disease caused by the fungus *Bretziella fagacearum* (formerly *Ceratocystis fagacearum*), and it primarily affects oak trees. Red Oaks (*Quercus section Lobatae*) are the most susceptible to oak wilt, and the disease often kills them quickly, typically within a few weeks to months after infection.

Highly susceptible species in San Antonio include:

- **Shumard Oak** (*Quercus shumardii*)
- **Pin Oak** (*Quercus palustris*)

While white oaks (*Quercus section Quercus*) are generally more resistant than red oaks, they can still be infected and experience significant decline, especially when stressed or exposed to the fungus.

Moderately susceptible species in San Antonio include:

- **Texas White Oak** (*Quercus texana*)
- **Chinkapin Oak** (*Quercus muehlenbergii*)

Southern Live Oaks are somewhat resistant to oak wilt but can still be affected, particularly if they are under environmental stress or if the disease spreads via root grafts.

Management Considerations

To manage oak wilt on site, it is crucial to detect symptoms early and remove infected trees promptly, ensuring proper disposal to prevent the spread of the disease. Preventing transmission through root grafts can be achieved by trenching or root pruning between affected and healthy trees. Avoid pruning oaks during high-risk months (April to June) and consider fungicide treatments for at-risk trees. Reducing tree stress through proper watering, mulching, and fertilization also helps.

LEAVES INFECTED BY OAK WILT DISEASE

Emerald Ash Borer

The Emerald Ash Borer (EAB) (*Agrilus planipennis*) is an invasive insect pest that has caused significant damage to ash trees in many parts of the United States. While it has been most destructive in northern and mid-western states, it has spread to southern regions, including San Antonio.

The primary species of ash that are susceptible to EAB that currently exist or have the potential to exist natively on the site include:

- **Green Ash** (*Fraxinus pennsylvanica*),
- **Texas Ash** (*Fraxinus texensis*),
- **Mexican Ash** (*Fraxinus berlandieriana*).

Management Considerations

Early detection, insecticide treatments, tree removal, and the replacement of ash trees with other species are key strategies to mitigate the damage caused by EAB at the Arboretum.

EMERALD ASH BORER DAMAGE

Cotton Root Rot (Phymatotricum)

Cotton Root Rot (caused by the soil-borne fungus *Phymatotrichopsis omnivora*) is a disease that affects a variety of plants in the San Antonio region. The fungus can cause rapid wilting, dieback, and eventual death of infected trees, especially during the hot summer months. Symptoms of infection include wilting and chlorosis (yellowing), stunted growth, premature leaf drop, root rot (darkening of the root system when inspected).

Susceptible species include (many present on-site):

- **Live Oak** (*Quercus virginiana*),
- **Shumard Oak** (*Quercus shumardii*),
- **Red Oak** (*Quercus rubra*),
- **Texas Red Oak** (*Quercus buckleyi*),
- **Pecan** (*Carya illinoinensis*),
- **Mesquite** (*Prosopis species*),

Live Oaks are highly susceptible and often a primary target for Cotton Root Rot, especially in urban and suburban landscapes.

Management Considerations

Trees planted in areas that are poorly drained or have clay-heavy soils are particularly at risk. Irrigation management and soil improvement are essential to reducing the spread of the disease. Cotton Root Rot can also spread through root grafts, so trees planted too closely together are at higher risk. The disease is more active during hot, dry periods when trees are stressed due to drought. Reducing tree stress through proper watering and mulching will limit the spread of the fungus at the arboretum.

COTTON ROOT ROOT DAMAGE

Dutch Elm Disease

Dutch Elm Disease (DED) is a fungal infection caused by *Ophiostoma* species, spread primarily by elm bark beetles. It blocks the tree's vascular system, causing wilting, yellowing, and eventual death of infected elms. Cedar Elm (*Ulmus crassifolia*) is the most abundant elm species at the arboretum today, and it is generally not considered to have high susceptibility to DED.

Management Considerations

Managing Dutch Elm Disease involves early detection, prompt removal of infected trees, and proper disposal to prevent the spread of the fungus. Fungicide treatments and insecticide applications can protect healthy trees and control the elm bark beetle. Pruning infected branches, sealing cuts, and planting disease-resistant elm varieties can further help manage the disease.

TREE DAMAGE FROM DUTCH ELM DISEASE

ILLEGAL POACHING

Species of cultural interest on site are vulnerable to illegal poaching. Today, multiple mature, large caliper mesquite (*Neltuma glandulosa*) specimen trees have been harvested by poachers. The physical loss of these specimens and subsequent area disturbance has larger ecological repercussions on the site, impacting water regulation and erosion control, aiding invasive species spread as well as reducing the seed bank, diversity, and abundance of native plant species

DEPOSITION OF TRASH

Trash enters the site typically through stormwater runoff from the surrounding neighborhoods. It accumulates along Salado Creek presents an issue to water quality and riparian health.

CLIMATE CHANGE

While shifting climatic patterns are already disrupting native plant communities on-site, these impacts are expected to worsen over the next century across Texas. Plant communities on site are particularly vulnerable to altered temperature patterns, precipitation levels, and increased frequency of extreme weather events. Rising temperatures and prolonged droughts stress plant communities on-site, making them more vulnerable to pests, diseases, and invasive species. These changes threaten the biodiversity of the site and surrounding ecosystems, as species may struggle to survive, adapt, or shift their range in time. Ultimately, this can lead to a decline in ecosystem health and the loss of important plant species that provide habitat and food for local wildlife.

FLOOD IMPACTS FROM SALADO CREEK

Salado Creek flooding can both promote the spread and establishment of invasive species by transporting them to new areas, altering habitats, and providing favorable conditions for their growth. Invasive species with rapid reproductive rates and high adaptability are particularly likely to take advantage of flood disturbances, leading to shifts in native species composition and ecosystem dynamics along the riparian corridor. Additionally, flooding exacerbates the deposition of trash, which is already an issue on site. Understanding these impacts can help inform management strategies to control invasive species, protect native ecosystems and minimize trash deposition at the Arboretum.

TYPICAL WATER LEVEL IN SALADO CREEK

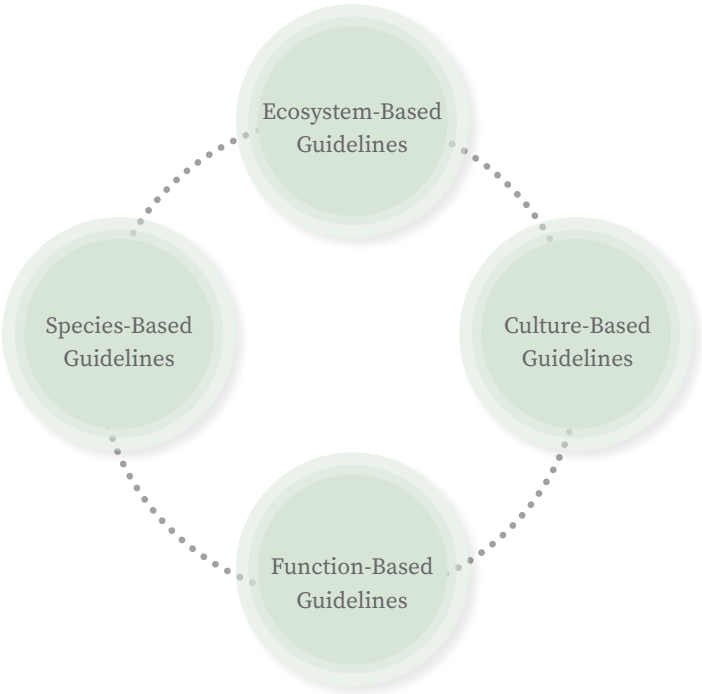
Establishing Principles

Restoration Guidelines

INTRODUCTION

The following section outlines a set of guiding restoration principles that will serve as a starting point for the establishment of a comprehensive restoration plan. These goals will continue to be shaped with input from local experts and stakeholders. A good goal meets "SMART" criteria: specific, measurable, achievable, results-oriented, and time-limited. The three overarching categories of goals are:

1. *Ecosystem-Based Design Guidelines*
2. *Function-Based Design Guidelines*
3. *Species-Based Design Guidelines*
4. *Cultural-Based Design Guidelines*



ECOSYSTEM-BASED GUIDELINES

Reduce the abundance of invasive plant species on site and monitor recruitment from surrounding areas using an adaptive management approach and Best Management Practices (BMPs).

Create optimal restoration conditions that support the successful establishment of native plant and animal communities by following site preparation best practices.

Key Actions

- Using an invasive species management plan framework, priority removal species and areas for treatment can be established and monitored.
- Determine system interrupters (also referred to as degrading agents) to establish key ecological management strategies.
- Current High priority system interrupters are: Hog, Rescue Brome, Hedge Parsley, Chinaberry, Ligustrum, Bermuda Grass, Johnson Grass.
- Prioritize stewardship and treatment of least affected areas first, while working towards areas of higher invasion.
- Heavily invaded areas can have lower prioritization if labor or time is a concern. Prescribed fire and goat grazing are effective management techniques for large areas where there may be low densities of native flora.
- Effective hog management strategies will require an Integrated Pest Management Plan that will include some combination of trapping through box traps and corral traps, culling, and fencing.

Key Actions

- *Site preparation is perhaps the most important element to be addressed in planning a restoration project. Initial successes are based upon steps taken to reduce weed competition, provide a suitable seedbed, and promote the growth of seedlings.*
- Each micro-site restoration will be different. Using site surveys, determine which existing vegetation community is present and decide what steps will be necessary to set back plant succession so that planted species can germinate and grow.
- In predominant herbaceous areas such as the former fairways, topsoil removal up to 6” (and reuse as fill on-site) can be an effective strategy for reducing introduced nutrients (historic agricultural fertilizers and manures) as well as reducing the invasive plant species seed bank. Where soil removal is not desired, soil solarization with tarps and plastic sheeting can be used to destroy current vegetation and the seed bank in the top 2’ to 6” of soil.

Select keystone and indicator species for each existing and desired landscape typology on site.

Key Actions

- *Keystone species are defined as species whose disappearance leads to cascading effects in an ecosystem, and precipitates other species losses. Keystone species have a disproportionate impact on the biodiversity of the ecosystem as they provide food, facilitate habitat, spread energy, or impact species populations among many functions they provide. There are different types of keystone species (e.g. predators, prey, plants), underlining the complexity of the interactions that comprise an ecosystem.*

- Using foundational plant species as ecosystem building blocks to achieve multiple ecological goals.

- Restore diverse habitat structure and representative native habitat typologies on site to allow wildlife communities to recover through bottom-up approaches to restoration.

- Select hero species that can be considered “restoration champions” in each representative restoration typology.

- Recognize how different indicator species will be relevant for each restored habitat typology, and should be evaluated for frequency and cover thresholds.

- Use good ecological indicators that capture the complexities of ecosystems while remaining simple enough to be easily and routinely monitored.

Create optimal restoration conditions that support the successful establishment of native plant and animal communities by following site preparation best practices.

Provide the critical patch size of different habitats to attract and sustain maximum species diversity of plants and animals

Key Actions

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Key Actions

- Identify and restore large continuous blocks of habitat with minimal "edge effect".
- Ensure the lifecycle needs of species can be met by creating appropriately-size habitat mosaics on site (i.e. adjacent wetlands and woodlands for amphibians or open basking areas for hibernacula for reptiles).
- Ensure restoration planting is placed in larger clusters and/or groups of associated species.
- Needs to be researched specific to the species in question.

Prioritize well-adapted native species, local provenances, and appropriate ecotypes in restoration areas.

Key Actions

- Use native species for restoration, to provide multiple ecosystem services, such as habitat structure and food provisioning for wildlife.
- Procure high-quality plant materials from local native seed suppliers and appropriate donor sites. Establish appropriate reference sites for seed collection and propagation at the Arboretum.
- Avoid the use of improved or selections of native plants often marketed as “nativars”in restoration areas. These plant selections should be incorporated in highly-manicured public gardens, where their attributes are best suited.
- Ensure the genetic diversity of species and local adaptation using appropriate seed transfer zones (STZs). Seed transfer zones are areas with similar climatic characteristics within which seeds can be transferred and still be well-adapted to their surroundings.
- Follow the planting principles of “Right seed, right time, right place”.
- Use seeds sources from within 300 miles of the site or nearer to ensure adaptability and improve success of initial establishment. The most limiting factor for all restoration sites in South Texas is seed availability.
- Source of local genotypes should be collected from as close to the site as possible. Seeds collected within 100 miles are also acceptable if closer seed collection is not feasible. A maximum radius of 300 miles can be used where necessary.
- Consider opportunities for assisted migration of species from southern climates on a species-by-species basis.
- Reference seed source listing at the Lady Bird Johnson Wildflower Center in Austin, TX.

Provide the critical patch size of different habitats to attract and sustain maximum species diversity of plants and animals

Key Actions

- Identify and restore large continuous blocks of habitat with minimal “edge effect”.

- Ensure the lifecycle needs of species can be met by creating appropriately-size habitat mosaics on site (i.e. adjacent wetlands and woodlands for amphibians or open basking areas for hibernacula for reptiles).

- Ensure restoration planting is placed in larger clusters and/or groups of associated species.
- Needs to be researched specific to the species in question.

FUNCTION-BASED GUIDELINES

Enhance Salado Creek floodplain resiliency through the restoration of riparian buffer communities.

Key Actions

- Restore a healthy riparian plant community to help reduce erosion, stabilize banks, and promote habitat for amphibians and other aquatic species.
- Plant deep-rooted vegetation, and installing coir logs or live stakes can help improve bank stability.
- Follow de-compaction strategies to improve soil quality along the riparian corridor. Specific strategies include: amending soil with organic matter, and aerating soil. Broadcasting seeds can over time reduce compaction as roots create space in soil structure.

Use existing native vegetation and vegetative communities to understand succession pathways on site.

Key Actions

- *Ecological succession is the sequence of changes that a biotic community passes through before reaching its maximum possible development within the climatic context of the region.*
- Prioritize the preservation and enhancement of existing high-quality vegetation.
- Use existing vegetation on site to guide ecosystems along the appropriate successional sequences toward the desired future ecological conditions. Succession is often somewhat unpredictable and can follow several paths depending on site and microsite conditions. The re-establishment of natural successional trends is a priority for all restoration typologies.
- Address degrading agents to site succession, including invasive plants and feral hogs.
- Work with natural disturbance regimes, such as fire, to kickstart successional processes.

Establish rigorous assessments plans for post-restoration monitoring programs.

Key Actions

- Establish monitoring time scales that consider immediate post-restoration, short term, and mid- to long-term outcomes.
- Establish monitoring protocols that capture key restoration indicators such as: increased area of high quality natural habitat, increased structural/ habitat diversity, increased native plant diversity, increased habitat connectivity, increased wildlife species diversity and increased abundance of indicator species.
- Use specific metrics to monitor restoration success through field surveys, mapping, floristic quality index, vegetation plots, canopy closure, plant surveys, and wildlife surveys.

SPECIES-BASED GUIDELINES

Prioritize tree protection and preservation of existing canopy cover

Key Actions

- Perform a full tree and canopy assessment, which will highlight areas for intervention.
- Re-use removed invasive trees as landscape features and materials, such as benches, play structures, path mulches, or fences etc.
- Leave dead fallen trees, the remains of large branches, and snags (also referred to as coarse woody debris, CWD) in woodlands due to the important ecological benefits they provide. Allowing CWD to remain on the forest floor promotes the recycling of nutrients trapped in wood and provides food and habitat for a wide range of organisms. Dead and standing trees, often referred to as snags should be assessed for safety considerations (proximity to trails and public areas) as well as impacts on the surrounding tree collection. Snags should be preserved and reinforced where possible to provide habitat for cavity-nesting animals and insects.

Prioritize plants that are adapted to Arboretum San Antonio's specific soil profiles.

Key Actions

- Use species that are adapted to the specific soil profiles on site to improve restoration outcomes.
- Ensure plant communities and soil microbial communities are appropriately matched.
- De-turf, deep-plow or use fire or grazing to reduce the elevated nutrient soil profiles present in the fairways.
- Introduce native soil microbial communities to areas with depleted soil fungal communities or areas where plant communities and soil microbial communities are mismatched.

Restore the structural complexity of the ecosystems on site to provide improved habitat structure.

Key Actions

- Reintroduce a variety of plant species that provide different vertical and horizontal layers in the landscape.
- Create diverse micro-habitats for a range of animals, from ground-dwelling insects to arboreal birds and mammals.
- Refer to habitat typology diagram for baseline information on appropriate habitat structure.

CULTURE-BASED GUIDELINES

Prioritize education and interpretation at key restoration sites.

Key Actions

- Enhance public awareness about restoration issues and outcomes through interpretive elements.
- Develop educational workshops and citizen science programs that empower local communities to actively participate in restoration efforts, such as planting native species or monitoring wildlife populations.
- Provide hands-on learning opportunities to strengthen local connections to the land and build a culture of environmental stewardship that promotes long-term care of restored ecosystems.
- Engage community members and visitors in restoration-focused activities, such as bio-blitzes, student research projects, monitoring workshops, and connection to restoration resources.
- Create action-based signage that asks visitors to stay on trails, brush shoes before entering certain areas, and asking people to remove plants and place in a disposal bin.

Use Indigenous and cultural land management strategies, where appropriate, to improve and promote native species assemblages.

Key Actions

- Engage local Indigenous organizations such as the American Indians in Texas (AIT) to ensure Indigenous land management strategies are being sensitively and appropriately integrated into the design.
- Showcase ethnobotanical relationships between the trees of San Antonio and Indigenous communities through educational signage, programming, and collections.
- Use Indigenous naming and narratives to highlight the stories and uses for trees in the forests of San Antonio.

Integrate landscape design elements within restoration areas to allow visitors to interact with the project in a safe and educational manner.

Show restoration benefits for health and wellbeing.

Key Actions

- Use permanent and temporary educational signs to alert visitors to the restoration in process, its benefits, and how they can help.
- Provide rest spots every 200 m to allow visitors to pause to observe the restoration process at a safe distance.
- Make restoration accessible to all communities by incorporating multiple language options, interpreting important plants with Indigenous or cultural significance, and use colors, typefaces, language, and images that can be understood at multiple age levels and abilities.
- Create educational programs and interpretive signage that teaches visitors about the importance of these ecosystem services and how restored habitats contribute to human well-being.

Key Actions

- Emphasize the mental health and psychological benefits of being in environments in good ecological health through signage and educational programs.
- Establish programs that provide educational pathways for local residents to engage in restoration, emphasizing green-skills jobs training, volunteer experience, local ecotourism, and sustainable agriculture.

Restoration Approach

Adaptive Management Approaches

INTRODUCTION

One of the central questions of ecological restoration is to determine what ecosystem state is being restored. There are two current schools of thought that guide approaches to this question, being 1) recovery of a defined historically determined target ecosystem (i.e. species composition of an ecosystem), and 2) recovery of natural processes (i.e. functional characteristics such as ecological functions like as water flux or nutrient cycles). Both approaches convene on the definition that ecological restoration is a process of rebuilding a natural system after human disturbance by restoring processes and food webs, to become a self-sustaining and resilient ecosystem. With climate change, returning to a pre-European reference community is unlikely and therefore a broader restoration approach must be taken.

In landscapes that are highly degraded and transformed, restoring to a historic ecosystem state is often not possible, and therefore it is more helpful to define a set of site-specific goals that outline key species, plant and animal community composition, and ecological processes to reach a desired “novel” restoration outcome.

For Arboretum San Antonio, the restoration priority is to increase ecological complexity and diversity – that is, to restore the structure, composition, and function of native plant communities that exist or may have existed on site.

Typically, restoration is a multi-decadal process that requires monitoring over a long period of time, following the principles of adaptive management. Under an adaptive management framework, progress toward restoration goals is measured while simultaneously monitoring and studying the efforts of previous management techniques. This iterative approach allows site management to be flexible to novel ecosystem responses and conditions that are not yet understood. Restoration goals often have both ecological and social underpinnings that acknowledge the value of Traditional Ecological Knowledge (TEK) as well as of scientific literature.

The following restoration plan includes a restoration strategy for each habitat type that includes site preparation, planting strategy, specific maintenance regimes, and a monitoring plan and management activities. Implementation of this plan will be a collaborative process that considers future climate readiness.

LEVERAGING SAN ANTONIO'S UNIQUE ECOLOGICAL CONTEXT

Four Texas Ecoregions converge in San Antonio, making the region a particularly rich ecological setting for restoration. This area of ecological overlap presents unique opportunities for the Arboretum site to restore and showcase a wide range of Texas ecosystems. Using overlapping plant assemblages that are representative of Blackland Prairie, Post Oak Savanna, Edwards Plateau, and South Texas Plains, four generalized typologies can be used to guide restoration at Arboretum San Antonio:

- **Riparian**
- **Savanna**
- **Grassland**
- **Upland Forest**

Within each of these generalized restoration typologies are several representative habitats, with unique ecological conditions that require a specific planting palette and approach to site preparation.

Riparian
- Floodplain Hardwood Forest
- Wetlands and Open Water
- Wet Meadows & Ephemeral Streams

Savanna
- Post-Oak Savanna
- Mesquite Savanna

Grassland
- Blackland Tallgrass Prairie

Upland Forest
- Oak-Hardwood Motte
- South Texas Brush Country

Each habitat condition on-site will require different restoration techniques, planting procedures, species selections, and site preparation to be successful. It is imperative that a coordinated effort be made to draw upon the expertise of other agencies and groups with knowledge and training on ecological restoration in Texas. Local and state organizations, such as Trinity University, Texas A&M, Native Prairie Association of Texas, San Antonio River Authority, Texas Parks and Wildlife, Texas Audubon, and others will be critical partners in the success of restoration efforts at the Arboretum.

Potential Stakeholders

- Texas Invasive Species Institute
- Kika de la Garza Plant Materials Center *(specializes in rangeland restoration and wildlife habitat enhancement, erosion control/water quality improvement on agricultural land)*
- Caesar Kleberg Wildlife Research Institute
- South Texas Natives Project
- Texas Agri-Life Research Station
- Native Prairie Association of Texas
- The Hill Country Headwaters Conservation Initiative (HCHCI)
- Soil and Water Conservation Districts
- Native Prairies Association of Texas San Antonio Chapter for Blackland Prairie Restoration
- SAWS - San Antonio Water System
- Lady Bird Johnson Wildflower Center
- Trinity University
- Texas A&M University
- Native Plant Society of Texas - San Antonio Chapter (NPSOT-SA)
- Master Naturalists
- Bexar Branches Alliance
- Texas Society for Ecological Restoration

Regional Native Nurseries

- Texas Friendly Plants Nursery (San Antonio, Texas)
- Medina Garden Nursery (Medina, Texas)
- Natives of Texas (Kerrville, Texas)
- Pollinatives (San Antonio, Texas)
- The Nectar Bar (San Antonio, Texas)

Site Preparation

Site preparation is critical to the success of restoration at the arboretum. Before planting, it is important to eliminate undesirable vegetation, eradicate weeds, remove plant debris, and ensure that there is an appropriate surface to facilitate good seed-to-soil contact and transplant success. Site preparation techniques will vary based on habitat typology, and must consider maintenance over time. Some typologies, such as meadows or pollinator plantings, may be low maintenance, but all typologies will require some level of maintenance in the near-to-long term. The following is an overview of some of the current site preparation techniques that are frequently used on restoration projects of this scale. Pros and cons are discussed for each strategy and specific management considerations are made for the arboretum.

Use of Herbicides

Post-emergent herbicides with glyphosate are cost-effective and require little labor, making them commonly used for site preparation. To minimize environmental impact, they should be used carefully or alongside other methods. Herbicides are most effective when applied during active plant growth, especially as plants like grasses approach flower development. Users should follow all instructions, dilute products correctly, and apply on calm, windless days to prevent drift. All herbicide handlers should undergo testing and receive a herbicide applicators license from the State of Texas, Department of Agriculture. The Arboretum may enlist services and advice from the San Antonio River Authority on herbicide applications near aquatic habitats.

Management Considerations

Herbicides can be an essential tool for successful restoration across the arboretum, as long as it is used thoughtfully and in combination with other methods to minimize environmental impact. Applications should be made judiciously on plant species that are resistant to other management techniques and applied through direct means, i.e. cut stump dabbing on woody species. Invasive weeds should never be removed without a post-herbicide restoration (seeding or plugging) to combat the return of invasive species. Otherwise, the effort will be wasted due to a very likely return to pre-herbicide levels

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Pros

- **Low Labor and Cost:** They are cost-effective and require less labor compared to other methods like manual removal.
- **Targeted Application:** Herbicides can be applied selectively to target specific plants, which helps minimize damage to surrounding native vegetation when used correctly.
- **Fast Results:** Herbicides often show rapid results, quickly reducing the presence of unwanted vegetation

Cons

- **Environmental Risks:** Herbicides, especially when overused or improperly applied, can harm non-target plants, animals, and ecosystems from broadcast spray, accidental application, and through rainwater run-off and leaching. This includes the risk of contamination of water sources, soil, or nearby habitats.
- **Health Concerns:** Prolonged exposure to herbicides can pose health risks to humans, wildlife, and pets, especially when not handled or applied correctly.

Tilling

Tilling is used in site preparation for restoration primarily when addressing soil compaction, creating a suitable seedbed for planting native species, or disrupting invasive species with shallow root systems. It may also be necessary when restoring former agricultural land to improve conditions for native plants

Management Considerations

It is recommended that tilling is avoided for restoration at the arboretum. In place of tilling, broadscale soil aeration along with repeated close mowing or prescribed fire along with raking can help create seed-soil surface contact for native plants to establish.

Pros

- **Soil De-compaction:** Tilling can help break up compacted soil, improving water infiltration and root growth, especially in areas where the soil has become hard or dense.

Cons

- **Threat to Ground-Nesting Insects:** Tilling kills ground nesting insects and brings weed seeds to the surface where they will germinate and negatively impact wildflower establishment**.**
- **Soil Structure Damage:** Repeated tilling damages soil structure, speeds erosion, and releases carbon dioxide into the environment. In addition, discing and tilling breaks up soil microbial networks, facilitating further soil degradation and encouraging invasive species that respond positively to soil disturbance and high nutrient loads.

Smothering

For small areas or demonstration restoration plantings (1000 sq ft or less), smothering is an ideal, chemical-free method for site preparation. This involves covering the area with overlapping cardboard or newspaper, then adding a layer of compost, leaves, or other organic material. The site should be left to smother for an entire growing season before planting.

Management Considerations

Key management considerations include selecting appropriate materials—such as cardboard, mulch, or landscape fabric—that effectively block light and suppress plant growth. The area should be cleared or mowed beforehand to ensure close contact between the smothering material and the ground. Smothering typically requires several months to over a year, during the hot months, so long-term site monitoring is essential. It's important to secure materials against wind or water movement and to avoid disturbing nearby native vegetation. Planning for follow-up planting with native species is critical to prevent invasive regrowth once the smothering layer is removed or decomposed.

Pros

- **Chemical-Free:** Smothering is an organic method that avoids the use of herbicides, making it more environmentally-friendly compared to chemical approaches.
- **Improves Soil Health:** As the materials break down, they enrich the soil with organic matter, enhancing its fertility and structure.
- **Simple and Low-Cost:** Smothering materials like cardboard, newspaper, and organic mulch are inexpensive and easy to source

Cons

- **Limited Effect on Perennials:** Some deep-rooted perennial weeds may not be fully eradicated by smothering.
- **Potential for Weed Regrowth:** If not properly maintained, smothering materials may degrade unevenly, leading to uneven weed control.
- **Area-limited:** Smothering is only effective in small areas and may not be suitable for the larger scale restoration at the arboretum. Smothering is not effective in areas with steep slopes that have high erosion potential or poor drainage.
- **Invasive density:** Smothering is not suitable in areas where weed pressure is high (i.e. fairways)

Solarizing

Solarizing is a non-chemical method of weed and soil-borne pest control that uses the sun's heat to kill unwanted plants, seeds, pathogens, and pests. It involves covering moist, bare soil with clear plastic sheeting during the hottest part of the year—typically summer—for a period of 4 to 8 weeks (or longer, depending on climate and goals).

Solarizing is a similar method to smothering and is more than 90% effective at eliminating weeds. It involves covering the area with clear or black plastic, burying the edges, weighting with rocks, and trapping heat to smother unwanted vegetation without the use of herbicides.

Management Considerations

Smothering and solarizing have a lot of similarities and are both highly effective site preparation methods for small plantings or restoration demonstration areas, but cannot be applied in the larger restoration areas due to the labor intensive set-up. Solarizing and smothering are not effective on steep slopes or areas with microtopography. Solarizing is most effective during the hottest, sunniest months—typically summer. The soil should be moist and bare before applying clear plastic sheeting and the plastic must be tightly sealed and secured to prevent heat loss and avoid being disturbed by wind. Sites must receive full sun for several weeks (usually 4–8) for optimal results. It's also important to monitor for regrowth along edges or holes, and to plan for native re-planting.

Pros

- **Fast-Acting and Highly Effective:** Solarizing can take a season or less, depending on conditions, and it is effective even in colder months if the ground is workable.
- **Kills a Wide Range of Weeds:** It targets both surface and deeper-rooted weeds more effectively than smothering. It may require additional applications for tough rhizome/root-based weed species.
- **Soil Health Benefits:** In addition to killing weeds, solarizing can help break down soil pathogens and pests.

Cons

- **Labor-Intensive Setup**: Installing the plastic properly (securing edges and ensuring full coverage) can be time-consuming. The plastic will require maintenance throughout the growing season due to wind and storms.
- **Soil Overheating:** If not done carefully, solarizing can overheat the soil, potentially harming beneficial soil organisms.
- **Area-limited:** Same as smothering, solarizing is only effective in small areas (<½ acre) and may not be suitable for the larger scale restoration at the arboretum.

HABITAT INSTALLATION AND ESTABLISHMENT

At a high level, it is important to distinguish whether to use seeds, plugs, transplants, or a combination of all three, to kickstart the restoration process. The ratio of seeds to transplants will depend on the restoration typology, desired outcomes, budget, and ecological factors.

Transplants

Transplanting refers to moving existing plants from one location to another, usually from a donor site to a restoration site. Mature plants can be carefully dug up and relocated to the restoration site. This technique is particularly suitable for rare/threatened plants, woody plants, shrubs, or grasses that are difficult to grow from seed.

TRANSPLANT EXAMPLE

Pros

- **Head Start:** Transplants are already established, and therefore have a headstart over starting from seed. Transplants are able to quickly add vegetative cover to the landscape and support the restoration of insect and wildlife populations.
- **Ecological Site Mitigation:** Transplants can come from a wide range of development projects near San Antonio where they may otherwise be destroyed. Establishing a volunteer group to help with plant transplantation and working with developers on how to market/promote the transplant work can help defer costs of this work-intensive effort.
- **Acquiring Hard to Find or Rare Species:** A benefit of transplanting plants from development areas is the possibility of acquiring many or sizable groups of hard-to-find or otherwise rare plant species not common in the nursery industry.

Cons

- **Time and Labor-Intensive:** Correct transplanting takes time, care and skill. Typically, irrigation will be required for successful establishment.
- **Narrow planting window:** It is typically best to transplant in the fall, to allow root growth and establishment throughout the winter when environmental stressors are low.
- **Transplant Shock:** The plants may face transplant shock as they acclimatize to their new environment, especially in harsh or unpredictable climates or during times of drought.
- **Movement of Soil or Plant Pathogens:** Transplanting species outside of the Arboretum to the grounds could be a vector for pathogen introductions. Care must be taken to ensure plants are disease and pest free, and soil movement is minimized.

Plugs

Plugs are young plants or seedlings grown in small containers, usually 2” tubular plug forms. This planting method is often used to restore plant cover in degraded ecosystems in a quick and cheap manner. The term “plug” refers to the fact that the plant, with its root system, is removed from a small tray and planted into the ground in a restoration site, usually with a drill auger. Plug planting is a far more reliable approach compared with seeding and transplants. There is much needed research to assess the best practices and timing of the plug planting approach. The arboretum is the perfect place for these types of studies.

TYPICAL PLUG

Pros

- **Cost:** Plugs can be less expensive than transplants, as they are smaller and often grown in controlled nursery conditions before being planted. This planting method also requires less carbon inputs than traditional #1 or #5 containers.
- **Fast Establishment:** Plugs establish quickly as they are at an early developmental stage.
- **Species Flexibility:** Plugs allow for more flexibility in the number of species and can be strategically planted in different densities depending on the needs of the restoration.
- **High Return on Investment:** Plug planting done late fall/early winter can be done with little irrigation and very high rates of success. Local experts can advise on which species are better from plug versus seed.

Cons

- **Time and Resources:** Plugs may require more time and resources to grow compared to seeds, as they need to be grown in a nursery before being planted out.
- **Transplant Shock:** Similar to larger transplants, plugs can also face transplant shock as they acclimatize to their new environment.

Both techniques require careful site preparation and post-planting care, including irrigation, mulching, and weeding.

Seeds

Direct seeding has been considered a cost-effective system for ecological restoration with tree species, particularly when compared to planting nursery-raised seedlings. It involves planting seeds directly into the restoration site and allows large areas to be planted in a shorter time – either mechanically or by hand. Seeding allows for the establishment of individuals in appropriate sites for root development and vegetation development that is more similar to natural succession. Fall is usually the best time to install new habitats with seed, though early spring can also work well. While seeding is a common approach, costs can be high for native seed, and success is hit or miss–depending heavily on rainfall timing.

Application of Seeds

Small areas can generally be hand-seeded by scattering the seed, similar to broadcasting. It is advisable to mix the seed with a larger volume of materials such as sand, peat moss, or vermiculite to increase its bulk for dispersal. This practice facilitates more even distribution across the planting area and ensures that the seed is applied uniformly. For larger areas (greater than one acre), specialized equipment, such as seed broadcasters or drop seeders, may be employed to simplify the process. These tools typically include manufacturer-provided calibration instructions to optimize effectiveness. For very large sites (exceeding five acres), a tractor-mounted drill seeder or pasture seeder is often the preferred option. Regardless of the method used, seeds will germinate most effectively when they are placed on or just beneath the soil surface, rather than deeply buried. Watering the site post-planting (or seeding before rainfall) will assist in incorporating the seed into the soil's upper layer, thereby enhancing germination.

Pros

- **Cost-Effective:** Seeds are the least expensive option and allow for a large number of plants to be introduced to the restoration site at once.
- **Biodiversity Enhancement:** Seed mixes can introduce a wide range of species, including those which are difficult to grow as plugs or transplant.
- **Natural Establishment:** Plants grown from seed tend to acclimatize more naturally to the site conditions, leading to more successful restoration outcomes.

Cons

- **Lower Success Rate:** Seeds can be vulnerable to environmental factors such as drought, flooding, or predation. The germination rate might be lower, and not all seeds will establish successfully.
- **Longer Timeline:** Seeing results with seedlings has a longer timeline than with transplants or plugs.
- **Dormancy:** High rates of dormancy for many native species.

METHOD SELECTION

Transplants are ideal when immediate results are preferred, there are resources for higher costs, or the restoration is focusing on a habitat that requires larger, more established plants for stability (e.g., wetlands or forests). Plugs are a good middle ground, offering more cost-effectiveness than transplants and a higher success rate than seeds, making them suitable for many of the restoration typologies at the arboretum. The return on investment of plugs is higher than seeding and transplants. Seeding is best when budget is a concern, and the site conditions are favorable for germination. It is also ideal for restoring large areas with a variety of species, although lower establishment rates and longer wait time for results should be expected.

NATIVE SEED CAN BE COLLECTED ON SITE.

Invasive Species

Adaptive Management Approaches

INTRODUCTION

Invasive species on site must be controlled through eradication, containment, control, and mitigation. The following section describes different Integrated Pest Management (IPM) strategies that should be used in combination to control invasive species on site. As a general rule, no removal efforts should be done without a post-removal restoration plan in place. Removal of invasive species without placement of competitive, desirable species will likely result in return of invasive species in a very short period. There are many researchers in San Antonio who specialize in the use of restoration as invasive species biocontrol who may be interested in supporting implementation of invasive species control combined with experimental approaches. This work could potentially be part of USDA or NSF funded projects.

MANUAL CONTROL

Manual control refers to the use of physical, hands-on methods to remove or manage invasive species without the use of chemical or biological controls. Methods include hand-pulling, digging, water-level manipulation/flooding, mulching, burning, and removal of alternate hostels. Manual control works best on small populations; typically manual control efforts must be persistent and several treatments may be needed to reduce or eliminate the target population.

PRESCRIBED FIRE

Prescribed fire (also known as “controlled burning”) refers to the deliberate, controlled application of fire to a specific area under carefully managed conditions to achieve ecological benefits The purpose of prescribed fire is to restore the natural fire-dependent processes of an ecosystem that has been disrupted by human activity, land-use changes, or the suppression of natural fires. It is used to reduce invasive and woody plant density and competition, stimulate the growth of native plants, return nutrients to the soil, promote germination of dormant seeds, and enhance wildlife habitat. The strategies is ideal in communities that have evolved with fire, such as the Blackland Prairies and Oak Woodlands on site. Burning is not recommended in the healthy plant communities on site, such as in the South Texas Brush Country restoration areas. Spot treatment with fire, when large-scale burns are either inappropriate or cannot be done, can be preferred and works well on seedlings and young saplings, either individually or in small groups.

Prescribed fire is allowed in San Antonio. Any burning must follow local burning regulations, local ordinances and consult with management experts.

MECHANICAL CONTROL

Mechanical control includes hoeing, cutting, girdling, tilling, mowing, chopping and constructing barriers using tools or machines. These techniques are most useful in areas with large infestations where the terrain does not create safety or equipment issues. Typically mechanical control is usually most effective when used in conjunction with herbicide treatments. It is recommended to leave roots in the ground for larger species, such as *Ligustrum*, especially along the creek, to reduce potential erosion along the banks.

CHEMICAL CONTROL

Biological control refers to the use of animals, fungi, or diseases to control invasive populations. This technique uses control organisms that typically come from the native range of the target species and require a period of study to ensure that they will remain specific to the target population. It is important that these control organisms do not harm native species, crops, or other ornamental species. These strategies typically require federal and state permits for their use.

CULTURAL CONTROL

Cultural control involves manipulation of forest structure and composition to control invasive species or the alternation of a stand so that effects will be limited if invasion occurs. Trees that are potentially susceptible to host species can be reduced as a component of the stand. It is recommended to maintain a level of canopy closure that impedes shade-intolerant invasive species, or to use advanced regeneration that can compete with invasive plants before removing the understory.

DISPOSAL

For species that continue to develop seeds once they have been pulled from the ground, effective control means that you must remove the flowering plants from the site to keep the seed from spreading. Invasive species should be placed in clear bags with labels, and disposal should be coordinated with their local public works office for collection and disposal.

Next Steps for Invasive Species Management

Further mapping and site assessment can help determine a greater level of resolution for invasive species management strategies. Mapping infestation locations and extents will be critical to a successful eradication effort. Based on the preliminary vegetation survey the highest abundance of invasive species on site are:

Observed Invasive Species

Flora

- **Hedge Parsley**, *Torilis arvensis*, native to Central and southern Europe
- **Rescue Brome**, *Bromus catharticus*, native to South America
- **Perennial Rye Grass**, *Lolium perenne*, native to Europe
- **Johnson Grass**, *Sorghum halepense*, native to Asia and northern Africa
- **Japanese Privet**, *Ligustrum japonicum*, native to Japan and Korea
- **Glossy Privet**, *Ligustrum lucidum*, native to China, Japan, and Korea
- **Chinaberry**, *Melia azedarach*, native to Indomalaya and Australasia
- **Bastard Cabbage**, *Rapistrum rugosum*, native to Europe, the Azores, the Madeira Islands, Canary Islands, northern Africa, and western Asia
- **King Ranch Bluestem**, *Bothriochloa ischaemum*, native to Atlantic Coasts of Europe to Pacific Shore of Asia
- **Kleberg Bluesetem**, *Andropogon annulatum*, native to Africa, Asia, Papua New Guinea
- **Buffelgrass**, Cenchurus ciliaris, native to Africa, Indonesia, Asia, and the Middle East
- **Alligatorweed**, *Alternanthera philoxeroides*, native to South America
- **Sheep Sorrel**, *Rumex acetosella*, native to Eurasia and the British Isles
- **Denseflower Knotweed**, *Persicaria glabra*

Fauna

- **Wild Boar**, *Sus Scrofa*

LOLIUM PERENNE

BROMUS CATHARTICUS

TORILIS ARVENSIS

MANAGEMENT OF THE WILD BOAR POPULATION

Wild boar (Sus scrofa) populations are a significant ecological threat to the arboretum, with the potential to cause damage to native habitats, restoration efforts, collections, and wildlife. Various management strategies are employed across Texas to limit the ecological impacts of wild boars, which can be applied to the arboretum. Below are some common strategies, along with their pros and cons:

At the arboretum, methods like trapping, fencing, or the use of professional pest control services are recommended. These approaches help manage the population more safely and effectively without endangering public safety or creating disturbances in populated areas. The most effective approach often involves an Integrated Pest Management strategy that combines multiple methods tailored to the arboretum's needs and resources available.

Trapping

Trapping involves the use of box traps, corral traps, or cage traps to capture wild boars. Traps are placed in areas frequented by wild boars, and captured animals are either removed or euthanized.

Pros

- **Selective Capture:** Trapping allows for targeting specific individuals or groups, particularly sows and young boars, which can help reduce reproductive rates.
- **Non-lethal Option:** Trapping is a more humane option compared to other methods, as animals can be relocated or euthanized in a controlled manner.

Cons

- **Labor-Intensive:** Requires regular checking and maintenance of traps, which can be resource-intensive and time-consuming.
- **Limited Effectiveness:** It can be difficult to trap large numbers of boars, as they are wary of traps, and some boars may avoid them after being captured once.
- **Bycatch:** Other animals, such as non-target species, may inadvertently be captured.

Hunting

Wild boars can be hunted using various methods, including bow hunting, firearms, or night hunting (often using thermal imaging). Hunters often target boars from elevated blinds or vehicles, or in some cases, use trained dogs to track and corner wild boars.

Pros

- **Effective in Reducing Population:** When done on a large scale, hunting can significantly reduce wild boar populations, especially in areas with high boar densities.
- **Recreational Value:** Hunting wild boars is a popular recreational activity that also provides meat for consumption.

Cons

- **Limited Impact on Large Populations:** Hunting alone is often insufficient to control boar populations, especially in areas with large, dispersed populations.
- **Safety Risks:** Hunting can be dangerous, especially at night or in areas with high human traffic.
- **Recruitment:** Hunting can be ineffective if not managed properly, as boars are prolific breeders and can quickly repopulate areas. Population recruitment from neighboring groups is likely.
- **Public Perception:** Given the arboretum's proximity to residential areas, hunting can have safety and perceptions concerns.

Aerial Gunning

Aerial gunning involves shooting wild boars from helicopters or fixed-wing aircraft, typically by trained professionals. This method is often used in large, remote areas where other methods are less feasible, and likely is not the best approach for the Arboretum.

Pros

- **Effective in Large Areas:** Aerial gunning can cover large expanses of land, making it particularly useful for managing boar populations in rural or remote regions.
- **High Efficacy:** This method can result in a high number of kills in a short period, particularly when boars are concentrated in certain areas.

Cons

- **Safety Concerns:** Aerial gunning is not typically used in urban centers due to safety, legal, and ethical concerns – and is more commonly employed in rural or remote areas where the hog populations are higher and where there is less risk to human populations and infrastructure.
- **Expensive:** The cost of hiring pilots and maintaining aircraft makes aerial gunning a resource-intensive option.
- Risk to Non-target Species: There's a risk of accidentally injuring or killing non-target animals if the shooting is not carefully controlled.
- **Limited Access:** In some areas, the terrain or regulations may limit the ability to use aerial gunning effectively. Furthermore, sparse canopy cover is required to locate feral hog populations.

Fencing

Fencing involves installing barriers (usually electric or woven-wire fences) around high-risk areas to keep wild boars out. This method can be used to protect particulate collections, tree establishment, sensitive ecosystems, and restoration efforts.

Pros

- **Long-Term Protection:** Once installed, fencing can provide long-term protection for vulnerable areas.
- **Non-lethal:** This method does not involve harming or killing the boars, making it a more humane option.

Cons

- **High Initial Cost:** Installing and maintaining effective fencing can be expensive, especially over large areas.
- **Not 100% Effective:** Wild boars are strong and resourceful, and some may find ways to breach fences, particularly if they're not maintained properly.
- **Floodplain:** The impacts from flooding can lead to debris accumulation and/or damage along the fence line, erosion of fence posts, and alignment and leveling issues that shorten the lifespan of the fence.

Chemical Control

The use of poison baits is another method of reducing wild boar populations. It involves distributing bait laced with a toxic substance that specifically targets wild boars.

Pros

- **Cost-Effective:** Poisoning can be less expensive than other methods, especially in areas with large boar populations.
- **Wide Area Coverage:** It can be used over large areas, particularly in regions where trapping or hunting is not feasible.

Cons

- **Non-Target Species Risk:** Poison can unintentionally affect non-target species, including pets, livestock, and wildlife.
- Ethical Concerns: The use of poison is controversial due to its potential to cause suffering in animals.
- **Regulatory Issues:** In some regions, poisoning is heavily regulated or banned due to the environmental and ethical concerns surrounding its use.

Integrated Pest Management (IPM)

IPM combines multiple strategies, such as trapping, hunting, fencing, and chemical control, to create a comprehensive, long-term approach to managing wild boar populations.

Pros

- **Comprehensive Approach:** By combining methods, IPM can be more effective than relying on a single strategy.
- **Adaptable:** Strategies can be adjusted depending on the specific situation, terrain, and available resources.

Cons

- **Complex and Resource-Intensive:** Implementing an IPM strategy requires significant coordination, expertise, and resources.
- **Difficult to Evaluate Success:** Because multiple methods are used simultaneously, it can be challenging to determine which specific strategy is most effective.

Analog Sites

& Restoration Precedents

Savanna

Prairie

South Texas Brush Country

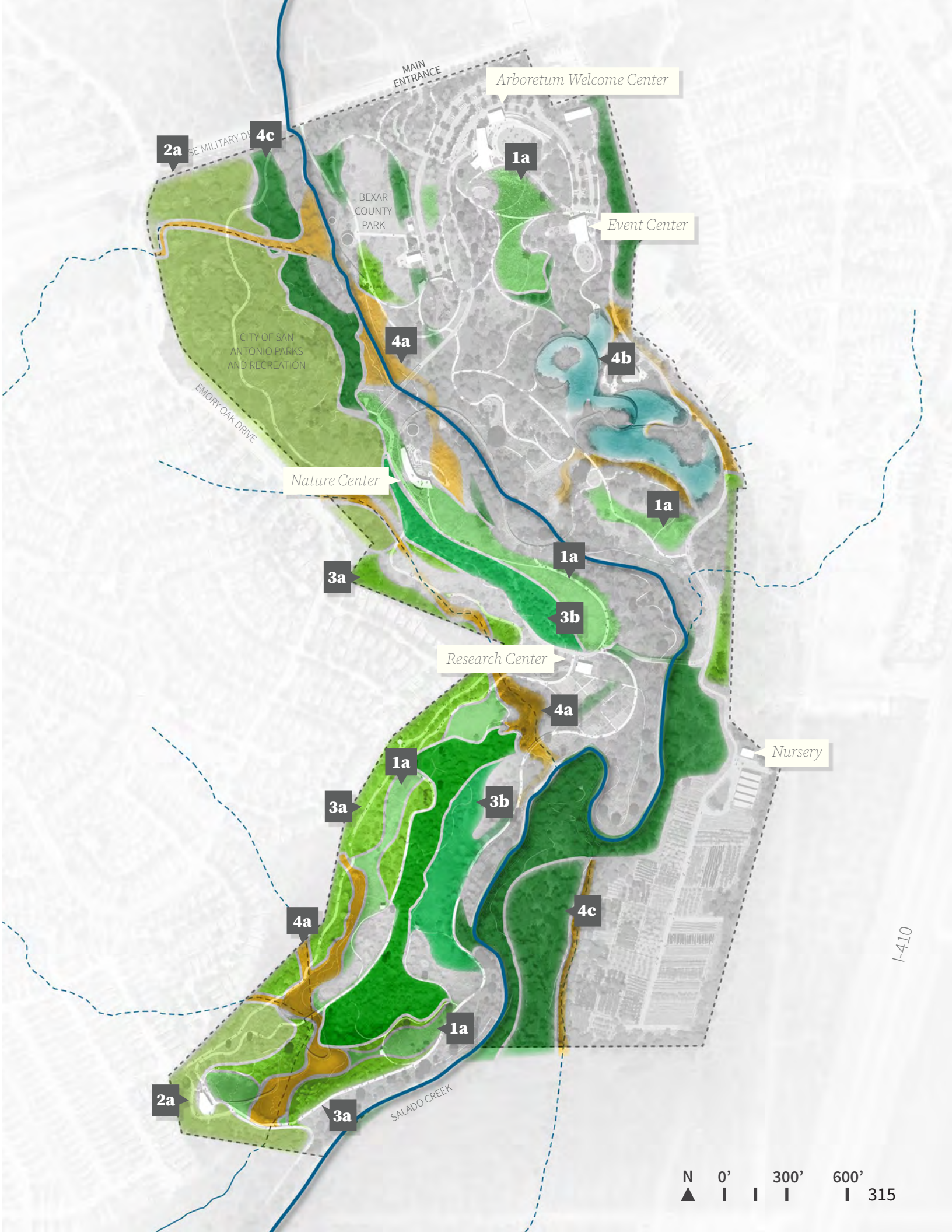
Riparian

Restoration Typology

Grounded in Site Ecology

INTRODUCTION

The Arboretum is categorized into four dominant restoration habitat typologies: Prairie, Upland Forest, Riparian, and Savanna. Typologies are further divided into sub-categories that each have specific restoration strategies, focus species, native plant and animal communities, and restoration targets. The restoration typologies and sub-typologies are illustrated in section diagrams in the following chapter.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EMORY OAK DRIVE
Nature Center
Research Center
Nursery
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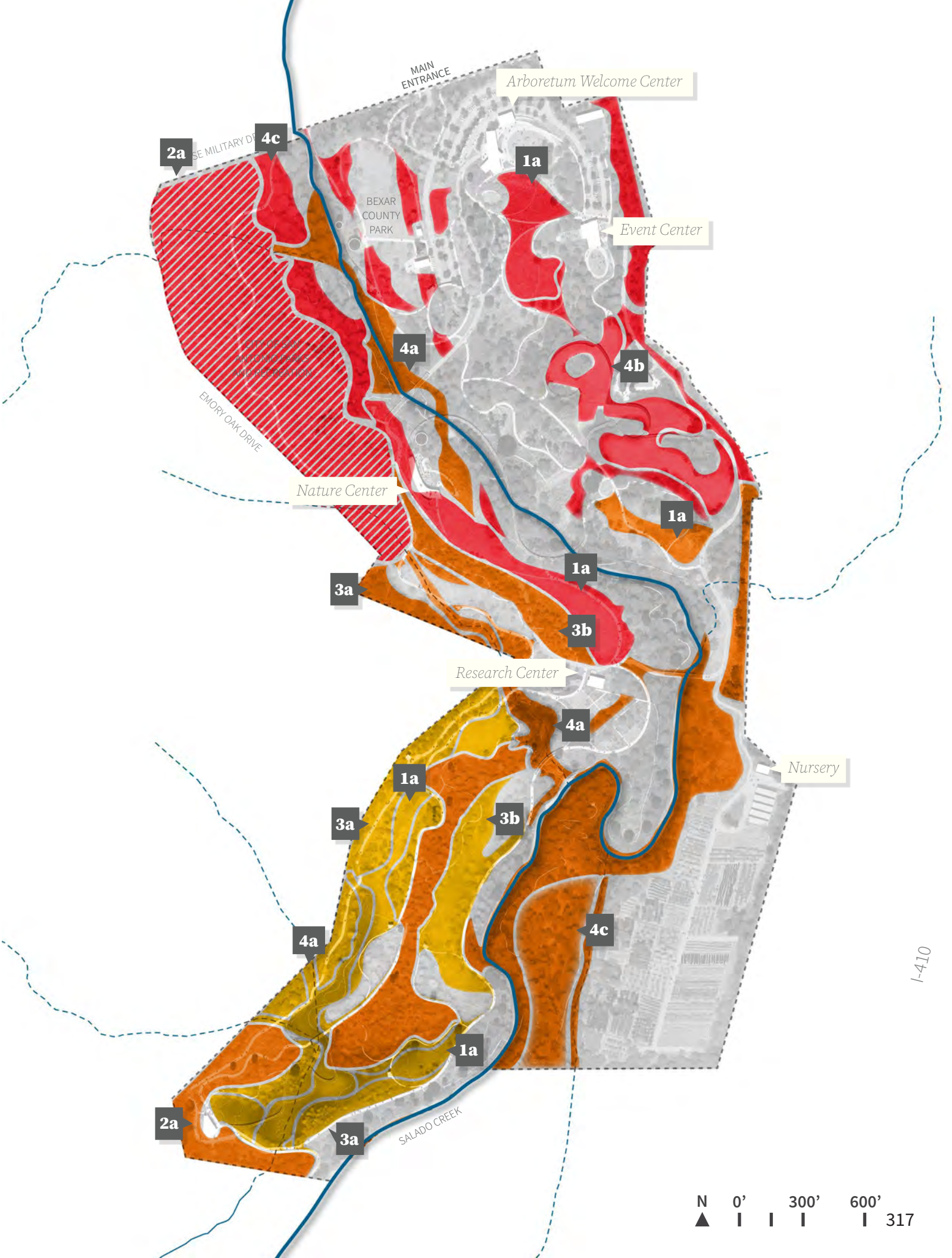
Restoration Priority

Strategic Phasing

INTRODUCTION

Restoration priority is assigned based on two main factors: the visibility of restoration outcomes and the condition of existing vegetation. High priority refers to restoration areas that are highly visible where the existing vegetation is high quality. These areas are concentrated at the entrance to the site, as well as along the northern section of the floodplain forest. Lower priority does not mean low value; rather, low priority restoration areas indicate low quality vegetation located in areas of the site that are less accessible and less visible to the public, especially in early phases. As high priority areas are completed, lower priority areas are moved up the priority list.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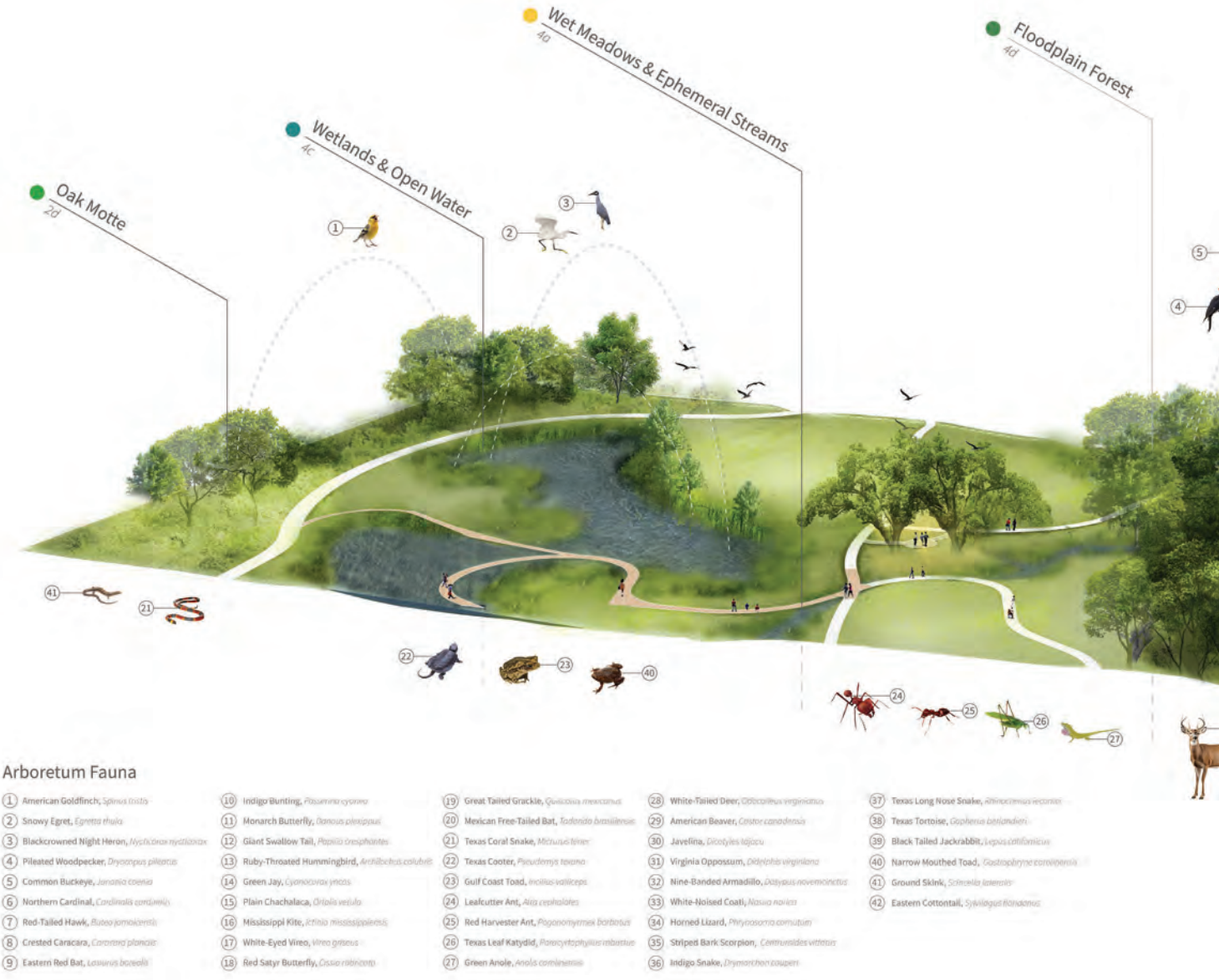
Restoring Function

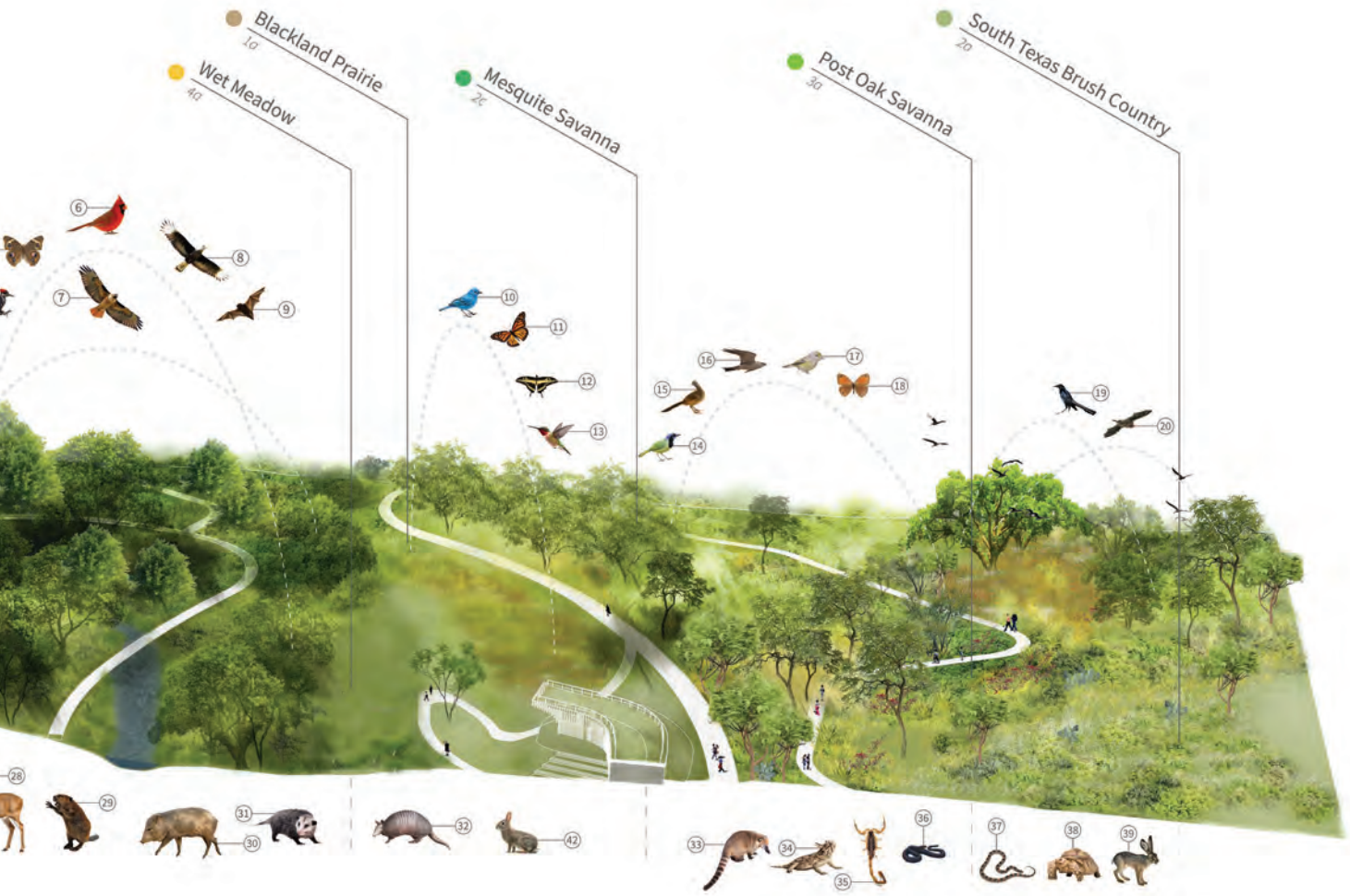
Building Back Biodiversity and Food webs



Arboretum Fauna

1. American Goldfinch, *Spinus tristis*
2. Snowy Egret, *Egretta thula*
3. Blackcrowned Night Heron, *Nycticorax nycticorax*
4. Pileated Woodpecker, *Dryocopus pileatus*
5. Common Buckeye, *Junonia coenia*
6. Northern Cardinal, *Cardinalis cardinalis*
7. Red-Tailed Hawk, *Buteo jamaicensis*
8. Crested Caracara, *Caracara plancus*
9. Eastern Red Bat, *Lasiurus borealis*
10. Indigo Bunting, *Passerina cyanea*
11. Monarch Butterfly, *Danaus plexippus*
12. Giant Swallow Tail, *Papilio cresphontes*
13. Ruby-Throated Hummingbird, *Archilochus colubris*
14. Green Jay, *Cyanocorax yncas*
15. Plain Chachalaca, *Ortalis vetula*
16. Mississippi Kite, *Ictinia mississippiensis*
17. White-Eyed Vireo, *Vireo griseus*
18. Red Satyr Butterfly, *Cissia rubricata*
19. Great Tailed Grackle, *Quiscalus mexicanus*
20. Mexican Free-Tailed Bat, *Tadarida brasiliensis*
21. Texas Coral Snake, *Micrurus tener*
22. Texas Cooter, *Pseudemys texana*
23. Gulf Coast Toad, *Incilius valiceps*
24. Leafcutter Ant, *Atta cephalotes*
25. Red Harvester Ant, *Pogonomyrmex barbatus*
26. Texas Leaf Katydid, *Pterecyrtophyllus mbutue*
27. Green Anole, *Anolis carolinensis*
28. White-Tailed Deer, *Odocoileus virginianus*
29. American Beaver, *Castor canadensis*
30. Javelina, *Dicotyles tajacu*
31. Virginia Opposum, *Didelphis virginiana*
32. Nine-Banded Armadillo, *Dasypus novemcinctus*
33. White-Noised Coati, *Nasua narica*
34. Horned Lizard, *Phrynosoma cornutum*
35. Striped Bark Scorpion, *Centruroides vittatus*
36. Indigo Snake, *Drymarchon couperi*
37. Texas Long Nose Snake, *Rhinocheilus lecontei*
38. Texas Tortoise, *Gopherus berlandieri*
39. Black Tailed Jackrabbit, *Lepus californicus*
40. Narrow Mouthed Toad, *Gastrophryne carolinensis*
41. Ground Skink, *Scincella lateralis*
42. Eastern Cottontail, *Sylvilagus floridanus*

1 **Prairie**
1a Blackland Tallgrass Prairie
2 **Upland Forest**
2a South Texas Brush Country
2b Oak Motte
3 **Savanna**
3a Post Oak Savanna
3b Mesquite Savanna
4 **Riparian**
4a Wet Meadows and Ephemeral Streams
4b Wetlands and Open Water
4c Floodplain Forest



Prairie

Restoration Typology

INTRODUCTION

A Blackland Prairie ecosystem is a vibrant and diverse landscape that showcases a unique combination of grasses, wildflowers, and occasional trees or shrubs, all adapted to the fertile, dark soils and specific climatic conditions of eastern-to-central Texas.

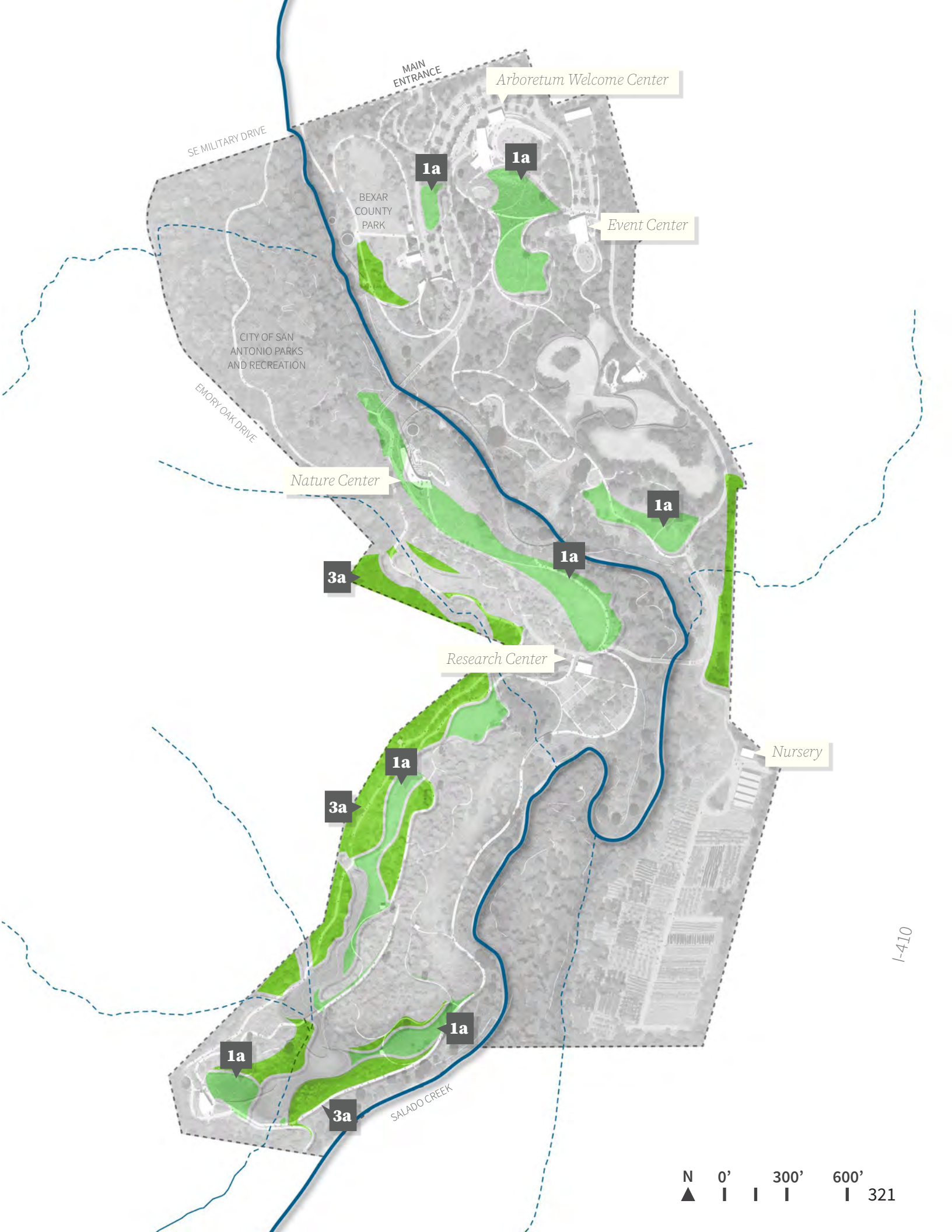
1a Blackland Tallgrass Prairie

Ecological Conditions

The Blackland Prairie Restoration Typology is best suited to deep, fertile, “black” soil, primarily vertisols (clay-rich soils). These soils are high in organic matter and support a wide variety of grasses and other vegetation. The soils tend to be slightly alkaline.

Topography

Blackland prairies are typically found in areas with flat or gently rolling landforms, often with minimal elevation changes. This terrain allows for the growth of grasses and prevents water from draining too quickly, maintaining moisture. Most suitable areas at the arboretum are the former fairway openings.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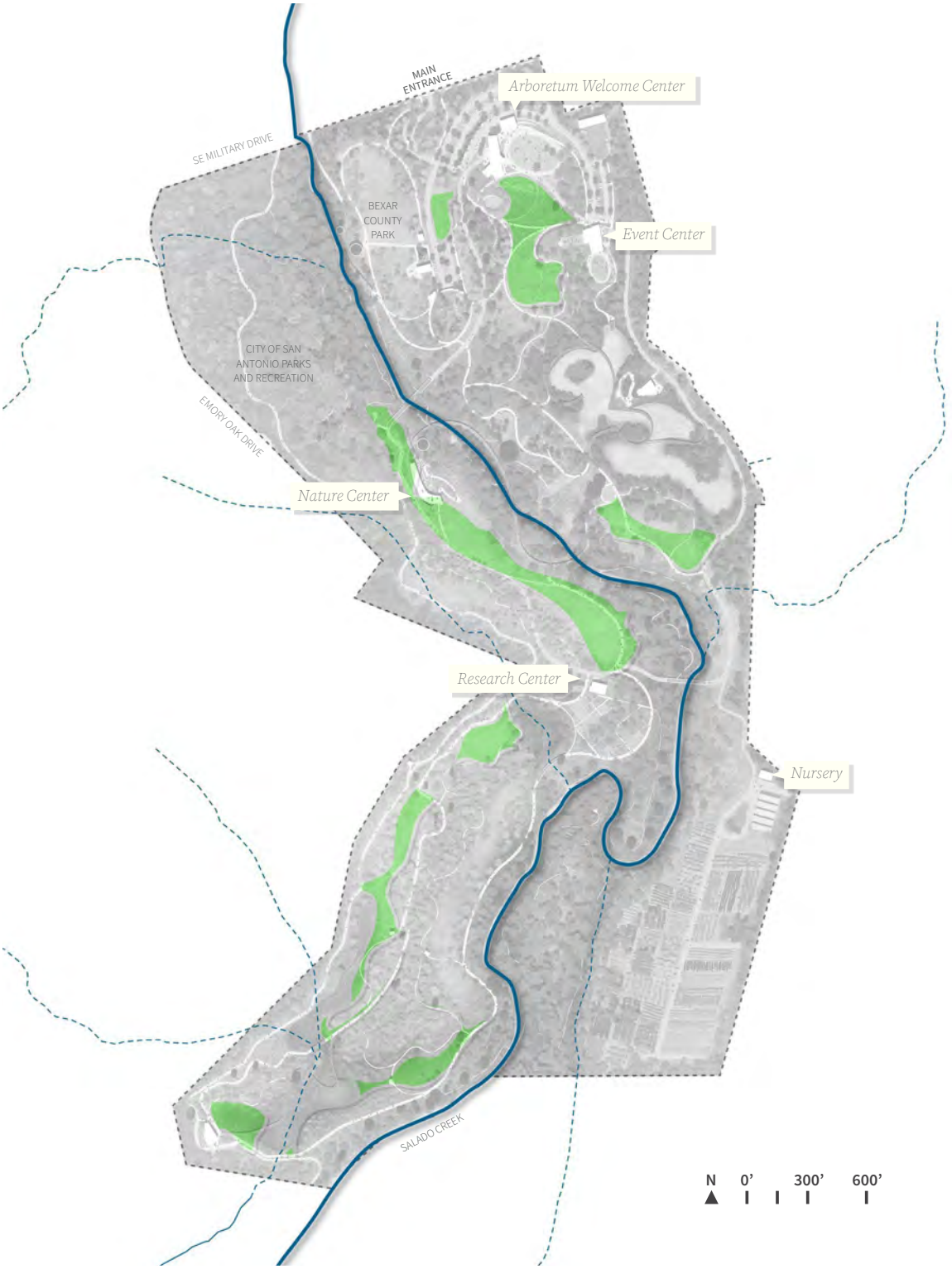
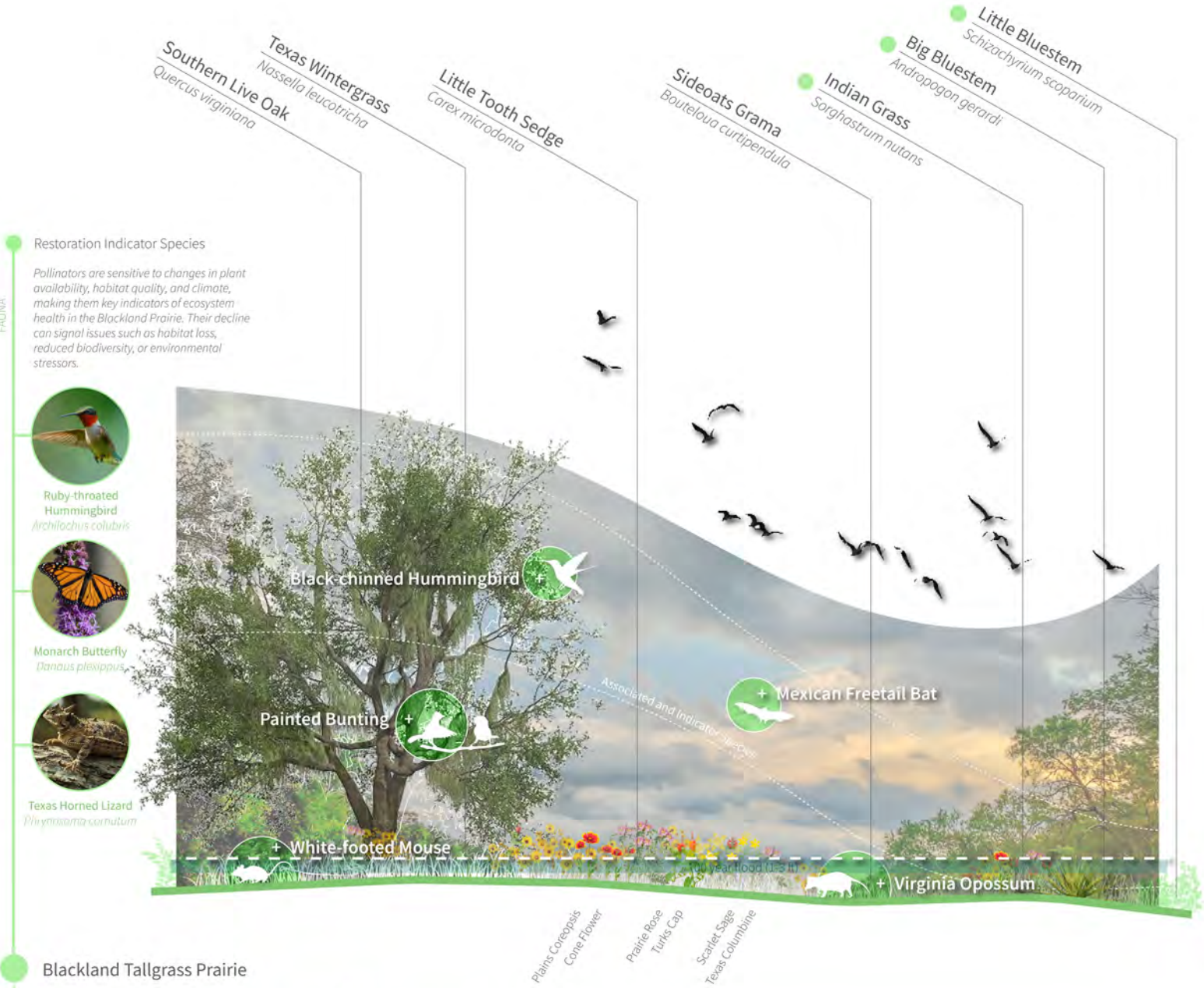
1a Blackland Tallgrass Prairie

The Prairie Restoration Collection showcases the rich biodiversity of the Blackland Prairie, one of the most endangered ecosystems in North America, shaped by fire and grazing. Featuring native grasses, wildflowers, and widely spaced prairie trees, this collection serves as a living model for prairie restoration.

1 **Prairie**
1a Blackland Tallgrass Prairie



Restoration Indicator Species



Blackland Tallgrass Prairie

CANOPY COVER <20%

Restoration Target

Restored prairies should have a diversity of continuously flowering (early spring through late fall) species for pollinators. This restoration typology should retain dead prairie vegetation over the winter to allow spring emergence of larvae.

Upland Forest

Restoration Typology

INTRODUCTION

A restored upland forest has a diverse community of tree species and high levels of canopy cover, typically consisting of four different structural layers, including the canopy, the sub-canopy, the shrub layer, and the herb layer.

2a South Texas Brush Country

Ecological Conditions

South Texas Brush Country should have a landscape of open, thorny shrubs, small trees, grasses, and cacti, interspersed with areas of open grassland. The structure is relatively low, with dense understory and scattered trees, providing a habitat that supports a variety of wildlife.

Topography

This restoration typology is best suited to low nutrient, tighter soils that are higher in the landscape compared to savanna grassland. This typology presents itself as a closed shrubland or low woodland in dry and arid areas of the site.

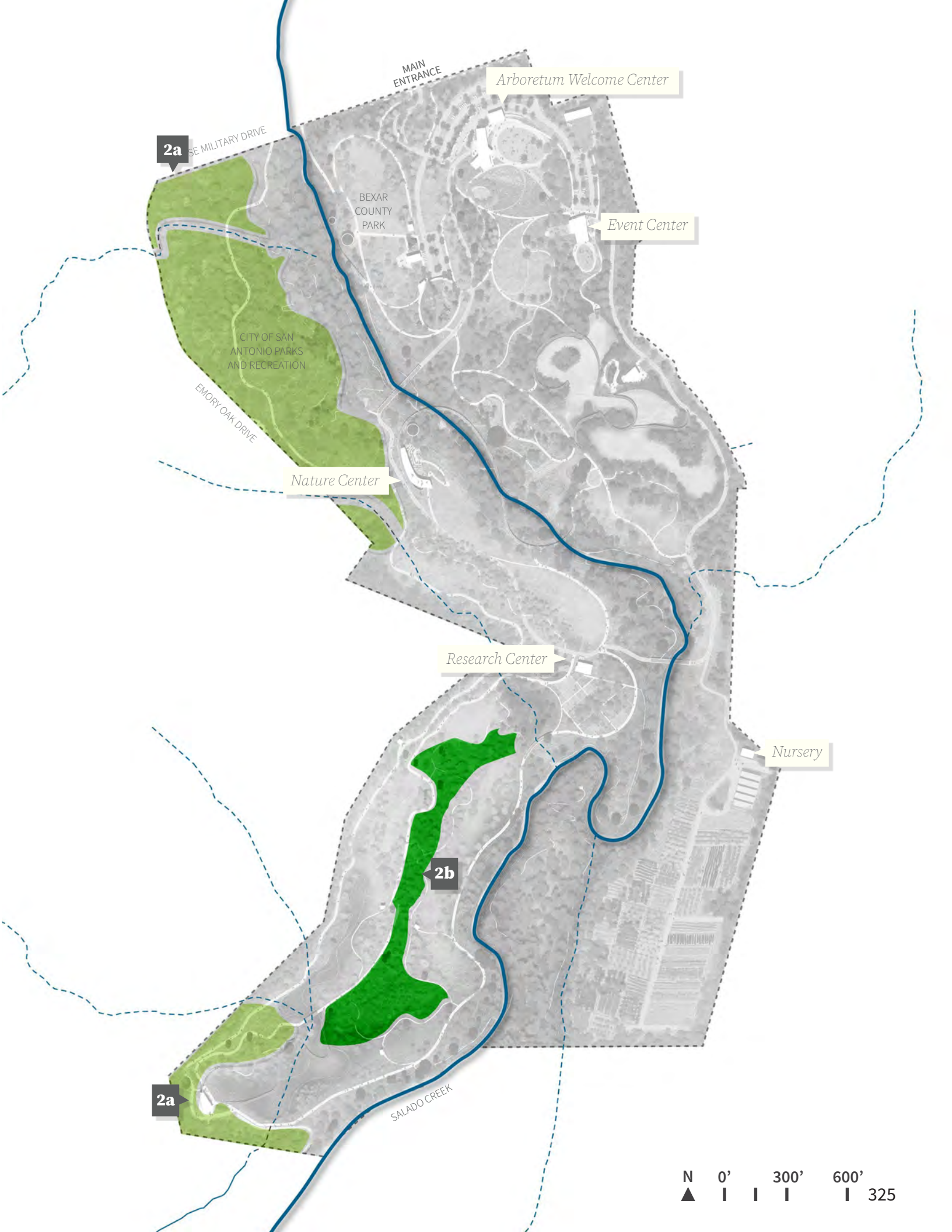
2b Oak Motte

Ecological Conditions

Oak-hardwood mottes should consist of a small, localized stand of oak trees (often a mix of species like live oak, white oak, and post oak) that forms a distinct cluster or “island” of trees within a broader landscape.

Topography

The topography where oak hardwood motte formations are found varies widely. They are often found in well-drained upland loamy soils that have higher moisture retention.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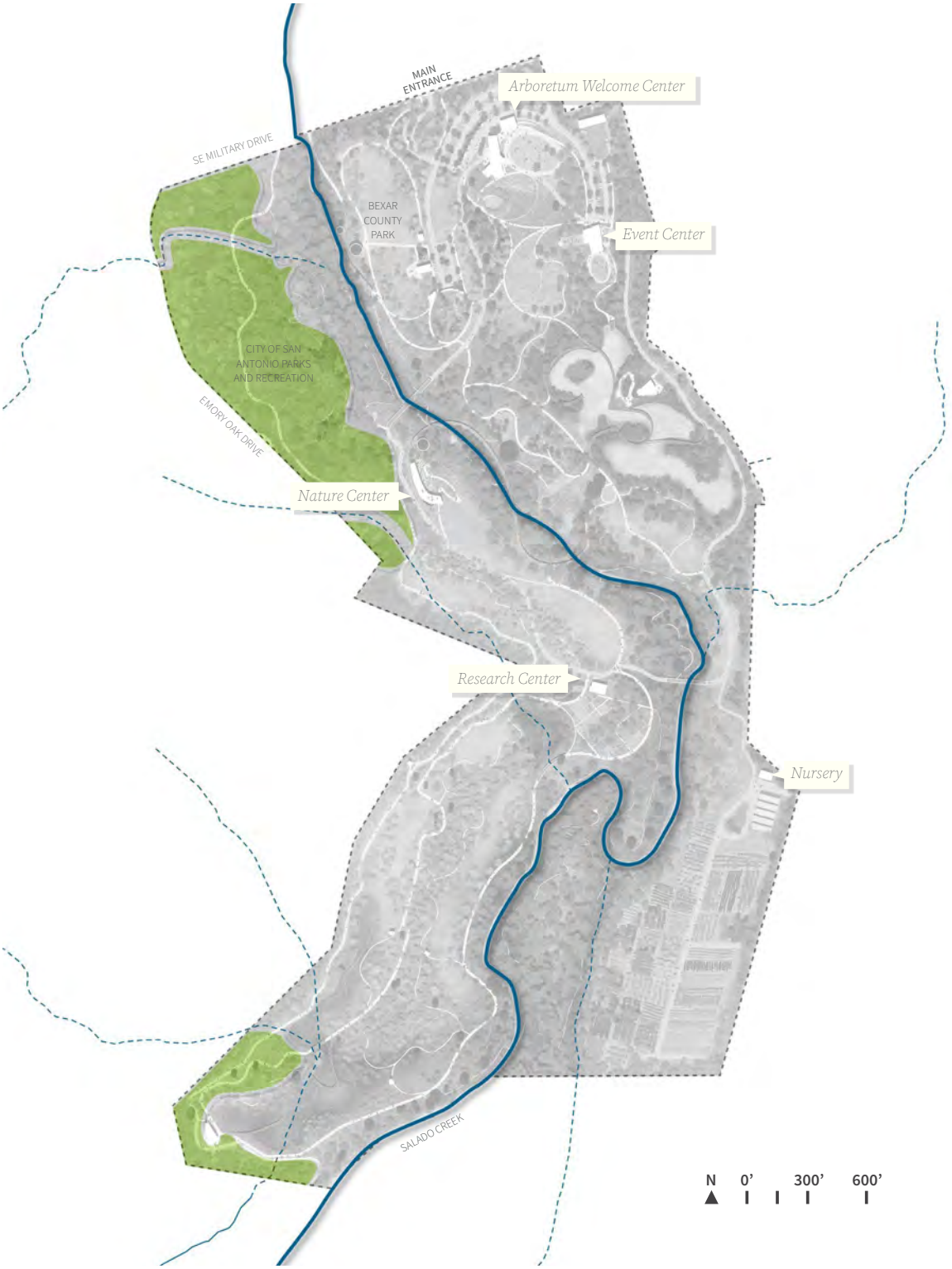
2a South Texas Brush Country

The South Texas Brush Country Collection features hardy, drought-tolerant trees and shrubs like mesquite, guajillo, and granjeno. It reflects the dense, wildlife-rich thornscrub landscapes unique to southern Texas.

2 **Upland Forest**
2a South Texas Brush Country
2b Oak Motte



Restoration Indicator Species

Pecan
Carya illinoinensis

Texas Persimmon
Diospyros texana

Huisache
Vachellia farnesiana

Spanish Dagger
Yucca gloriosa

Honey Mesquite
Neltuma glandulosa

Texas Pricklypear
Opuntia engelmannii

Agarita
Berberis trifoliolata

Guayacan
Guaiacum angustifolium

Restoration Indicator Species

Birds are good indicators of ecosystem health because they are sensitive to changes in habitat quality, food availability, and pollution, making them early indicators of environmental shifts.

FAUNA

Northern Bobwhite Quail
Colinus virginianus

Cedar Waxwing
Bombycilla cedrorum

Texas Horned Lizard
Phrynosoma cornutum

South Texas Brush Country

CANOPY COVER >70%

FLORA

Pecan
Carya illoinensis

Texas Persimmon
Diospyros texana

Huisache
Vachellia farnesiana

Honey Mesquite
Neltuma glandulosa

Spanish Dagger
Yucca gloriosa

Texas Pricklypear
Opuntia engelmannii

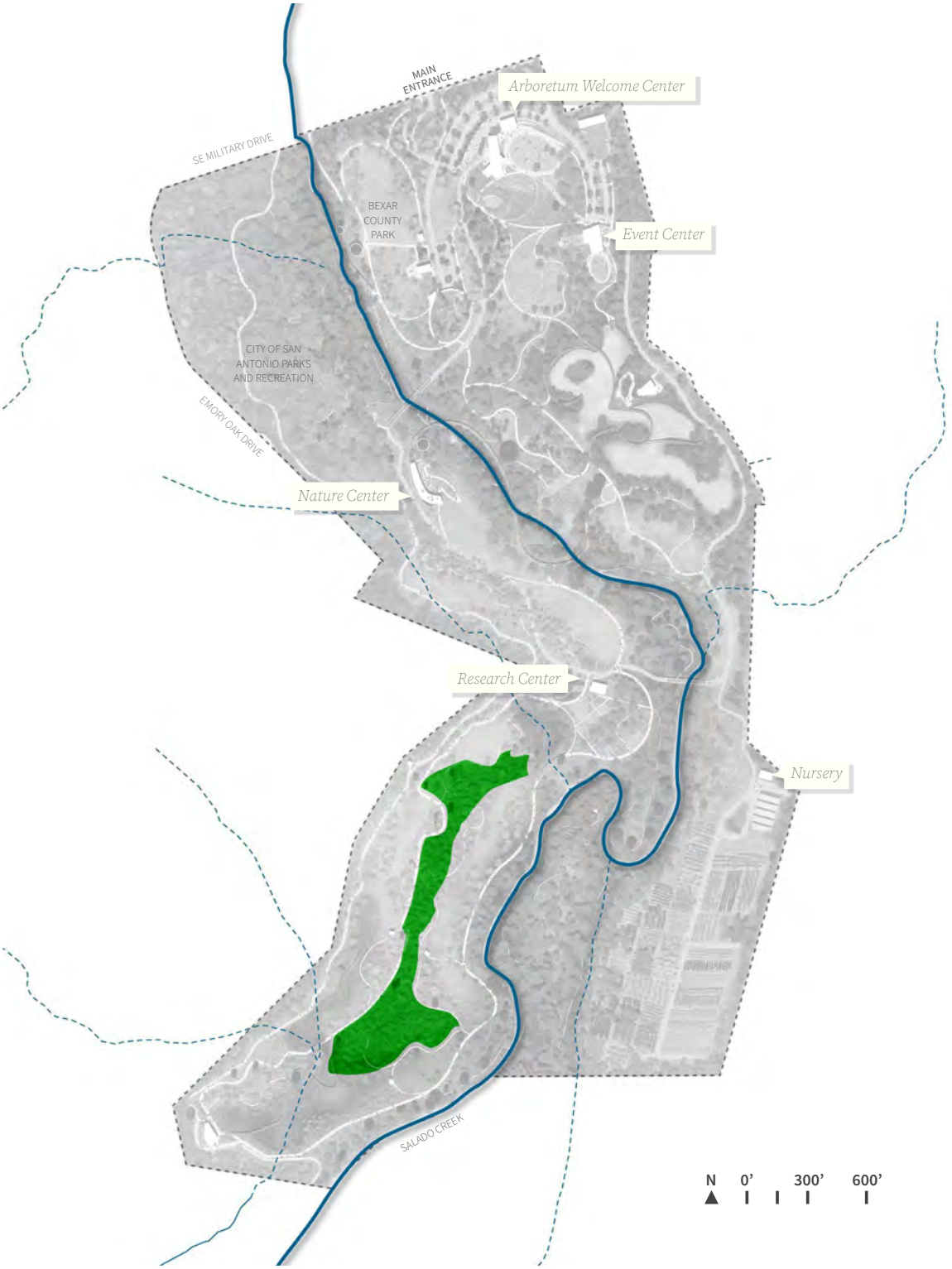
Restoration Target

Restored forests should have continuous/closed canopy for interior forest birds. Dead wood and rotting logs are vital for restoring ecological processes, providing habitat, and improving nutrient cycling.

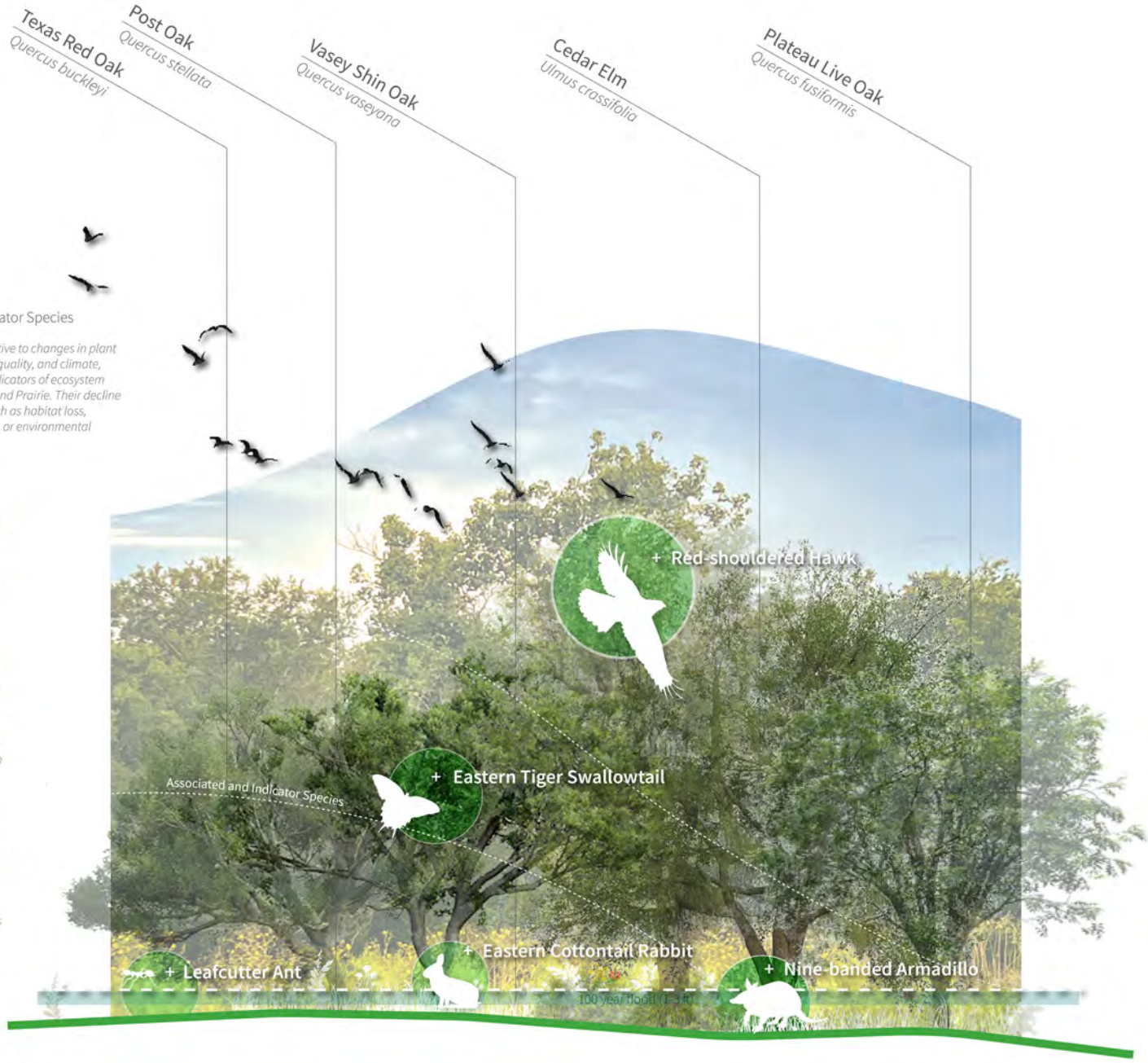
2b Oak Motte

An oak motte is a small, dense grove of live oaks or other native oak species that stands out amid surrounding prairie or brushland. These mottes provide vital shade, habitat, and ecological diversity, often serving as wildlife refuges and cultural landmarks in the landscape.

2 **Upland Forest**
2a South Texas Brush Country
2b Oak Motte



Restoration Indicator Species



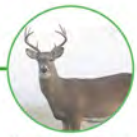
FAUNA

Restoration Indicator Species

Pollinators are sensitive to changes in plant availability, habitat quality, and climate, making them key indicators of ecosystem health in the Blackland Prairie. Their decline can signal issues such as habitat loss, reduced biodiversity, or environmental stressors.

Eastern Bluebird
Sialia sialis

Texas Horned Lizard
Phrynosoma cornutum



White-Tailed Deer
Odocoileus virginianus

Oak Hardwood Motte

CANOPY COVER **75%**

Texas Red Oak
Quercus buckleyi

Post Oak
Quercus stellata

Vasey Shin Oak
Quercus vaseyana

Cedar Elm
Ulmus crassifolia Nutt.

Plateau Live Oak
Quercus fusiformis

Texas Ash
Fraxinus albicans

Amerian Beautyberry
Callicarpa americana

Texas Bluebonnet
Lupinus texensis

Indian Blanket
Gaillardia pulchella

Restoration Target

Restored prairies should have a diversity of continuously flowering (early spring through late fall) species for pollinators. This restoration typology should retain dead prairie vegetation over the winter to allow spring emergence of larvae.

Savanna

Restoration Typology

INTRODUCTION

Restored savannas should have patches of shrubs mixed together among the trees and ground layer species. Similar to the restored prairie typology, the open savanna typology should have a diversity of continuously flowering species for pollinators.

3a Post Oak Savanna

Ecological Conditions

Rolling to level topography, often on plateau tops, but also on gentle slopes with well drained, sandy-to-loamy soils. The Post Oak Savanna Grassland is a transitional habitat between the tallgrass prairies and wooded forests, characterized by a mix of open grassy areas interspersed with scattered, often widely spaced, trees.

Topography

Rolling to level topography, often on plateau tops, but also on gentle slopes with well drained, sandy-to-loamy soils

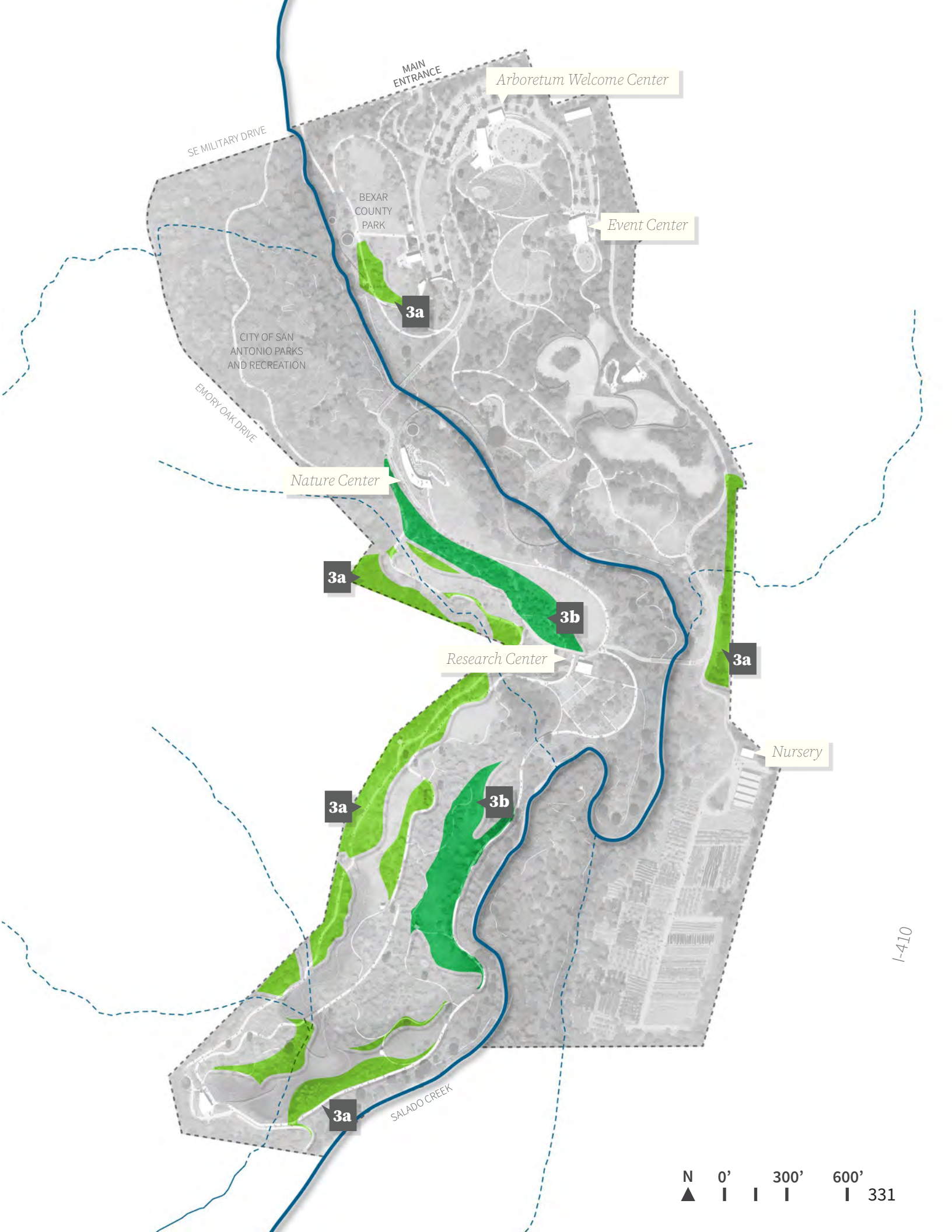
3b Mesquite Savanna

Ecological Conditions

This restoration typology is best suited to well-drained loamy or sandy savanna soils and floodplain soils.

Topography

This restoration typology is best suited to well-drained loamy or sandy savanna soils and floodplain soils. They are found in a variety of topography from flat-to-gently sloping terrain in South Texas Plains, to hilly and rocky landscapes in Texas Hill Country.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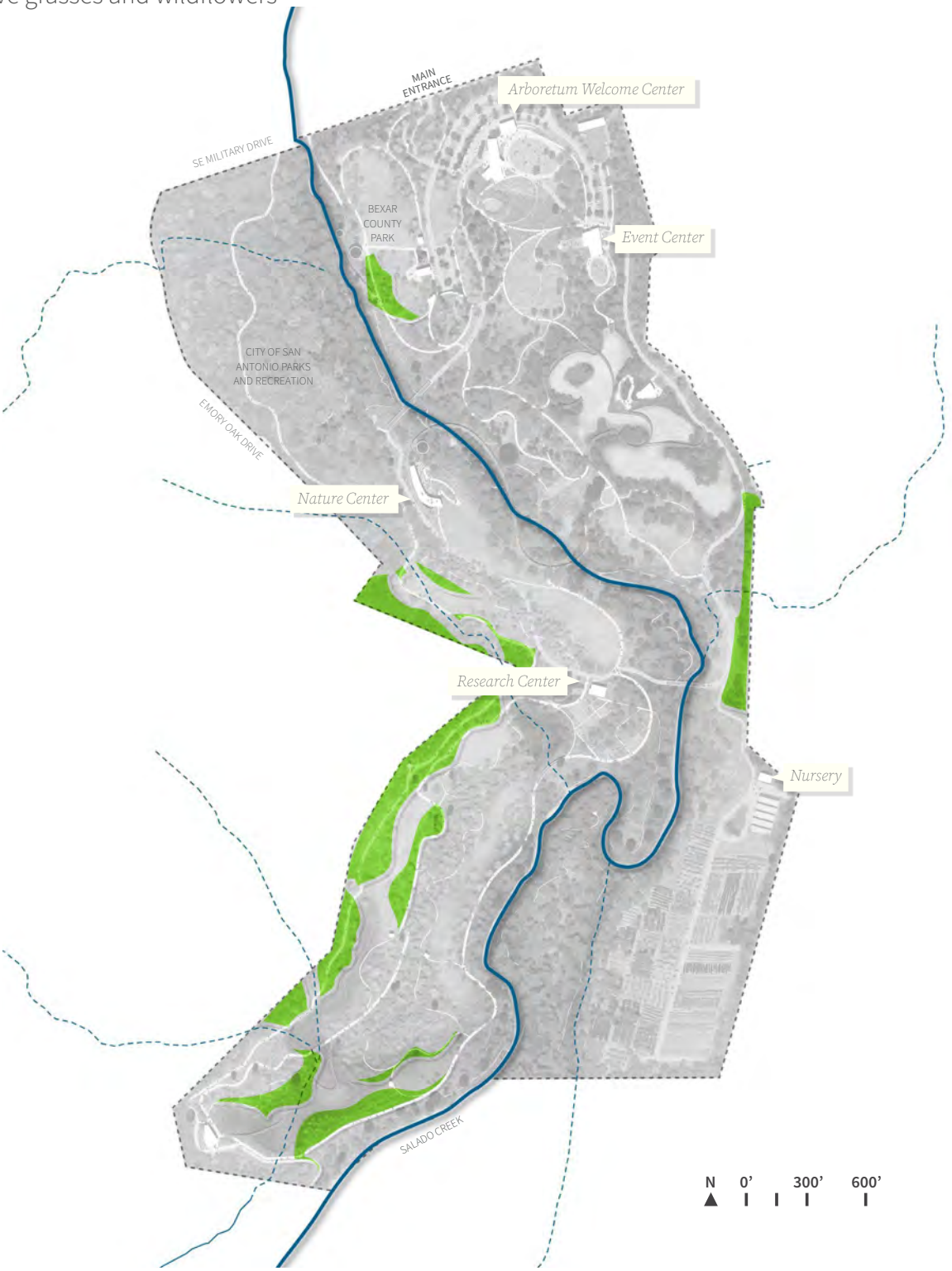
3a Post Oak Savanna

The Post Oak Savanna Grassland is a transitional habitat between the tallgrass prairies and wooded forests, characterized by a mix of open grassy areas interspersed with scattered, often widely spaced, trees. A restored or healthy post oak savanna should feature a sparse canopy of widely spaced post oaks, a mix of native grasses and wildflowers



Restoration Indicator Species

Yaupon
Ilex vomitoria

Wooly Birch
Betula pubescens

Ashe Juniper
Juniperus ashei

Eastern Redbud
Cercis canadensis

Bur Oak
Quercus macrocarpa

Black Walnut
Juglans nigra

Mexican Plum
Prunus mexicana

Post Oak
Quercus stellata

FAUNA

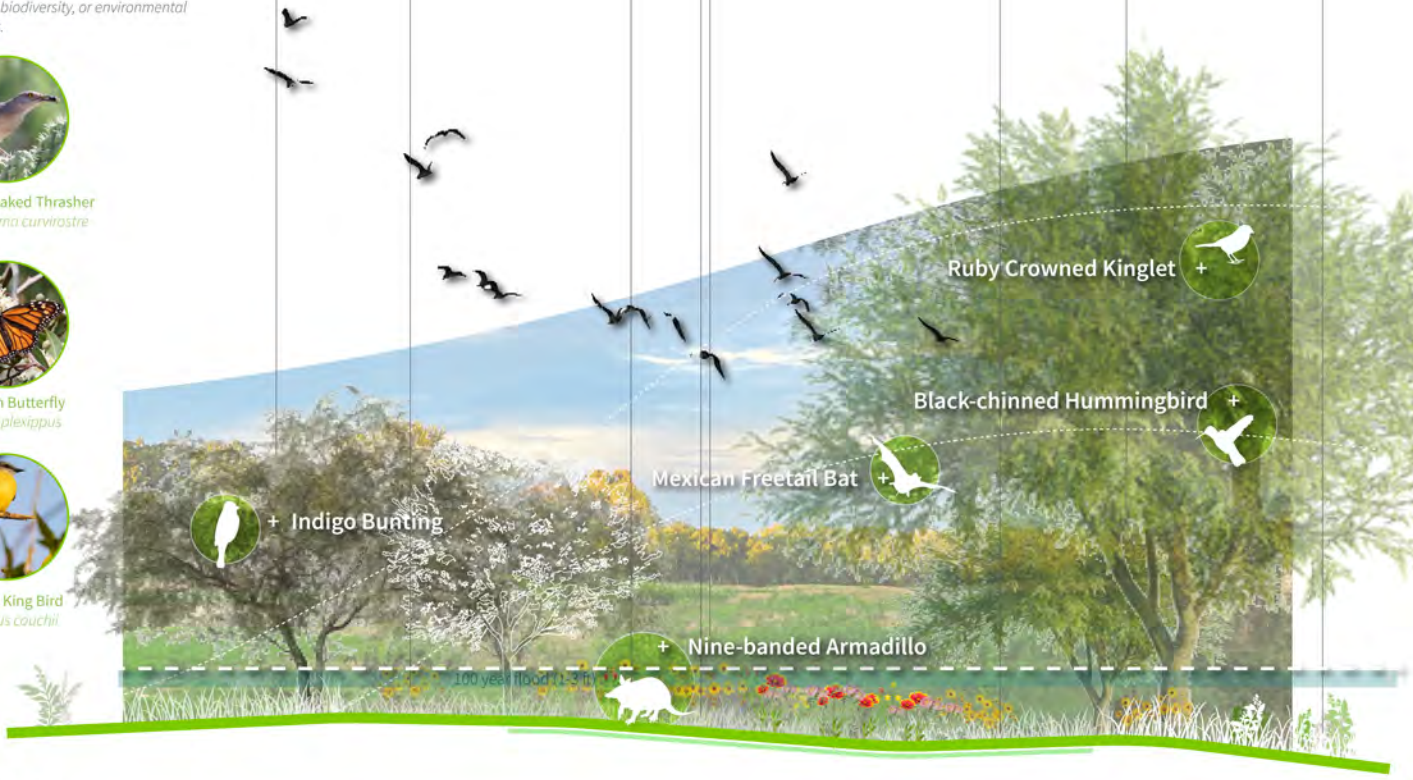
Restoration Indicator Species

Pollinators are sensitive to changes in plant availability, habitat quality, and climate, making them key indicators of ecosystem health in the Blackland Prairie. Their decline can signal issues such as habitat loss, reduced biodiversity, or environmental stressors.

Curvebeaked Thrasher
Toxostoma curvirostre

Monarch Butterfly
Danaus plexippus

Couch's King Bird
Tyrannus couchii



Post Oak Savanna

CANOPY COVER <60%

Woolly Birch
Betula pubescens

Post Oak
Quercus stellata

Pecan
Carya illinoinensis

Black Walnut
Juglans nigra

Bur Oak
Quercus macrocarpa

Mexican Plum
Opuntia engelmannii

Spanish Dagger
Yucca truceulata

Ashe Juniper
Juniperus ashei

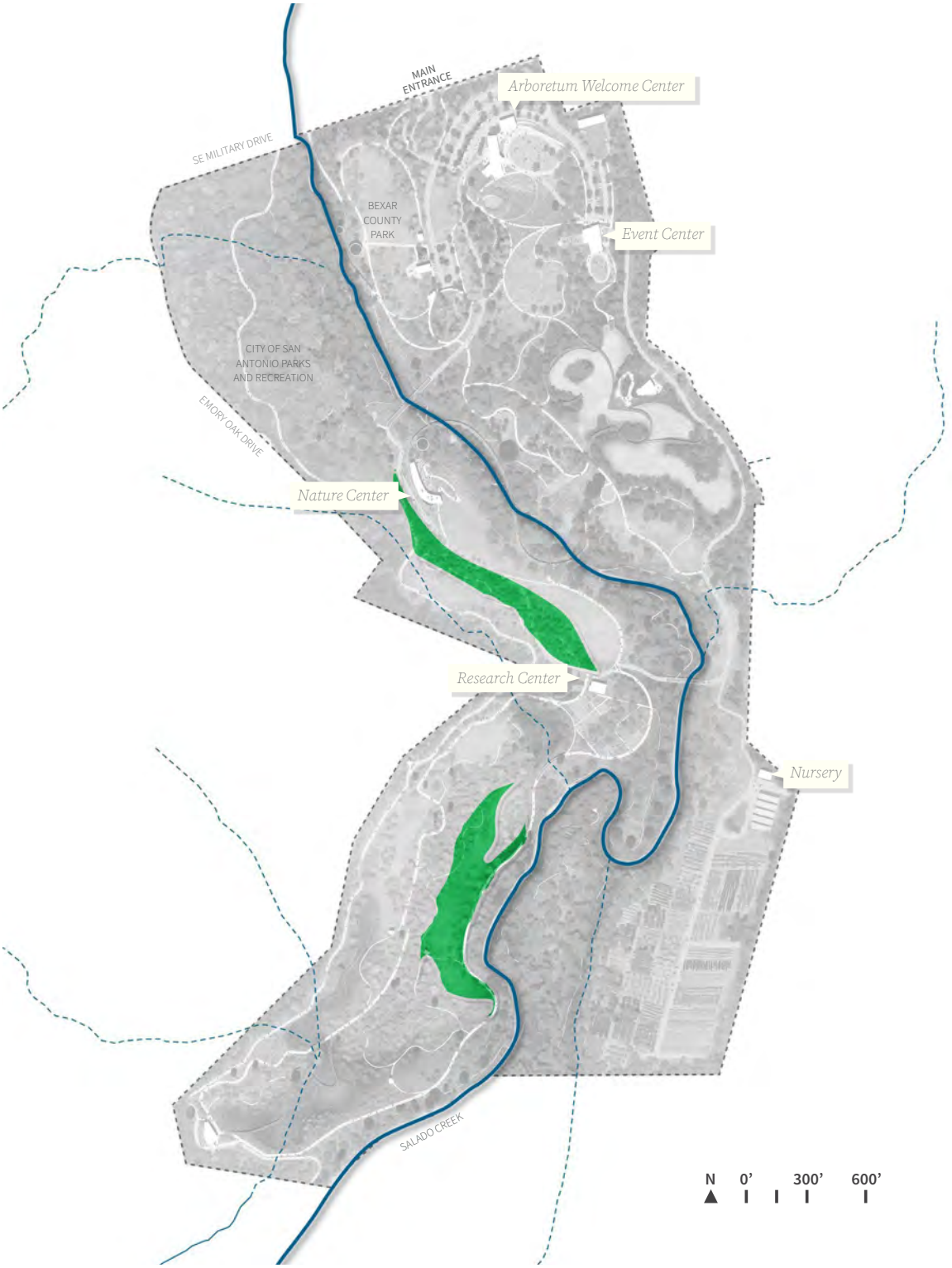
Restoration Target

Restored prairies should have a diversity of continuously flowering (early spring through late fall) species for pollinators. This restoration typology should retain dead prairie vegetation over the winter to allow spring emergence of larvae.

3b Mesquite Savanna

Mesquite must be managed as a savanna, or as a mosaic of grassland and thicket. Mesquite invade grasslands and their presence establishes an understory.

3 **Savanna**
3a Post Oak Savanna
3b Mesquite Savanna



Restoration Indicator Species

Honey Mesquite
Neltuma glandulosa

Huisache
Vachellia farnesiana

Texas Pricklypear
Opuntia engelmannii

Ashe Juniper
Juniperus ashei

Spanish Dagger
Yucca gloriosa

Guayacan
Guaiacum angustifolium

Agarita
Berberis trifoliolata

Lote Brush
Ziziphus obtusifolia

Restoration Indicator Species

Birds are good indicators of ecosystem health because they are sensitive to changes in habitat quality, food availability, and pollution, making them early indicators of environmental shifts.

FAUNA

Monarch Butterfly
Danaus plexippus

Western Meadowlark
Sturnella neglecta

Lesser Goldfinch
Spinus psaltria

Mesquite Savanna

CANOPY COVER 50%

FLORA

Ashe Juniper
Juniperus ashei

Spanish Dagger
Yucca gloriosa

Huisache
Vachellia farnesiana

Honey Mesquite
Neltuma glandulosa

Texas Pricklypear
Opuntia engelmannii

Lote Bush
Ziziphus obtusifolia

Agarita
Senegalia greggii

Guayacan
Guaiacum coulteri

Restoration Target

Restored forests should have continuous/closed canopy for interior forest birds. Dead wood and rotting logs are vital for restoring ecological processes, providing habitat, and improving nutrient cycling.

Riparian

Restoration Typology

INTRODUCTION

The Riparian restoration typology is composed of the water-shaped habitats of floodplain forests, wet meadows, ephemeral streams, and wetlands and open water—showcasing the biodiversity and ecological importance of Texas' waterways. These areas support wildlife, filter water, and buffer against floods.

4a Wet Meadows & Ephemeral Streams

Ecological Conditions

A wet meadow or ephemeral stream typically features seasonally saturated soils, fluctuating water levels, and high plant diversity adapted to periodic flooding and drying.

Topography

This restoration typology is best suited to low-lying seeps, ephemeral wetland edges, the floodplain of Salado Creek, and low-lying areas of the fairways.

4b Wetlands & Open Water

Ecological Conditions

Restored wetlands or seeps should have areas of open water, emergent vegetation, and native upland buffer prairie and savanna habitats. By considering varying water depths, emergent vegetation, edge habitat, and seasonal water patterns, these areas can support a wide variety of wildlife and contribute to important ecological functions such as water filtration, flood mitigation, and wetland habitat creation

Topography

This habitat typology is found in the natural and man-made depressions at the site's pond area.

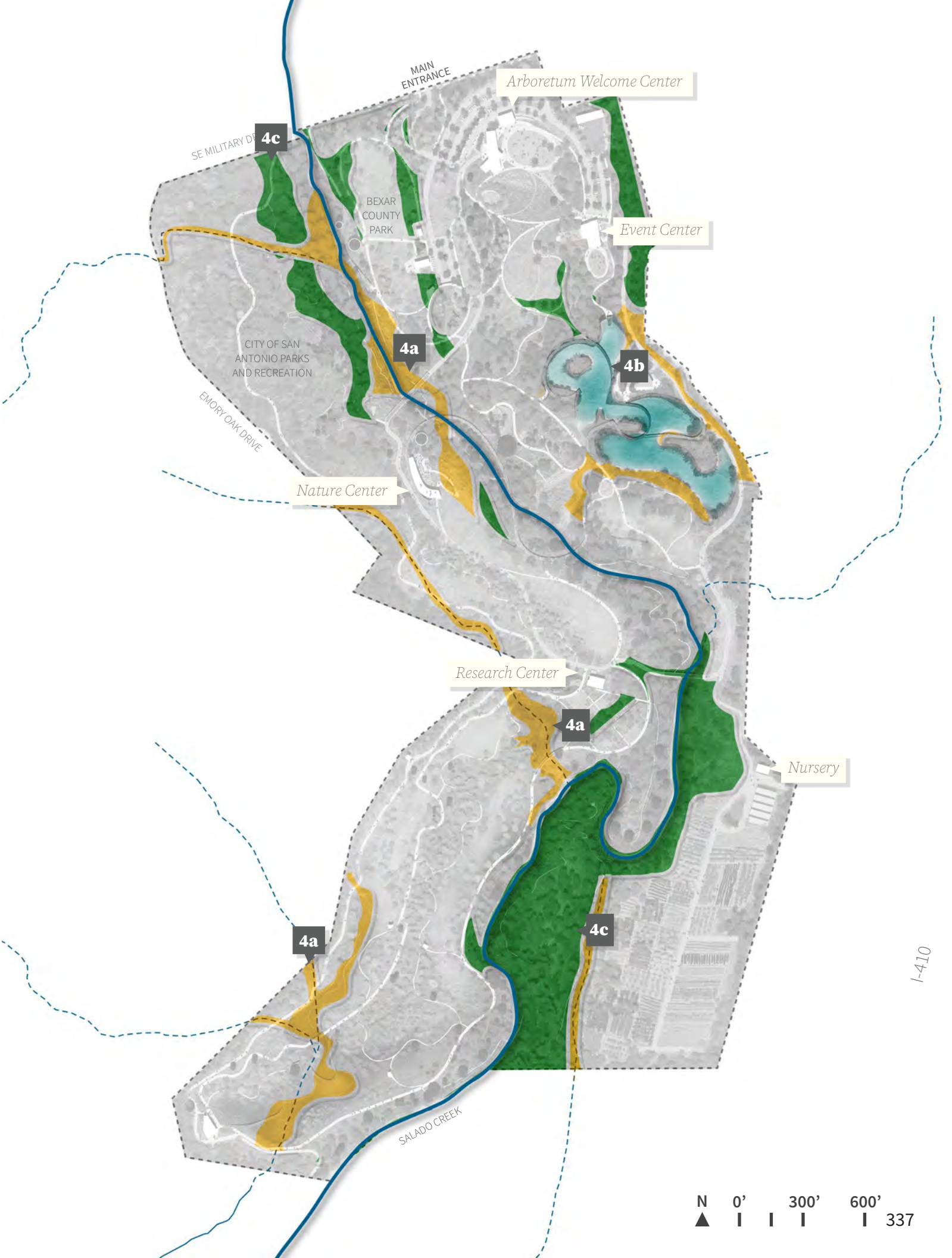
4c Floodplain Forest

Ecological Conditions

Restored floodplain forests should have continuous/closed canopy for interior forest birds. Dead wood and rotting logs are vital for restoring ecological processes, providing habitat, and improving nutrient cycling.

Topography

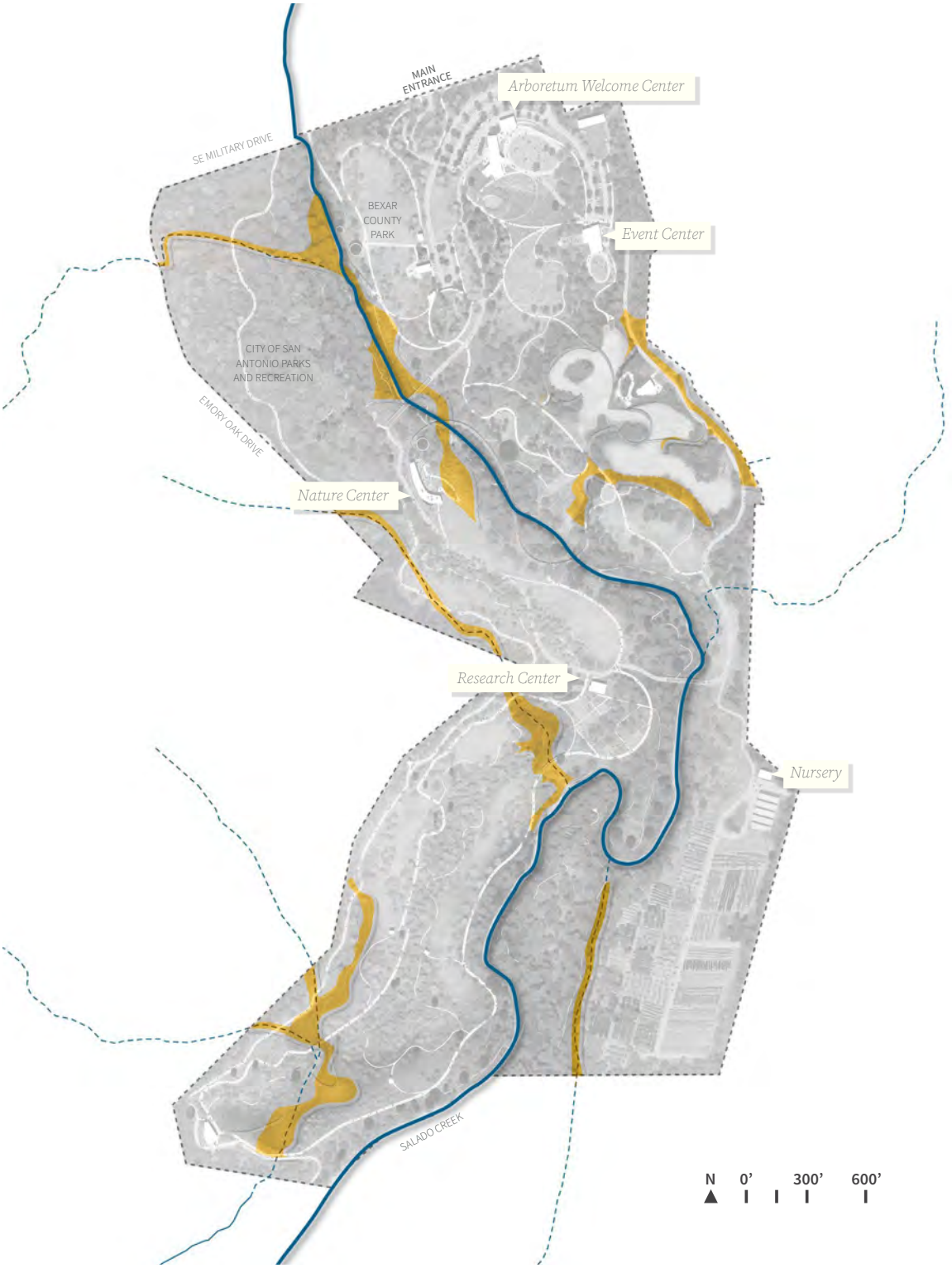
This restoration typology is best suited to the Salado Creek Corridors and other loamy bottomlands.


MAIN ENTRANCE
Arboretum Welcome Center
SE MILITARY DR
4c
BEXAR COUNTY PARK
Event Center
CITY OF SAN ANTONIO PARKS AND RECREATION
4a
4b
EMORY OAK DRIVE
Nature Center
Research Center
4a
Nursery
4a
4c
I-410
SALADO CREEK
N
0’
300’
600’
337

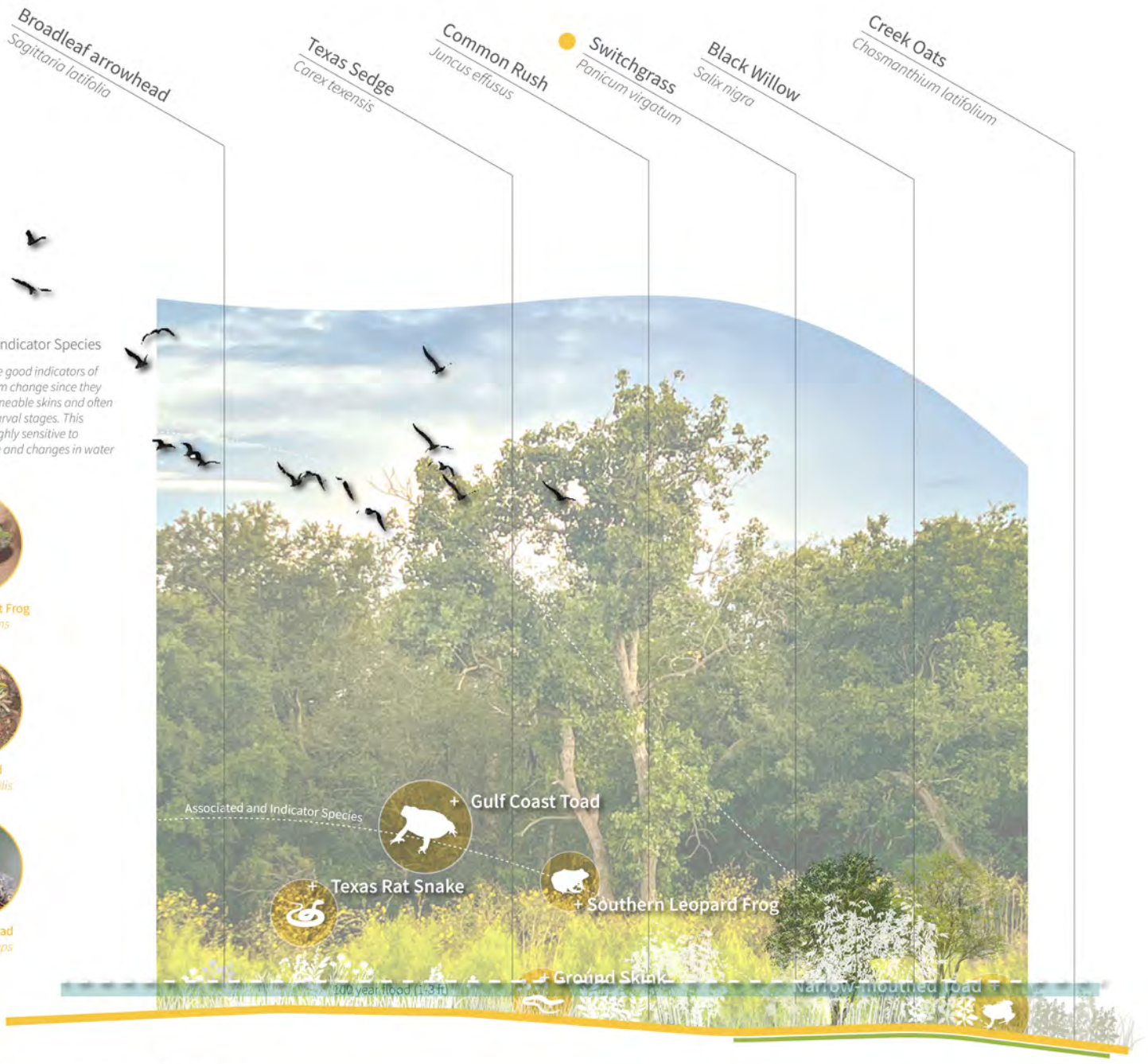
4a Wet Meadows & Ephemeral Streams

These habitats often occur along low-lying drainage areas or intermittent creeks, supporting native grasses, sedges, and wildflowers that thrive in the clay-rich soils and respond to seasonal rainfall patterns.

4 **Riparian**
4a Wet Meadows & Ephemeral Streams
4b Wetlands and Open Water
4c Floodplain Forest



Restoration Indicator Species



FAUNA

Restoration Indicator Species

Amphibians are good indicators of wider ecosystem change since they have semi-permeable skins and often have aquatic larval stages. This makes them highly sensitive to habitat change and changes in water quality.

Northern Cricket Frog
Acris crepitans

Green Toad
Anaxyrus debilis

Gulf Coast Toad
Incilius valliceps

Wet Meadows and Ephemeral Streams

CANOPY COVER — 5-10%

FLORA

Texas Sedge
Carex texensis

Common Rush
Juncus effusus

Switchgrass
Panicum virgatum

Black Willow
Salix nigra

Giant Ragweed
Ambrosia trifida

False Dayflower
Tinantia anomala

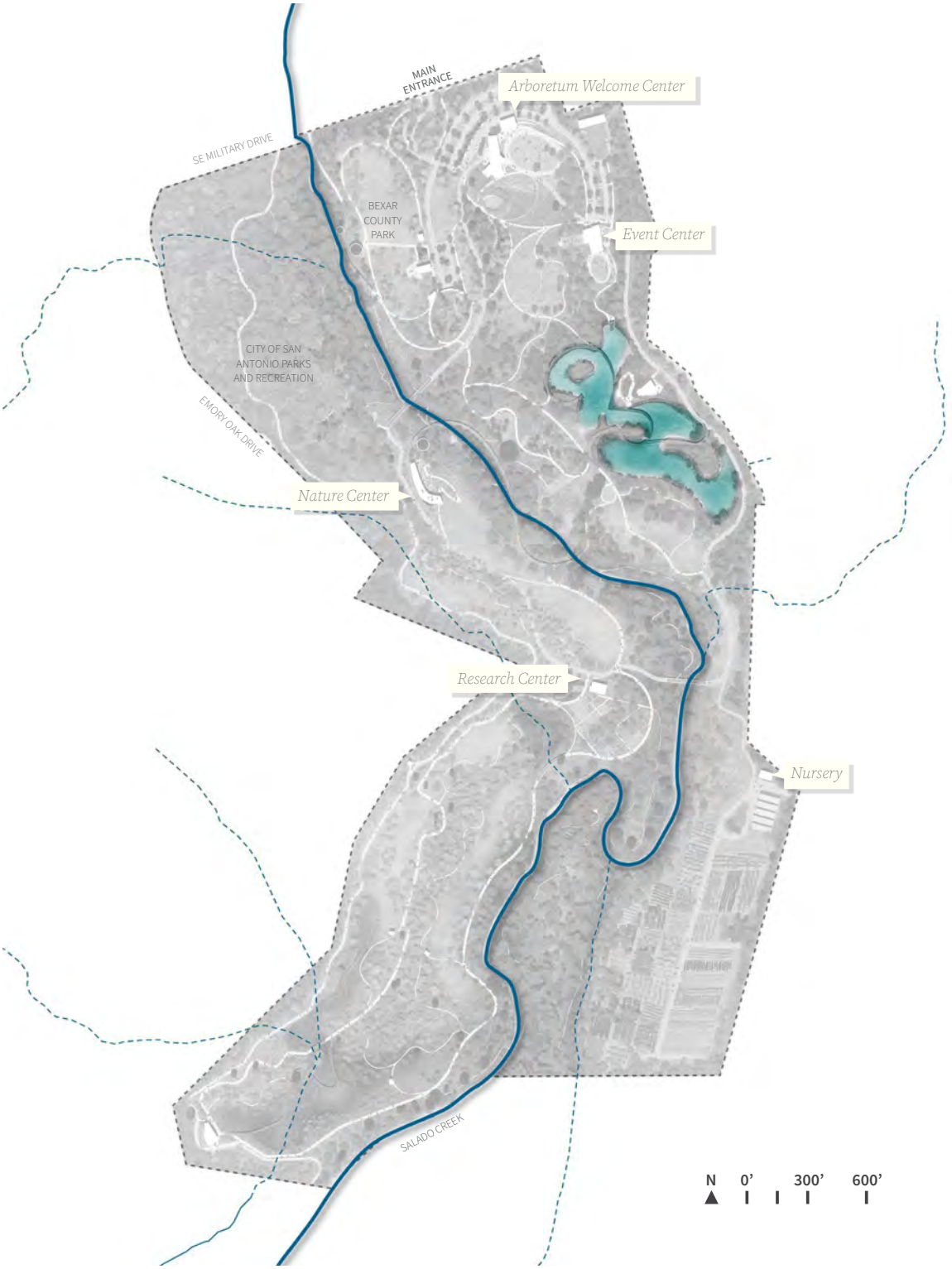
Restoration Target

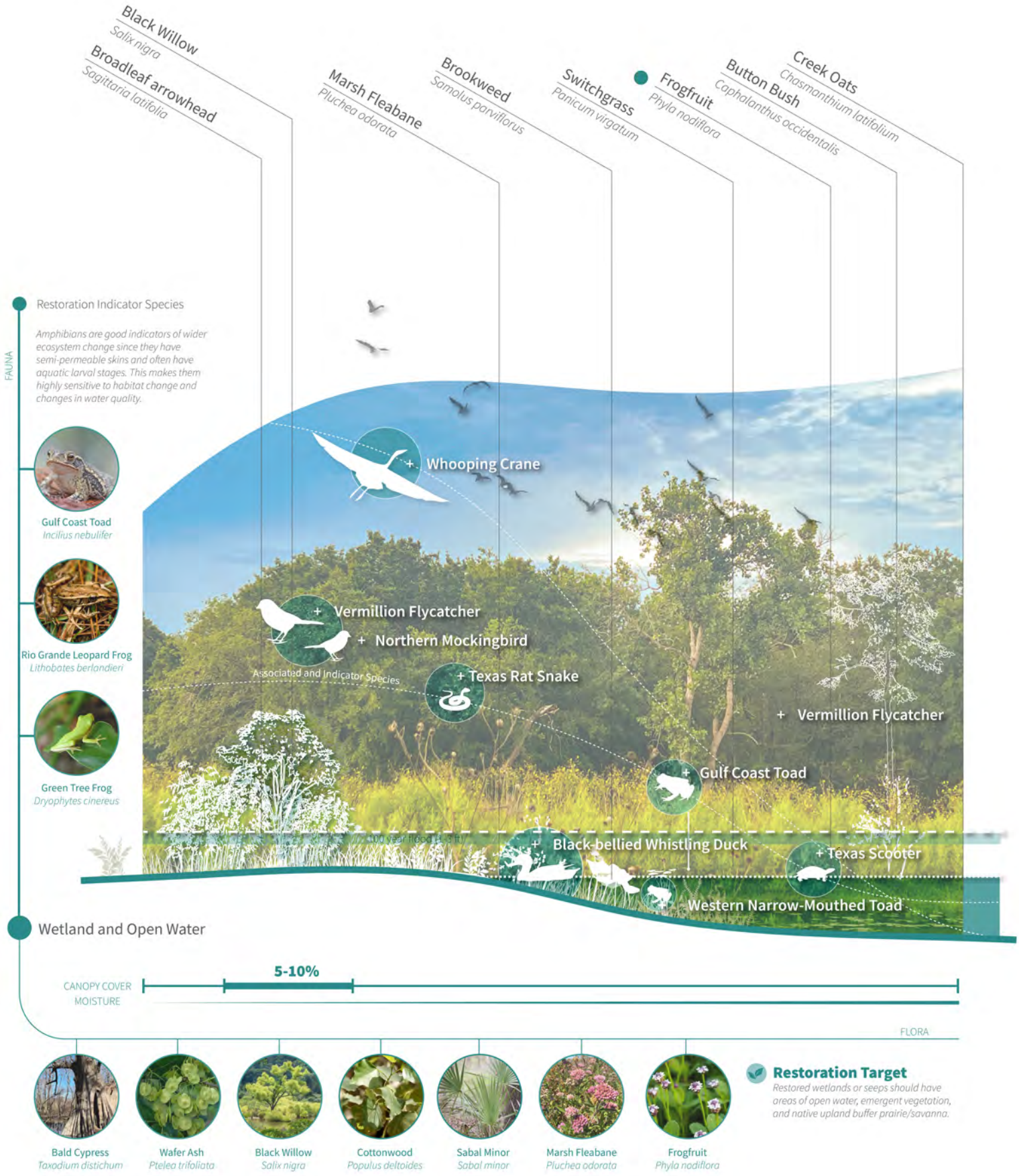
Restored wetlands or seeps should have areas of open water, emergent vegetation, and native upland buffer prairie/savanna.

4b Wetlands & Open Water

These areas—ponds and riparian wetland—support diverse wildlife, including amphibians, wading birds, and native wetland vegetation like cattails, rushes, and smartweed, and play a crucial role in water filtration and flood mitigation.

4 **Riparian**
4a Wet Meadows & Ephemeral Streams
4b Wetlands and Open Water
4c Floodplain Forest

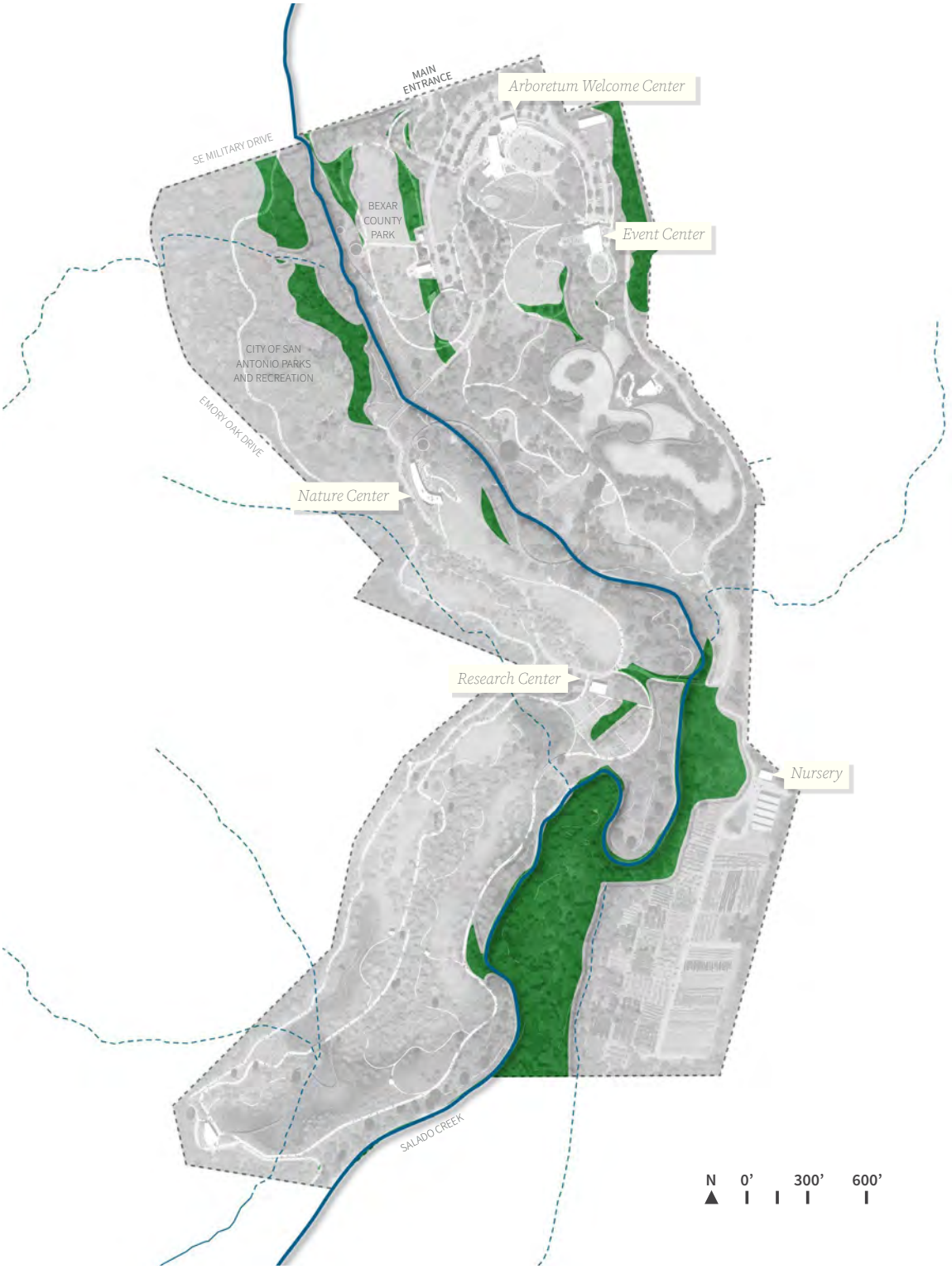


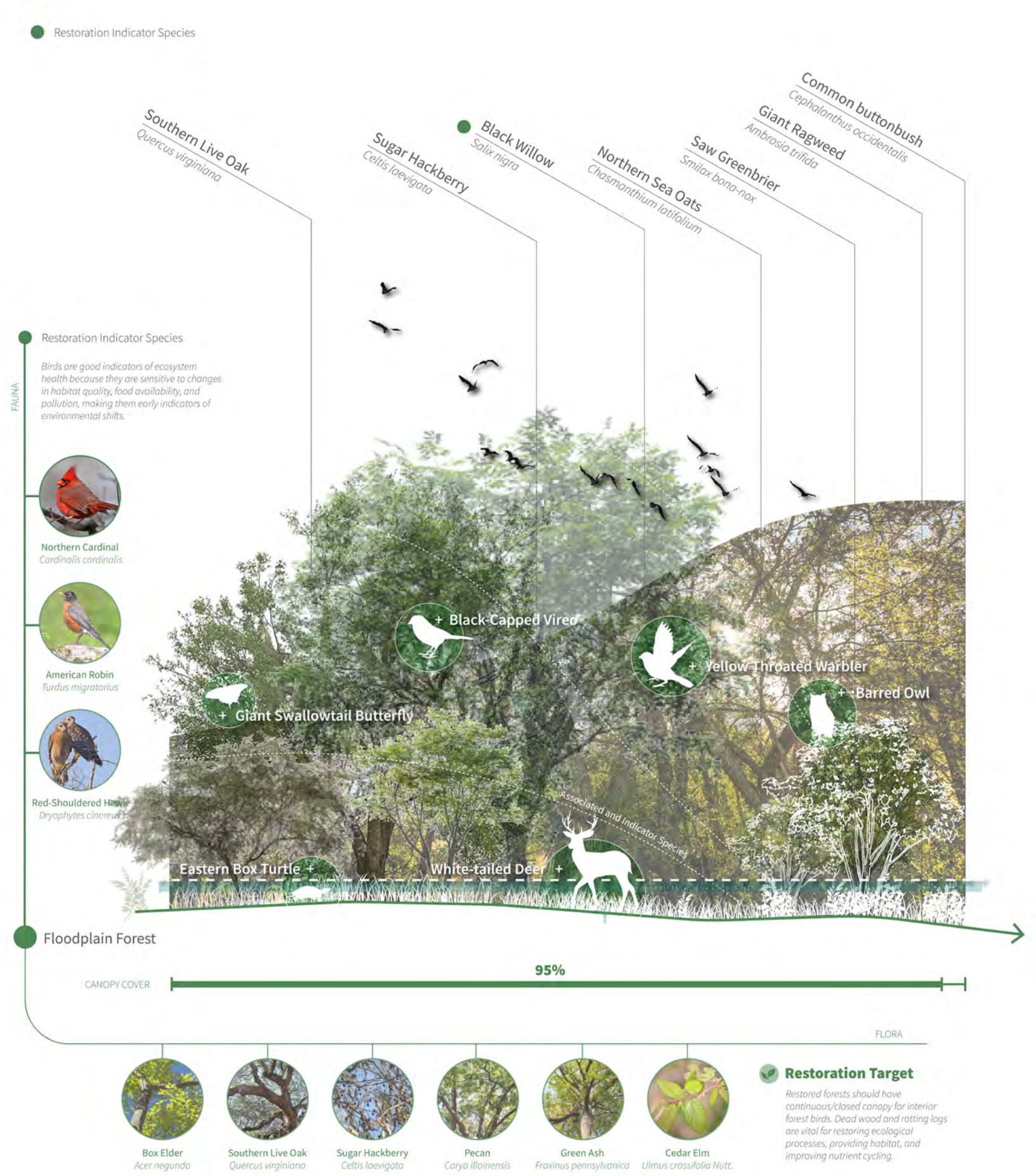

Black Willow
Salix nigra
Broadleaf arrowhead
Sagittaria latifolia
Marsh Fleabane
Pluchea odorata
Brookweed
Samolus parviflorus
Switchgrass
Panicum virgatum
Frogfruit
Phyla nodiflora
Button Bush
Cephalanthus occidentalis
Creek Oats
Chasmanthium latifolium
Restoration Indicator Species
Amphibians are good indicators of wider ecosystem change since they have semi-permeable skins and often have aquatic larval stages. This makes them highly sensitive to habitat change and changes in water quality.
FAUNA
Gulf Coast Toad
Incilius nebulifer
Rio Grande Leopard Frog
Lithobates berlandieri
Green Tree Frog
Dryophytes cinereus
+ Whooping Crane
+ Vermillion Flycatcher
+ Northern Mockingbird
Associated and Indicator Species
+ Texas Rat Snake
+ Vermillion Flycatcher
+ Gulf Coast Toad
100 year flood (1.5 ft)
+ Black-bellied Whistling Duck
+ Texas Scooter
Western Narrow-Mouthed Toad
Wetland and Open Water
CANOPY COVER
MOISTURE
5-10%
FLORA
Bald Cypress
Taxodium distichum
Wafer Ash
Ptelea trifoliata
Black Willow
Salix nigra
Cottonwood
Populus deltoides
Sabal Minor
Sabal minor
Marsh Fleabane
Pluchea odorata
Frogfruit
Phyla nodiflora
Restoration Target
Restored wetlands or seeps should have areas of open water, emergent vegetation, and native upland buffer prairie/savanna.

4c Floodplain Forest

These forests are dominated by species like cedar elm, pecan, and green ash, and provide critical habitat for migratory birds, mammals, and pollinators, while also helping to stabilize streambanks and manage floodwaters.

4 **Riparian**
4a Wet Meadows & Ephemeral Streams
4b Wetlands and Open Water
4c Floodplain Forest




Restoration Indicator Species
Southern Live Oak
Quercus virginiana
Sugar Hackberry
Celtis laevigata
Black Willow
Salix nigra
Northern Sea Oats
Chasmanthium latifolium
Saw Greenbrier
Smilax bona-nox
Giant Ragweed
Ambrosia trifida
Common buttonbush
Cephalanthus occidentalis
FAUNA
Restoration Indicator Species
Birds are good indicators of ecosystem health because they are sensitive to changes in habitat quality, food availability, and pollution, making them early indicators of environmental shifts.
Northern Cardinal
Cardinalis cardinalis
American Robin
Turdus migratorius
Red-Shouldered Hawk
Dryophytes cinereus
+ Black-Capped Vireo
+ Yellow-Throated Warbler
+ Barred Owl
+ Giant Swallowtail Butterfly
Associated and Indicator Species
Eastern Box Turtle +
White-tailed Deer +
100 year flood
Floodplain Forest
CANOPY COVER
95%
FLORA
Box Elder
Acer negundo
Southern Live Oak
Quercus virginiana
Sugar Hackberry
Celtis laevigata
Pecan
Carya illoinensis
Green Ash
Fraxinus pennsylvanica
Cedar Elm
Ulmus crassifolia Nutt.
Restoration Target
Restored forests should have continuous/closed canopy for interior forest birds. Dead wood and rotting logs are vital for restoring ecological processes, providing habitat, and improving nutrient cycling.

Monitoring

& Adaptive Management

ONGOING ASSESSMENT

Post habitat-installation monitoring is critical to the success of ecological restoration. It provides essential feedback, helps guide adaptive management, and ensures that restoration efforts achieve the desired ecological outcomes.

Monitoring is an important tool that is used to assess progress towards established restoration goals. Continuous monitoring helps identify issues such as invasive species encroachment, water quality degradation, or failures in vegetation growth. As restoration projects often face unforeseen challenges, monitoring provides real-time data that allows arboretum managers to adapt their strategies. For example, if a particular species is not thriving, adaptive management can be used to change the restoration approach or reintroduce missing components. The data collected can help managers understand long-term ecological trends and can inform future restoration projects at the arboretum. To the right are some suggested metrics of restoration success that could be monitored over a multi-year period.

- Increased area of high quality natural habitat (mapping, acres, floristic quality index).
- Increased structural/habitat diversity (visual, vegetation plots, mapping, canopy closure)
- Increased native plant diversity (plant surveys/ monitoring)
- Increased habitat connectivity (mapping of natural areas and connections)
- Increased wildlife species diversity, including pollinators (amphibian and reptile, bird, mammal, insect surveys/monitoring)
- Increased abundance of indicator species (surveys, monitoring)

Next Steps

FUTURE EFFORTS

- Rare species Inventory
- Invasive Species Inventory (% Cover, Target Species for Eradication, Priority Ranking)
- Mapping Invasive Species Locations and Extents
- Develop a process of identifying the species of highest priority for a management program
    - Reference Priority Invasive Species for South Texas
    - Priority should be assigned based on the potential effectiveness of the control effort
    - Species life histories
        - Response to fire
        - Reproduction
        - Growth
        - Longevity
    - Plant Strategies
    - Responses to disturbance
    - Changes in species distribution in time and space

- Establish specific management goals, objectives, and tolerance levels for invasive species
- Identification of principal approaches to the project.
- Big Idea: Early Detection. Rapid Response
- Partnerships with local high education institutions to establish student research programs and volunteer opportunities.