WONDROUS NATURAL TRAIL IN THE LOST RIVER CAVE

LA 395 Independent Study
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This document was produced by Jeongok Park for the Friends of the Lost River Cave, Bowling Green, Kentucky. It was developed in conjunction with the Spring 2020, LA 395 Independent Study.

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Project Abstract

The Friends of the Lost River Cave (FLRC) has been working on its long term management plan focusing on two themes, preserving the cave and its ecosystems from the menace of the city’s urban developments and providing the local children an educational nature play park. The 70 acres site property is playing the role of a nature sanctuary with significant natural and cultural histories in the urban city of Bowling Green, Kentucky. The karst cave in a valley supports unique ecosystems, and the rare prairie barren restoration site about 20 acres have been preserved. FLRC believes that this natural gift can provide the local children to engage and learn both natural and cultural assets of them.

To complement the FLRC’s resource management plan as an educational nature play park, two new additional designs are proposed, a new trail system in the prairie restoration site and an expended nature play area. First, the new trail system can provide not only access to the prairie site but also a connector to the existing valley, nature play area, wetland, and the Bowling Green’s Greenway. It also will serve visitors, volunteers, and maintenance groups a better walking and moving environment for their activities. Resting spots are proposed in a quarter-mile of interval along the new trail to provide adequate tree shades. An overlook area proposed at the high point of the prairie site will serve not only as one of the resting places with the view of the entire barren prairie site but also as an outdoor classroom incorporated with sitting stones inspired by Jen Jensen’s council ring.

Second, the expanded nature play area can allow children and their families to engage in nature, to learn about nature, and promote their physical and psychological health throughout playing with nature elements, soil, water, and living things. The constructed wetland is one of the efforts of the city’s stormwater management plan. Children and their families can learn the critical concept of the water cycle, wetland environment, and how plants and soil clean the water through playing in the expanded nature play area.
01. Project Background

Location

The Lost River Cave is located in the urban city, Bowling Green, Kentucky. Figure 1 is Warren County Map that shows the proximity of the city from major cities. The cave sits on the corner of the Nashville Rd and Dishman Lane. The Nashville Rd connects to the city’s downtown and Western Kentucky University in the north, and the Nashville, Tennessee in the south. The Dishman Lane connects the Cave Mill Rd on the east. Both roads have significant commercial areas with heavy traffics.

Figure 1. Warren County Map

The Bowling Green Greenway connects the local parks and natural places for promoting active lifestyles (Greenway, 2014) as shown with the green line in Figure 2. The Greenway passes through the center of the cave property.

Figure 2. City of Bowling Green and Lost River Cave Location (Data Source: USGS, 2016; KYFWR, 2016; KYTC, 2015; DGI, 1998; DGI, 2001; DGI, 2006; KYTC, 2017).
Protecting the cave from adjacent developments

Figure 3. City of Bowling Green and Landcover shows the land cover in 2016. The red area is representing the developed medium intensity to high intensity areas along the major roads, Nashville Rd, Scottsville Rd, and Russellville Rd.

Developing the city is beneficial for people and the community; on the other hand, expanding the city with developments can threaten nature in urban.

The Friends of the Lost River Cave foresaw the city's expended developed areas near to the cave, so they had decided to preserve the cave including supporting seven ecosystems intensively.

In 2001, they purchased an additional 42 acres then became about 70 acres sites. They started to plan for preserving and maintaining the cave, valley, and prairie area as an urban nature sanctuary (FLRC).
02. Inventory

EXISTING SITE AMENITY

The Lost River Cave, Inc., about 70 acres of the private urban preserve could be devised three areas,

• VALLEY
  the cave, blue holes, historic sites

• PRAIRIE RESTORATION
  opened barren prairie, exposed limestone bedrock area

• NATURE PLAY
  a visitor center, gift shop, parking lot outdoor classrooms, and wetland

The City’s Greenway passes through the center of the property, which is open to the public.
02. Inventory

SEVEN ECOSYSTEMS
Because of its geological, hydrology, topological characteristics, it has provided diverse ecosystems in the property. The valley including blue holes (Photo11) growing native wildflowers (bluebells, hepatica, and spring beauty) and native trees (tulip poplar, pawpaw, hickory, and elm) provides habitats for indigenous animals and migratory birds (SRI). Prairie site is restoring the Big Barrens of Kentucky, which has few remnants that still exist (SRI). It provides a unique value not only in supporting native habitats, birds, and butterflies, but also attracting biologists and tourists too (SRI). The karst cave supports the unique ecosystem for bacteria, crayfish, cavefish, and bats (FLRC).

Photo 11. Blue Hole in the valley forest
03. Analysis Map

Analysis

The accesses to the property are mainly three different places. The main entrance near the visitor center has a noticeable structure of the Lost River Cave (Photo1). The access point for only maintenance groups is located on Cave Mill Rd, and the client does not want visitors to use it, so it has been hide by thick fence trees. The accesses from outside of the property, from the Lost River Cave elementary and the Bark park, seem to need improvement for the better pedestrian experience.

The existing Greenway passing though the property is about 1 mile long, and it does not have any separations or resting spots during the trail until meeting the Cave Mill Rd. This trail is about 12 feet and allows bikes too (Greenway, 2014).

Along the Greenway, the valley area's view is good, but accesses are limited because of its steep slopes. On the other hand, the prairie restoration area is overexposed from the Dishman Lane road without any buffer or fence trees yet. The high point in the prairie restoration is the recommended site for an overlook area that can see the Greenway, prairie site, and the limestone bedrock outcrop area.

Legend

- Uncomfortable Crosswalk
- Unsafe & Uncomfortable Waking
- Possibility of applying safe Route to School Program
- Good Connection with Existing Greenway
- Noticeable Entryway
- Good Condition of Nature Play
- Good View
- Bowing Green Greenway
- Disconnected to its Downtown
- Unclear Road Entry to the Future Educational Center
- Limited Access to the Park from Adjacent Residential Areas (No Sidewalk / Entry)
- Crosswalk Signage at the Greenway
- Limited Access to the natural Wetland due to slope
- No Crosswalk & Sidewalk
- Many People Use this Unknown Gateway to Enter the Valley
- Limited Access to the Park from Adjacent Residential Area
- Exposed views and Noise from the Road
- Limited Access to the Park from Adjacent Residential Area
- Trail head
- Limited Access to the natural Wetland due to slope
- Crosswalk Signage
- Limited Access to the Park from Adjacent Residential Area
- No Crosswalk & Sidewalk
- Many People Use this Unknown Gateway to Enter the Valley
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- Many People Use this Unknown Gateway to Enter the Valley
- Limited Access to the Park from Adjacent Residential Area
- Exposed views and Noise from the Road

Figure 10. Analysis Map (Data Source: USGS, 2016; KYFWR, 2016; KYTC, 2015; DGI, 1998; DGI, 2001; DGI, 2006; KYTC, 2017).
Opportunities

The student designer was able to identify several opportunities for the prairie restoration site through the inventory and analysis of the site.

1. Potential Outdoor Learning: The constructed wetland and retention pond could be a great outdoor learning resources.

2. Potential Nature Play Expended: The existing nature play area could expand to the constructed wetland, an empty site, and further to the prairie restoration area.

3. Potential Overlook Area: Good resting place about the half of the trail, high point, good view of the site.

4. Potential Screening Tree Fence: Face on southern aspects to get more sunlight. Being exposed from Dishman Rd. To provide comfortable walking experience for visitors & volunteers, tree canopy is critical.

Figure 9. Opportunity Map (Data Source: USGS, 2016; KYFWR, 2016; KYTC, 2015; DGI, 1998; DGI, 2001; DGI, 2006; KYTC, 2017).
05. Concept

Legend
- Trail
- Flow
- Rest Spot
- Overlook
- Prairie Restoration Area
- Tree Area
- Meadow, Grass, Ornamental Plants
- Expanding Natural Play Area
- Safe Pedestrian Improvement Area

Concept 2

Legend
Trail
Flow
Rest Spot
Overlook
Prairie Restoration Area
Tree Area
Meadow, Grass, Ornamental Plants
Expanding Natural Play Area
Safe Pedestrian Improvement Area

Nashville Rd
Dishman Lane
Cave Mill Rd

Concept 2

Legend
Trail
Flow
Rest Spot
Overlook
Prairie Restoration Area
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Safe Pedestrian Improvement Area

Nashville Rd
Dishman Lane
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Legend
Trail
Flow
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Prairie Restoration Area
Tree Area
Meadow, Grass, Ornamental Plants
Expanding Natural Play Area
Safe Pedestrian Improvement Area

Nashville Rd
Dishman Lane
Cave Mill Rd
05. Concept

1. Improvement Access point
   - Connect to the existing of Greenway, valley of the cave, the nature play near wetland, and the prairie Area
   - Potential wayfinding & signage implementation area

2. Extending Nature Play Area
   - Better connecting to the wetland
   - Potential Eatable Forest with nature play elements
   - Diverse kids age groups /activities

3. Overlook Area
   - Jen Jensen’s Council Ring type seating area
   - Curb line indicating stone location representing topographic

4. Expending Nature Play Area
   - Utilize the WKU’s weather observation Area as educational opportunity for kids

5. Resting Area
   - Provide a overlook to the natural wetland below from the Greenway,

6. Pedestrian Improvement
   - Provide schools safe connection
   - Promote welcoming walk and bike experience

7. Future Open Space
   - Providing diverse family & regional events on the lawn surrounded thick trees canopy

8. Future Access Point
   - Providing opportunity to adjacent neighbors to utilized the Greenway and the prairie area often.

Overlook Inspiration
The client pointed out the potential overlook site, the high point in the area. The area has exposed by views from Dishman Rd, so it needs to be enclosed environment to have a cozy resting overlook place. Fence raw by trees might be better than structural fences. The student designer also proposes it with an outdoor classroom setting inspired by Jen Jensen’s council ring, and the client liked the idea too.

Photo15. Council Ring with Stones for resting & outdoor Learning
Legend

1. Visitor Center
2. Future Educational Center
3. Improved Trail Head
4. Maintenance Parking & Green House
5. Stepping Stone Wetland Play Area
6. Tree Canopy Outdoor Classroom Set
7. Council Ring Overlook Area
8. Outdoor Educational Play Area
9. Resting with Overlook to the wetland

Suggested Signage Location
06. Master Plan

**Expended Nature Play Area**
- Connected to existing wetland and Greenway (a)
- Supporting maintenance groups and volunteers by reorganizing parking space and greenhouse (b)
- Greenhouse utilize for preserve the barren paririe’s seeds and research purposes (c)
- Eatable Garden (d)
- Outdoor class setting with council ring (e)
- Promoting diverse physical activities in stepping stone, a play hill, and Tree walk area (f1, f2, f3)
- Considered universal design principle on trail (g)

**Prairie Restoration Overlook Area**
- Connected to existing Greenway & nature play area (h)
- Separated prairie restoration area with four different areas for future management plan (i)
- Outdoor class setting with council ring (j)
- Supporting maintenance groups and volunteers by resting spots and width enough for golf carts (k)
- Considered universal design principle on trail (l)
- Screen noise, views, pollutions from Road by Trees (m)
- Tree canopy along the proposed walking path for adequate shades (n)
07. Design Suggestions

The proposed outdoor classroom with the council ring at the overlook site in the prairie restoration site. The proposed fence raw with trees also the trees along the council ring layout could provide adequate shades for sitting, resting, and studying there. The site elevation change is not smooth, less than 4%, so that the overlook could be applied to the universal design concept for ADA access.
The proposed sand dust trail with the universal design principle for everybody can access. It connects to the existing Greenway, different resting spots, and various types of prairie areas along with the exposed limestone outcrop. However, to preserve the native barren species, this trail could be limited to access with pets or bikes by indicating signages. Despite the characteristic of the prairie environment, tree canopy along the nature trail is recommended for comfortable working experience.


Cover Page Photos


Photo 8. Lost River Cave


Page 25.

Photo 16. Tree Play. (N). Retrieved from https://www.londonplay.org.uk/content/30402/build_a_playspace/made_by_london_play/play_trees/play_trees

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Photo 21. Nature Play - Risk Management Retrieved from https://creaseymahannaturepreserve.networkforgood.com/events/16456-thrive-forest-school-fall-classroom-tour?fbclid=IwAR3PvgX3r-iwBROTQZoijTRvmKOxDzYguzsN5g6dEXPXo3Ig6H-IFFCtIDk


