Community Process

Guiding Design Outcomes

Public meetings were the primary vehicle for community engagement. From September through November, three community meetings were held in Curtis Hall on the Curtis Arboretum grounds. The overarching objective of these meetings was to create a dialogue and information sharing process between community members and the student designers, thereby influencing and shaping the development of the final design alternatives.

Each meeting had a specific objective.

1. Introduce the project, share design precedents, and identify community priorities through discussion and a survey.

2. Reveal the results of our inventory and analysis and discuss how this in formation could influence design considerations.

3. Share the results of the survey, present the four final design concepts created by student teams, and explore how the community can utilize these concepts going forward.

Several methods were employed to broadcast these meetings. An informational flyer announcing the schedule of community meetings was created and distributed in the neighborhoods adjacent to the park. A Facebook page was established to post information, updates and invite visitors to complete the survey. An email address was established so that community members could contact the design team directly and for the design team to send out meeting reminders. And finally, each meeting was announced in advance on the Township's website.

As a result of the initial meeting, a community steering committee was established to work more directly with the students throughout the process. Additionally, a Cedarbrook Middle School science teacher who incorporates Rock Creek research in her classes distributed the survey to her students and the design team presented the four final concept alternatives to the students.

The Survey

Rock Creek Greenway Vision

Demographics and Experience

1) I am interested in Rock Creek as (please circle your answer): as a nearby resident; town employee; resident of Cheltenham; other (please explain) _____.

2) I visit Rock Creek:

Never | Quarterly | Monthly | Weekly | Daily

3) Activities I like to do at Rock Creek are (circle or check as many as appropriate):

Walk | Walk my dog | Fish or other stream activity | Rock climbing

Nature observation /Bird Watching | Meditate | Other (describe) _____

4) I rate the quality of Rock Creek environs as:

Poor | Fairly Poor | Neutral | Fairly Good | Superior

Vision for Rock Creek

5) Please complete the statement below. Feel free to use the back of this paper if you need more room to answer the question.

'The year is 2020 and Rock Creek Park/ Greenway is as good as it can be. It is the kind of place where:

_____

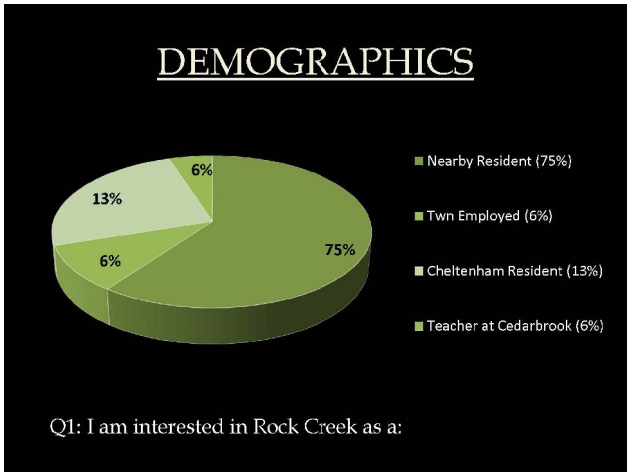
_____

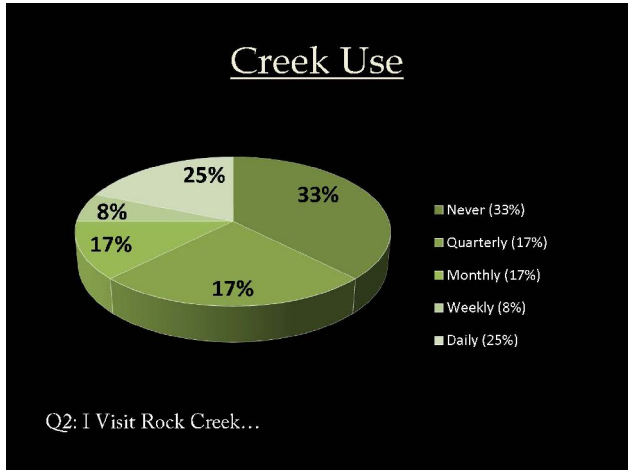
_____

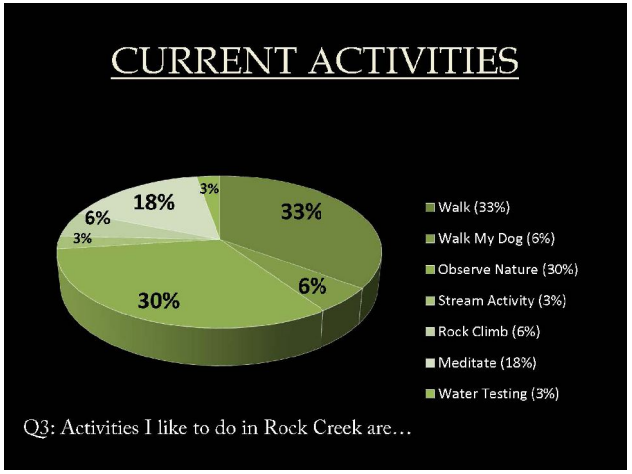
6) Is there anything else you would like to tell us?

_____

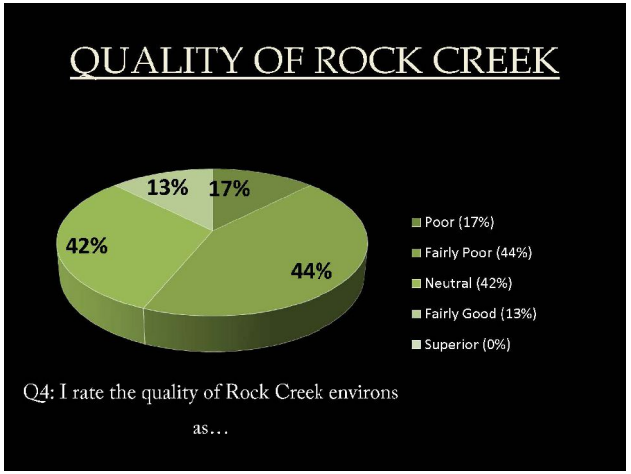
13 September 2012 v 1.0

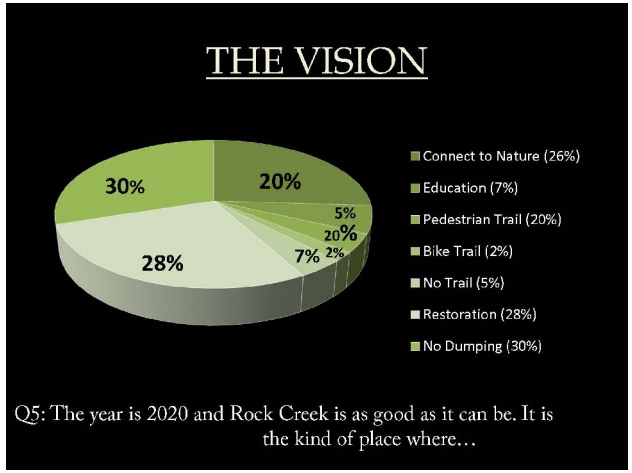


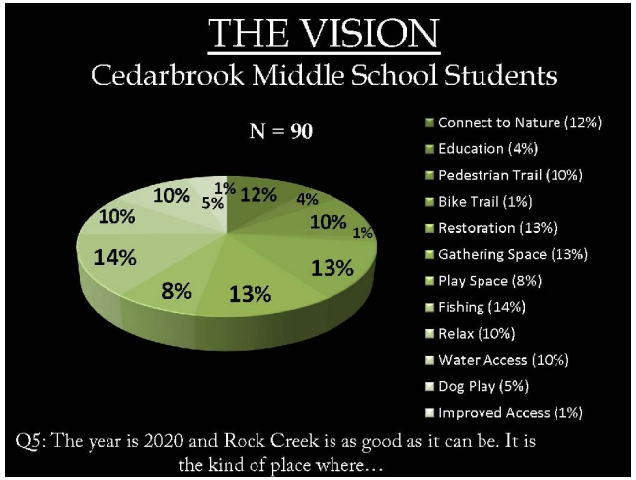




Survey Results: A Glimpse Into the Communities Vision (Respondents (n=21)







ROCK CREEK

Woodland Design Studio: Fall 2012
Professors: Mary Myers & Joe Sikora

School of Environmental Design
Temple University Ambler

Master Plan Development

Introduction to Masterplan Development

Following the second community meeting, students considered the feedback from neighbors and the results of the inventory and analysis and worked on individual concept plan and master plan proposals. After each student presented their individual plan to faculty and classmates, each plan was vetted for the soundness of the ecological measures and storm water mitigation designs.

Out of the 15 plans presented, common themes emerged and groups were formed to create more developed master plan proposals. The four teams formed were titled:

- Restoration Focus

- Education Focus

- Moderate Design

- Intensive Design

Master Plan Development

Restoration Focus

Project Goals

Based on many neighbors expressing fears about safety regarding a public trail so near their homes, the first master plan focused on restoration with no trail. When researching possible funding sources for restoration without trails, wildlife sanctuaries were considered. A variety of bird species were encountered on each visit to the creek, including a pileated woodpecker and a great horned owl, demonstrating the importance of the remnant forest to local animals.

Inspiration

Two local bird sanctuaries in the Cheltenham park system were looked at as models, the Edward Hicks Parry Bird Sanctuary and the George A. Perley Bird Sanctuary. Each of these parks had received grants for native plantings and invasive plant removal and each focused on creature habitat rather than on recreational uses.

Features and Highlights

To provide high quality habitat for birds and other animals, the creek would require mass removal of the heavily invasive plant species, restoration of the native vegetation and stabilization of the stream bank and steep slopes. The plan would also include overlooks with bird blind structures at several key points along the creek for visitors and students at the middle school to enjoy the diversity of bird species.

As the inventory revealed, invasive plant species had blanketed the slopes on either side of the creek, spread downhill from neighbor's yards and was shading out the remnant native plants and trees. A plan for removing the knotweed, Norway maple trees, English ivy, phragmites, porcelainberry, Japanese honeysuckle and other prevalent weed species was created, phasing removal in patches and utilizing manual removal methods such as hand-pulling, girdling trees and using Weed Wrenches to pull larger shrubs. Stream bank erosion would be repaired with coconut fiber logs and fascines of woody plant stems installed in high-erosion points along the water's edge. Hillside erosion would be mitigated with the placement of coconut fiber fabric pouches filled with soil.

Ecologically appropriate plantings of native species would then be installed to restore the ecosystems of the valley:

- Floodplain: red maple, white pine, dogwood, red willow, witch hazel, spicebush
- Upland: red oak, sweet birch, black gum, white ash, serviceberry, mountain laurel
- Edge: arrowwood viburnum, witch hazel, tea berry, elderberry, wood fern, wood aster

These plantings would provide a variety of flowers, berries, beautiful foliage and colorful stems in all seasons as well as help hold the soil in place as their roots develop. Each would also help provide food, cover and nest-making materials for local and migratory birds, among other animals.

Birding hot-spots were designed at an existing green spaces including a small park adjacent to the creek, along a path at the middle school and alongside of the dog park. Bird blinds, wall structures with viewing cut outs surrounded by native plantings, would provide visitors with visual access to the birds for photography or identification, without needing to permit the public to walk down the length of the creek.

RESTORING HEALTH AND HABITAT TO THE ROCK CREEK ECOSYSTEM

ROCK CREEK

RESTORATION MASTER PLAN

Woodland Design Studio: Fall 2012
Professors: Mary Myers & Joe Sikora

School of Environmental Design
Temple University Ambler

Kevin Ries, Allison Ostertag, Michele M. Fafette
Aerial Concept by Chen Liang

MIXED POPULATIONS
multiflora rose (*Rosa multifora*)
amur honeysuckle (*Lonicera maackii*)
wineberry (*Rubus phoenicolasius*)
burnign bush (*Euonymous alatus*)
english ivy (*Hedra helix*)

DENSE MIXED POPULATIONS
burning bush (*Euonymous alatas*)
amur honeysuckle (*Lonicera maackii*)
Japanese knotweed (*Polygnum cuspiadtatum*)
wineberry (*Rubus phoenicolasius*)
bittersweet (*Celastrus orbiculatus*)
multiflora rose (*Rosa mulitfora*)
tree of heaven (*Ailanthus altissima*)
Norway maple (*Acer platanoides*)
Japanese honeysuckle (*Lonicera japonica*)
common periwinkle (*Vinca minor*)

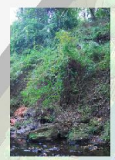
DENSE SINGLE POPULATION
Japanese knotweed (*Polygnum cuspidatum*)
common reed (*Phragmites australis*)

INVASIVE VEGETATION MAP

oriental bittersweet

Japanese knotweed

burning bush



Invasive species degrading streambanks and choking the stream.

Invasive species crowding the canopy and floor layer of the woodland

WEED WRENCH

CUT-AND-PAINT

GIRDLING

INVASIVE REMOVAL PHASE MAP

0 100 200

ROCK CREEK

RESTORATION METHODS

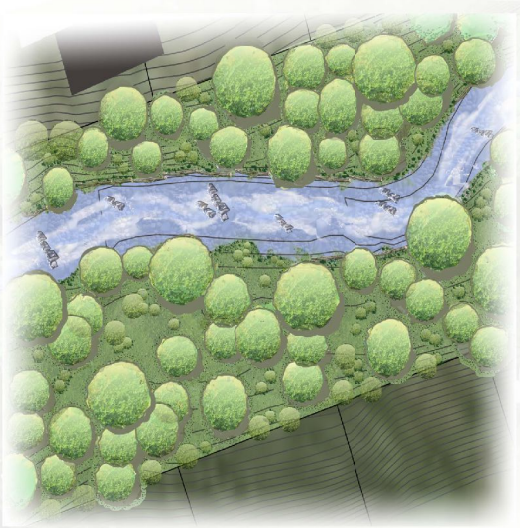
Woodland Design Studio: Fall 2012
Professors: Mary Myers & Joe Sikora

School of Environmental Design
Temple University Ambler

Kevin Reis, Allison Ostertag, Michele M. Fafette
Aerial Concept by Chen Liang

THE PROBLEMS:

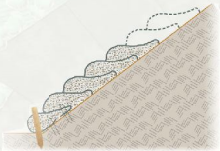
SOIL EROSION ON SLOPES
SOIL EROSION ON FLOODPLAIN
INVASIVE PLANTS
INACCESSABILITY



THE SOLUTIONS:

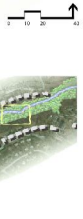
SOIL STABILIZATION-SLOPE
SOIL STABILIZATION-FLOODPLAIN
THE "PILLOW" METHODS
STREAMBANK STABILIZATION

STEP ONE: FILL KOIR FABRIC WITH MATERIALS;
HENCE FORMS "PILLOW;"
START AT BOTTOM OF SLOPE

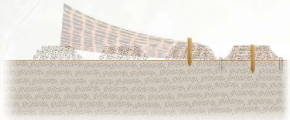


STEP TWO: PLACE STAKES AND STAPLES;
BUILD UP "PILLOWS" FROM BOTTOM TO TOP

RESULT

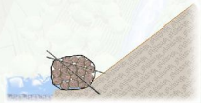


STEP ONE: MAKE ROWS OF LEAF
AND ORGANIC MATERIAL ON FLAT GROUND



STEP TWO: COVER GROUND WITH FABRIC
PLACE STAKES AND STAPLES;
HENCE FORMS "PILLOW;"

STREAMBANK STABILIZATION



STEP ONE: PLACE FASCINE MADE
OF LONG BRANCHES TIED
TOGETHER WITH WIRE;
SECURED INTO BANK WITH
REBAR CROSSED AT ANGLE
INTO BANK AND TIE

STEP TWO: PLACE LIVE PLANTINGS

ROCK CREEK

RESTORATION METHODS

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Aerial Concept by Chen Liang

EDGE PLANTING AREA

red oak (*Quercus rubra*)
sweet birch (*Betula lenta*)
serviceberry (*Amelanchier canadensis*)
witch hazel (*Hamamelis virginiana*)
mountain laurel (*Kalmia latifolia*)
tea berry (*Gaultheria procumbens*)
wood fern (*Dryopteris cinnamomea*)
arrowwood (*Viburnum dentatum*)

UPLAND PLANTING AREA

red oak (*Quercus rubra*)
sweet birch (*Betula lenta*)
black gum (*Nyssa sylvatica*)
white ash (*Fraxinus americana*)
tulip poplar (*Liriodendron tulipfera*)
arrowwood (*Viburnum dentatum*)
mountain laurel (*Kalmia latifolia*)
tea berry (*Gaultheria procumbens*)
wood fern (*Dryopteris cinnamomea*)
witch hazel (*Hamamelis virginiana*)
spicebush (*Lindera benzoin*)
serviceberry (*Amelanchier canadensis*)

FLOODPLAIN PLANTING AREA

red maple (*Acer rubrum*)
Eastern red cedar (*Juniperus virginiana*)
white pine (*Pinus strobus*)
witch hazel (*Hamamelis virginiana*)
red willow (*Salix laevigata*)
dogwood (*Cornus sericea*)
spicebush (*Lindera benzoin*)

PLANTING PLAN MAP

Jewelweed (*Impatiens capensis*) being crowded by knotweed (left)

Herbaceous plants mitigate erosion and provide organics

Beech and oak species provide shade and habitat

Spicebush (*Lindera benzoin*) and silver maple (*Acer saccharinum*) are examples of species found in upland and floodplain areas.

Willow (*Salix spp.*) and hazelnut (*Corylus americana*) are examples of a tree and shrub which stablize slopes and streambanks.

PLANTING PHASE MAP

0 100 200

ROCK CREEK

RESTORATION METHODS

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Dark-eyed Junco

Eastern Towhee

Nuthatch

Purple Finch

Carolina Chickadee

Flycatcher

Pileated Woodpecker

Cardinal

Great Horned Owl

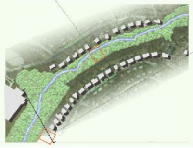
American Kestral

Above: Some of the many birds found or heard on our Rock Creek visits

Habitat Restoration: Creek and Floodplain Replanting

Wistar Park Bird Blind: Wistar and Green Valley Roads

Bird Sanctuaries help not only birds, but the community. Birds help control rodent and insect populations, and they help disperse seeds, increasing forest growth and conservation. They are easy to observe throughout the year and serve as an example of the importance of species diversity.



Alternate-leaved Dogwood

Serviceberry Tree

Blue Flag Iris

Arrowwood Viburnum

Joe Pye Weed

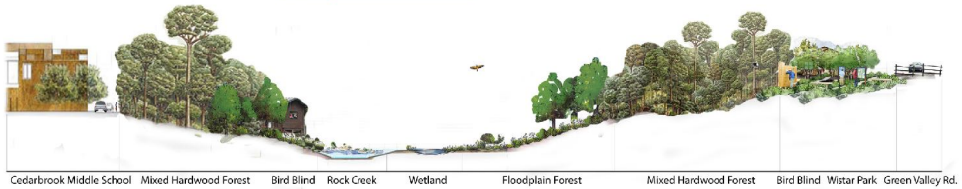
Elderberry

Spicebush

Winterberry

Wood Aster

Above: Native plants that provide shelter and food and for local and migratory birds, as well as beautiful berries, flowers and fall foliage



Above: Bird blinds would allow Cedarbrook Middle School students and visitors to Wistar Park a glimpse into the Rock Creek Bird Sanctuary, but eliminate trails in the stream corridor. Native plant restoration of the forest would provide healthy habitat for birds as well as natural beauty for neighbors who look out on the creek. This will be a unique ecosystem, essential for migratory birds looking food and rest.

Local birding groups could be an asset in park beautification and monitoring. The Wyncote Audubon Society is one of the nation's oldest birding clubs, founded in 1914, and provides families and adults with education on birding, field trips, photo contests and a speaker series. The members helps maintain local parks with clean up events in the spring and fall.

ROCK CREEK

BIRD SANCTUARY DETAILS

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Temple University Ambler

Kevin Reis, Allison Ostertag, Michele M. Fafetto
Aerial Concept by Chen Liang

Master Plan Development

Education Focus

Project Goals

The Educational Master Plan proposes to link the community, education, and the environment in a safe and ecologically responsible manner. The plan implements enhancements to Rock Creek Drive, underutilized portions of land at Cedarbrook Middle School, and Rock Creek's stream banks. The design builds upon key recommendations from the Restoration Master Plan including stream bank stabilization, the removal of exotic, invasive plants, and planting of native species to restore and preserve ecosystem function and wildlife habitats. The plan has a major loop trail near Cedarbrook Middle School and a smaller trail by Curtis Arboretum; these sites are connected by a new green sidewalk along Rock Creek Drive. Additional design features include: kiosks that introduce key learning opportunities via interactive stations; an amphitheater that serves as an outdoor classroom; rain water harvesting systems; and a fresh water mussel pond and a vernal pool.

Inspiration

Several precedents in greenway design inspired this plan including the Mountain to Sound Greenway, the Phoenix Trail in United Kingdom, Little Sugar Creek Greenway in Charlotte NC, and Black Rock Sanctuary in Phoenixville, PA. These precedents highlighted interactive educational environments and holistic design.

Features and Highlights

The trail, which begins at the rain harvesting system on school property, takes advantage of the natural topography of the Rock Creek site. The path transitions to bridges that bring the visitor over the waterfall and rain harvesting system revealing scenic views. The next feature on the trail is the amphitheater outdoor classroom. This can be used as a gathering area for all school disciplines as well as for community activities. The last feature on the school side of the bank includes a station where students can explore the effects of erosion and understand topography through sand tables.

The trail affords multiple learning opportunities: students can learn how rain harvesting systems can slow, filter, and reduce storm water runoff and see first-hand how to reduce flooding downstream and improve the quality of Rock Creek.

The wooden bridge that brings people across the creek includes a seating area for viewing and sketching the scenic overlook. Once across the creek, the right branch of the closed trail is a boardwalk loop over the restored wetland habitat. The left branch explores the restored flood plain forest. Next, there is an opportunity to interact with the creek water at the Creek Beach or Lily Pad Hangout. The trail continues up to the overlook area with seating and views. The trail then returns to the bridge. Also along the trail is a GPS Tree Hunt where one can use a smart phone and GPS coordinates to find 5 specimen native trees.

There are additional educational features near the Curtis Arboretum. In order to walk there safely along Rock Creek Drive, sidewalks are included in the design; these sidewalks incorporate rain harvesting green gardens that are aesthetically pleasing and environmentally beneficial.

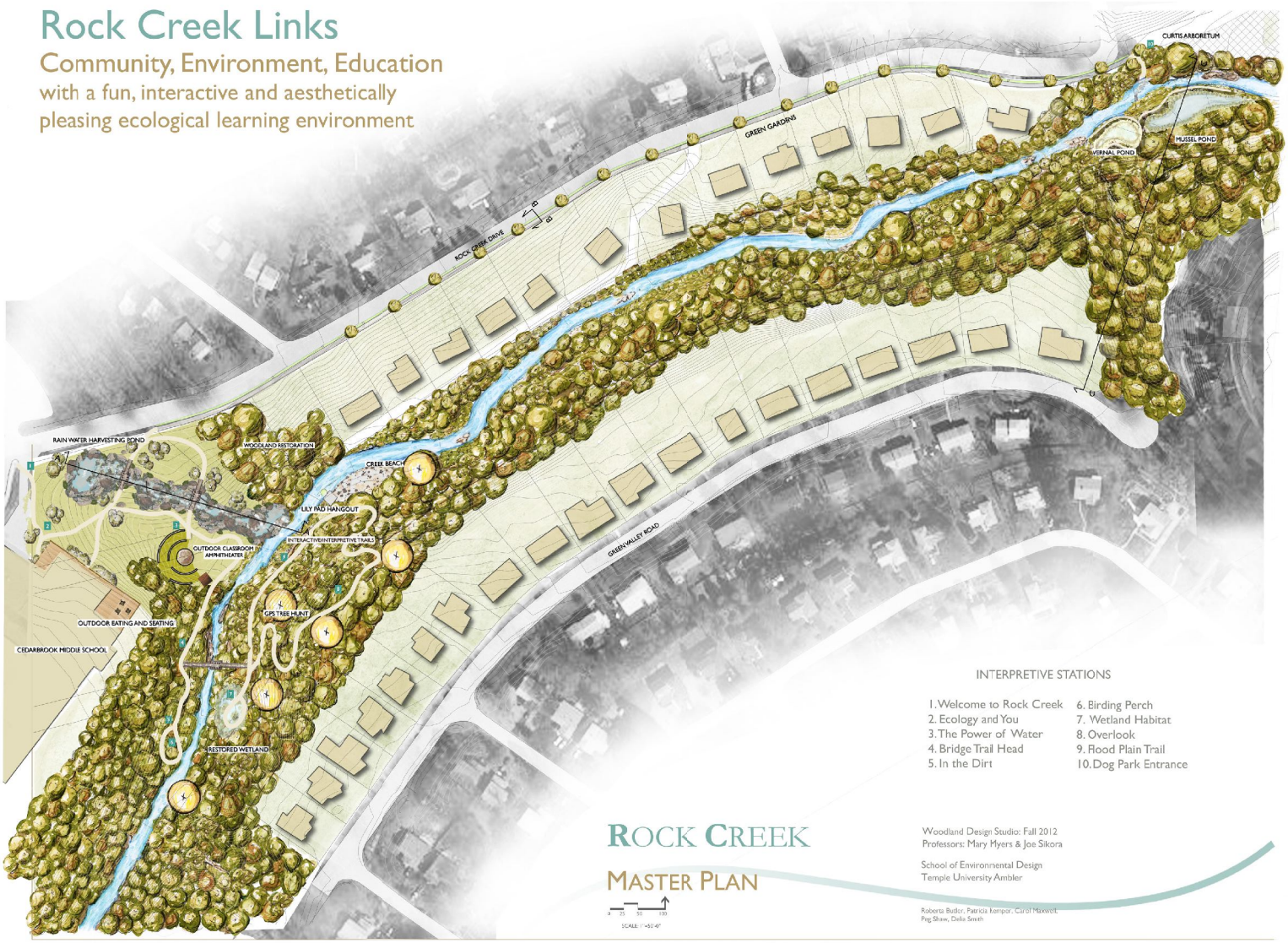
The last station features a fresh water mussel pond and an adjacent vernal pool. These pools provide an opportunity to learn about the similarities and differences between aquatic habitats. One is an area that is connected to the creek; the other is an aquatic environment that occurs seasonally due to runoff.

The implementation of the fresh water mussel pond will help filter impurities in Rock Creek's water and will also serve as a key learning hub for students to better understand the links between human activities and healthy environments.

Rock Creek Links

Community, Environment, Education

with a fun, interactive and aesthetically pleasing ecological learning environment



INTERPRETIVE STATIONS

1. Welcome to Rock Creek
2. Ecology and You
3. The Power of Water
4. Bridge Trail Head
5. In the Dirt
6. Birding Perch
7. Wetland Habitat
8. Overlook
9. Flood Plain Trail
10. Dog Park Entrance

ROCK CREEK

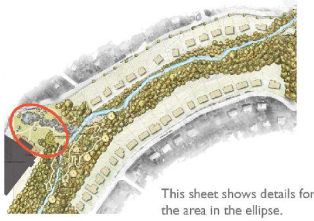
MASTER PLAN

SCALE: 1" =50'-0"

Woodland Design Studio: Fall 2012
Professors: Mary Myers & Joe Sikora

School of Environmental Design
Temple University Ambler

Roberta Budor, Patricia Kemper, Carol Maxwell, Peg Shaw, Delia Smith



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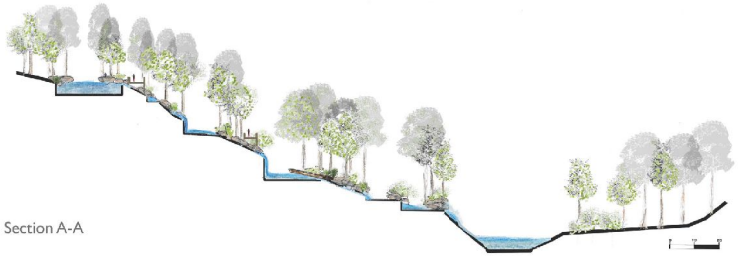
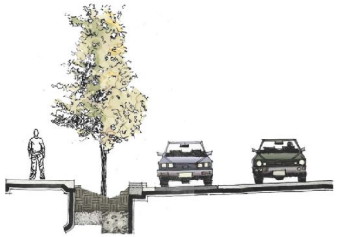


Section A-A

The rain water harvesting ponds at the school introduce visual interest as well as environmental benefit.

A new shed near the creek allows the science teacher to store equipment.

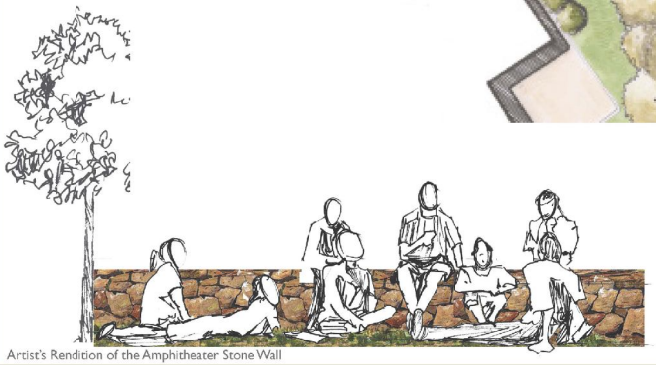
School Site Detail



Section B-B

Not to scale

New sidewalks along Rock Creek Drive connect Cedarbrook Middle School with the community and Curtis Arboretum. The design's green gardens harvest and filter rain water. This feature will help reduce the amount of rain entering Rock Creek and improve the quality of the creek's water.



Artist's Rendition of the Amphitheater Stone Wall

ROCK CREEK

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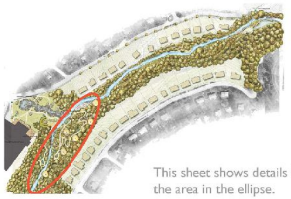
School of Environmental Design
Temple University Ambler

Roberta Butler, Patricia Kempe,
Carol Maxwell, Peg Shaw, DJ Smith

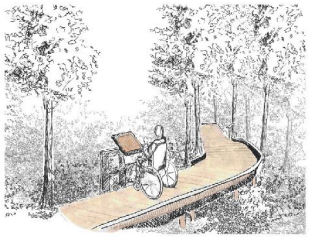
The interactive closed loop learning trail allows students to experience the creek on both banks.



This sheet shows details for the area in the ellipse.

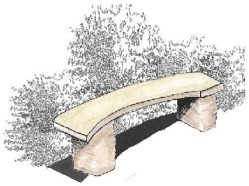
The Creek Beach offers a fun place for children to experience the creek. It includes a lily pad hangout that uses convertional floating dock technology so children can sit in the creek without getting wet.

The bridge that links both banks includes seating for viewing and artistic efforts.



Interpretative signs along the trail help people understand the benefits of a healthy environment.

Using a smart phone, one can find the five specimen native trees along the trail. Barcodes at the beginning of the trail and on the trees will take you to a website to answer a question about the tree. You'll then receive the GPS coordinates to the next tree on the trail.



Benches along the trail allow people to rest and enjoy the view.

ROCK CREEK

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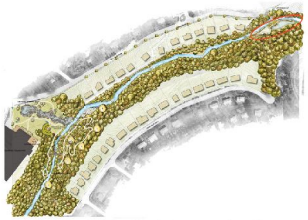

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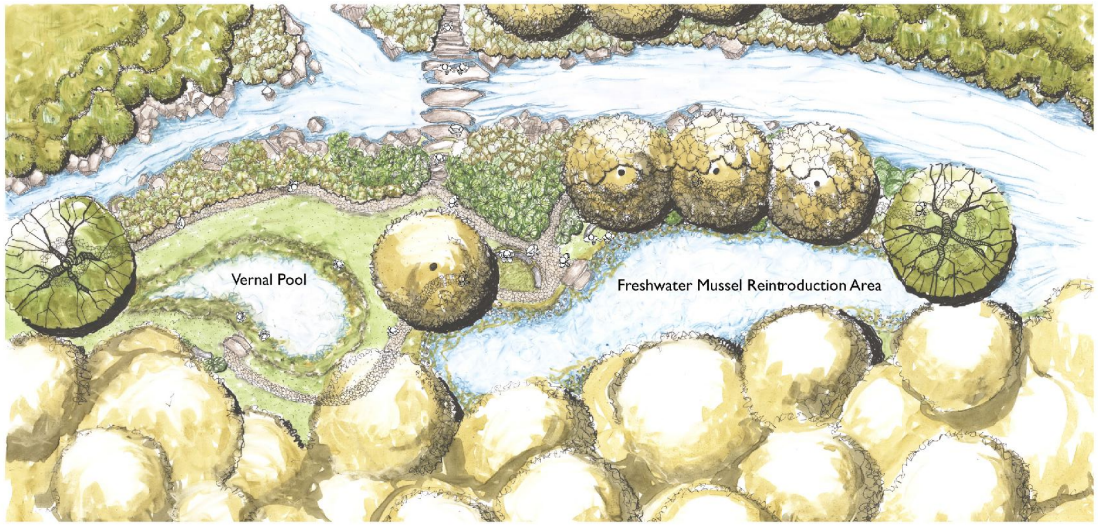


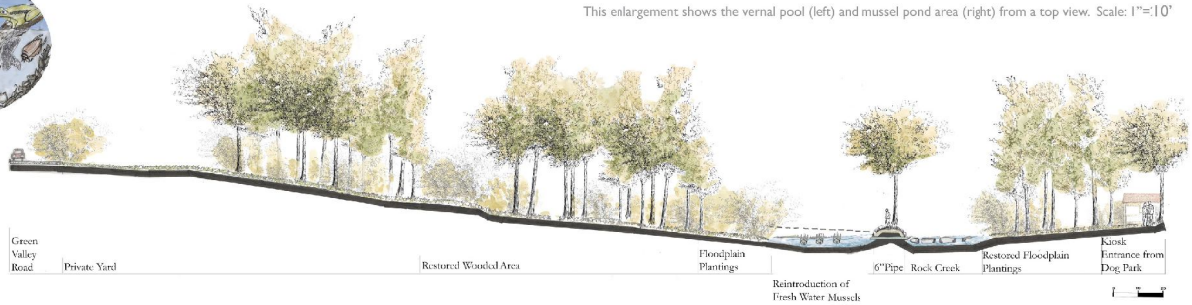
This enlargement shows the vernal pool (left) and mussel pond area (right) from a top view. Scale: 1"=10'

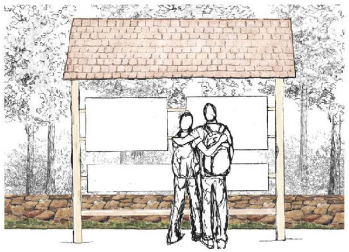
Freshwater Mussel Reintroduction Area

Fresh water mussels provide a good indicator for water quality. Here, students will learn about the interactions between water quality and aquatic life.

Vernal Pool

Vernal pools are an important breeding and nursery habitat for salamanders, frogs and other forest dwelling amphibians. This pool will help increase biodiversity and provide a learning opportunity for children.





Interperative Kiosk

An interperative kiosk is located near the trail entrance. Educational details and status updates of the nearby mussel pond and vernal pool entice vistors to explore these features. A large map of the park illustrates everything the park has to offer.

ROCK CREEK

Woodland Design Studio: Fall 2012
Professors: Mary Myers & Joe Sikora

School of Environmental Design
Temple University Ambler

R. Butler, P. Kemper, C. Maxwell, P. Shaw, DJ Smith

Moderate Design

Project Goals

Our design goals encompass a restored green connection that emphasizes the environment as an extension of the classroom, providing a relaxing outdoor experience, both physically and mentally. The design is actualized by a rustic trail system complemented by simple elements with detail to the historical significance of the local community.

Inspiration

The source of inspiration stemmed from the current use of green space by the local middle school students as well as the potential for exploration of existing woodland and wetland environments. It was our intention to create a greenway that celebrates and enhances the natural world, reconnecting people with the land in a mutually beneficial way that offers educational benefits and highlights the rich heritage of the area.

Features and Highlights

The Outdoor Classroom provides an interactive and safe environment for local students to explore the natural world. The boardwalk allows four season access and a safer option when ground conditions are not optimal after heavy rains or as an alternative pathway for a change in scenery. The Wet Meadow Loop Trail simultaneously offers a quiet, reflective space for those who would prefer to avoid the rigors of the woodland trail system or a respite for those who have made their way through the upland trail as well as a natural turn around for those who have completed the woodland trail circuit. As guests venture into the Wetland they are exposed to a rich and diversely planted aquatic ecosystem. The wetland provides a dynamic learning environment for young and old; using the Wetland Boardwalk to safely navigate through the wetland the process of bioremediation can be witnessed as the wetland serves the very important function of water filtration. In addition to its ability to ease erosion and flooding, the wetland serves as an important habitat for various aquatic wildlife species.

Replacing the existing dog park, the Vegetated Infiltration Basin provides a storm water system that is both aesthetically pleasing and ecologically significant. During storm events, water is held in the basin releasing slowly to recharge the water table. The Woodland is a restored area that allows for the observation of various woodland species within the context of their natural habitat. The Woodland Trail offers an intimate connection for walkers as they are ushered through the restored environment. Scenic views are interspersed with wildlife sightings adding another dimension to the experience of the space. The Elevated Ramp provides Americans with Disability Act (ADA) accessibility, specifically for the middle school children who participate in the Cedarbrook Middle School Environmental Club and whose access to the creek has been often limited.

The ramp gives the option to enter the outdoor classroom and also leads to the historical bridge crossing. The Founding Families Plaque provides the historical context of the area, highlighting the multicultural foundation and cooperation that influenced the development of the area during a time of social unrest. Placed on centered ledges on each bridge the plaques preserve the historical significance of the area for generations to come. The Sill allays flooding during storm surges, backing water up to deliver the needed irrigation for the constructed wetland. Rustic Seating throughout the area is constructed from repurposed materials when possible, seating found along the wet meadow loop trail is fashioned from invasive trees removed during the restoration process, overall the seating design borrows from the natural beauty of the area and enhances natural forms and textures.

Restoring Natural Connections

To create a nature trail with emphasis on community, education, and restoration of Rock Creek and its surrounding woodland

Design Goals

To provide a relaxing outdoor experience both physically and mentally through a rustic trail system and simple elements.

Connecting visitors to the creek by way of a constructed wetland, which allows one to experience native vegetation and wildlife in an aquatic habitat.

Place emphasis on the park as an environment to learn and as an extension of the classroom.

ROCK CREEK

Master Plan

0 25 50 100

Woodland Design Studio: Fall 20 2
Professors: Mary Myers & Joe Sikora

School of Environmental Design
Temple University Ambler

C. Liang, C. Baker, J. Durkin, B. Lorka

Elevated Ramp

The Elevated Ramp allows for ADA access to the pedestrian trail and outdoor classroom. It also gives visitors the opportunity to view the forest from a unique perspective.

Context Map

Design Details

The historic bridge is constructed out of local stonea reminder of those who first made this region home.

The loop trail seating is constructed using repurposed wood from invasive tree species removed during restoration.

The Founding Families paque represents the four diverse groups of settlers, who worked cooperatively during a time of cultural unrest shaping Cheltenham township.

The woodland trail seating is carved from local boulders providing comfort and durability complementing the rustic beauty surrounding them.

The stream sill is used to raise the water level, supplying the needed irrigation for the wetland area.

The kiosk is made from repurposed material, serving to orient visitors and provide pertinent information about the site and trail system.

ROCK CREEK

Context Map & Details

Woodland Design Studio: Fall 2012
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Outdoor Classroom

The Outdoor Classroom provides a unique learning space through which both the students and the faculty of Cedarbrook Middle School can gather to explore the natural world. The boardwalk ensures safe and convenient access to the woodland even when ground conditions are less than pristine.

Wetland Boardwalk

The Wetland Boardwalk ushers visitors through a lush aquatic environment providing four season access to this diverse ecosystem.

Infiltration Basin

The Vegetated Infiltration Basin captures excess stormwater during storm surges.

Woodland

The Woodland creates a restored sanctuary for the region's wildlife, including native bird species, white tailed deer and red fox.

Wet Meadow Loop Trail

The Wet Meadow Loop Trail is a respite from the Woodland Trail, offering a place for quiet reflection and serenity.

Woodland Trail

The Woodland Trail acts as a walkable connection between Curtis Arboretum and Cedarbrook Middle School. Walkers will be able to enjoy the diversity and wonder of the restored environs.

ROCK CREEK

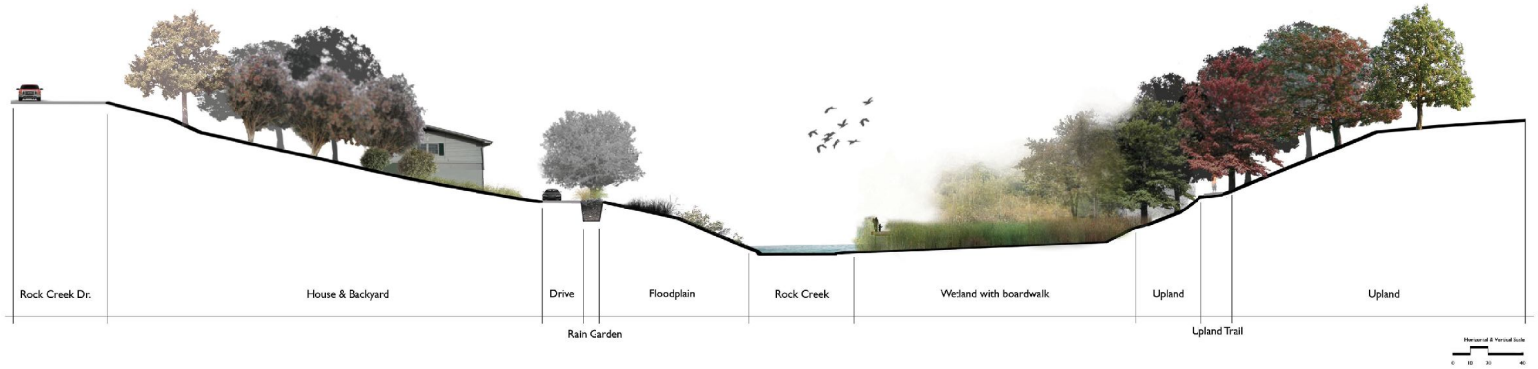
Perspectives

Woodland Design Studio: Fall 2012
Professors: Mary Myers & Joe Sikora

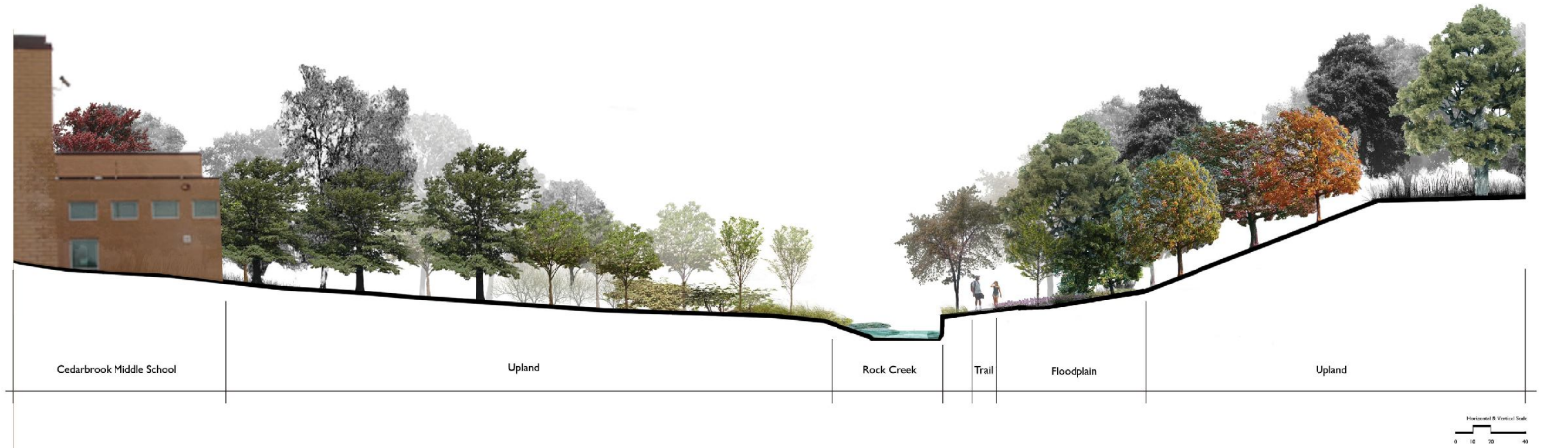
School of Environmental Design
Temple University Ambler

C. Liang, C. Baker, J. Durlin, B. Loeka

Section A



Section B



ROCK CREEK

Site Sections

Woodland Design Studio: Fall 2012
Professors: Mary Myers & Joe Sikora

School of Environmental Design
Temple University Ambler

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Master Plan Development

Intensive Design

Design Goals

This plan for Rock Creek focuses on reducing the effects of high intensity storm surges, while restoring the native plant communities along the creek and preserving natural resources. We use a trail to connect Rock Creek Park to the surrounding neighborhood, and Cedar Brook Middle School to Curtis Arboretum. The trail has several access points, providing opportunities to learn about local history and ecological restoration.
Several goals drove design decisions:

- The desire to reduce damage done by storm surges
- The need to restore native plant communities
- The desire to create an aesthetically pleasing experience along throughout the park and at destination points
- The objective of providing several entrances connecting to the surrounding community
- The desire to create a linear park that provides opportunities for passive recreation and education

The plan aims to solve ecological problems, through intensively engineered solutions that suit the natural context. In addition to ecological factors, local history and community input influenced design decisions.

Highlights and Features

In order to reduce damage resulting from storm surges, we propose constructing a 6' tall earthen surge dam. An earthen surge dam as opposed to a standard dam, will not disrupt the natural daily flow of the creek. Water will continue to flow through a culvert at the bottom of the dam. During storm surges, volume of water in the creek increases. All of it cannot pass through the culvert. We have created a detention basin to accommodate excess storm water. Visually, an earthen dam is less intrusive than a standard dam, even though it is a thoroughly engineered element.

We propose that the creek bed be raised two feet throughout the site with the use of log sills. While this strategy does not reduce water flow in anyway, it allows for the construction of wetlands at strategically placed locations along the creek. This strategy returns the water table closer to historic levels, allowing native plant communities to thrive. We propose to restore three different habitat types in Rock Creek Park; upland forest, floodplain forest, and wetland forest. It is important to restore native vegetation in order to provide the historic diversity that supports a healthy ecosystem.

Looking back at the history of Cheltenham Township provided the design team with the inspiration to model a hydroelectric structure after a historic grist mill. The mill structure is an orientation and education feature located near Curtis Arboretum. The grist mill capitalizes on existing water flow by utilizing it to generate electricity to power trail lighting. Mill elements include the opening of the rear of the structure to allow access and visibility, a gathering space outside of the structure, and a fireplace for ambiance during public events. The grist mill and bridge, sit on a man-made schist outcropping in order to blend into the natural setting.

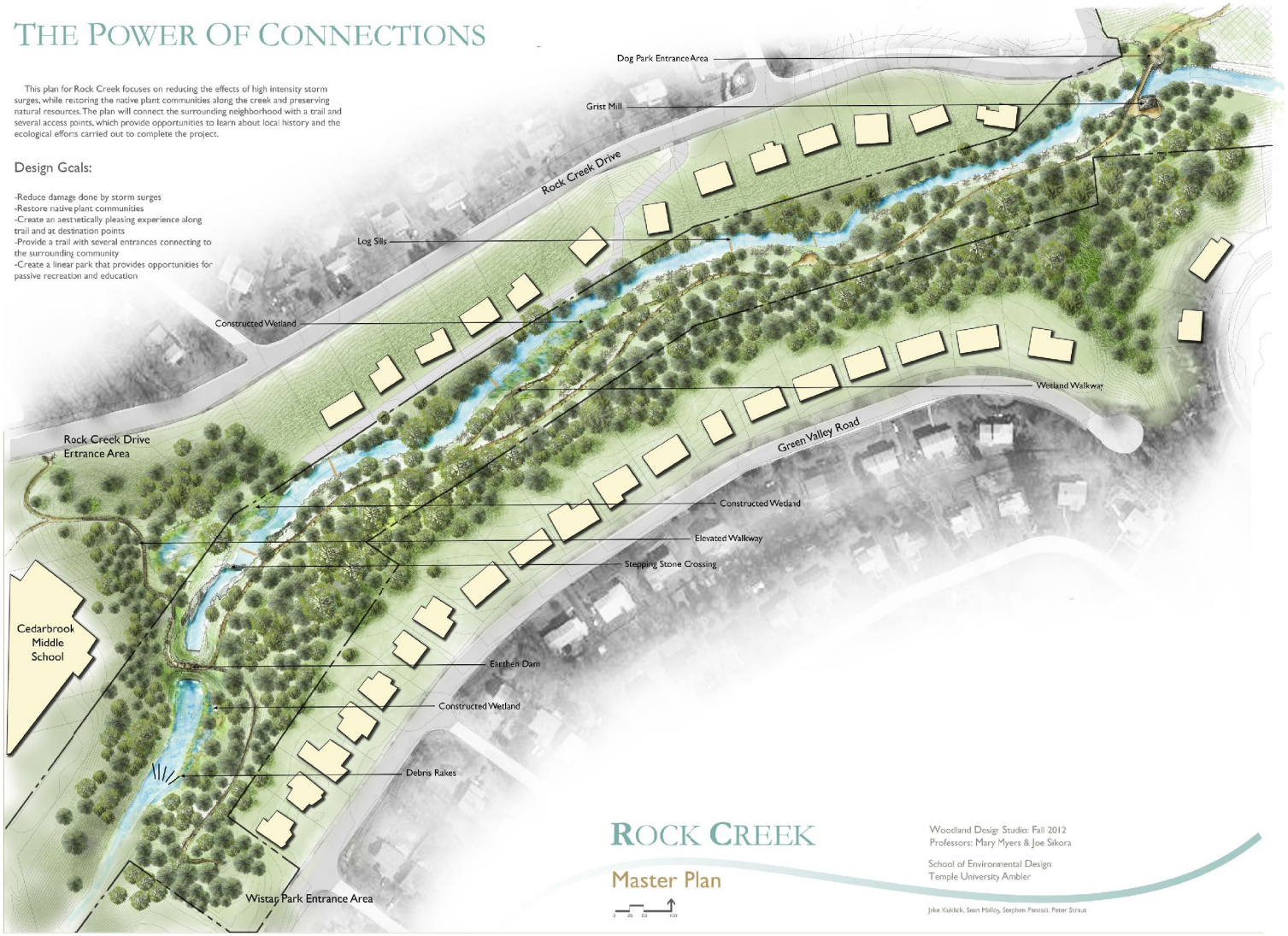
The trail has several access points that connect the community to the park. These access points are located at Wistar Park, Cedar Brook Middle School on Rock Creek Drive, and on Rock Creek Drive closest to Curtis Arboretum. These connections create a sense of community and investment, which is important for maintaining the restoration efforts.

THE POWER OF CONNECTIONS

This plan for Rock Creek focuses on reducing the effects of high intensity storm surges, while restoring the native plant communities along the creek and preserving natural resources. The plan will connect the surrounding neighborhood with a trail and several access points, which provide opportunities to learn about local history and the ecological efforts carried out to complete the project.

Design Goals:

-Reduce damage done by storm surges
-Restore native plant communities
-Create an aesthetically pleasing experience along trail and at destination points
-Provide a trail with several entrances connecting to the surrounding community
-Create a linear park that provides opportunities for passive recreation and education



ROCK CREEK

Master Plan

0 25 50 100

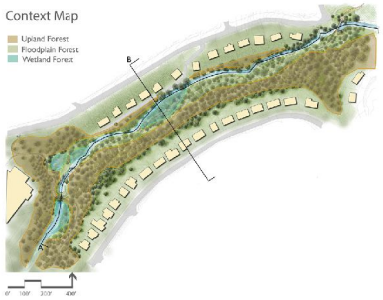
Woodland Design Studio: Fall 2012
Professors: Mary Myers & Joe Sikora

School of Environmental Design
Temple University Ambler

Jake Kuklick, Sean Malloy, Stephen Parossi, Peter Straus

Section A:
Creek Bed Centerline

Context Map



Typical Plant Distribution By Forest Type

The Rock Creek Site has three main habitat types in regards to plant communities. In undergoing a restoration of the woodland along the creek, it is important to be mindful of the subtle and major differences between plant communities.

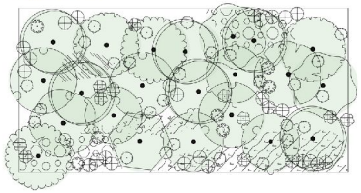
The three main forest types are the upland forest, largely occupying the steep slopes of the site, floodplain forest located in the floodplain and along stream banks, and wetland forest in the constructed wetland zones along the creek.

The wetlands are created by raising the water table with the use of log sills and in some areas grading the floodplain to be at one foot of elevation change from the creek or less.

Each habitat is represented in the following plant lists and diagrams showing the ideal plant densities and diversity for a healthy woodland.

* Plant species lists based off research performed by Jim Zarkin and Kevin Rubio

Upland Forest



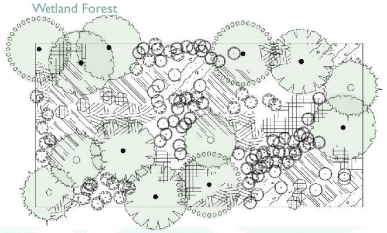
Plant Species//Upland Forest

Trees
Red Maple/Acer rubrum
Mockernut Hickory/Carya alba
Tulip Poplar/Liriodendron tulipifera
Sweet Cherry/Prunus serata
White Oak/Quercus alba
Chestnut Oak/Quercus montana
Red Oak/Quercus rubra
Black Oak/Quercus velutina
Sassafras/Sassafras albidum

Shrubs
Beaked Hazelnut/Corylus cornuta
Spicebush/Lindera benzoin
Highbush Blueberry/Vaccinium corymbosum
Arrow-Wood Viburnum/Viburnum dentatum

Herbs
Wild Ginger/Asarum canadense
Lady Fern/Athyrium filix-femina
Hay Scented Fern/Dennstaedtia punctilobula
Christmas Fern/Polystichum acrostichoides

Wetland Forest



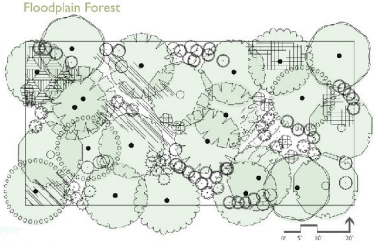
Plant Species//Wetland Forest

Trees
Red Maple/Acer rubrum
Black Gum/Nyssa sylvatica
Pin Oak/Quercus palustris
Black Willow/Salix nigra

Shrubs
Buttonbush/Cephalanthus occidentalis
Winterberry/Ilex verticillata
Spicebush/Lindera benzoin
Red Willow/Salix lucidiana

Herbs
Spotted Jewelweed/Impatiens capensis
Sensitive Fern/Onoclea sensibilis
Royal Fern/Osmunda regalis
Broad Leaved Cattail/Typha latifolia

Floodplain Forest



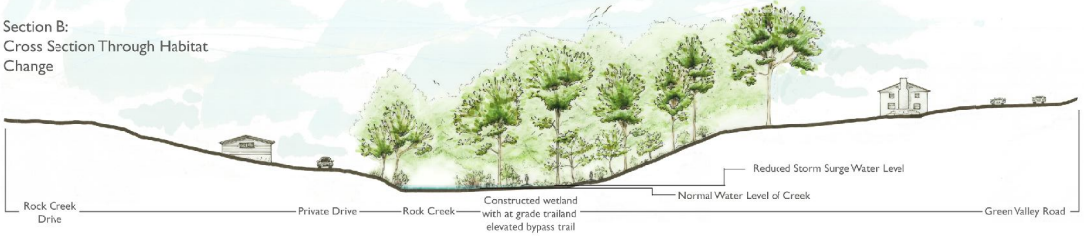
Plant Species//Floodplain Forest

Trees
Red Maple/Acer rubrum
Black Ash/Fraxinus nigra
Black Gum/Nyssa sylvatica
White Oak/Quercus alba
Swamp White Oak/Quercus bicolor
Black Willow/Salix nigra

Shrubs
Hazel Alder/Alnus serrulata
Buttonbush/Cephalanthus occidentalis
Winterberry/Ilex verticillata
Spicebush/Lindera benzoin
Swamp Rose/Rosa palustris
Red Willow/Salix lucidiana

Herbs
Sensitive Fern/Onoclea sensibilis
Cinnamon Fern/Osmunda cinnamomea
Royal Fern/Osmunda regalis
Arrow Arum/Peltandra virginica

Section B:
Cross Section Through Habitat Change



ROCK CREEK

Habitats and Plant Communities

Woodland Design Studio: Fall 2012
Professors: Mary Myers & Joe Sikora

School of Environmental Design
Temple University Ambler

Jake Kuklick, Sean Mallov, Stephen Panasci, Peter Straus

Detail Plan of Dam

Context Map

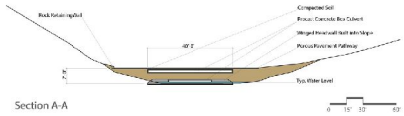
Surge Dam

Dealing with the erosive of storm water onsite is one of the goals we focused on for this project. The amount of high energy water rushing through the creek during heavy storms has caused a large amount of erosion as well as adding a lot of water volume to downstream systems.

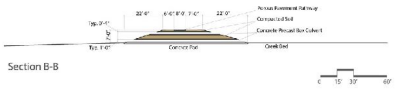
The surge dam is our recommended solution to the storm water problem. We wanted to avoid stopping the normal flow as this would disrupt the natural creek system. However, the only way to decrease the energy that rushing water gains is to retain it. Water will be allowed to flow through a culvert at the creek elevation. During storm surge, the heavy amount of water that will not be able to pass through this small culvert will back up, creating a detention basin until it flows over the spillway 3' above the creek bed.

The dam is situated so that it creates a natural wetland just upstream of Cedarbrook Middle School where toxins in the water can be filtered out by native wetland plants. Downstream of the dam two wetlands are created and will be able to filter toxins because of the decreased energy of the water.

Construction of the dam begins with laying down a crushed pad in the creek bed. Then interlocking precast concrete culvert boxes and compacted soil are layered on top. The precast concrete culvert boxes are 20'x4' for normal flow and 40'x4' for the overflow. The corners of the boxes are chamfered at 45 degrees in the corners for easy flow. Interlocking porous stabilization structure is placed on the downstream side of the dam. This then is covered in soil and planted.



Section A-A



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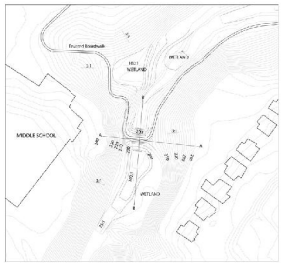
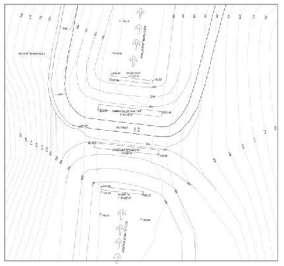


Grading Plan



Detail Grading Plan

Grading

The grading begins with installing logsills throughout the creek to raise the water table level back to its natural level. The creek has been scoured out 2' by high energy storm water. Next, slopes where possible, can be graded to be resistant to erosion. Boardwalk pathways are used in places where the slopes are too extreme to be regraded properly. Along the pathway to the west of the surge dam, a retaining wall is installed using rock native to the area. Wetland areas are created by increasing the size of the wide, flat areas in three places. The slopes in the wetlands do not exceed 2% at any point.

The surge dam after construction. An 8' wide pathway runs along the top of the dam and connects the Cedarbrook Middle School with the Curtis Arboretum. The pathway is made out of porous paving.

ROCK CREEK

Dam Details

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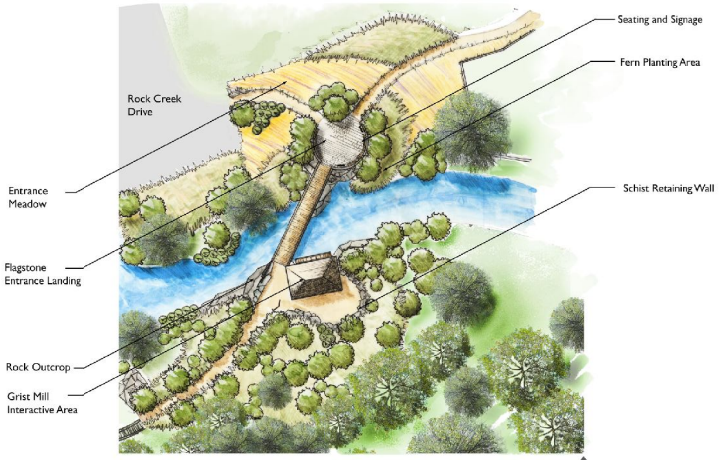


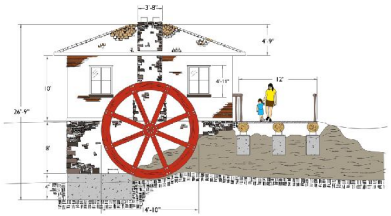
Detail Plan of Grist Mill

Context Map

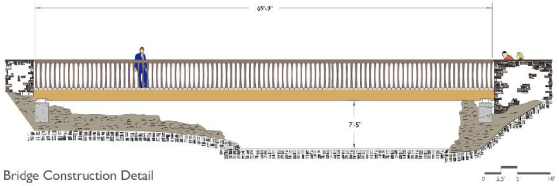
Grist Mill and Wood Bridge:

As part of the Rock Creek Greenway Project, we wanted to create a landscape element that would become a landmark and a symbol of Rock Creek and the Power of Water. To do this, we looked to the history of Cheltenham Township and the history and form of Curtis Arboretum. We also looked at the water flow of Rock Creek and realized this water flow has a tremendous amount of power while moving. We realized we could capitalize on the water flow by utilizing it to generate electricity. This electricity will be utilized to power the trail lighting along the greenway. Looking back at the history of Cheltenham Township provided the design team with the inspiration to model the hydroelectric generation structure after a historic grist mill. We then turned the Grist Mill into a destination along the creek by incorporating a creek crossing into the structure, opening up a corner of the building to make it accessible, incorporating a wood burning fireplace into the interior, and creating a small plaza on the south side of the structure.

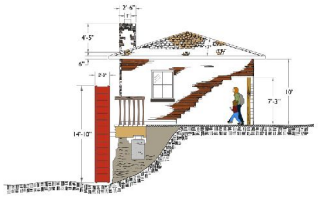
To add to the aesthetic quality of the Grist Mill and Bridge, both were designed to be constructed on a man-made Wissahickon Schist Stone Outcropping, and both are constructed out of wood, stone, and steel which is finished to have the appearance of wood.



Grist Mill Construction Detail: Wheel Profile



Bridge Construction Detail



Grist Mill Construction Detail: Side Profile

Grist Mill and Bridge

ROCK CREEK

Grist Mill Detail

Woodland Design Studio: Fall 2012
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Temple University Ambler

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Conclusion

Cheltenham Township seeks to restore, beautify and connect the public to Rock Creek Park. As the site inventory revealed, the park is currently suffering from storm water surges, water pollution, trash, an abundance of invasive species, soil erosion and general neglect.

Despite this deterioration, the site exhibits remarkable vigor and beauty. There are a significant number of grand old native trees, such as beech, maple and hickory. The understory is peppered with native spice bush, witch hazel and virburnum shrubs and native ground plants like Virginia creeper and sedges. The abundant bird species and wildlife found in the park is a testament to the importance of these native plant communities for the habitat they provide. The striking topography of the site is an unusual asset. Upstream, the steep ravine offers inspiring vistas, while downstream the gently sloping hillsides offer a tranquil retreat. Where the bedrock is at the surface, the creek displays a beauty that is characteristic to the region. Revealing golden green hues with a glint of mica, these natural formations provide gentle cascades and deep pools that invite the visitor to linger.

An examination of relevant design precedents uncovered a host of applicable considerations for Rock Creek Park. These included boardwalk trails, naturalized storm water mitigation elements and interpretive kiosks. Historical and cultural analysis led to the proposed grist mill and design details using local stone construction, among others. The community engagement process informed the design outcomes significantly. Between the survey and the meetings, student designers learned of the desire for an aesthetically pleasing restored park, storm water mitigation, improved water quality, restrained public access and educational opportunities.

As a result of this communication and combined with the research and keen observation of the site, student teams developed four design alternatives for the Township to consider going forward: 1. A no trail option with a focus on ecological restoration of the site, 2. A closed loop trail option with a focus on educational opportunities at either end of the site, 3. A moderate, connecting- trail option with minimal infrastructure with a focus on creating opportunities to enjoy the park and 4. A connecting-trail option with a focus on creating destination features.

In summary, Rock Creek Park has the potential to become a regional model for ecological restoration and park development within a developed and historical Township setting. Key assets for the restoration of the Rock Creek Park include the adjacent residential communities, as well as the Curtis Arboretum and Cedarbrook Middle School. Both the residents and the institutions would benefit from Park improvements. The continued involvement of these stakeholders will greatly strengthen the Townships' efforts and ultimately lead to the successful restoration of this valuable public asset.