

Blue Hole Regional Park



Landscape Performance Benefits

- Protects 93 acres or 96% of the undisturbed area of the site, which was identified as potential habitat for 19 different endangered, threatened, or species of concern.
- Increased plant species richness by 17% with the addition of 31 ecologically valuable native hardwood, prairie grass, and forb species.
- Maintains or reduces stormwater runoff flow rates sitewide, despite the addition of 320,000 sf of new park development.
- Saves an estimated 600,000 gallons of potable water per month by using drought tolerant turf and on-site well water for recreation field irrigation. This results in an estimated annual cost savings of \$25,500.
- Saved approximately \$230,000 in mulch costs by double-shredding the trunks of invasive cedars removed from the site and using this to cover all designed mulch areas.
- Saved approximately \$40,000 by reusing excavated limestone found on-site instead of purchasing boulders.
- Improved user satisfaction with new park amenities by 165%, perceptions of safety by 101%, and perceptions of visual appeal by 75%, as compared to previous conditions.
- Increased visitation by 60% in the first year, generating an estimated \$112,000 in entry fee revenue. In the second year, visitation nearly doubled again to 31,000, generating an estimated \$217,000.

Designer

Design Workshop

Land Use

Park/Open space

Project Type

Park
Stream restoration

Location

100 Blue Hole Ln.
Wimberley, Texas 78676

Size

126 acres

Budget

\$3.45 million

Completion Date

Phase I: 2011; Phase II: 2012

Overview

Located in the heart of the rugged Texas Hill Country, the cool pristine waters of the "Blue Hole" have attracted local swimmers for decades. Threatened by development, the swimming hole and surrounding 126 acres were purchased in 2005 by the City of Wimberley to protect the beloved icon, which had nearly been "loved to death" by overuse, and to create a sustainable regional park. Informed by a stakeholder-led design process, the design team created a plan that protected and enhanced the site's ecologically sensitive areas, despite the addition of 320,000 sf of new park development. Today, the park offers an enhanced swimming hole, an extensive interpretive education program, and active recreation amenities for thousands of annual visitors.

Sustainable Features

- Impervious surfaces were limited to 7.8% of the site and 70% tree coverage was maintained even though an additional 320,000 sf of park amenities and active programmed space were added.
- 365 linear feet of the Cypress Creek streambank was stabilized (85% of total length) by amending soils and adding 5,300 sf of native cover vegetation (mostly grasses).
- Four designated limestone slab access points to the Blue Hole swimming area were created to allow users to climb into and out of the water without damaging tree roots or causing erosion of the streambank. The slabs were located by mapping informal use patterns.
- Ten microdetention ponds (rain gardens) connected by bioswales capture stormwater in eight

different drainage zones, slowing, infiltrating, and filtering the water before it enters the Cypress and Deer Creeks.

- A 5,100-gallon cistern collects rainwater from the Community Pavilion roof and recycles it for use in the restroom toilets. A 2,900-gallon cistern collects water from the office and bathhouse roofs and stores it for use in irrigating the entry garden during drought conditions.
- 100% of the new plantings are native to the region, including 7 species of hardwood trees and custom seed mixes of prairie grasses and forbs.
- To ensure resiliency against flash floods, soil composition and species were selected for quick plant material establishment, stone paving was mortared to a concrete base, and custom site furniture was anchored to a concrete slab.
- Park amenities include 4.6 miles of recreation trails, 50% of which are ADA accessible, and a connection to the regional Ann and Roy Butler Hike and Bike Trail.
- The tennis courts were strategically integrated into the site's natural topography below a steep bluff to minimize visual impact, provide adjacent slopes conducive to seating, and direct stormwater runoff into the bioswales.
- Indigenous materials were incorporated across the site to reflect the regional vernacular and to reduce economic and environmental costs. Limestone boulders, excavated during construction, were used for retaining walls, trail markers, seating features, and landscape accents. Invasive cedars trunks removed during landscape restoration were repurposed as bollards, fencing, tree stakes, light poles, and art features. Remaining cedar material was double shredded into mulch for the planting areas and soft-surface trails.
- Six nature-based playground features were made from re-purposed material found on-site: Limestone water play table with carved runnels and an interactive water source, cedar roots turned upside-down into "Cedar Teepees", balance beams made from old telephone phones, limestone slab climbing structures, and limestone slabs laid into the ground for hopscotch.
- Ten interpretive signs educate users about the sustainable design features, the geology of the Texas Hill Country (specifically Blue Hole), the history of the Blue Hole, and the native vegetation. Signs are placed in high-activity locations adjacent to the referenced feature.
- City taxes are not used for the park's economic survival. Long-term annual operation costs for maintenance and management are paid for by the park entrance fees and through an endowment created by the Friends of the Blue Hole, with assistance from the City and Design Workshop.

Challenge

Years of informal recreational use caused Blue Hole's banks to become overrun, compacted, and no longer able to support new vegetation growth, including native Cypress trees which help stabilize the banks. The design team was challenged to not only revive and protect this local treasure for future use, but to create a regional park that could accommodate new recreational amenities without compromising local ecosystems or the park's visual character and rugged Texas Hill Country appeal. Economic sustainability was crucial; construction and operations costs needed to fit within available and future funds, so as to not burden tax payers.

Solution

To restore Blue Hole's banks, invasive cedars were removed, a new understory was established, and limestone recreation access points were added to protect the cypress from further damage caused by swimmers. Through low-impact development principles and land sensitivity analysis, the design team minimized the impact on water quality and native flora and fauna by restricting new development to areas previously damaged by former agricultural use and by limiting impervious surfaces to less than 8% of the site -- a new precedent for parks in this area. To ensure signage and structures were in keeping with the design character of the Texas Hill Country, native stone and hardwood were used. To address economic stability, a custom Operations and Maintenance Plan was created to ensure the park remains fiscally sustainable for years to come.

Cost Comparison

- A prefabricated "typical" playground element cost \$46,700 for the equipment, installation, fall surface material, and drainage work. The total cost for the six "nature-based" play elements made from materials found on the site was \$102,350.

Lessons Learned

- A thorough public process that included community member input and stakeholder-led masterplan refinement allowed the design team to set very precise and measurable goals that better match the expectations of the citizens.

- When designing microdetention pools (including raingardens and bioswales), nuances in the physiological conditions of a site should be carefully considered. Due to large amounts of exposed limestone on site, percolation in the bioswales and raingardens is not happening as quickly as desired.
- When designing in areas susceptible to flash floods, it is important for vegetation and structural elements to be resilient to high-velocity flows and periods of submersion. The design team specified quick establishing deep-rooted vegetation, as well as mortaring stone paving and anchoring site furnishings to a concrete slab. Despite having been exposed to three 7' flash floods since installation, all trees, paving areas, and furnishings remain intact and unaffected.
- Educating stakeholders about the benefits of reusing materials harvested on site can improve understanding of and appreciation for the environmental and vernacular significance of this sustainable design practice.
- Planning for long-term maintenance during early design development allowed the design team to write the detailed Blue Hole Regional Park's Operations, Management, and Monitoring Plan (OM Plan), which included an additional 30% of construction cost maintenance endowment for the complete funding of site amenities outlined by stakeholders in the fundraising goals. The benefit of writing the OM Plan first instead of post-construction (as is typical for park management plans), was that the amenities were completely funded by the endowment.
- By closely monitoring the anticipated construction costs during each phase of design, though detailed cost estimates, the design and construction costs came in 16% lower than the City's anticipated budget of \$4.1 million.
- Prior to design, a species inventory was conducted to identify areas of potential habitat for endangered, threatened, and species of concern. Though none of the 19 species identified were observed on site during the assessment, at project onset it would have been beneficial to develop a long-term monitoring protocol to determine changes in species presence over time.
- Post-occupancy user surveys are a useful tool for assessing perceptions of design improvements. It is important to conduct a pre-construction user survey, as well as to develop a replicable survey protocol which can be administered at regular intervals, so as to measure long-term social performance.

Project Team

Client: City of Wimberley, Texas

Architect: Taniguchi Associates

Engineers: Baker-Aicklen, MJ Structures, PBS J

Contractor: TF Harper and Associates

Irrigation: James Pole

Additional consultants: Heather Venhaus, GreenPlay LLC, FEULS Inc., Walter P Moore, Moon Design, Lady Bird Johnson Wildflower Center

Role of the Landscape Architect

Design Workshop was retained by the City of Wimberley to provide park planning, landscape architecture, and environmental graphics from concept through full implementation. This included permitting, schematic design, design development, construction documentation, construction observation, and an Operations and Maintenance Plan, as well as designing the wayfinding and signage elements and a post-implementation website. Design Workshop also facilitated several stages of community outreach, as well as a stakeholder-led master plan refinement and design process aimed at ensuring that the design for the park balanced the needs of the community with the value of the historic Blue Hole and the surrounding ecosystems.

Case Study Prepared by:

Research Fellow: Jessica Canfield, Assistant Professor, Kansas State University

Research Assistant: Elise Fagan, MLA Candidate, Kansas State University

Firm Liaison: Allyson Mendenhall, Steven Spears, and Emily Risinger, Design Workshop

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References & Resources

Friends of Blue Hole

SITES 2009 Certified - One Star

Colorado ASLA Honor Award for Research and Communication, 2012

Texas ASLA Honor Award, 2011

Additional Images













