2014

Berlovitz Woods Master Plan

AS PREPARED FOR THE TIPPECANNOE PARKS DEPARTMENT

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PURDUE UNIVERSITY – EDCI 506 | Final Project Report

Contents

0 Executive Summary

In a cooperative effort, Purdue University's EDCI 506 (Environmental Education) has coordinated with the Lafayette Parks Department in development of planning options for the under-utilized property known as Berlovitz Woods. In accordance with the educational goals of EDCI 506, this master plan was designed to provide a vehicle for broadly aged integrated learning experiences while still addressing the most general needs of the surrounding community and maintaining a desirable public experience.

The following report describes the overall property plan, detailing three primary focus areas. Consideration is given to all aspects of property improvements, however; attention is directed primarily toward the educational aspects, as this is the prescribed evaluative criteria, as dictated by EDCI 506. Brief mention of infrastructure, seasonal constraints and generalized implementation are also included. Most detailed images and design examples are referenced in the appendices.

1 Introduction

1.1 Background

Julius Berlovitz (1866-1933), an Austrian born immigrant who entered the United States in 1878, became a prominent Lafayette businessman while also operating a 1900 acre farming and livestock operation outside of the city. A 19.2 acre parcel of that agricultural land, located at the intersection of McCarty Lane and Veteran's Memorial Parkway, was donated to the Lafayette Parks Foundation in 2001 by descendants of Berlovitz. At this time, the property remains completely undeveloped.

1.2 Site Description

The parcel (approximately 1280 ft. x 620 ft.) originally consisted of a small pastoral block in the southeast corner, along with a mature woodland and small, approximately two acre wetland area in the northern portion. Currently, secondary-growth predominates with a variety of old-growth trees remaining, some in various states of decline. An abundance of invasives such as bush-honeysuckle and garlic mustard have become heavily entrenched into the undergrowth. Volunteers, including children's groups and members of the Purdue community, have contributed time and expertise over the last decade in an attempt to curtail the invasive problem, but efforts have been sporadic and progress, while positive, has been slow.

1.3 Goals and Objectives

The Lafayette Parks Foundation originally assembled a conceptual plan for the property in the early 2000s while numerous other groups have offered streams of potential development ideas over the years. Unfortunately, state funding never materialized to enact any of these plans and other priorities have since taken precedence. Meanwhile,

volunteers still battle invasives in the hope of reclaiming a usable property that will one day be recognized as a member of the city park system.

With the loss of all surrounding woodlands and the impending area conversion from agricultural to industrial use, it is important to consider maintenance of a locally accessible park representing the various aspects of natural environments lost to urban development. The area is nearby to residential subdivisions and numerous commercial attractions, providing a potential audience that is on the move and likely to be interested in a thoughtfully developed island of nature adrift in a sea of urban sprawl. Additionally, establishing links to the natural world in a society moving ever more deeply into its technological cocoon is of great importance for all age groups. This is especially true for today's children, many whom have been effectively insulated from many significant environmental interactions.

This master plan proposal intends to address development of the Berlovitz property into a park-like setting that will broadly appeal to a wide audience, offering particular focus toward educational opportunities, both for children and adults, readily incorporated into an overall pleasing and drawing aesthetic.

2 Master Plan

2.1 Plan Summary

To maximize appeal, the proposed park conversion of the wooded Berlovitz parcel addresses three primary focuses: recreation, exercise, and education. Public availability of recreational areas within increasingly urban environments is declining while peripheral residential developments continue to increase. The proximity of health care facilities lends the potential of a natural alliance in regard to promotion of exercise and general wellbeing through outdoor activities, easily promoted through the park atmosphere. The increasing school age population coupled with the decreasing availability of natural areas for self-discovery suggests effectively utilizing and garnering support for newly developed parks will necessitate maximizing benefits. Incorporating educational aspects into a setting while maintaining mass appeal can be readily accomplished in a property such as Berlovitz woods.

Recreation and exercise will coexist through a combination of walking trails and open areas, supporting both focused and casual property exploration. Information supporting effective use will be available through a number of channels. Education will focus both on individual and group learning, addressing issues relevant to an array of age groups. Extensive use of signage and multimedia support, along with expertly developed guidance for organized activities will support effective use of the resources.

It should be noted that the plan, as presented, has been conceptually established. Various boundaries, delineations and theme focuses have been arbitrarily assigned, as have trail mappings and infrastructure placements. Final decisions would be guided by thorough
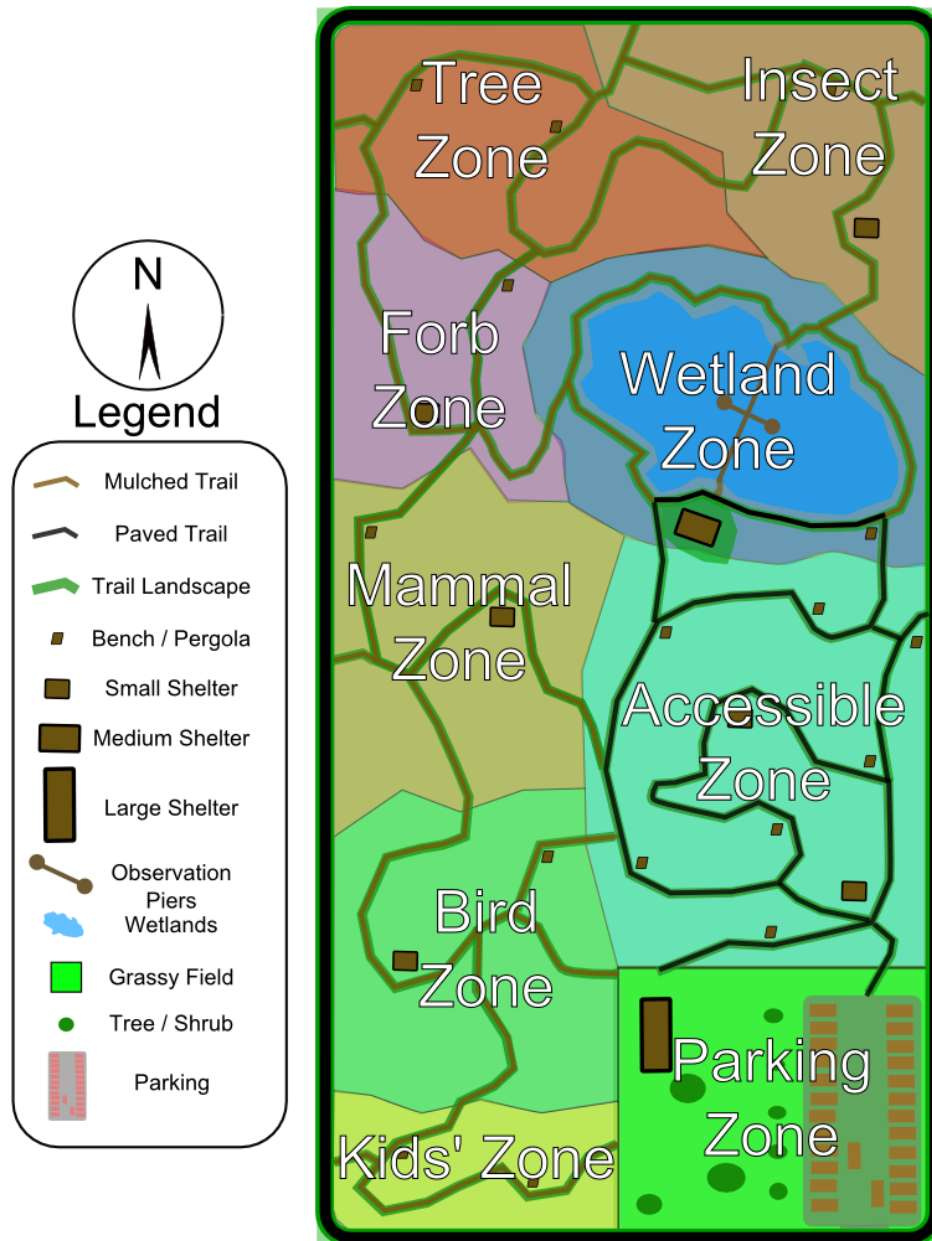
evaluation of site characteristics as well as minimization of environmental impact and development expenditures.

Conceptual imagery examples are included in Appendix 4.5.

2.2 Plan Targets

An overview of the proposed master plan is provided in Figure 3. Further details regarding development follow.

Figure 3. Master Plan Overview

2.2.1 Recreation and Relaxation

As a park, Berlovitz woods has adequate size to provide extensive casual walking trails, exposure to woodland and aquatic areas as well as typical park activities such as picnics and gatherings.

2.2.1.1 Recreation Areas

The southeast corner of the plan calls for a grassy clearing of the old pasture portion of the property, now severely overgrown. This area would accommodate road access and parking as well as provide an open recreation area for activities, picnics or informal sports. It is landscaped with large and small shade trees, providing a varied environment, and borders access trails into the wooded portion.

2.2.1.2 Walking Trails and Resting Areas

The walking trails traverse most areas of the park woods. While the trail system as illustrated in conceptual only, a final design considering local features and environmental impacts should follow a similar layout. A primary trail will wind through and around the woods, intersecting with numerous shorter forks, providing access to and from the exterior and other park areas. The trail system will encircle the wetland area as well, providing access to a walking bridge over the water affording the best vantage point from which to view the related wildlife.

The portion of the park just north of the parking area accesses a paved trail system, providing woodland access to those with mobility limitations or other restrictions, such as strollers. All of the internal trails will provide some seating areas, such as benches, tables, and gazebos as well as small clearings that may be used to rest or otherwise relax and unwind. This accessible area will provide an increased number of such areas for patrons.

2.2.1.3 Gathering Areas

Gathering areas will be placed throughout the park for picnics. A large shelter containing picnic tables will be located near the main entrance of the park. Smaller covered shelters will be located throughout in each zone for use by visitors. Small clearings may be provided along trails containing benches, water features or similar restful attractions. These support public rest areas, relaxation or reading and informal picnic or social gatherings.

2.2.2 Health and Fitness

With the proximity of the IU Health Arnett Hospital and the extensive subdivision developments to the northeast of this property, having a safe, contained area in which to engage in physical activity, whether walking, jogging, or just moving around out-of-doors is a great benefit. The hospital in particular may have use for a park-like setting to provide outdoor excursions for visiting families while also promoting general wellbeing through physical activity. Partnering opportunities may exist here as well.

2.2.2.1 Walking Trails

The general layout of Berlovitz woods lends itself to the idea of an encompassing walkway, following the perimeter of the woods. This walkway would be paved (asphalt or other) and wide enough to accommodate two-way foot traffic, both walking and jogging, while not impinging other potential uses. The smooth surface would accommodate strollers, scooters, wheelchairs, walkers and most other types of mobility assistance. High speed transport, such as bicycles and roller skates, as well as skate boards, would be discouraged or prohibited.

In addition to the perimeter walkway, the Accessible area (as shown in Figure 1) also provides an internal pathway that is also paved in a similar fashion to the external. This may provide sheltered access to walking, jogging or other means of movement as well as granting a more scenic environment to traverse. The internal walkway is of particular interest to those who are photosensitive or should otherwise avoid excessive sun exposure but still desire to engage in outdoor activities.

The remaining trails can also be used for causal activity, providing the most scenic views and long, winding paths to follow.

2.2.2.2 Signage and Support

In keeping with the health and fitness theme, signage would be incorporated to support users. Mile markers, fractional or otherwise, as well as reminders of proper technique, recommended exercise goals, health benefits, and interesting exercise or dietary facts can provide feedback and encouragement to participants. Online support can include trail maps, leg mileages, exercise routines and goals, dietary guidance, and general health coaching.

2.2.3 Environmental Education

To complete the plan for a multi-use property, incorporation of environmentally focused educational material and activities may be included in any or all of the above areas. The network of walking trails establishes an access framework for a guided sequence of learning opportunities, spread throughout the park. The types of activity will divide across two themes.

2.2.3.1 Informal or Self-Guided Education

The property, as a whole, may be subdivided into regions focusing on particular themes. This would both provide a wide array of presentable topics and entice interested patrons to actively seek out all areas of the park. In general, these "zones" will share a universal design in structure and presentation, with content variances suitable for particular topics. This will provide an easy to follow and coherent program for patrons, maximizing engagement. Certain zones may exhibit a number of special characteristics and, while still maintaining a cohesive design, warrant unique additions or treatments. These will be discussed separately.

A list of primary zones, along with some more specific educational topics, is given in Table 1. These topics are of general interest and may be modified according to local needs.

Table 1. Educational Zones and Topics

Zone Theme	Educational Topics
Tree	Species, bark, leaf, fruit information
	Wildlife uses
	Human uses
	Threats (insect, disease, etc.)
	Age and historical fact
Birding	Native bird species information
	Migration, nesting and feeding habits
	Threats
	QR codes linking to birdsongs and/or other AV
Small Mammal	Native species information
	Lifecycle, feeding information
	Threats and/or fun facts
Insects	Common woodland insect species
	Roles in lifecycle of forest (e.g. decomposition)
	Examples of infested trees with insect description/lifecycle
Forbs	Native plant species
	Role in forest succession
	Animal uses
	Threats from invasives
	Historic human uses (i.e. used to be used for…)
Wetlands	Wetland formation and lifecycle information
	Related wetland species information
	(e.g. Mammal, Bird, Amphibian, Insect, Tree)
	Wetland benefits
	Threats, pollution sources, etc.
Kids'	Colorful signage and/or markers
	Areas to directly interact, crawl in, climb on
	Features brought to their level (scaled down/lower)
	Incorporate some topography (small hills)
Accessible	Paved trails allowing wheelchair, scooter and walker access
	Connects parking area to wetland and adjacent areas through a dedicated zone
	Trails interconnect within zone so a quick return is possible
	Theming would be a sampling of all topics to allow exposure without requiring access to entire park

Implementation would be through use of signage, supplemented with multimedia technologies as appropriate. It is important to consider a low-tech base, such as permanent signage, to provide the simplest and most broadly receivable presentation. In addition, the physical presence and interaction coupled with a requirement to intermittently stop and focus can reduce the detachment that may result from purely technological presentations.

Examples of signage may be found in Appendix 4.3. Displays may be as simple as pointing out examples of local species, providing entertaining factoids or providing a simple question or task (e.g. "What species is the large silver tree behind you?" or "Wait quietly one minute: How many different birds to you hear?"). The tasks may be particularly suited to younger children, helping them engage with their surroundings. More complex displays, providing additional detail, background information, images, or multimedia links may also be used. Simple signs can serve as mile markers (at appropriate increments) while larger displays may be placed at locations best suited for exemplifying a point.

Effectively linking presented information with supporting multimedia may enhance a patron's experience. This can be accomplished in a number of ways and should provide accessibility to the widest audience. As handheld technologies are pervasive, utilizing QR-codes (quick response) or providing textual web-links may be the simplest. Another option would be providing downloadable access to relevant files that could be loaded on other media devices and utilized within the park. Providing access to printable (or preprinted) pamphlets may provide basic support in the absence of personal technologies. In-place audio or video is unlikely to be a viable long-term option. Provided adequate technical expertise, a complete smartphone app incorporating global positioning, audio and video prompted tour guidance as well as dynamic interactive content, customizable for seasonal changes, could be considered for future development.

Multimedia content should supplement the topic points, without overwhelming the user with extraneous information. It should also serve to bridge accessibility gaps. Audio narration for visually impaired patrons and alternative language text or narration for non-native speakers are primary examples. Beyond that, providing images and video to illustrate small, rare or otherwise difficult to observe items; audio to illustrate birdsong, mammal calls and insect sounds; directed links to additional background or further information for those interested; and assessment of interactive activities should be the goal of integrating technology.

An important aspect of maintaining educational engagement is to impose some accountability on the subject. In addition to providing informational materials throughout the park, questions should be posed to provide an exercisable outlet for the acquired knowledge. As mentioned above, questions may be posed on simple signs, scattered throughout the park, or they may be incorporated into the more complex displays, public structures or even electronically through supplemental online quizzes. Questions may range from simple identifications of sample species or factual recall of previously presented information to those that require making connections across topics (i.e. applying learned information to simple ecological or environmental

situations and predicting outcomes or identifying relationships). Feedback would depend upon the question type and complexity. Answers could be provided on the backs of signs, hidden under liftable flaps, provided at another location (to provide you time to think about an answer), via web links (QR-codes), or possibly through printed answer sheets for parents and others to use. Overall, a particular zone would follow its theme for providing and asking for information; however, occasionally interspersing questions from other zones (and indicating which) would serve to momentarily change focus and allow patrons to maintain perspective.

Three of the zones from table 1 provide for somewhat different opportunities. The Wetlands zone features a perimeter trail that encircles to wetland area. The goal is to get the patrons into the transition areas so differences in structure and composition may be appreciated. Visible access to the water and its potential wildlife is also important for maintaining engagement. In addition, a walking bridge across the marsh area, with potential walkout observation piers, is suggested. Placing the patron within an alternate environment demonstrates features and differences that may be overlooked from an external viewpoint. This also provides additional educational opportunities with an "up close and personal" focus; something that would be difficult otherwise.

The Kids' zone places focus on the needs and interests of younger children. Locating this area near the main park access allows easy utilization by parents with children without requiring extensive travel into the park complex. This area will focus on simplified presentations, utilizing colors, images and more tactile and interactive experiences. Plants and animals may be given playful names, animal or insect homes may be scaled to where a child can interact (e.g. a large nest, an aboveground burrow system, travel inside a tree), elevated mounds may provide outlets for physical activity, structures allowing climbing or crawling to access can create intrigue, a small pond with a clear acrylic walled dugout may provide insight into aquatic life; the options abound. Educational topics would be varied to maintain interest and questions should be straightforward while also considering multiple age groups. This area would link into another likely to be of interest to younger children (e.g. the Birding zone).

The Accessible zone, as described in section 2.2.2 and 3 above, provides access particularly to individuals unable to navigate traditional trails. As such, the educational aspects of this zone should also be varied. They may consist of a combination of established informational displays used elsewhere in the park as well as novel displays, only available within this zone. As many of the patrons in this area are likely to be either older or parents of very young children, some focus toward these groups should be considered in presenting material (e.g. historical facts, importance to future generations). In addition, the accessible nature of this zone partially overlaps with the Wetlands zone, specifically connecting to the bridge and a portion of the perimeter trail, providing access to the information and experiences they have to offer.

2.2.3.2 Structured Group Education

To address the needs of school groups, clubs or even families looking for more guidance, an array of structured educational activities may be made available through downloadable or other printed material. Such activities may focus on the topics of a particular zone, may span multiple regions of the park, or may progress toward more research related goals. Sets of activities may be divided by ages, allowing an adequate balance of comprehension and detail to be achieved. Grouping may be by school levels (primary, secondary, etc.) or by age groups (k-2, 3-4, etc.). Younger groups may engage in simple activities such as bird watching, leaf collection, or identification of shapes in nature. Advanced students may engage in more scientific activities such as water quality sampling, tree inventories, invasive species assessments, biomass and carbon cycling, soundscapes and noise pollution, or small scale watersheds, among others. Post-secondary and possibly citizen science needs could also be readily addressed. Some of the more advanced activities above may benefit from larger or more long-term data collection efforts. Combining the efforts of more dedicated or better trained observers could aid in producing useful research results.

Supporting materials would provide the group leaders (e.g. teachers, parents) with background information, relevance of the issue, ways to tie it into the local environment, procedures to carry out the activity, how to interpret the results, what they might mean, and questions to pose the groups regarding what may have been found. They would also include handouts, data sheets, simplified information for the participants, as well as sources of additional information for those interested. Appendix 4.4 provides some more detailed examples of structured activities. Expansion will be required for finished products.

2.3 Seasonal Considerations

Given the regional climate and potential for extreme weather, winter activities are anticipated at a minimum. Use of the walking trails, both internal and external, may be expected; as can certain seasonal activities, such as winter bird watching. Some educational activities may be adaptable to or custom designed for particular seasons (e.g. migration, timing of germination and flowering). At the least, some year-round consideration for snow removal and trail maintenance should be made.

2.4 Facilities and Infrastructure

2.4.1 Access and Parking

Park access may be directly from Veteran's Memorial Parkway or McCarty Lane. Parking is illustrated in the southeast corner, where pastureland was last present. This also adjoins the signaled intersection of the above roadways.

2.4.3 Structures and Equipment

2.4.3.1 Specialized Structures

Two specialized structures are envisioned within this plan. One is the aforementioned wetland bridge with potential observation piers. This may take a variety of forms, one of which is depicted in Appendix 4.5. The other is an observation tower placed within

the park. Such a tower would provide patrons the opportunity to view the forest system from multiple vantage points, increasing the appreciation for spatial relationships and the overall stratified nature of the park. Many patrons may have never have observed a tree or any other arboreal wildlife from anything but a terrestrial viewpoint. Such an experienced may be welcomed. Appendix 4.5 again depicts a sample structure.

2.4.3.2 Additional Considerations

In addition to the expected materials requirements of a park installation, two additional items should be mentioned. These are not a direct requirement but may be considered as supplemental support structures. One is a form of use monitoring. For the purpose of evaluating interest and use patterns, systems such a vehicle counters or video surveillance of the parking area may be beneficial. The latter, while more investment, provides the most flexible analysis of usage patterns as well as providing a means of security. The second is a sound barrier system. The traffic patterns, especially along the parkway, generate significant noise that permeates throughout the wooded area. This noise may prove distracting to visitors and also present potential issues with normal functioning of the forest ecosystem. Excess noise pollution primarily disrupts normal communication, defense, and mating behaviors. A potential solution, although costly, is erection of sound barriers (similar to those found along highway corridors) along the park perimeter adjoin the roadways. This may be camouflaged using a galvanized metal lattice and plantings of climbing vegetation. When mature, the appearance would be of greenery walls rather than concrete panels. The barrier would be best if overlapping sections were put in place; effective blocking most of the traffic noise but still allowing unfettered access to and from the park interior for both guests and wildlife.

3 Implementation

3.1 Phasing

Given the current property state and condition, significant work remains in controlling an overabundance of invasive species. Additionally, identification of forest features and evaluation of existing old growth for condition and safety will determine trail positioning and intensity of landscape modification required. Initial trail installation and basic parking facilities would complete the initial phases.

Installation of supporting structures, such as shelters, benches, tables and bridges would begin the secondary phases. Improvement of parking facilities and final paving of the required trails would also be expected. Concurrently, development and installation of supporting materials for education would be underway. This includes signage and web-based multimedia support.

Final phases would see completion of extensive educational activity plans, refinement of multimedia support, implementation of more advanced technologies, completion of complex interactive environments for younger children, as well as implementation of use monitoring systems (both quantitative and qualitative, as in usage surveys or user feedback).

3.2 Collaboration

3.2.1 Fundraising and Support

Functional ties to the local hospital with support provided toward patient families as well as staff members in the area of physical exercise, relaxation, and social gatherings may foster developmental or maintenance support toward the park. Local community members and local professionals and artisans may also provide voluntary support in both manpower and physical goods. Donated time and activities in support of development and/or execution of necessary activities or programs as well as professional donations such as design services, crafting of specialized park features (benches, signage, interactive features, etc.) should also be considered. Fostering public input helps to encourage community ownership of the project.

4 Appendices

4.1 Logic Model and Evaluation Plan

Logic Model

Planning	Implementation		Evaluation			
Inputs	Throughputs		Outputs	Outcomes		
Resources	Activities	Participants	Counts/ Feedback	Short-term	Mid-term	Long-term
Trails	Walking, hiking, running/jogging (some handicap accessible)	Community members, hospital employees and patients, local schools	Surveys, number tracker in parking lot	Returning to park to partake in the trails	Bring friends and other people to woods for trail use	Visit other parks with trails
Kid's Zone	Trails, play park, scaled features, environmental activities, ex travel inside a tree	Local children of the community, elementary students	Surveys, feedback from elementary teachers	Continue to utilize the activities the woods offers	Influence parents to become more environmental aware	Pursue environmental education in future
Canopy Tower	Offers different view of tree canopy and wetland	Community members, local schools	QR Scan Surveys, number counter on how many people go up	Visit the woods at different seasons to observe differences	Visits other parks/woods with towers	Further studies in canopy studies
Wetland Bridge	Offers opportunity to get a view of wetland from the middle of wetland area	Community members, school students	Surveys	Revisits the wetland at different times to observe differences	Bring friends or family members to study wetland	Study wetlands different wetland s in the Lafayette or surrounding areas
Environmental activities/trails educational packets	Environmental field activities for all ages (ex. Tree scavenger hunt)	School groups, boy scouts, girl scouts, youth groups, etc.	Teacher surveys, participant surveys, number of packet downloads	Continue to revisit the woods and partake in activities with different groups	Learn and partake in ways to positively impact the environment.	Students pursue environment studies in future careers

Evaluation Plan

Evaluation Question	Indicators	Data Sources	Tools (Assessments)	Design and Sampling
What do you want to know?	*How will you know it?*	*Who/what provides the data?*	*What will you use to gather the data?*	*When and from whom will the data be collected?*
The number of people use the trails	Observing the number of people visiting the woods and surveys taken by park visitors	Community members, hospital employees, patients, etc.	Vehicle counter in parking lot and security cameras	Monthly recording of park visitors
Frequency of environmental education packets downloaded/used	Monitor the times the activities are downloaded	Teachers, community group leaders	Surveys for use and website download counter	Yearly sampling of data collection from teachers surveys and website
Effectiveness of environmental education activities throughout the woods	Results from teacher surveys and participant surveys	Teachers, students, youth groups	Surveys on website and QR scan brief surveys	Surveys collected each time the activities are used
Use of Kid's Zone and Activities	The number of community younger children use of zone	Parents and their children of the community or children patients at hospital	Surveys, camera, and number counter	Data collected from children and their parents monthly

4.2 Tables and Maps

Overview of region

Topographic Overview
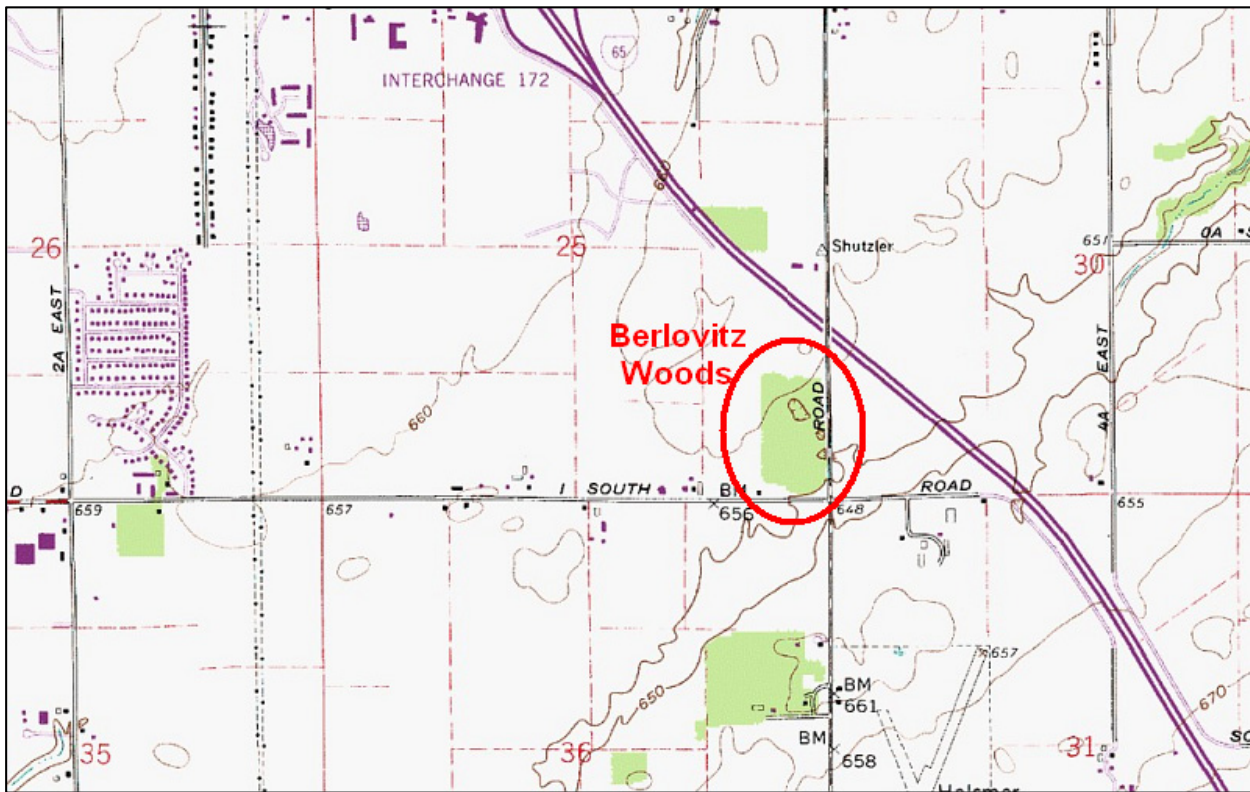
Winter and Summer Aerials

(Highlights extent of wetland coverage; top is north)

4.3 Signage

4.3.1 Trail Signage

Following are some examples of large and small scale trail signage providing information to visitors.

Large Trail Signage- Bird Zone Example

Barred Owl (Strix *varia*)

Species Range-
Barred owls are common across the eastern US and southern Canada, also extending into the Pacific northwest.

Habitat-
These birds are found in mixed forests with large trees and abundant snags. Unfragmented woodlands provide the best prey and shelter diversity.

Barred owls are nocturnal hunters that prey upon a number of small mammals, birds, reptiles, fish, and insects including voles, rabbits, Starlings, snakes, crayfish and large moths. An owl pair will maintain a one square mile territory for life, never migrating. They are mature at 2 years and may live in excess of 20 years. Primary threats to the Barred owl are predation by Great Horned owls and Northern Goshawks as well as human related deforestation and habitat fragmentation. Residential development and introduction of roads both reduces suitable habitat and increases car-owl collisions.

Additional Facts-
Males are 30% larger and do not sit on nests
Adults are 1-2.5 lbs. and 16-20" long with 39-44" wingspans
Females lay 2-3 white eggs from December to March
Incubation is 30 days
Nesting trees are white pine, red cedar, oaks and silver maples

Resources-
Mating Calls

Further Study

Large Trail Signage- Tree Zone Example

What is made from trees?

We're all familiar with forest products like lumber, furniture, and paper. But few of us realize how many different things we regularly use that are manufactured from trees. In fact more than 5,000 wood and paper products make our lives better each day.

Did you Know?
· Candles-tree gum can be used to make candles.
· Combs-wood pulp and cellulose can be used to make plastics.
· Football helmets-ethyl cellulose use for making impact-resistant plastics.
· Maple syrup- sap from trees.
· Shampoo-methylcellulose can be used to thicken shampoo and conditioner.

Large Trail Signage- Activity Example

Large Trail Signage- Exercise Example

Primary Small Signage- Tree Zone Example

Snags

Snags are dead trees that still stand within a forest. Since they no-longer grow, they are subject to insect and other decay activities, forming many holes and cavities. Many smaller animals and birds rely upon these cavities to make a home, making them an important part of the forest.

This tree used to be a large white oak but is now often home to a pair of Pileated Woodpeckers.

Translatable Text Link

How long does the Pileated Woodpecker live?

Primary Small Signage- Exercise Example

Mile Marker

0.7 Miles

Mile Marker

1.14 Miles

Running Tip:

Don't view stopping during runs as a failure. Use short break to build recovery and distance. Add extra miles by breaking them down into four parts with 30 second or 1 minute walks every 0.25 miles.

Running Tip:

Stretch well before each run/walk to prevent further injuries.

Signage References
> Barred Owl
> > http://www.sdakotabirds.com/species/maps/barred_owl_map.htm
> > http://www.allaboutbirds.org/guide/PHOTO/LARGE/barred_owl_granthickey1.jpg
> > http://cams.allaboutbirds.org/channel/43/Barred_Owls/
> > http://www.fcps.edu/islandcreekes/ecology/barred_owl.htm
> > http://www.in.gov/dnr/kids/5875.htm

4.4 Organized Activities

4.4.1 Students or Other Learning Groups

Following are some examples of learning activities suited for larger groups of students or groups. Some preparation will be required to successfully execute the activity.

4.4.1.1 Spatial Distribution of Species

- **Objectives**
  - Students will (1) identify differences in species diversity across various habitat types within the forest, (2) discern key factors that play a role in their success, and (3) learn to relate species distribution with environmental characteristics
- **Methods**
  - Time: 1 class period for background and to practice techniques, 1-3 hours in the field, 1-2 class periods to evaluate a discuss results
  - Note: Best suited for field trip or group outing were extra time is available (i.e. after school, weekend)
- **Materials**
  - Park Map
  - Data Collection, Plot Description Sheets
  - Magnetic Compass
  - Measuring Tape
  - Roll of Twine (with flag tied at desired length of plot radius)
  - Species (e.g. tree) Field Guide or Handouts
  - Camera (optional)
- **Background** (brief)
  - Forest environment may appear to be a random assortment of trees and plants with various birds, insects and animals but closer inspection reveals many subtle patterns as to what is present in a particular area and how areas flow into one another. Factors such as elevation, sun exposure, proximity to water, soil types, abutment to agricultural or urbanized areas all play a significant role in how suited an area is for supporting particular species. Some species may be very specialized for an extreme condition; being unable to survive in another extreme. Others may be more general, able to exist in a wide array of habitats.
  - When evaluating a large area, you initial observations may be limited to what is immediately in front of you. Often, too much available information may obscure the details of what exists. To overcome this, sampling is used to concentrate on much smaller areas, allowing you to filter out all the competing information. This way, you can focus your effort on identifying finer levels of detail, often uncovering information that was not immediately apparent.
  - Plot sampling uses multiple small plots of a given area to represent a much larger region. Each plot is analyzed in more detail than is realistically possible for the entire area. Simple plots are circles with a fixed radius. A distance is measured from a designated point. Anything falling with the measured distance is valid for data collection. Anything outside is ignored. The data from within the area represented by each plot may then be combined, averaged and scaled upward to represent the larger region.

- **Procedure** (basic steps)
  - o Prep
    - ▪ Brief students on the concept of how the environment (even one that appears to be very much the same, such as a park) consists of ecosystems that blend into one another. Have the students come up with examples of different ecosystems and how they vary from one another. Provide some information on how sampling may be used to investigate details in otherwise large areas.
    - ▪ Break students into groups of 3. One will take notes while the other two will perform measurements. The roles may be switched.
    - ▪ Have them become familiar with the compass and tape measure and how to read each properly. Have them set-up a sample plot and determine what to include and exclude.
  - o Field Activity
    - ▪ Provide a list of sample sites with directions from well-established landmarks (e.g. shelter, bench, trail fork) from which each group will collect data. Class should be distributed across a variety of habitat types; each group should complete at least two different habitat-types.
    - ▪ Have students identify plot location and fill in requested items on data collection and plot description sheets (see below)
    - ▪ Have them collect as many sites as time allows
    - ▪ Take photos of each site if possible; note photo number on data sheet
  - o Evaluation/Discussion
    - ▪ Have groups prepare a couple of paragraphs to compare and contrast the different habitats they encountered. They should reference their notes, drawings and photos.
    - ▪ Have the groups compile their species data into a spreadsheet. Have columns prepared and provide categories for habitat types and specific species to aid in comparisons.
    - ▪ Have the students identify differences between the different habitats (e.g. species types, numbers, sizes)
    - ▪ Students should discuss their findings with the class and come to a consensus.
    - ▪ They should compare the data findings with their observation paragraphs. Another paragraph should be generated to discuss how the data relates to their original findings.
- **Variations**
  - o Use data collected over several years at different locations to allow students to map habitat regions in the forest
  - o Have students discuss what characteristics make a species well-suited for a habitat and what might happen if the habitat begins to change.
  - o Utilize various species of interest (e.g. trees, plants, insects, invertebrates)
- **Evaluation**
  - o Discuss how adjoining habitats might differ and how that both helps and hurts competing species?
  - o Discuss how climate change may affect ecosystem habitats and what consequences that might bring to local species?

- o Discuss what might be expected to occur if a large forest tree is knocked down by a storm? What type of habitat change does this involve?
- **Example Plot Locations**
  - o #1)   Habitat A: SW corner of trail 5 Gazebo- 100 paces at 120 degrees
  - o #2)   Habitat A: Trail 4 and 7 fork- 75 paces at 37 degrees
  - o #3)   Habitat D: Large rock near trail 17 picnic table- 34 paces at 45 degrees the 56 paces at 13 degrees
  - o Plot locations should be approximate but get students into the correct habitat types
  - o Could use pseudo-random assignments from landmarks but care should be taken as to final destination
  - o Focus is not on measurement techniques but on collecting some useful data to evaluate

Data Collection Sheet (Trees) - Sample

Students					
Date					
Plot Number	Tree Species	Circumference	Alive/Dead	Canopy/Understory/Sapling	Notes

Plot Description Sheet - Sample

Plot Number	
Description	
Sketch of plot and surrounding area	

4.4.1.2 Exploring Nature with Different Senses
(Adapted from Project Learning Tree)

Using different senses is the basic way that everyone can collect information about the world around them. This activity has different sections so students can focus on one of their sense at the time and explore the nature in different ways.

- **Activity 1: The Shapes around Us**
  - **Overview**
    - In this activity, students learn to search for the shape and color around them from both natural and man-made objects.
  - **Objectives**
    - Students 1) experience nature in new way 2) learn to observe things actively 3) find more details in their surroundings 4) express their feeling
  - **Materials**
    - Papers, pen, Toilet paper tubes, glue, tape, papers (construction paper)
  - **Background**
    - nature is filled with different objects that have different shape, color and size like a tree that has a cylinder trunk and it leaves can be triangle shape, green in spring and summer but orange and yellow in the fall.
    - Eyes are responsible of the visual sense. The retina at the back of the eyes receives the light of an object and then you can see that object. Eyes are important and sensitive that can be protected in skull bones.
  - **Procedure**
    - The first step is asking students to go out and bring whatever they can, it can be pebble, soil, tree leaves, plastic.
    - Then engage them by asking them: what shape does it remind you of?
    - Can you find any other object that has the same shape?
    - Also you can pile all of the collected objects and ask students to categorize them to circle, triangle, square shape and then by size. Even students can make an object such as tree or house with the collected material.
  - **Shape walk**
    - A field walk helps students to have more interaction with nature. In this activity, students can choose one of the shape and then in their outdoor exploration, they should find 3 to four object with that shape or close to that shape. They can look for the shape that they chose and write a list of them or collect them. Students can be divided to group of three or four, students with different shape should be in each group, then they can go to shape walk in group and come back and give a report of their list.
  - **Shape acting**
    - The instructor can choose some of the collected object and then ask students to make that shape with their body, their hands, and their fingers or even in different situation like while students are sitting or lying or standing. Ask them to move like that object under the wind or in different season.
  - **Making binocular**
    - You can ask students to make their own binocular and use it to observe their surroundings.
    - Materials:
    - Toilet paper tubes, glue, tape, papers (construction paper)

- o making it is really easy and by gluing two tubes together and decorate it and adding some string to the side that help students to carry it easier.
- **Art activity**
  - o They can make a color print of leaves with different shapes or other natures on the paper.

Children's Binocular

- **Activity 2: Open Up Your Ears**
  - **Overview**
    - o In this activity, students are encouraged to listen to their surrounding and identify the source of different sound.
  - **Objective:**
    - o Students will 1) learn about different sources of sounds, 2) explore the nature through its sound 3) understand that things may not be seen but can be heard 4) listen actively
  - **Materials**
    - o Papers, pen, clipboard, soundscape sheet
  - **Background**
    - o There are a lot of sounds around us the sound of wind, birds, rain, and car. In each location we have combination of special sounds that exist there that will change during the time. This combination is called soundscape that is the inspiration for many musicians and artists.
    - o Sound is an energy that travels through a medium that can be air, liquid or solid and after it reached to the eardrum and then transfer through three small bones and then reach to the membrane.
    - o Sound has different characteristics like frequency and loudness (amplitude).

- o There are many reasons that animal use sounds. It is for communication, attracting mates, defending territories, navigation and warning. and also there are different ways that they produce sound, they can vocalize like many birds, or rub their body together like many insect or even some animals make sound by touching an object like many marine mammals slap the water that make the sound.
- **Procedure**
  - Sound walk
  - Sound walk is an outdoor activity that engages students into listening to different sound source. In this activity students will be taken to different sites and they listen while their eyes are closed. Students can carry their clipboard and the printed sound walk sheet (Appendix A) or even piece of paper to write different sources of sound. The instructor can explain that there are different sources of sound that can be classified to geophony, sound of natural but geophysical elements, biophony, sound of natural and biological elements and anthrophony, human made sounds.
  - Making sound
  - Students can share their experience of sound walk and then the instructor can ask them to make their favorite sound after the end of the sound walk.
  - Another related activity is asking students to collect nature and make different sound with them such as sound of rain, sound of wave.

- **Activity 3: Nature in Hand**
  - **Overview**
    - o In this activity, students use their sense of touch to explore the pattern and the softness or roughness of the surface in different material especially different tree trunk.
  - **Objectives**
    - o Students will 1) learn how to use and trust their sense of touch 2) use correct words to describe their feeling 3) explore their surroundings to be in touch in nature directly
  - **Materials**
    - o Papers, pen, clipboard, crayon, blindfold
  - **Procedure**
    - Imagine you are in a dark room, how can you find things or find your way? It is possible if you touch things around yourself. Different things have different texture, you can touch things by your hands and feel its texture when the nerve of your skin take the info to the brain. Even you can touch things with your feet. There are different receptors that are related to touching like heat, pain, cold and pressure that can give you alarm when you are in danger.
    - You can do either of these activities below to reach the objectives

- Use a shoebox as a mystery box and make a hole on the top and put different items in the box. Students cannot see what is inside the box and it is really interesting for them to explore it by putting their hand inside the shoebox and guess what they are touching.
- Use the blindfold for students and hand them different items, so they can guess what it is.

- **Hug the tree**
  o Take students out to a place that there are a couple of trees. Pair them up and ask one of them to wear blindfold, the other students should take the first one to a tree to hug.
  o the blindfolded student have time to touch the tree and find out the details through touching then they come back to the first place that they started and blindfolded students can take off their blindfold and they can look for their tree. They try to match different trees with the features they sensed through their touching the tree.

- **Texture walk**
  o The instructor can use some hula-hoop and put them in different location with different textures and items within them and ask each group to go to one of them and explore it with their eyes closed.

- **Art activity**
  - Rubbing activity is really good to show the texture to students, they can put their paper on bark of the tree or some leaves and rub their pencil to get the pattern of the surface of that shape.
  - Using sense of smell and taste can be added to this activity but it really depends to the age of audience and the area they are visiting.

- **Evaluation**
  o Discuss with students what they learned in each step? Which sense did they use differently today?
  o Discuss their outdoor experience and how it is different with indoor activities in term of using their senses?
  o Discuss how animals use the same sense to make sense of their environment?
  o Discuss with them how they can improve their senses?

- **Appendix A**
  - **Sound-walk sheet**

Name:
Date:
Soundscape: Type pf sounds
List all of the sound in your surrounding and put them in correct categories. List the location that you hear the sound e.g. it was close to the forest, or it was from road.
Keep a tally of every kind of sound you hear on your walk. What sound do you hear the most?

Natural Sound				Human made sound	
Biophony	**Tally**	**Geophony**	**Tally**	**Anthrophony**	**Tally**
Sound of frog		Sound of rain		Sound of motorcycle	

4.4.1.3 Tree Species Scavenger Hunt

- **Objectives**
  - Students will (1) identify different species of trees throughout the forest, (2) use a dichotomous key to identify trees, (3) discuss the importance of learning to identify trees.
- **Methods**
  - Time: 1 class period for introduction to field guides, 30 minutes in the field, 30 minutes to discuss identifying tree species by leaf shape using a field guide.
- **Materials**
  - Park Map
  - Species (e.g. tree) Field Guide or Handouts
  - Camera
  - iPad or iPhone with the application Leaf Snap
  - Dichotomous key
- **Background**
  - This lesson is meant to be a follow-up to a lesson on the basic terminology and concepts necessary for dendrology. Students should be taken to an area that has a variety of different tree species.
  - Explain to the students how dichotomous keys work and for each number they have two choices, if the students never worked with one before. Discuss

terms such as terminal buds, whorled, alternate branching, compound leaf, conifer, deciduous, simple leaf, palmate leaf, scaly needles, and spur branch.
- o Students should be able to work together in teams of two to find examples of leaves that meet the criteria determined by the instructor. For younger students these can be kept relatively simple and may include only one characteristic; for older or more advanced students the list may include multiple characteristics.

- **Procedure**
  - o Prep
    - ▪ Introduce students to tree species and field guides and how leaf shape can help identify tree species. Look at different compositions of leaves from different species of common trees of Indiana.
    - ▪ Break students into groups of 2 (groups of 3 students will work well too).
    - ▪ Have them become familiar with the Leaf Snap app or tree field guide before going out in park.
  - o Field Activity
    - ▪ Provide a list of tree species or different leaf types for students to collect pictures. The students can collect samples by taking photos on LEAF SNAP or with a camera, or by physically collecting the samples; teacher's decision.
    - ▪ Have students perform the scavenger hunt in groups.
    - ▪ Take photos or collect samples of each item on the scavenger hunt list to report back to classroom teacher.
  - o Evaluation/Discussion
    - ▪ Have groups share the photos or samples collected for the scavenger list.
    - ▪ Have the students identify differences between the different tree species. Ex. Compound vs. simple leaf tree species.
    - ▪ Review the use of field guides to students' advantages.
- **Variations**
  - o Use different scavenger hunt list depending on school age of children.
  - o Use a list of different tree species for the scavenger hunt.
- **Evaluation**
  - o Follow up quiz on leaf characteristics relating to tree species
  - o This can also be used as an alternative assessment.
    - ▪ Sample quiz
      Match these terms with the best definition.
      ___1. simple A. one leaf per node, alternating back and forth on the stem
      ___2. compound B. two leaves growing at the same node, directly across from one another
      ___3. whorled C. 3 or more leaves growing at same node
      ___4. opposite D. a leaf made up of one leaflet per petiole
      ___5. alternate E. a leaf made up of multiple leaflets per petiole

      Circle the correct response(s) for the samples shown to you.
      6. Simple or Compound 7. Alternate Opposite Whorled

8. Simple or Compound 9. Alternate Opposite Whorled
10. Simple or Compound 11. Alternate Opposite Whorled
12. Simple or Compound 13. Alternate Opposite Whorled
14. Simple or Compound 15. Alternate Opposite Whorled
16. Simple or Compound 17. Alternate Opposite Whorled
18. Simple or Compound 19. Alternate Opposite Whorled
20. Simple or Compound 21. Alternate Opposite Whorled
22. Simple or Compound 23. Alternate Opposite Whorled
24. Simple or Compound 25. Alternate Opposite Whorled
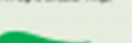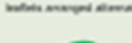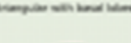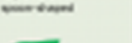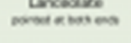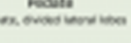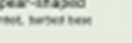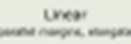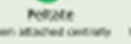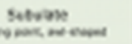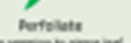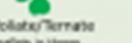
- **Example Scavenger Hunt List**
    o a leaf that has opposite arrangement
    o a leaf that has alternate arrangement
    o a leaf that is simple
    o a white oak
    o a leaf that is compound
    o a red maple
    o a leaf that is compound and opposite
    o a leaf with teeth and lobes
    o a leaf with entire margins
    o a pine
    o a silver maple
    o a tulip tree (state tree of Indiana)
    o a walnut
    o a red oak
    o a white pine
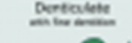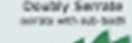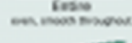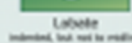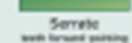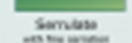
- **Field Guide**
    o If students do not have access to an iPad or iPhone with Leaf Snap, or a dichotomous key distribute the field guide to students.

SHAPE

MARGIN

VENATION

TREE IDENTIFICATION

1. Find A Leaf...
2. Hold It Up To The Chart Below...
3. What Kind Of Tree Did It Come From?

Loblolly Pine	White Oak	Sweetgum
Southern Red Oak	Redbud	Yellow Poplar
Hickory	Red Maple	Sycamore
American Holly	Sassafras	Dogwood

GEORGIA FORESTRY COMMISSION

4.5 Supporting Imagery

Perimeter Walking/Exercise Path

Paved Walking Trails

Wetland Bridge

Observation Tower

Sound Barrier

Before: After:

Imagery References

- http://images.summitpost.org/medium/750492.jpg
- http://bguadagni.blogspot.com/2013_09_01_archive.html
- http://www.fs.usda.gov/Internet/FSE_MEDIA/stelprdb5428538.jpg
- http://www.boutiquehotelspain.co.uk/content/puntosInteres/Wooden-bridge-in-the-Tablas-de-Daimiel-wetland-Daimiel_punto_16_00772_B.jpg
- http://www.eyeonmichigan.com/guides/eastgrandrapids/images/park_bigpic2.jpg
- http://cdn.athleticmindedtraveler.com/sites/athleticmindedtraveler.com/files/migrated/cities/_images/properties/rotterdam-72/workouts/818/het_park_path_2.JPG?1275423273
- http://www.forestryforum.com/gallery/albums/userpics/29497/Observation_tower.jpg
- http://peninsulatransportation.org/wp-content/uploads/2012/10/059.jpg
- http://www.acoustiguard.com/Noise-Barrier-Walls/
- http://www.clairepotterdesign.com/theecospot/2013/03/11/spotted-a-great-low-tech-green-walling-system/
- http://jakobwirerope.blogspot.com/