

PLUM CREEK WETLANDS PRESERVE

933 EAST COURT STREET
SEGUIN, TX 78155

SH 130 WETLAND MITIGATION SITE-
LOCKHART, TEXAS



GUADALUPE BLANCO RIVER TRUST

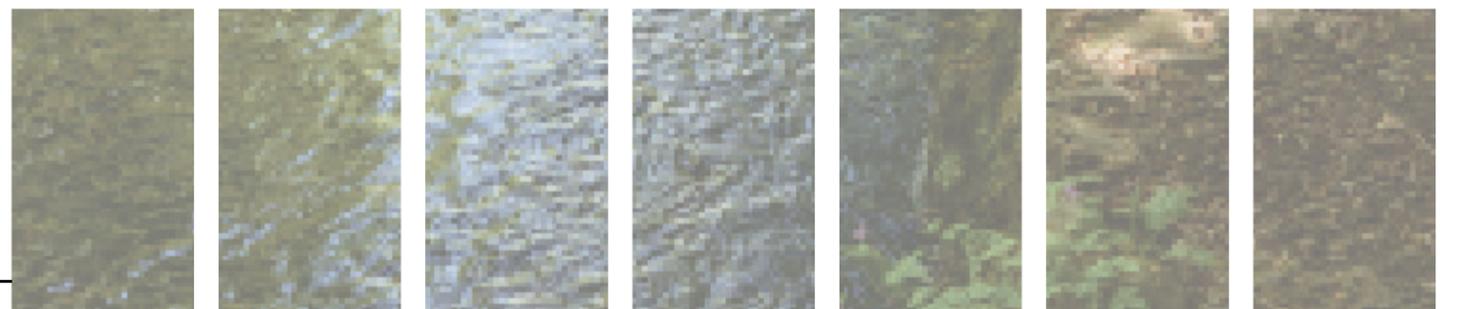
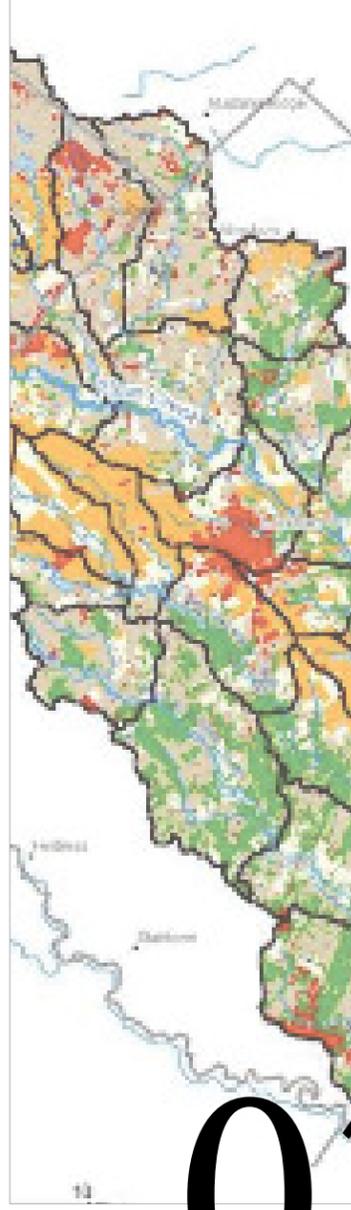


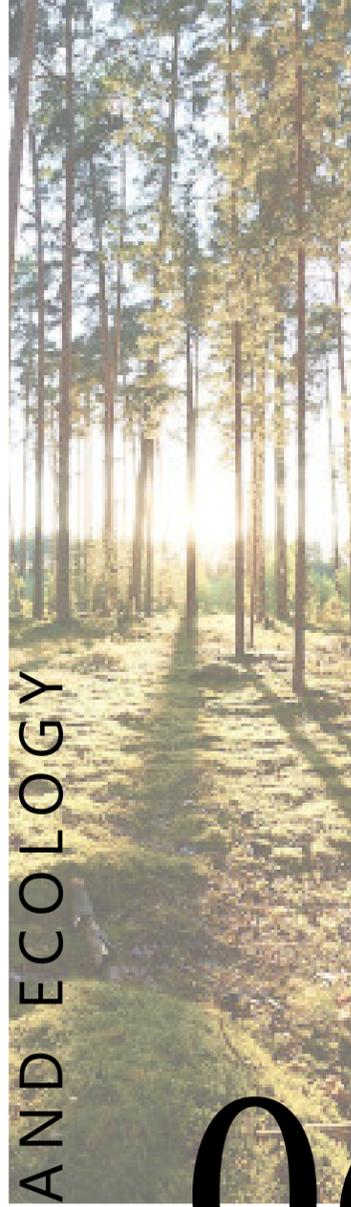
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SITE HISTORY

Plum Creek Watershed Preserve



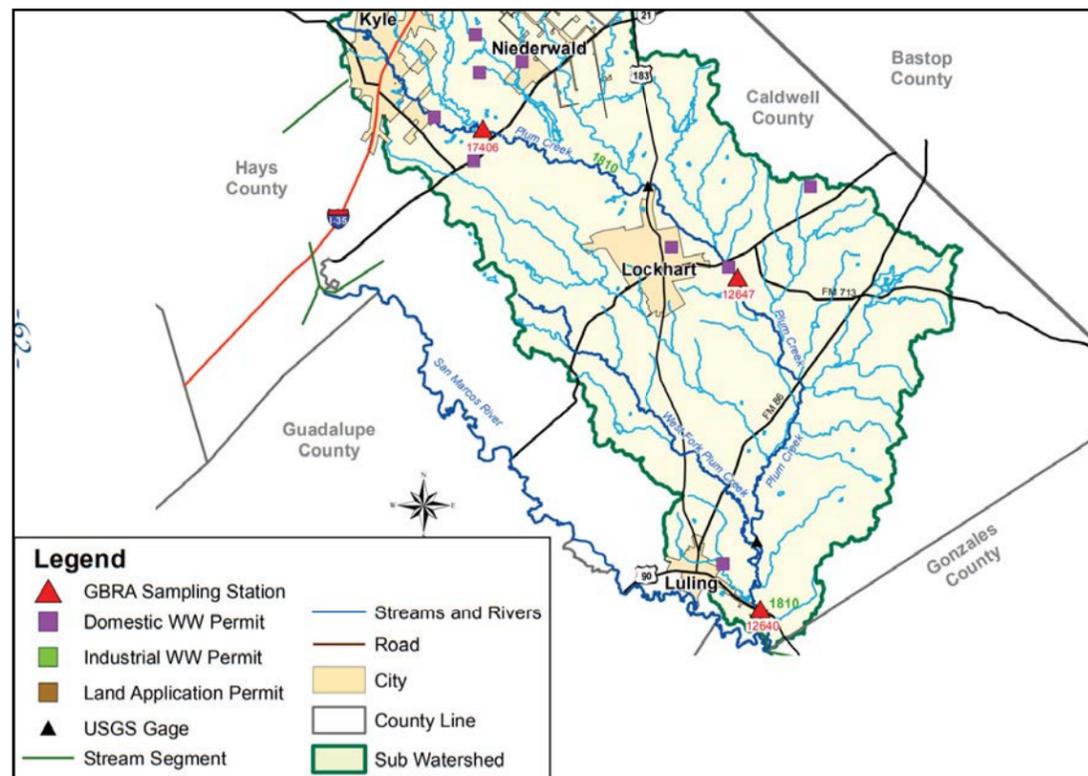
Background History

Plum Creek Watershed experienced increased immigration with the establishment of land grants in the region. To spur settlement after the Mexican War for Independence, numerous colonies were chartered in the 1820s and 1830s. Settlers from Mexico and the The United States moved into the region.

Therefore, Plum Creek played a major role in this colonization, as most of the small communities were established along the waterway and its tributaries.

The influx of settlers caused friction with Native Americans in the area, and several skirmishes and raids plagued the area. Leading to The Battle of Plum Creek in 1840, where bands of Comanche chiefs and warriors passed through the area following a raid. Retracing their steps along the Guadalupe Valley after attacking several settlements including Linnville and Victoria, the raiding party was intercepted along Plum Creek near present-day Lockhart by a combined army of volunteers, Texas Rangers, and Tonkawa Indians. By the end of a running fight covering 15 miles, more than 80 Comanche warriors were reported killed, while only one Texan was killed. Some of the plunder taken in the raids was recovered, and the Battle of Plum Creek proved to be pivotal in ending significant conflict with Comanche bands in the area.

The urban development of Plum Creek has a largely agricultural history and remains heavily influenced by farming and livestock, portions of the watershed are undergoing significant change. In 2004, urban land use accounted for 8.4% of the total land area in the Plum Creek Watershed. Northern sections of the watershed, particularly near Kyle and Buda along the Interstate 35 corridor, have been marked by rapid suburban growth, with city populations rising quickly over only a few years.



Water-

The drainage area is 397 square miles through San Marcos River, Plum Creek, Clear Fork Creek.

The aquifers are located in Edwards-Balcones Fault Zone, Carrizo Wilcox.

The vegetation in the area is: Deciduous Forest 23.6%, Pasture/Hay 22.9%, Shrublands 11.4%, Grass/Herbaceous 22.4%, Row Crops 14.4%.

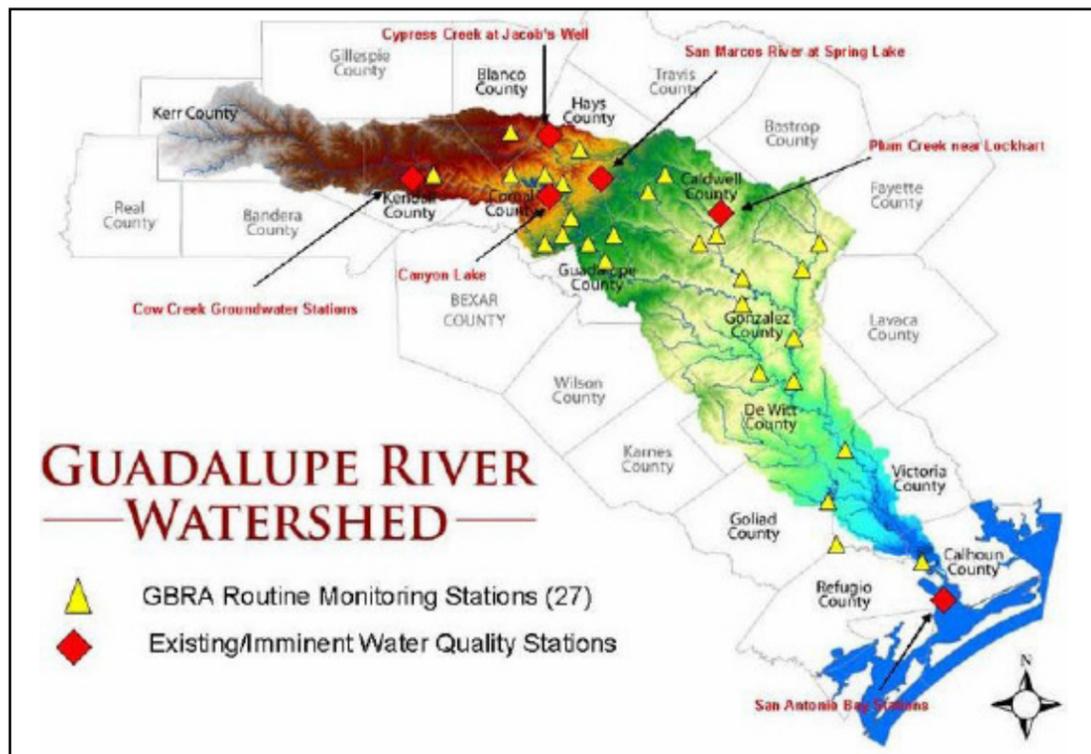
The climate is average annual rainfall 33 inches, Average annual temperature January 40°, July 95° The land is mostly used for industry, urban, oil and gas production, cattle, hog and poultry productions, agriculture, crops (sorghum, hay, cotton, wheat and corn)



Mitigation Plan

TxDOT Austin District is the owner of the Plum Creek Mitigation Plan, located in Caldwell County, Texas. The project type is Section 404, Wetland Mitigation, Water Quality Impacts, Impacts to Wetlands, Surface and Groundwater, Vegetation and Wildlife Impacts, Floodplains. This mitigation plan involved the creation of wetland mitigation sites along Plum Creek in Caldwell County and the establishment and monitoring of riparian vegetation at these sites. Recommendations of species to be planted and planting densities for each species were approved by the U.S. Army Corps of Engineers and included in project construction. Subsequent monitoring and reporting of vegetation restoration success ended in 2015.

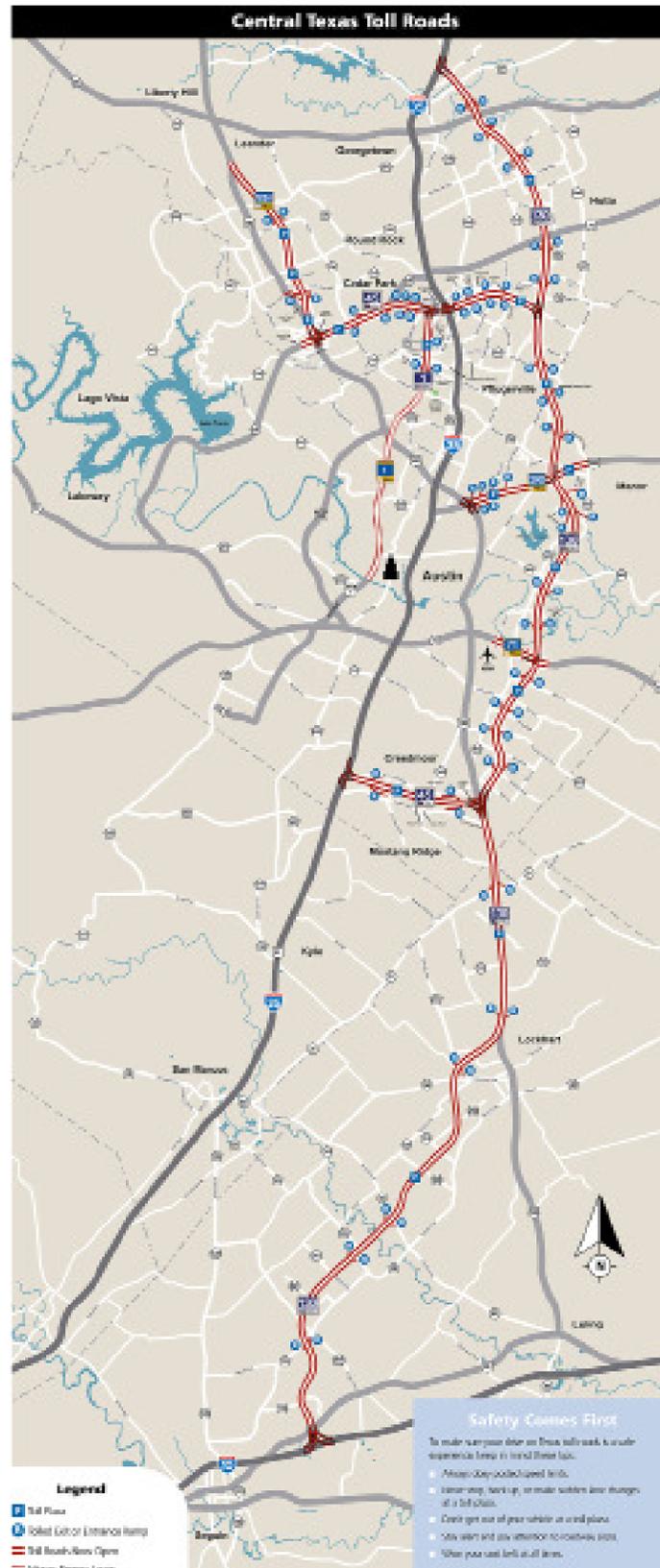
The Plum Creek Wetlands Preserve is 265 acres of land Caldwell County, Texas. Here the owner is Guadalupe-Blanco River Trust (GBRT), a conservation easement held by Guadalupe-Blanco River Authority (GBRA). Which purpose is to protect, maintain and enhance wetland, and provide recreational activities while protecting habitat. The Plum Creek Wetland Preserve was acquired through donation from the Texas Department of Transportation. In 2008, 21 bioretention basins were constructed (29 as of now).



Part of the Guadalupe-Blanco River

The Guadalupe-Blanco River Trust is a 501(c)(3) nonprofit land trust organization that was developed to conserve land in the Guadalupe River Watershed for its natural, recreational, scenic, historic and productive value. Was founded in 2001 by Guadalupe-Blanco River Authority.

Texas A&M and American Farmland Trust collected data from the 1997 to 2007 census that shows Texas is home to over 142 million acres of private farms, ranches and forestlands.



Toll Road

Prior to 2012, Interstate 35 was the only major highway linking the San Antonio and Austin areas and, as a result, was becoming increasingly congested. As early as 1986, local officials began planning a parallel reliever highway for I-35. By the late 90's, with the tremendous population growth of both cities as well as truck traffic regularly clogging I-35, state and local officials dusted-off the plan and christened it SH130.

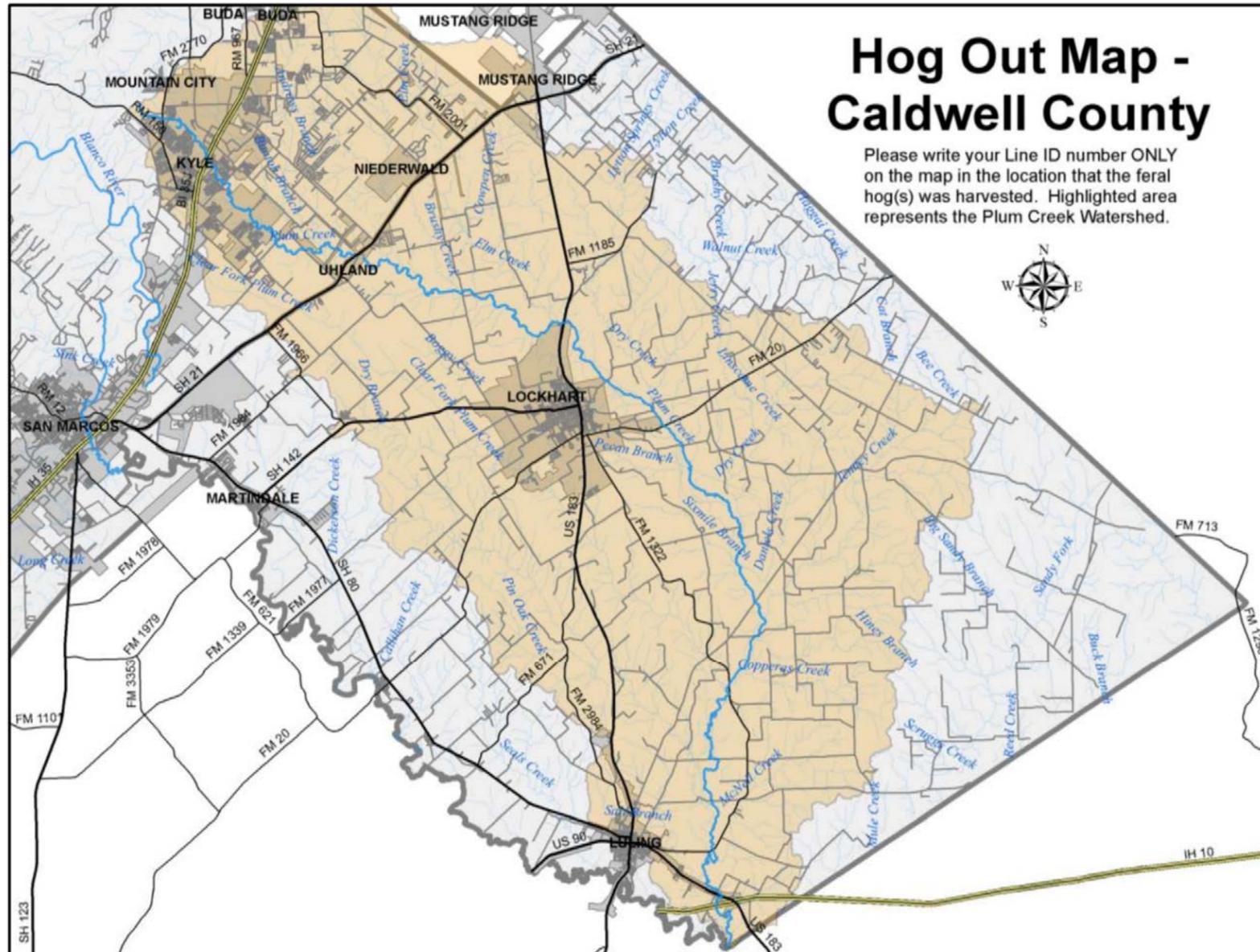
Due to limited funding, the project was developed as a toll project. The 41 mile section from Mustang Ridge to Lockhart and from the to I-10 near Seguin, known as segments 5 and 6, were built under a Comprehensive Development Agreement between the state and the SH 130 Concession Company LLC. The agreement called for the consortium to build and maintain the roadway for 50 years in exchange for keeping a portion of the tolls collected. Construction began in April 2009 opened to traffic on October 24, 2012.

These segments are often cited as a reason for low usage of SH 130 between Seguin and Austin. This low usage led to the company operating Segments 5 and 6 to file for bankruptcy protection in 2016. To help provide a more cohesive bypass route to drivers, the Texas Transportation Commission in 2011 approved extending the SH 130 designation from the southern terminus of the SH 130 toll road east of Seguin westward along I-10 to Loop 410 to I-35 South, thus allowing drivers to follow a single-numbered route.

The construction of State Highway 130 required TxDOT to mitigate the impact to wetlands along the entire highway due to the construction. This mitigation plan involved the creation of wetland mitigation sites along Plum Creek in Caldwell County and the establishment and monitoring of riparian vegetation at these sites. Recommendations of species to be planted and planting densities for each species were approved by the U.S. Army Corps of Engineers and included in project construction. Subsequent monitoring and reporting of vegetation restoration success ended in 2015.

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Invasive Spe-

In Texas, feral hogs cause a variety of problems including crop, pasture and rangeland damage, predation of livestock, pets, and wildlife, transmission of disease and parasites, and plant communities and other environmental damage.

Therefore competitions to get rid of hogs where created, such as, Hog Out 2012 While the Partnership was unable to secure funding for dedicated feral hog removal efforts through a TWS staff position, it was determined that significant water quality benefits to Plum Creek could be realized through local initiatives in Caldwell County and Hays County to reduce economic and ecological damage from feral hogs.

Funds from the statewide "Hog Out" competition and grant program from October through December 2012. After planning meetings with AgriLife Extension, county officials and local landowners, the Partnership was able to facilitate and manage Hog Out programs in both Caldwell and Hays County.

TWO

NATURAL HISTORY
AND ECOLOGY

Purpose and Mission Statement

The mission of the Guadalupe-Blanco River Trust is 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. The property is owned by the Guadalupe-Blanco River Trust (GBRT) and has been designated as a conservation easement held by the Guadalupe-Blanco River Authority (GBRA). The conservation easement ensures the following purposes:

- Protect, maintain and enhance the wetland, riparian and wildlife habitat on the property.
- Provide appropriate outdoor recreational opportunities while protecting the conservation values of the property.
- Provide scientific and educational opportunities related to wetlands, wildlife, and conservation.

Natural History

What's a Wetland?

A wetland is a place where land is covered by water, either fresh, salt or somewhere in between. Wetlands are some of the most productive habitats on the planet. They often support high concentrations of animals - including mammals, fish, birds and invertebrates.

Wetlands and Biodiversity

Wetlands provide habitat for many species of fish, mammals, amphibians, reptiles, birds, and insects with improved water quality and increased food supply. Wetlands purify water by filtering natural and manmade pollutants that are harmful to wildlife and adjacent bodies of water.

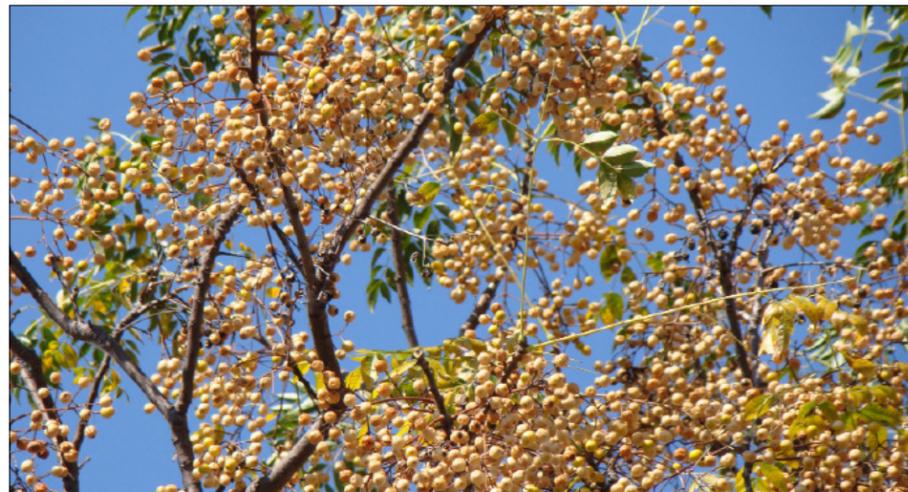
The biodiversity allows vegetation to grow and attract native species to the wetlands and improves the food chain since the ecosystem traps and holds nutrients. Biodiversity is crucial to the management of wetlands and wildlife helps maintain the functions of the wetlands.

Site History

The Plum Creek Wetlands Preserve consists of 265 acres of ranch land located in Caldwell County, Texas, in the blackland prairie ecoregion of Texas. Plum Creek Wetland is a part of the larger Plum Creek Watershed, one of the 10 watersheds that feed into our beautiful Guadalupe River. The Plum Creek Watershed is 367 square miles of land, while the creek is 52 miles long. It encompasses Hays county and parts of the city of Buda, Kyle, Lockhart, and Luling. In 2008, 21 bioretention basins were constructed on the property as mitigation for road construction on SH-130. The bioretention basins help stop non-point pollution due to runoff after it rains and end up in the watershed:

- Excess fertilizers, herbicides, insecticides
- Oil, grease and toxic chemicals
- Bacteria and waste from pets, livestock, faulty septic tanks
- Sediment from poorly managed construction sites or yards.





Vegetation

99% (264 acres) of the Plum Creek Wetlands Preserve is located within the 100-year floodplain. Some of the constructed bioretention basins and water features will likely be periodically inundated by flooding. The features would likely not require planting of wetland species because the area appears to support a substantial seed bank of these plants.

Compensatory over-planting of trees is intended to address mortality due to drought and other adverse conditions. At least two sessions of mechanical weed control between rows of planted trees (probably shredding) shall be planned each year during the summer to prevent grasses and weeds choking out on woody plantings.

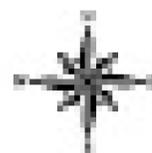
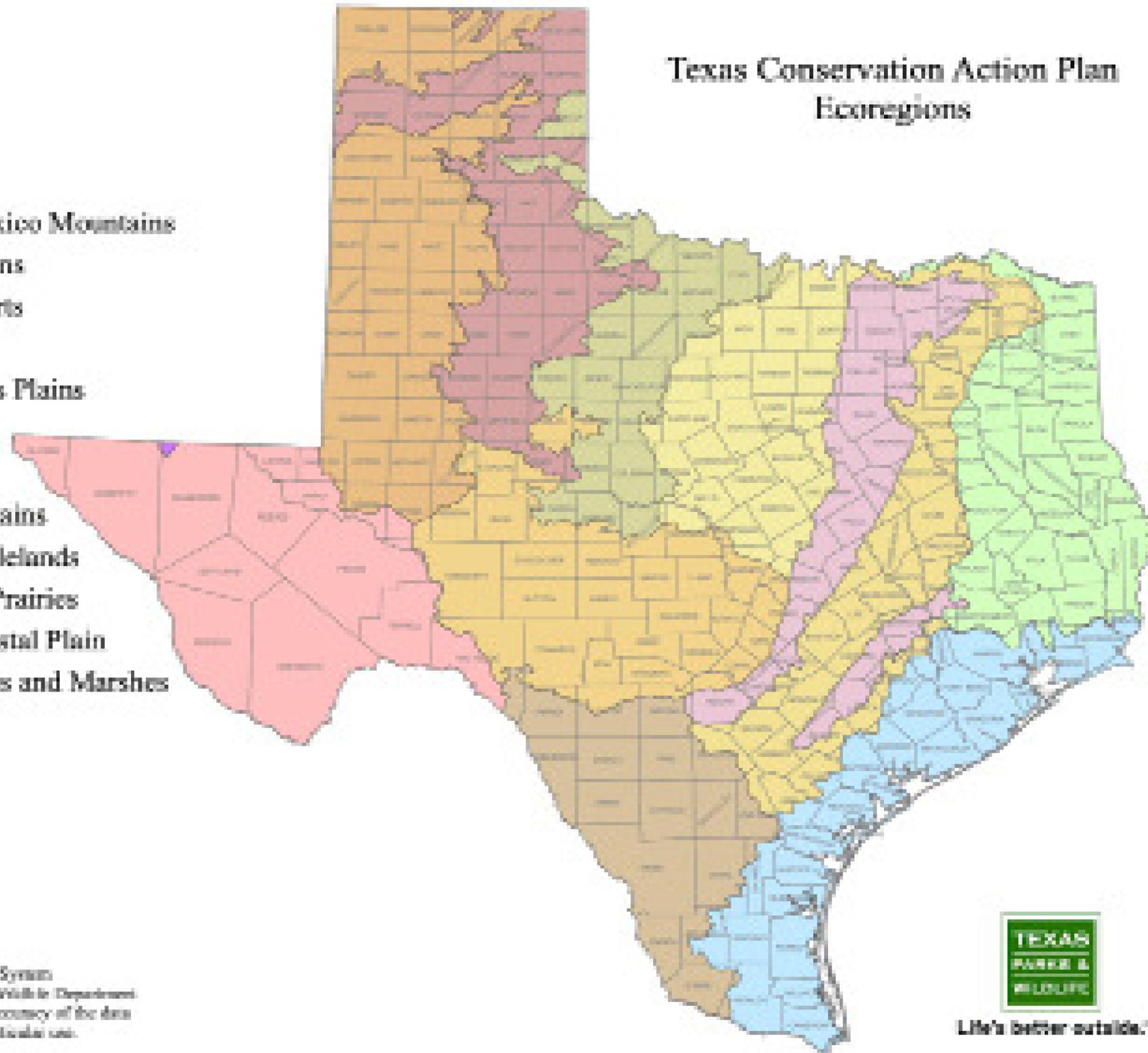
Field surveys have shown that the site has been greatly affected by grazing and other activities and is still recovering. Invasive woody species such as chinaberry, Chinese tallow, cattail, giant ragweed, are also affecting the site. Giant Ragweed is the predominant weed problem on this property. In many areas, the species is nearly a monoculture stand that outcompetes the native grasses and other desirable species. They need to be chemically and manually removed. Chemical control methods and seeding with native species will be necessary to bring the plant community back to a near climax community.

When using these chemicals it is important to know which to use and in which locations because they can ultimately harm and kill the aquatic wildlife around the marshlands. The aggressive growth of these unwanted plants can also form dense populations that compete with desirable species and provide little protection for soil erosion. No individual species should constitute more than 30% of the vegetative community. Annual monitoring is necessary. It should be done in the time frame of mid-April to mid-June when plants are flowering and can be easily identified. Future monitoring events should be used to create a comprehensive list of plant species at the property.

- An overall impression of the current condition of the property.
- Any obvious disturbances to plant communities.
- Significant changes in dominant species within each plant community.
- Observation of any development activities that may have disturbed soils or resulted in runoff.
- New plant species that may have been observed.
- Identification of all observed wildlife species including mammals, reptiles, and birds.
- Overall impression of the vegetation management of the property with recommendations for changes, if required.

Texas Conservation Action Plan Ecoregions

- Arizona/New Mexico Mountains
- Central Great Plains
- Chihuahuan Deserts
- Cross Timbers
- East Central Texas Plains
- Edwards Plateau
- High Plains
- Southern Texas Plains
- Southwestern Tablelands
- Texas Blackland Prairies
- Western Gulf Coastal Plain
- Gulf Coast Prairies and Marshes



20 May 2011
Projection: Texas Statewide Mapping System
Map compiled by the Texas Parks & Wildlife Department
GIS Lab. No claims are made to the accuracy of the data
or to the suitability of the data for a particular use.



Life's better outside.™

Region

Clayey Bottomland Range Site (94% of property)

Climax community:

Mixture of grasses, forbes, shrubs, and some trees

Composition

- Little bluestem (30%)
- Virginia wildrye (20%)
- Switchgrass (15%)
- Indiangrass (15%)
- Vine mesquite (5%)
- Perennial and annual forbs (5%)
- Trees and shrubs (10%)

If degradation occurs:

Switchgrass and Indiangrass will decrease

Further degradation is indicated by the establishment and increase of the following species:

- Vine mesquite (greater than 5%)
- Meadow dropseed
- Buffalograss
- Annual weed
- Annual grasses

Blackland Range Site (5% of property)

Climax community:

True prairie that has a few large live oak, elm, and hackberry trees along the draws and in a few motts

Composition

- Little bluestem (50%)
- Indiangrass (20%)
- Texas wintergrass (5%)
- Vine mesquite (5%)
- Other grasses (10%)
- Perennial forbs (5%)
- Woody plants (5%)





Monitoring Point 1

According to "The Land Management Plan" by Adams Environmental Inc. This is the vegetation found on the site. The document splits the site into three different monitoring points and it lists the different plant life found in each.

Grasses Observed:

Common Name	Scientific Name	Foliar Cover (%)
Bermudagrass	<i>Cynodon dactylon</i>	30

Herbaceous Broadleaf Vegetation Observed (within the stream channel):

Common Name	Scientific Name	Foliar Cover (%)
Wood Sorrel	<i>Oxalis drummondii</i>	20
Giant Ragweed	<i>Ambrosia trifida</i>	15
Plains Horsemint	<i>Monarda citriodora</i>	15
Other	--	10

Woody Vegetation Observed:

Common Name	Scientific Name	Foliar Cover (%)
Shrubs		
Retama	<i>Parkinsonia aculeata</i>	5
Honey Mesquite	<i>Prosopis glandulosa</i>	2
Trees		
None observed at this point		

Monitoring Point 2

Grasses Observed:

Common Name	Scientific Name	Foliar Cover (%)
Virginia Wildrye	<i>Elymus Virginicus</i>	90

Herbaceous Broadleaf Vegetation Observed (within the stream channel):

Common Name	Scientific Name	Foliar Cover (%)
Giant Ragweed	<i>Ambrosia trifida</i>	2
Bedstraw	<i>Galium aparine</i>	2
Wild Carrot	<i>Daucus carota</i>	2

Woody Vegetation Observed:

Common Name	Scientific Name	Foliar Cover (%)
Shrubs		
None observed at this point		
Trees		
Cedar Elm	<i>Ulmus crassifolia</i>	50
Sugarberry	<i>Celtis laevigata</i>	10

Monitoring Point 3

Grasses Observed:

Common Name	Scientific Name	Foliar Cover (%)
Bermudagrass	<i>Cynodon dactylon</i>	40

Herbaceous Broadleaf Vegetation Observed (within the stream channel):

Common Name	Scientific Name	Foliar Cover (%)
Giant Ragweed	<i>Ambrosia trifida</i>	20
Carolina Geranium	<i>Geranium carolinianum</i>	10
Broomweed	<i>Amphiachyris dracunculoides</i>	5
Wood Sorrel	<i>Oxalis drummondii</i>	5
Wild Carrot	<i>Daucus carota</i>	5
Rain Lily	<i>Cooperia pedunculata</i>	2
Cocklebur	<i>Xanthium sp.</i>	2

Woody Vegetation Observed:

Common Name	Scientific Name	Foliar Cover (%)
Shrubs		
None observed at this point		
Trees		
None observed at this point		



Dominant Species

The following are species that you can expect to see in the region: white-tailed deer, hogs, opossum, raccoon, Eastern cottontail, swamp rabbits, nine-banded armadillo, coyote, gray fox, skunk, bobcat, many species of raptors, waterfowl, frogs, lizards, rattlesnakes, coral snakes, pollinators, and birds all live in the region. Wetlands are important permanent and temporary homes for birds during migration. The illustration shows the Central and Mississippi migration paths for hundreds of bird species. Some of the birds that live or migrate through the region include Carolina wrens, painted buntings, summer tanagers, yellow-throated and white-eyed vireos, prothonotary, and yellow-throated warblers. Native species including American bison, wolves, and jaguars used to inhabit the region before the destruction of tallgrass ecosystems and hunting.



Wildlife Management

Feral hogs and white-tailed deer management is crucial for the biodiversity of Plum Creek Wetlands. Feral hogs are often detrimental to stream water quality and when they migrate they alter topography and runoff/collection patterns, and vegetation community composition. While the natural predators for white-tailed deer have decreased in Texas, posing a threat to the biodiversity of the region. It is important to maintain genetic diversity to reduce the spread of disease and starvation of the wildlife population.

THREE

PRECEDENTS STUDY

Cibolo Nature Center

Location:
Boerne, Tx

Learning center
Multi-purpose auditorium
Exhibit space
Reference library
GIS lab
Technology center
Wet-lab classroom

source(s)

<https://www.lakeflato.com/eco-conservation/cibolo-nature-center>





Description

Located on a 100-acre preserve in the Texas Hill Country, the Cibolo Nature Center's new Lende Learning Center demonstrates the non-profit's mission to promote good stewardship of land and wildlife. The complex crafted of assembly pavilions and connected by open air walkways, the project is thoughtfully sited in a way that takes advantage of its dense stand of Live Oak trees. Shady courtyards provide well-defined outdoor classrooms and event spaces. The learning center includes a multi-purpose auditorium, exhibit space, reference library, GIS lab, technology center and wet-lab classroom.



Wasit Visitor Centre

Location:

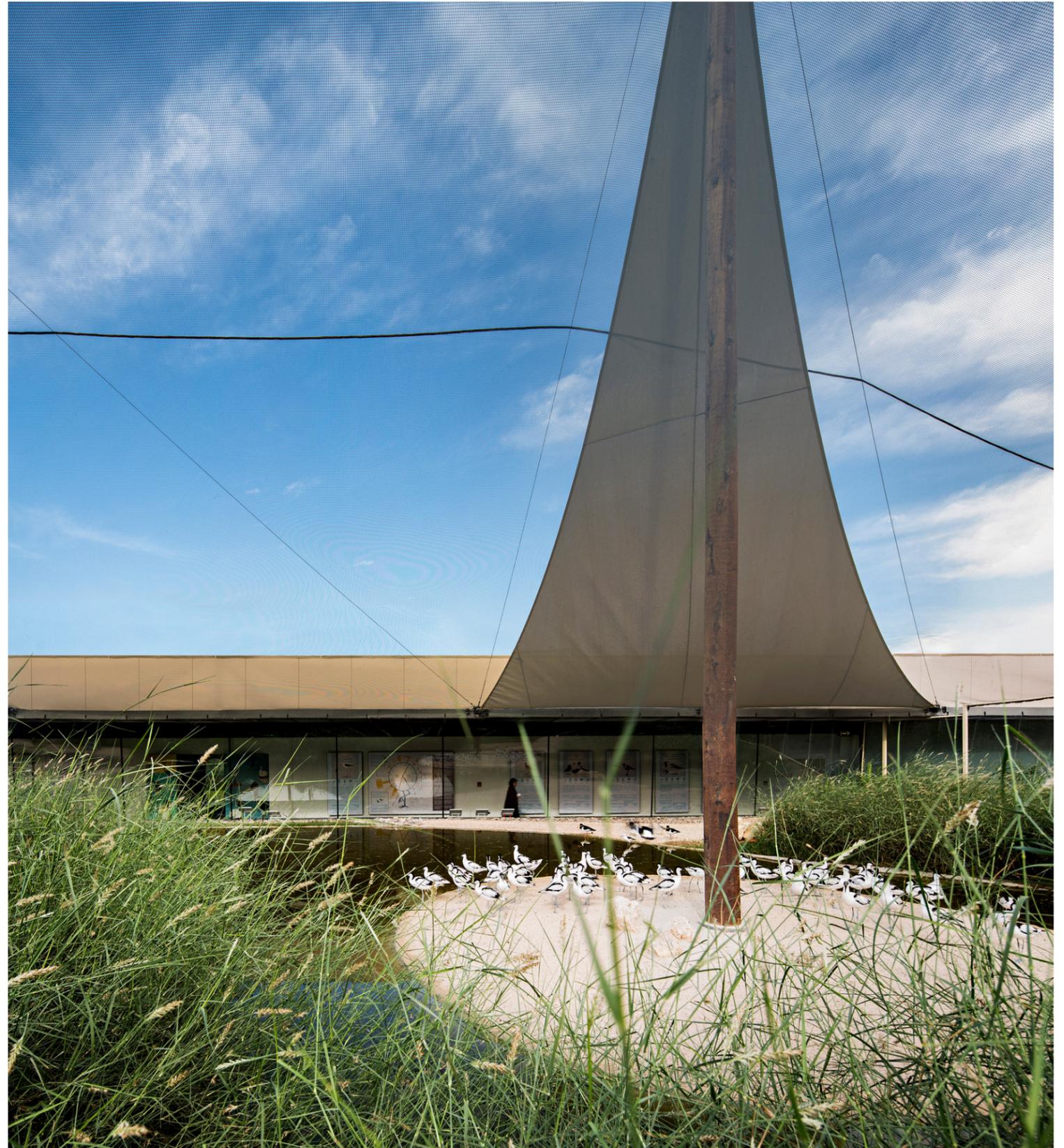
Sharjah, United Arab Emirates

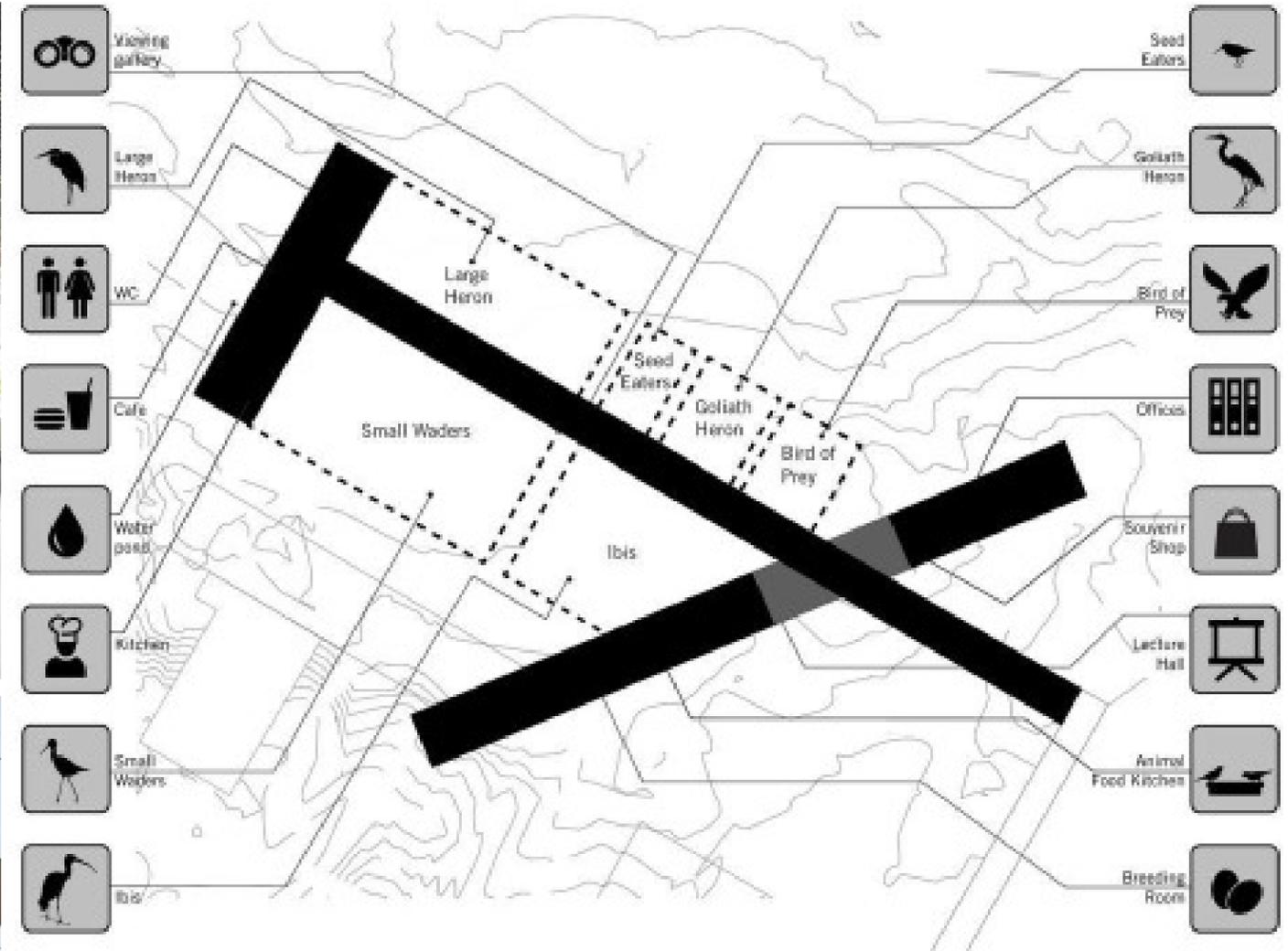
Protecting the natural environment,
Education on the wetland ecosystem and about the birds
Bird watching and research
Underground into a linear Gallery

source(s)

https://www.archdaily.com/784055/wasit-natural-reserve-visitor-centre-x-architects?ad_source=search&ad_medium=search_result_projects

<https://x-architects.com/en/projects/wasit-visitor-centre/5345>





Description

Wasit Natural Reserve was originally a waste-water and rubbish dump. The rehabilitation process of the damaged eco-system started in 2005, 40,000m² of rubbish removed, 35,000 trees been re-planted, healing the land from toxic chemicals and conservation of the Unique salt flats and costal sand dunes.

After years of efforts to bring the non-migratory birds back to the site, WNR is now home to 350 species of birds, a landing zone for 33,000 migrate birds, and a breathing lung to Sharjah city.

A wetland visitor center is established on site to continue protecting the natural environment, educate people on the richness of the wetland ecosystem and provides information about the birds that frequent the area and other wetlands areas of the emirate. The facility became heaven for bird watchers and researchers.

The architecture of the center blends with its' surroundings and uses the existing topography to minimize the visual impact on the natural scene. When visitors arrive, a pathway leads them underground into a linear Gallery. A fully transparent wall allows the visitors to experience the birds' natural environment and become part of it.

Shangri La Nature Center

Location:
Orange, Texas

Program:
Visitor center

Nature education and research facilities:
Outdoor education center
Classroom pavilions
Bird-viewing blinds

LEED Platinum certification
Suspended walkways

source(s)

<https://www.lakeflato.com/eco-conservation/shangri-la-nature-center/?project=open>

https://www.solaripedia.com/13/306/3503/shangri_la_botanical_gardens_2.html

<https://www.aiatopten.org/node/122#:~:text=Design%20%26%20Innovation&text=The%20primary%20goal%20was%20a,natural%20environments%20of%20Shangri%20La.>





Description

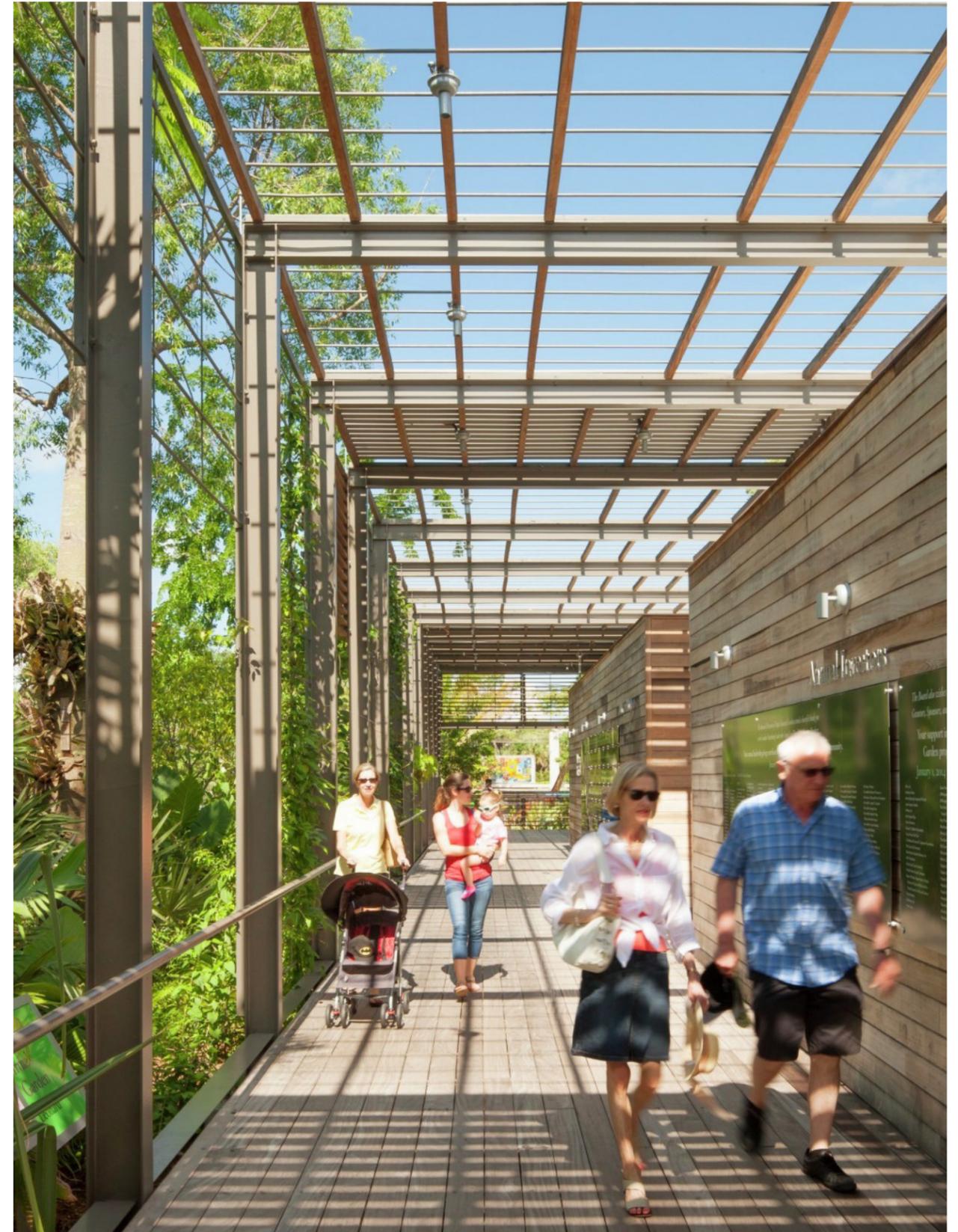
Situated on Adams Bayou, this project preserves more than 250 acres of cypress / tupelo swamp and wooded uplands, while restoring the historic Shangri La Gardens. A Visitor Center at the entrance orients guests to the site's history and resources. Nature education and research facilities include an outdoor education center, classroom pavilions and bird viewing blinds, carefully situated within the preserve to provide hands-on learning opportunities. Suspended treehouse-like walkways minimize the structure's footprint on the land. The project achieved the first LEED Platinum certification for new construction along the Gulf Coast.

Naples Botanical Garden Visitor Center

Location:
Naples, Florida

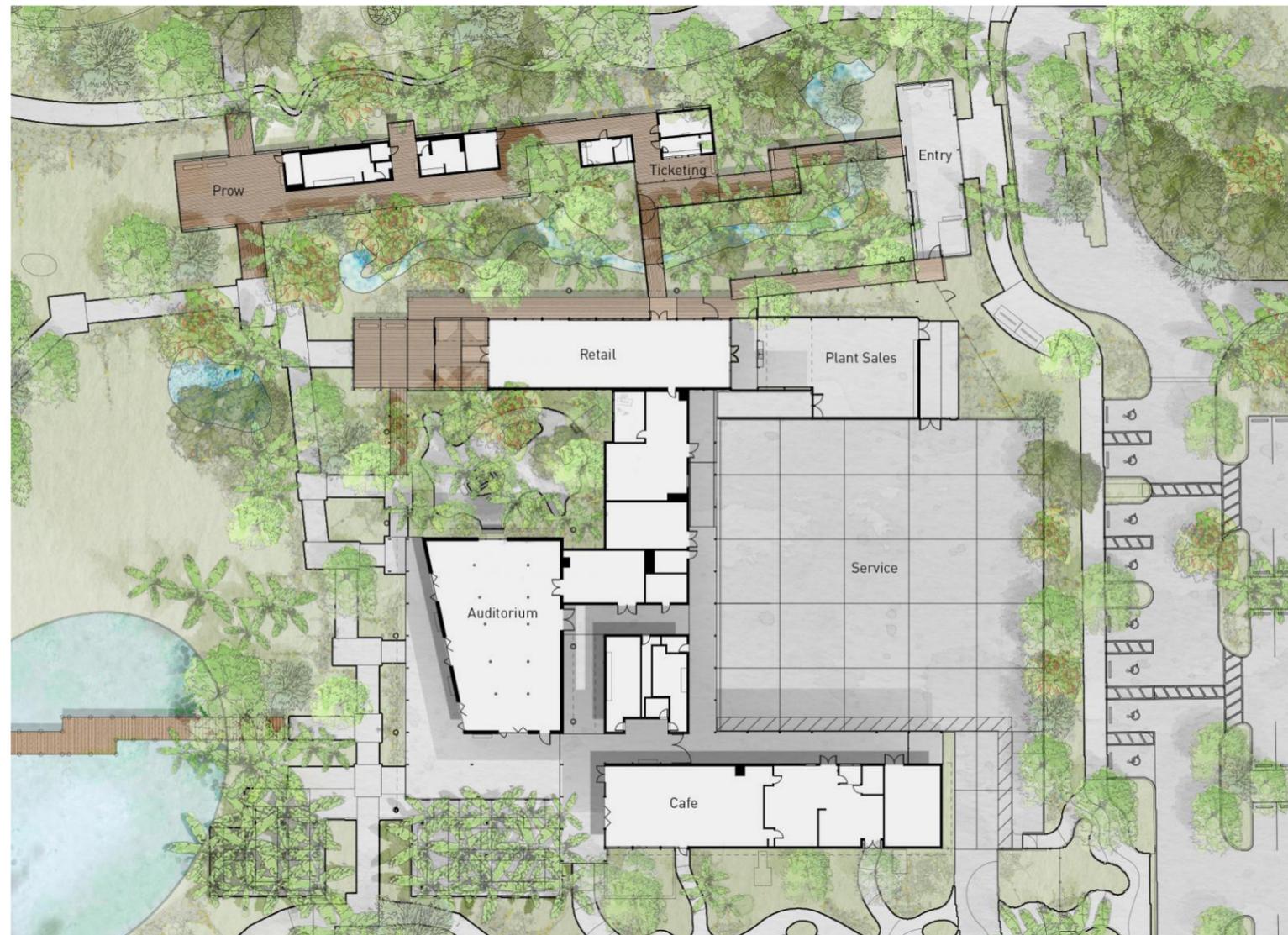
LEED Gold Certification
Ticketing
Retail
Exhibit
Plant Sales
Auditorium
Cafe

source(s)
<https://www.lakeflato.com/eco-conservation/naples-botanical-garden-visitor-center/?project=open>



Description

The Naples Botanical Garden Visitor Center sits delicately upon a world class, 160-acre botanical garden. The visitor center continues a legacy of preservation by partnering with local ecosystem in an environmentally responsible way. Wooded pavilions crafted from local and durable Sinker Cypress entwine throughout lush gardens and plant collections to create an immersive and engaging experience for visitors and researchers as well as an enticing venue for events. The center is immersed in restored natural habitats and lush vegetation from seven tropic regions. As visitors enter through an intimate walkway that meanders through plant life, buildings are scaled as a back-drop to the larger landscape. The program is broken down into three small buildings so visitors will be continually engaged by the restored natural habitats. The visitor center has 14,000-square-feet of interior space for ticketing, retail, exhibit, event and cafe/dining, with 16,000-square-feet of exterior areas.

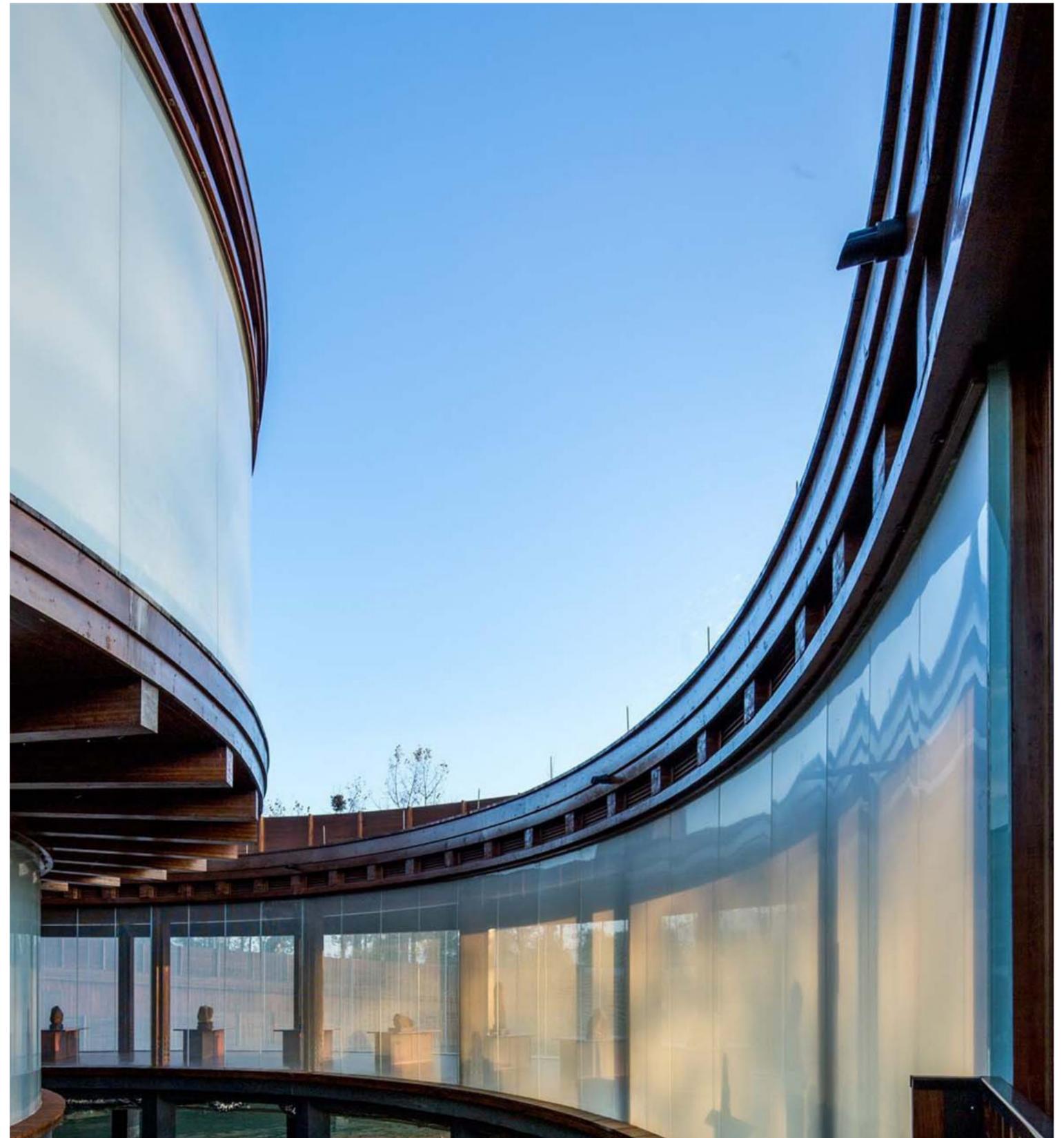


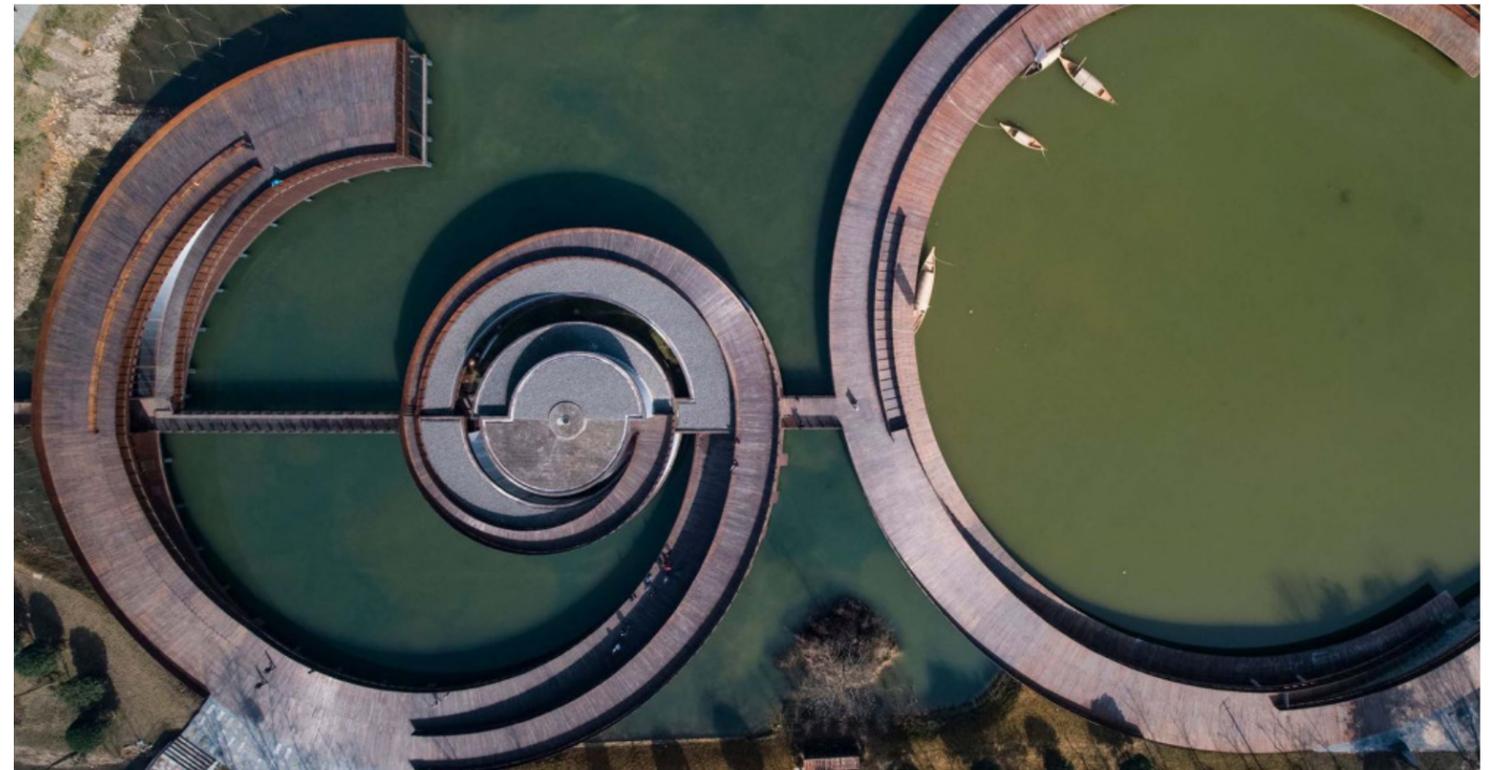
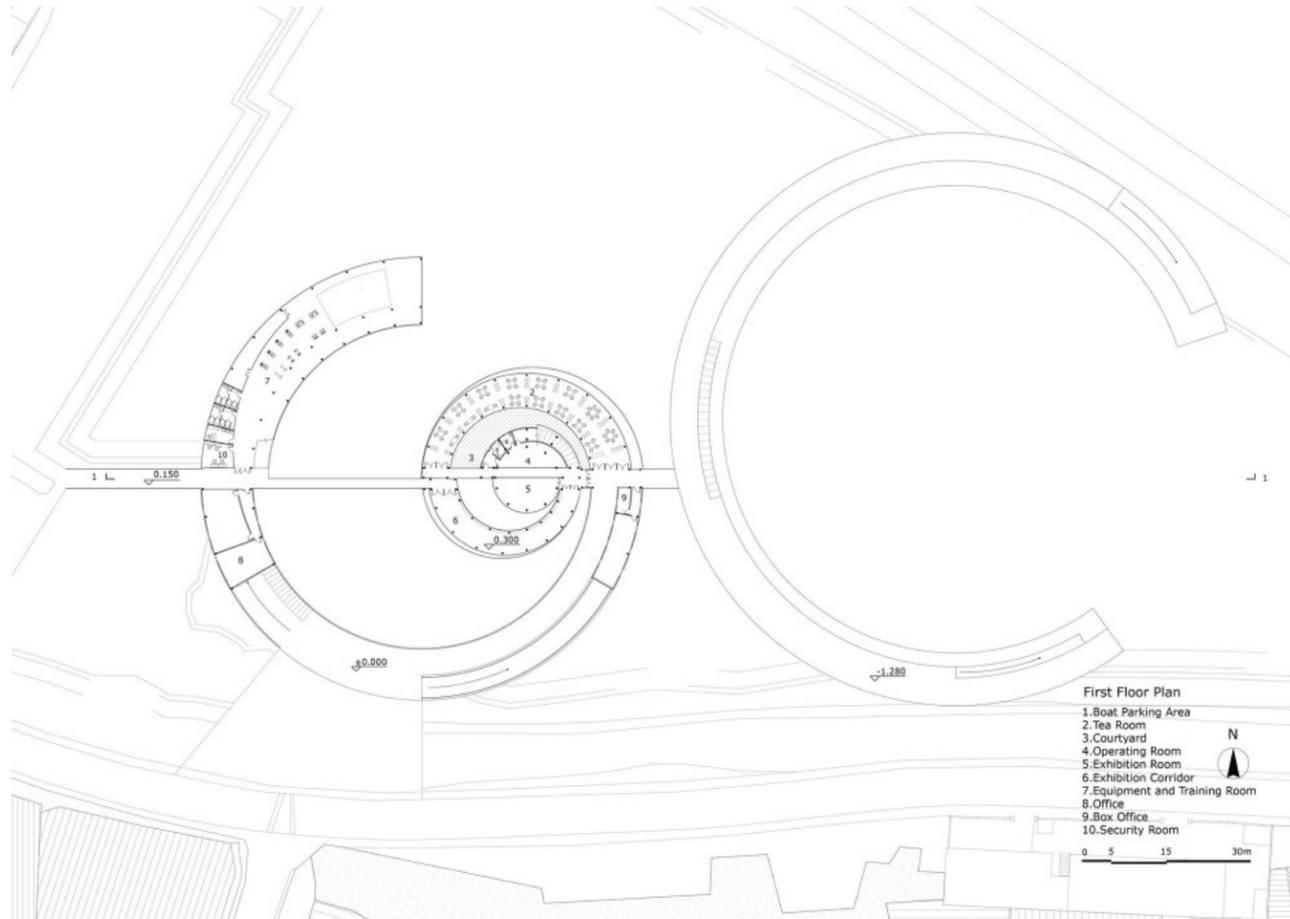
Dushan Leisure Center

Location:
Lishui, China

Visitor center,
Water sports facilities
Gym for water sports athletes

source(s)
https://www.archdaily.com/940377/dushan-leisure-center-dna?ad_source=myarchdaily&ad_medium=bookmark-show&ad_content=current-user





Description

Dushan Mountain is the most iconic landmark in the region, and the gateway to Songyang County and its urban center.

The architectural programs are organized through a spiral with the visitor facilities at the center and a gym at the far end, connected by an east-west walkway as a shortcut.

A "C" shape dike connects to the Songyin River will also become the passage for pedestrians, bicycles and tourism electric shuttles. The overall configuration provides an undulating walkway for above the harbor, with constantly changing views of the Mountain & Water.

The project adopts timber structure as natural material, low-carbon construction, and traditional special quality. Glass curtain walls with different gradient of translucency bring subtle shift on building façades as misty surfaces on the water. Layers of indoor and outdoor space create interplay of views, like the traditional Chinese landscape garden.

The meditation room on second floor is also a multi-function room. The opening on the roof casts the trace of sun on the floor with bronze plates of different hours in the Chinese 24 solar terms, creating a dialogue with the nature and time.

FOUR

LIVING BUILDING CHALLENGE

Living Building Challenge

The living building challenge is a set goals to create an innovative sustainable building that generates all of its own energy with renewable resources, captures and treats all of its water, a project that operates efficiently and transforms what we think of as sustainable design.

Instead of doing less harm to the environment, the Living Building challenge seeks to improve the environment around it so that humans and ecosystems can be integrated into each other instead of as separate entities, allowing a symbiotic relationship between people and nature. Unlike LEED, the Challenge is not based on a checklist of sustainable practices but is instead based on a philosophy approach and studies the performance of the building to measure its success.

The Challenge understands that each design is different, so the program takes into account that each building design is adapted to design decisions of the project, location, and the bioregion it is located in. The structure of the program comes from seven performance categories which they call "petals": place, water, energy, health + happiness, materials, equity, and beauty. Within each petal, there are imperatives that can be applied to any conceivable building project. This means that the Living Building Challenge can be applied to new construction, existing buildings, and even interior projects.

Another aspect of it is that they have different certifications, so even if the building only achieves one petal it can still be registered as part of a living building. This encourages many designers and the building owners to strive for a successful living building even after the construction is done. By looking at the performance of the building, changes can be made to improve the overall design. The Living Building Challenge is a step into a new type of design, a typology that creates an environment where humans and ecology come together in a cohesive relationship instead of independent from one another.

source(s)

<https://living-future.org/lbc/>



Josey Pavilion

Location:

Decatur, TX

Status:

Full Living Building

Petals Achieved:

Place

- Habitat Exchange – donated a 778-acre of conservation land
- Human Powered Living – Majority of building visitors come by bus

Water

- 13,000-gallon cistern that collects and reuses rainwater
- Blackwater is treated by an onsite constructed wetland

Energy

- 4 kW solar array
- Pavilion can completely open in the summer to capture prevailing winds

Health & Happiness

- Project located away from the city reducing noise and chemical pollution

Materials

- Materials thoroughly vetted to ensure that they are red list-free
- Reduce carbon footprint by using wood as the main material

Equity

- It is a rural project that is surrounded by nature
- The pavilion itself is only accessible by foot

Beauty

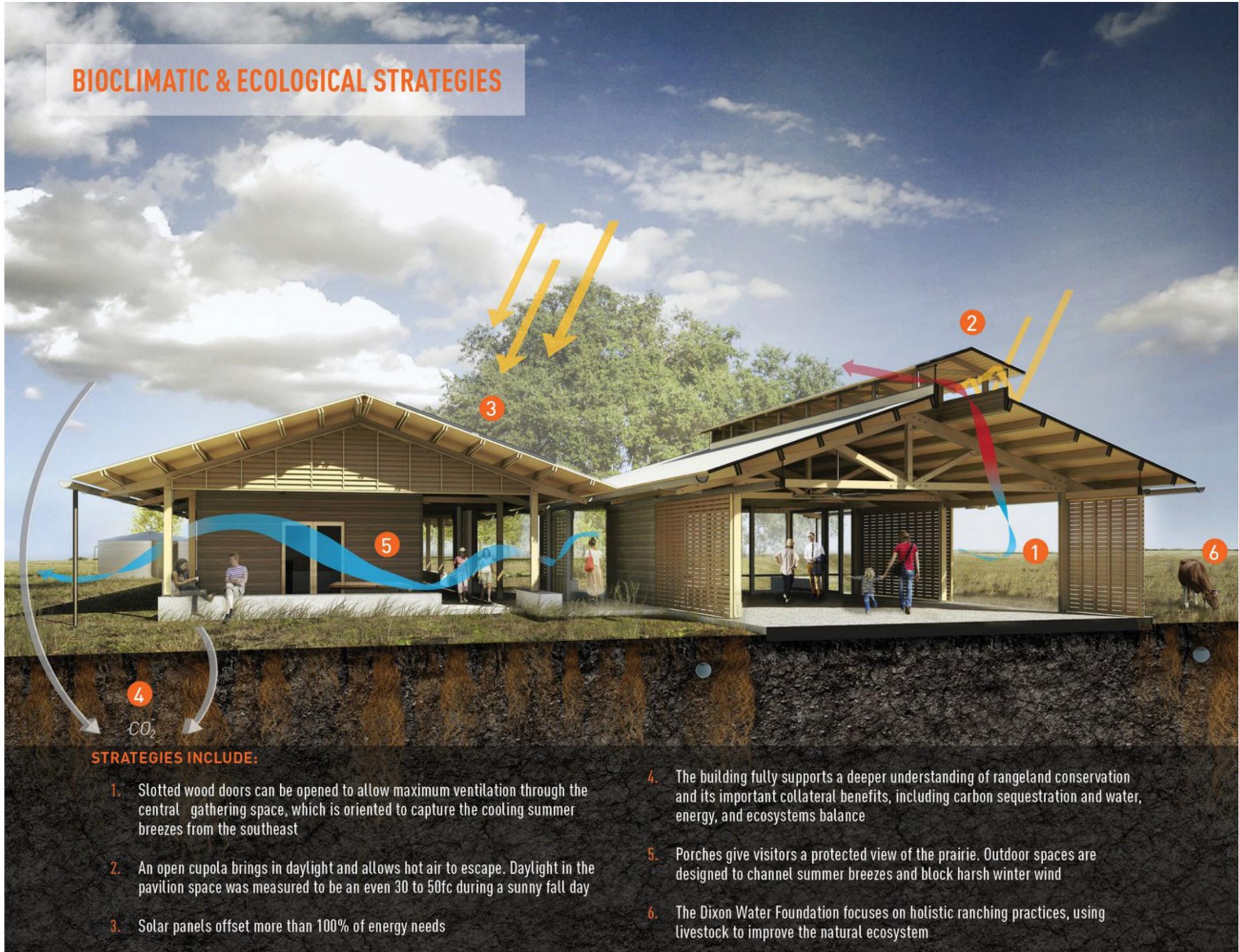
- The pavilion works as one with nature
- Allows all who visit it to be educated on living buildings

source(s)

<https://living-future.org/lbc/>



BIOCLIMATIC & ECOLOGICAL STRATEGIES



STRATEGIES INCLUDE:

1. Slotted wood doors can be opened to allow maximum ventilation through the central gathering space, which is oriented to capture the cooling summer breezes from the southeast
2. An open cupola brings in daylight and allows hot air to escape. Daylight in the pavilion space was measured to be an even 30 to 50fc during a sunny fall day
3. Solar panels offset more than 100% of energy needs
4. The building fully supports a deeper understanding of rangeland conservation and its important collateral benefits, including carbon sequestration and water, energy, and ecosystems balance
5. Porches give visitors a protected view of the prairie. Outdoor spaces are designed to channel summer breezes and block harsh winter wind
6. The Dixon Water Foundation focuses on holistic ranching practices, using livestock to improve the natural ecosystem

Place

Intent: "to realign how people understand and relate to the natural environment that sustains us". It can tell us where we can build, how to protect and restore places that we do choose to build on, and how to create healthy pedestrian communities (DOWN WITH THE MACHINES). Our rapid development as a society towards suburban sprawl and interstate highways, when done so recklessly, threatens the natural place that does still exist. Connected communities, healthy densities, and natural systems integrated into everyday lives.

01: to protect wild and ecologically significant places and encourage ecological regeneration and enhanced function of the communities and project sites. Avoid building on key wildlife sites, document preexisting conditions, contribute positively to ecology, no chemicals into the landscape.

02: All projects MUST dedicate a portion of their total project area to growing local food, giving community access to that food.

03: All projects MUST give equal acreage to an approved Land Trust organization or the Institute's Living Future Habitat Exchange Program.

04: Focus on pedestrian owned communities, built at human scale, with places for communities to gather, with places for weather protected storage and showering facilities, with electric vehicle charging stations, while minimizing impervious surfaces on the site. Further focus on carpooling, pedestrian walkways, and surveying occupant sov trips.

Water

Intent: "to realign how people value water; to address the energy and chemicals involved in transporting, purifying and pumping water; and to redefine "wastewater" as a precious nutrient and resource". More and more communities are losing access to water; can be mitigated by closed loop systems based on available resources and localized treatment. Use the water you need, recycle it, take care of it, and don't mess up the hydrology of the surrounding site.

05: Treat water as a precious resource, follow regional building water guidelines, affordable housing can use water handprinting, treat stormwater on site, and if needed design stormwater detention systems.

06: 100% of water must come from site precipitation, closed loop system, or other recycled system and purified with no chemicals. Emphasis on potable and nonpotable uses. Treat grey and black water on site, through infiltration, or through handprinting. Onsite drinking water storage is required.





Energy

Intent: "to create new sources of renewable energy that allows projects to operate year-round in a resilient, pollution-free manner". Emphasis on energy efficiency and centralized energy. (DOWN WITH NONRENEWABLE ENERGY).

07: Energy is a precious resource, minimize energy related carbon emission that contribute to climate change. Must follow energy performance requirements with use of meters, emphasis on energy use reduction in total.

08: Buildings must be "zero ready" backed by renewable energy resources (NO CARBON). This leads to net positive buildings with requirements of 105% of supplied energy, emphasis on submetering and accounting for carbon emissions during construction with offsets.

Health & Happiness

The intent of the Health + Happiness Petal is to create healthy spaces that allow all species to thrive by connecting people to nature and ensuring that our indoor spaces have healthy air and natural daylight.

I-09 healthy interior environment: The intent of this Imperative is to promote good indoor air quality and a healthy interior environment for project occupants.

I-10 healthy interior performance: The intent of this Imperative is to demonstrate ongoing high-quality indoor air and a healthy indoor environment.

I-11 access to nature: The intent of this Imperative is to provide opportunities for project occupants to directly connect to nature, and to assess the success of the Health + Happiness Imperatives.

Equity

The intent of the Equity Petal is to elevate equity as a project goal, and to transform developments to foster a just and inclusive community that enables all people to participate, prosper, and reach their full potential. It is grounded in the belief that a society that embraces and engages all sectors of humanity and allows the dignity of equal access and fair treatment is a civilization in the best position to make decisions that protect and restore the natural environment that sustains all of us.

I-17 Universal Access: The intent of this Imperative is to allow equitable access to, and protections from negative impacts resulting from the development of, Living Building projects. This includes how the buildings relate with its surrounding buildings and environment.

I-18 Inclusion: The intent of this Imperative is to help create stable, safe, and high-paying job opportunities for people in the local community, and support local diverse businesses through hiring, purchasing, and workforce development practices.

Materials

The intent of the Materials Petal is to help create a materials economy that is non-toxic, ecologically restorative, and transparent. Throughout their life cycle, building materials are responsible for many adverse environmental issues, including personal illness, habitat and species loss, pollution, and resource depletion. The Imperatives in this section aim to remove the worst known offending materials and practices and to drive business toward a truly responsible materials economy. When impacts can be reduced but not eliminated, there is an obligation not only to offset the damaging consequences associated with the construction process, but also to strive for corrections in the industry itself. Over the past decade, the Red List has transformed the building industry from one where ingredients were held in secret to one where transparency is becoming the new normal.

I-12 Responsible Materials: The intent of this Imperative is to set a baseline for transparency, sustainable extraction, support of local industry and waste diversion for all projects.

I-13 Red List: The intent of this Imperative is to foster a transparent materials economy free of toxins and harmful chemicals.

I-14 Responsible Sourcing: The intent of this Imperative is to support sustainable extraction of materials and transparent labeling of products.

I-15 Living Economy Sourcing: The intent of this Imperative is to support local communities and businesses, while minimizing transportation impacts.

I-16 Net Positive Waste: The intent of this Imperative is to integrate waste reduction into all phases of projects and to encourage imaginative reuse of salvaged “waste” materials.

Beauty

The intent of the Beauty Petal is to recognize the need for beauty and the connection to nature as a precursor to caring enough to preserve, conserve, and serve the greater good. As a society, we are often surrounded by ugly and inhumane physical environments. The key to creating beautiful buildings is to embrace a biophilic design process that emphasizes that people and nature are connected and the connection to place, climate, culture and community is crucial to creating a beautiful building.

I-19 Beauty and Biophilia: There are no current limitations to this Petal other than embracing our connection to nature and what we as a society choose to value.

I-20: Education and Inspiration: The intent of this Imperative is to provide educational materials about the operation and performance of the project to the occupants and the public in order to share successful solutions and catalyze broader change

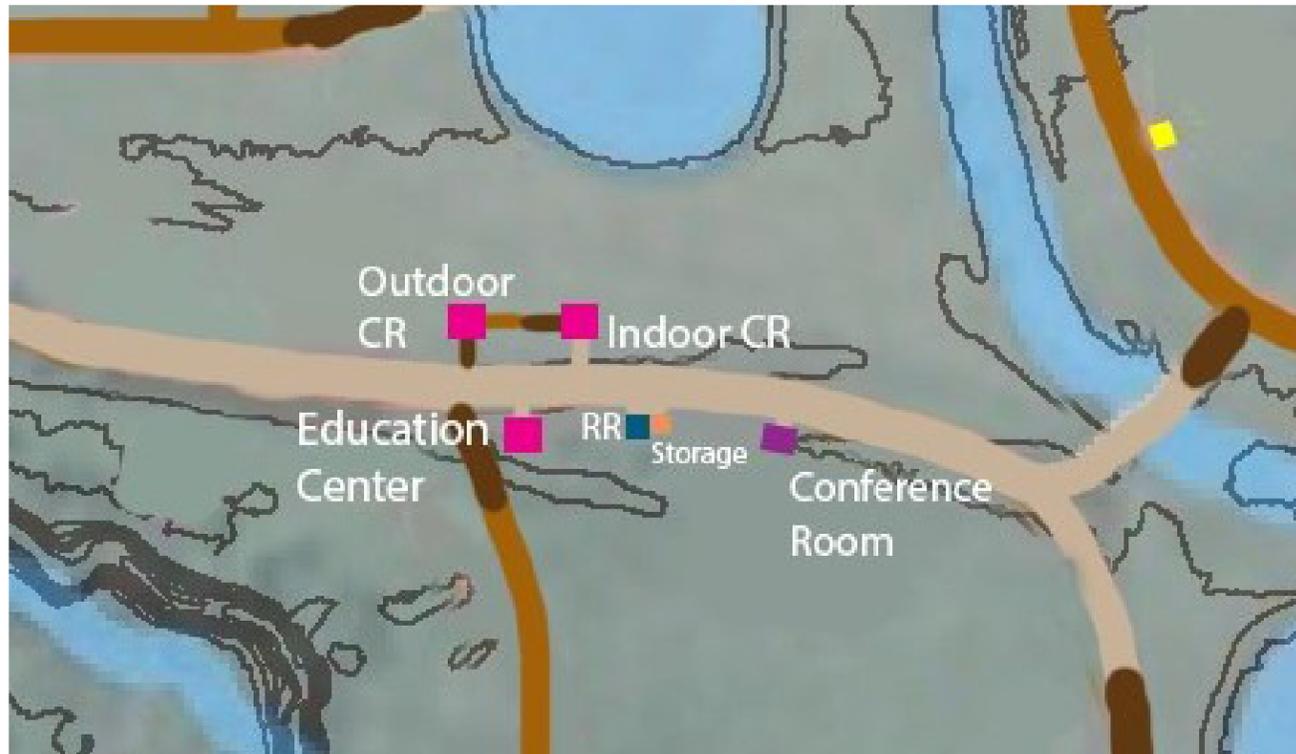


FOUR

TEAM MASTER
PLANS

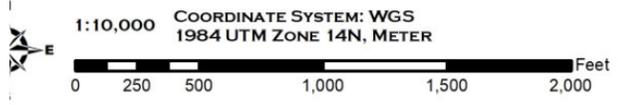
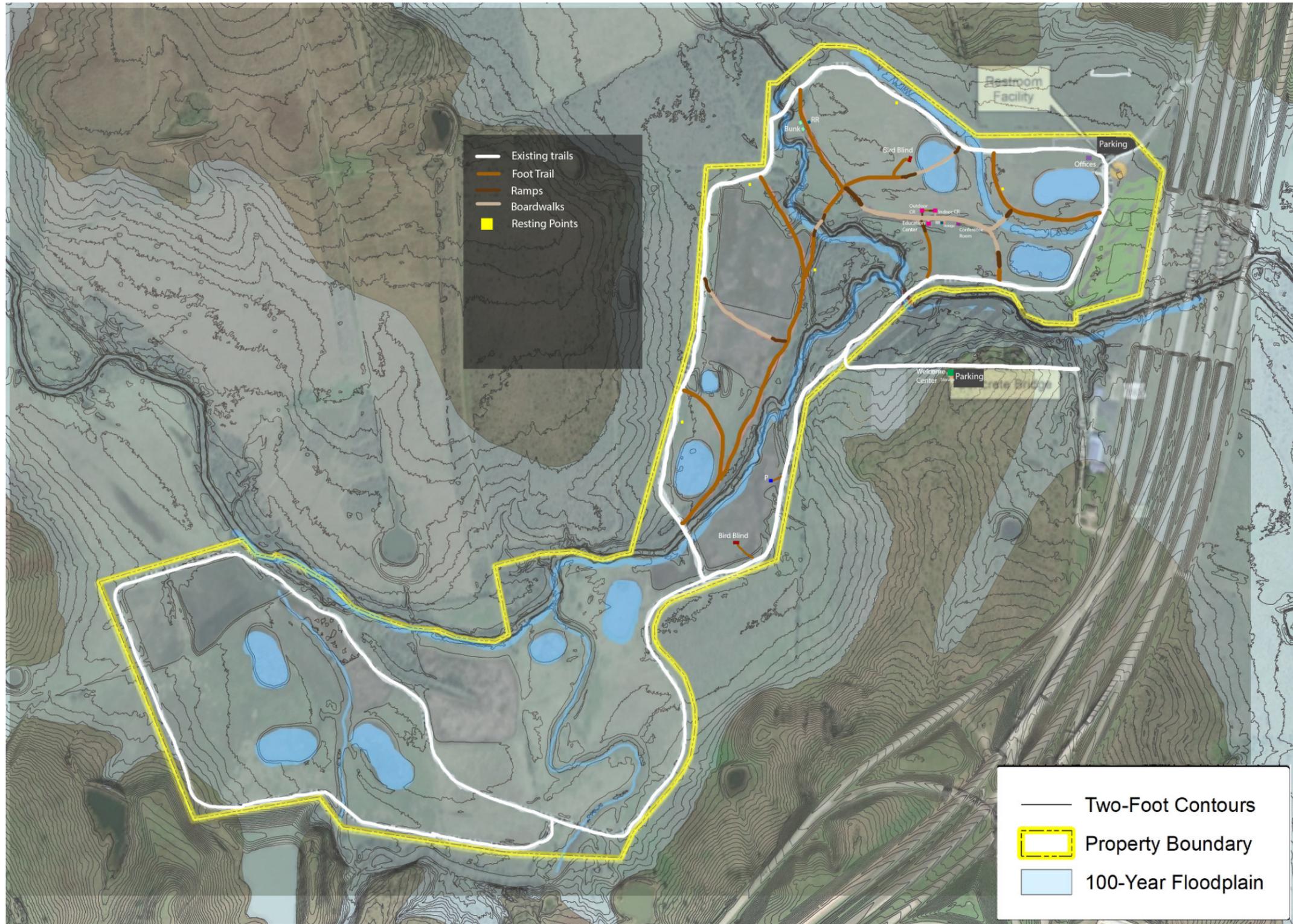
Team 1

Nancy Caballero, Eva Martinez, Josue Cespedes



Description

This proposal unites the essence of nature with the experience by developing several structures throughout the site, allowing the visitors to walk to the establishments while experiencing the beauty of nature. The goal is to provide a space for community by bringing together the education buildings and the conference room at the center of the site, which becomes a meeting point for various groups to gather for different activities, but also a space for relaxation and privacy by placing the bunk houses and some outdoor patios in a more separated area where visitors can sit and admire the landscape and the natural sound. The bird blinds are also placed in a more isolated and quiet space where birds can be best seen and heard with the natural sound. Throughout the site, we have provided several spaces for resting allowing the visitors who go jogging or walking have somewhere to pause and gather, this resting points are located in different parts of the site which allows the visitor to experience the various landscapes of the site.

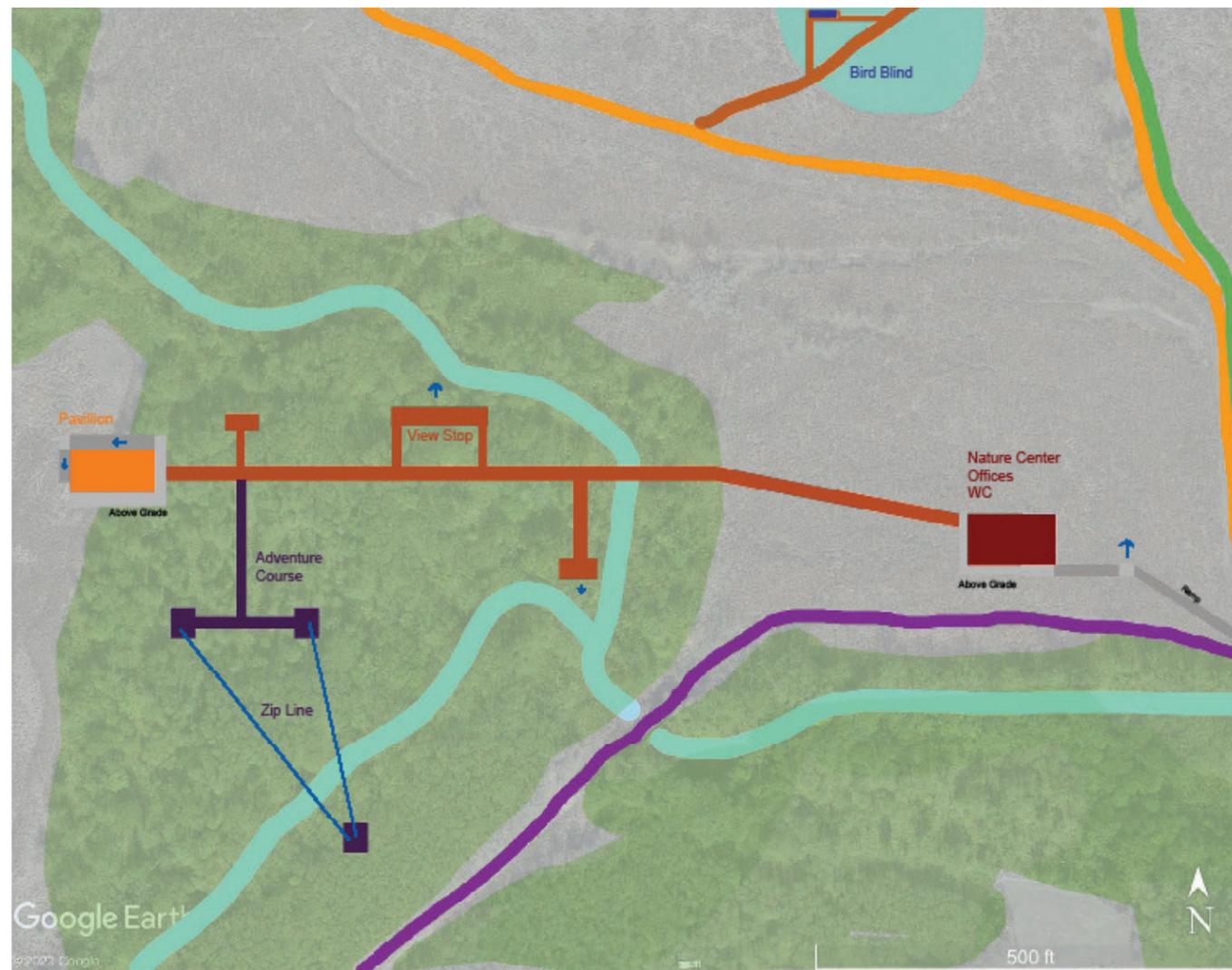


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,



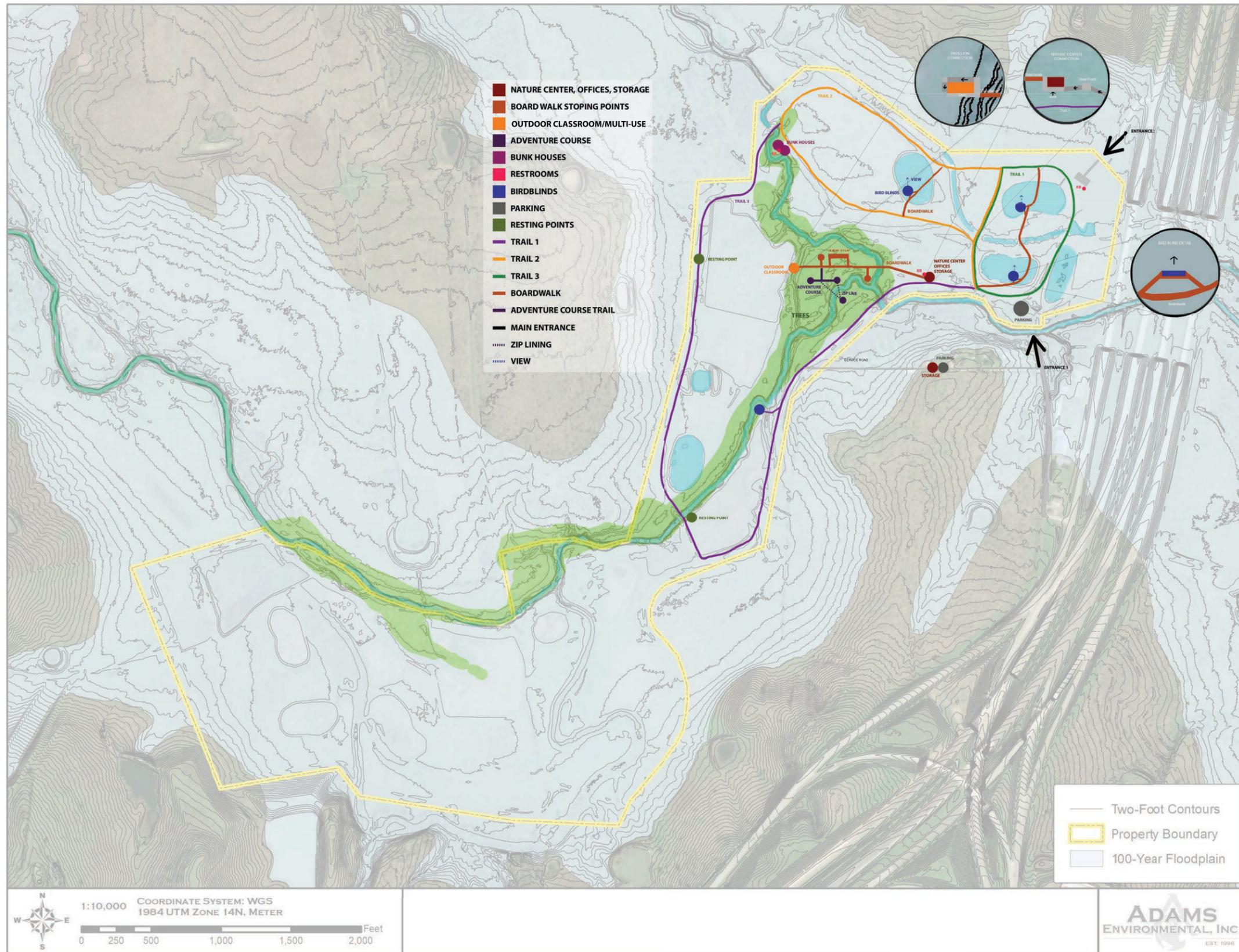
Team 2

Emma Schnelle, Chase Conn, Roxana Colocho



Description

The design of the visitor and staff facilities at the Plum Creek Wetland Preserve encourages human observation and educates visitors on the local ecology. Most of the program is placed in the central part of the site, adjacent to waterways, forests, and grassland regions, to encourage further exploration of the preserve. Raised boardwalks throughout the site guide the visitor to various significant areas that offer views of the landscape and biodiversity. This is accomplished through a regenerative design approach, aiming to preserve the natural wetland environment. Passive strategies are implemented throughout the buildings to reduce energy consumption. Healthy interior spaces establish a relationship with surrounding nature and foster a sense of well-being among visitors. These structures are carefully designed to have a minimal footprint on the site.



Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,

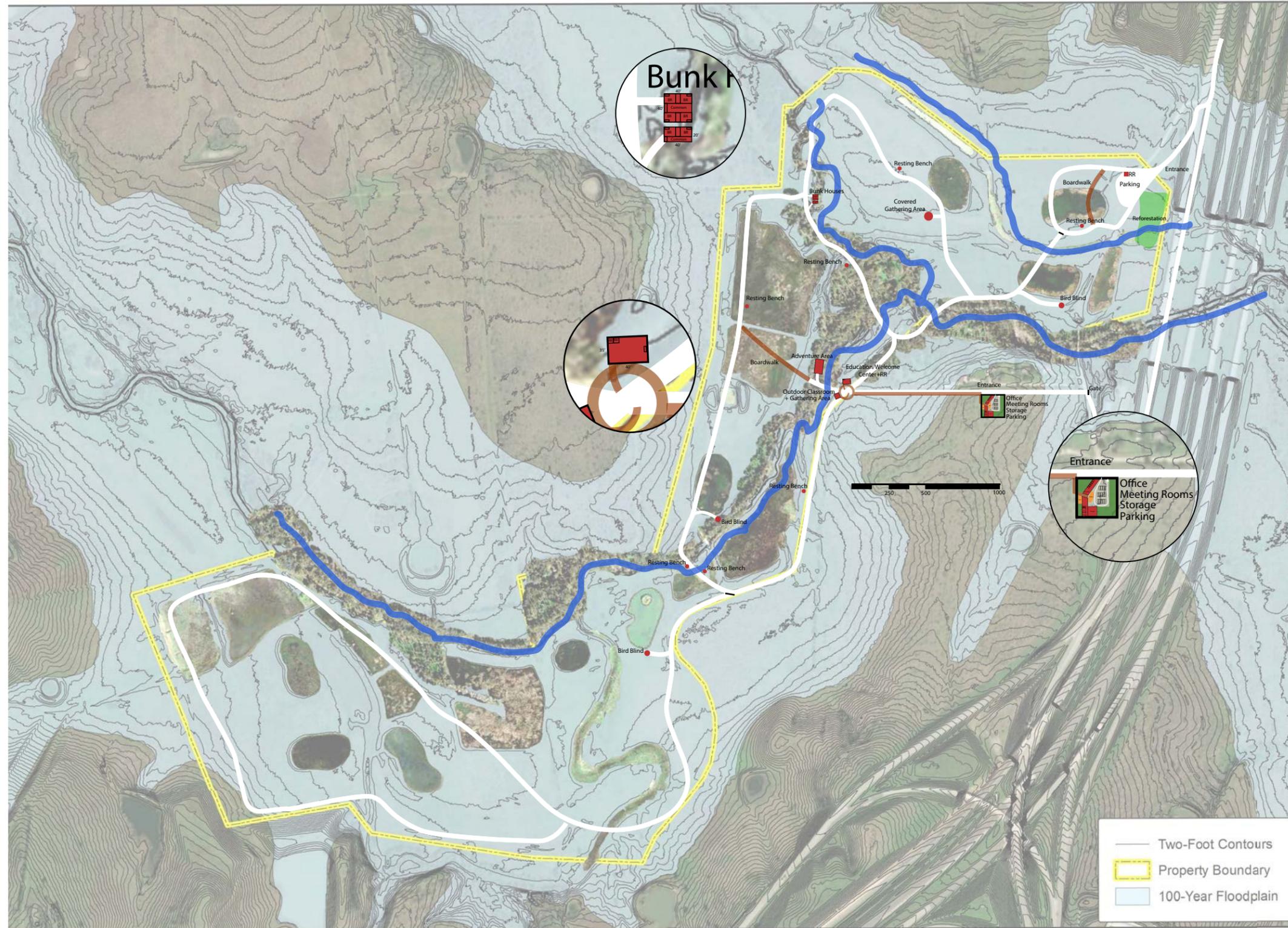
Team 3

Emma Duncan, Kyla Gonzalez, Rey Delgado



Description

In order to create an organic, interesting experience that relates to and connects the visitor(s) to the surrounding environment, we decided to form this experience in the shape of a flower. The entrance walkway, or "stem", leads the occupants through the threshold separating the busy commotion of traffic and everyday life, to a quiet, preserved environment. Once you cross the threshold and have stepped into this new world of trees and wildlife, you are welcomed by an unobtrusive office space surrounded by landscaping. The 'stem' leads the occupant to a focal circular walkway, the "pistil" or center of the flower, which not only provides a 360 view of the surrounding landscape, but serves as the connection between floor level and our elevated path. This central loop is where we housed our two main structures: the welcome center and the shaded outdoor classroom/gathering area. By placing these structures in the same area we are able to reduce our building footprint and unnecessary alteration of the site. The various trails extend out from this central loop, the same way flower petals do, creating a connection that allows for community interaction, guiding visitors through our site in a way that feels natural and enjoyable.



Team 4

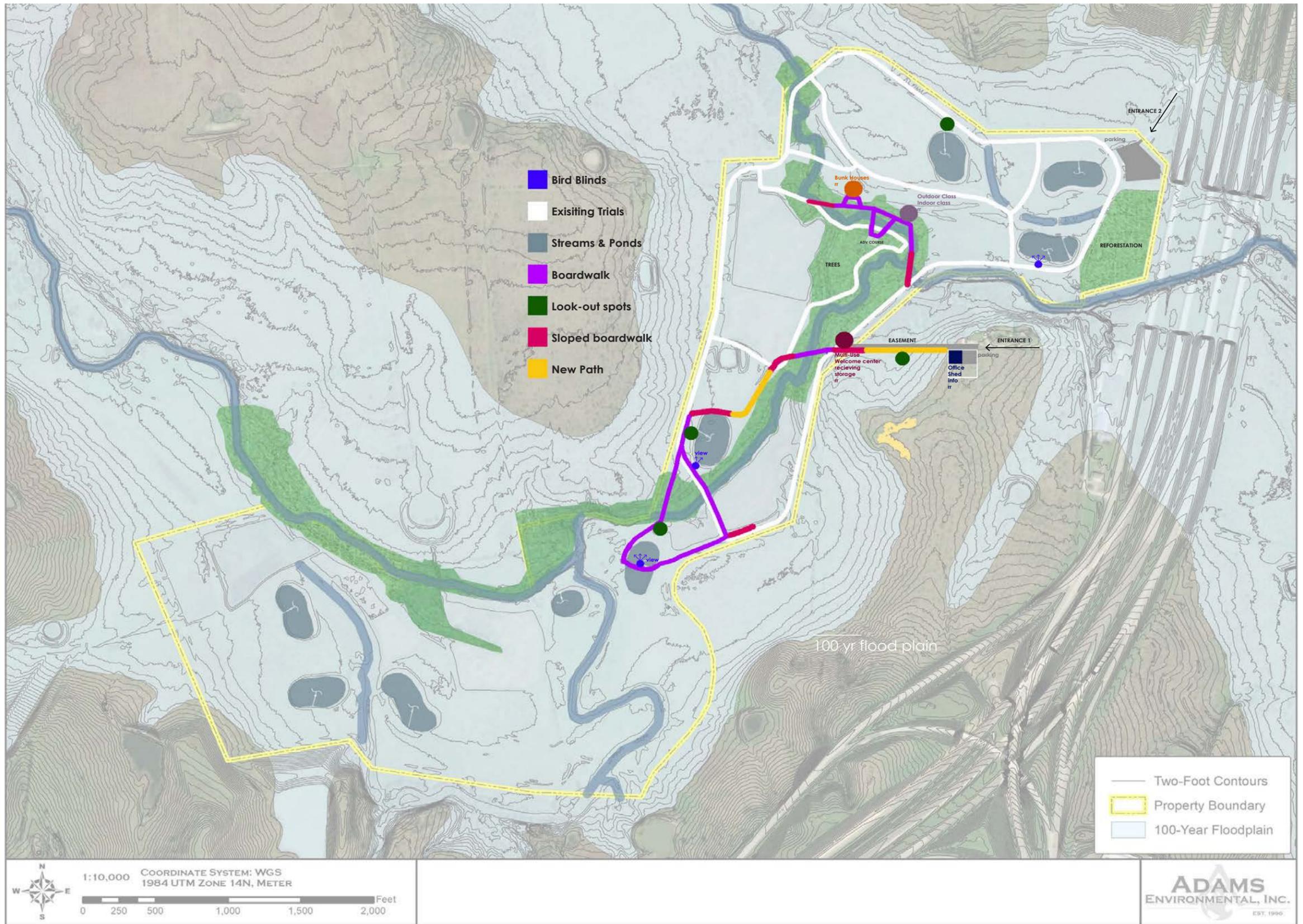
Asia Nolan, Emma James, Karina Martinez



Description

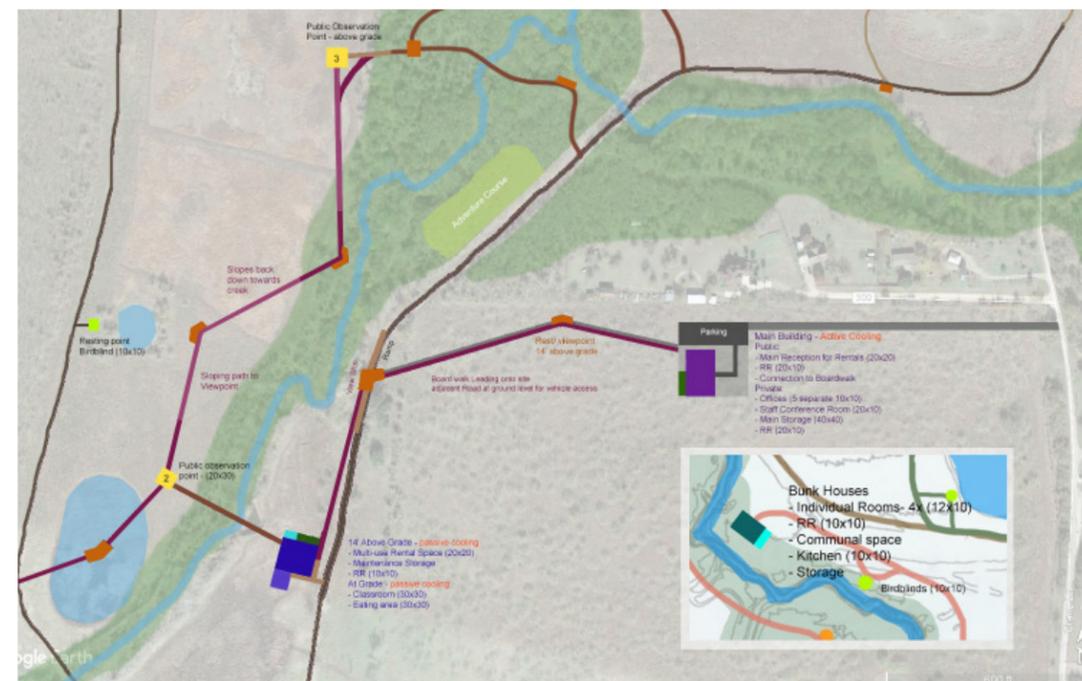
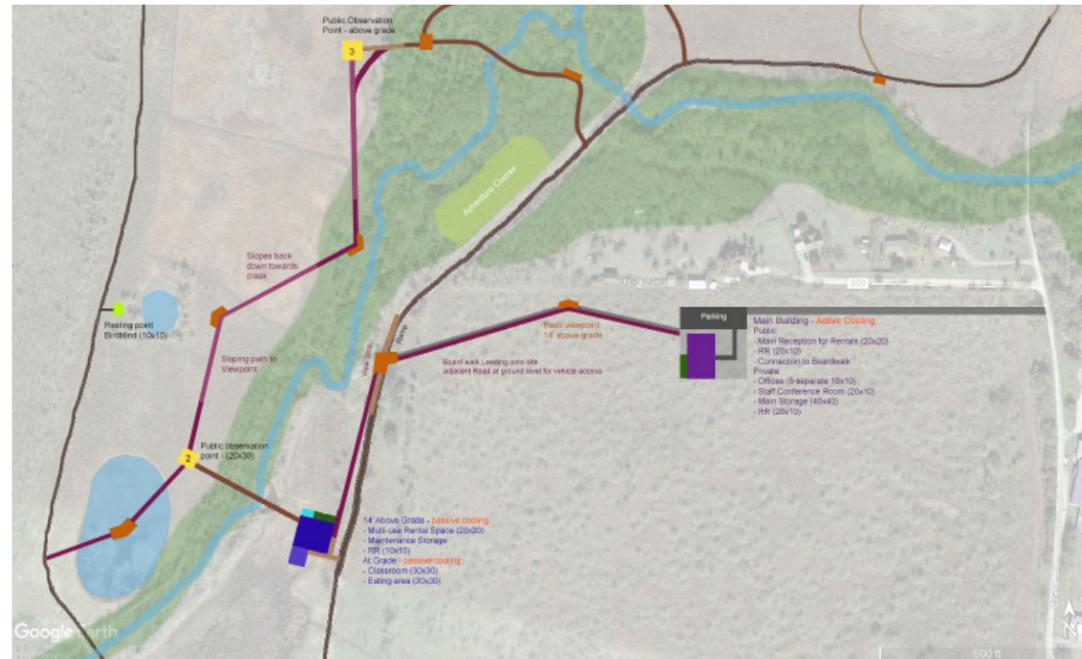
Upon arrival visitors will travel down a path where they will experience a transition from the urban city to the wetlands. Before entering the preserve, they will have the option to explore the wetland by walking the trails or getting on to the boardwalk. By connecting each building to one another through the boardwalk, the visitor can experience different habitats and wildlife within the preserve when traveling to a different building. Visitors will have access to various bird blinds and looking spots while on the boardwalk, along with opportunities to get off of the boardwalk and onto a trail. Following the creek north to the outdoor classroom provides a space for educational programs and demonstrations, from there visitors can retreat to the bunkhouses for an overnight stay which is located close by to the adventure course.





Team 5

Jessica Mosher, Manav Patel, Mariana Ramirez

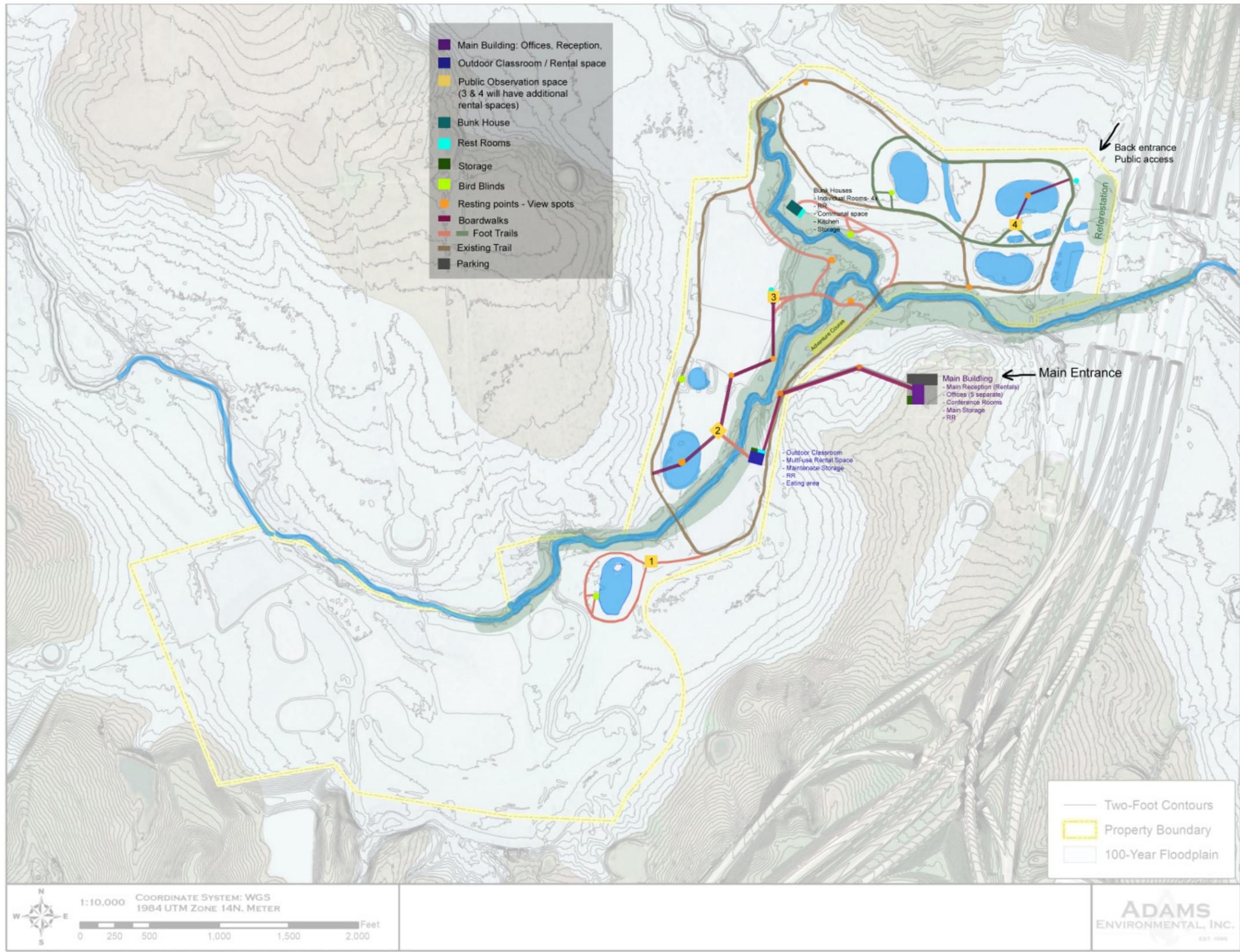


Description

The design of the nature center focuses on creating an educational environment for visitors, while also providing an immersive outdoor experience to promote and protect the ecology of the preserve. As the site features multiple types of environments, a key aspect of the design is to distribute public observation areas throughout the site to provide a more immersive experience for visitors. There are four main observation structures, each located in the different environments of the site with two featuring additional rental areas elevated above the floodplain.

The design also utilizes the donation site for the location of the welcome center building, which will house the offices, main public reception area, and the main storage for the site. A secondary building for the main rental space, outdoor classroom, and eating area will be located further onto the site and is connected to the welcome center by a boardwalk. Visitors can take the boardwalk directly to the site from the main building and go to the rental facility or go straight to the different trails that will explore the various landscapes of the site. Another extensive boardwalk will also connect two of the main observation points. It is designed to gradually slope upward to a vantage point, from which visitors can look out over the landscape.

In addition, the design will also encourage visitors to engage with the site, by providing facilities for recreational activities like hiking, camping, birdwatching, and picnicking. Bird blinds will be located along the trails in key locations of the site, and a bunkhouse for extended visits will be available further onto the site near the creek. By distributing the different observation points and activities, the design allows visitors to fully experience and appreciate the preserve while also being in an immersive and educational environment.



Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,

Team 6

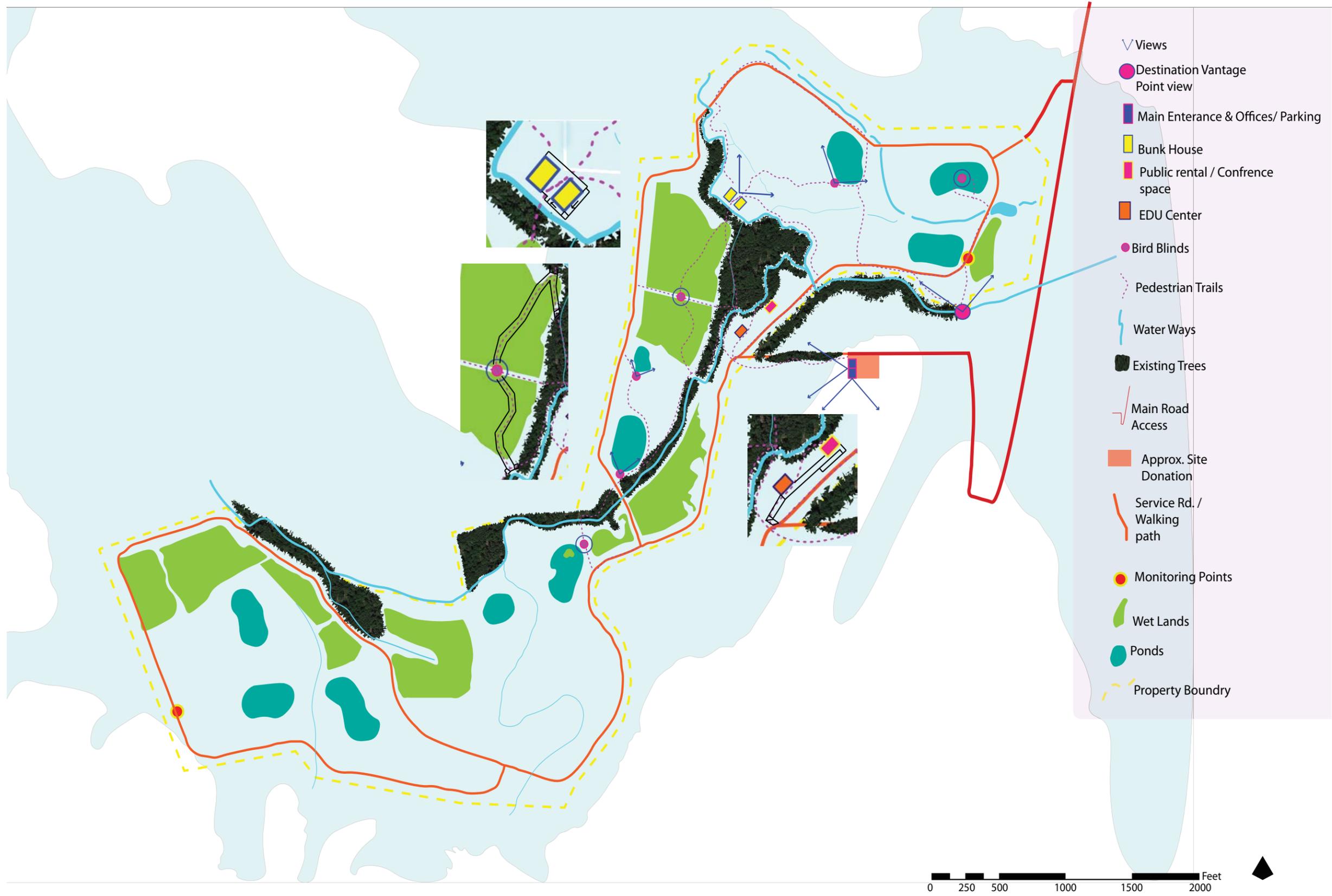
Gabriela Perez, Ryan Rodriguez, Romeo Perez

Description

Our goal with this design was to preserve, educate, and inspire the visitors to Plum Creek Wetlands Preserve. The placement of the Nature center on the donation space is to provide a pleasant reception with open ventilation by having a covering and deck for both visitors and staff. This will give the visitors a nice lounging area as it provides shade and creates an educational environment of the local plants and wildlife. Visitors will be encouraged to explore the trails with hopes of spotting local wildlife as they transition through a garden of the local ecology and engage the trail head as it becomes an inviting boardwalk.

Visitors entering the trails will experience up-close viewing of wildlife and vegetation by having boardwalks over sources of water, having designed bird-blinds in the ponds for engaging encounters. With an education center open to schools giving students an opportunity to study the ecology of the site and it's different ecosystems within the wetlands.

The motivation behind the trails is to inspire the visitors with an immersive experience and explore the various environments located throughout the wetlands. Explore the whole site by trekking a sequence of paths which will allow visitors to switch courses to see different regions and attractions.



- ∨ Views
- Destination Vantage Point view
- Main Entrance & Offices/ Parking
- Bunk House
- Public rental / Conference space
- EDU Center
- Bird Blinds
- - - Pedestrian Trails
- Water Ways
- Existing Trees
- Main Road Access
- Approx. Site Donation
- Service Rd. / Walking path
- Monitoring Points
- Wet Lands
- Ponds
- - - Property Boundry

