OBSTACLES IN PARADISE

Family Activities for Paradise Creek Nature Park

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ABSTRACT

Our team was assigned the task of designing a program for families visiting the newly opened Paradise Creek Nature Park in Portsmouth, Virginia. In correspondence with the Elizabeth River Project (ERP), our main objective was to design activities that facilitated a relationship between the community's families and the natural environment, while also encouraging team-building skills and knowledge of the local ecology. Although there is an overwhelming amount of talk about sustainability very few people actually act on it, let alone truly understand what it entails. It is this lack of knowledge and lack of appreciation for nature that is preventing our world from progressing and promoting environmentally friendly lifestyles, and that is exactly what our project of the Paradise Creek Nature Park intends to address.

We designed an obstacle course comprised of ten structures that family members can go through together while at the park. The structures are educational, in that most are based around interactions between native plant and animal species, are eco-friendly, in that they'd be built almost exclusively from natural and recycled materials, and encourage cooperation and communication between park visitors. This report details the ideas, influential sources, educational benefits, estimated costs, necessary materials, and basic construction processes associated with each structure.

After many changes in our view of the scope of the project, modifications to our timeline, and research on similar projects, we have managed to develop a design that we call "Obstacles in Paradise." We have provided ERP with ten structures that they may pick and choose from to add to their park. Our team reasoned that if ERP chose to adopt our project, they could begin by implementing the four best structures first and evaluate if those structures attracted more visitors and enhanced visitors' park experience. Once this evaluation period had passed, ERP could continue to add structures or stop construction with the initial four. Of course, before any building of structures could begin, we would need to acquire safety approval from the local government, advertise the obstacle course, recruit volunteers to help with construction, attain the needed materials, and plan seasonal events to continue to attract visitors.

Although we extensively researched obstacle course structures and thoughtfully designed ten unique structures that met our project's objectives, we could develop the project further. We currently lack knowledge of local building and safety regulations, and we have not seen the park aside from photographs, making visualizing a completed project difficult. With that said, our obstacle course provides ERP with a variety of ideas to consider for family visitor programming. Most importantly, we met our group's objectives of educating visitors and facilitating cooperation among visitors, with the core goal of deepening the relationship between park visitors and the local ecology. If visitors have memorable experiences in Paradise Creek Nature Park, ideally they would feel more connected with the natural environment and thus be more inclined to conserve and restore it. Ultimately, we hope that "Obstacles in Paradise," based on the ideas presented by Joshua Yates, will help to make "sustainability" less of a buzzword and more of a principle of our culture. After all, we live in a world in which, "…humans, as a species, are not just biological agents, but also geological agents," meaning our behavior shapes our environment, and thus we have the responsibility to maintain that environment for not only ourselves, but also the entirety of world species.[1]

I. Introduction

Our workshop's project addresses the need for family visitor programming at the new Paradise Creek Nature Park. The Elizabeth River Project (ERP) is a non-profit organization that was created in order to revitalize the Elizabeth River in the Chesapeake Bay. The first part of the project was to create the physical park, which was opened in December of 2012. The next phase aims to establish a relationship between humanity and nature by offering educational and recreational institutions within the site. By educating the

community members about their roles as stewards of the river and the environment, the park can be both a site of recreation and a site that responds to larger issues of sustainability and awareness. With that said, ERP needs our help to create family visitor programming, which will attract tourists and spark an engagement between the community and nature.

Our hope is to introduce interactive and creative learning activities that will show visitors the importance of community teamwork and natural conservation to foster their roles as stewards of natural resources. Furthermore, we aim to teach the visitors about the science of the present ecosystem, which will hopefully evoke compassion and appreciation for this natural site. By doing so, visitors will hopefully play a more active role in environmental protection and will be more conscious of how their actions are impacting the natural environment, which supports the broader goals of sustainability. Our society takes for granted the pleasures of our consumer society, yet if they are more aware of natural processes then they are more likely to make eco-friendly, resourceful, and proactive decisions.

The lecture given my Brandon Ballagee really inspired our work. Ballagee is a part of the ecological arts movement and creates trans-disciplinary work that is both aesthetically pleasing and informative for the public. One of his projects, "*The Malformed Amphibian Project"* consists of photographing and staining abnormal frogs. Ballagee writes, "As each photograph is intended to engage the viewer, simultaneously, each print is intended as a reliquary to a short-lived life."[2] His works are beautiful, yet also trigger a sense of empathy from the viewer and successfully reach out to a diverse group of communities. In our project we aim for the same sensitivity but rather than just making visual artwork we have chose to create interactive works. It is through this conscious outlook that community members will start to protect this park as an extension of their home.

The stakeholders in this project include those involved with the Elizabeth River Project, those who visit the park, and, most importantly, those who live in the community around the park and the Elizabeth River. We hope our family-oriented activities will positively affect stakeholders by increasing interest in the Paradise Creek Nature Park, the Elizabeth River Project, and their role in positively influencing the environment. The age-range of stakeholders is very broad, though we see this as positive because sustainability needs to be an inter-generational recognition of responsibility to care for and protect the world in which we live. Our hope is that by allowing park visitors to interact with nature and contribute to the restoration efforts, they will be inspired to continue visiting the park as well as assist with the goals of the Elizabeth River project. The upkeep of the park is a regenerative process, and while we want the visitors to enjoy an interactive trail through the park, we also want to inspire them to help. In the end, having invested stewards will be mutually beneficial for the community members, the site itself, and all while encouraging sustainability on a larger scale.

II. Activities and Obstacles

On the following page we have detailed ten different "obstacles" (stations) that our group is proposing to be installed throughout the Paradise Creek Nature Park as part of the family visitor program. We have included an explanation of each idea along with a description of the educational components, materials and cost estimates, and outside sources that may have been utilized for each station. Our hope is that Robin Dunbar and those at the Elizabeth River Project will look through these proposed ideas and select a few to construct throughout the Paradise Creek Nature Park.

We propose a phased installation of the different sites that follow. We recommend first installing three to four of the projects throughout the park and then adding one or two new installations per year (see Figure 1). It is also possible to replace installations from year to year, as new ideas are generated. We feel the

best way to implement this project would be to involve the community as much as possible. The different installations could be posted to the Paradise Creek Nature Park website and community members can then have the opportunity to go online and vote for their favorite ideas. This platform could further be used to generate donations and pledges for the different installations. This would be accomplished by having two buttons below the different ideas. The first button would be to simply vote while the second would be a pledge button that would encourage contributions. This information would establish a donor pool and could potentially help with the material and construction costs. This will generate greater community interaction with our obstacle course at the nature park.

We thought that an interactive, mostly natural obstacle course would be a fun way to bring visitors closer together with their family members and with nature. Most of the obstacles are based on facts about a native species, and all the obstacles encourage family members to work together and familiarize themselves with the environment. We decided on this design because nothing else seemed to equally meet our objectives of providing visitors with fun, structured activities and educating visitors about the local ecology. This obstacle course makes learning environmental facts entertaining, memorable, and understandable for a variety of visitors. It also gives visitors something to do when they go to the park, rather than just wander around, thereby promoting a deeper interaction between people and nature. Ideally, visitors will have good experiences on the obstacles and associate those positive feelings with the natural environment, and ultimately making them more inclined to participate in local conservation efforts.

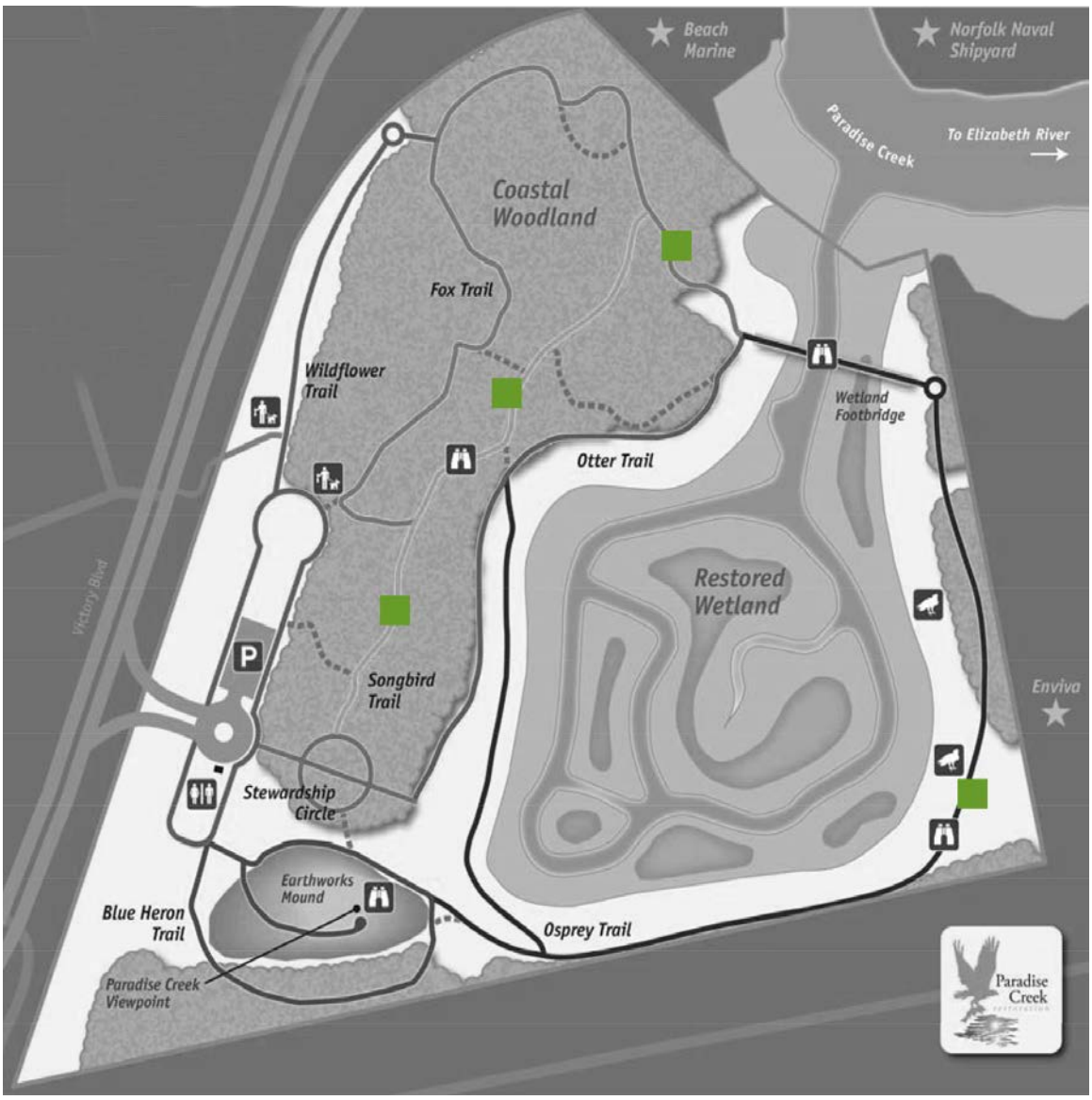

Figure 1. Representation of our beginning stage of "Obstacles in Paradise" if ERP decided to adopt our project. Pictured is a park map, with each green square indicating the location of an obstacle course structure? Certain obstacles need to be closer to the creek, while others had to be in a more forested area, which impacted our decision on structure location. In addition, the locations are spread out throughout the park, which will hopefully cause a visitor to travel through the entire site and get the entire experience of the creek.

1. Zebra Swallowtail and Paw Paw Structure

Idea: A large wooden cube with different ropes to climb on (Figure 1) with fake paw paw fruits (made from recycled materials, such as rubber) attached at random on the structure. This structure should resemble a paw paw plant, so if we could paint the rubber paw paw fruits and the wooden posts green, that would be ideal. We could plant a paw paw tree (Figure 2) at each of the structure's corners to further provide for imagery. To include some artwork, images of Zebra Swallowtail butterflies (Figure 3) could be painted onto the wooden posts that make up the base of the structure. We also came across some little butterflies made from old soda cans (Figure 4) that would be attached somewhere along the structure as well, so as to incorporate artwork made from recycled materials. The main idea is that the structure should resemble a group of paw paw plants and that the kids climbing on it can pretend to be Zebra Swallowtail butterflies that are resting on its leaves, laying their eggs, and preparing for flight.

Significance: The larvae of the Zebra Swallowtail butterfly exclusively feed on the leaves of paw paw plants. Although the Zebra Swallowtail butterflies eat only the leaves, the paw paw fruit is edible – in fact, it's the largest edible fruit native to the United States.

Cost Estimate

- 16 soda-can butterflies, 4 on each post: (16 x $1.50 each) + $0.50 shipping and handling = $24.50
- Main structure (estimates from www.homedepot.com): rope ($40 for 400 ft nylon rope) + posts ($0 trunks found in forest/donated + $10 water sealing stain = $10) + nails ($10) + rubber paw paw "fruits" ($0—rubber found in dump + made by volunteers) + green paint ($20) = $80
- Painted swallowtail butterflies: $0 (painted by volunteers)
- 4 paw paw plants: $0 (harvested from natural environment and transplanted by volunteers)

TOTAL COST ESTIMATE = $104.50

Construction Process: Once the materials are collected, volunteers could have 3 work days during which 1) The main structure could be assembled by installing the wooden posts in the ground, tying the rope framework together into a climbable design, and attaching the rope web to the posts with the nails (a supervisor would be needed for this day to ensure safety and proper assembly and stability of the structure) 2) Painting the wooden posts with water sealant, painting the posts green, painting on the swallowtail butterflies, making the paw paw fruits from rubber and attaching them to the rope web and 3) Planting the paw paw plants on the four corners and attaching the soda can butterflies to the posts with nails.

Source:

- Facts for the educational segment of this structure were found at: http://www.chesapeakebay.net/fieldguide/critter/paw_paw
- The recycled butterfly art pieces can be found and purchased from: http://www.etsy.com/listing/64975843/flirty-recycled-butterfly-magnet-great?ref=tre-4daefff648348eefde1bcb71-16
- The idea for the main structure can be found at: http://www.shutterstock.com/pic-75346414/stock-photo-jungle-gym-exercise-equipment-made-of-wood-and-ropes-in-a-playground.html

Figure 1

http://www.shutterstock.com/pic-75346414/stock-photo-jungle-gym-exercise-equipment-made-of-wood-and-ropes-in-a-playground.html

Figure 2

Paw Paw plant to base fake fruits off of
http://www.chesapeakebay.net/fieldguide/critter/paw_paw

Figure 3

Zebra Swallowtail Butterfly to base paintings on posts off of
http://www.chesapeakebay.net/fieldguide/critter/zebra_swallowtail

Figure 4

http://www.etsy.com/listing/64975843/flirty-recycled-butterfly-magnet-great?ref=tre-4daefff648348eefde1bcb71-16

2. Park Community Chalkboard

Idea: A large chalkboard could be installed along a walkway to encourage the creation of art surrounded by nature, with fellow community, and representing images of the natural environment. The chalkboard could also serve as a form of casual communication between park visitors and as a means to post news bulletins reflecting local environmental conservation movements, community garden workdays, ERP contact information, etc. Finally, the chalkboard could serve as a loose way to see if community members are using the park, such that the more artwork present on the board, the more people seemingly walk through the obstacle course area.

Significance: There would be no source of formal education here, but the chalkboard would serve as a great opportunity for art expression and conveying important community messages concerning Paradise Creek Nature Park and the local environment. It would definitely be feasible for an ERP official or volunteers to write a "fact of the week" about the local ecology in the middle of the board for people to read while they draw.

Cost Estimate:

- Plywood for board (8 ft x 16 ft) (www.homedepot.com) = $ 70
- Water sealant (www.homedepot.com) = $10
- Chalkboard paint (www.worldpaintsupply.com) = $17.00
- Chalk sticks (52 sticks) (www.waresdirect.com) = $6.00
- Lock box for chalk sticks (www.amazon.com) = $12.00

TOTAL COST ESTIMATE = $115.00

Construction: Volunteers could make this board easily in one day. The plywood board could be painted with the water sealant, shortly followed by the chalkboard paint. Volunteers could then prop the board up along a sturdy tree or two along the path between obstacles. The chalk sticks could be put in a lock box next to the board.

Source: The idea for the park community chalkboard comes straight from Charlottesville – a more rustic version of the slate chalkboard on the downtown mall:
http://preservationinpink.wordpress.com/2009/06/22/charlottesville-community-chalkboard/

Figure 1

Community chalkboard on the Downtown Mall in Charlottesville, VA
http://preservationinpink.wordpress.com/2009/06/22/charlottesville-community-chalkboard/

3. Nutria Balance

Idea: Participants must work together to balance on a large, wobbly board. If an edge hits the ground the team must start over. Everyone must be on opposite ends of the board (the shorter ends) by the end of the activity. As a safety precaution, no one can suddenly jump off the board, and when exiting during or at the end of the activity, everyone must exit off of one end.

Significance: The Nutria are an invasive species, brought over from South America beginning in the 1930s for their fur. Because they lack natural predators in North America, their population has boomed. They can eat up to 25% of their body weight a day in plant matter and so are especially destructive to the environment in large numbers. Therefore, while a few nutria in our ecosystem is sustainable, in large numbers they may tip the scale and throw the delicate balance of our ecology off (source: http://www.mdsg.umd.edu/issues/restoration/non-natives/workshop/nutria.html).

Cost Estimate:
- (15) 2" x 6" x 12' board = $127.5
- (3) 6 " 6 " x 12' board = $120
- box of 2.5" deck screws = $30
- (104) 2.5" x 5/16" galv. lag screws = $100
- (104) 5/16" galv. washers = $45
- (6) 8" x ½ " galv. lag screws = $10
- (6) ½" galv washers = $15

TOTAL COST ESTIMATE = $450 (prices based off of Lowe's)

Construction: See appendix for detailed diagram and instructions

Sources: Poplar Ridge at the University of Virginia has its very own balance board, known as the "Whale Watch." Contact program director John McCall at jwm3g@eservices.virginia.edu for an opportunity to discuss or visit.

Figure 1

http://www.uri.edu/ajc/wpines/images/teambuilding/team_06.jpg

Figure 2

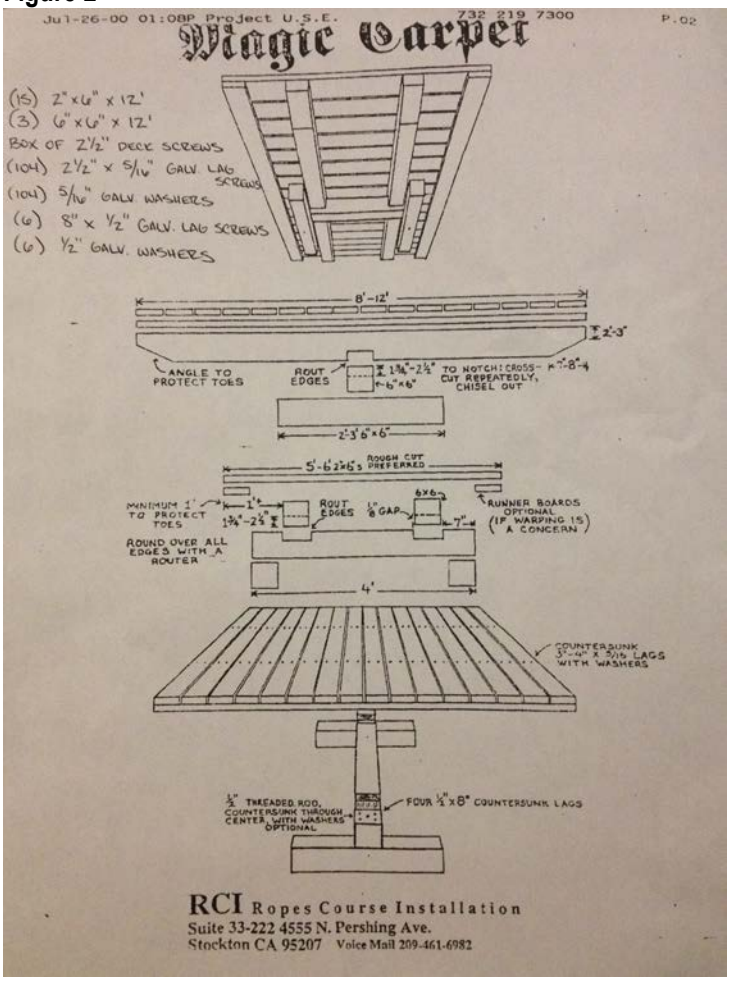

Diagram of possible construction process from the administrators of Poplar Ridge

4. Tree Knees

Idea: In this activity, there are 9 posts set up next to each other. One person stands on each post, leaving one empty in the middle (eight people total may participate). The left side is "team turtle" and the right side is "team snake". Each team must get everyone to the opposite side following the rules of "traffic jam" which are described in more detail on the source below.

Significance: Bald Cypress trees are notable for their "knees" that protrude from the ground that is part of their root system. Many animals survive in the swamps they are found in, including snakes and turtles as well as bees, ducks and owls. They can grow up to 100 feet tall
(source http://www.chesapeakebay.net/fieldguide/critter/bald_cypress)

Cost Estimate:
9 stylized stumps. Estimate around $7. Contact T.C. Sculptors at http://www.stumpcarver.com for quotes.
TOTAL COST ESTIMATE = $630

Construction: Acquire nine tree stumps, hire professional stump/wood carver to design in approximate shape of cypress tree knee. Place into ground in a half moon shape approximately one foot apart.

Source: http://www.ventureteambuilding.co.uk/traffic_jam.html Gives more detail on how the activity is played.

Figure 1

Bald Cypress tree with knees
http://www.floridastateparks.org/oleno/img/photogallery/original/oln-baldcypressknees-dominickmartino.jpg

Figure 2

Example of “traffic jam” game in action
http://www.pa.org/zencart/images/18368.trafficjam.jpg

5. Log Activity

Idea: The primary structure for this activity would consist of a row of elevated horizontally placed logs or poles. Park goers would be encouraged to navigate through these logs or poles by playing the parts of various woodland animals. Park goers could play the part of a squirrel and hop from one log to the next, testing their agility and balance. Another way to experience this activity would be to “become a snake” and slither your way under one log and then over the next, alternating down the row. Yet another way to navigate through would be by crawling under the entire row of logs, playing the part of a mouse that skitters around under the brush.

Significance: This activity would help to change the perspective of the park goer as they switch from animal to animal. The activity would show people how animals move through nature and how important their natural environments are, while at the same time helping to teach people about the biodiversity that inhabits their surroundings. This activity has health and fitness benefits as well.

Cost Estimate:

- For logs or poles - Will need to contact a lumber supplier for prices
- An alternative solution may be to partner with a local utility provider that may have old utility poles which they could donate

Construction: The setup for this activity could be easily accomplished with the help of volunteers. The construction process would require setting a foundation for the poles to lie. This could be done by digging a hole for the logs to lie across or using posts that have been planted in the ground to elevate the poles themselves.

Source: This type of obstacle has been used in military training for a long time. The main inspiration for this design came from the " Tough Mudder" events. However, we simplified the design for a more enjoyable experience.

Figure 1

http://toughmudder.com/wp-content/uploads/2012/06/Tough-Mudder-CO-2012-Gudkov-Sat-17811.jpg

6. Volunteer-Needs Posting Board

Idea: In order to create greater interaction with the park by visitors, there would be a large board near the park entrance. The postings on this board would be updated frequently as the needs of the park change over time. When a group or family enters the park, they can take note of some of the volunteering needs they may be able to contribute during their visit to the park. This would result in greater contributions to the park while leveraging a source of help that may not otherwise be aware of the impact they could have. A secondary use for the same space would be to put up community postings or other information on taking action at home. The uses for this board are many and go far beyond the scope explored here. Another aspect to help enhance this program is to also have a volunteer activities page on the Paradise Creek Nature Park website. This page could have more information on preparing the necessary materials and resources that would be needed for some higher level projects.

Significance: The educational opportunity here is to help express how every person in the community can play their part and as a group have a large impact on the environment. An added benefit would be that potential volunteers arrive at the park with no plan in mind. It is the perfect opportunity for them to give back and feel great for accomplishing something while helping the community and environment.

Cost Estimate: Through online channels the cost would vary depending on size from **$637-$934** (http://www.globalindustrial.com/g/office/boards/bulletin-outdoor/polly-products-outdoor-enclosed-message-boards-95051)
TOTAL COST ESTIMATE = ~ $785.50 (the average of the price range)

Construction: The board setup would arrive in pieces and need to be constructed. Holes would need to be dug for the post foundations. Then the parts would need to be constructed and held in place while concrete could be poured in dry and then watered to setup over time drawing moisture from the ground.

Source: These types of posting boards can be found in many parks and outdoor community locations. The idea for this project came from parks that post volunteering opportunities online. It would be more effective if everyone could contribute without having the idea before arriving. The following page consists of a picture of the board in mind.

Figure 1

http://i21.geccdn.net/site/images/n-picgroup/95051.jpg

7. Beaver Stacking – Build Your Own Beaver Dam

Idea: Visitors could construct their own beaver dam using sticks and leaves which they would find in the park. There would be a designated area where visitors would build their own dams, accompanied by a sign describing how and why beavers build dams.

Significance: We came up with the idea of having visitors build beaver dams because it is an educational learning activity that also involves creating nature-inspired artwork. We wanted to include nature-inspired artwork in the park that was interactive for visitors. Much of our vision was inspired by artist Andy Goldsworthy's work. Goldsworthy uses natural elements as a medium for his work, letting them degrade into even more striking pieces over time. Each day, visitors could add to the existing dams or take apart dams and build new ones for themselves. Visitors would learn about beavers and why they construct dams, while at the same time contributing to this natural artwork.

Cost Estimate: This activity would only require using natural materials from the park itself. The only cost associated with this station would be constructing the sign accompanying it, which should be taken care of by the signage group

TOTAL COST ESTIMATE = $0.00

Construction: The only construction involved would be to put up the sign.

Source: We found this activity on the Pinnacle Mountain State Park website. The description for the activity on the website reads, "Beavers are considered by many people to be nuisance animals because of all the dams they build, but they are actually quite beneficial to people and other wildlife. Discover the importance of beavers during this program before making your very own mock beaver dam." http://www.arkansasstateparks.com/events/build-a-beaver-dam-78581/#.UVpPXGjT1UQ

Figure 1

Beaver Dam
http://www.newswise.com/articles/beavers-dam-good-for-songbirds

8. The Northern Spring Peeper Race

Idea: Everyone goes to the "starting line" and bends down into the position of a frog. Then they will start making a single clear "peep" note every second (and extremely loud), to denote the first signs of spring, all while playing leap frog across the ground. To stimulate the springtime, there will be water misters overhead. The visitors will then start to reach the "finish line" in which case the misters will stop, and they will freeze and pretend to be hibernating in the winter.

Significance: This race will teach the seasonality changes of a Northern Spring Peeper. In the spring, which also happens to be the start of their mating season, the peepers all make an extremely loud "peep" noise to let everyone know it is the beginning of the season. The peepers get especially loud after a humid evening or a warm spring rain, which is what the water misters are supposed to recreate. Then, as the year rolls around and winter approaches, the peepers go into hibernation until the following springtime.

Cost Estimate:

- **Water mister kit**: $16.97 (plus shipping) at home depot
  http://www.homedepot.com/Heating-Venting-Cooling-HVAC-Parts-Accessories-Misting-Systems/h_d1/N-5yc1vZc4n0/h_d2/Navigation?langId=-1&storeId=10051&catalogId=10053&searchNav=true
  **Note: We are unsure if there are any available water pumps or the expenses associated with running water through the mister; the water can come from the creek if possible

- **Rope** (to close off the start and finish of the race): $8.81 (plus shipping) at home depot http://www.homedepot.com/p/Everbilt-3-8-in-x-50-ft-Brown-Sisal-Rope-18005/202079623#.UVojl6vwK9w

TOTAL COST ESTIMATE = $25.78

Construction: Once the materials are collected, the rope has to be laid out (and possibly nailed down) in a rectangular form. At one end the water mister needs to be setup in which the hose has to attach to a water pump and then the mister head attached to the hose.

Source: http://www.chesapeakebay.net/fieldguide/critter/northern_spring_peeper (The peeper)

Figure 1

Water mister at the Tanger Family Bicentennial Garden
http://www.greensborodailyphoto.com/2011/week23/

Figure 2

Priceless game of leapfrog
http://pad2.whstatic.com/images/thumb/2/2d/Play-Leapfrog-Intro.jpg/300px-Play-Leapfrog-Intro.jpg

9. The Bald Eagle Walk

Idea: Visitors climb up a ladder (or steps) and eventually reach a bridge in which they can go for a treetop walk. The bridge will be completely enclosed with cargo netting to avoid safety issues and will have a ladder (or steps) at the opposite end to get down. Furthermore, everyone will pretend that they are a bald eagle and stick out their arms, flat and straight, and soar through the trees; in addition they can make a sharp cackling "kleek-kik-ik-ik-ik" while flying.

Significance: Bald eagles fly in the Chesapeake Bay area to look for prey. When they fly their wings are flat and straight and they make a cackling noise. Another interesting fact is that a male and female bald eagle will sometimes lock their talons together while flying and tumble towards the ground, which implies their romance. The visitors can mimic all of this as they go on the treetop walk.

Cost Estimate:

- Cargo netting: Roughly $7,000 (could be more or less); dependent on the amount need and which type of cargo netting is purchased
  http://www.incord.com/amusement/cargo-netting.htm
  **This website has a "request a quote" link
- Wood planks (to walk across): $7.97 each at Lowes, x25 planks, total= $198.75
  http://www.lowes.com/pl_Treated+Decking_4294810417_4294937087_?cm_cr=Lumber-_-Web+Activity-_-Lumber+Top+Flexible-_-SC_Lumber_TopFlexible_Area-_-178608_9_hardware_Pop_Cat_3-dimensional_lumber_and_studs&cm_cr=Lumber-_-Web+Activity-_-Lumber+Top+Flexible-_-SC_Lumber_TopFlexible_Area-_-178608_7_Treated_Decking#!
- Drill: $80.00 at Lowes
  http://www.lowes.com/Tools/Drills-Drivers/_/N-1z0yhrv/pl
- Ladder: $150.00-$200.00 at home depot, x2, $300.00- $400.00
  http://www.homedepot.com/Building-Materials-Ladders/h_d1/N-5yc1vZ25ecodZaqnp/Ntk-All/Ntt-

ladder/h_d2/Navigation?Ntx=mode%20matchall&catalogId=10053&Nu=P_PARENT_ID&langId=-1&storeId=10051&primarySearchOnly=true&currentPLP=true&omni=c_Ladders&searchNav=true&searchRedirect=ladder&redAB=A

- Climbing rope: $24.99 at home depot
  http://www.homedepot.com/p/PlayStar-Climbing-Rope-PS-7828/203294564#.UVoweKvwK9w

TOTAL COST ESTIMATE = $7,603.74

Construction: Build a suspended footbridge from one tree to another using rope, a drill, and the wood planks. Attach and surround the bridge with cargo netting. Provide ladders at both ends of the bridge.

Source: http://www.lowes.com/cd_Build+a+Footbridge_487955556_ (How to build a foot bridge)
http://www.chesapeakebay.net/fieldguide/critter/bald_eagle (The bald eagle)

Figure 1

Treetop walkway in Busch Gardens Africa, Tampa Bay, Florida
http://www.themeparkreview.com/forum/files/ropeme_640.jpg

10. Black Duck Walk

Idea: Visitors move from one floating wooden plank to another, pretending to an American black duck waddling through the water looking for food. This could be a very fun way to integrate a water-related activity into the obstacle course. However, but it could also be dangerous if there are no shallow areas in which to do this. If necessary, this obstacle could be moved to land.

Significance: American Black Ducks nest in eastern wetlands, including freshwater and salt marshes. They dabble in shallow water to feed on small insects, amphibians, and plant material. During migration and winter, they rest and forage in protected ponds, marshes, and bays. Visitors can learn about these characteristics and eating patterns of the black duck, while having fun splashing around in a shallow area of water.
(Information about the American Black Duck from:
http://www.allaboutbirds.org/guide/american_Black_Duck/id)

Cost Estimate:

- Plastic Rope that can stand being in the water: Maxis Pulling Rope from Home Depot (300 feet x 3 packs) = $446.00 x 3 = $1,338

http://www.homedepot.com/p/t/202071946?catalogId=10053&langId=-1&keyword=rope&storeId=10051&N=25ecodZ5yc1v&R=202071946#.UVyCVGjT1UQ

- Wooden logs: $7.30 (per 8'x6" untreated log) x 30 logs = $219

http://unitedwoodproductsinc.com/products/roundpolesposts.html

- Metal Stakes: $1 x 4 = $4 http://www.rei.com/product/693154/rei-steel-stake?cm_mmc=cse_froogle-_-pla-_-product-_-693154&mr:referralID=8c00dfa8-9c9b-11e2-9389-001b2166c62d

TOTAL COST ESTIMATE = **$1,561**

Construction: We will first need to assess whether this can in fact be done in water or if it needs to be moved to land. We need volunteers to help assemble each floating log blank. We will have 5 total planks, 6 logs making up each plank. We will tie all of the planks together using the Maxis Pulling Rope, and use metal stakes to secure the rope in the ground.

Source: The inspiration for this activity comes from the Heiwa no Mori Koen Field Athletic Course in Japan (see figure below). However, we would want to build the planks closer together than they appear in the following figure, with less rope in between.

Figure 1

Example of Floating Logs
http://modernmarketingjapan.blogspot.com/2012/04/best-childrens-sports-park-and-obstacle.html

III. Conclusion

What have you accomplished so far?

We have brainstormed and researched ten ideas for obstacles and stations which could be implemented throughout the Paradise Creek Nature Park. We have estimated costs of necessary materials along with the construction processes for each obstacle. In addition, we have tried to incorporate educational elements about native plants and animals into each station to provide significance and meaning. We have an example photograph of what each obstacle would look like, and the source of inspiration sited for each example. We realize that not all ten of our stations could or should be implemented into the park at once. We simply wanted to provide as many suggestions as possible for Robin Dunbar and the Elizabeth River Project.

We suggest that the ERP consider the cost, ease of construction, and educational importance of each station when deciding what obstacles to implement in the park. We feel that the best way to implement this project would be to involve the community in the decision process. We suggest posting the ten possible family-learning installations on the Paradise Creek Nature Park website and allowing community members to go online and vote for their four favorite station ideas. Community members could pledge to donate money for the different installations when they vote online. By allowing community members to have a say in which stations are implemented, this could foster a greater interest in visiting the park when the instillations are complete. We have attached a map of Paradise Creek Nature Park with potential structure locations.

What questions or barriers remain?

We are still not entirely sure what kind of family learning activities the Elizabeth River Project is looking to implement in the park. It was wonderful having Robin Dunbar visit us at the beginning of the semester, but other than that interaction we have not had much dialogue with the ERP. Robin gave our group a lot of freedom in designing activities for the park. We had a lot of fun brainstorming our own ideas of what we think would be great family activities at the park. However, we cannot be sure that the ERP will like or implement any of our ideas. Another barrier that our group faces is that we do not know what the building codes and safety regulations are for the area in Portsmouth where the park is located. We are not sure if our suggested proposals would be approved for construction or violate local public safety boards. Lastly, we do not know if all of our proposed ideas are entirely feasible. It is very difficult to know exactly how our stations would work because we have been unable to visit the park. For example, for the Northern Spring Peeper Race, we do not know what source we would use to get water for the mister. For the Black Duck Walk, we do not know if there is any area of water that is shallow enough to safely do the activity, or if it should be moved to land.

How did you measure, assess, and document your work?

During our meetings in workshops and outside of class, our group brainstormed many different possible stations. We have a long email thread where we would share links to various park websites and see what other group members thought. We have created numerous Google documents and Excel spreadsheets to keep track of all of our possible ideas. We discussed the benefits and risks of each idea that we came up with. We tried to ensure that we had a native plant or animal incorporated into each activity. Of the 10 obstacles that we decided upon, we documented each one by idea, educational relevance, cost estimate, description of necessary construction process, and the source of inspiration (along with pictures). We have an Excel spreadsheet that documents structure, inspiration, cost, materials, website, and team member in charge.

We suggest measuring the success of our project by tracking the number of park visitors. We hope that our project will create exciting new activities that will entice people to come to the park, so the way to measure the success of a project is to see if more people in fact visit the park each day and utilize the available activities. Visitor attendance can be tracked by buying a sign-in logbook to place near the main circle of the park. With this rise in tourism will come a rise in awareness, and furthermore, there will be more support in keeping the park in a good condition.

IV. Future Work

Now that our semester has come to a close, the project will be handed over to Robin Dunbar and the Elizabeth River Project. They will decide which obstacles they would like to incorporate into the park and from there, depending on approval from public safety boards, build the structures. The below work should be undertaken by our community partners to ensure the completion and success of these activities.

- Decide which projects to install and possible modifications to make with ERP Board approval
- Acquire approval from public safety board to build structures
- Advertise new additions to park on web page, in local schools, on the River Barge, in local recreation centers (YMCAs, gyms, etc.), in local churches, etc.
- Recruit community partners, including River Star schools and members of stewardship program, to help with construction

• Clear areas, purchase necessary materials and build structures
• Create and install instructional/educational signs
• Modify paths to lead off to structures from main path
• Hire appropriate maintenance staff
• Advertise grand opening of new additions; such an opening event could include special programs, food, entertainment, guest speakers, etc.
• Plan seasonal events to prolong interest in park and increase amount of visitors
• Monitor success of stations (via surveys and/or observations) to determine future changes or additions

V. Lessons Learned

What were the barriers to success that you had to overcome in creating your project design and how did you resolve them?

Our goals from the beginning of this project were to come up with many different activities and educational opportunities for families and visitors to the Paradise Creek Nature Park. In the early stages, we tried to compile as many different options as we could think of. This quickly spiraled into an unmanageable amount of research and work for a group that could not devote all of our time to doing so. We decided to focus in on several installations around the park that would help to meet much of the criteria we wanted to convey to visitors. With this in mind, we began selecting ideas and fleshing them out into activity ideas. It was also very challenging to coordinate schedules between people from different classes and colleges. We decided that each person would specialize in a couple of activities and we would spend our limited meeting times sharing information, editing, and planning. It was also difficult to locate information on others' parks or programs that matched what we wanted to do, so we took some ideas from what we did find and adapted them for our needs. A challenge from the beginning of this project was dealing with the variety of visitor types and age groups. We attempted to make the activities fun for all ages and engaging for a wide audience. It was also difficult to find prices and cost estimates for designs that are not standardized. There were no materials list provided from the projects we researched. We attempted to make our best estimates and find sources for as many of the materials as possible.

Review your goals from the beginning of the semester and address what you did not achieve and why.

Since we made our initial assumptions of our goals we have made some changes in the scope and scale of our project that impacted their achievement. We also changed how the project would be distributed between group members. This had the effect of cutting up the individual installation between group members instead of each group member taking a different aspect of the installations. The timeline we had estimated was also a little skewed as the research phase ended up bleeding into the planning phase and they have both actually run together for the most part. At this point we do hope to achieve the goals initially laid out by the end of the semester.

What did you learn about creating change?

Change takes a great deal of time, planning, and research. At the end of all this investment of time, all you really have is a relatively untested hypothesis that still needs to be proven. Once this first phase is completed there are still many steps left until a result can even be determined either positive or negative. Change taken as a whole is unmovable much like a stream in the wild. However, doing a little bit here and there has a lasting impact. Enough small steps taken and accomplished can alter anything. In the case of the above simile, a beaver placing one stick at a time turns that stream into a pond. Change is definitely

accomplishable but it takes time and perseverance to create. Bringing fresh ideas to an issue can create change. Implementing everything that our group has recommended and researched may be challenging, but we have really creative ideas that can energize the Elizabeth River Project and the Portsmouth community in new ways.

What will you do different if doing it again?

One major change in the future would be break the project into more manageable pieces in the early stages so that each contributor can be more focused for a greater amount of time. Along this same line would be to have more time to prepare between when information is made available for a project and when the project is due. This was most noticeable between our group assignments and the first deliverable due date of less than one week. It would also be nice to have more group work time in workshops as schedules between group members can be highly variable outside of class. However, this does have the benefit of emphasizing effective communication skills through digital and electronic media. Further, it would have been very beneficial to visit the site to get a greater understanding of the layout and available resources. The distance required to travel to the park was too great for group members to be able to go.

VI. Appendix

Structure	Inspiration	Cost	Materials	Website	Team member in charge
Paw Paw Structure	Shutterstock (website)--mostly original idea	$104.5	16-soda can butterflies, 400 ft of rope, 4 posts, nails, rubber paw paw "fruits," 4 paw paw plants	www.shutterstock.com/pic-75346414/stock-photo-jungle-gym-exercise-equipment-made-of-wood-and-rope-in-a-playground.html	Rebecca
Log Activities	Tough Mudder Log-Bog-Jog	Quotes Needed depending on need	Recycled Utility Poles	http://toughmudder.com/obstacles/log-bog-jog/	Will
Tree Top Walk	Treetop walkway in Canungra, Scenic Rim, Australia	$7603.74	Cargo Netting, wood planks, drill, ladder, climbing rope	http://www.lowes.com/cd_Build+a+Footbridge_487955556_ http://www.queenslandholidays.com.au/things-to-see-and-do/tree-top-walkway/index.cfm http://www.whistler.com/treetrek/	Jordana
Frog Mister	Water mister at the Tanger Family Bicentennial Garden	$25.78	Water mister	http://www.greensborodailyphoto.com/2011/week23/	Jordana
Tree Knees	Poplar Ridge	$630	Stylized tree stumps	http://www.virginia.edu/ims/poplar-ridge/	Christina
Black Duck Walk	Japanese Park (Heiwa no Mori Koen Field Athletic Course)	$1557	Logs, ropes	http://modernmarketingjapan.blogspot.com/2012/04/best-childrens-sports-park-and-obstacle.html	Sarah
Nutria Balance Board	Poplar Ridge	$450	Various sized boards and screws	http://www.virginia.edu/ims/poplar-ridge/	Christina
Beaver Stacking	Pinnacle Mountain State Park	Free (using all natural materials)	Sticks and leaves from the park	http://www.arkansasstateparks.com/events/build-a-beaver-dam-78581/#.UVujzmjT1UR	Sarah
Chalk Board	Downtown Charlottesville	$115	Chalk board paint, plywood (8 ft x 16 ft), water sealant, chalk sticks, lockbox	http://preservationinpink.wordpress.com/2009/06/22/charlottesville-community-chalkboard/	Rebecca
Visitor Board	Many Parks	$637-$934	Outdoor Cork Board	http://www.globalindustrial.com/g/office/boards/bulletin-outdoor/polly-products-outdoor-enclosed-message-boards-95051	Will

ENDNOTES

[1] Yates, J. (2012). Abundance on trial: The cultural significance of "sustainability". *The Hedgehog*

[2] Ballengee, B (2009) "An Impetus for Biological Research in the Arts: A Practioners Statement" in Research in Art, Nature & Environment (RANE) Artful Ecologies 2" Pub: University College Falmouth, 2009 Conference Papers