Wise County Nature and Fitness Trail

Wise County, Virginia



Prepared for Wise County
June 2013

community design assistance center
College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

Project funding provided by the US Forest Service in cooperation with the Southern Group of State Foresters and the Virginia Department of Forestry.







Project Team

Elizabeth Gilboy	Director
Lara Browning	Project Coordinator
Gardner Burg	Graduate Student, Landscape Architecture
Kyle Cooper	Undergraduate Student, Landscape Architecture
Brad Davis	Undergraduate Student, Landscape Architecture
Peter Dunne	Undergraduate Student, Landscape Architecture
Nick Proctor	Graduate Student, Landscape Architecture

Acknowledgements

Greg Cross	Wise County Litter Prevention and Recycling Coordinator
Carl Snodgrass	Executive Director, Wise County Industrial Development Authority
Ed Brooks	Library Assistant, GIS Specialist, Virginia Tech
Angela Robinson	GIS Mapping Technician, Wise County

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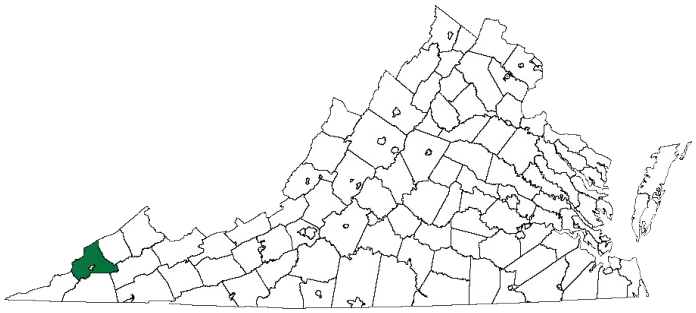
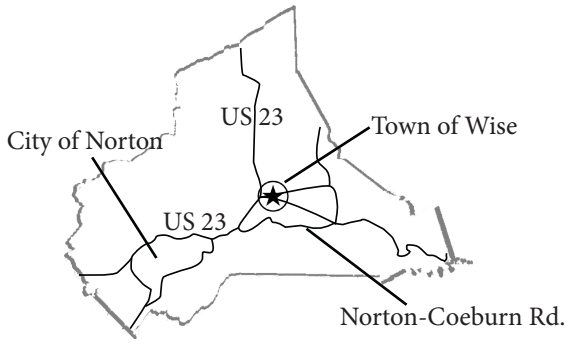
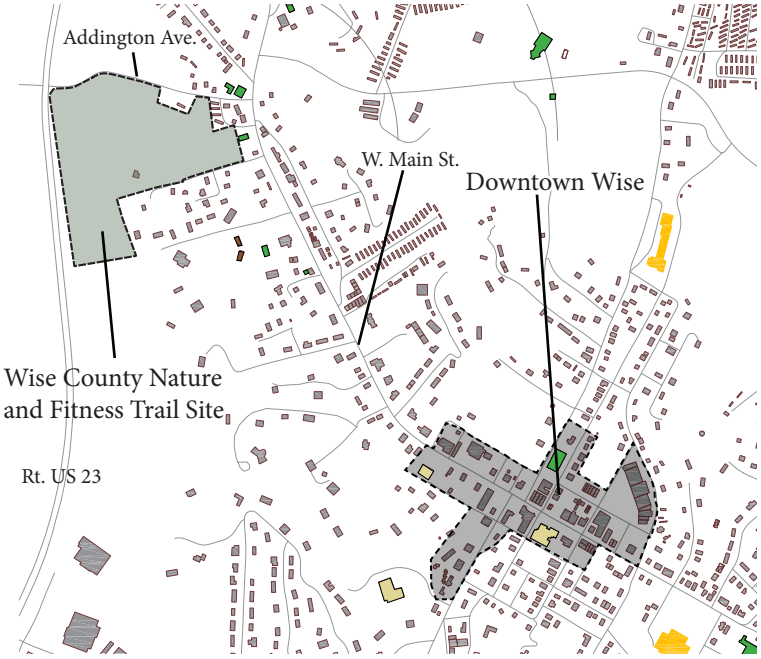
Project Description



Virginia state map highlighting Wise County



Wise County map highlighting the location of downtown Wise.



The project site is located northwest of downtown Wise.

Approximately 40 acres of land and a house located in the Town of Wise were bequeathed to the Wise County Industrial Development Authority by Carol Buchanan with the understanding and intent that it be used as a sanctuary park for animals and birds and would be open to the public to enjoy nature along the paths and trails. The current vision for the site is to develop a series of nature trails on the property that are of varying degrees of difficulty. Additionally, in order to provide opportunities to combat the problem of obesity in the area, exercise stations along the pathways and an outdoor classroom for educational sessions and presentations were desired. Parking and a picnic area were desired as well.

The Community Design Assistance Center worked with a team of stakeholders including the Wise County Health Department, Wise County Litter Control Department, Keep Wise Beautiful, Keep Southwest Virginia Beautiful, and the Upper Tennessee River Roundtable to develop a conceptual master plan for the site. The team also prepared focus area designs as needed for areas, such as the parking lot, and supporting sketches to visually convey ideas for various areas within the park (i.e. outdoor classrooms, exercise stations, etc).

Design Process



CDAC team members Lara Browning (left) and Kyle Cooper (right) discuss present site conditions while conducting site analysis.



CDAC team members Nick Proctor (left), Brad Davis (center) and Lara Browning (right) discuss ideas for the future park.

Throughout the design process, the CDAC team interweaved their design skills with the local expertise of the Wise community members to develop a conceptual master plan that was in accordance with Mrs. Buchanan's will and met the desires of the community. The team first visited the site for initial inventory and analysis of the site in February 2013. In the following months, the design team followed an iterative cycle of idea generation, critique, discussion, community review, and concept refinement, resulting in a final conceptual master plan and final concepts for each of the focus areas.

Throughout this process, many community members participated by sharing their opinions at public meetings as each design matured. The CDAC team presented preliminary design concepts to the community for review and feedback in March 2013. From here, the design team refined the ideas based on community comments to generate final concepts. The CDAC team presented these designs to the community on May 13, 2013.

This report documents the design process and highlights the design ideas developed with the help and direction of the Wise community.

Site Inventory and Analysis



A Wise community member and CDAC team members Kyle Cooper (center) and Lara Browning (right) explore the existing dense rhododendron thickets throughout the site.

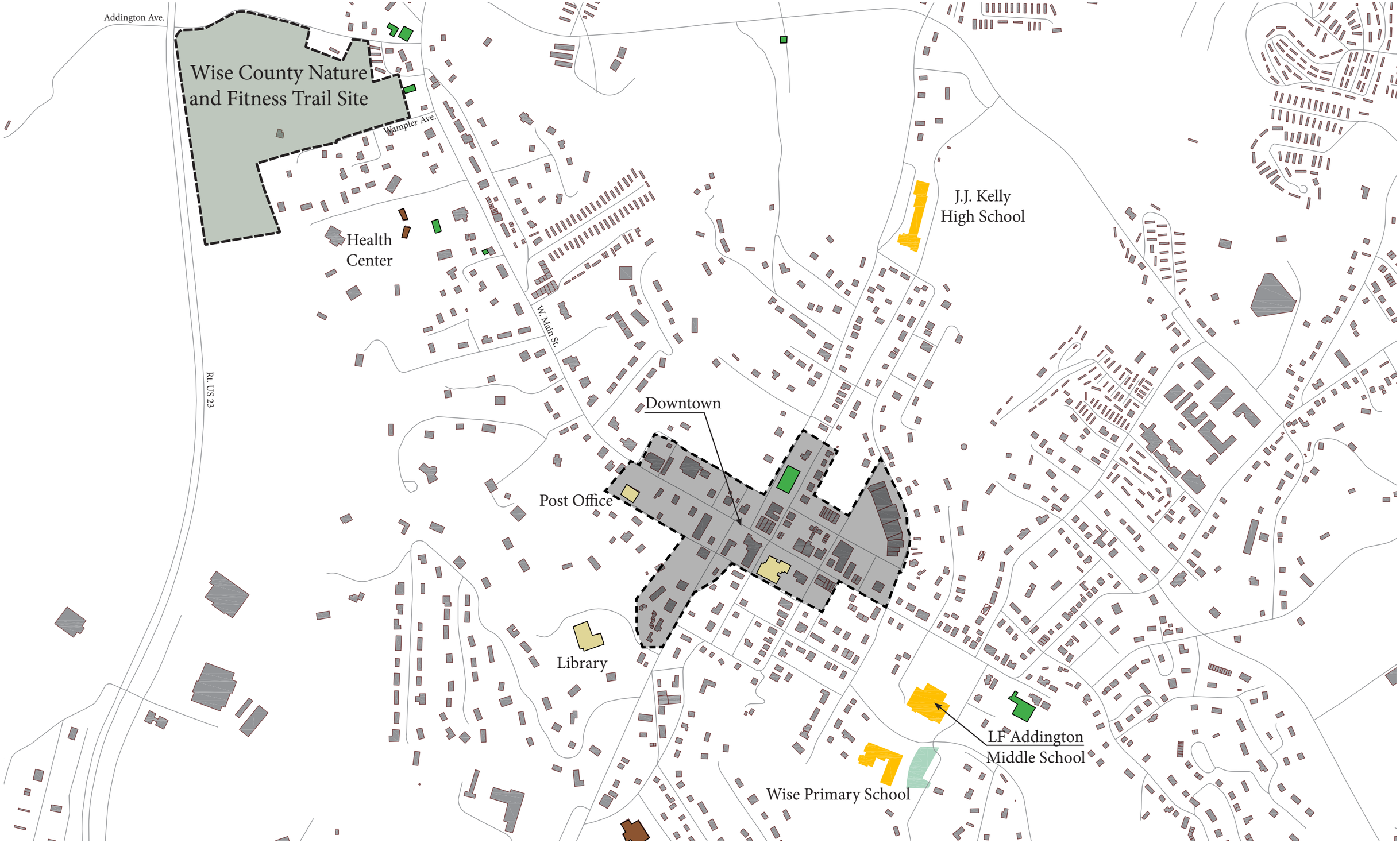


CDAC Team member Kyle Cooper investigates the possible location for a nature play area on the heavily wooded site.

While conducting the inventory and analysis for the project site, the CDAC team visited with various County officials as well as conducted independent data gathering. The CDAC team examined walkability, vegetation cover, current land use, surrounding land use, and water runoff . This helped the team to identify opportunities and constraints as well as appropriate locations for particular activities to take place. Examples included siting walking trails through the back side of the site, locating where educational opportunities might be present within the site, as well as locating the recreational areas that could be established within the woodland site. In addition, the CDAC team led a community meeting where they heard the needs and desires of Wise citizens.

Critical findings included:

- Wise has a desire to address its health and obesity issues and provide more exercise opportunities to residents and visitors.
- The County has few natural, walkable areas for community use.
- Citizens wish to gain access to engaging, educational, and recreational opportunities outdoors for all ages to learn and play within nature.
- Citizens are interested in the creation of wildlife habitats to foster education and sustainability.
- The site's diverse topography and mature forest growth creates many opportunities and constraints that impact the area's hydrology and what activies can occur on the site. There are many instances where the topography can be utilized to develop active recreation opportunities. What follows is a graphic conceptual presentation of a number of those opporunities through site plans, precedent imagery and character sketches.



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Town of Wise Context Map

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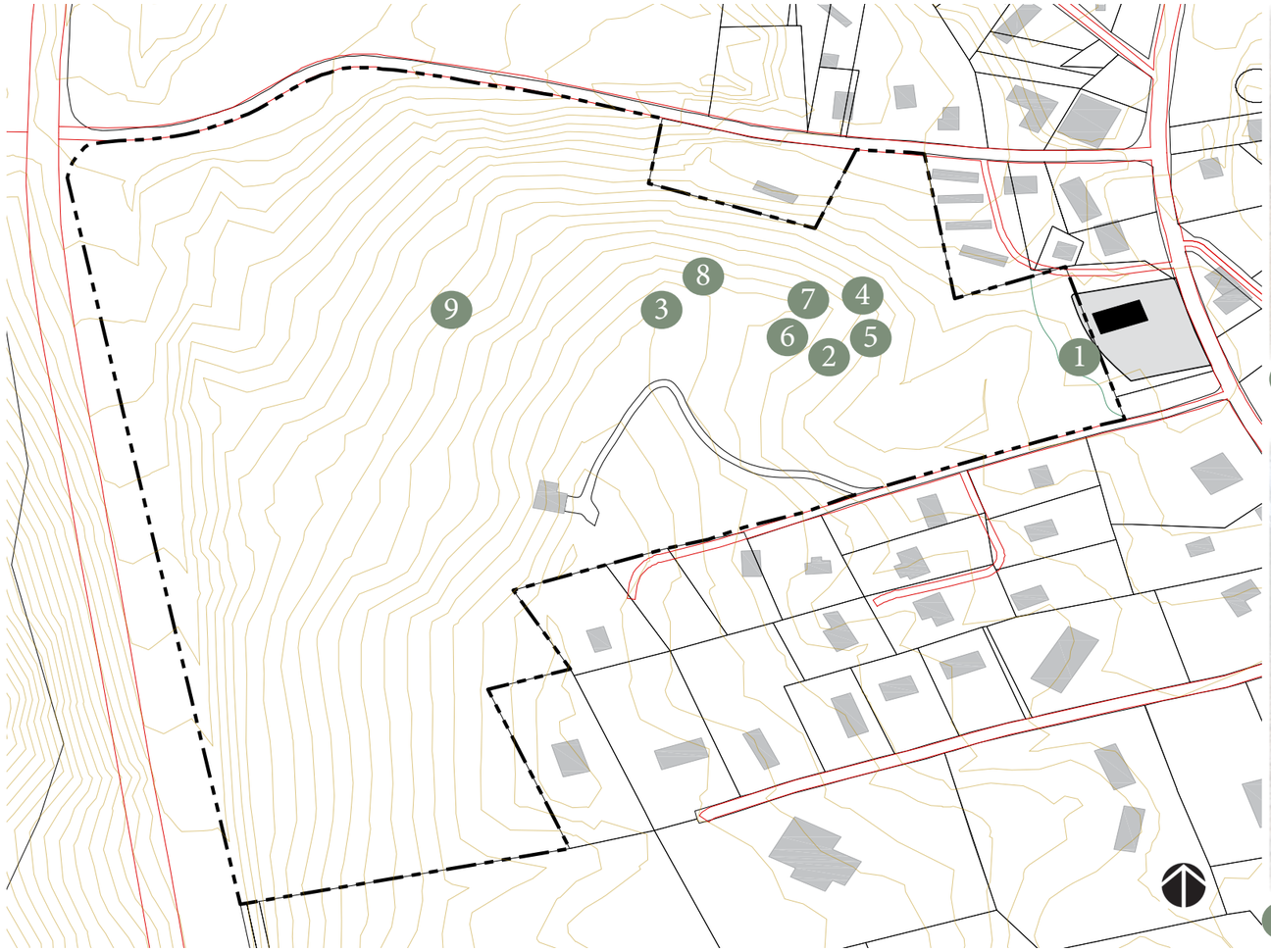



1 Park Entrance and Trail Head



2 Classroom A



3 Classroom B



4 Natural Play A



5 Dry Stream Bed



6 Large Downed Tree and Rock Outcrop



7 Mossy Rocks and Stream Bed



8 Exposed Rocks and Thick Growth



9 Rhododendron Thickets

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Existing Site Character and Features

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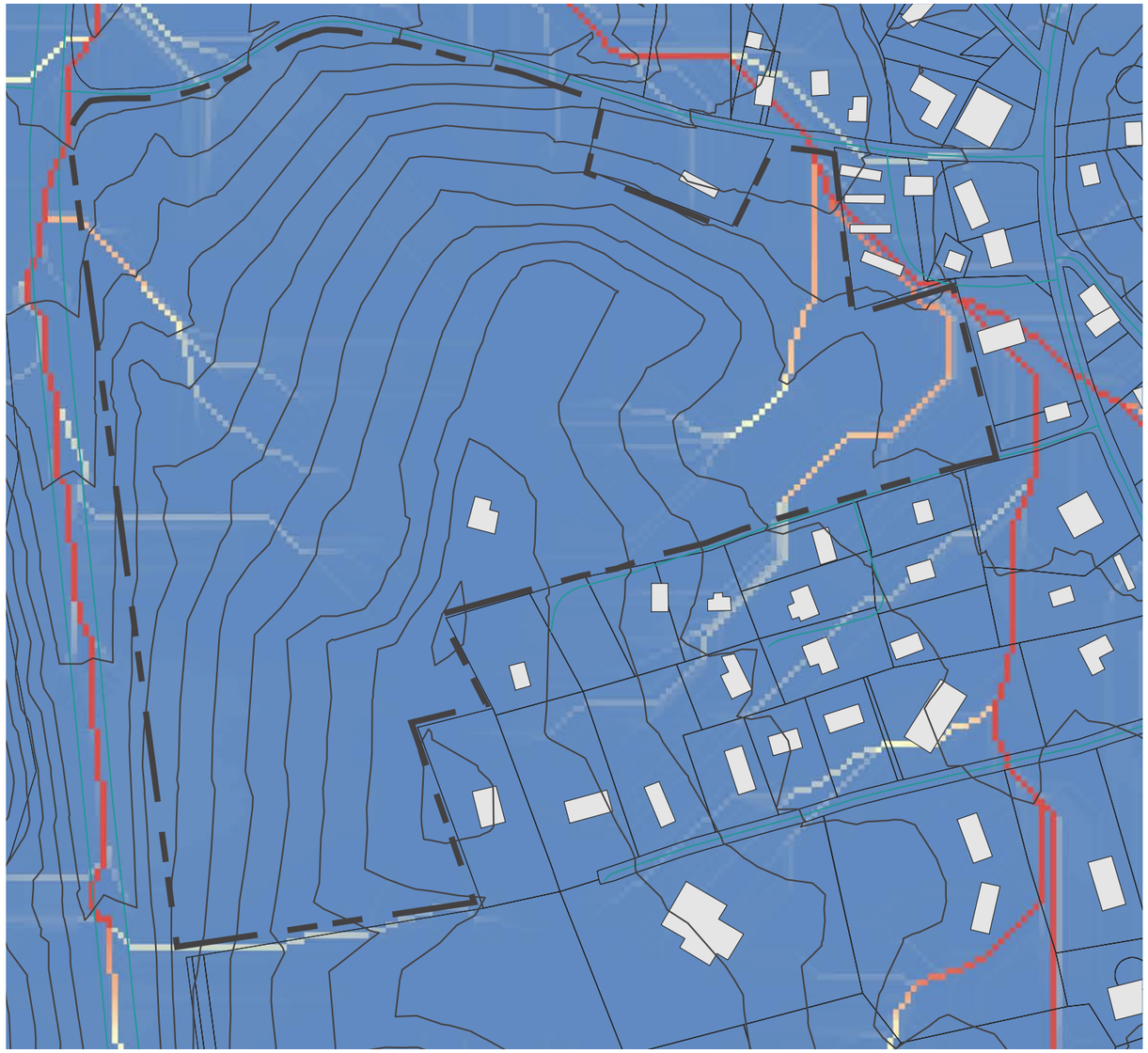
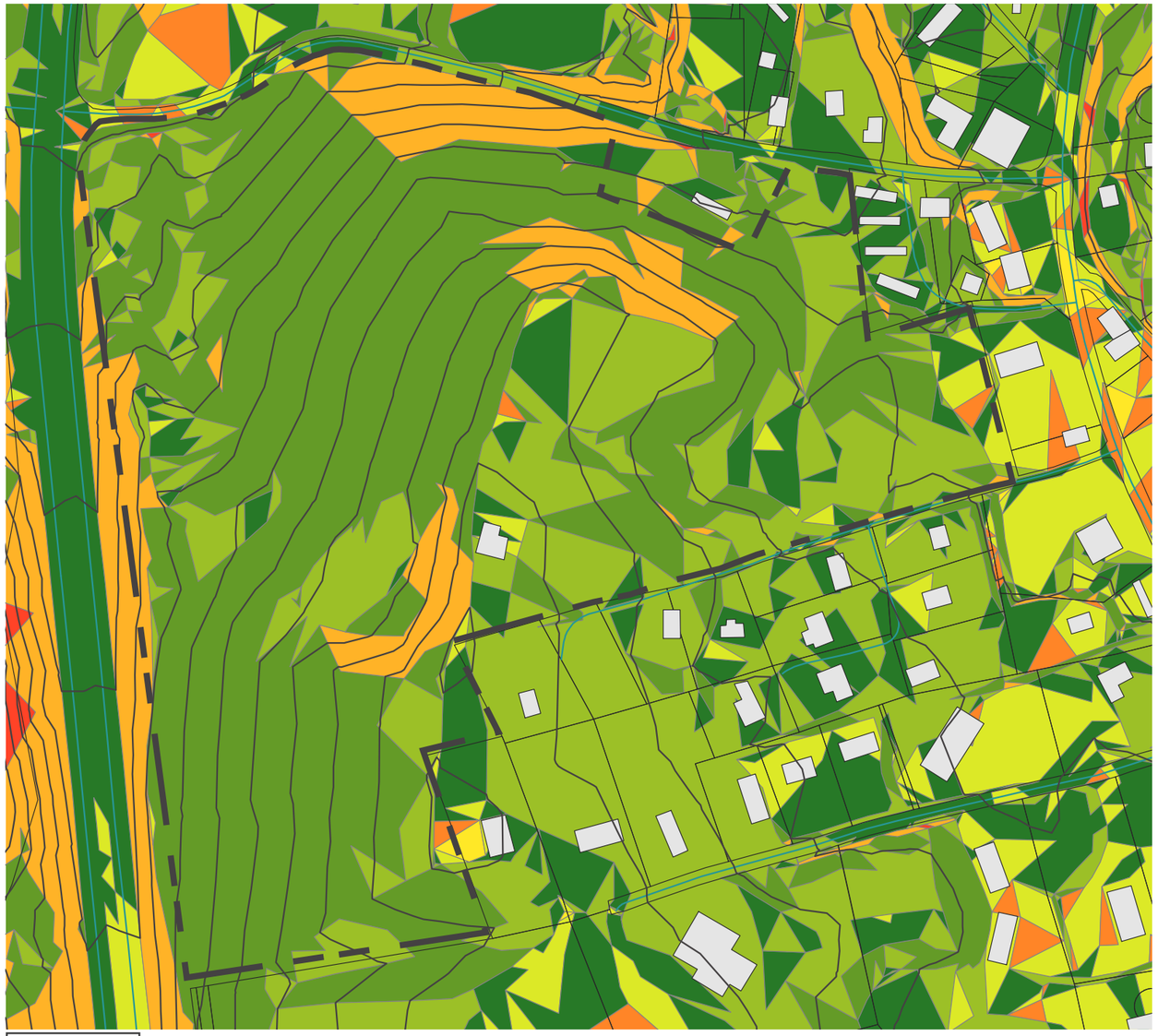


low
moderate
high

Water Accumulation Model

Water is channelized through four main swales on site, connecting to a stream system that runs through the trailer park and neighborhoods to the northeast and southeast sides of the site. These ephemeral streams may need more sensitive design decisions or protective measures if found to be ecologically important.



1-2%
2-5%
5-10%
10-20%
20-45%
above 45%

Slope Analysis

Overall, the slopes on the site are fairly steep, with some flat land near the church grounds. This means that care in trail design must be taken in order to prevent erosion as well as to provide suitable traversal for the visitors to the park.

0’ 100’ 200’ 400’

N

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Topography Analysis

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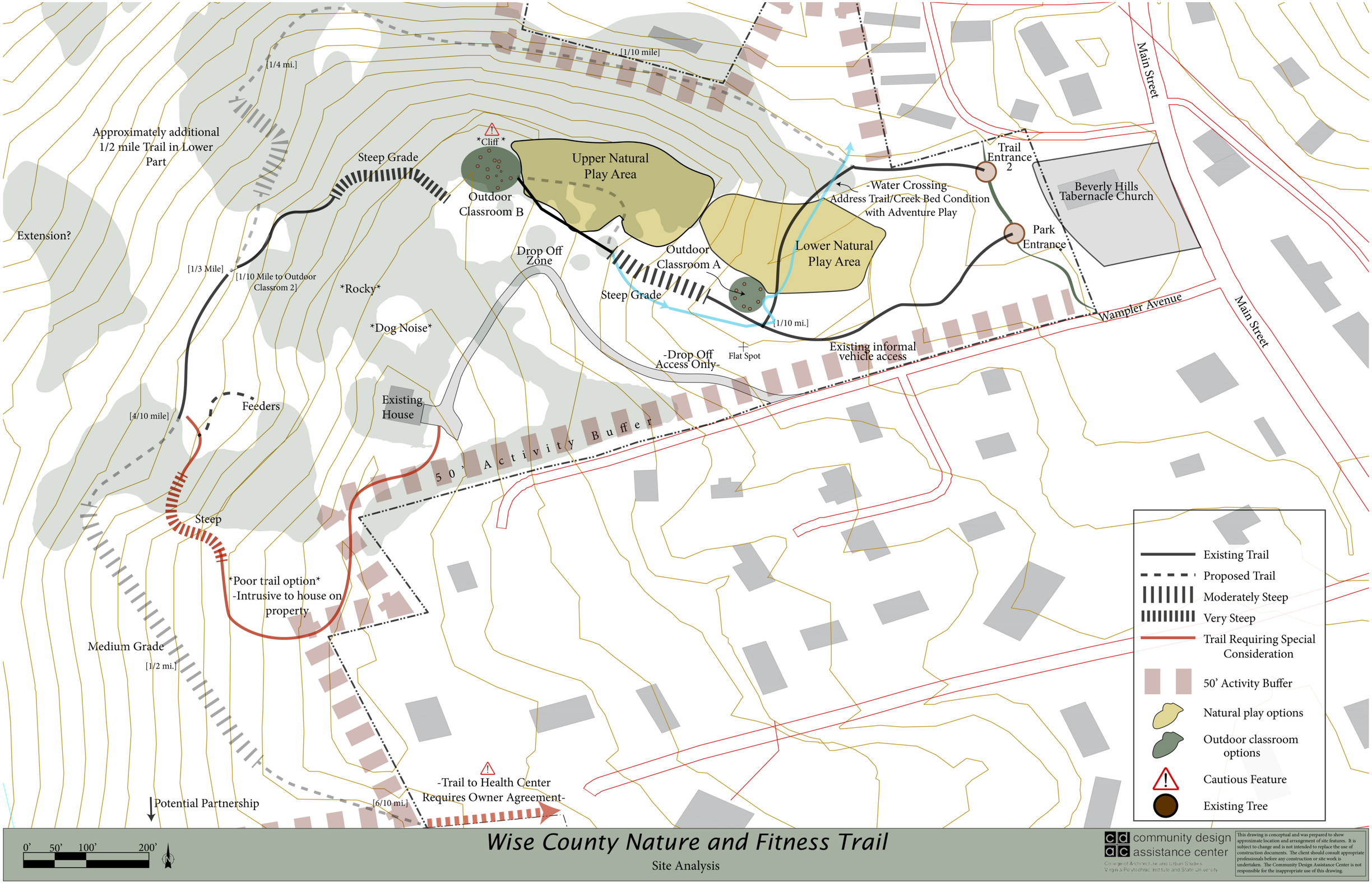

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Site Analysis

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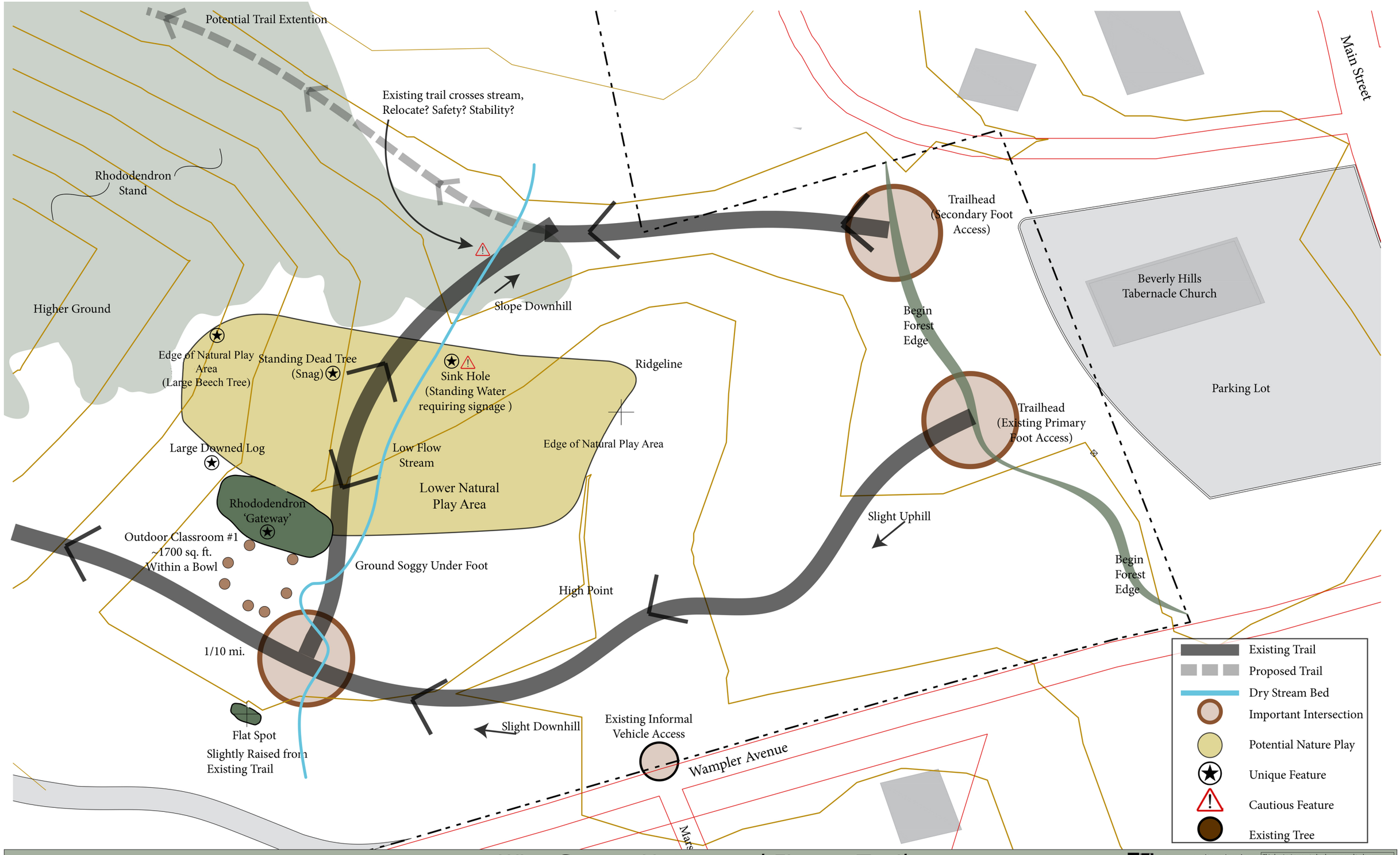

0' 25' 50' 100'

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Site Entrance Analysis

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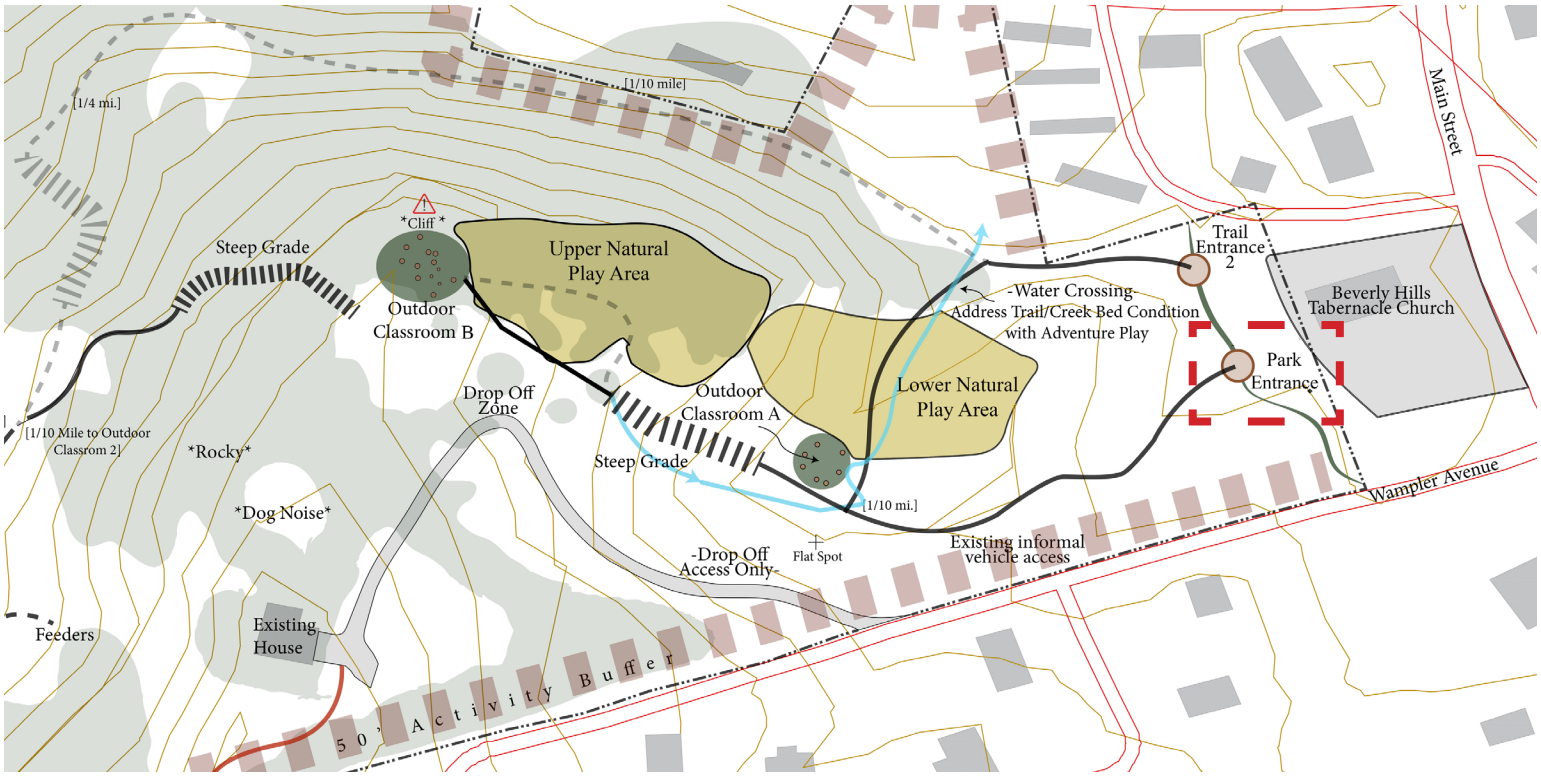
Preliminary Design Concepts



CDAC team member Nick Proctor explains some of the conceptual designs for the trail system at a community meeting on April 8, 2013.

The CDAC team developed two preliminary conceptual designs for the entrance to the park (Park Entrance A & Park Entrance B) and two preliminary concepts designs for outdoor classrooms and nature play (Outdoor Classroom A/Lower Nature Play Area & Outdoor Classroom B/Upper Nature Play Area) (See page 12: Site Analysis for design locations). Due to the topography of the site, both concepts shared a similar trail system. The CDAC team presented these designs to the community for review and comment. In addition, the CDAC team displayed a variety of images with different ideas for materials, layout, and activities, to get a sense of the overall aesthetic and function that the community desired for the park. Detailed descriptions of each concept and supporting 11x17 drawings are found on the following pages.

Park Entrance: Concept A



Concept A for the Park Entrance aims to bring the forest into the area behind the church and provide naturalistic amenities that blend into the surrounding woodland. The Welcome Pavilion is placed close to Main Street and with its attractive plantings, poses as the gateway into the park. Active and passive recreational opportunities are produced by way of a social fitness area, a children's playground, and an alternative gathering space. The combination of active and passive spaces creates a locus of community activity for the Town and County.

Primary Features

1. Gathering Space

A small shaded gathering space along the wood's edge provides an area for personal retreat or space for small social gatherings.

2. Child Play Area

A small natural play area provides children with a space to play while parents socialize or exercise in the fitness area. Features include climbing logs, boulders, and a climbing wall.

3. Trail Head and Signage

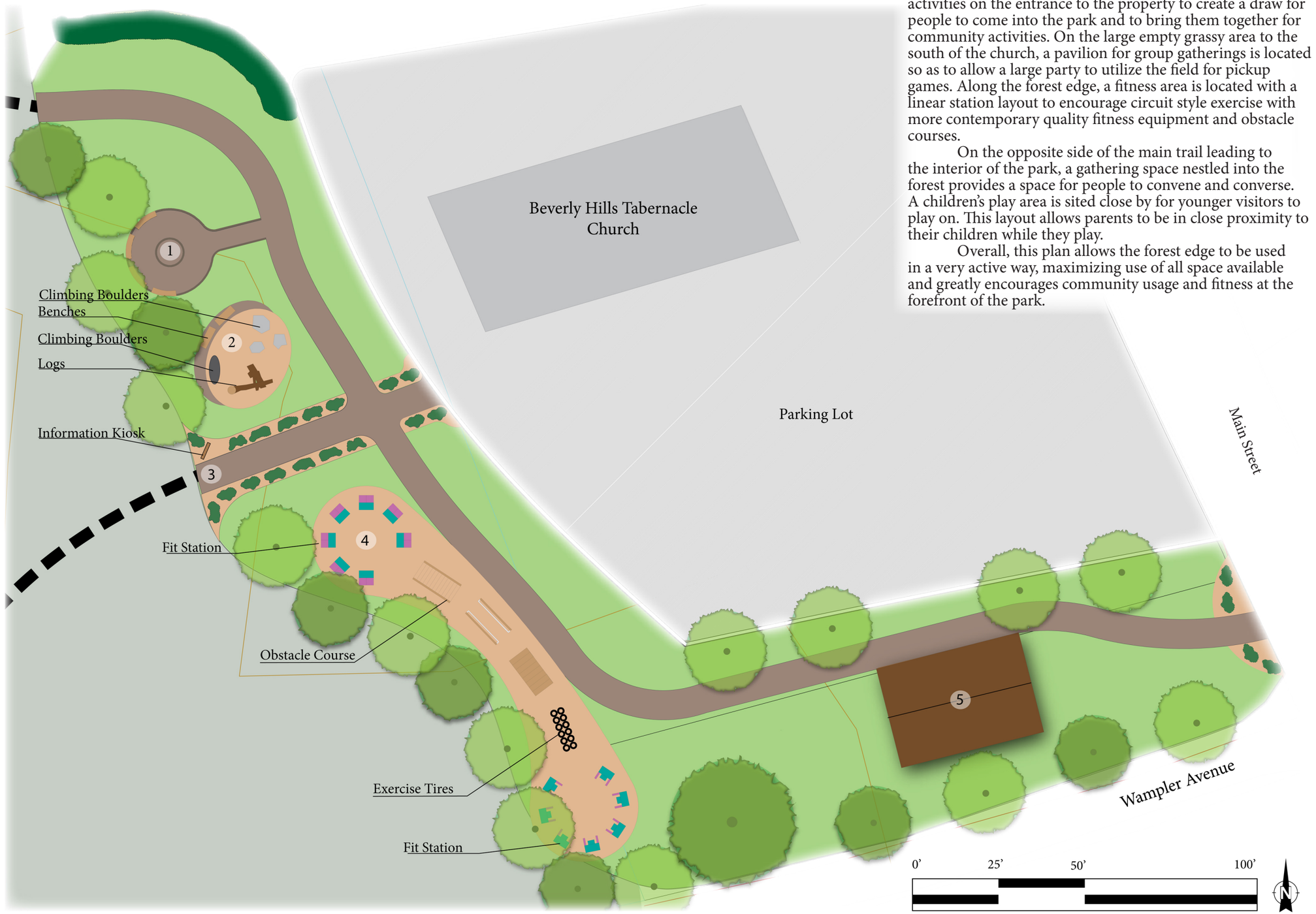
The primary entry trail head has plantings to improve aesthetics and to enhance entry into trail. Signage informs, orients, directs, and informs the user of features and destination points along trail.

4. Social Fitness Area

A space dedicated to fitness, this area provides both personal and social fitness opportunites. Two circular areas at opposite ends encourage and support social fitness activities. The two are connected via an obstacle course in the middle.

5. Pavilion

A covered pavilion serves both church and community functions.



This concept aims to establish a highly visible array of activities on the entrance to the property to create a draw for people to come into the park and to bring them together for community activities. On the large empty grassy area to the south of the church, a pavilion for group gatherings is located so as to allow a large party to utilize the field for pickup games. Along the forest edge, a fitness area is located with a linear station layout to encourage circuit style exercise with more contemporary quality fitness equipment and obstacle courses.

On the opposite side of the main trail leading to the interior of the park, a gathering space nestled into the forest provides a space for people to convene and converse. A children's play area is sited close by for younger visitors to play on. This layout allows parents to be in close proximity to their children while they play.

Overall, this plan allows the forest edge to be used in a very active way, maximizing use of all space available and greatly encourages community usage and fitness at the forefront of the park.

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Park Entrance A Conceptual Design

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Pavilion Material Combinations



Movable Seating
Wood, Natural finish



Permanent Seating
Metal, Painted finish



Open Floor
Wood, Natural finish



Wood, Metal mix
Moveable Seating

Alternative Gathering Space Detail



Child Play Area







Social Fitness Area Examples







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Park Entrance A Concept and Pavilion Types

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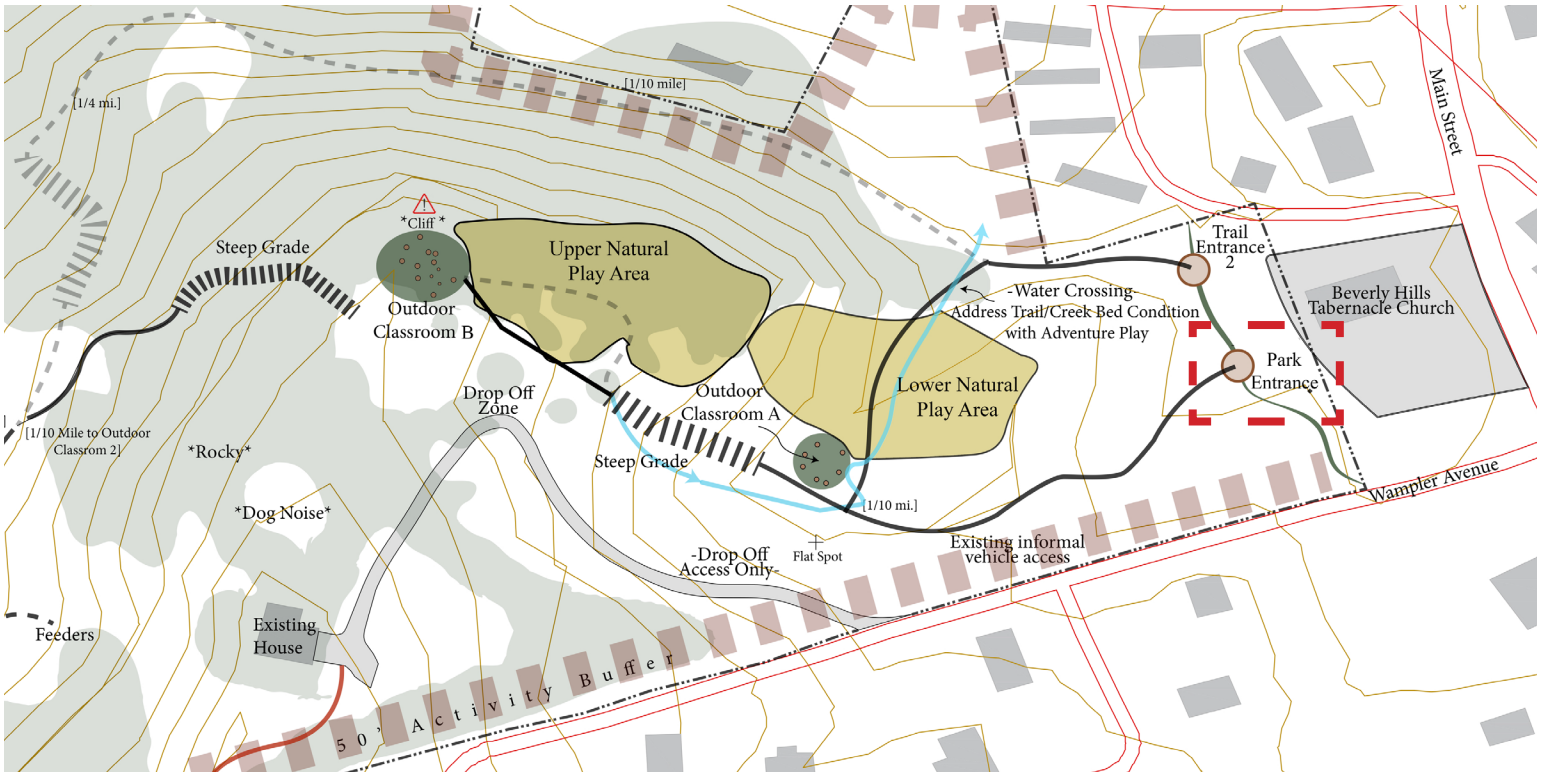
Park Entrance: Concept B



Concept B for the Park Entrance approaches the entrance to the park in a more passive manner than that of Concept A. Large patches of grass are kept for unprogrammed open greenspace such as catch, frisbee, and informal gathering. Major elements include a small t-shaped pavilion surrounded by aesthetic plantings that allows church groups and the public to gather rain or shine. The more active areas, such as group exercise stations, are tucked behind the pavilion within the covered of the forest's canopy. A secondary entrance at the corner of the property leads to the greater trail system of the park.

Primary Features

1. Trail Information
A small wooden sign gives an overview of the trail system. Information might include distances, average walking times, and fit trail equipment locations.

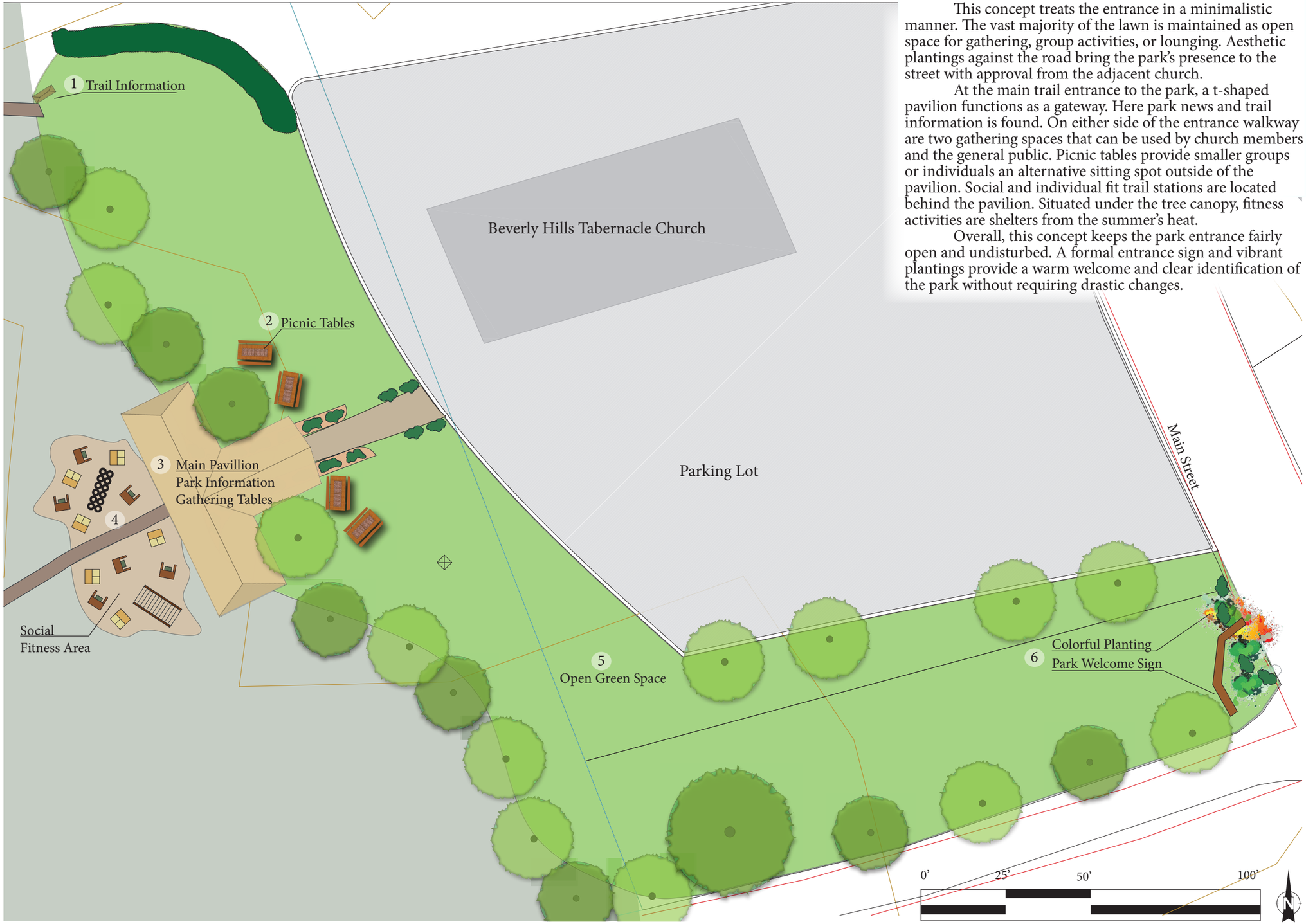
2. Picnic Tables
Wooden picnic tables can be used in an informal layout for multiple occasions when the weather is pleasant. Also, they could be used by visitors or church members.

3. Main Pavillion
This larger, multi-section pavilion is where all the park information and community message boards can be found. There are two gathering spaces under the covered structure. This allows two groups to gather at once without necessarily disturbing the other.

4. Social Fitness Area
A space dedicated to fitness, this area provides both personal and social fitness opportunites.

5. Open Green Space
This space is open for free use. It can be used for exercise, playing catch, or simply lounging in the sun.

6. Park Welcome Sign and Plantings
This sign is to welcome visitors to the park from Main Street. It will contain information such as supporting groups of the park as well as park hours. Colorful and multi-season plantings create an attractive corner for the church and park entrance.



This concept treats the entrance in a minimalistic manner. The vast majority of the lawn is maintained as open space for gathering, group activities, or lounging. Aesthetic plantings against the road bring the park's presence to the street with approval from the adjacent church.

At the main trail entrance to the park, a t-shaped pavilion functions as a gateway. Here park news and trail information is found. On either side of the entrance walkway are two gathering spaces that can be used by church members and the general public. Picnic tables provide smaller groups or individuals an alternative sitting spot outside of the pavilion. Social and individual fit trail stations are located behind the pavilion. Situated under the tree canopy, fitness activities are shelters from the summer's heat.

Overall, this concept keeps the park entrance fairly open and undisturbed. A formal entrance sign and vibrant plantings provide a warm welcome and clear identification of the park without requiring drastic changes.

Wise County Nature and Fitness Trail

Park Entrance B Conceptual Design

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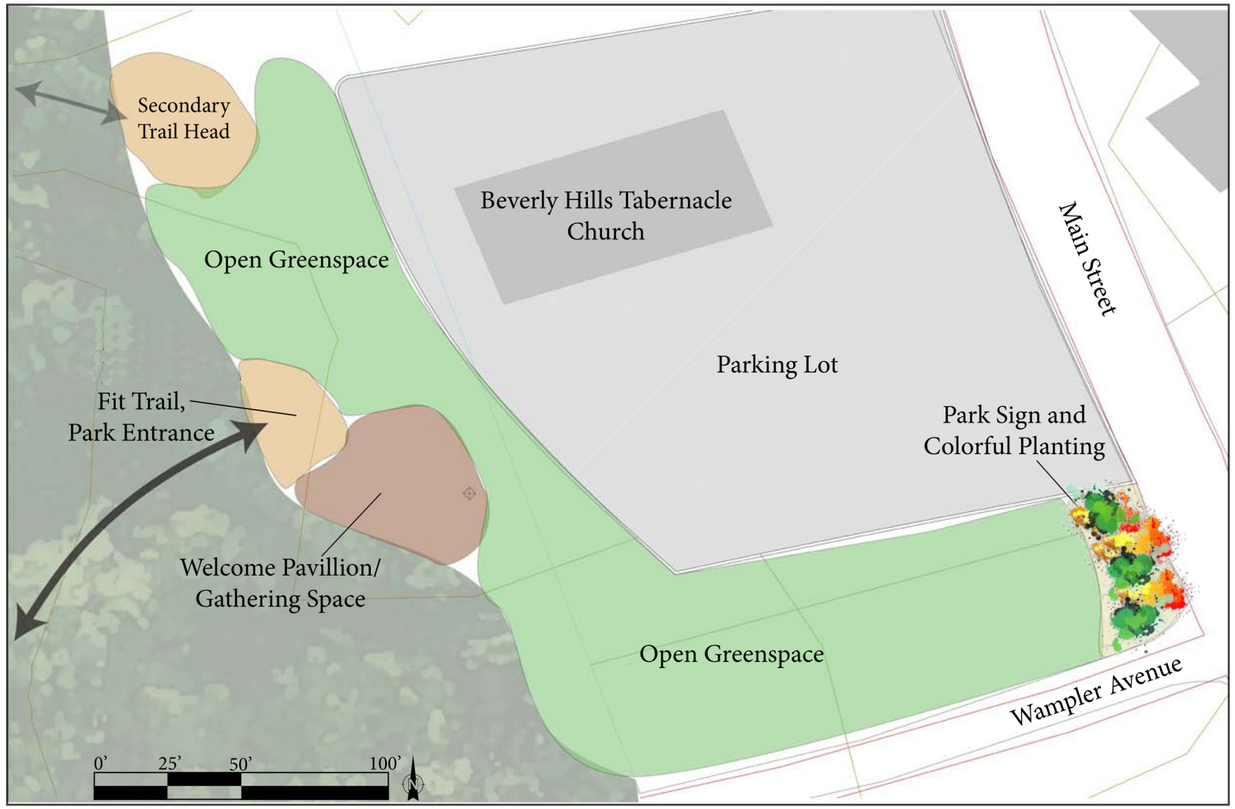


Multi-Section Pavillion







Single-Section Pavillion







Open Greenspace Activities





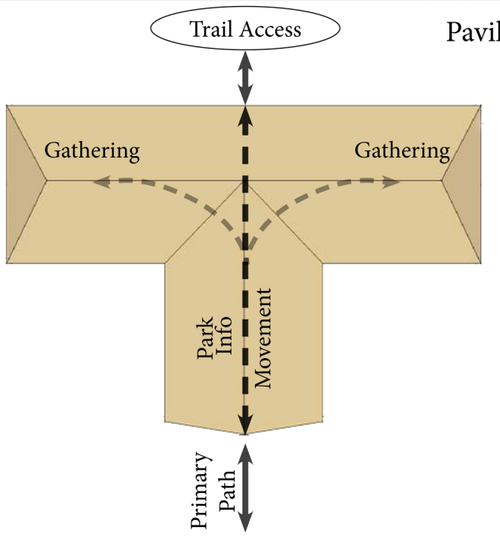


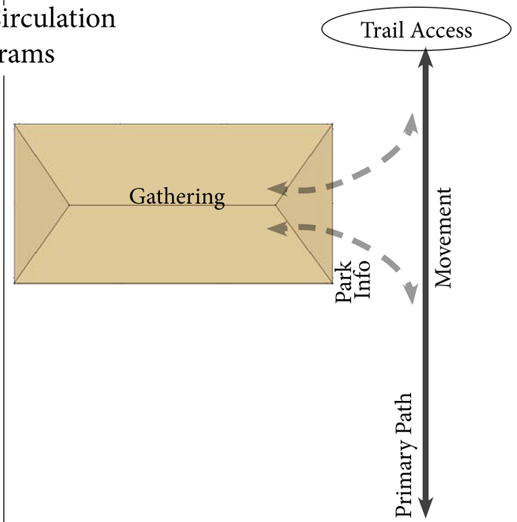






Pavilion Circulation Diagrams





Wise County Nature and Fitness Trail

Park Entrance B Concept and Pavilion Circulation Types

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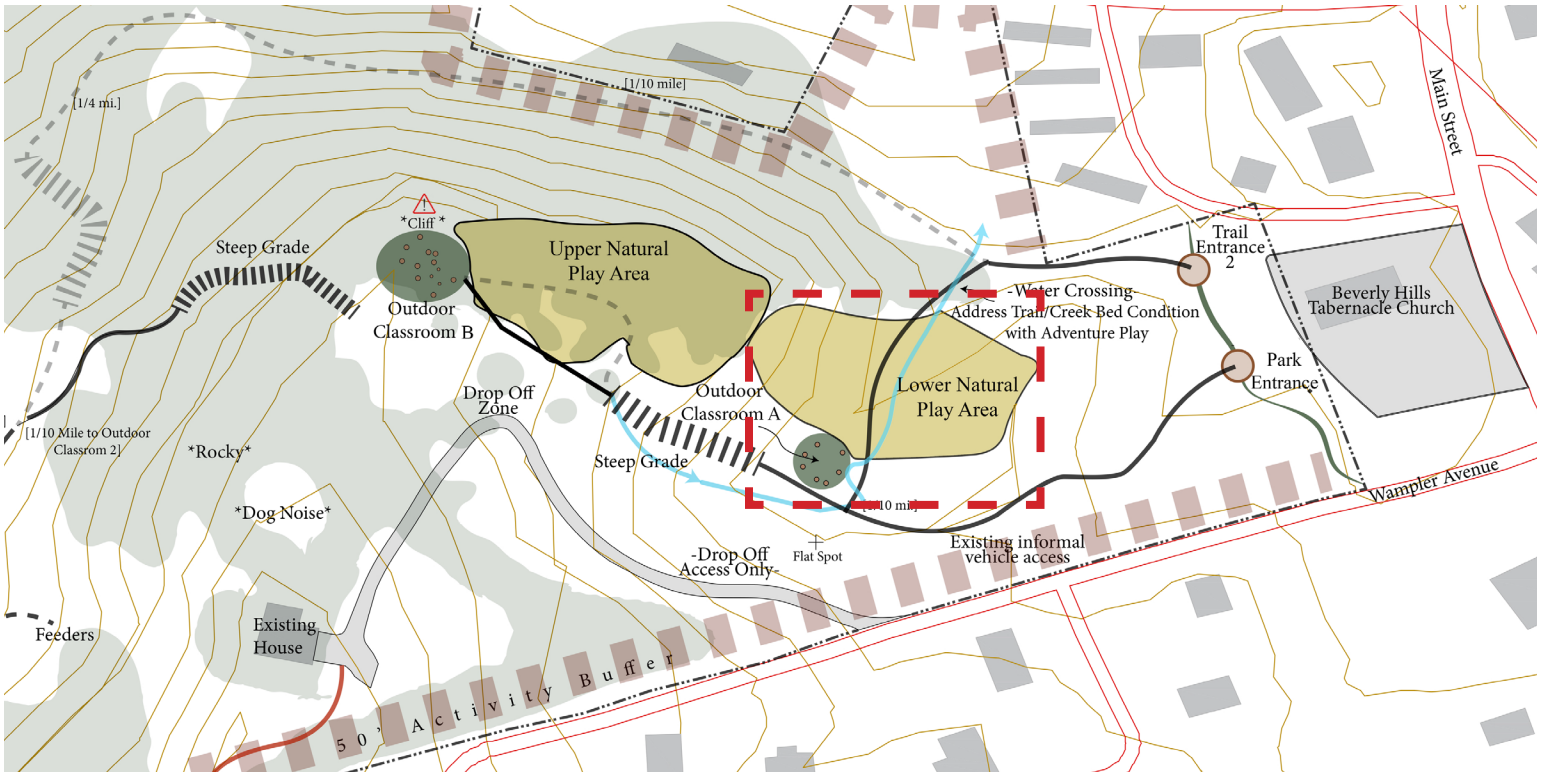
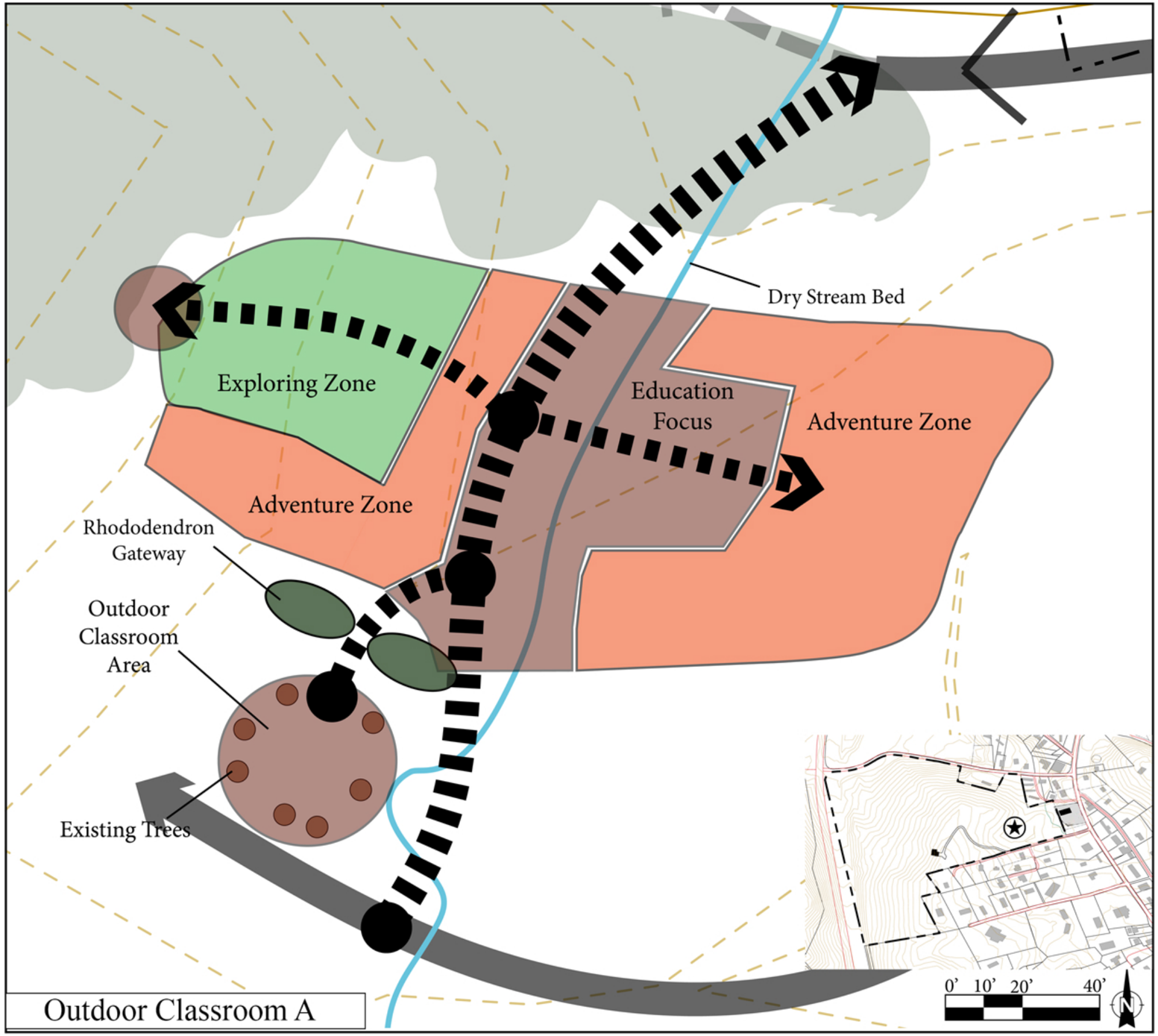
Lower Natural Play Area/Classroom A



Moving further into the site, the Lower Natural Play area and Outdoor Classroom A focus on the middle area of the site and develop a dynamic educational and recreational space within the woods. The elements within the space, such as the fossil dig and bird blind, allow people of all ages to get closer with nature in an engaging way.

The design straddles an ephemeral stream that is found through the center of the play area after heavy rains. The lower nature play area utilizes the hills and its central location to create a variety of physical activity opportunities as well as interpretive and educational activities. This area allows people to learn and teach about the various wildlife, history, and culture of the woodland and region surrounding Wise. What at first appears as only play is actually a very educational and playful way to learn.

The concept for Outdoor Classroom A is designed to take advantage of the natural valley shape of the interior part of the site. This concept includes an educational area focused around a dry stream bed and an adventure play zone located on either side of the proposed trail. The adventure play zone offers a variety of contemporary play equipment such as a slide and swing, as well as more natural elements such as rock climbing, stick play, and fossil digging. An informal gathering space on site can act as a classroom area for teachers to collect their students before sending them out to explore particular areas to learn or play, depending on the day's activities.



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Primary Features

1. Outdoor Classroom

The classroom uses the existing tree patterns, tree cookie groundcover, and boulder seating.

2. Boardwalk

A raised boardwalk allows for safer travel through area and handicap accessibility to most areas.

3. Gathering/Play Area

Stumps and boulders create both a play and social space. Elements can be used for seating in groups or for balance and jumping. Stumps also serve an educational purpose with responding leaf patterns burnt into the top of each stump.

4. Free Play/ Construction Zone

Raised logs provide an area to exercise and enhance balance skills.

5. Seating

Boulders both encompass and serve as seating in this space. This space links access to the stream bed, swing, slide, and fossil dig.

6. Fossil Dig

This sand/soil pit can serve in fossil discovery and education. Plaster can be used to create fossils and can be mixed in soil.

7. Animal Tracks

Prints of local species of animals are imprinted into blocks of concrete

8. Slide

A slide using the natural topography is a safe and fun element.

9. Hill Climb

Logs and rocks serve in creating an adventurous climb back to the top.

10. Swing

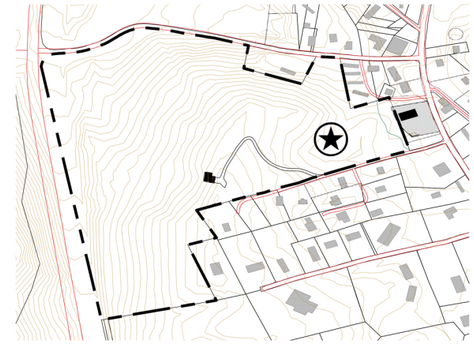
This multi-person swing mimics the shape of a tree.

11. Bird Blind

The bird blind camouflages users from birds to enhancing the experience and increasing visibility of birds in their natural habitats.

12. Fallen Tree

The existing fallen tree can be used as a natural element to climb and play upon.





0’ 10’ 20’ 40’

Wise County Nature and Fitness Trail

Outdoor Classroom A Conceptual Design

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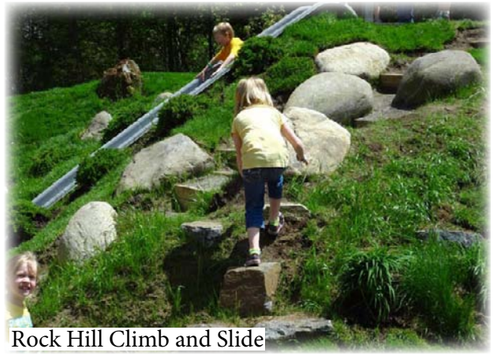
Nature Play A


Nature-Form Swing


Survival Fort


Rock Hill Climb and Slide


Fort Making

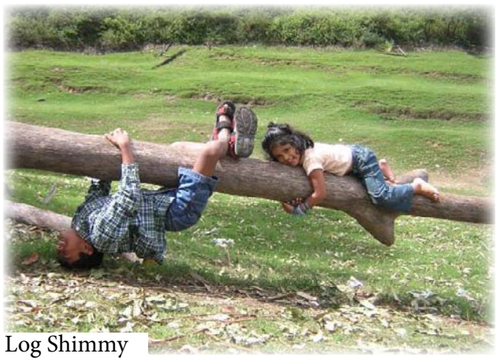

Fossil Find


Land and Lava


Balance Act


Stump Hop


Adventure Slide


Log Shimmy


Boulder Climb


Tube Slide


Bird Blind


Animal Tracks


Log Climber


Dirt Dig Zone

Nature Play B

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Nature Play Examples

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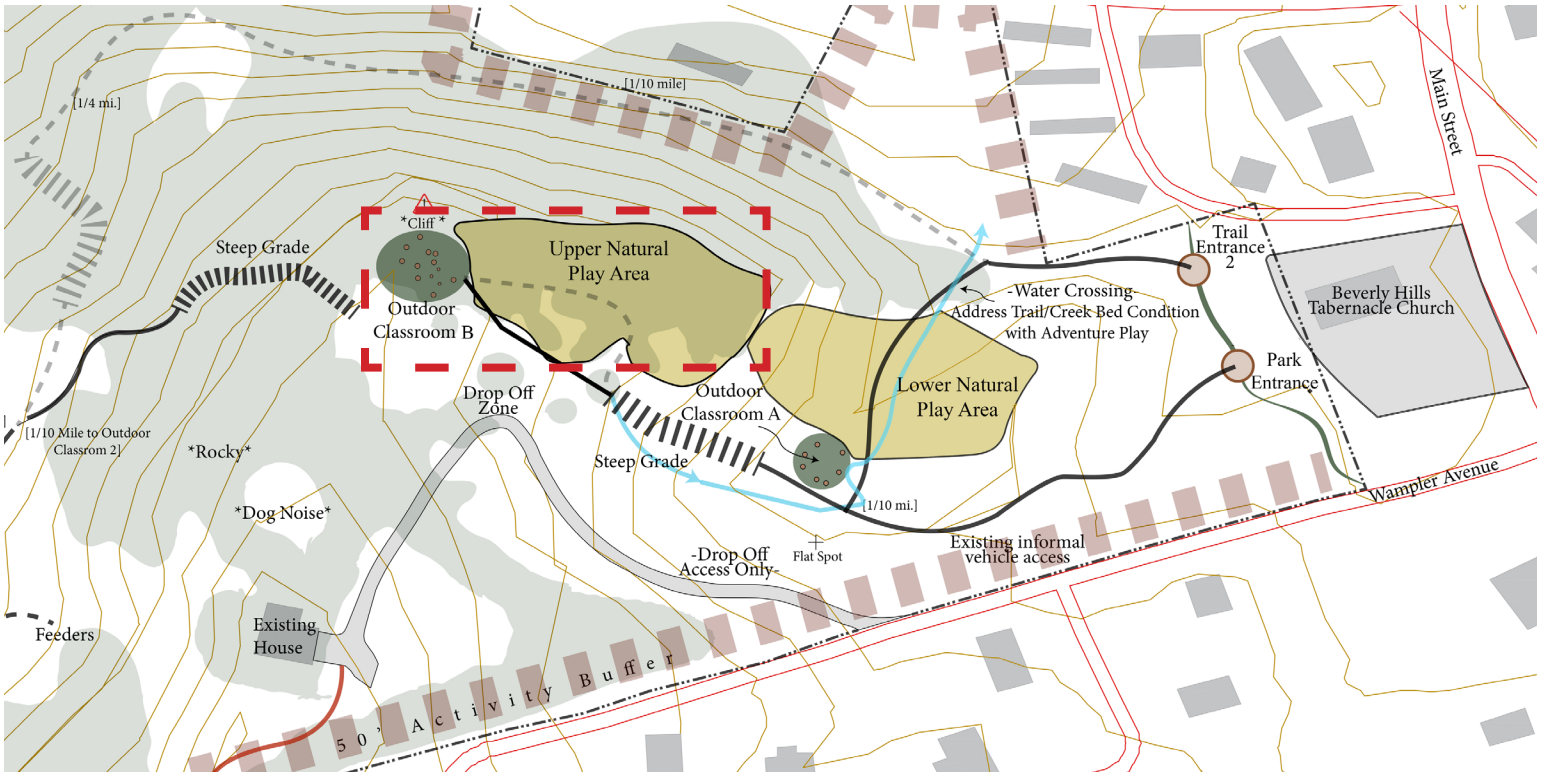
Upper Natural Play Area/Classroom B

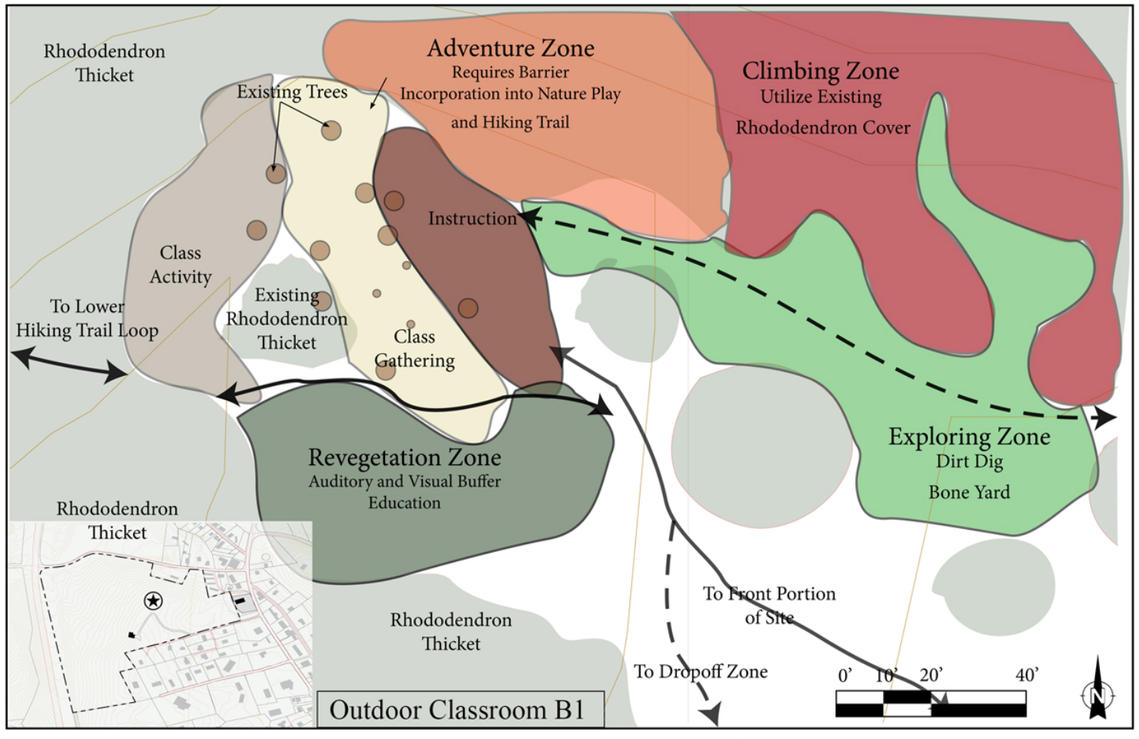


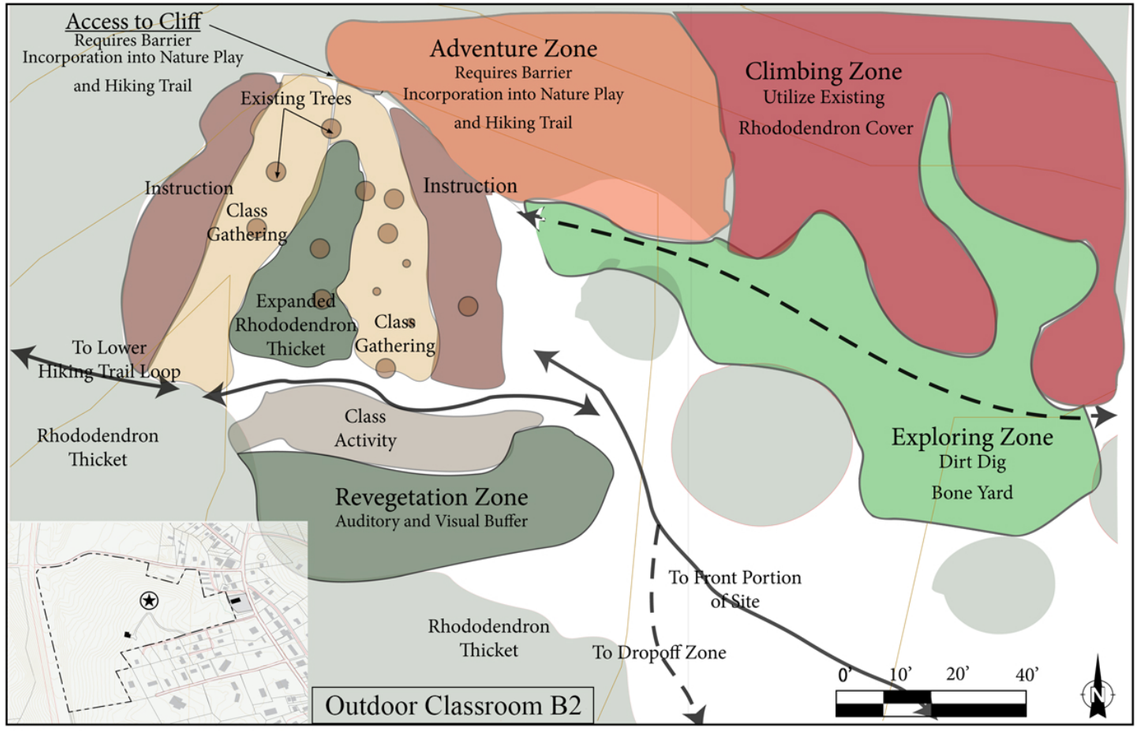
The Upper Natural Play Area and Outdoor Classroom B is located further back in the site. Outdoor Classroom B is a formal, structured outdoor space that allows teachers to bring groups of students and instruct in a more traditionally programmed educational space, complete with tables and movable seating. The space utilizes existing vegetation and in some areas expands it so that the educational portion of the site is screened from the rest of the naturally open area. By doing so, the classroom lends itself for a variety of forest gardens that are themed around different topics, such as aesthetic value, edibility, and medicinal or utilitarian uses.

The Upper Natural Play Area associated with Outdoor Classroom B is simply a designated area for exploration. Elements, such as digging stations and fort building zones can be included, but they are informal in nature.

Outdoor Classroom B is located further into the site on a high point on the property and is divided into two alternate concepts, B1 and B2. The first concept, B1, is a much more developed plan that includes a more definite division of zones with a more structured layout as well as more developed equipment for recreation. An adventure zone and a climbing zone blend into the lower classroom/ play area with a more formal array of spaces for education on the western side of the site. A revegetation zone acts as a buffer to the house on site, muffling noise and vision to keep the focus on the activities within the classroom area. This concept aims to make the whole space usable by one large group of students and their teachers, with more freedom of movement.

Concept B2 applies the same concepts as B1 but divides the space into two by extending the existing rhododendron stand on site. The space can be used by two classes at once, in a more focused atmosphere separated away from recreation and natural play. This concept also allows for access to the existing cliff face as well as the secondary trails running through the back end of the property.





Wise County Nature and Fitness Trail

Outdoor Classroom B1 and B2 Conceptual Diagrams

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Primary Features

1. Classroom Tables

The tables are roughly three feet by four feet. In the middle is an imbedded tray that can be used for various classroom activities such as rock identification, worm farms, or soil experiments. The tray can be covered for security and storage. Seating utilizes logs on end.

2. Log Bench Seating

These half hewn logs can be used for formal classroom instruction for any group using the outdoor classroom. This structure orients students towards the teacher's station at the front of the outdoor classroom.

3. Teacher's Station

The teacher's station is very similar to the classroom stations but is longer to allow students to gather around during a demonstration. This station can have a covered shelter incorporated into it for storage or cover during inclement weather.

4. Revegetation Zone

This is an opportunity for the students to get first hand experience with the native species of the area. This revegetation zone will eventually function as an auditory and visual buffer to the existing house that is on the property. Unlike the adventure play, this zone is primarily for education

5. Annual and Perennial Forest Garden

This garden focuses on the aesthetic potential of native species to create an attractive and educational entrance to the outdoor classroom area.

6. Forest Edible Garden

This garden focuses on how the forest can be a source of food. Unlike a kitchen garden, it highlights what species were used when foraging was a popular method of collecting food.

7. Frontier Garden

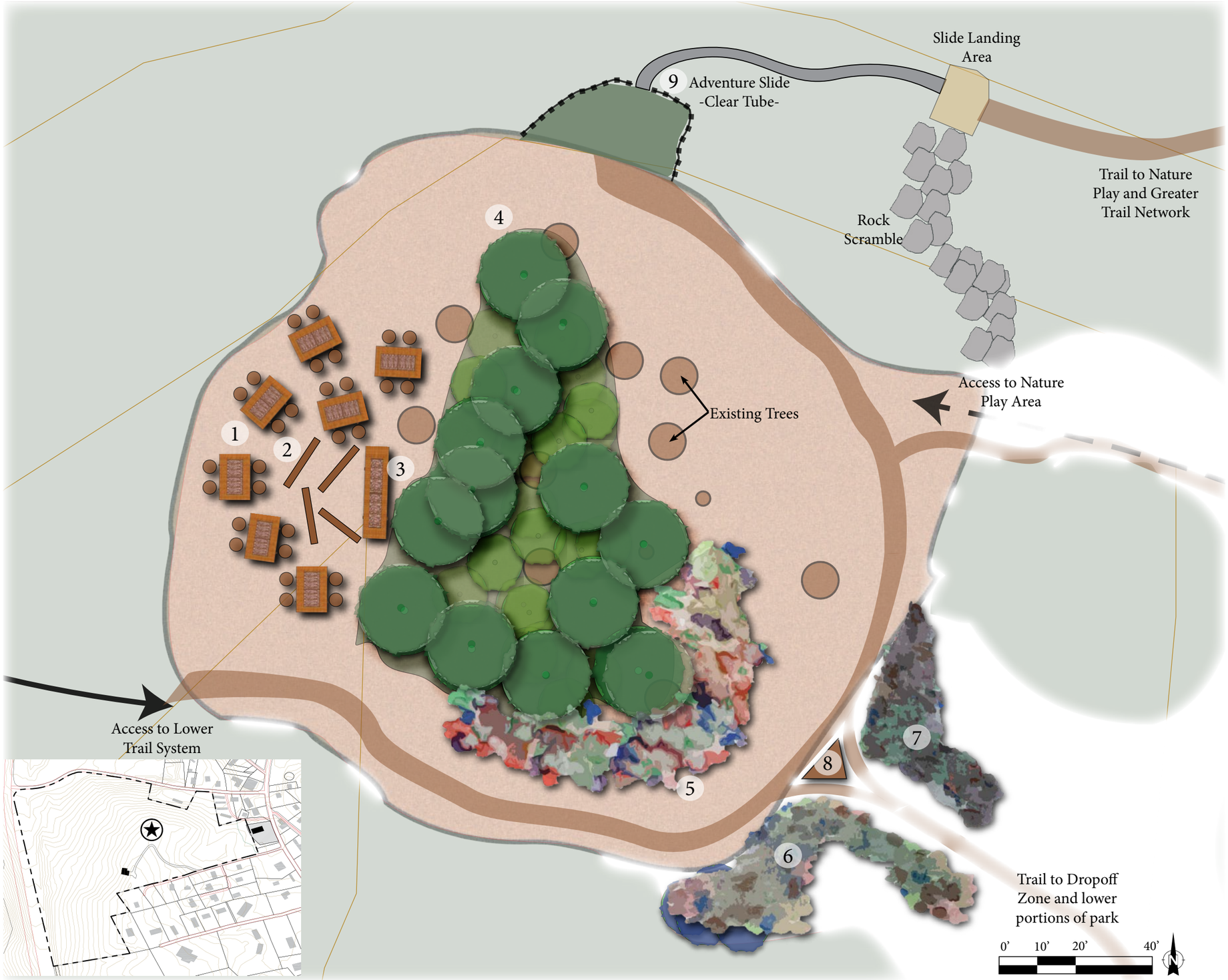
This garden focuses on the utilitarian aspects of the forest native species. Demonstration might include how various dyes were used by native people of the area for dying fabrics.

8. Informational Kiosk

This kiosk provides information about the various trails that intersect here, classroom schedules, or available activites in this part of the park.

9. Adventure Slide

This slide uses the existing cliff to place a slide, entering the nature play area.



Wise County Nature and Fitness Trail

Outdoor Classroom Option 2 Conceptual Design

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Formal Instruction

- Lessons
- Demonstrations
- Special Programs


Demonstrations


Teacher- focused


Ampitheater Style


Informal Arrangement


Split Log Benches

Class Activity

- Connection to S.O.L 's
- Soil and Rock Classifications
- Natural Process
- Meteorology
- Wildlife and Plant Cycles


Woodlawn Structures


Rock Types and Creation



Soil Types and Composition


Temporary Shelter and Wilderness Techniques


Biology and Owl Pellets



Weather Stations


Planting in the Forest


Bird Houses and Wildlife


Worm Farm and Soil Creation


Water Processes, Soil, and Erosion


Wayfinding and Orientation

Revegetation Zone

- Native Planting
- Classroom Lessons
- Monitoring Growth


Planting techniques


Native Species Education


Forest Ecology


Forest Organisms


Teamwork

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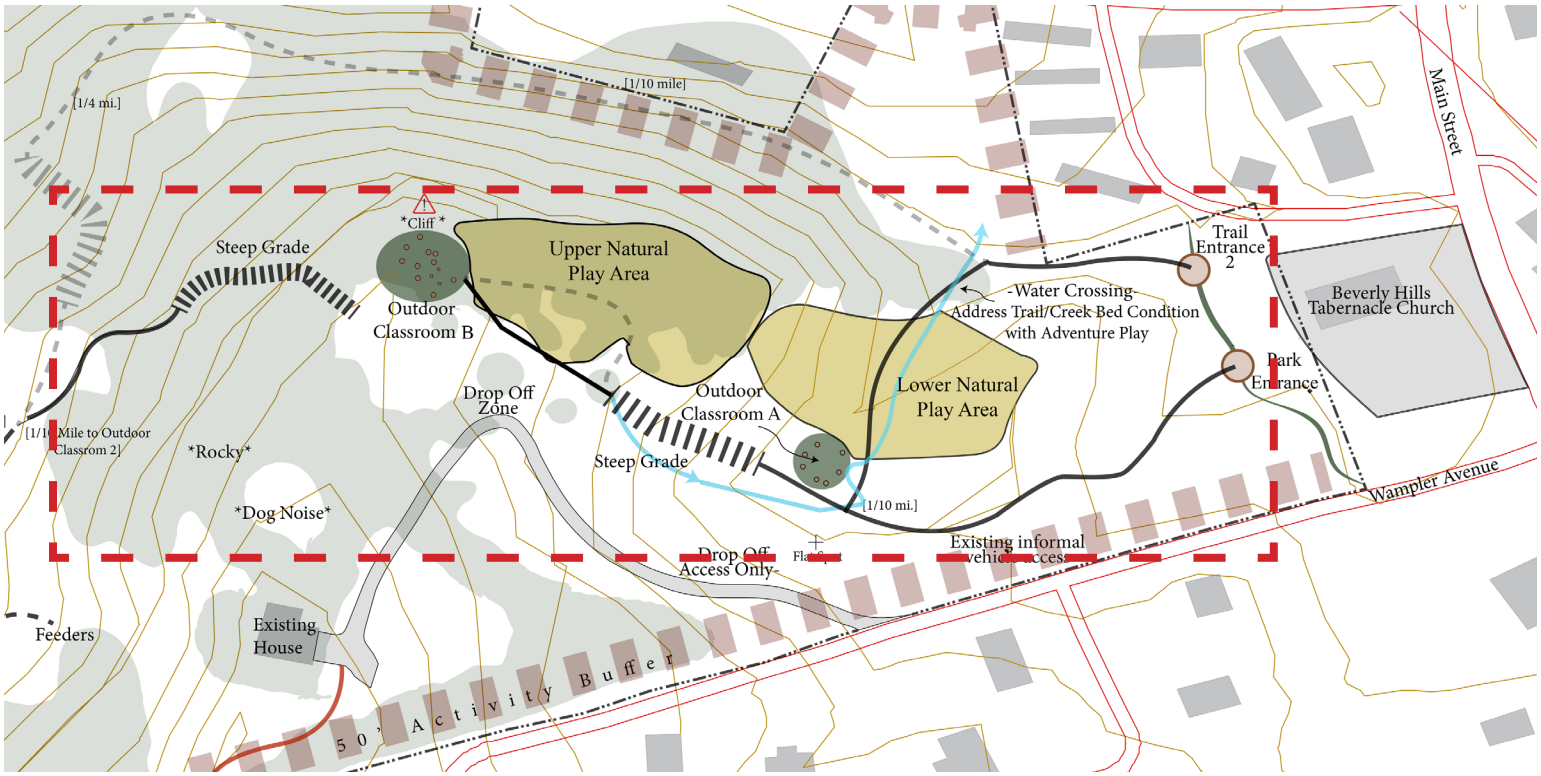
Fitness Trail System



Finally, a fitness trail system running through the site offers a variety of different difficulty levels, as well as incorporates fitness trail stations and benches for exercise and rest along the tracks. Signage for natural and fitness elements provides guidance for people within the woods. Potential materials associated with the signage and equipment for each of the concepts range from rustic to contemporary.

Outdoor Classroom B

Outdoor Classroom A

Beverly Hills Tabernacle Church

Main Street

Wampler Avenue

Health Department

access here requires owner agreement

0’ 50’ 100’ 200’

Existing Trail

Potential Trail

Social Fit Trail Station

Single Fit Trail Station

Trail begin

Trail end

Trail Example 1
Distance: 0.85 mi.
Trail Type: 2



Native, ungraded trail surface; 0-12” wide

Trail Example 2
Distance: 1 mi.
Trail Type: 2/4



Native surface with some improved sections borrowed from on-site or imported from off-site; 12-24” wide

Trail Example 3
Distance: 0.5 mi.
Trail Type: 3



Native surface with some material borrowed from on-site; 12-18” wide

Trail Example 4
Distance: 1.5 mi.
Trail Type: 2/3



Improved areas using on-site and imported materials; 18-24” wide.

Trail Example 5
Distance: 0.3 mi.
Trail Type: 4



Wise County Nature and Fitness Trail

Park Trail Conceptual Design

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Fit Trail

- Logs, Limbs, Stumps
- Using Grade Changes
- Lumber, Wood Only
- Wood and Plain Metal

- Individuals
- Social Fitness

Rustic










Contemporary

Trail Signage

- Natural vs Man-Made
- Hand drawn vs Printed
- Neutral vs Colorful

- Lessons
- Demonstrations
- Special Programs
- Trail Distance Markers

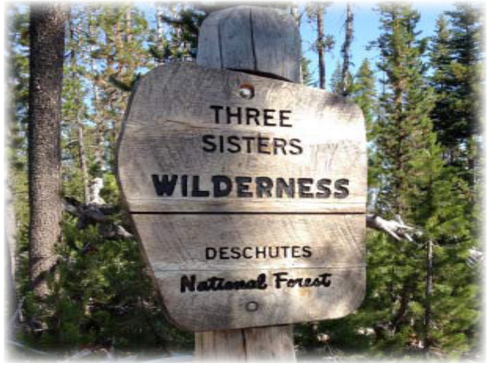
Rustic













Contemporary

Wise County Nature and Fitness Trail

Fit Trail and Trail Signage Spectrum

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Final Conceptual Master Plans



The preliminary conceptual designs went through several phases of refinement after the CDAC team considered input from community members and County staff from two different community meetings. Recurring concerns included maintaining the naturalistic state of the existing park, incorporating education through both activities and interpretive signage, and displaying a sensitivity to the immediate neighboring properties surrounding the site.

The final conceptual designs work to provide educational, energetic, and ecologically-sensitive opportunities that integrate the wishes of the former property owner with the needs and desires of the County. By utilizing a phased approach to the site's development, the site in its new and public life can mature and grow in a way that mimics the forest's evolution to its enjoyable state today.

The following pages contain the final conceptual drawings and ideas generated by the CDAC team in response to community input and design critique. As mentioned earlier, this design process is vision-oriented. The following descriptions demonstrate manageable short-term steps within the bigger picture. The Appendix contains more detailed information such as reference lists the CDAC team used as well as soil tests and plant lists for planting suggestions throughout the property.

The CDAC team and Wise residents focused efforts on four different areas within the park.

1. The park entrance design is found at the portion of the site closest to Main Street. Visitors to the park can park in the church parking lot as long as there is not a scheduled church function already taking place such as Sunday service.
2. The nature play area is located after the first hill into the property. It is situated within the bottom of a bowl-like topographic area that has an intermittent stream passing through it. This is where education takes place in the form of active play.
3. The outdoor classroom is located in a clearing after walking up a medium-steep trail after passing by the nature play area. The outdoor classroom is close to a bend in the existing driveway that can be used as a supply drop-off location for the outdoor classroom.
4. A phased trail system allows park visitors to explore the rest of the property. The trail system includes benches, fit trail stations, and educational interpretive signage.



Development Phases

Phase 1
formalize existing trails,
install pavilion and
entry signage

Phase 2
extend new trails
install outdoor classroom

Phase 3
finish back trail network
install nature play area

Wise County Nature and Fitness Trail

Final Conceptual Master Plan



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Primary Features

1. Trail Information
A small wooden sign gives an overview to the trail system. Information might include distances, average walking times, and fit trail equipment locations.

2. Reflection Area
A small shaded gathering space along the wood's edge provides an area for personal retreat or space for small social gatherings.

3. Open Green Space
This space is open for free use. It can be used for exercise, playing catch, or simply lounging in the sun.

4. Park Welcome Sign and Plantings
This sign welcomes visitors to the park from Main Street. It will contain information such as supporting groups of the park as well as park hours. Colorful and multi-season plantings create an attractive corner for the church and park entrance.

5. Main Pavilion
This single section pavilion is where all the park information and community message boards can be found. There is one common gathering space with picnic tables under the covered structure. Access to the park is located beside the pavillion. Restrooms are included as a possible later OPTION.

6. Social Fitness Area
A space dedicated to fitness, this area provides both personal and social fitness opportunites. Obstacle course equipment provide a different type of exercising. A children's play is in between the pavilion to allow parent supervision in different locations. Finally, it is sited on the edge of the woods for shade.

7. Picnic Tables
Recycled composite picnic tables that appear to be made of wood can be used in an informal layout for multiple occasions when the weather is pleasant. Church groups and visitors to the park can use them for gathering or meals.



Wise County Nature and Fitness Trail

Park Entrance Conceptual Master Plan

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A. Wooden park shelter with crushed gravel trails, park information center on right and optional restroom on the left.



B. Park lawn with recycled plastic picnic tables among newly planted trees with picnic shelter in the background.



Mixed size gravel provides stable trail surface for visitors.



Engineered Wood Fiber provides a stable ground for children to play on in the play area.



C. Reflection area surrounded by colorful perennial plantings and forest with a gravel walking surface. Bench line to outer edges of the space for small-medium group seating.









Recycled plastic picnic tables provide ample space for eating and socializing.

Small boulders and logs for improving motor skills.









Rustic exercise equipment allows adults and older children to engage in station style fitness and open space allows for more variety of pickup games and other activities.

Wise County Nature and Fitness Trail

Park Entrance Details

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Planting Plan Key

AH- American Hophornbeam
BO- Burr Oak
CO-Chestnut Oak
GG-Arborvitae 'Green Giant'
PH- Pignut Hickory
RM- Red Maple
RB- Red Buckeye (Aesculus pavia)
RO- Red Oak
SW- Sourwood
TP- Tulip Poplar
TH-Thornless Honeylocust
WF- White Fringe Tree
WP- White Pine


American Hophornbeam


Bur Oak


Chestnut Oak


Arborvitae 'Green Giant'


Pignut Hickory


Red Maple


Red Buckeye


Red Oak


Sourwood


Tulip Poplar


Thornless Honeylocust


White Fringe Tree


White Pine

0' 25' 50' 100'

Wise County Nature and Fitness Trail

Park Entrance Planting Plan

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Primary Features

1.Informal Gathering Space

The classroom uses the existing tree locations, a small, central wooden platform, and boulder seating.

2. Boardwalk

A raised boardwalk allows for safe and ecologically-sensitive travel through the area and handicap accessibility to most areas.

3. Gathering/Play Area

Stumps and boulders create both a play and social space. Elements can be used for seating in groups or for balance and jumping. Stumps also serve an educational purpose with corresponding leaf patterns burnt into the top of each stump.

4. Sand Playground/Fossil Dig

Fine sand allows for creative endeavors and tactile construction. This sand/soil pit can serve in fossil discovery and education. Plaster can be used to create fossils and can be mixed in soil.

5. Seating

Benches around a shade tree allow for resting at the center of the site This space accesses the stream bed, labyrinth, and fossil dig, and hill climb.

6. Animal Tracks

Prints of local species of animals are imprinted into blocks of concrete.

7. Stream Access

Path to the stream through the site allows for up close and personal views of semi-flowing water, mossy stones, and critters.

8. Hill Climb

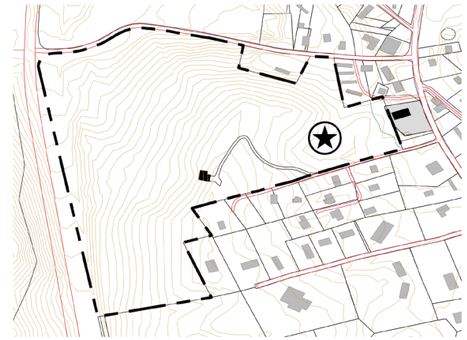
Logs and rocks serve in creating an adventurous climb back to the top.

9. Bird Blind

The bird blind camouflages users from birds to enhance the experience and increase visibility of birds in their natural habitats.

10. Fallen Tree

The existing fallen tree can be used as a natural element to climb and play upon.





Perspective View andAngle

0’ 10’ 20’ 40’

N

Wise County Nature and Fitness Trail

Natural Play Area Conceptual Master Plan

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A. An informal gathering space provides an unstructured educational area for classes of all ages. Students have the option to sit on stones or logs for seats.



B. The labyrinth of found stones on the edge of the nature play area allows children an alternative and quieter activity, yet still provides the opportunity to feel included as part of the larger group.



C. A bird blind located on the west hill of the nature play area is a fun yet educational opportunity for people of all ages. Interpretive signs help identify birds in the area and particular characteristcs of their habitats.



D. An overall view of the nature play area shows the climbing stumps and boulders, and a sand fossil dig in the background

Materials



Wood strips about an inch across provide a safe, sturdy mat upon which the children can play on, and which blends well into the natural surroundings.



Fiberglass-reinforced concrete or natural logs from trees cleared on-site during construction utilize repurposed materials for stable seating for people within the park.



Fiberglass-reinforced concrete or natural boulders from the county become play equipment for the kids to scramble, climb, and play on and around.



The sand pit becomes a discovery ground for children to learn about the various prehistoric animals that lived in ancient times within Wise County, such as giant elk, mastodon, and saber-toothed cat.

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Primary Features

1. Classroom Tables

The tables are roughly three feet by four feet. These tables utilize heavy duty timber so as to withstand high levels of activity by students, or handle a wider range of materials during classroom learning exercises.

2. Log Bench Seating

These half hewn logs can be used for formal classroom instruction for any group using the outdoor classroom. This structure orients students towards the teacher's station at the front of the outdoor classroom.

3. Teacher's Station

The teacher's station is very similar to the classroom station and allows students to gather around during a demonstration. This station can have a covered shelter incorporated into it for storage or cover during inclement weather.

4. Revegetation Zone

This is an opportunity for the students to get first hand experience with the native species of the area. This revegetation zone will eventually function as an auditory and visual buffer to the existing house that is on the property. Unlike the adventure play, this zone is primarily for education.

5. Annual and Perennial Forest Garden

This garden focuses on the aesthetic potential of native species to create an attractive and educational entrance to the outdoor classroom area.

6. Forest Edible Garden

This garden focuses on how the forest can be a source of food. Unlike a kitchen garden, it highlights what species were used when foraging was a popular method of collecting food.

7. Frontier Garden

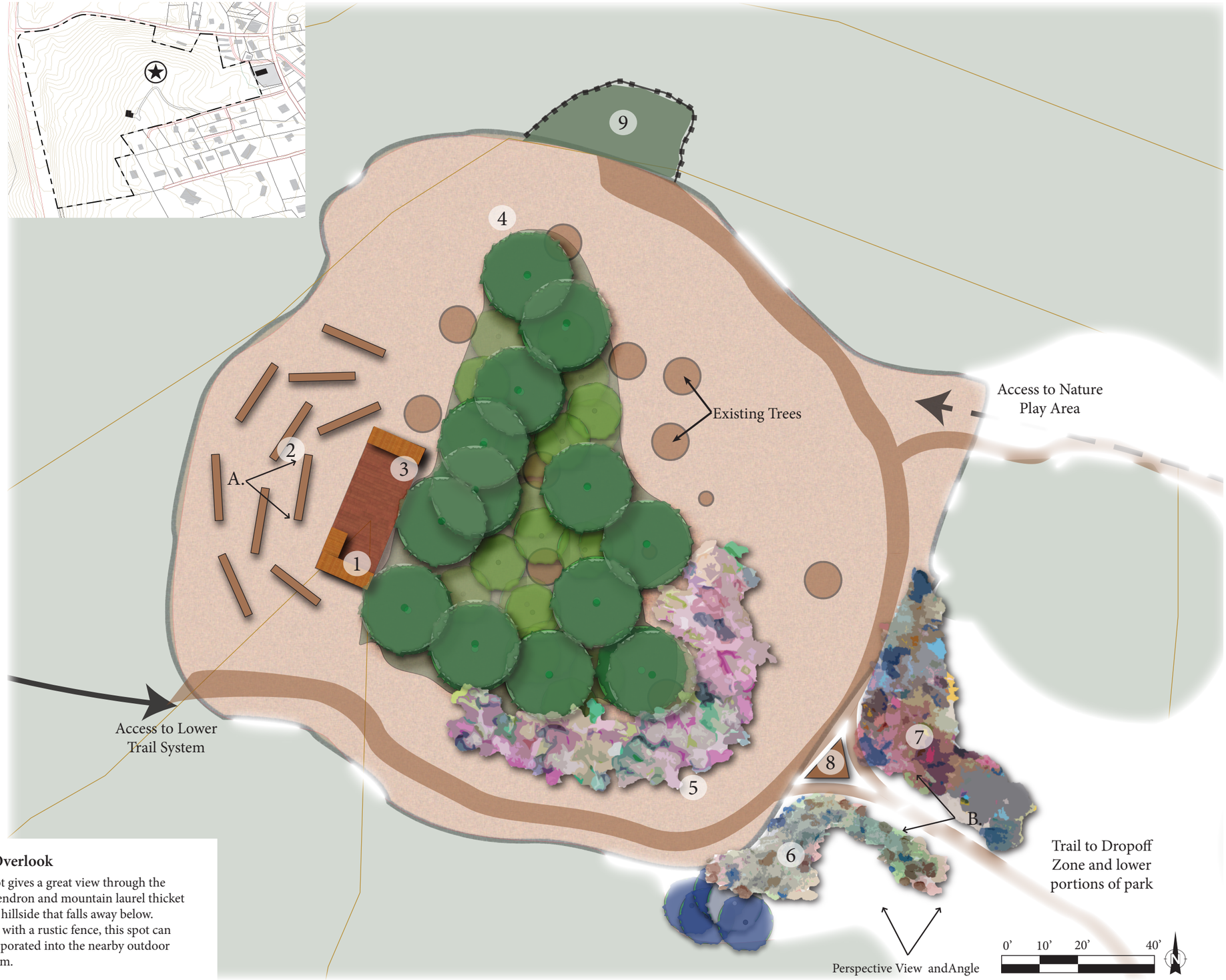
This garden focuses on the utilitarian aspects of the forest native species. Demonstration might include how various dyes were used by native people of the area for dying fabrics.

8. Informational Kiosk

This kiosk provides information about the various trails that intersect here, classroom schedules, or available activites in this part of the park.

9. Cliff Overlook

This spot gives a great view through the rhododendron and mountain laurel thicket covered hillside that falls away below. Secured with a rustic fence, this spot can be incorporated into the nearby outdoor classroom.



Wise County Nature and Fitness Trail

Outdoor Classroom Conceptual Master Plan

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A. The instructor's station and educational area creates a semi-structured education space with demonstration tables, storage, and moveable, hewn log seating for class activities and a revegetated rhododendron thicket background.



B. Forest gardens and an information kiosk mark the entrance to the outdoor classroom area. The frontier, edible, and aesthetic gardens allow students and visitors to get hands-on experience with various native plantings.

Materials



Split-Timber logs for groundlevel benches accommodates students.



Oak planks for the instructor station provides onsite storage and activity space for classes.



Mulch derived from shredded leaves and compost materials within the forest can be used for planting the forest gardens.

Formal Instruction

- Lessons
- Demonstrations
- Special Programs





Class Activity

- Connection to S.O.L 's
- Soil and Rock Classifications
- Natural Processes
- Meteorology
- Wildlife and Plant Cycles







Revegetation Zone

- Native Planting
- Classroom Lessons
- Monitoring Growth





Wise County Nature and Fitness Trail

Outdoor Classroom Details

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Jacob's Ladder





Wild Sweet William





Trillium: Wakerobin





Virginia Bluebells





Leucothoe 'Girard's Rainbow'





Woodland Aster





Cinnamon Fern





Ramp



Elderberry



Common Wood Sorrel



Native Persimmon



Serviceberry



Sassafras



Snakeroot



Yellowroot



Witch Hazel



White Oak



Mountain Mint



Ginseng



Partridge Berry















Wise County Nature and Fitness Trail

Plant Pallette for Edible Garden

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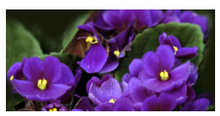
Trees	Plant	Detail	Requirements	Special Notes
Sweet Birch			Needs shady, cool and moist soil, very sensitive to drought Needs full to partial sunlight Prefers acidic soil Needs management against birch leafminer Mulching very beneficial	Pollarding at later ages brings it within reach of humans. Twigs, buds, leaves all edible; makes a sap that can be distilled into syrup Can reach 40-50' if unpollarded
Sassafras			Zone 4-9 Rapid Growth Rate Needs full to partial sun Has irregular shape Likes moist, well drained, acidic soil, but can adapt to neutral pH and dry soils with some slight chlorosis	Can be used to make tea, rootbeer flavor tea Twigs and leaves are edible 30' Spread 50' Height
Maples			Zones 3-9 Likes neutral to acidic pH soil Likes moist, well drained soil. Full to partial sunlight, likes full sunlight in cooler climates	Make good syrups, sugar maple in particular
Persimmon Tree			Medium water use Part shade Dry to moist rich soil such as sandy loam	Aromatic understory tree Orange colored fruits attract wildlife, sweet when ripe Blooms yelllow and green Flowers April through June 36'-72' deciduous
Serviceberry			Found in thickets and wooded areas	Harvest fruits in the fall (June-September) Fruits are comparable in usage to blueberries
Perennials				
Indian Cucumber-root			Sun, part shade Moist loam and sand	Blooms May and June Yellow, green, brown colors Purple and blue berries
Spicebush			Zone 4-9 Likes full shade to partial sun Likes moist to wet woodland soil Can tolerate variable pH	Has nice smell; edible berries 12' mature height, with slow to medium growth rate
Violet			Grows well in wet springs, meadows and bogs	3"-8" in height Flowers from April to June Dried leaves can be made into tea, and flowers can be candied Some yellow species are mildly cathartic
Wood-sorrel			Low, delicate woodland flower	Cloverlike leaves that have a sour taste When used in a cold tea can reduce the effects of nausea Excessive consumption may inhibit the absorbtion of calcium into the body
Ramp			Zone 4-7 Shade to Partial Shade Likes moist soils that are high in organic matter, well draining, and under deciduous trees. Avoid wet soils if possible.	Lots of cultural awareness and acceptance Used with garlic, eggs and potatos Pick bulb early Good for Vitamin C 6-12" tall, 4-6" wide

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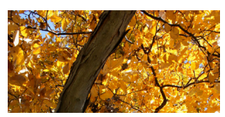
Trees	Plant	Detail	Requirements		Special Notes	
Basswood			60'-80' tall Full sun to shade Soil moisture from moist to dry Neutral pH	Much prefers moist, rich well drained loamy soils Grow at a medium rate	Used in rope making and threadmaking A hot bath with basswood flowers and linden flower tea soothes cold symptoms	
Juniper			Low water use Full sun to part shade Prefers dry soil Is cold and heat tolerant		Used in rope making and cording, can be used to create fenceposts; cedar oil is used for medicine and perfumes. Evergreen	Fragrant, scale like foliage Useful for Christmas trees or shelterbelts Attractive to birds and butterflies Berries chewed for canker sores
White Oak			Medium water use Sun to partially shade tolerant Dry to moist soil prefers deep moist, welldrained loams and sands		Bark and branches good for basket weaving Fall conspicuous and good shade tree Edible acorns after tanin leached out Gather nuts from September to October	Avoid disturbing old tree root areas with construction
Black Ash			40'-50' tall Full sun to shade High water use Prefers moist to wet soil, native habitat is wet	woods, stream banks and lake margins Prefers acidic soils (pH <6.8) such as peat soils and also sandy loams	Very hardy tree, lives for long time Bark and branches good for basket weaving Attractive to birds Blooms March-April White-Purple blooms	
Black Walnut			50-75' tall/wide High water use Needs sun and part shade Moist soils Circumneutral pH	Sandy/clay loam soils Is cold and heat tolerant Slow growing if not in preferred sunny, moist, and fertile site	Nuts are useful for dyes, but may cause litter issues and stain. Certain plants will not grow under trees due to juglones Does attract birds and butterflies	
Shagbark Hickory			60'-80' tall Medium Water use Ranges from full sun to shade Acidic soil pH <6.8 Prefers well drained fertile soil	Tolerant of Sandy, loam, and clay soils	Pollarding at later ages brings it within reach of humans. Bark is easily combustible Yellow dye Fragrant , attracts birds	
Tuliptree			Medium water use Sun to shade Moist, acidic rich soils Insect and disease free Intolerant of compacted soils	Drops foliage in drought	Nesting tree for birds Yellow, green, brown blooms Blooms from April to June Flowers attract humming birds First Nations used the inner bark medicinally as	worming medicine, antiarthritic, cough syrup and cholera remedy. Larval Host for Eastern Tiger Swallowtail butterfly

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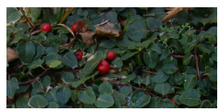
Small Trees/ Shrubs	Plant	Detail	Requirements	Special Notes
Paw-Paw Tree			Medium Water Use Full sun to shade Moist, rich, slightly acid sandy to clay soils Understory tree No insect or diseases	Aromatic Fragrant fruit, tastes like banana Used for cakes and sauces Pick before fruit falls to ripen at home May cause skin irritation and gastrointestinal issues if handled excessively Larval host for Zebra Swallowtail, Pawpaw sphinx
Elder			Medium water use Part shade Wet to dry rich slightly acid soil Fast growing tree and highly competitive	Good erosion control on moist hillsides may need to be cut to ground yearly to keep bush under control Berries edible when used in jellies and preserves, pies, as well as wine. 6'-12' Fruit is black and purple White blooms Flowers in May and June
Witch Hazel			Medium water use Part to full shade Dry to moist acidic and well drained soils. Likes rich sandy to loamy soils Avoid long term extreme dry conditions Plant in full sun for fuller, more symmetrical plants	Understory tree Fruits are small brown capsules, eaten by birds Browsed by deer Blooms orange, yellow, green, brown Blooms from September to December Native habitat is moist woods and thickets Used as astringent, tea, medicines against rashes, insect bites, burns, poison ivy
Perennials				
Mountain Mint			Part shade Moist, Calcareous soil Can be agressive but less so in dry soil Native habitat is wet prairiess stream edges, moist bluffs	Attracts butterflies and bees White and purple blooms Blooms from July to August
Ginseng			Sun to shade Moist soil that is humus and organic enriched	White blooms Red fruit Blooms from June to August Often used as a medicinal tonic Attracts birds
Partridge Berry			Low to medium water use Part to full shade Dry to moist soil that is humus rich and acidic. Prefers sandy to medium loam soil	Evergreen, grows low to the ground Berries consumed by turkeys, grouse, quail and skunk Can be used to make tea to aid in childbirth Attracts birds Fragrant with conspicuous flowers Blooms white, pink, and purple Blooms in pairs from May to October
Snakeroot			Medium water use Shade Dry sandy to clay loam soils	Showy ground cover Attracts butterflies and is larval host to pipevine swallowtail butterfly Blooms yellow and purple Blooms April to June
Yellowroot			Full shade Acidic sands, gravel and silts Great groundcover for moist sites Suckers from roots	Perennial Blooms purple Blooms from April to May Natural habitat is damp woods, wet depressions, and stream banks

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	Plant	Detail	Requirements	Special Notes
Black Haw			Moist to dry soils Likes full sun Medium water use Circumneutral pH	Blooms white clusters of flowers, April - June Plum-like fruits, colors range from green to whitish then blue-black Can be woody shrub or small tree 10'-20'
Smooth Arrow-wood			Sun, part shade, shade Moist, acidic soils	Attracts many gamebirds and small mammals 6'-12' Blooms May to July White flowers with yellow stamens Black and purple fruit
Box Huckle-berry			Part shade Sandy, acid soil Needs organic matter	Evergreen shrub Blooms May-July with White or pink flowers Berries dark blue and edible Suitable under rhododendrons
Perennials				
Christmas Fern			Medium water use Part shade, shade; keep out of the sun Moist acid humus rich soils Likes rocky, sandy soils Needs good drainage	Useful as border, accent, and groundcover Attracts ruffed grouse
Bugbane			Grows well in dry shade under hardwood trees Zone 5-9	Good pollen source for beneficial insects Host plant for Appalachian azure butterfly Blooms in shade for 4+ weeks 4'-7'
Crested Iris			Typically found in marshes and wet meadows	Showy violet, yellow or red flowers Flowers May to June 2'-3'
Foamflower			Part sun to shade Tolerates wet soils Zone 3-9	White or pink flowers Blooms late spring to late summer Perennial 4"-24"
Galax			Low to medium water Part shade, shade Dry to moist acidic soil, well drained rich sand or loam	Delicate ground cover Browsed by deer Blooms in May, June with white flowers
Fern-leaved Yellow Fox-glove			Typically found in dry woods	Blooms in August and September with yellow flowers
Rue Anemone			Part shade Moist humus rich acidic soil	Blooms white and pink Blooms March through June Highly conspicuous flowers 0-1'

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	Plant	Detail	Requirements	Special Notes
Jacob's Ladder			Shade Moist, neutral, humus rich soils Goes dormant in drought conditions	Frequented by bees Pink, blue blooms Flowers in April to May 10”-15”
Phlox divaricata			Medium water use Part shade to shade Moist acidic to alkaline soils	White, Red, Pink, Purple Blooms Flowers March through May Normally blue lavender or white blooms Flowers attract butterflies such as swallow-tails, gray hairstreaks and western pygmy blues Roots consumed by voles and rabbits 8”-18”
Trillium: Wakerobin			Sun to shade Moist Acidic humus rich sandy loam	White and pink blooms Large flower becomes pink as it matures Flowers in May to June Perennial 1’-3’
Virginia Bluebells			High water use Part to full shade Moist neutral rich soils	Highly conspicuous flowers Pink, blue, purple blooms Flowers from March through June Great show in masses
Leucothoe ‘Girard’s Rainbow’			Part to full shade Moist, acidic organic well drained soils Avoid drought conditions Good for ground cover under trees and shrubs	White bloom color Flowers in spring Evergreen Deer resistant Fragrant 6’ Good for winter interest Variegated colors
Woodland Aster			Great groundcover Full sun to shade Dry to average soil	Nectar plant for butterflies Nesting material and seed source for birds Blooms in fall 18”-24”
Cinnamon Fern			Medium to high water use Sun to shade Moist, wet acidic soils Sandy to clay soils	1’-3’ First shows silver fiddleheads Matures from green to chocolate brown Perennial Nesting spot for birds Root crown is used as a potting medium Non-blooming, reproduces by spores
Wild Geranium			Part shade Gravelly to clay soils	1 foot Extensive branching and sprawling White and pink blooms Blooms from March to July Annual
Goat’s Beard			Medium to high water use Full sun to full shade Moist to wet acidic soils Needs a lot of space	3’-6’ White blooms Blooms in May-June Male plants have showier flowers Great for spring displays Larval host for Dusky Azure butterfly
Green-and-Gold			Part shade Moist, acidic, well drained to drier soils Very adaptable, avoid full shade	Blooms yellow Blooms April through October Can be used as ground cover Extremely showy, blooms sporadically over long period 0-1’

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Outdoor Classroom

Drop Off/Zone

Nature Play

Beverly Hills Tabernacle Church

Main Street

Wampler Avenue

Health Department

Existing Trail

Introduced Trail

Social Fit Trail Station

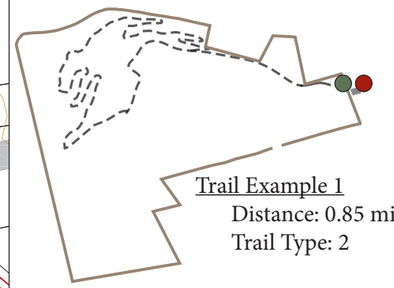
Single Fit Trail Station

Bench Location

0’ 50’ 100’ 200’

Trail begin

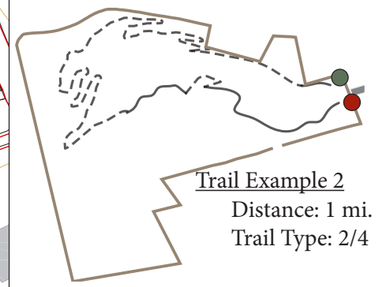
Trail end



Trail Example 1
Distance: 0.85 mi.
Trail Type: 2



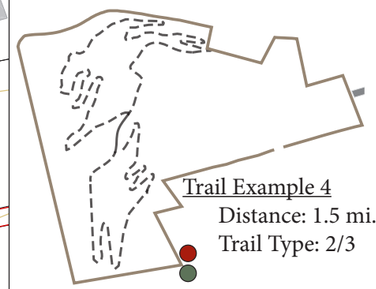
Native, ungraded trail surface; 0-12” wide



Trail Example 2
Distance: 1 mi.
Trail Type: 2/4



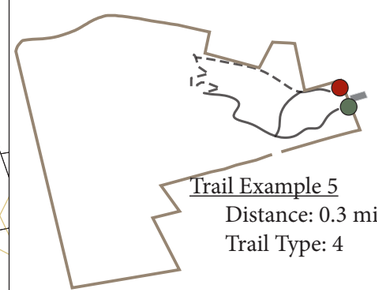
Native surface with some improved sections borrowed from on-site or imported from off-site; 12-24” wide



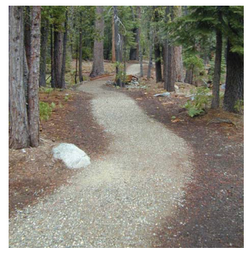
Trail Example 4
Distance: 1.5 mi.
Trail Type: 2/3



Native surface with some material borrowed from on-site; 12-18” wide



Trail Example 5
Distance: 0.3 mi.
Trail Type: 4



Improved areas using on-site and imported materials; 18-24” wide.

Wise County Nature and Fitness Trail

Fit Trail Conceptual Master Plan

community design assistance center
College of Architecture and Urban Studies
Virginia Polytechnic Institute and State University

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Similar to the rustic nature of the installations in the outdoor classroom and natual play areas, the fit trail utilizes materials and textures for exercise equipment and signage that blend nicely into the site.

Fit Trail Equipment

















Example Signage









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Trail Construction Techniques

from Felton, Vernon. “Part Five: Tools for Trailwork, Part Six: Trail Construction, Part Seven: Trail Maintenance.” Trail Solutions: IMBA’s Guide to Building Sweet Singletrack. Boulder, Colo: IMBA, 2004. N. pag. Print.



Rustic stairs that prevent erosion



Bench graded into step slope



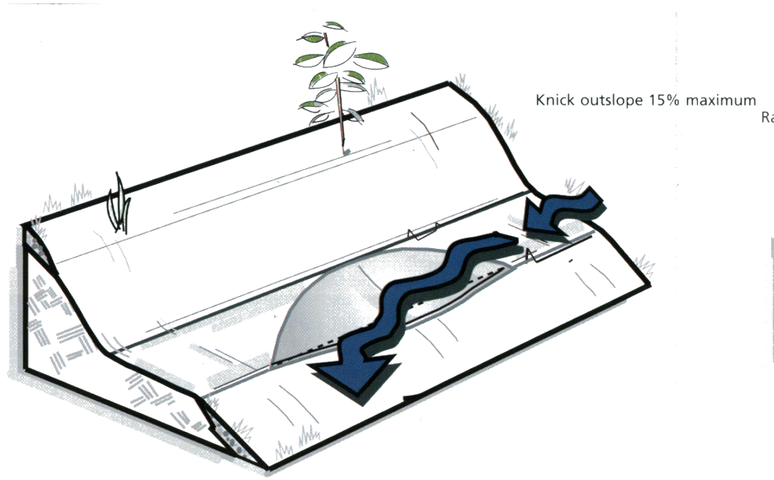
Boardwalk with edging to prevent tripping

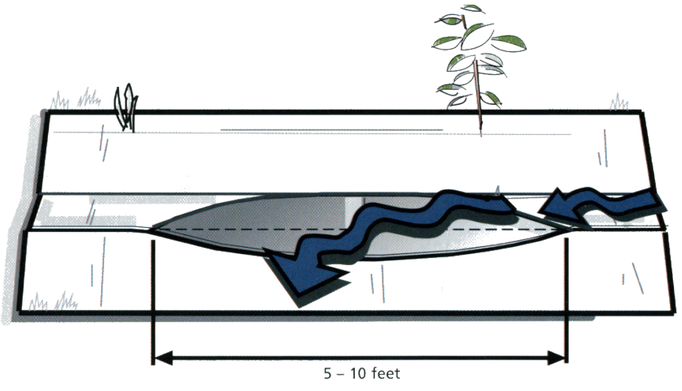


Boardwalks used across washout areas to prevent further erosion

Trail Knick

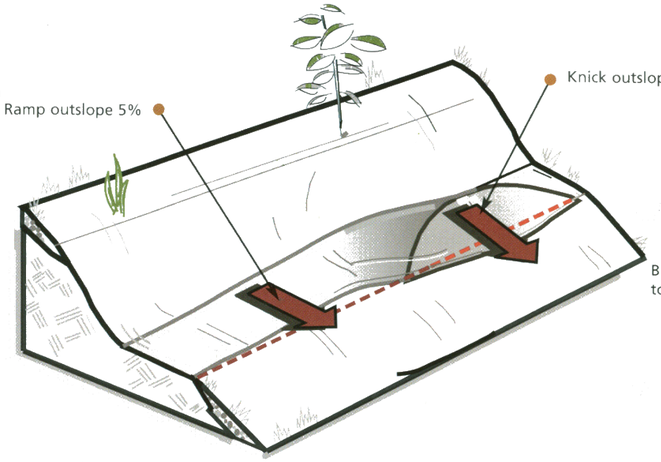
A trail knick is a way to shed water from the trail surface by strategically removing a portion of the trails edge that forces water from the trail and down the slope. The bottom image on the left is of a freshly constructed trail knick.

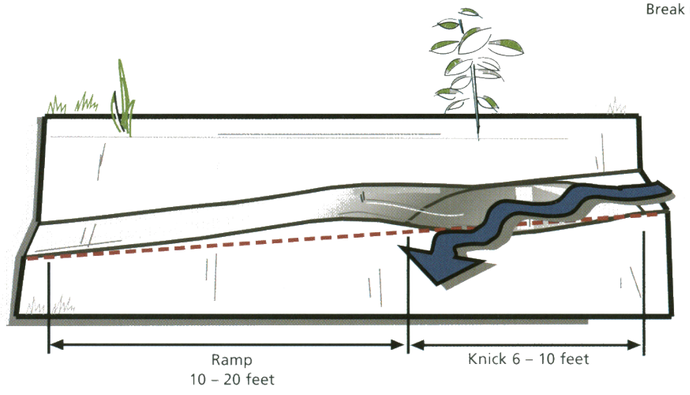




Trail Grade Dip

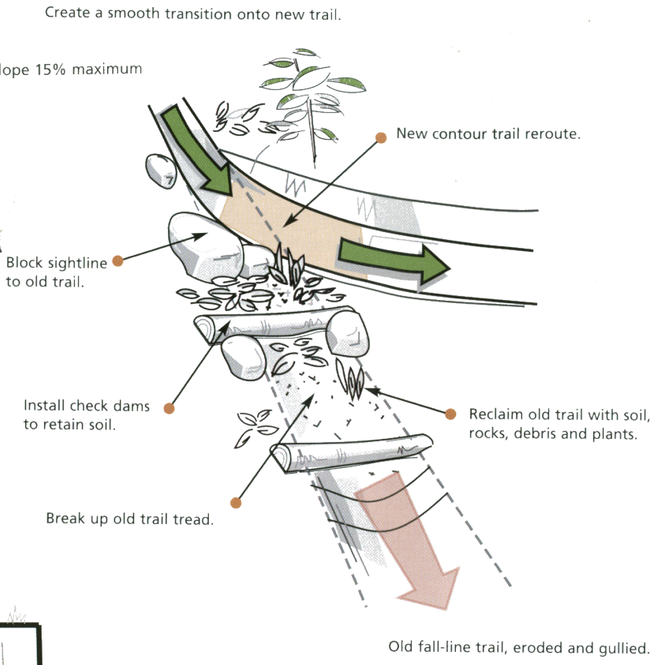
A trail grade dip is similar to the trail knick. It expands on the concept and uses a bermed area on the downhill portion of the knick that further forces water off the side of the trail instead of washing down the trail surface.





Changing Trail Direction

When changing an existing trail’s direction it is very important to cut off the previous trail trajectory. The surface and the line of sight must be disrupted in order to draw the person in the new direction. Conceal the previous path with soil, rocks, debris and plants.



Habitat Creation

An integral part of any woodland is the creation and preservation of habitat for the various species of animals and plants that live within the ecosystem. With careful implementation, the integrity of the woodland lot as a home for wildlife can be preserved and encouraged amid the community usage of the park.





Bird and bat boxes provide a simple, cheap, and effective way to provide safe clean homes for a variety of bats and songbirds to take shelter in within the woods. These shelters can be installed evenly through the woodland and act as year-round homes for these animals.



Allowing dead trees and logs to remain on site also gives valuable space for animals to take shelter within, or provide a useful source of food for detritivores and fungi as they decay. This can be a useful educational tool for showing how lifecycle processes progress and how animals use the tree throughout all stages of living.





Bird Blind Examples

While the bird blind illustrated as part of the nature play area is serviceable, it's always good to show alternatives in design that can be utilized depending on the desires of the community. Below are a few examples of some bird blind designs that offer a different take on the structure.



Similar to the bird blind suggested earlier, his particular type of bird blind allows for more shelter, while taking up less space and provides wider windows for viewing of the birds.



This type of blind is much more rustic, with a hewn look that can easily be created by community members for a larger scale crafting project within the woods.



This blind is slightly smaller in size while allowing for shelter underneath the blind and room for seating and observation.

Nature Play Research









Over the course of designing these woodland trails and recreation areas, and through discussions with Wise County staff, it became apparent that allowing for natural play was very important in creating the park.

Research has shown that children who are exposed to nature and play within nature from a young age grow to be sensitive and caring to the needs of the environment. In addition, natural play areas stimulate their senses and thinking skills far more than a traditional playground or school ground.

Children who play in natural areas are also more focused, less stressed, more creative, solve problems more effectively, learn leadership and self governing skills, and become more at peace with themselves and the world around them via testing their limits and learning/understanding how nature works and acts.

Natural play also combats the overly structured and scheduled school day and life of most children, offering them a means to engage in informal, imaginative, meaningful discovery and play, coming together to express themselves within their environment.

Natural play brings nature from something that is foreign to children into something that is readily accessible and allows them to understand that nature can exist within their own neighborhoods and is easy to seek out.

Overall, natural play positively benefits children far more than the traditional playground and playground equipment by allowing them to truly explore the world around them, rather than simply blowing off energy via physical exertion. Natural play and its implementation in the County can provide a multi-pronged approach towards teaching children to love the world around them, get them active, and most of all, have fun.

For an article on the importance of nature play and children, visit http://www.whitehutchinson.com/children/articles/nature.shtml

Labyrinth Reference









Labyrinths have long been used as a meditative, introspective tool that can help to calm down and make people at peace.

Labyrinths are not mazes, but rather a single pathway back and forth that eventually leads to a single point in the center. The side to side motion of the labyrinth is said to help to ease anxiety, depression, balance issues, and helps people decompress from stressful activities. It can be a very useful counterpoint to other playground equipment for allowing children and adults alike to take part in a lower key exercise within high activity places.

Labyrinths can be made out of many different materials, even from simple stones, and be as large or as small as the space and needs require. They can be a fun community building exercise as many people can help to lay the stones and create the patterns.





Benches: Construction Alternatives



Benches for some visitors can turn a mediocre visit into a highly enjoyable one. Resting places are noted on the final trail conceptual drawing earlier in this document. Special consideration should be taken when placing a bench along the trail. The surface underneath the bench should be hardened and secure under foot to prevent erosion. It should not be constructed in a manner that retains water or is in a direct path of water runoff. The example to the left utilizes timbers to secure the soil underneath. This helps to ensure a minimal amount of washout beneath the bench.



Benches can come in all different shapes and size. There are many creative solutions past the standard bench in the previous picture. The bench to the left is constructed using a mix between milled and natural timbers. A log is split for the seat that made secure using a milled lumber bottom.



Using community constructed benches is a great opportunity to include residents in the construction of their own park. Boy Scout, school, and church groups are a great place to start when sourcing volunteers. The community's personal investment in the park helps to encourage self monitoring and care for the site's integrity as a whole.

Fencing: Rustic Options

Fencing can be utilized in various ways on the site and with different styles to help create identity within a location. Possible fence/railing locations on site includes the cliff near the upper classroom and the board walk sections in the lower nature play area.



Standard log and wire fencing can make for a rustic look, though care must be taken to ensure maintenance is well kept to avoid issues with the wires.



Cut wooden fencing can provide a more handcrafted look, and provide some individual flair with wood colors.



Through time, all fence types weather and take on their own character. This images shows how lichen growth from minimal washing can add character and help the fence achieve a more natural and rustic appearance.



Hand woven tree branch fencing can be an extremely unique way to frame an area and allow for a community crafting exercise as well as incorporate dead branches on site into the design.

Mile Markers

As with all the site furnishings, the mile markers along the trail remain in the rustic and minimalistic scheme.



Here is a mile marker that has the information routed out and painted. Paint colors should remain neutral and non-vibrant. The post in the image is treated but maintains a natural finish. Using treated lumber will ensure that the post lasts through time, reducing maintenance costs in the long run.



This mile marker also has routed and painted information. Again, the colors are neutral. The post is painted white. Over time, the white paint will come off, achieving a weather and rustic appearance. The paint, like the treated lumber, helps with the durability of the post through time as it is exposed to the elements.



This mile marker option is slightly different than the previous two. It is likely metal and is printed. This sign is appropriate in situations where more information is needed than a number indicating distance. While the sign is manufactured, colors remain neutral with a brown background. The sign is very functional and is not intrusive to the forest environment. This type of sign is very common on forest service trails.

Tree Identification Tags

Tree Identification tags can be used to help educate visitors to the trails and educational areas about the variety of trees that exist within the site. These can come in a wide variety of shapes and sizes depending on the needs and feel of the space.



This type is more formal, detailing the common and scientific names of the tree as well as some identifying characteristics such as height, zone, and native country. These can also be designed to list some of the uses both present and historical, adding more of an interpretive element to them.



These tags are more utilitarian and subtle which are useful for blending into the trails or providing some sense of discovery. They can also be made more cheaply than the above if budget is a concern, and are very durable, being made of metal. Care will need to be taken to make sure the wire does not girdle the tree over time.



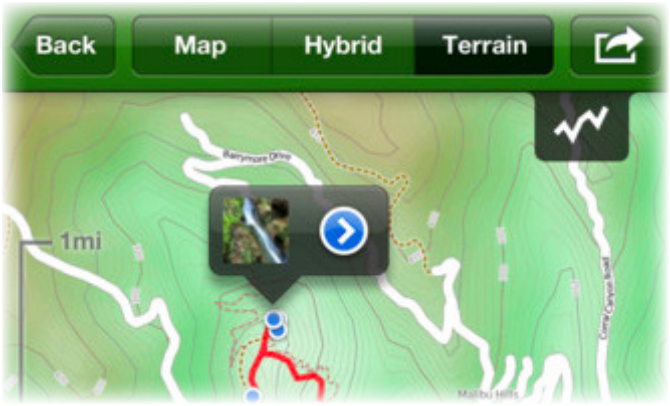
Finally, tree tags can be custom made, or even painted on materials and hung around specific trees, making for a more fun, community oriented activity and colorful expression. This sort would be highly useful in more educational oriented areas for younger students, allowing them to really make a mark on their surroundings and learn about trees in the process. Care will need to be taken to make sure any twine, wire, etc. does not girdle the tree over time.

Identification Apps and Technology

There are several opportunities throughout the site to integrate cutting-edge technology into the educational process by using various smart phone applications. Professor Wally Smith of UVA-Wise is currently developing such technologies that can be implemented on site to augment classroom work.



There are several applications that can be used on smart phones, tablets, and other mobile devices. Plant tags can include a scan-able QR tag (example immediately left) that when scanned brings up various details about the plant (far left).



Other applications can work at a site scale level. The example application to the left notifies park visitors of interesting features throughout the park. These items can be changed during the course of the seasons. For example, there might be a tree with a spectacular bloom that is worth hiking to. This application would tell the location and what to look for when walking to the special feature.



Other applications might focus on the region's wildlife. A digital library collects images of local wildlife that can be compared to an animal track found on the ground in person. An application like this can then be expanded by Wise County students to more thoroughly document the tracks that are found on the site. This database can then be cross-referenced with other nature areas within the county and region to compare what animals prefer living in particular environments.

Geocaching

Geocaching is another digital activity that capitalizes on the growing technological aids that are available in the educational environment.



Geocaching involves using a GPS device and map to locate hidden features throughout the property using a map coordinate list. These coordinates can be inputted into a handheld GPS device like the one pictured on the left.



Items marked during geocaching can be placed by someone as a 'treasure' or might be an existing notable feature on the property such as a rare tree or interesting cliff. The process of finding such items functions similar to an outdoor treasure hunt.



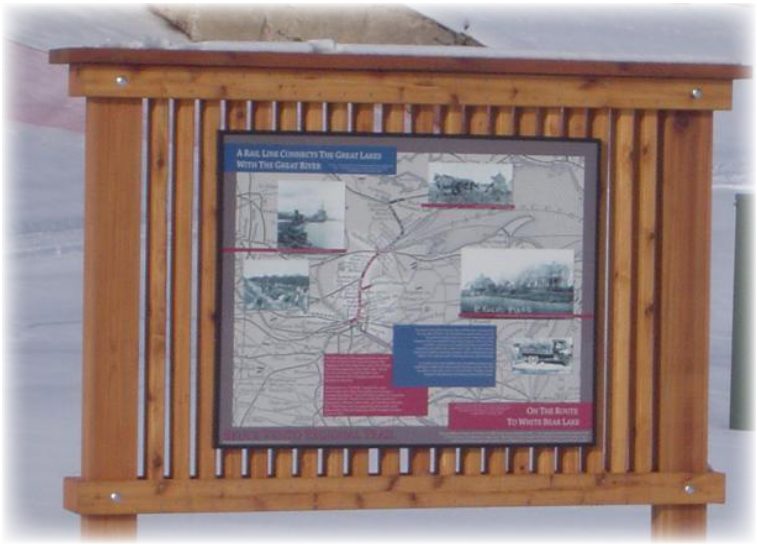
Geocaching has many social benefits as well. Learning the skills and hunting for the treasures involves teamwork and cooperation. Students learn skills related to wayfinding, orientation, and map reading. All of these have real-life implications when traveling or, for example, if someone was to get lost hiking, that person could use this skill set to help get back to a known landmark.

Signage

Signage throughout the site ensures that visitors have an interactive, educational, and fun time while visiting the Wise County Nature and Fitness Trail. Apart from providing visitors with necessary information, signage plays an important role in character development and the feel of the site. Many community members voiced the desire for signs to remain rustic in nature and provide interpretive information when available.



A larger, more comprehensive sign is more appropriate for the entrance pavilion at the beginning of the trail system. Information here should be displayed in a larger configuration. This would be an appropriate place for general news, park layout, group meeting times, trail network distance and expected walking times of each trail.



Signs throughout the park need to contain a diverse set of information. Signs placed periodically throughout the trail system should include a map of the site's trails for orientation purposes. This information can be combined with interpretive information specific to the sign's location. This might include plants immediately close by or a relevant mileage marker.



All of the site's sign structures should be constructed from either found wood from the property or unfinished treated lumber. Painting and overall size should be kept to a minimum. Any signs that require such treatment should be concentrated in the more developed areas near the front of the park. The sign to left is an example of a roofed sign that is fairly small and uses milled, untreated wood.

Walking Surface Materials



Mixed size gravel trail mix. Accessible trail surfaces should be “firm and stable”.



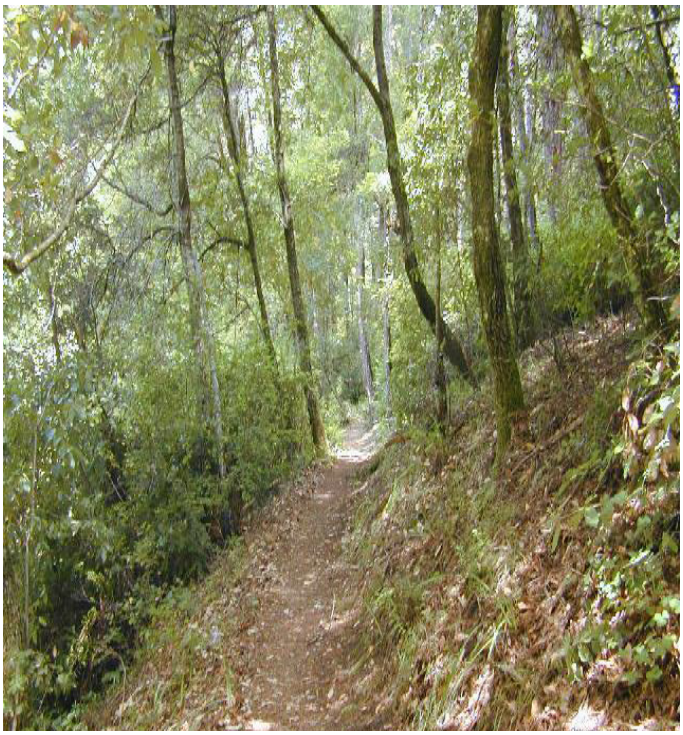
Crushed fines (crushed rock or limestone) is one commonly used material that can be used for ADA accessible trails in natural areas. It also compacts and drains well.



Engineered Wood Fiber chips make a good surface for ADA accessible playground settings.



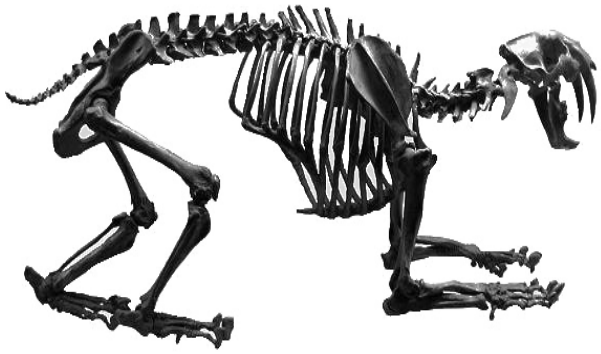
Rock/boulder aggregate. Can provide an extremely rustic surface that can provide a good challenge for those who are looking for something more intense in their trail material choices. Not ADA accessible.



Compacted dirt trails. These are most cost effective aside from initial grading and compaction, but may not be easily ADA compatible depending on site and ground quality.

Fossil Dig Educational Opportunities

Plaster casts can be created of animals that existed in prehistoric times to teach young children about the wildlife that existed in the areas around Wise County in ancient times.



Saber-toothed Cat:
A major hunting predator during the Ice Age. They are well known for their massive fangs which they would use in conjunction with their powerful neck muscles to take down large prey such as mastodons and elk.



Giant Elk:
Herbivorous species that preferred meadows and open woodlands, their claim to fame was their size (over 6' tall) as well as their massive horns.



Mastodon:
Relative to the Woolly Mammoth, this relative to the elephant preferred coniferous woodlands and were prevalent through North America during the Ice Age.

Conclusion

The design ideas proposed for enhancing the woodland site gifted to Wise County by Mrs. Carol Buchanan are long term visions that can be implemented incrementally. The designs encourage community gathering, health, wellness, connectivity, and a deeper, closer connection to nature. Just as the conceptual design process was a collaborative effort with CDAC, County staff, and the Wise community, so should design implementation be an opportunity for community collaboration and pride. It is the CDAC team's hope that these ideas are a catalytic start for a journey into a new and vibrant chapter of the County's history.

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Appendix A: Community Input

-The following community feedback sheets are summaries of comments made by community members that attended those public meetings-

February 15, 2013 Community Meeting

Wants/Needs Wise

1. Sidewalks
2. Barbaraville, KY- Union College
3. City & College clean up, town and UVA Wise do similar with Earl Dean Lake (Trails, picnic)
4. Picnic Areas
5. Dog Park-Socialize dogs
6. Interpretive Signs
7. Education of Trees, Natural Features, Wildlife, Flowers, Wise Attractions.

Wise: Current Amenities and Needs

1. Wetlands @ UVA Wise: Trails
2. Camp Bethel: Past High school: Regulated use
3. Cabins, Bed and Breakfast, Girl Scouts
4. Mines on Campus
5. Nowhere else in Wise
6. Trails for running: Dual Lane: Running Strollers
7. No sidewalks, except Main
8. Need for extensive areas for walking
9. Soccer fields by airport
10. Waking trail at UVA wise (Pool, Tennis) : BORING
11. Mothers go downtown on sidewalk, Walmart, middle school track

Goal 1. Education

1. Undisturbed
2. Tree ID, Herbaceous Flora and Fauna
3. Trails through Different Environments
4. Ease of Access-Middle School
5. Study of Birds
6. App created by Wally for ID
7. Elementary school
8. Kids don't play in woods
9. Activities: Species ID, Learning Stations
10. Geology: Why Plants Here
11. Geologic and Mining History
12. Swings, Climbing Wall
13. Prefer Natural Play Area
14. Points for Good Views?
15. Show Direction
16. Point to Significant Features
17. Local History

Playgrounds @ school
UVA Wise: Abandoned Strip Mine
Camp Bethel: Only Wooded Area

Goal 2. Keep Natural

1. Fly Ash- surface for trails? Keep treatments only on ADA sections
2. Look @ Soils – Stabilize Soils and Do soil analysis
3. Donations from Local Quarries
4. Don't use wood chips- Hold Moisture
5. Trash Cans- strategically placed
6. Crossing drains-reverse grades, avoid culverts
7. Stones for stairs: Like Roaring Branch-Big Stone
8. Talk to Breaks and Natural Tunnel
9. KEEP TREES
10. Entrance sign to credit Mrs. Buchanan

Goal 3. Habitat Creation

1. Bat houses and other
2. Wildflowers
3. Native Plantings
4. Protect flowers
5. Full of Bears and Deer
6. UVA Wise Botany Dept. and VA Tech
7. Endemic Amphibians
8. Wild Azalea
9. Stat Permits for Fauna
10. BioBlitz
11. Envirothon-Host
12. Annual Event
13. High school Competition
14. Event with Stations-Regional
15. Habitat Values
16. VA Dept. of Forestry
17. Assist in Management plan > 10 acres
18. Beekeeping: Bad idea, liability; but demonstrations on property
19. Outdoor classrooms
20. Bird feeders, bench, id
21. Keep with what you would find on property- enhance, not bring in new- keep pristine

Goal 4: Exercise

1. Possibility of varying levels of trails (difficulties) Time to Hike
2. Options for every family member
3. Physical Fitness Stations
4. Raise appeal-Sit ups, steps
5. Places for people to sit and rest
6. Mix- fitness trail and more concentrated area
7. COPE-challenging course
8. Boyscouts; look for ideas
9. Pennington Gap: Can make stations instead of purchasing – fit trail
10. Great need for adult outdoor fitness opportunities
11. Mile Markers so people know distances
12. Show how long loop should take
13. Think along lines of ski slopes; "Black diamond"
14. Signs-water availability
15. Water fountain(?)

Goal 5. Increase awareness of property and purpose

1. 1. Maintenance
2. Like to have kids
3. Long term plan for sidewalks to access park
4. Access to trailer park
5. About Buchanans, idea behind park
6. Bike lanes and bike racks
7. On property parking lot
8. Signage on property
9. Birding: Richard Peake Expert-Birds of the Cumberland

April 8, 2013 Community Feedback

PARK ENTRANCE

1. Like Pavilion B but incorporate children's play area
2. Like more of the grass
3. Pavilion B limits access
    -Entering through the middle could be awkward
    -Offer T-Pavilion but have access to trail on the side
4. Like the fitness area tucked into the trees
5. Like the reflection area
    -Fitness area on one side of trail and reflection on the other?
6. Bathrooms placed near or incorporated into the pavilion
7. Explore having the children's play and contemplative area in the grassed area
8. Like the idea of plantings somewhere around the pavilion, even if there are 'welcome' plantings somewhere else.
9. Someone mentioned the idea of incorporating a pond or a water feature on site

Nature Play A

1. Incorporate:
    -Litter/ recycling
    -Erosion processes
    -Watershed activities for Upper Tennessee watershed to Gulf of Mexico
2. Tree tags along trail
3. Incorporate interpretive signs
    -Coal/coal history
4. Boardwalk is probably too expensive
    -Look into other alternatives and basic cost study for various options
5. Someone mentioned the idea of incorporating a pond or a water feature on site
6. Bird boxes! All around the educational area
7. Concern about tagging and carving on equipment

Outdoor Classroom

1. Incorporate the opportunity to identify wildlife
    -Details about animals
    -Snags as habitat
2. Benches would be nice as a resting stops through the park as a whole
3. Raised platform, sort of like a stage where the teacher or instructor would be
    -Allow for education programming that is not behind the desk
4. Kids don't need tables, benches that are wide enough to write would be OK
5. Maintain rustic feel
6. Incorporate the identifying phone app that the UVA-Wise professor is developing
7. Bird boxes! All around the educational area
8. Tree tags all throughout educational areas
    -Wildflowers and perennials also!
9. Concern about tagging and carving on equipment

Fit trail

1. All stations would like to be stationary
2. All wooden
3. RUSTIC
4. Signage kept in rustic theme
5. The trail cannot go through the corner property to connect to the trail
    -Explore the option of using the other neighboring property as access
    -Design the trail network as a closed system within the park but allow for the option of a spur trail
6. Make sure to include mile markers along the trail
    -Try to incorporate the markers into the post of other interpretive signs that will be along the trail when possible
7. Tree tags all throughout trail
    -Wildflowers and perennials also!
8. There is a good mix of trail lengths and difficulties: keep trails
9. Keep things as rustic in appearance as possible
10. Concern about tagging and carving on equipment
11. General
    -Keep both nature play and classrooms
    -Do not use the church's side lot
    -Use the T-Pavilion on the side

Appendix B: Soil Analysis

Soil Sample Locations

1.

	ph	bph	p	k	ca	mg	zn	mn	cu	fe	b
1.	7.07	N/A	30	37	1472	142	5.6	12.4	2.2	23.7	0.5
2.	6.33	6.18	3	21	851	88	1.4	8.3	1.7	33.4	0.2
3.	7.04	N/A	5	33	1270	116	2.3	7.6	0.9	11.5	0.5
4.	6.14	6.21	2	40	886	94	2	9.7	2.5	29.2	0.2
5.	7.81	N/A	7	49	2774	167	22.9	21.3	1	10.2	0.4
6.	4.64	5.31	3	27	279	27	2.3	6	0.4	53	0.1

	cec	pctacidity	pctbasesat	pctcasat	pctmgsat	pctksat	p_rating	k_rating	ca_rating	mg_rating
1.	8.6	N/A	100	85.4	13.5	1.1	H	L+	VH	VH
2.	6.3	20.6	79.4	67.1	11.4	0.8	L	L	H	H
3.	7.4	N/A	100	85.9	12.9	1.1	L+	L+	VH	VH
4.	6.4	17.6	82.4	68.8	12	1.6	L	M-	H	H
5.	15.3	N/A	100	90.3	8.9	0.8	M-	M-	VH	VH
6.	8.1	79.4	20.6	17.1	2.7	0.8	L	L	L+	L+

Soil Test Note #1

Virginia Cooperative Extension

PUBLICATION 452-701

Explanation of Soil Tests

Rory Maguire, Extension Nutrient Management Specialist, Virginia Tech
Steve Heckendorn, Soil Test Laboratory Manager, Virginia Tech

The accompanying Soil Test Report (and supplemental Soil Test Notes, when provided) will help you assess your plant's need for fertilizer and lime.

The "History of Sampled Area" section restates the information you filled in on the Soil Sample Information Sheet you submitted with the soil sample.

The "Lab Test Results" section shows the relative availability of nutrients numerically and if appropriate, as a rating. The rating may be interpreted as follows: L=Low, M=Medium, H=High, VH=Very High, EH=Excessively High (soluble salt test only), DEF=Deficient, or SUFF=Sufficient, and sometimes a "+" or "-." When soils test Low, plants almost always respond to fertilizer. When soils test Medium, plants sometimes respond to fertilizer and a moderate amount of fertilizer is typically recommended to maintain fertility. When soils test High to Very High, plants usually do not respond to fertilizer. If there is no rating for a nutrient, the adequacy of that nutrient in the soil for the plant you specified has not been determined.

The following is an explanation of the symbols and abbreviation used in the report:

Report Symbols and Abbreviations

P = phosphorus	K = potassium
Ca = calcium	Mg = magnesium
Zn = zinc	Mn = manganese
Cu = copper	Fe = iron
B = boron	SS = soluble salts
lb/A = pounds per acre	ppm = parts per million
meq = milliequivalent	g = gram
pH = acidity	Sat. = saturation
N = nitrogen	P_2O_5 = phosphate
K_2O = potash	% = percent

Est-CEC = estimated cation exchange capacity

AG = agricultural limestone (dolomitic or calcitic)

Fertilizer Recommendation

The fertilizer recommendations may be used for the same crop for two to three years. After this time, it is advisable to retest the soil to determine if significant changes have occurred in nutrient levels. When the soil tests Very High for phosphorus or potassium and no fertilizer for these nutrients is recommended, you should retest the following year to determine if fertilizer will be needed. Due to the variability associated with sampling, fertilizer application rates may be varied by a plus or minus 10 percent.

No soil test is performed for **nitrogen** because this element is too mobile in the soil for laboratory results to be useful. Nitrogen fertilizer recommendations are based on the crop/plant to be grown, the previous crop, and when applicable, the soil's yield potential. Comments on the report and other enclosed Notes, if any, will have further information regarding nitrogen.

Lime Recommendation

If needed, a lime recommendation is given to neutralize soil acidity and should last two to three years. After that time, you should have the soil retested. The measured soil test levels of calcium and magnesium are used to determine the appropriate type of limestone to apply. If neither dolomitic nor calcitic lime is mentioned, or "Ag" type or "agricultural" limestone is stated on the report, then it does not matter which type is used. When no information on the Soil Sample Information Sheet was provided regarding the last lime application, the lab assumed you have not applied lime in the past 18 months. If this is not correct, contact your Extension agent for advice on adjusting the lime recommendation to take into consideration recent lime applications. Do not over lime! Too much lime can be as harmful as too little. For best results, apply lime, when possible, several months ahead of the crop/plant to be planted to allow time for more complete soil reaction.

www.ext.vt.edu

Virginia Tech 1872 Invent the Future

Produced by Communications and Marketing, College of Agriculture and Life Sciences, Virginia Polytechnic Institute and State University, 2010

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VSU Virginia State

Methods and Meanings

For more detail on the lab procedures used, visit *www.soiltest.vt.edu* and click on "Laboratory Procedures."

Soil pH (or soil reaction) measures the "active" acidity in the soil's water (or hydrogen ion activity in the soil solution), which affects the availability of nutrients to plants. It is determined on a mixed suspension of 1:1, volume to volume ratio of soil material to distilled water.

Virginia soils naturally become acidic, and limestone periodically needs to be applied to neutralize some of this acidity. A slightly acid soil is where the majority of nutrients become the most available to plants, and where soil organisms that decompose organic matter and contribute to the "overall health" of soils are the most active. When a soil is strongly acidic (< 5.0-5.5), many herbicides lose effectiveness and plant growth is limited by aluminum toxicity. When soils are overlimed and become alkaline (> 7.0), micronutrients, such as manganese and zinc, become less available to plants.

For most agronomic crops and landscaping plants, lime recommendations are provided to raise the soil pH to a slightly acid level of between 5.8 and 6.8. Blueberries and acid-loving ornamentals generally prefer a 4.5 to 5.5 pH, and an application of liming material is suggested when the soil pH drops below 5.0. For the majority of other plants, lime may be suggested before the pH gets below 6.0. This is to keep the soil pH from dropping below the ideal range, since lime is slow to react and affects only a fraction of an inch of soil per year when the lime is not incorporated into the soil. If the soil pH is above the plant's target pH, then no lime is recommended. If the pH is well above the ideal range, then sometimes an application of sulfur is recommended to help lower the pH faster; however, most of the time, one can just let the soil pH drop on its own.

A Mehlich buffer solution is used to determine the **Buffer Index** to provide an indication of the soil's total (active + reserve) acidity and ability to resist a change in pH. This buffer measurement is the major factor in determining the amount of lime to apply. The Buffer Index starts at 6.60 and goes lower as the soil's total acidity increases and more lime is needed to raise the soil pH. A sandy soil and a clayey soil can have the same soil pH; however, the clayey soil will have greater reserve acidity (and a lower Buffer Index) as compared to the sandy soil, and the clayey soil will require a greater quantity of lime to be applied in order to raise the soil pH the same amount as the sandy soil. A reported Buffer Index of "N/A" means that it was not measured since the soil (water) pH was either neutral or alkaline and not acidic (soil pH ≥ 7.0) and therefore requires no lime.

Nutrients that are available for plant uptake are extracted from the soil with a Mehlich 1 solution using a 1:5 vol:vol soil to extractant ratio, and are then analyzed on an ICP-AES instrument. An extractable Mehlich 1 level of phosphorus from 12 to 35 pounds per acre (lb/A) is rated as medium or optimum. A medium level of potassium is from 76 to 175 lb/A. Medium levels of calcium and magnesium are 721 to 1440 and 73 to 144 lb/A, respectively. Calcium and magnesium are normally added to the soil through the application of limestone. It is rare for very high fertility levels of P, K, Ca and Mg to cause a reduction in crop yield or plant growth. Levels of micronutrients (Zn, Mn, Cu, Fe and B) are typically present in the soil at adequate levels for plants if the soil pH is in its proper range. See Soil Test Note 4, at *www.soiltest.vt.edu/stnotes*, for documented micronutrient deficiencies in Virginia.

Soluble Salts (**S.Salts**) or fertilizer salts are estimated by measuring the electrical conductivity of a 1:2, vol:vol ratio of soil material to distilled water. Injury to plants may start at a soluble salts level above 844 ppm when grown in natural soil, especially under dry conditions and to germinating seeds and seedlings. Established plants will begin to look wilted and show signs related to drought. This test is used primarily for greenhouse, nursery and home garden soils where very high application rates of fertilizer may have led to an excessive buildup of soluble salts.

Soil **Organic Matter** (SOM) is the percentage by weight of the soil that consist of decomposed plant and animal residues, and is estimated by using either the weight Loss-On-Ignition (LOI method) from 150° to 360°C, or a modified Walkley-Black method. Generally, the greater the organic matter level, the better the overall soil tilth or soil quality, as nutrient and water holding capacities are greater, and improved aeration and soil structure enhance root growth. The percent of organic matter in a soil can affect the application rate of some herbicides. Soil organic matter levels from 0.5% to 2.5% are ordinary for natural, well-drained Virginia soils. A soil organic matter greater than 3% would be considered very high for a cultivated field on a farm, but can be beneficial. Due to relatively large amounts of organic materials being commonly added to gardens, the soil organic matter in garden soils can be raised into the range of 5% to 10%.

The remaining values that are reported under the "Lab Test Results" section are calculated from the previous measured values and are of little use to most growers.

Estimated Cation Exchange Capacity (**Est-CEC**) gives an indication of a soil's ability to hold some nutrients against leaching. Natural soils in Virginia usually range in CEC from 1 to 12 meq/100g. A very sandy soil will normally have a CEC of 1 to 3 meq/100g. The CEC value will increase as the amount of clay and organic matter in the soil increases. This reported CEC is an estimation because it is calculated by summing the Mehlich 1 extractable cations (Ca + Mg + K), and the acidity estimated from the Buffer Index and converting to units commonly used for CEC. This is also an Effective CEC since it is the CEC at the current soil pH. This value can be erroneously high when the soil pH or soluble salts level is high.

The percent **Acidity** is a ratio of the amount of acid-generating cations (as measured by the Buffer Index) that occupy soil cation exchange sites to the total CEC sites. The higher this percentage, the higher the amount of reserve acidity in the soil, and the higher the amount of acidity there will be in the soil solution and the lower the soil pH will be. A reported Acidity% of "N/A" means that a buffer index was not determined, and the acidity is probably less than 1 meq/100g and/or 5%, and the soil pH is alkaline (greater than 7.0).

The percent **Base Sat**uration is the ratio of the quantity of non-acid generating cations (i.e., the exchangeable bases, Ca, Mg, and K) that occupy the cation exchange (CEC) sites.

The percent **Ca, Mg, or K Sat**uration refers to the relative number of CEC sites that are occupied by that particular nutrient and is a way of evaluating for any gross nutrient imbalance.

Additional Information

For questions and more information, contact your local Virginia Cooperative Extension (VCE) office or go to *www.ext.vt.edu*. Contact information for your local Extension office appears on the upper left of your soil test report.

Conversion Factors

(Some Values are Approximate)

1 acre = 43,560 square feet

1 pound of 5-10-5, 5-10-10 or 10-10-10 fertilizer = 2 cups

1 pound of ground limestone or ground dolomitic limestone = 1.5 cups

1 pound of aluminum sulfate or magnesium sulfate = 2.5 cups

1 pound of sulfur = 3.3 cups

1 quart = 2 pints = 4 cups

1 pint = 2 cups = 32 tablespoons

1 tablespoon = 3 teaspoons

1 bushel = 35.24 liters = 1.25 cubic feet

Pounds per 100 square feet x 0.54 = lbs per cubic yard

100 square feet = 5 feet x 20 feet, 10 feet x 10 feet, or 2 feet x 50 feet

1,000 square feet = 50 feet x 20 feet, 10 feet x 100 feet, or 25 feet x 40 feet

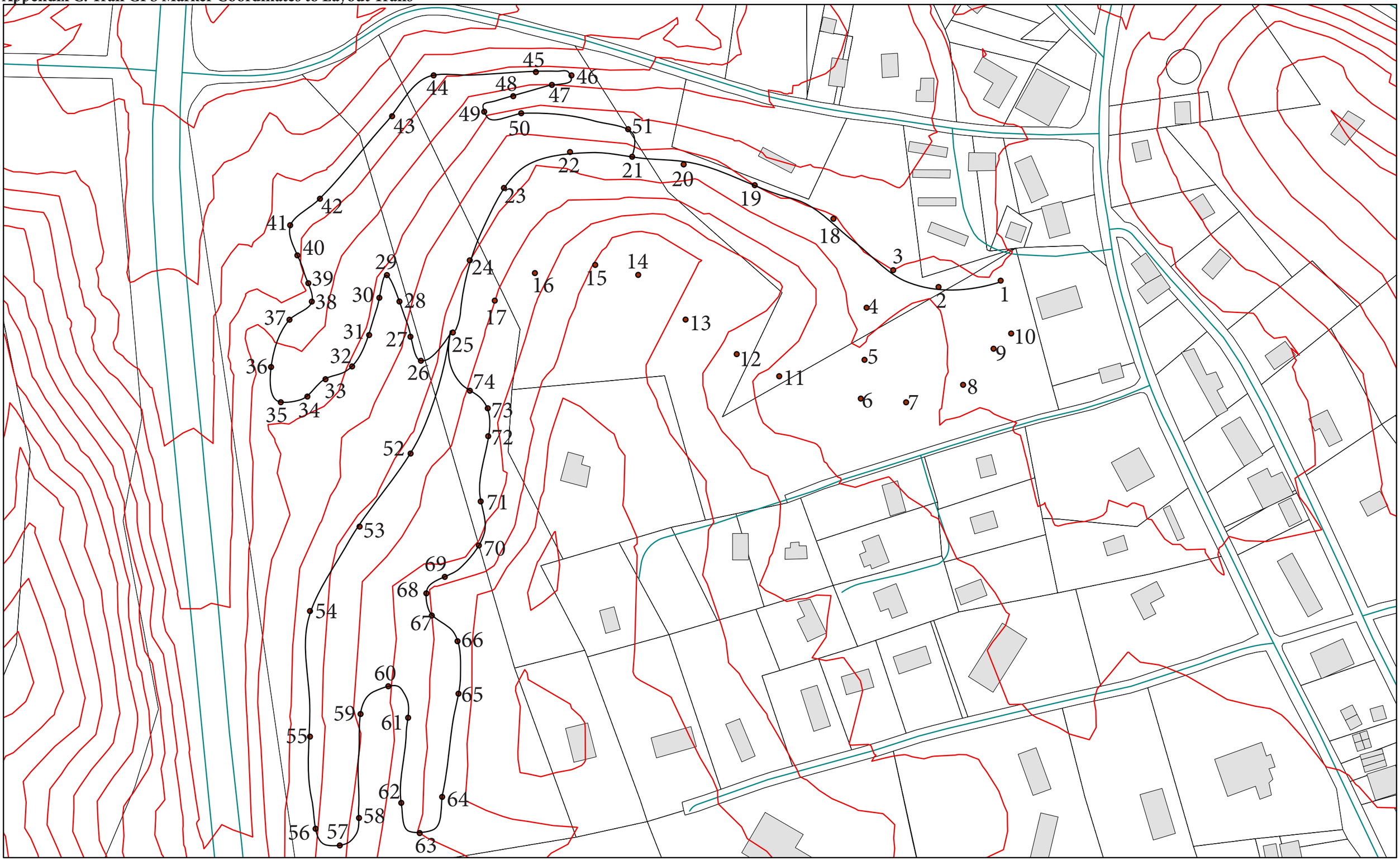
Pounds per 100 square feet x 436 = pounds per acre

Pounds per 1,000 square feet x 43.6 = pounds per acre

Pounds per acre x 0.0023 = pounds per 100 square feet

Pounds per acre x 0.023 = pounds per 1,000 square feet

Appendix C: Trail GPS Marker Coordinates to Layout Trails



Trail GPS Markers Coordinate List

1. 10,288,977.600 3,544,244.713 Feet
2. 10,288,861.271 3,544,233.324 Feet
3. 10,288,775.854 3,544,264.237 Feet
4. 10,288,729.485 3,544,195.090 Feet
5. 10,288,724.604 3,544,097.471 Feet
6. 10,288,716.469 3,544,029.951 Feet
7. 10,288,801.886 3,544,021.003 Feet
8. 10,288,906.826 3,544,054.356 Feet
9. 10,288,962.957 3,544,120.249 Feet
10. 10,288,993.056 3,544,148.721 Feet
11. 10,288,567.124 3,544,069.748 Feet
12. 10,288,490.041 3,544,110.894 Feet
13. 10,288,397.506 3,544,173.090 Feet
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16. 10,288,119.728 3,544,258.810 Feet
17. 10,288,043.773 3,544,205.642 Feet
18. 10,288,666.603 3,544,357.552 Feet
19. 10,288,523.374 3,544,418.315 Feet
20. 10,288,393.166 3,544,456.293 Feet
21. 10,288,296.594 3,544,471.484 Feet
22. 10,288,184.832 3,544,481.249 Feet
23. 10,288,061.134 3,544,416.145 Feet
24. 10,287,998.200 3,544,281.597 Feet
25. 10,287,967.818 3,544,149.218 Feet
26. 10,287,909.225 3,544,099.305 Feet
27. 10,287,887.523 3,544,139.453 Feet
28. 10,287,869.077 3,544,206.727 Feet
29. 10,287,848.461 3,544,254.470 Feet
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31. 10,287,815.909 3,544,144.878 Feet
32. 10,287,780.101 3,544,088.454 Feet
33. 10,287,732.358 3,544,062.413 Feet
34. 10,287,697.636 3,544,032.031 Feet
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73. 10,288,031.6492 3,544,010.30096 Feet
74. 10,287,998.663 3,544,042.592631 Feet

Appendix E: Image Sources

Outdoor Classroom Activities

http://blog.lib.umn.edu/jcomazzi/myblog/assets_c/2010/04/DSC_0043-thumb-400x265-38001.jpg
http://www.valleywater.org/uploadedImages/Programs/TeachersStudents/SchoolProgram/coyoteclassroom.jpg?n=9095
http://lh5.ggpht.com/bxnQJMulFqzF_FTY2EVmkA9ZBl6sLj9ZMaPhA2KY36TyxDAbJxebHx7Ar_tfJXJKY_FF=s114
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http://blog.activityhero.com/wp-content/uploads/2012/05/2.png
http://3.bp.blogspot.com/_A9GusUZeeIA/TSMdET0YccI/AAAAAAAAF7U/HGV0EF4dAMc/s1600/IMG_1377.JPG
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http://images.szallas.hu/packages/1142262/original/704620.jpg

Revegetation

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Outdoor Fitness Equipment

Websites:

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