Plum Creek Wetlands Preserve
Master Development Plan

PLUM CREEK
Wetlands Preserve

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Photographer: Anna Prusaitis Ybarra

Photographer: Keneth Harvey

EASTERN PHOEBE

This Neotrpoical migratory songbird migrates through Texas and likes to use The Plum Creek Wetlands Preserve as a stop off point on its journey South.

Introduction

A

Photographer: Anna Prusaitis Ybarra

Introduction

The Plum Creek Wetlands Preserve (PCWP) is owned and managed by the Guadalupe-Blanco River Trust (GBRT). With over 20 years of conservation experience in the Guadalupe River watershed, GBRT aims to bring our conservation ethic to its roots by centering a community conservation program on the land itself. PCWP shall be a local hub for the whole community to experience conservation, education, recreation, and restoration. The Preserve is located near a growing city, Lockhart, and its wetlands serve as critical habitat that is uncharacteristic of the area. As the eventual centerpiece of our programming, PCWP demands a master plan vision that can emphasize elements of the property that are crucial to the Preserve's sustainability and prioritize those elements for the future growth of GBRT and PCWP. At its core, the Master Plan vision aims to reassert the primary assets of the Preserve and determine how to best balance restoring and maintaining habitat while meeting the potential as an outdoor education center. The vision provides PCWP's primary stewards, namely the GBRT staff and numerous volunteers, with an accurate assessment of the Preserve and a set of strategic recommendations that will enable the stewards to build a community space for future generations more effectively. This Plan is more than a master plan for the PCWP, it is the beginning of a new strategic direction for our organization. As such, working in partnership and collaboration with our current and future community partners, GBRT's implementation of this Plan will ensure sustainability of habitat and use of the property, organizational success and growth of a community.

Photographer: Anna Portraitist Ybarra

Mission: Conserving water resources by managing wetlands, protecting habitat, and promoting appreciation of the natural world.

Vision: Promoting conservation, sustainability, and appreciation for the natural world through compatible research, education, and low-impact recreation opportunities, while supporting the mission of the Guadalupe-Blanco River Trust.

Goal 1: Protect, maintain, and enhance the wetland, riparian and additional wildlife habitat on the property

Goal 2: Provide scientific and educational opportunities related to water, wildlife, and conservation

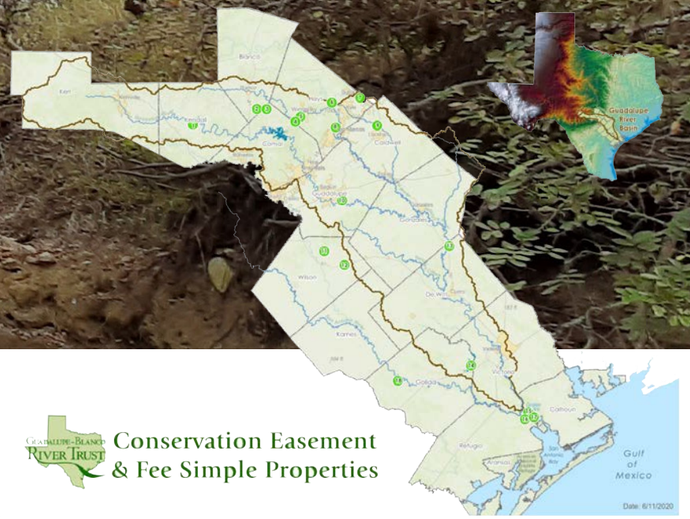
Goal 3: Provide appropriate outdoor recreational opportunities while protecting the conservation values of the property

Early Action Components

Vegetation management - historic overgrazing and flooding have created a need for habitat improvement, invasive species management and vegetative upkeep. Small-scale grassland and forest restoration has begun, and further management will allow for improved visitor experience and safety enhancement.

Trail improvements - Initial repair and consistent maintenance of at least two miles of trails will provide the opportunity for the public to access the site for hiking and biking.

Office and nature center - Infrastructure is needed for consistent property oversight and will increase public access and involvement, and more community opportunities.



Equipment and storage - Adding to the equipment cache and creating a place for storage will allow land managers and volunteers to have quick access to the tools and equipment necessary for restoration and maintenance.

Site Security - Installing or improving security fencing, gates, video and photo surveillance will help reduce trespass and liability, protecting equipment and infrastructure from theft or damage, and allow land managers to successfully implement all other early action.

Plan Elements

Community - Outreach through community-based engagement activities, opportunities and meeting spaces.

Land Management - Conserving and restoring habitat and water resources using best management practice techniques.

Research - Providing a living laboratory for research institutions, citizen science, and special projects centered on native landscapes, habitat and water quality.

Education - Individual and group study opportunities, including self-guided, instructor-led and special designed visits.

Recreation - Low impact community recreation for public and private enjoyment.

Key Terms

- **Floodplain -** An area of low-lying ground adjacent to a river, formed mainly of river sediments and subject to flooding.
- **Aquatic** - An aquatic plant or animal, especially one suitable for a pond or aquarium.
- **Emergent Wetlands** - A class of wetlands characterized by erect, rooted, herbaceous plants growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content, excluding mosses and lichens.
- **Permeable** - To flow over and away from a surface.
- **Stewardship** - The job of supervising or taking care of something, such as an organization or property.

Photographer: Anna Prusaitis Ibarra

The Guadalupe-Blanco River Trust:

The Guadalupe-Blanco River Trust (GBRT) is a 501(c)(3) nonprofit entity founded in 2001 to preserve the unique natural heritage of the Guadalupe watershed for future generations by protecting open landscapes, working farms, and ranches, and wildlife habitat through conservation easements, education, and outreach that connects people to the water and land."

GBRT is an accredited land trust, a charitable organization whose primary mission is land and water conservation. Land trusts actively work to conserve natural resources by land or conservation easement acquisition or by stewardship of such land or easements.

The accreditation standard is a mark of distinction in land conservation awarded to land trusts meeting the highest national standards for excellence and conservation performance.

GBRT serves an 18-County range from the Texas hill country to the Gulf of Mexico along the Guadalupe River watershed. GBRT has a passion for helping landowners, ranchers, and nature lovers protect their land for present and future generations. Conserving land in the watershed helps protect wildlife and vegetation in one of the most diverse rivers in the country. The Guadalupe River crosses four ecoregions, from the Edwards Plateau at its headwaters, through the Blackland Prairie and Post Oak Savannah, to the Gulf Coast Prairies and Marshes at its mouth. GBRT focuses on projects that will protect the health and quality of the River and its tributaries, including riparian corridors, wetlands, coastal habitat, working farms and ranches, and sensitive habitats or features. As a local land trust, GBRT works with willing landowners to establish perpetual conservation easements.

GBRT holds multiple conservation easements and owns two properties within the Guadalupe River watershed.

Site Description:

The Plum Creek Wetlands Preserve (PCWP) is located a few miles northeast of the City of Lockhart in Caldwell County, Texas. PCWP was initially built in 2008 by the Texas Department of Transportation (TXDOT) as compensatory mitigation when the State Highway 130 Toll Road (SH 130) was constructed in central Texas. The highway is a high-speed toll road system connecting San Antonio and Austin. In the early 2000s, TXDOT contracted Lone Star Infrastructure, a consortium of major highway construction contractors and civil engineering firms, to design and build the first section of SH 130. The construction caused degradation of approximately 20 acres by filling a wetland site elsewhere along the route with dredge materials. This required TXDOT and its contractors to offset those impacts through compensatory mitigation, or Permittee Required Mitigation (PRM), under Section 404 of the Federal Water Pollution Control Act Amendments of 1977 (Clean Water Act), which is overseen and enforced by the U.S. Army Corps of Engineers (USACE).

The mitigation process involved acquiring the property, engineering designs, mechanical alteration to hydrological function, and planting and preserving vegetation to recreate and enhance a bottom land range site. The project constructed or improved 24 separate ponds, wetland, and stream features.

When construction was complete in 2009, the PRM project went through a 5-year monitoring period. After those five years, the USACE determined the project met its goals of the 404 permit and was no longer required to be managed by TXDOT and its contractors. Through landscape design and hydrological restoration, TXDOT created a unique opportunity to observe a constructed habitat project in progress.

In 2014, following the compensatory mitigation activities, TXDOT donated the entire 265-acre site to GBRT, where it is now known as the Plum Creek Wetlands Preserve.

During the past eight years of GBRT management, the PCWP has developed into a keystone project, defining and demonstrating the work GBRT does to support its mission to preserve the Guadalupe River watershed and connect people to the water and the land.

This PCWP Master Plan provides a path forward to developing this unique environment that will improve area water quality and establish natural habitats, creating a world-class nature center that supports low-impact recreation.

Hydrology:

Two streams pass through PCWP on their way to the San Marcos River. The larger of the streams, Plum Creek, is historically an ephemeral stream that currently flows year-round due to the city of Kyle and others' treated wastewater outfall at its headwaters. Plum Creek is a 52-mile stream that begins in Hays County north of Kyle and flows southeast through Caldwell County, passing Lockhart and Luling before meeting the San Marcos River near the Caldwell-Gonzales County line. Creating a world-class nature center that supports low-impact recreation.

Surface water features on the Preserve include Plum Creek and six intermittent tributaries. The hydrology of the Preserve and the presence of planted wetlands decrease the movement of sediments and soil into Plum Creek. The 24 surface water features, including bio-retention basins, constructed on the property by TXDOT remain present. In a typical year, these depressions hold water and support hydroponic vegetation communities.

Federal Emergency Management Agency (FEMA) data shows that approximately 99% (264 acres) of PCWP is located within the 100-year floodplain. Some of the constructed bio-retention basins and water features will be periodically inundated by flooding. The wetland features support a substantial seed bank of beneficial vegetation. Water features and bio-retention basins are excellent attractants for terrestrial wildlife, wading birds, raptors, and waterfowl.

Habitat:

The property supports a diverse wildlife population. Constructed wetlands of varying sizes, depths and vegetation provide water and habitat for many terrestrial and aquatic species. Stream side forests, or riparian areas, protect migration and movement corridors.

Key Terms

- **Range Site** - The principal units of rangeland classification that are based on categorizing vegetation according to site potential.
- **Conservation Easement** - A voluntary, legal agreement that permanently limits uses of the land in order to protect its conservation values.
- **Ephemeral Stream** - Stream that forms after a rain.
- **Eco-Region** - A major ecosystem defined by distinctive geography and receiving uniform solar radiation and moisture.
- **Extraterritorial Jurisdiction (ETJ)** - The legal ability of a government to exercise authority beyond its normal boundaries.
- **Tributary** - A river or stream that flows into a larger river or lake.
- **Bio-Retention** - the process in which contaminants and sedimentation are removed from storm water runoff.

Existing Site Conditions:

The PCWP is mainly undeveloped, with the only man-made building being a restroom facility located at the entrance at the northeastern corner of the property. Roads traversing the property are two-track pasture roads maintained by regular use. One concrete bridge and several concrete low water crossings are present on-site.

Fences surrounding the property are primarily in good order, except for the area in the most active region of the floodplain that buffers HWY 183. Legal hunting on the property is encouraged to manage deer populations and remove feral hogs.

Bathrooms – The single building on site. The bathrooms are not in working order due to the water line being shut off after a leak beneath the foundation. This building is currently serving as on-site storage for GBRT equipment.

Trails – Approximately 5 miles of improved gravel trails and 3 miles of other trails currently exist on the Preserve in various states of usability. Trails have been maintained with mechanical shredding and use by staff.

Water Crossings - TXDOT created 16 low water crossings. Crossings consist of substantial concrete structures that are mainly in good condition. Occasional clearing of log jams following flood events is necessary.

Wetlands and surface water – 50 acres encompassing 24 separate features with an average size of 2 acres are present on the Preserve. Different types of surface water features consist of ten deep ponds, six emergent wetlands, four forested scrub wetlands, and four altered stream beds. These features were planted with various native plants beneficial to wetlands.

Riparian areas – 20 acres of riparian areas exist on the Preserve, chiefly buffering Plum Creek. Several riffles and runs make for a healthy riparian area. However, much erosion has created several cut banks at the more significant bends in the creek. Log jams are common after flood events.

Open Areas- Over 200 acres of range sites are mostly inundated with Bermuda grass, giant Ragweed, cocklebur, and Johnson grass, although soil sampling has shown that a healthy number of native Forbes and prairie grasses exist within the seed bank.

Forest Areas- 30 acres of forest areas provide a healthy over story of Cedar Elm and Sugar-berry. Invasive China-berry is scattered within the forest and riparian areas.

Invasive Species:

Non-native and invasive species are an increasing threat to most watersheds. At PCWP, many invasive woody species, such as China-berry, are present in considerable quantities. Additionally, herbaceous invasives such as giant Ragweed are great in number. This species tends to be very aggressive and can form dense populations that compete with desirable species and provide little protection for soil erosion. Giant Ragweed is the predominant weed problem on this property. In many areas, the species is nearly a mono-culture stand that out-competes the native grasses and other desirable species. Other exotic and/or invasive plant species identified are Johnson grass, coastal Bermuda, ligustrum, and in some cases, mesquite. Feral hogs are a significant invasive species problem and can negatively affect habitat in many ways.

Board of Directors

GBRT is guided by the leadership of a Board of Directors. The Board comprises members with backgrounds and interests in environmental-related fields. The passion this Board brings to the conservation of the Guadalupe River is immense and a significant asset. A strong board is the backbone of an organization, and GBRT is lucky to have the support of its Board. The GBRT Board supports this master plan and emphasizes the importance of the PCWP to the organization, the watershed, and a growing community.

Bill Blackwell, President

Oscar Fogle, Vice President

Denis R. Mueller, Treasurer

Wilfred Korth

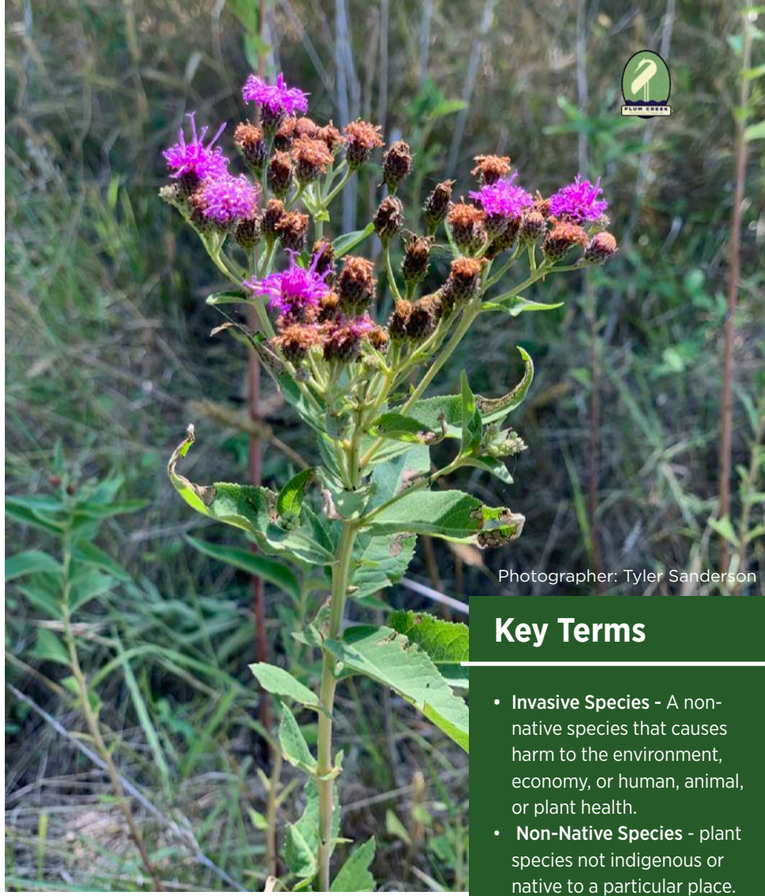
Ronnie Luster

Diane McMahon

John P. Schneider

Maggie Snow

Dr. Stephen Wilson



Photographer: Tyler Sanderson

Relevant Plans and Studies:

There have been many steps leading to the current state of the PCWP. Prior to the purchase and construction of the site by TXDOT, plans, studies, and designs were generated to ensure the property met all needs and objectives. After the acquisition, GBRT worked with community partners and stakeholders to ensure community outreach occurred. Participants in the outreach included: Association of Nature Center Administrators, Texas Parks and Wildlife Department, City of Lockhart, Caldwell County, Guadalupe-Blanco River Authority, TXDOT, John Bunker Sands Wetland Center, Texas State University, The University of Texas at San Antonio (UTSA), Austin Nature & Science Center, Plum Creek Conservation District, Plum Creek Watershed Partnership, Texas Master Naturalists, Texas Master Gardeners, Ducks Unlimited, and First Lockhart National Bank.

Following the outreach phase, preliminary assessments and reports were conducted.

Key Terms

- **Invasive Species -** A non-native species that causes harm to the environment, economy, or human, animal, or plant health.
- **Non-Native Species** - plant species not indigenous or native to a particular place.
- **Scrub-Shrub Wetland** - A class of wetlands dominated by woody vegetation less than six meters (20 feet) tall. The species include tree shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions.
- **Land Management** - The process of managing the use and development.
- **Low Impact Recreation** - recreational activities that are commonly unorganized and noncompetitive, including, but not limited to, picnicking, bird watching, kite flying, and walking.
- **High Flow Events** - Flow events that exceed the average base flow in a stream.

Detailed Compensatory Mitigation Plan

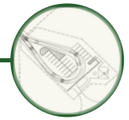
2003

As the permittee for wetland mitigation, **TXDOT** created a proposed plan to utilize the now PCWP as a mitigation site. The plan set goals and objectives, proposed the mitigation activities to include design, construction, hydrology, plantings, and it set performance standards.

Lone Star Infrastructure compiled a package for the property design, including site requirements, compliance, accessibility standards, safety, and other considerations.

Plum Creek Design Package

2007



Mitigation Construction Plans

2008

TXDOT released for construction the design package, or "As-Built." The plan includes all relevant surveys and designs for constructing roads and trails, low water and stream crossings, bridges, parking lot and entrance, bathrooms, bio-retention ponds, emergent wetlands, deep ponds, and other land alterations.

Upon acceptance of PCWP, the **GBRT board and Staff** created a concept summary for preliminary property use. The summary included management goals and outlined the top three priorities for GBRT's use of PCWP.

Project Concept Summary

2014

This report identified and addressed the immediate needs of the PCWP. During this review, the **ANCA Peer Consult Team** identified vital areas where GBRT needed input, surveyed community stakeholders, and interviewed Staff, Board, and partners. The report provided recommendations, considerations, and observations for the development of a nature center at PCWP and outlined the process of creating a nature center.

Peer Consultation: Association of the Nature Center Administrators

2016

A **Texas State University MBA Capstone team** created a marketing report. The analysis focused on internal and external resources, potential partnerships, target stakeholders, market research and data, brand and marketing strategies, and alternatives. **Adams Environmental, Inc.** Developed a Land Management Plan. The plan provides site maps, natural site attributes, recommendations for natural resource management procedures, and a land monitoring plan.

Marketing Planning Report & Land Management Plan

2020

Engineering/Architectural

2021

A **UTSA Design-Build architecture class** created student-led site development plans for the desired infrastructure at PCWP. A final "master plan" project laid out designs and concept imagery for large-scale development of PCWP, including buildings, trails, and other community nature center needs.

Photographer: Anna Prusaitis Ybarra

Photographer: Tyler Sanderson

City of Lockhart & Surrounding Communities

The location of PCWP carries several advantages and disadvantages. Overall, the site is in an optimal location, and if GBRT plans accordingly, there is considerable market potential and an excellent opportunity for site usage.

PCWP is within the City of Lockhart's limits and ETJ. Lockhart is in central Texas, approximately 30 miles from Austin and 60 miles from San Antonio, TX, and is the County seat for Caldwell County. Lockhart has seen steady growth in population and development and an annual population growth rate of 1.4% (2020 U.S. Census). Current trends expect an even more significant influx of people to the community in future years. Lockhart's proximity to major and minor urban centers, including rapid growth along highway corridors, has made it a prime location for continued sprawl. Businesses, particularly high-tech and small business startups, have increased in recent years. While these businesses are located mainly to the east and north of Lockhart, within the metro area, substantial growth of suburbs and retail services is realized throughout the region. This is reflected in Caldwell County's phenomenal 32% job growth rate between 2008 and 2018, where approximately 2000 new jobs were created.

Race and origin demographics in the region fluctuate significantly based on location. According to the United States Census Bureau, approximately 53.8% of Caldwell County residents are of Hispanic or Latino origin, 38.2% are white, 6.6% are African American, 1.6% are American Indian, and 1% are Asian.

The area is rich in opportunities for several significant educational partnerships to promote the PCWP research and education objectives. In Caldwell County alone, there are 16 primary schools serving five distinct communities. However, GBRT can seek to gain interest and visitors from the six counties neighboring Caldwell County. These counties offer 305 thousand students at 425 different schools. Lockhart ISD has 6,140 students. 68% were considered "at-risk" of dropping out of school, and 71% of students were considered economically disadvantaged. In addition, the Preserve is in proximity to 20 higher education institutions, 12 universities and colleges, and eight two-year colleges. This well-educated population provides PCWP a fundamental level of access to supportive resources where countless educational partnerships are possible.

Key Terms

- **Climax Community** - An ecological community in which populations of plants or animals remain stable and exist in balance with each other and their environment
- **High Flow Events** - Flow events that exceed the average base flow in a stream.
- **Hydrological Function** - As applied to streams and rivers, the balance of water inflows to the basin with outflows from the basin.
- **Log and Debris Jams** - A crowded mass of logs blocking a river.
- **Terrestrial** - A land based community of organisms and the interactions of biotic and a biotic components in a given area.

Photographer: Carlos Fiol

Caldwell County does not have many public spaces for outdoor recreation. Public parks of every type are in high demand throughout the state. The limited lands available for public use are being adversely impacted from the high numbers of visitors. Additionally, these already overcrowded parks do not provide many opportunities for research and education because of their recreational focus. This includes a lack of local resources that provide essential research, education, and recreation outlets. Studies have shown that exposure to the natural world improves health, attention and focus, self-esteem, and general well-being, and PCWP aims to address this.

SURROUNDING SCHOOL CENSUS 2021

County Name	Schools	Students
Bastrop	25	15,794
Caldwell	16	7,964
Comal	41	26,019
Guadalupe	42	28,170
Hays	55	38,446
Travis	296	188,789
Total	**475**	**305,182**

The current location of the Preserve could be considered rural, in a predominantly rural and agricultural centered town. However, expected growth will likely change the surroundings. It can be anticipated that PCWP will be an urban nature preserve within the next several decades, and PCWP would need to address this in the future. The design and construction process for the Marion ISD projects can be broken down into seven distinct parts, each consisting of objectives and finite deliverables.

PCWP MASTER PLANNING COMMITTEE MEETINGS

A Master Planning Committee was assembled to bring community members with various targeted experiences into the planning process. GBRT sought to convene a group of individuals with relevant and diverse backgrounds to help create a logical vision for PCWP.

The committee process included four meetings held from June through October 2021. Utilizing the committee members' individual experiences and perceptions of the Preserve, meetings, and discussions provided a solid basis for establishing the Mission and Vision for the PCWP. The Committee's efforts resulted in the foundation for major objectives, a site plan, future activities, a timeline, funding needs, and the processes associated with implementing this plan.

Committee Meeting 1: Introduction to Planning Process - June 2021

Introduction of committee members, the Committee's purpose, and the master planning process. The meeting introduced the primary goals for the PCWP and GBRT's vision for the future.

Committee Meeting 2: Site Tour - July 2021

Site tour. A caravan tour of PCWP with seven stops at points of interest. Committee members observed the landscape on the drive and identified opportunities and areas of concern. At the stops, the Committee discussed those opportunities and concerns, visualized the potential for development, and had a round table discussion. Following the tour, members met for further discussion and set priorities for the initial site development phase.

Committee Meeting 3: Envisioning the Future - August 2021

Informal brainstorming. This meeting identified key stakeholders and stakeholder groups, determined allowable activities and use, set priorities for implementing actions, and discussed public access. The meeting was followed by an independent on-line survey to develop the final activities.

Committee Meeting 4: Setting Priorities - September 2021

The final meeting before drafting the master plan. PCWP Objectives were finalized, phases for implementation and construction were discussed and later established, and a proposed Site Plan was mapped.

PCWP PLANNING COMMITTEE

Name	Title	Organization
Jason Biemer	Plum Creek Watershed Partnership Member/Master Naturalist	Lost Pines Master Naturalist / Plum Creek Partnership
Virginia Condie	Executive Director	San Marcos River Foundation
John DeFillipo	Director	John Bunker Sands Wetland Center
Oscar Fogle	Respected Area Rancher	Oak Hill Ranch
Joann Garza-Mayberry	Texas Game Warden V	Texas Parks and Wildlife Department
Sangchul Hwang	Associate Professor Ph. D. Civil Engineering	Ingram School of Engineering Texas State University
Wilfred Coleto	Retired Chief Ranger	Colero Creek Park
Christina Lopez	Watershed Coordinator	Plum Creek Watershed Partnership
Cinde Thomas-Jimenez	Environmental Education Administrator	Guadalupe-Blanco River Authority (GBRA)
Joshua Tuck	Rivers, Trails, & Conservation Assistance Program	National Park Service
Tyler Sanderson	Executive Director	PCWP/GBRT
Stephen Risinger	Conservation & Stewardship Director	PCWP/GBRT

GREAT BLUE HERON

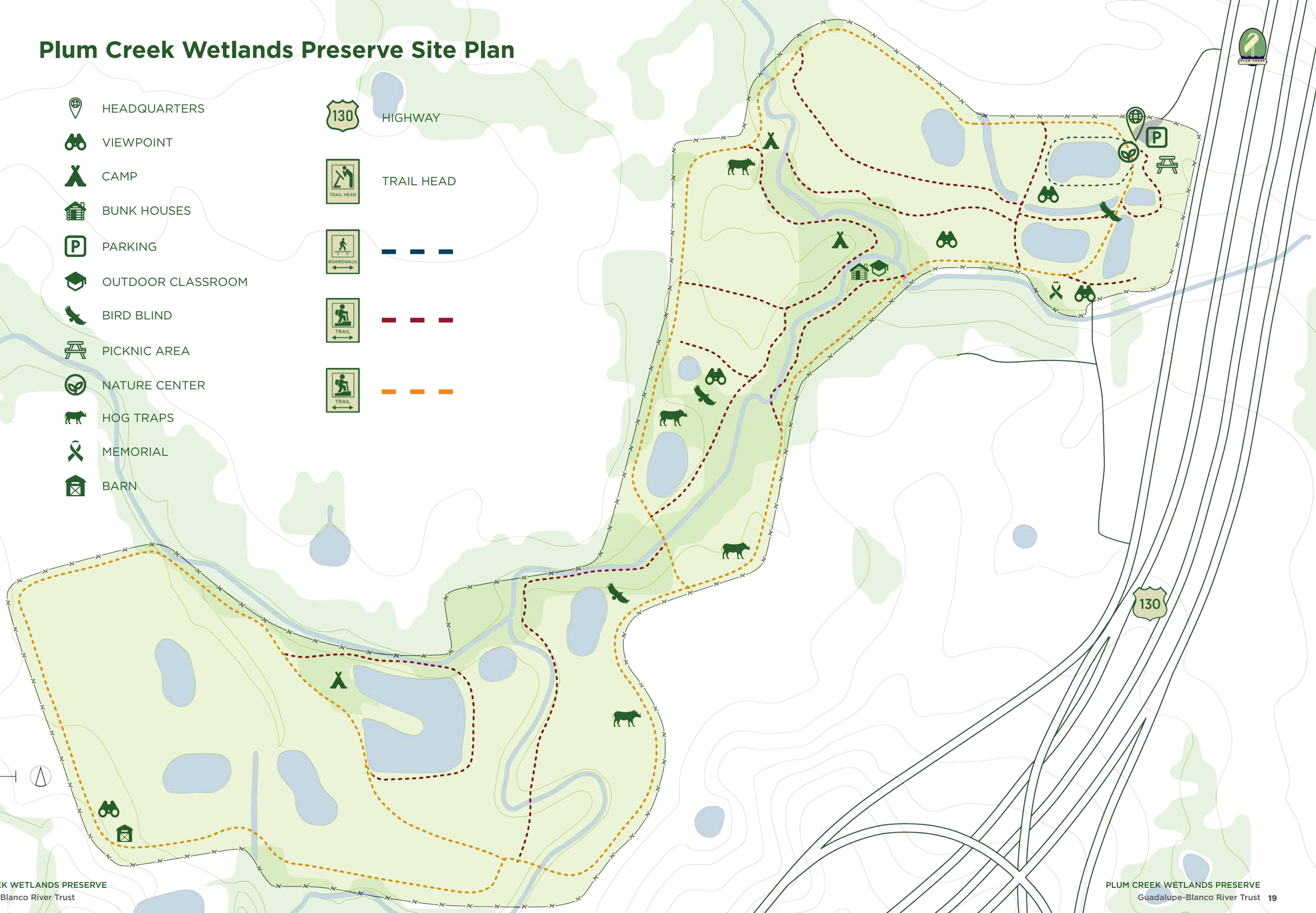
This large, wading waterfowl nests in forest canopies and feeds on fish, amphibians and crayfish, making PCWP's shallow wetlands the perfect place to call home.

Photographer: Carlos Fiol

Plum Creek Wetlands Preserve Site Plan

- HEADQUARTERS
- VIEWPOINT
- CAMP
- BUNK HOUSES
- PARKING
- OUTDOOR CLASSROOM
- BIRD BLIND
- PICKNIC AREA
- NATURE CENTER
- HOG TRAPS
- MEMORIAL
- BARN

- HIGHWAY
- TRAIL HEAD
- BOARDWALK
- TRAIL
- TRAIL



MISSION

Conserving water resources by managing wetlands, protecting habitat, and promoting appreciation of the natural world.

To elaborate on the mission, the primary goals and vision represent a foundation for the Objectives as established and confirmed by the Master Planning Committee. The goals serve as the basis for all decisions and actions related to implementing the master plan and future development of the site.

VISION

Promoting conservation, sustainability, and appreciation for the natural world through compatible research, education, and low-impact recreation opportunities, while supporting the mission of the Guadalupe-Blanco River Trust.

Goal 1: Protect, maintain, and enhance the wetland, riparian and additional wildlife habitat on the property

Goal 2: Provide scientific and educational opportunities related to water, wildlife, and conservation

Goal 3: Provide appropriate outdoor recreational opportunities while protecting the conservation values of the property

Photographer: Anna Prusaitis Ybarra

OBJECTIVES

Four major objectives will support the mission, goals, and vision of PCWP.

Objective 1: Water Quality and Habitat Preservation

The Preserve's landscape is its most important asset. The truth of this heavily influenced the master planning process. When outlining the main objectives for the Preserve, the Committee emphasized the importance of retaining the natural and man-made beauty while managing to enhance habitat and water quality. If there is no other action at PCWP, it must at least fulfill this primary objective. Implementation is described in this plan's Landscape and Ecology Recommendation section. Both vegetation management and hydrological function are of parallel importance.

Audience: Volunteers, contractors, researchers, donors.

Objective 2: Research

Providing an adequate venue for relevant research programs. Creating partnerships for specific research projects and serving as a collaborating partner. Research activities will drive and stimulate other preserve uses and activities, especially involving Objective 1.

Photographer: Anna Prusaitis Ybarra

Photographer: Stephen Risinger

Objective 3: Education

Providing engaging and interactive learning opportunities. Working with partners to offer school field trips that meet the Texas Essential Knowledge and Skills (TEKS) standards. Contributing to advanced training, workshops, and other group education such as Scouts, arborists, native plant society, area hunters, land managers, and others. Offering educational components to all activities, including interpretive signage, demonstration, and self-guided learning.

Audience: Public schools, private and charter schools, Montessori schools, home school groups, universities, scout groups, church groups, other community groups, volunteer organizations (e.g., Master Naturalist, Master Gardener, Native Plant Society, Kiwanis, etc.), Plum Creek Watershed Partnership, Guadalupe-Blanco River Authority, Texas Parks and Wildlife Department.

Objective 4: Recreation

Providing recreation facilities to support a range of programmed and self-directed activities. Offering compatible recreational uses that are sensitive to natural resources and emphasize the importance of environmental awareness, open space advocacy, and stewardship. This objective postulates that various safe and accessible outdoor recreation opportunities can build on the Preserves' goals for conservation and education.

Audience: Hikers, walkers, silent reflection, photographers, birders, botanical enthusiasts, technology explorers (geocachers, drones, etc.), Picnicking, day-trippers, group reservations.

Photographer: Tyler Sanderson

Site Plan

The Site Plan represents the sum of the master planning process, a graphic representation of what was put forth by the Committee to best enhance what makes PCWP such a unique asset to both Lockhart and the larger region. The Site Plan has evolved over approximately six months through meetings, stakeholder interviews and conversations, numerous site visits, and time spent by the planning committee to process all this input and identify common interests. The planning process took very seriously the principal goal of developing a plan for the Preserve that would allow it to be sustained for future generations and implemented over time.

Landscape and Ecology Recommendations

The foremost objective of PCWP is water quality and habitat preservation. To meet this objective, land management must be a priority. A current (5-year) land management plan will be followed and continuously assessed and updated as needed based on the current needs. Management concerns are reasonably straightforward: continued bank erosion, recurrent flooding, invasive species, degraded habitat, and water quality concerns. The Landscape & Ecology recommendations address these concerns, and their practical implementation is vital to the long-term sustainability of the Preserve. A broad goal of the Master Plan is to ensure landscape and ecology treatments communicate a clear transition from the passive management approach that was relied upon since inheriting the site from TXDOT.

Key Terms

- **ADA** - Americans with Disabilities Act.
- **Base Flow** - The portion of the stream flow that is sustained between precipitation events, fed to streams by delayed pathways.
- Hydrological Structures - Structures installed in natural or man-made waterways to impound, direct, control, or measure the flow of water.
- **Bioswales** - Channels designed to concentrate and convey storm water runoff while removing debris and pollution.
- **Buffer Strips** - vegetation that traps sediment, and enhance filtration of nutrients and pesticides by slowing down surface runoff that could enter the local surface waters.
- Runoff - Flow over and away from a surface.

Community Opportunities and Programming Recommendations

Programs will be the driver of public support and engagement at PCWP. GBRT must utilize these programs to grow its mission, outreach, and support.

- Based on the Objectives presented in the plan, and GBRT's mission, every human activity at PCWP should have educational components. Educational signage, demonstration, revolving, static displays, and self-guided hikes are examples of passive education. Once in place, these examples would be a come-as-you-go opportunity for all visitors.
- PCWP should have a targeted effort to host field trips for many ages. GBRT intends to work with partners to provide school field trips that meet the Texas Essential Knowledge and Skills (TEKS) standards. GBRT should offer an educational tool cache for teacher-led instruction as capacity grows, including lesson plans and materials. Nearby Lockhart State Park has a current field trip program for Lockhart Independent School District 5th graders. Building on that program, partnering with the program coordinator, GBRA, and using such programs as a model for future field trip programs will be worthwhile. Other public, private, and home- schools should be engaged as well. In addition, training, demonstrations, and workshops should be hosted throughout the year. These trainings can range from vignettes during small events to multi-day seminars and include groups such as master naturalists, scouts, arborists, native plant society, and area hunters.
- The publicly accessible section of PCWP can offer passive recreation, including hiking, bird watching, photography, picnicking, and a playground . Special event programs should be implemented to promote these opportunities offered to the public. GBRT-hosted events may include volunteer plantings, creek clean-ups, special fundraising, guided hikes, field-to-table dinners, and other events. There are also opportunities for private events, appointments, and rentals that can utilize rental spaces such as the outdoor classroom, meeting rooms, cabins, campsites, permitted site access, and possibly even weddings.

The current programming is focused on land management and restoration. In 2020, GBRT initiated an event called Re-Leaf. The program started as a volunteer tree planting event in November. Thanks to foundation grant funding, PCWP now offers Re-Leaf volunteer opportunities

Photographer: Anna Prusaitis Ybarra

Plum Creek Re-Leaf is an annual volunteer effort to restore PCWP by planting native trees, shrubs, and grasses

Throughout the year. There will be a bi-annual community-wide planting event; the spring event will plant grass plugs in range sites, and the fall event will plant tree seedlings within riparian buffers. Throughout the year, smaller, special group-focused events will occur. Those events may focus on planting more prairie or tree species, planting and transplanting wetland species, prescribed burning, removing invasive species, or data collection. Additionally, these events may include educational opportunities.

Future planning should include staffing additions to support these programs. A programming coordinator, volunteer coordinator, and education staff would ensure well-run activities. In addition, a PCWP membership program would engage community members and volunteers to take a sense of commitment to PCWP. GBRT may offer members special access days or activities, including other benefits.

As the Lockhart community develops and grows in the future, the PCWP is expected to become a more urban nature center; it should be anticipated that the upland areas surrounding the Preserve will become developed with either residential, industrial, or other impervious construction. PCWP was designed to collect storm water runoff, hold back on-site floodwaters, and slowly release storm water inputs into Plum Creek. While development around the boundaries is not an ideal scenario for a nature preserve, PCWP infrastructure is designed to handle excess storm water and should be used as a demonstration site for how storm water management can be achieved.

AMENITIES RECOMMENDATIONS

A Nature Center, bunkhouses, various forms of signage, a nature scape, and other low-impact recreation fixtures are all elements that comprise the desired amenities for the Preserve. Paying close attention to installing our amenities with great care will define the preserve experience; durable and well-placed site furnishings can improve the look of the Preserve, accommodate gatherings efficiently, and minimize negative impacts on the landscape. Since the site is almost entirely in the 100-year floodplain, all amenities will be elevated or constructed to withstand flood events.

The recommendations aim to improve the amenities within the Preserve in strategic ways that can be implemented over time as funding is available.

LOW IMPACT DESIGN AND GREEN INFRASTRUCTURE

Low impact design (LID) refers to systems and practices that replicate natural processes during the planning and construction of amenities. LID principles will be used in the planning and implementation of all added amenities in order to conserve the natural space, minimize development impacts, integrate storm water protection, and implement pollution prevention, proper maintenance, and public education programs. Examples of these practices include rainwater harvesting, permeable pavement, rain gardens, bioswales, and vegetated buffer strips.

Green Infrastructure design techniques will improve the energy and resource efficiency of the planned amenities by utilizing renewable resources, reducing energy consumption, and using local and sustainable materials.

FRONT ENTRANCE PARKING

First impressions are essential as visitors enter PCWP. An entrance gate offers site security and sets the tone for guests' expectations during their visit. Upon entering the gate, guests will find themselves in the parking lot, where perimeter parking spaces should be expanded off the current pavement using LID permeability principles , accommodating up to 30 vehicles, including a bus turnaround. Disabled parking should be designated immediately adjacent to a ramp and boardwalk, which would lead guests up to the central nature center building and trail-head kiosk. Overflow parking can be provided by staging vehicles along the grass shoulder of the main entrance road. A parking island could be the center of the lot, outfitted with a welcome sign, property map, site use rules, and native vegetation.

Conceptual entrance render: LPA Design Studios

Headquarters

Upon parking, guests should enter the designated public use area up the boardwalk ramp to the nature center and viewing deck. ADA access is available via this boardwalk ramp, taking visitors one story above ground level to the PCWP headquarters. A large viewing deck should connect an office building, restroom facilities, a nature center, and open-air exhibits. All headquarter structures should be similarly designed to fit the landscape of PCWP. Primary infrastructure currently in place includes a 200 amp electrical panel, city water connection, a septic system, security lighting, and a decommissioned restroom structure, which may be retrofitted for a shower house..

Nature Center

A large single-room facility should be designed to blend into the landscape and incorporate extensive window views, focusing attention on the natural area below. This facility would have rotating exhibits, a site history, and refreshments . As the first stop for guests, the nature center is the central location for information, safety, and congregation. The nature center could be available for public use during open days and hours. The facility could be available for rent or by appointment when PCWP is closed to the public.

Restrooms

Due to the location in the floodplain and the distance from a municipal sewage line, the best option for restroom facilities will be composting toilets, which are a type of dry toilet that treats human waste by a biological process. These toilets do not require a connection to septic tanks or sewer systems, and composting technology has advanced for simple user interface, maintenance, and odors. The restroom facilities should be elevated with the nature center and could be separated into single-stall, unisex rooms. Hand-washing sinks should connect to an in-place septic system, retrofitted for gray water sources, including sinks, showers, and drinking fountains. Gray water refers to domestic wastewater without fecal contamination, therefore fewer pathogens and safe for on-site treatment.

Work by: Roxana Colocho - UTSA School of Architecture & Planning

Work by: Chase Conn - UTSA School of Architecture & Planning

Office

Once constructed, GBRT staff will be permanently housed at the PCWP headquarters. Building offices on-site will allow GBRT to manage and oversee the development of PCWP and keep the designated public use area open during business hours. Elevated with the nature center and restrooms, the office building could include staff offices, a break room and kitchenette, and a small board room.

Wet Lab

Connected to the office should be a single room, combined classroom and lab space. The lab's primary purpose would be to offer a space for researchers and educators to conduct instruction and laboratory sampling procedures. The lab should be outfitted with workbenches, sinks, a refrigerator not for food use, and other lab equipment as needed by researchers. The wet lab can serve as a classroom for field trips and classes and can be rented by appointment.

Trail-head

As visitors leave the nature center and step out to the viewing deck, they should be greeted by a trail-head kiosk and open-air exhibits. The kiosk should provide important information, including rules and regulations, safety procedures, trail maps, and general directions to guests. The trail should commence at the kiosk and continue to a long boardwalk that extends throughout portions of the property.

Picnic Area and Playground

The current entrance road to PCWP is already being used as a stopping point for commuters along the main highway. Cars have been observed stopping at the gate for a quick roadside restroom or snack. When open for public access, GBRT anticipates PCWP as a roadside park or rest area to be used by many. To accommodate these visitors and protect the integrity of the natural space, a small picnic area and playground should be made available. This area should be inside the parking area fencing, funneling visitors who only wish to stop for a bite into a controlled area, directing them through the nature center to enter the public use area. These amenities must be constructed to withstand flooding and other natural elements, minimize maintenance, and include natural play features to encourage nature-based exploration.

Outdoor Classroom

An open-air, single-room classroom should be located just outside of the designated public use area across the private bridge traversing Plum Creek. A tree canopy walk should connect the bridge to the classroom, providing a unique view of the riparian area. The classroom could be available by appointment or be rented for a particular use. The screened-in, elevated room would offer a primitive learning opportunity among the canopy, while ground level could be utilized for shaded gathering space too.

Bunk Houses

Just upstream from the outdoor classroom should be a series of elevated bunkhouse cabins. Bunkhouses should be rustic and primitive and could be used as a space for group rentals such as scouts or youth groups or be rented individually for a primitive camping experience. The cabins should be connected by an elevated deck platform, providing a covered, ground-level camp area below. In addition, these cabins should be used for sleeping quarters for youth conservation corps as they assist in trail construction and maintenance.

Trails, Paths, and Roads

An approximately 2-mile, eight-foot-wide earthen trail system exists throughout PCWP . In addition, about 3 miles of improved, ten ft. wide road paths with limestone gravel road base exist and are used as vehicular access for site maintenance. These trails should be enhanced with corridor maintenance, re-cutting tread, and connected with

additional narrow, single-use trails. Current trails meander throughout the property, allowing hikers to experience many view sheds. Vehicular traffic should be restricted to site maintenance activities and allowance of special group access, including access to the outdoor classroom and bunkhouses. New and existing trails should be constructed and enhanced by a youth conservation corps.

Boardwalks

A boardwalk should begin at the nature center and kiosk, providing an elevated, ADA accessible trail experience that crosses a shallow pond and runs parallel to one of the constructed wetlands. The initially planned boardwalk would be approximately ½ mile out and back, constructed to withstand flooding and the elements, and built to accessibility standards. It should include widened tread spaced along the path for group gatherings, rest spots, and observation decks. Future boardwalk sections may be added as funding and need arises.

Bird Blinds

LPA reviews and coordinates all shop drawings, RFIs and other field directives with all affected disciplines before issuing a response to the field. At the same time, we coordinate documents requiring Marion ISD's input and approval. We take observed field conditions into account, as we provide appropriate, coordinated, and timely documentation to the field.

Shade Structures

Much of PCWP's trail system is in direct sun. Shade structures would provide hikers relief from the hot Texas sun as they meander through the system. Structures should be located strategically along the trails and incorporated into bird blinds and boardwalks.

Fencing

Boundary and security fencing is necessary for providing safety and security of the site. Clearly marked boundaries and sound fencing will reduce the threat of trespass onto the property and keep visitors within the limits of the Preserve. Boundary fencing should be mended and constructed around the perimeter and should be built with materials that will withstand flooding events or be cost-effective and straightforward to fix after such events.

Benches

Benches should be placed along with the trail and boardwalk system, providing places to rest and hydrate. Benches must be flood-proof and made of durable materials.

Signage

Directional and educational signage is key to a visitor's experience. Directional signage assists hikers while they navigate the trail system. Interpretive signage should be placed along the trails, featuring wildlife and vegetation native to the area, low-impact design techniques incorporated into construction activities, and education about wetlands, creeks, and watersheds. This type of signage also provides public users with self-guided hikes.

Memorial Arboretum

A 1-acre memorial arboretum site is in place adjacent to the historic County Road 20 steel truss bridge. Loved ones can plant and dedicate a tree in memory or honor someone special. Memorial trees should be chosen from a list of species native to the Plum Creek watershed and be outfitted with a placard. As it grows, visitors can access the arboretum by a short hike and rest on benches near the creek. The goal is to provide a place for loved ones to visit and reflect in a secluded, peaceful spot.

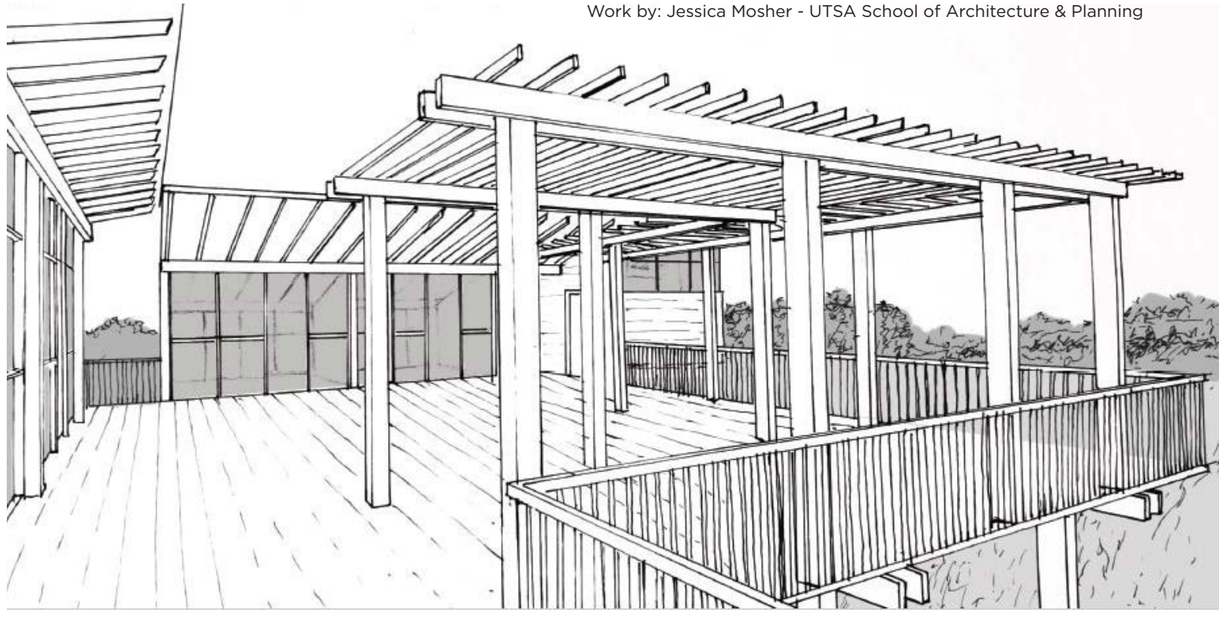
Barn

A maintenance barn is critical for the management of PCWP. Equipment and materials must be stored on-site, secure, and out of the floodplain. A small storage barn would house a future tractor and implements, all-terrain vehicles, trail tools, equipment, and other materials. The barn should be located on the 1-acre site out of the 100-year floodplain on the backside of PCWP. This will ensure secure, flood-safe storage. The barn should be retrofitted with rainwater harvesting and other LID principles and may be used for shaded group gatherings.

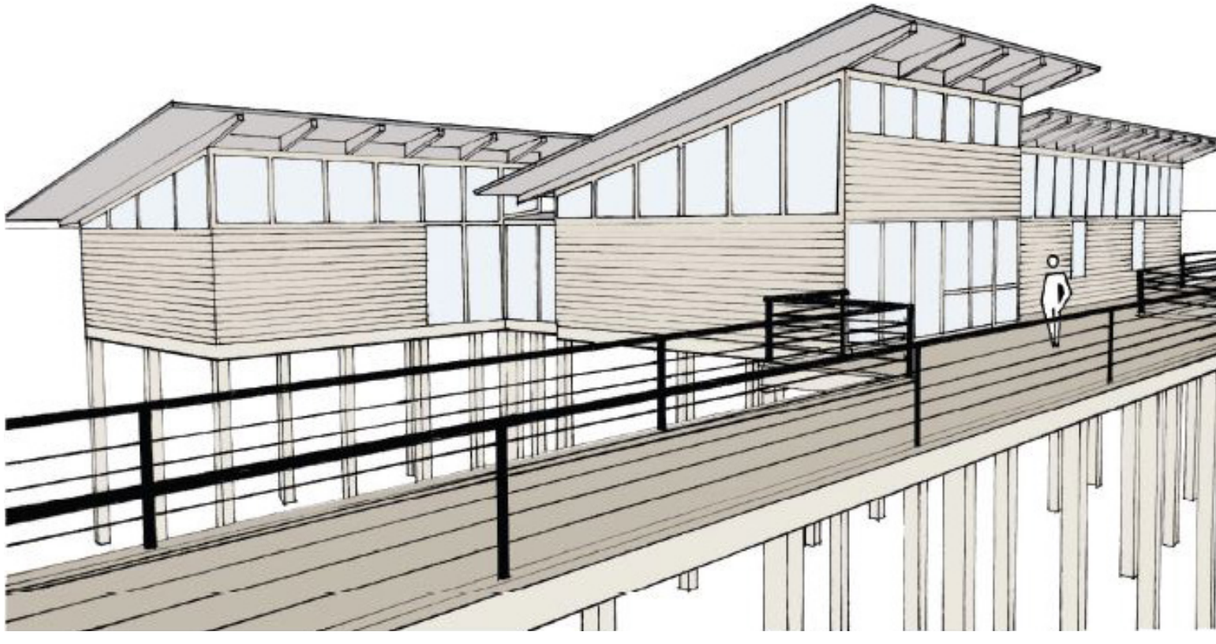
Viewing Tower & Viewpoints

A viewing tower with an observation deck would provide special access to users with 360-degree views of the Plum Creek valley. The tower would serve as a destination for group hikes and may be used for instruction, observation, and other activities.

Work by: Jessica Mosher - UTSA School of Architecture & Planning



Work by: Emma Schnelle - UTSA School of Architecture & Planning

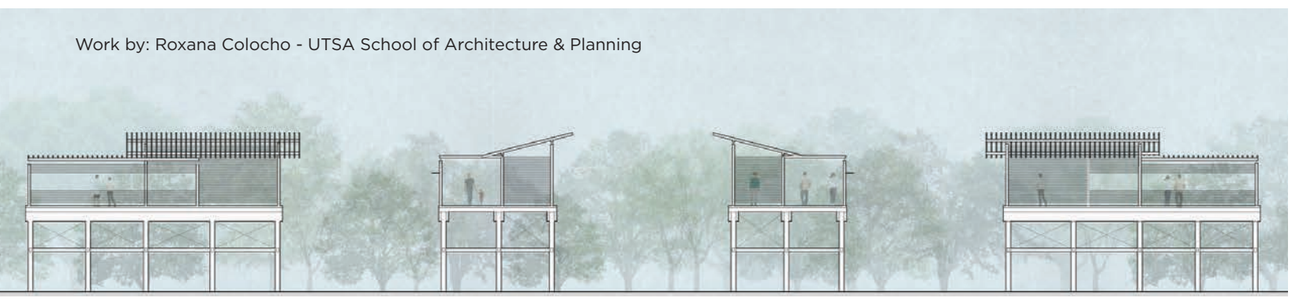


SPECKLED KING SNAKE

This nonvenomous critter prefers wetter habitats than other king snakes, often being found in the wetlands and streams of the PCWP.

Photographer: Carlos Fiol

Work by: Roxana Colocho - UTSA School of Architecture & Planning



Work by: Roxana Colocho - UTSA School of Architecture & Planning

Implementation

Given the cost and complexity of many of the proposed recommendations, implementation of the Plum Creek Wetlands Preserve Master Plan relies on a phasing strategy that prioritizes projects that can be implemented over time and that align with various partnerships and funding opportunities as they materialize. As with any master planning effort, there is a need to maintain interest and momentum over time. Implementing short-term goals is essential to meeting the intermediate and long-term goals. Using an iterative approach, the implementation should involve building, refining, and improving a project, while improving partnership opportunities, until the desired result is achieved.

Phasing Strategy

Implementation of the Master Plan depends on a Phasing Strategy for the proposed recommendations that prioritize those projects which are seen to be the most straightforward to implement, and those projects which need to be implemented before others.

Phase 1 includes all immediate needs for short-term development and growth. All Phase 1 practices are necessary for carrying out future phases successfully. Items include installing basic infrastructure (water, electricity, plumbing, and security), trail improvements, initial stage habitat restoration, and constructing a storage and equipment barn.

Phase 2 improvements are essential to providing the capacity for GBRT to initiate day-to-day operations. These amenities will significantly improve GBRT's capabilities to have on-site visitors.

Phase 3 will be where the grand vision for the Preserve as a community space and nature center will come to life. Projects undertaken in this phase will likely be more costly and complex to implement but will significantly add to the overall preserve experience.

Phase 4 is the long-term phase that includes community outreach and programming. This phase is the culmination of the previous phases and is where PCWP will truly become a community space. This will ultimately make PCWP the centerpiece of GBRT's community conservation programs. While many items in this phase should occur during the previous phases, Phase 4 should focus on them.

Phase 1

- Basic infrastructure (water, electricity, plumbing, and security)
- Trail improvements
- Initial stage habitat restoration
- Storage and equipment barn.

Phase 2

- Office building
- Restrooms
- Parking lot improvements
- Initial signage

Phase 3

- Nature center
- Boardwalks
- Kiosks and signage
- Benches
- Bird Blinds
- Outdoor classroom
- Bunkhouses

Phase 4

- Curriculum Development
- Educational programming
- Recreational programming
- Staffing and development
- Picnic area and playground
- Viewing tower

Funding Recommendation

To achieve all of the goals outlined in this master plan, we will need to take an adaptive and timely approach to take full advantage of the appropriate funding mechanisms as they become available. Funding strategies will differ for different elements of the Preserve and must include a diversity of income sources. However, the majority of the funding required to address the needs of the Preserve will come from grant funding and donations. This section provides brief descriptions of these funding implementation assistance opportunities.

Individual Contributions

Contributions from individuals are typically smaller but more frequent and can be bolstered by harboring a network of interested parties. GBRT should seek to engage these donors in an individual, more intimate approach, including direct asks, events, personal communication, donation programs such as dedicating structures like benches and bridges or donor planks on the boardwalk.

Corporations and Foundations

Corporate and Foundation support has played an essential role in the current development of PCWP. These contributions are more difficult to cultivate but often have a significant impact. GBRT should pursue specific entities in the community and continuously engage these organizations with activities to help establish PCWP as a high-profile project.

Sponsorships

Sponsors of events and gatherings will be crucial to continue providing quality environmental education for community members that enjoy the wetlands. This area of potential funding resources would likely gain traction during the late stages of implementation, where programming for the PCWP will be well underway and is actively supported by various groups and community organizations.

In-Kind Support

In-kind contributions may come in the form of goods, services, or people. The most impactful support of this type will come from volunteers. GBRT should establish a strong network of volunteers who assist with land management and restoration, trail maintenance, facilities and exhibit maintenance, instruction and tours, and other activities as necessary.

Entrance Fee and Memberships

Considering the Preserve will offer access to specialized recreational and educational opportunities that justify a nominal fee. Entrance fees for use of trails and amenities can provide valuable revenue for the management and upkeep of Preserve. Fees can be utilized to administer the use of facilities and programs that will maintain the balance of time, preserve resources, and reduce congestion within the Preserve. Creating a membership program could also be implemented. Similar to a State Parks Pass, memberships would be one-year access to Preserve amenities, including other benefits and special invitations.

Grants

To date, grants have been the primary funding source for improving the PCWP. The pursuit of viable grants often entails a rigorous and competitive application process. Much organization and oversight will be needed to effectively acquire grant opportunities to allow the PCWP to fulfill the vision outlined in this plan. Below are brief descriptions of grant programs that have been designated as feasible resources for funding for the Preserve.

Texas Parks and Wildlife Department

Grants can provide a significant source of additional funding for parks but should not be considered the primary source for park construction. Texas Parks and Wildlife Department - Texas Recreation and Parks Account (TRPA) is the primary source for parks grants in Texas and provides funding for recreational trails. Up to a 50 percent match can be obtained, up to $500,000 for new parks and trail facilities. Grant applications that stress joint funding and support from two or more local entities may have a greater chance of contending for the TRPA grants. These grants are highly competitive, and in recent years there have been far fewer grants available or awarded due to State budget restrictions.

North American Wetlands Conservation Act Grant

Provides funds to conserve wetlands and wetlands-dependent fish and wildlife through acquisition (including easements and land title donations), restoration, and/or enhancement with a maximum award of $1,000,000 and a 50% match obligation.

Local Park Grant Program

Assists eligible entities from communities with a population of 20,000 or less with the acquisition and/or development of public recreation areas and facilities throughout Texas with a maximum award of $750,000 and a 50% match obligation.

Community Outdoor Outreach Program

Provides reimbursement grants for programming that introduces under-served populations to environmental and conservation programs. Eligible expenses can include personnel, food, travel expenses, participant liability insurance, entrance fees, outdoor recreation equipment, and environmental education supplies with a maximum award of $30,000 and no match obligation.

Photographer: Anna Prusaitis Ybarra

Recreational Trails Fund

Provides funding for motorized and non-motorized recreational trail projects such as constructing new recreational trails, improving existing trails, developing trail heads or trailside facilities, and acquiring trail corridors. Funding is provided on a cost-reimbursement basis with a maximum award of $200,000 and an 80% reimbursement rate.

Conservation Grant Funding (Birding)

Provides conservation funding for nature tourism and avian habitat restoration, enhancement, and acquisition projects with a maximum award of $20,000 and no match obligation, although a match is preferred.

Shade Structure Grant Program

Funds the installation of permanent shade structures to cover outdoor areas not protected from the sun, such as playgrounds, pools, or recreation spaces, with a maximum award of $8,000 and no match obligation.

Clean Water Act Section 319 Grants

Funds the installation of low-impact best management practices such as rainwater harvesters, rain gardens, and previous parking areas with a 60% reimbursement rate.

Landscape and Ecology Recommendations	Cost Range
Blackland Prairie Restoration	$200,000-300,000
Memorial Arboretum	$100,000
Riparian Forest Restoration	$200,000-300,000
Wetland Restoration	$200,000-300,000
Feral Hog Management	$50,000
Total	**$1,050,000**
Amenities	**Cost Range**
Office / Nature Center / Wet Lab	$1,200,000
Improve Parking	$300,000
Construct Boardwalk	$500,000
Outdoor Classroom	$200,000
Bathrooms	$150,000
Bunk Houses	$150,000
Barn	$70,000
Bird blinds	$20,000
Signage	$20,000
Picnic Area	$50,000
Nature Playscape	$50,000
Benches	$25,000
Shade Structures	$35,000
Viewing Tower	$50,000
Improve Trail System	$50,000
Primitive Camping	$8,000
Total	**$2,660,000**

Additional Resources & Acknowledgments

Photographer: Carlos Fiól












Acknowledgments

GBRT would like to thank all of those in our community who helped develop the PCWP vision, and all those who have invested time, resources and energy in the creation of this plan. Special thank you to the GBRT Board of Trustees, the PCWP Planning Committee, previous Committee and community involvement, the National Park Service for a Rivers, Trails & Conservation Assistance Program Grant, the Land Trust Alliance for a master planning grant, and the many more who have contributed along the way.

Additional Resources and Supplemental Documents

Detailed Compensatory Mitigation Plan (2003)

Plum Creek Design Package (2007)

Mitigation Construction Plans (2008)

Project Concept Summary (2014)

Peer Consultation: Association of Nature Center Administrators (2016)

Marketing Planning Report

Land Management Plan

Engineering/Architectural Design Package

Property Use Policies and Procedures

Mapping Package

Boundary Survey and Field Notes

Baseline Documentation Report

Stakeholder Outreach Survey Responses

General Warranty Deed

General Liability Insurance

Indemnification Form

Annual Monitoring Reports

Conservation Easement

List of Species Observed

Made Possible By:

Land Trust Alliance
Together, conserving the places you love

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For additional information please contact us at: inquiry@gbrtx.org or call 830.560.3981