Redbud Run Conservation Area
Conceptual Master Plan

Prepared for the Department of Game and Inland Fisheries and the
Opequon Watershed, Inc.,
October 2011

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

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Urban and Community Forestry grant

Project Team

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Acknowledgements

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Carl Rettenberger	Chapter Member and Past President, Winchester VA Chapter of Trout Unlimited
James Springer	Senior CADD Technician, Patton Harris Rust & Associates
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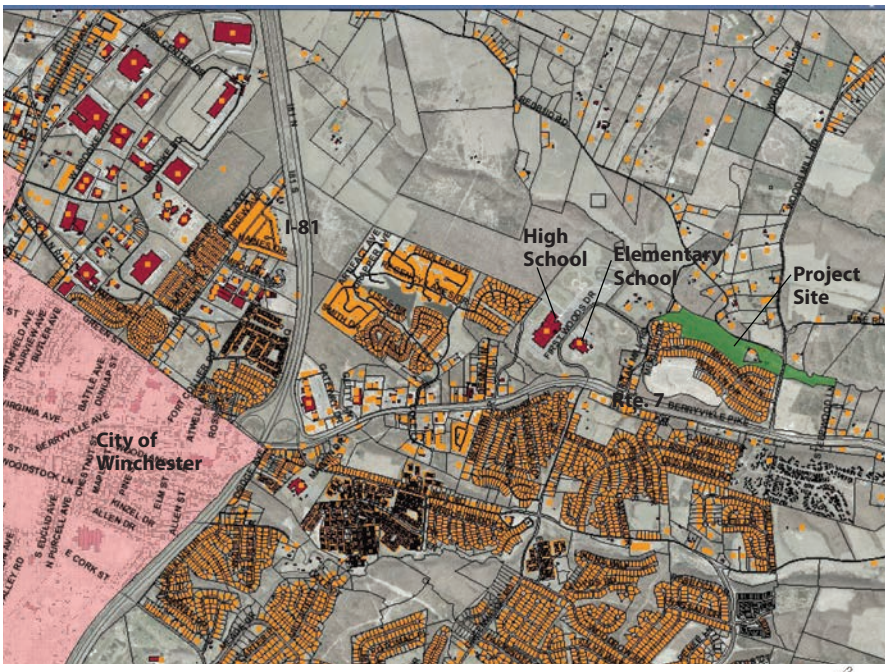
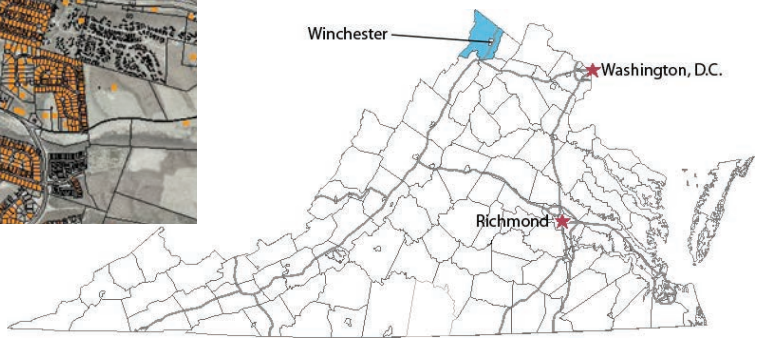
Project Description



Project site located within Frederick County



State map highlighting the City of Winchester and Frederick County

"The Redbud Run Greenway is located in Frederick County, Virginia, just north of the City of Winchester. It is a multi-faceted watershed management project providing protection, access, and interpretation of natural and historic resources, while involving a diverse group of partners. The Opequon Watershed, Inc. (TOW), Winchester Trout Unlimited, and the Lord Fairfax Soil and Water Conservation District have worked with the City of Winchester and the Shenandoah Valley Battlefields Foundation to implement the Conservation Reserve Enhancement Program (CREP) in the headwaters of the lower section of Redbud Run. The Virginia Department of Game and Inland Fisheries (DGIF) has reintroduced native brook trout to the stream as a result of this protection. Redbud Run also supports reproducing rainbow trout.

In 2003, the local partners negotiated with the developer of a 300 unit residential subdivision to lessen the impact on the stream through stormwater best management practices (BMPs) and permanent land protection. As a result, 30 acres and ¾-mile of stream from a 155-acre tract of land were donated to DGIF in late 2004. TOW and other local partners in the Redbud Run Greenway Alliance (RBRGWA) are working closely with DGIF on the development of a management plan for the Redbud preservation parcel. A series of conceptual trail routes are being proposed to accommodate a variety of user groups."[1] Trails will provide limited access for passive recreation, stream access for trout fishing, wildlife viewing and natural, cultural, and historic resource interpretation. There is an historic house on site as well as bank barn that can be restored/stabilized and used for interpretation purposes. Because of the site's close proximity to Millbrook High School and Redbud Elementary School, there are ample opportunities to utilize the site as an outdoor classroom for many topics of interest.

The Community Design Assistance Center (CDAC) worked with the RBRGWA to develop a conceptual master plan for the site, including the portion to the east of Woods Mill Road. The DGIF's vision for this property, to maintain it as pristinely

[1]Taken from project application submitted by Jim Lawrence.

as possible and to retain or develop a good riparian buffer, guided design decisions for the site. Detailed conceptual designs were prepared for parking and pedestrian access to the site from Woods Mill Road. The conceptual master plan for the site looked to connect the existing trail system to the proposed parking area (east of Woods Mill Road) as well as to the adjacent Millbrook High School and Redbud Elementary School. The master plan also sought to enhance the current trail system as it relates to ADA opportunities (grade and surfacing) and stream crossings. Ideas for integrating the historic house and barn into the master plan for cultural interpretation and education were also developed along with possible locations for additional interpretative and educational signage on site.

Design Process

CDAC team members Laura Sokol (l) and LaDell Sumpter (r) explore the site with Jim Lawrence (c).

CDAC team members discuss the bio-retention area with Jim Lawrence (l), Opequon Watershed Inc.; Carl Rettenberger (l ctr), Trout Unlimited; Steve Reeser (r ctr) DGIF, and Ron Mislowsky (r), Patton Harris Rust & Associates.

The CDAC design team began the project with an initial site visit in January 2011. The team explored the site and connection opportunities to existing trails on the 3rd Battle of Winchester property with client representative Jim Lawrence. The CDAC team returned to Blacksburg to prepare inventory and analysis maps and develop preliminary design concepts.

The preliminary design concepts were presented to the client in April 2011 for review and comment. The CDAC team returned to the site to meet with the client as well as Frederick County School System staff, Trout Unlimited volunteers, and a local engineer and building company to discuss the parking design and problem areas on the site.

Based on conversations with the different parties as well as comments from the preliminary design concept presentation, the CDAC team refined the concepts into a single conceptual master plan for the various areas of the site. This refined concept was presented on site in August 2011.

This short, supporting report was prepared to document the design process and highlight proposed design concepts.

Site Inventory and Analysis

Jim Lawrence (l) describes runoff sources to the project site as well as road crossing ideas.

The CDAC team explores potential outdoor gather areas for school classes on site.

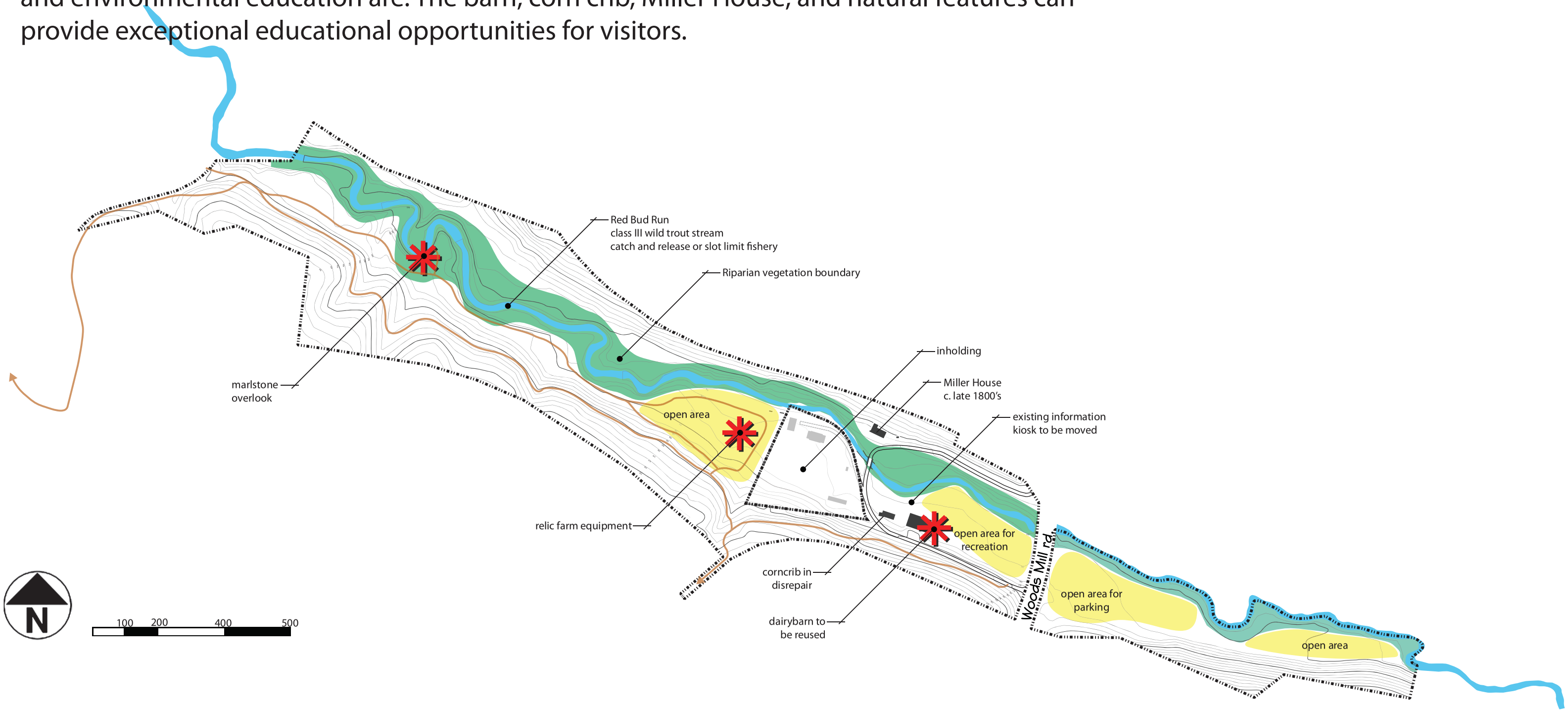
The CDAC team's first visit to the Redbud Run site in January 2011 offered a unique perspective of the site under 8 inches of snow from the previous days. The team made note that even though the majority of the site's use would be during warmer months, having a perspective of the site through bare vegetation with a blanket of snow on the ground proved beneficial. Sight lines were visible through the bare vegetation and an understanding of how steep the terrain was in certain areas was integral in describing the site's character for future design ideas. Sketches, pictures, and conversation highlighted unique views, places, and objects around the site.

The second CDAC visit to the site came in June 2011. During this visit, preliminary design ideas were re-presented to new project stakeholders. Problem areas and connections were also re-examined with the client team. A site visit during the warmer months proved beneficial as well to understanding the site at a time when it would see greater use. This visit clued the team into more ideas surrounding the natural processes that were going on within the site.

Three different inventory and analysis maps were created for the site after the June visit. These maps combined information from the January visit with findings from the June visit to create the final analysis and inventory maps. Cultural and environmental resources, topographical constraints, and site circulation and access analyses were mapped, providing a better perspective on the processes within and issues surrounding the site. An overall trail connections analysis and recommendations map showing the site in relation to its context was also created. Each analysis produced valuable information that was key to creating a master plan for Redbud Run Conservation Area. These maps can be found on pages 10-12.

Site inventory & analysis

This analysis looks at the exisitng condition of the site and where opportunities for cultural and environmental education are. The barn, corn crib, Miller House, and natural features can provide exceptional educational opportunities for visitors.



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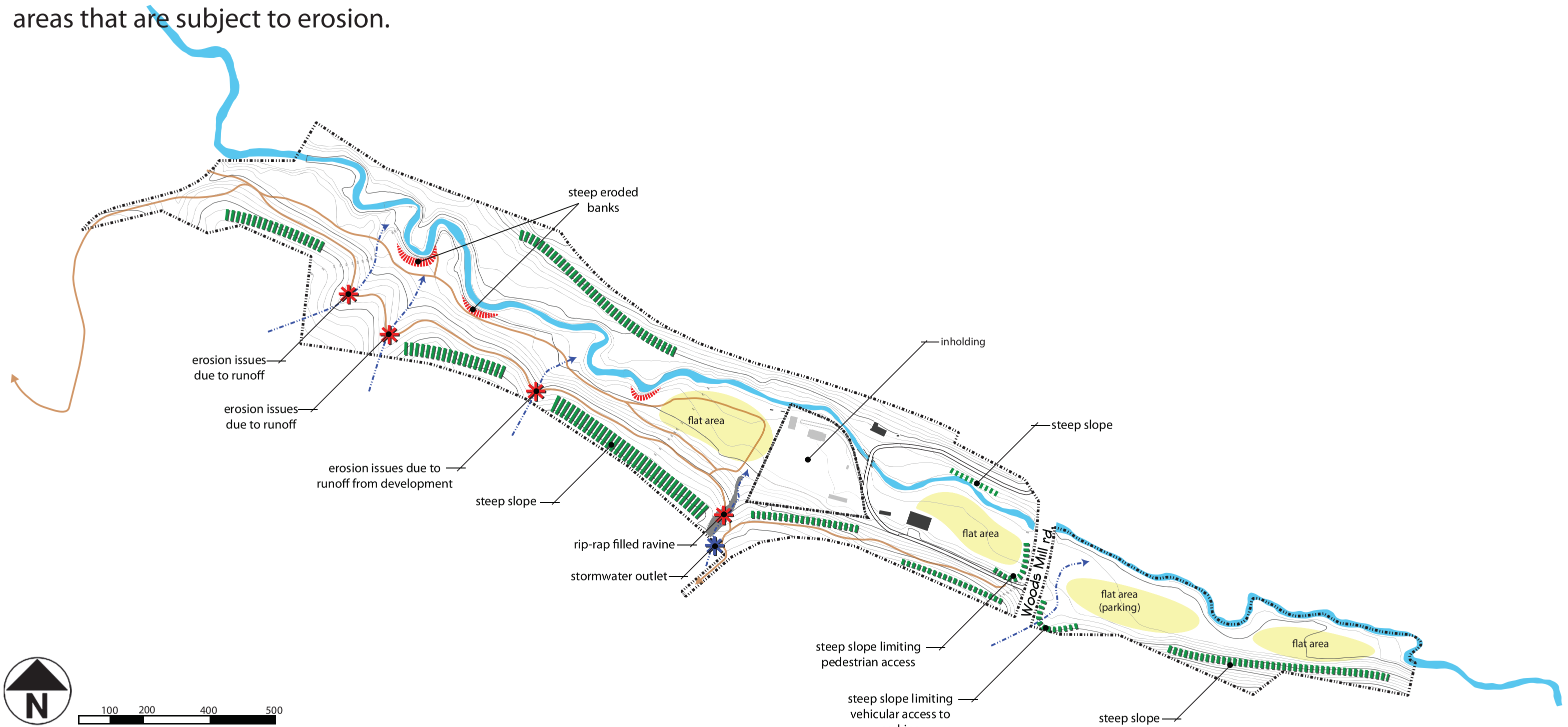
Site inventory & analysis

This analysis examines topographical and other physical issues related to the site to determine areas best suited for trails, recreation, access, and learning. The analysis also takes into account areas that are subject to erosion.



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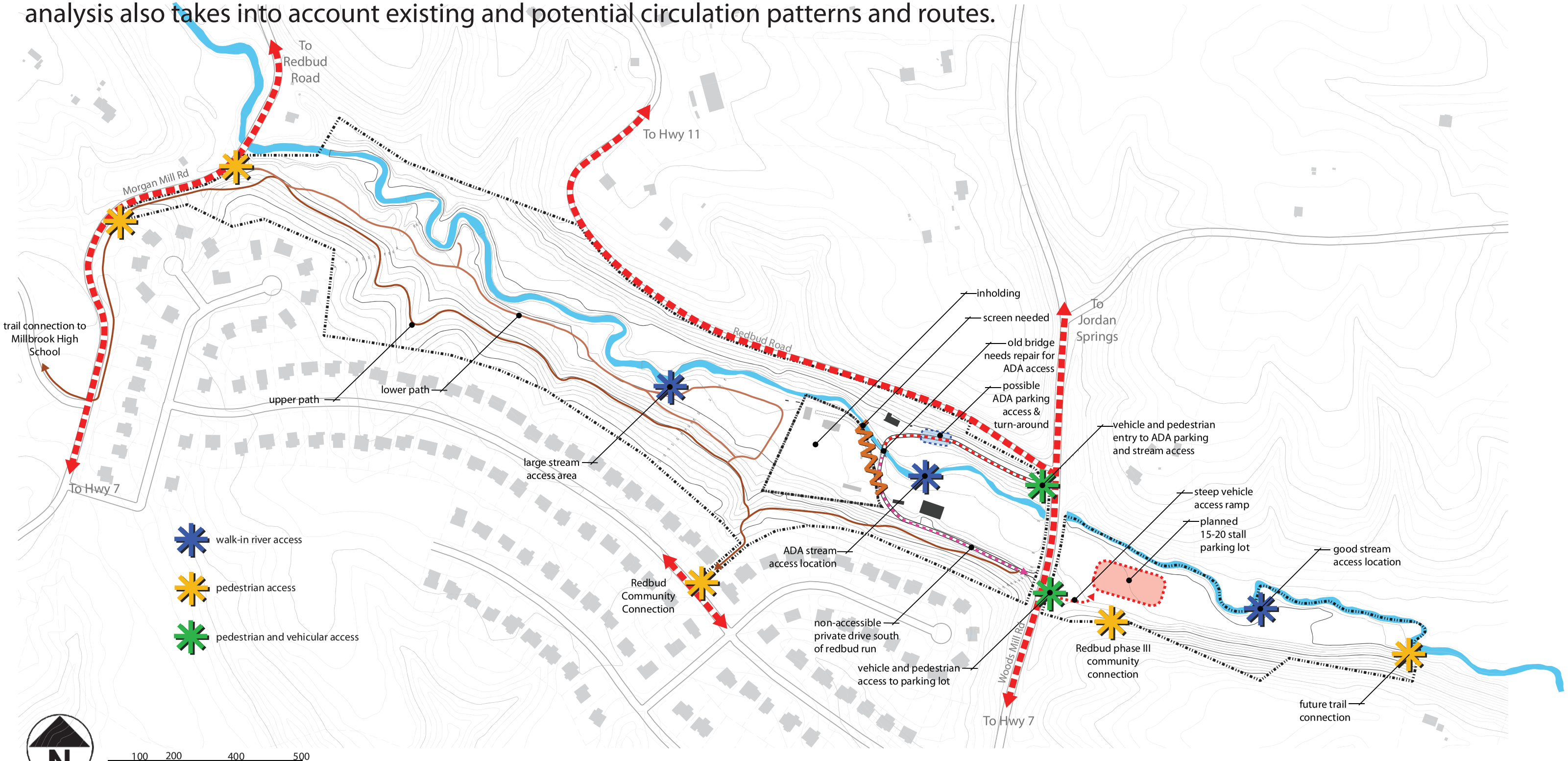
Site inventory & analysis

This analysis examines existing and potential access for pedestrian and vehicular traffic. The analysis also takes into account existing and potential circulation patterns and routes.



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Preliminary Design Concepts

Barn Rustic log seating concept

Traditional concept for formal learning areas

The CDAC design team developed two preliminary design concepts for both a central gathering area and neighborhood access to the site. These concepts, as well as initial design idea solutions to problem areas on site and design concepts for the bio-retention area near the proposed parking lot were presented to the client in April 2011.

Preliminary Concept A - Barn Rustic

Barn Concept A:

The broad curvilinear paths allow for low maintenance mowing consistent with current maintenance techniques. This curved geometry is reinforced at all entrances, including both sides of the barn and at the future potential visitor center in the historic house on site. Curved entrance ways are created through mowed semi circles with shrubs as borders. To create select views into the dense forest underbrush, small sections are proposed to be cleared and planted with low growing shrubs to create purposeful keyhole windows providing views to the creek from trails, meadow, and barn. An outdoor classroom is created along the side of the barn. Proposed benches and stage elements can be made from recycled wood from the corn crib. The overall design concept is very low impact and blends in with the forest environment while still defining distinct spaces.

Community Entrance Concept A:

Broad curvilinear mowed paths are also used at the community entrance for easy maintenance. Small shrubs are planted on alternating sides of the curves to accentuate the geometry and allow permeable access to the path from the neighboring houses. Larger shrubs, such as forsythia, provide a barrier at the end of the trail as the grade gets steeper. The low impact, rustic paths are framed by a series of simple arched metal arbors to create a gateway into the park. These rustic arbors are consistent with the agricultural theme seen in the reuse of the barn as an education center and recycled corn crib wood for bench elements throughout the site.

11x17 pullouts for Concept A can be found on page 16.

Preliminary Concept B - Traditional

Barn Concept B:

The planned renovation for the barn area will contain more structures for community use as well as re-purposing existing buildings. Stairs and benches will be crafted from the existing corn crib on site for an amphitheater that will be built into the hillside next to the barn. A deck will be constructed on the backside of the barn to increase entertainment space for the barn's upper level. The bridge crossing the stream will be restored and a pull off for ADA parking will be added. Small trees and large shrubs will be used to create barriers and mark private property boundaries (Juniperus virginiana 'Hillspire'; Hillspire Juniper). Plant selection throughout this area will also consist of native/non-invasive plants.

Community Entrance Concept B:

The community entrance is marked by a wooden arbor and surrounded by more formal style plantings, which are all native/non-invasive. The boundary between the adjacent properties and the trail will be marked by dense, low, thorned hedges. As the short path between the community sidewalk links up to the main trail, plant selection and orientation become less formal and include native plants meant to hold soil and create barriers such as Forsynthia x intermedia (Forsynthia).

11x17 pullouts for Concept B can be found on page 17.

Detail Solutions:

Bridging*[1]*:

A wooden foot bridge with railing is proposed for areas with steep grades. Concrete footers will stabilize the bridge and wooden slats will create the structure—making for a simple means of installation and construction. The railing would only be placed on the steeper side for safety reasons.

Plantings:

Proposed plantings to help with bank stabilization as well as defining areas of usage include: Virginia Rose, red twig dogwood, forsythia, and yaupon holly. These plants require minimal maintenance.

Culvert Area:

The path above the culvert would be built up with soil to stabilize the path. The culvert would be hidden amongst natural stone and plantings for a more natural look.

Boardwalk with Steel Edging:

Proposed boardwalks are similar in construction to the wooden foot bridge with railing. Boardwalks would be needed in less severe areas of slope, with minimal runoff. The steel edging and wood panels would also be a great asset to the barn motif with its rustic appeal.

11x17 pullouts for Detail Solutions an be found on page 18.

[1] Sources came from Portland's Trail Design Guidelines: http://www.portlandonline.com/parks/index.cfm?c=49181)

Parking Lot Bio-retention

Based on initial conversations with the client, the anticipated parking area will accommodate up to 15 spaces for vehicles. Bio-retention, in the form of rain gardens, is proposed to address the impervious surface created by parking as well as stormwater that is directed on site from adjacent development. These proposed rain gardens will collect runoff before it enters the stream. The plants used in the gardens range from dry to very wet tolerant and require minimal maintenance. From the parking lot, site users can walk along the stream on the parking lot side or they can cross the street heading to the barn. A proposed path separates pedestrians from the parking entrance road, making for a safer experience for the user.

11x17 pullouts for Parking Lot Bio-retention an be found on page 19.

Concept A: Barn Rustic

- curvilinear
- metal detailing
- re-use of farm building wood
- mowed landscape
- minimal impact/maintenance

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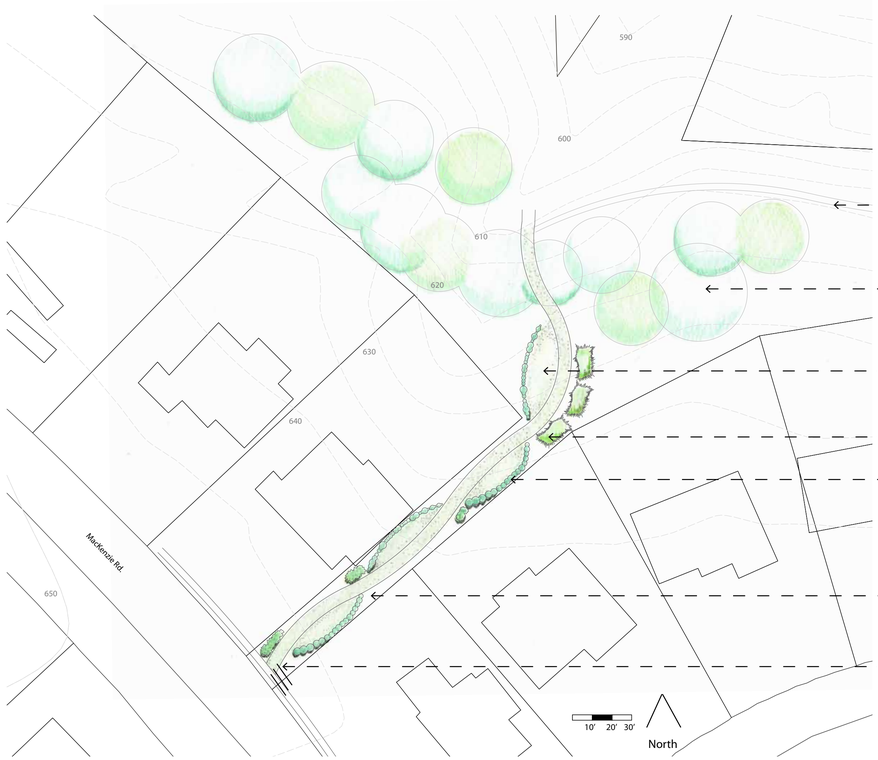

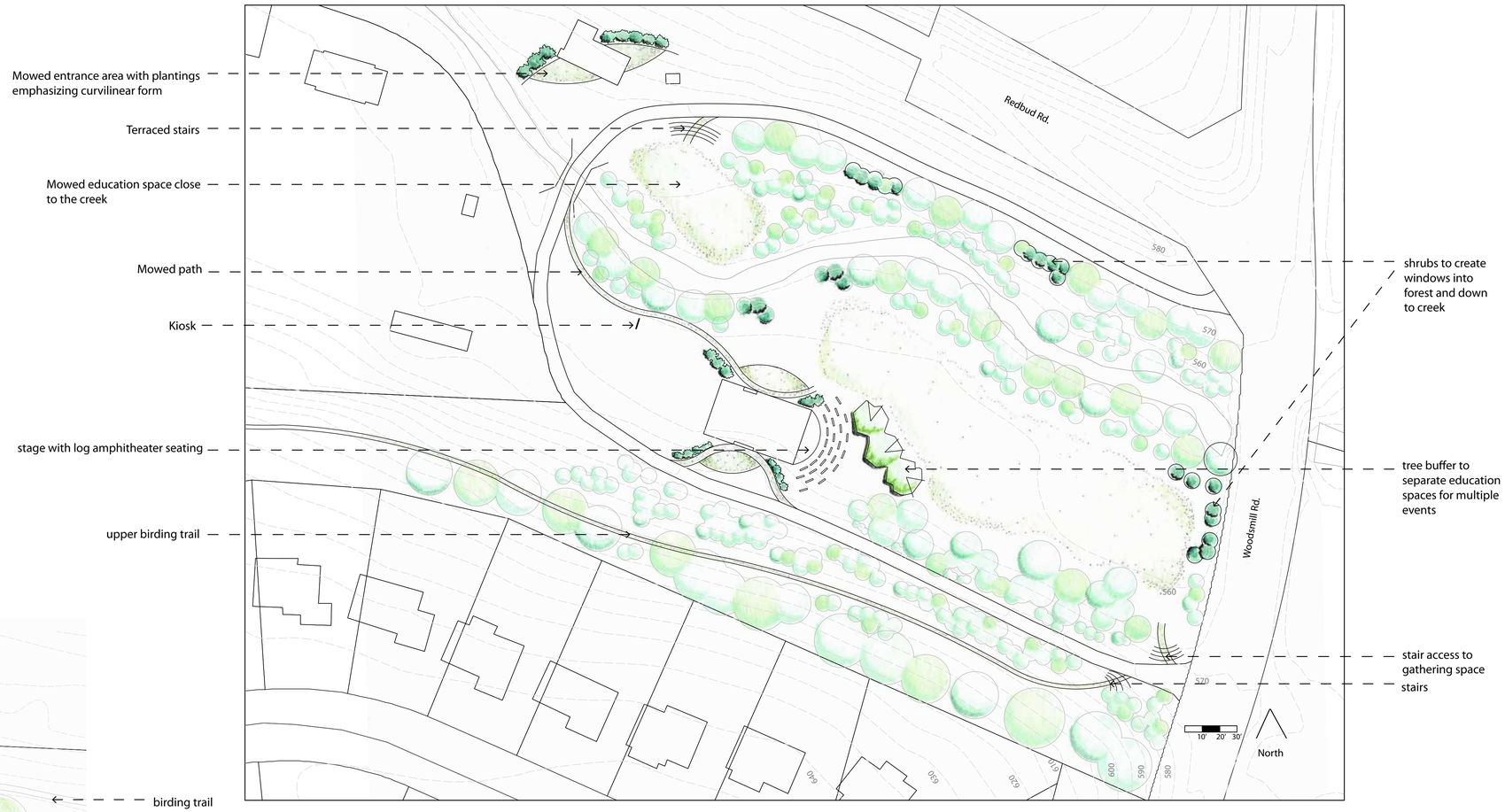

http://www.chicagohomemag.com/

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Concept B: Traditional

- structured
- streamlined
- wooden detailing
- open

<u>Community Entrance and Barn Planting Palette</u>

Taxus baccata 'Repandens' (Yew)

Ilex x meserveae 'China Girl' (China Girl holly)

Schizachyrium scoparium (Little bluestem)

Vinca minor 'Atropurpurea' (periwinkle)

Campsis radicans (Trumpet vine)

Mahonia aquifolium (Oregon Grapeholly)

Juniperus virginiana 'Hillspire' (Hillspire Juniper)

Forsythia x intermedia (Forsythia)

images from Virginia Tech Dendrology Department

http://www.humbleacres.com/catalog/pages/grasses/grass_schizachyrium_blue_heaven.html

http://picasaweb.google.com/bobtheplantguy/ListermanAssociatesPlantsOfNotePics#

bing image search

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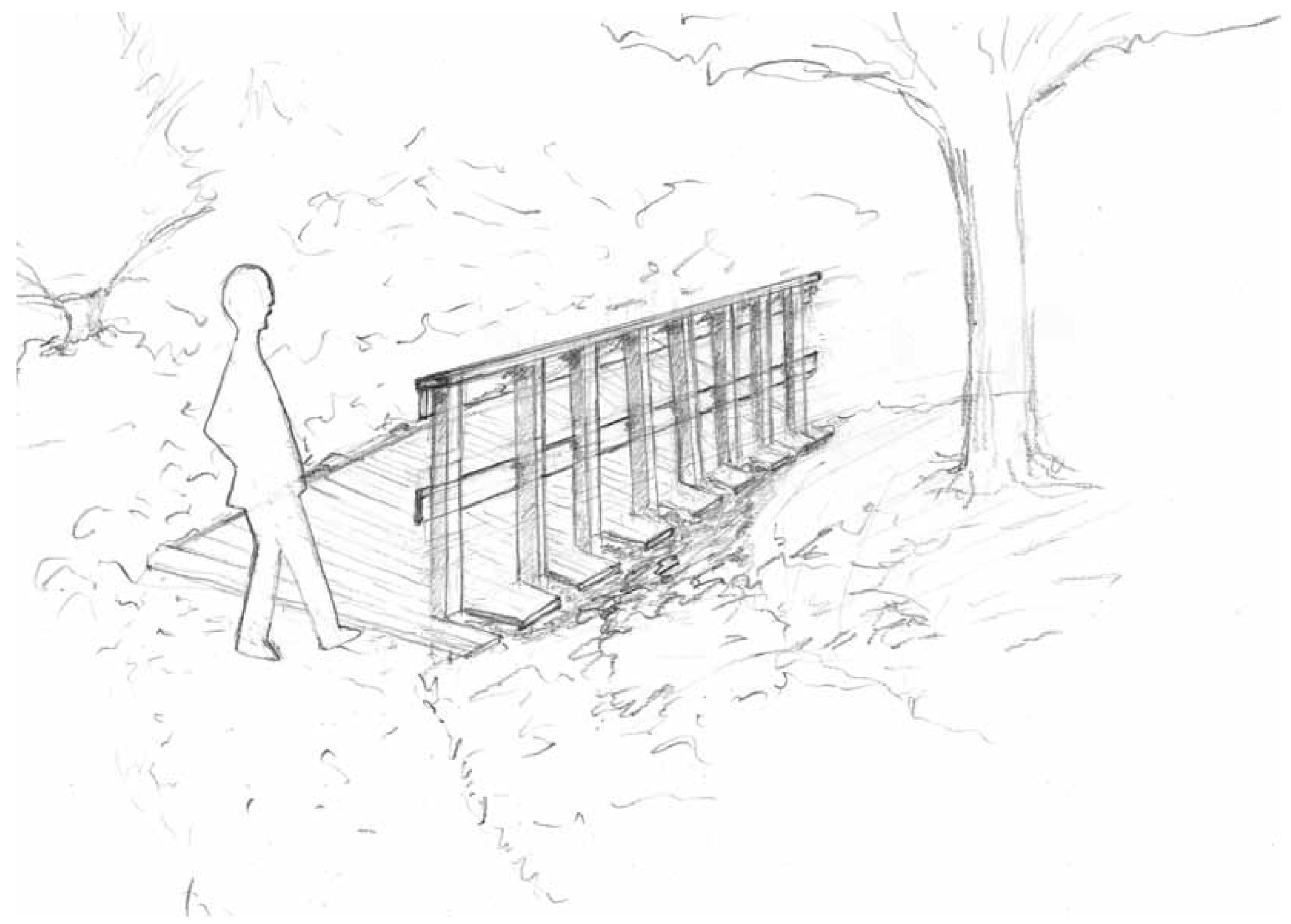
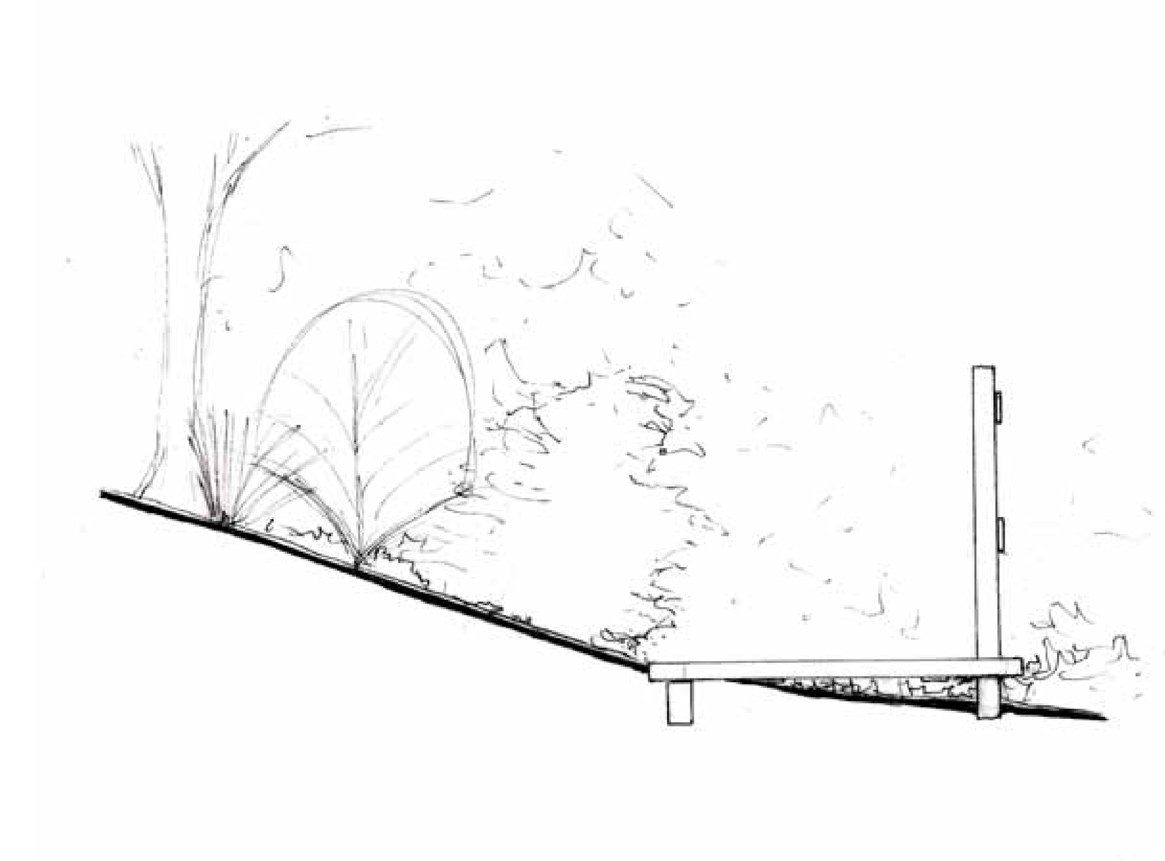
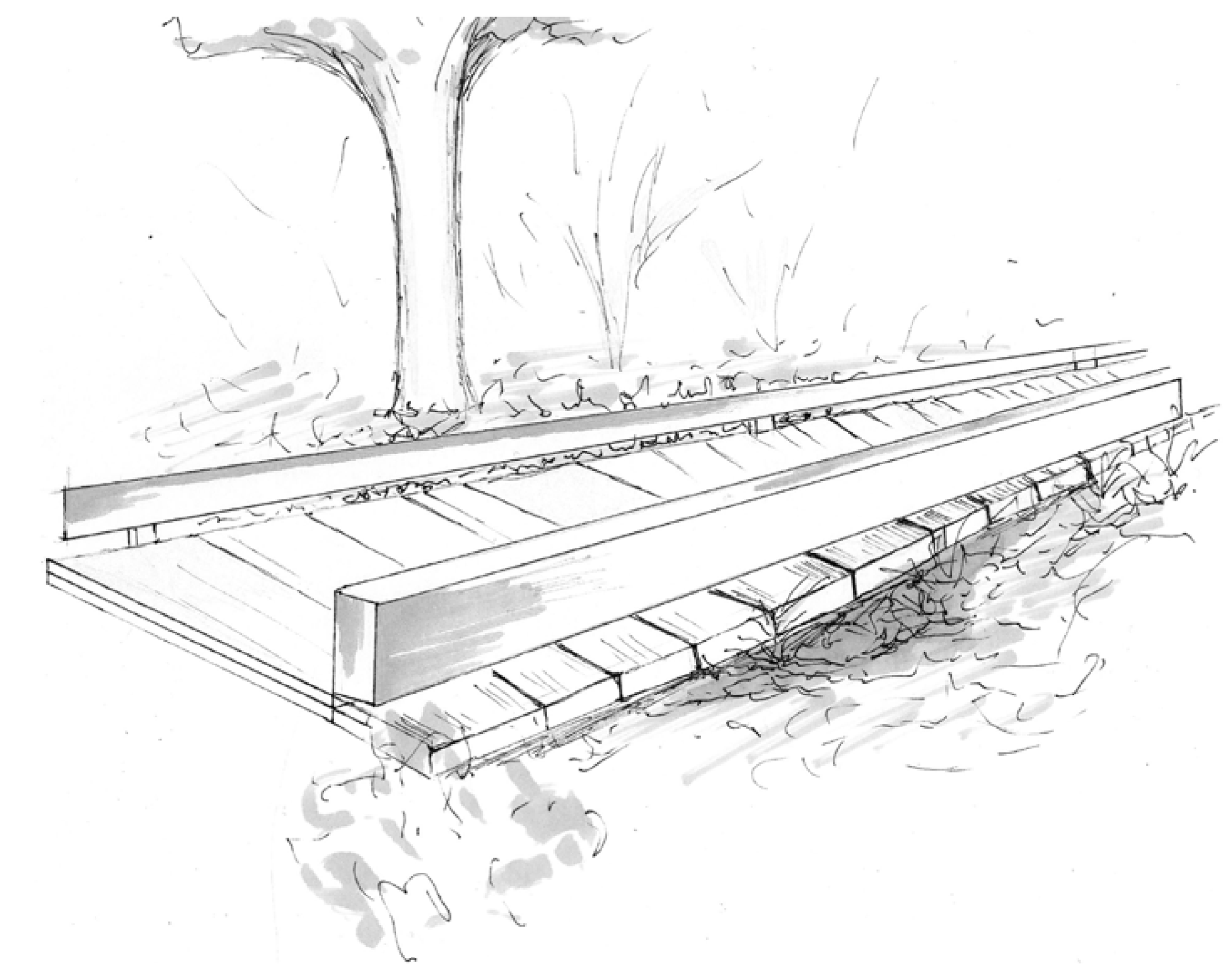
Detail Solutions: Bridging

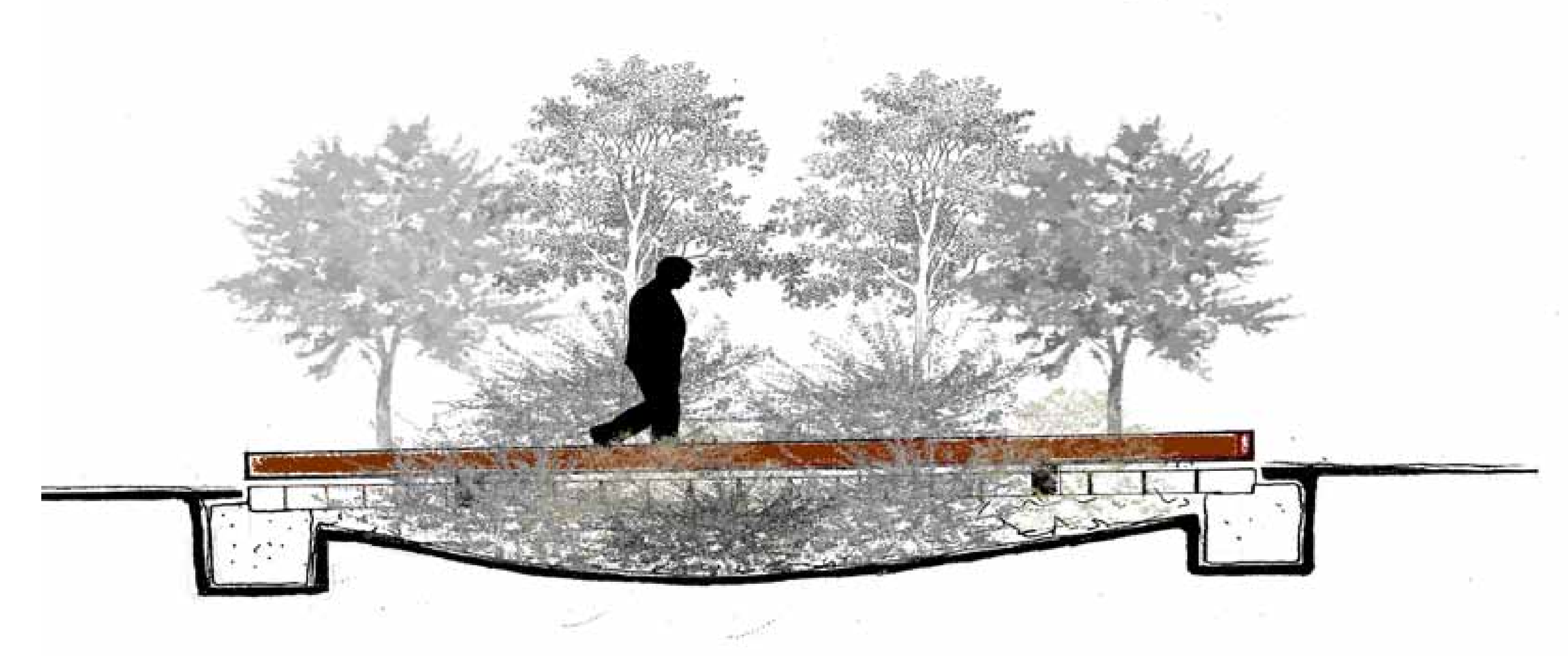


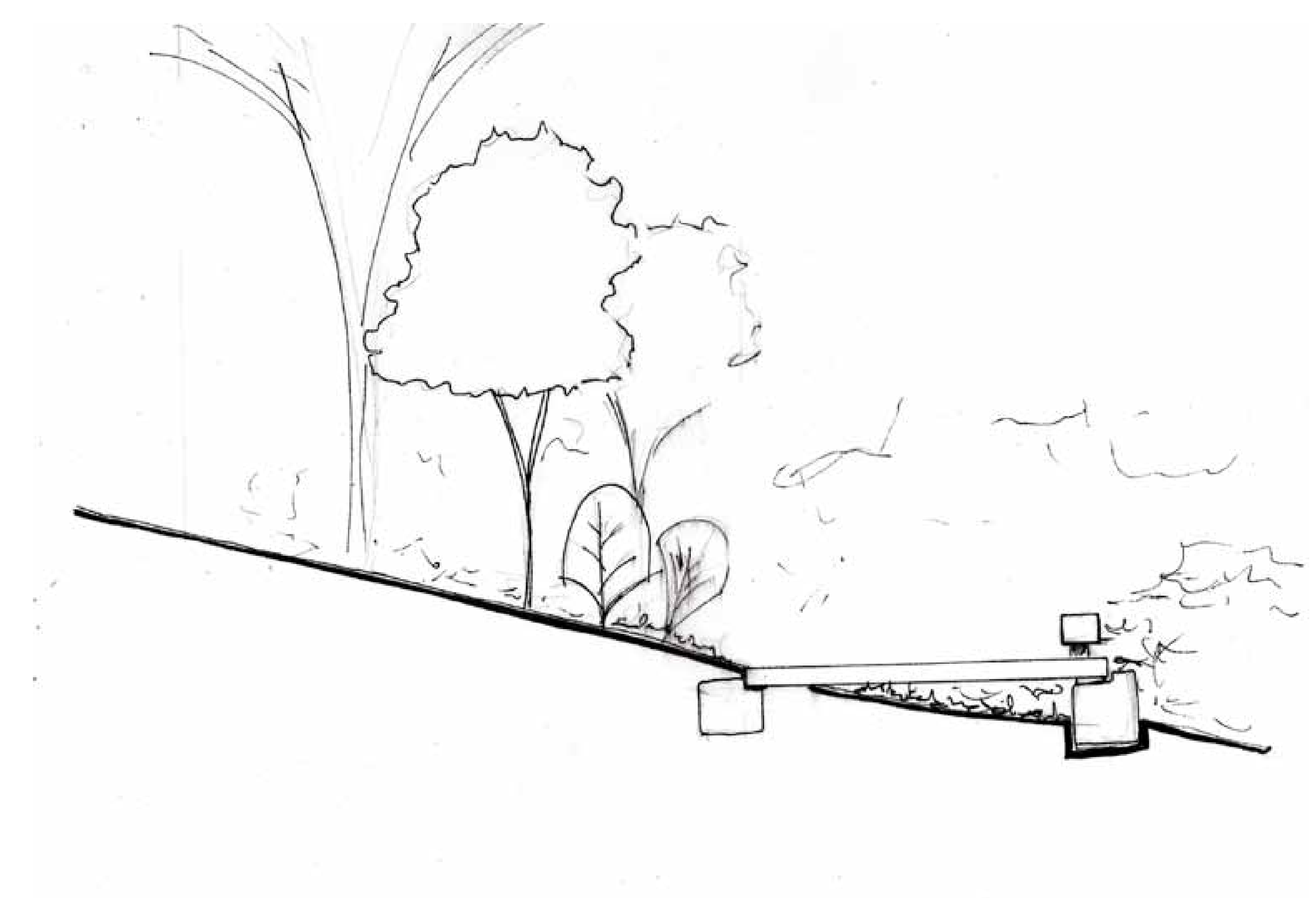


Wooden Foot Bridge with Railing: The railing is only on one side of the bridge for safety reasons. Its constructed over the ravine on a concrete block foundation for minimal installation.

Boardwalk with steel edging: This solution is a more minimal crossing structure for low drainage areas. Materials consist of wood and steels beams for rustic context







Erosion & Barrier Control on Trail

Rosa virginiana (Virginia Rose)

Cornus alba 'Elegantissma' (redtwig dogwood)

Forsythia x intermedia (Forsythia)

Ilex vomitoria (Yaupon holly)

http://www.britannica.com/EBchecked/media/116167/Virginia-rose

Virginia Tech Dendrology Department

http://www.my-photo-gallery.com/tag/yaupon-holly/

Culvert: Example of culvert as a solution to drainage problem in ravines. The path above the culvert would be built up with soil to stabilize a path. The culvert would be hidden within natural elements of vegetation and stone. The slopes runoff will be directed to a swale and then directed through a pipe into a rock edging.

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Detail Solutions: Parking

Rain Garden

Cornus sericea (redosier dogwood)

Forsythia xintermedia (border forsythia)

Betula Nigra (river birch)

Iris sp. (common iris)

Ilex glabra (Inkberry holly)

Echunacea pupurea (purple coneflower)

Rudbeckia hirta (black-eyed Susan)

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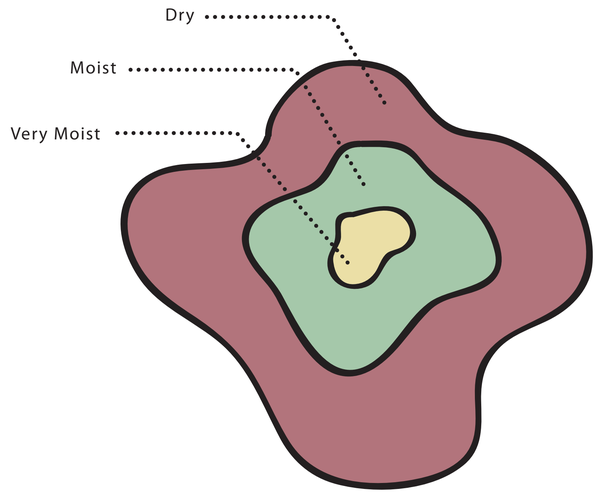
http://www.wholehealthhealing.com/?p=340

http://zhurnaly.com/cgi-bin/wiki/BlackEyedSusanBee

Rain Garden Diagram



Rain Garden: The garden will collect and filter runoff from the gravel parking lot and road before the water reaches the creek.

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This drawing is conceptual and was prepared to show approximate location and arrangement of site features. It is subject to change. Users should consult appropriate professionals before any work. The client should consult appropriate professionals before any construction or site work is undertaken. The Community Design Assistance Center is not responsible for the inappropriate use of this drawing.

Final Conceptual Master Plan

Sketch of timber stairs to be used on steep grades

The final conceptual master plan combines elements from both preliminary concepts to capture the character of the Redbud Run Conservation Area. The pristine Redbud Run trout stream that borders the 30 acre site provides a clear example of what conservation efforts can produce even in urbanized areas. The conservation and protection of the stream guided the efforts to produce a master plan that limits the human footprint, utilizes existing historical artifacts, and evokes the natural character of the site. Taking note of other conservation areas around the country, the Redbud Run Conservation Area Master Plan provides recreational and educational opportunities for the surrounding communities.

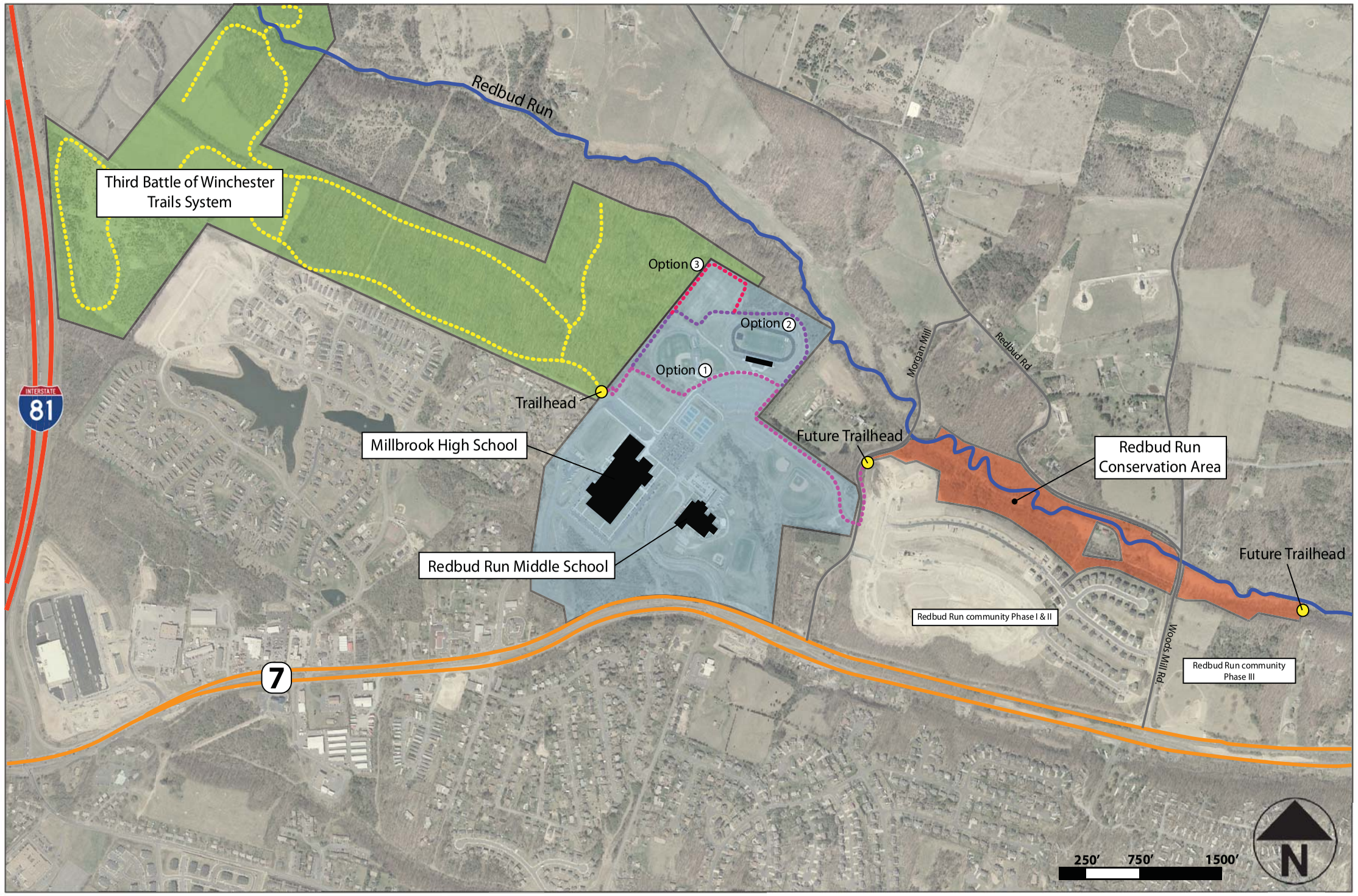
The master plan takes cues from the natural character of the site in its material choice. Site signage and kiosks are made from wooden materials to minimize visual impacts. Infrastructure pieces such as stairs, bridges, and seating areas are also constructed out of wood. Where possible, wood pieces should be salvaged and reused from the deteriorating corn crib, or from fallen trees on site. Wood can prove to be a less expensive alternative to other materials and references the character of the Redbud Run Conservation Area.

Along with conservation of the site's existing character, new infrastructure elements such as parking and driveways will be implemented with low impact development techniques. A new 21 space parking area on the east end of the property will be constructed of gravel and include a bio-retention and filtration garden buffering its border with Redbud Run. This bio-retention and filtration garden also mitigates negative water quality issues emanating from the first phase of the adjacent development just south of the site. Through bio-filtration, sedimentation, and plant uptake, the quality of water draining into Redbud Run will be greatly improved adding to the health of the stream and the trout within. Supplemental plant lists were also created to address issues around the site. These include streambank erosion, general site erosion, and native meadow grass replanting. See Appendix A for these lists.

The proposed trail system for the site combines ease of navigation with delineation of trail types depending on the experience and needs of the users. The trails provide bird watching opportunities and access for trout fishermen while offering ADA accessible paths to the stream edge for educational purposes. The trail system considers the local context by providing new access points for students from Millbrook High School and Redbud Run Elementary School. East of Woods Mill Road, a proposed trail spur from the parking lot offers access for a potential camping area and possible future trail connection to the east.

11x17 pullouts of the final conceptual master plan can be found on the following pages.

Local context & trail connections



Objectives:

- Provide connection to Millbrook High School and Redbud Run Middle School
- Provide connection to the Third Battle of Winchester Battlefield trail system
- Accomodate future trail connection opportunities and land acquisitions

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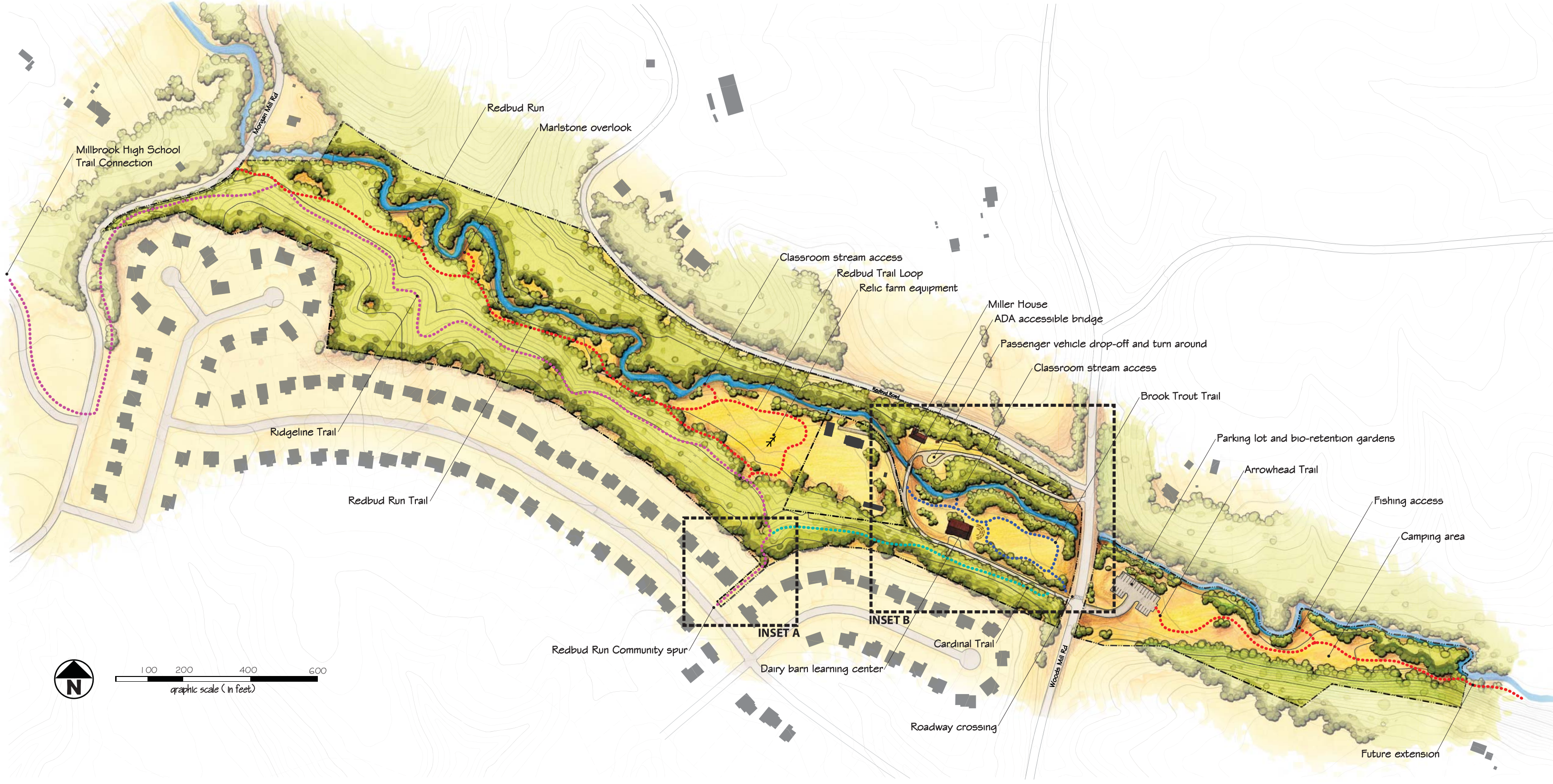

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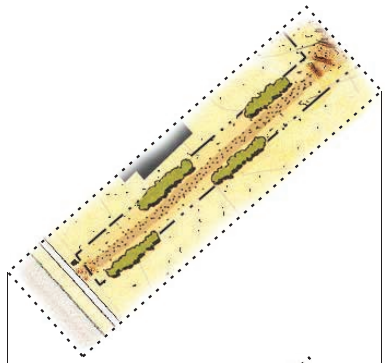
Master plan

Insets

Inset A

Community access

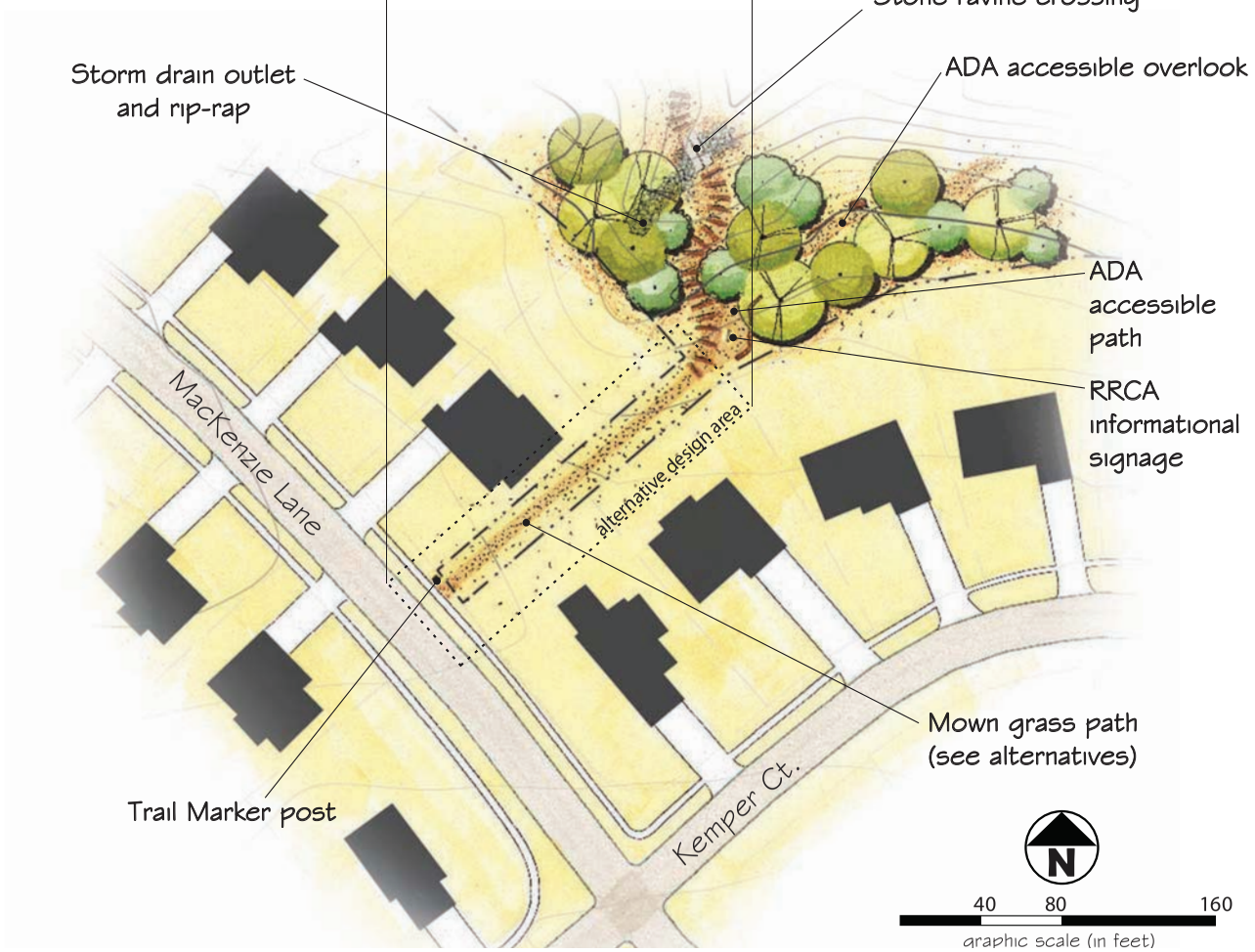


Alternative A

An alternating edge of low shrubs creates separation and governs walking route

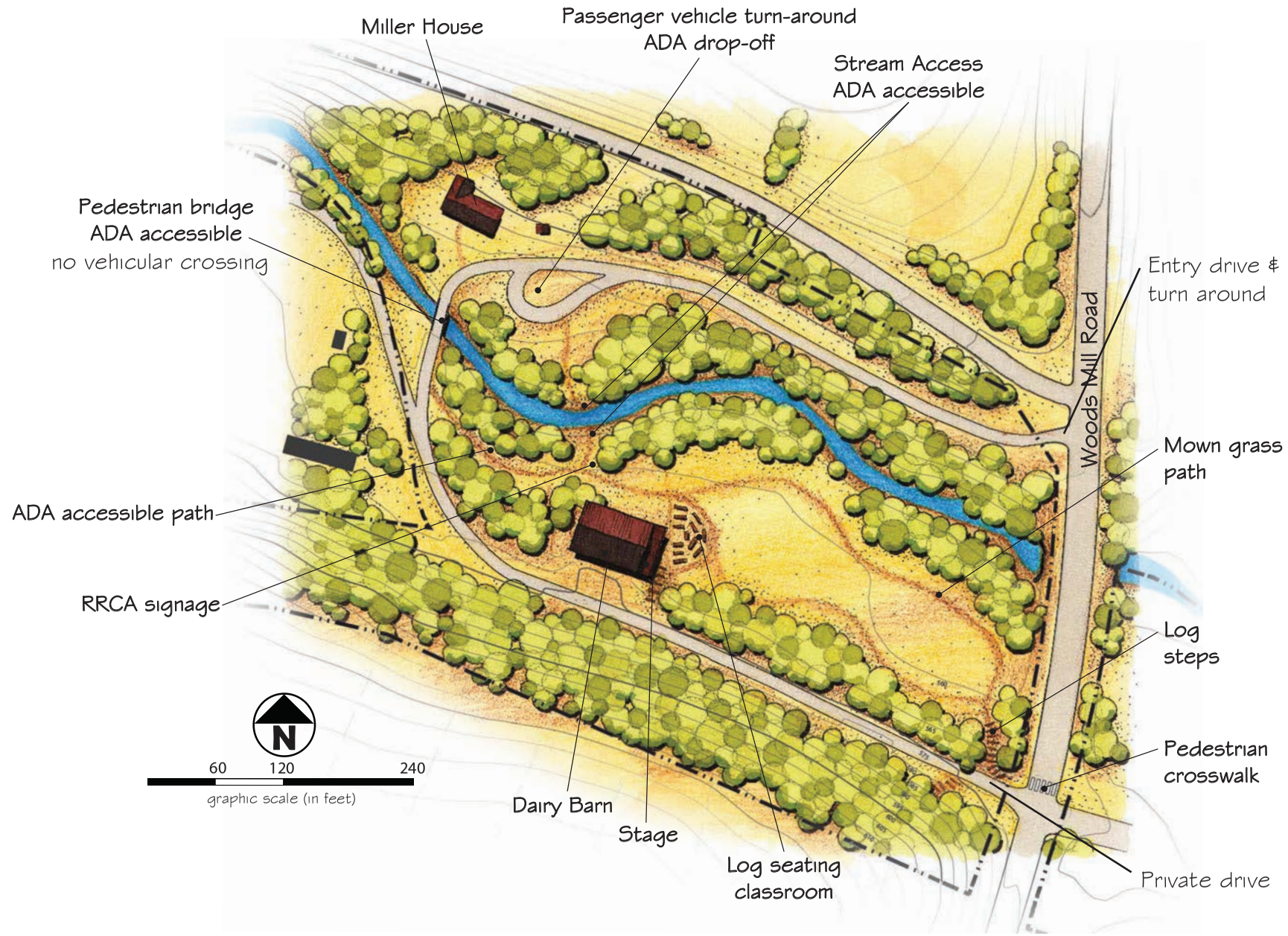
Alternative B

An alternating edge of trees creates separation and distinction of walking route



Inset B

Dairy Barn Learning Area



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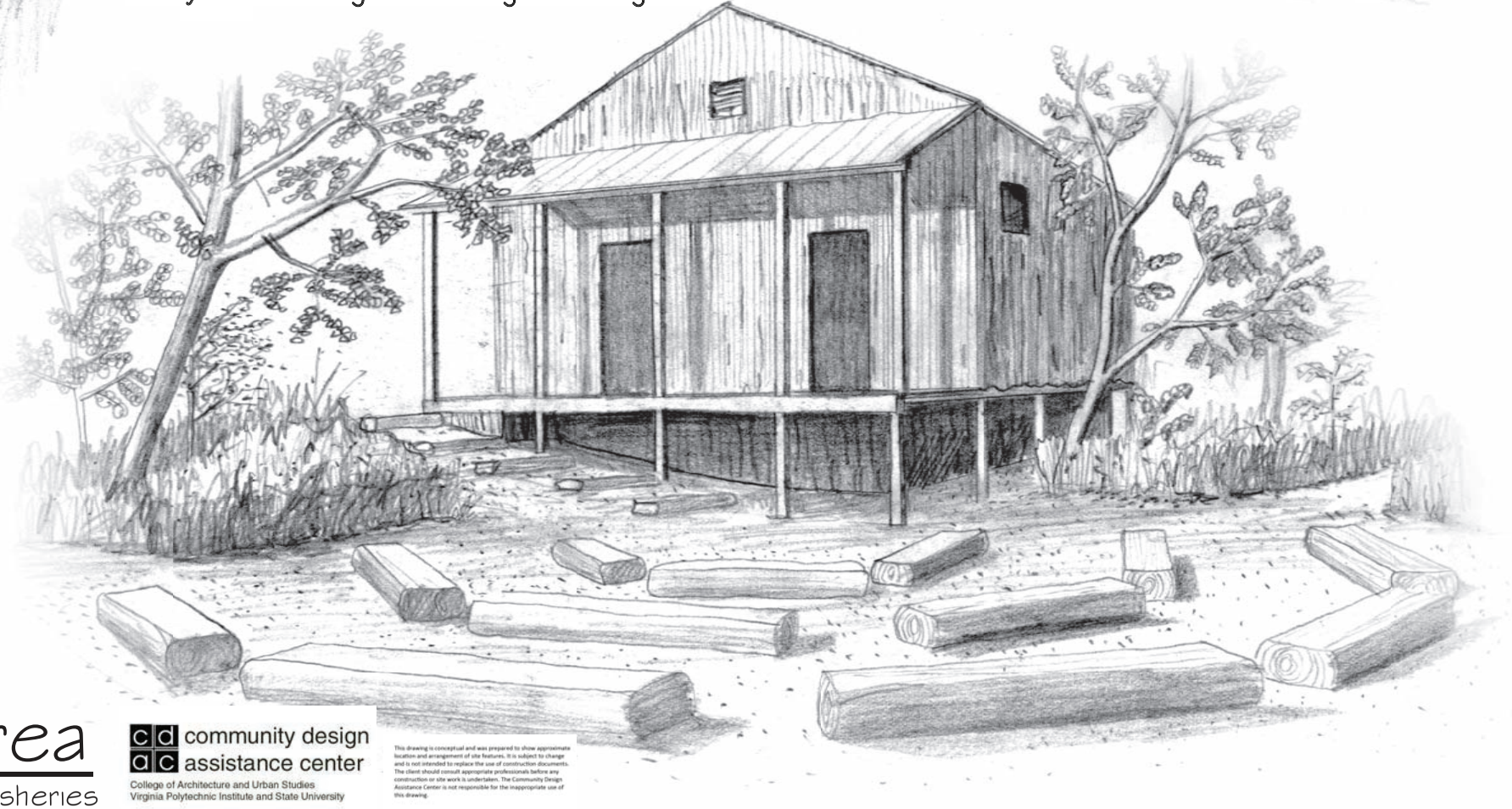
Master plan
sketches

Wooden stair access from Woods Mill Rd.

Wooden bridge over gulley

Dairy barn stage and log seating circle



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Trails network & signage

Trail Marker Post

Trail Marker Sign


RRCA Informational Kiosk

Redbud Run Trail
.8 miles

Morgan Mill Rd

Marlstone
Overlook

ection to
ook High
chool

Redbud Run Trail Loop
.2 miles

Passenger Vehicle Drop-off
ADA Accessible

Brook Trout Trail
.15 miles

Ridgeline Trail
.7 miles

Marked Trail Access from
Parking Lot

Arrowhead Trail
.4 miles

Cardinal Overlook
ADA Accessible

Redbud Run Phase I & II
Community Connection

Cardinal Trail
.15 miles

Woods Mill Rd

Redbud Run Phase III
Future Community
Connection

Future Trail
Extension

N

100 200 400 500
graphic scale (in feet)

KEY
- River access points
- Overlook
- Trail marker posts or signs
- RRCA Informational Signage Kiosk

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Master plan

Trail Types

Adapted from VA Department of Conservation & Recreation "Greenways &Trails Toolbox" (2011)

Birding & Hiking Trail

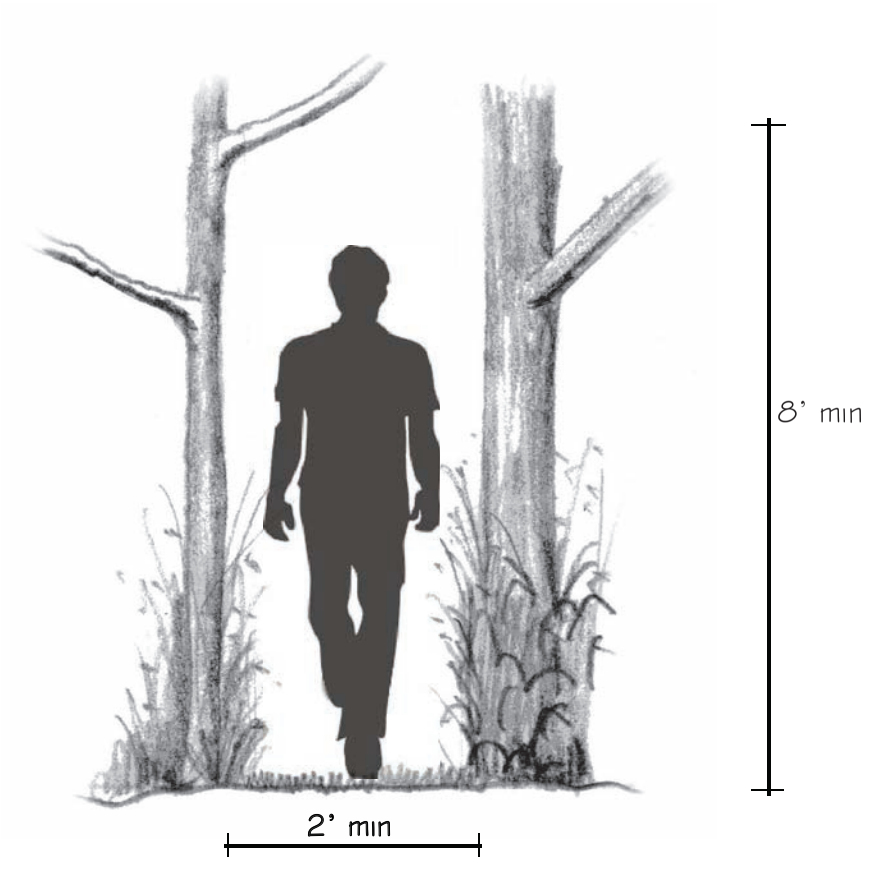
Trail Surfaces
- Natural soil and stabilized soil
- Wood chips and VDOT #21A or larger crushed stone in areas with heavy traffic and/or drainage problems

Trail Grades
- Running grade: 8-10%, not to exceed 15%
- Minimum running grade: 1%
- Cross-slope: min. 1% and max. 5%
- Accessible running grade: max. 5%
- Accessible cross-slopes: max. 5%

Trail Tread Width
- 2 feet wide in rustic settings
- 5 feet wide in heavily-trafficked areas

Vertical Clearance
- 8 feet from trail surface

Horizontal Clearance
- 2-foot shoulders on each side of tread



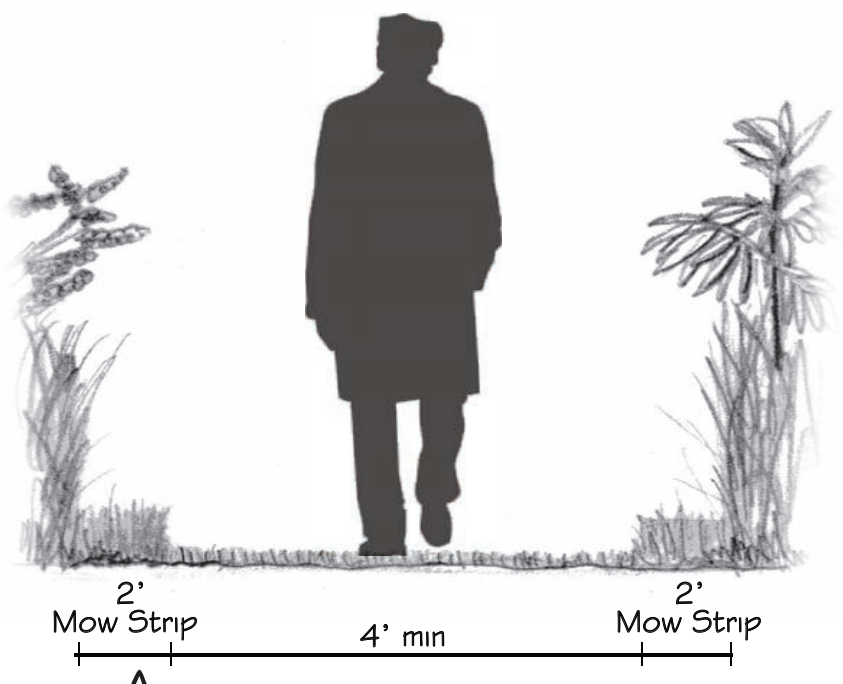
Mowed Trail

Trail Surfaces
- Natural soil and mown grass
- Wood chips and VDOT #21A or larger crushed stone in areas with heavy traffic and/or drainage problems

Trail Grades
- Running grade: 8-10%, not to exceed 15%
- Minimum running grade: 1%
- Cross-slope: min. 1% and max. 5%
- Accessible running grade: max. 5%
- Accessible cross-slopes: max. 5%

Trail Tread Width
- 4 feet wide in rustic settings
- 5 feet wide in heavily-trafficked areas

Vertical Clearance
- 8 feet from trail surface



Paved / Loose Paved Trail

Path Surfaces
- Asphalt, Prime and Double Seal, Aggregate/
- Crushed Stone (VDOT #21A), Concrete

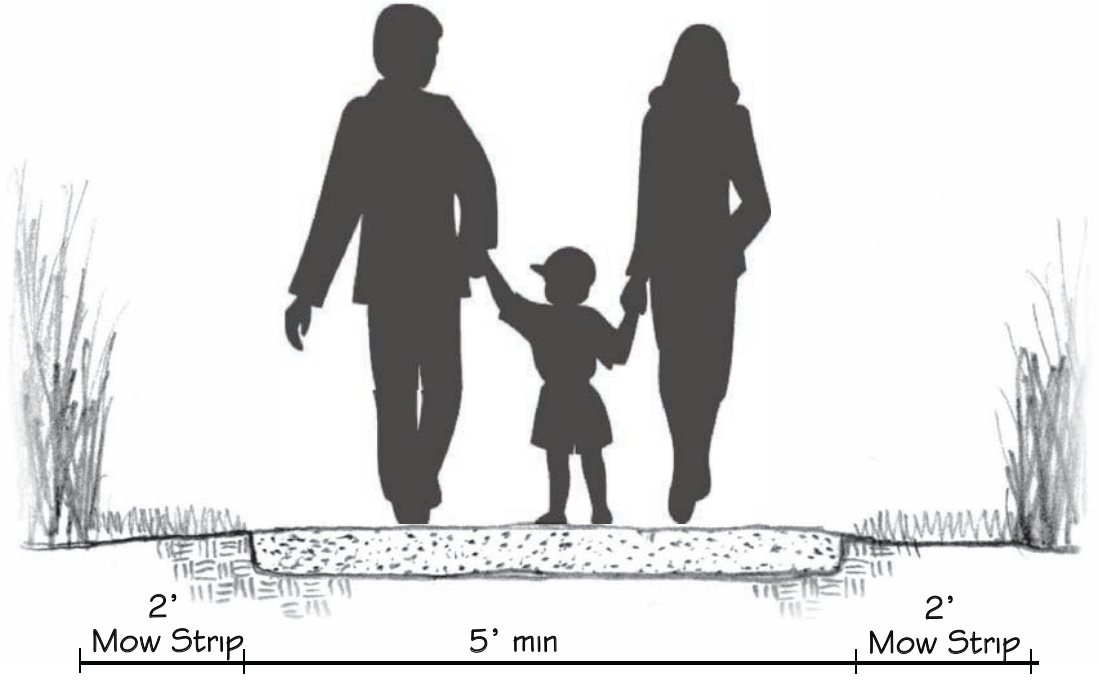
Path Construction
- Excavated to subgrade flush with surrounding ground or perched on exisitng soil

Path Grades
- Ideal running grade: 2-3%
- Ideal Minimum running grade: 1%
- Ideal Maximum running grade: 5%
- Cross-slope: min. 1% and max. 2% on asphalt, concrete, and boards; 3% max. on other surfaces

Path Tread Width
- 5 feet minimum, 8' - 10' recommended

Vertical Clearance
- 8 feet from trail surface

Horizontal Clearance
- 2-foot shoulders on each side of tread



Redbud Run Conservation Area

Concept Plan : Prepared for Virginia Department of Game and Inland Fisheries

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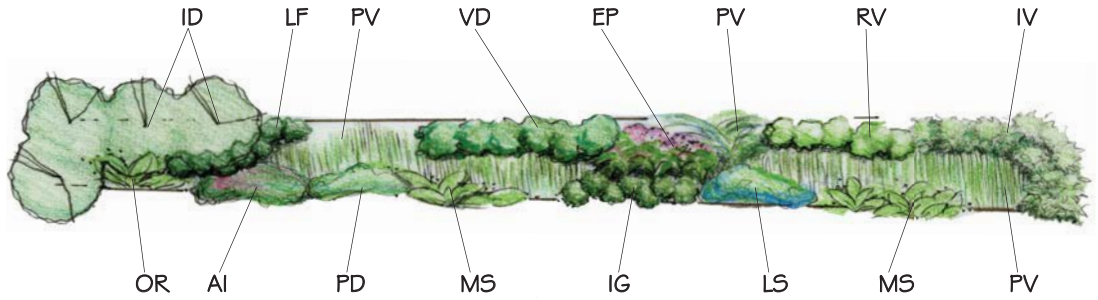
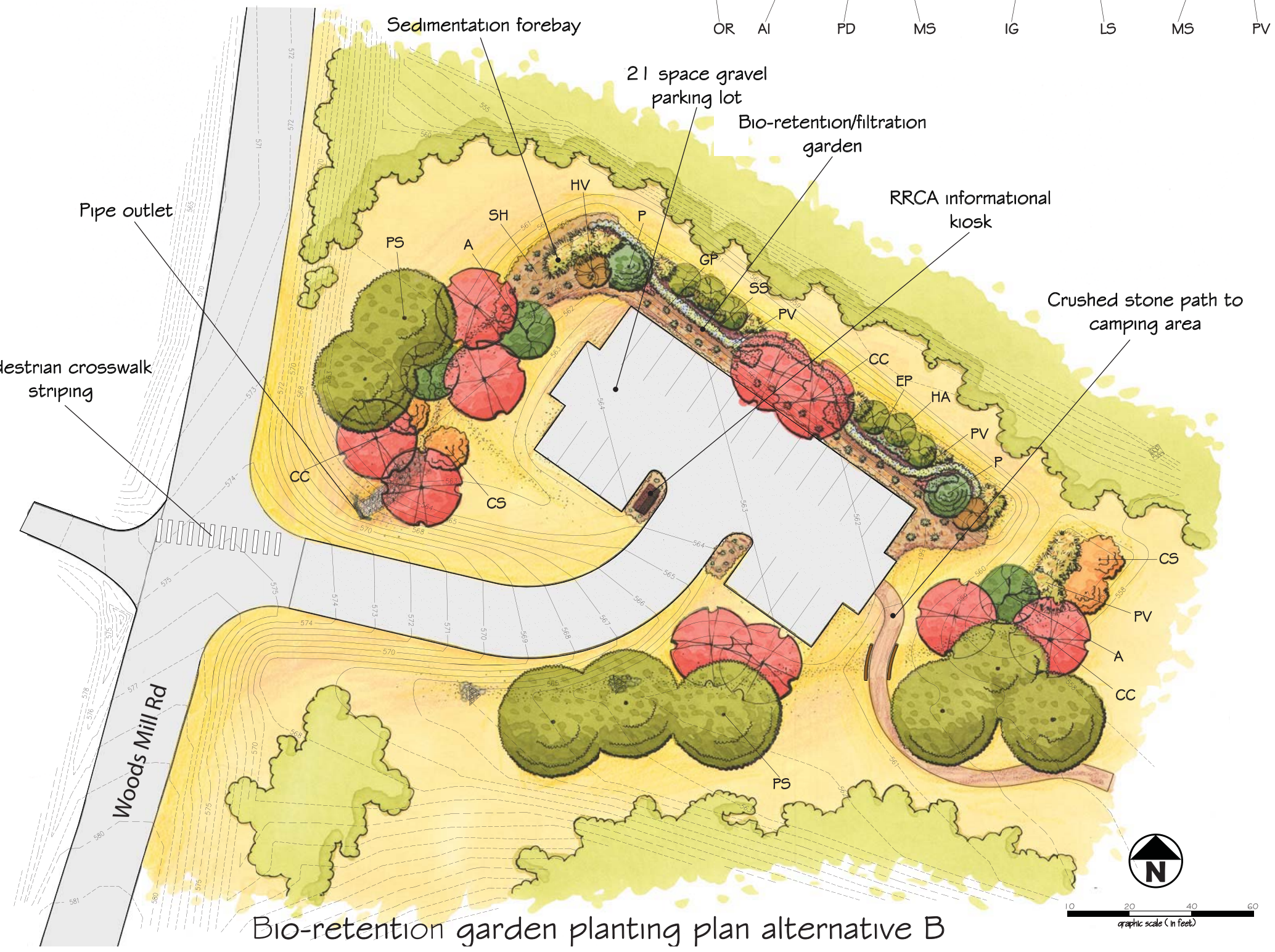
Virginia Polytechnic Institute and State University

Master plan
parking lot planting plan

Bio-retention garden planting plan alternative A





Bio-retention garden planting plan alternative B

Alternative A

Annuals/Perrenials		
Swamp milkweed	*Asclepias incarnata*	AI
Great blue lobelia	*Lobelia siphilitica*	LS
Woodland phlox	*Phlox divaricata*	PD
Virginia sweetspire	*Itea virginica*	IV
Joe-pye weed	*Eupatorium purpureum*	EP
Grasses/Ferns		
Ostrich fern	*Matteuccia struthiopteris*	MS
Switch grass	*Panicum virgatum "Cloud 9"*	PV
Royal fern	*Osmunda regalis*	OR
Shrubs/Trees		
Drooping leucothoe	*Leucothue fontanesiana*	LF
Possumhaw	*Ilex decidua*	ID
Swamp azalea	*Rhododendron viscosum*	RV
Inkberry holly	*Ilex glabra*	IG
Arrow-wood	*Viburnum dentatum*	VD

Alternative B

Annuals/Perrenials		
Joe-pye weed	*Eupatorium purpureum*	EP
Firewheel	*Gaillardia pulchella*	GP
Coneflower	*Echinacea purpurea*	EP2
Black-eyed susan	*Rudbeckia hirta*	RH
Virginia sweetspire	*Itea virginica*	IV
Grasses/Ferns		
Switch grass	*Panicum virgatum*	PV
Little bluestem	*Schizachyrium scoparium*	SS
Indian grass	*Sorghastrum nutans*	SN
Prairie dropseed	*Sporobolus heterolepis*	SH
Shrubs/Trees		
Serviceberry	*Amelanchier sp.*	A
Redbud	*Cercis canadensis*	CC
Red-osier dogwood	*Cercis sericea*	CS
Silky dogwood	*Cornus amomum*	CA
Witch hazel	*Hamamelis virginiana*	HV
Hibiscus	*Hibiscus aculeatus*	HA
White pine	*Pinus strobus*	PS
Ilex decidua	*Possumhaw*	P

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Conclusion

The Virginia Department of Game and Inland Fisheries offered a unique opportunity to conserve a lightly disturbed natural area in just outside of Winchester along a beautiful stretch of Redbud Run. The Redbud Run Conservation Area conceptual master plan brings together the visions of multiple stakeholders to create an educational and recreational amenity for area residents. A rich local history combined with a class III wild trout stream provided a great foundation for the CDAC design team to build upon. Professional collaboration along with information from local experts informed the majority of the sites features and ensured a more complete vision for the future of the Redbud Run Conservation Area.

Appendix: Supplemental Plan Lists

Areas:

Streambank erosion control plant list

Streambank erosion is an issue in many urban watersheds. Higher volumes of water flowing at faster rates combined with riparian vegetation loss are damaging our local streams. The list of species of plants below have been shown to help combat erosion by helping to fortify the banks of urban streams.

Streambank erosion control plant list	
Annuals/Perennials	
Swamp milkweed	*Asclepias incarnata*
Marsh marigold	*Caltha palustris*
Flat-top white aster	*Doellingeria umbellata (Aster umbellatus)*
Joe-pye weed	*Eupatorium dubius*
*Blue vervain	*Verbena hastate*
*New York ironweed	*Vernonia noveboracensis*
Grasses / Groundcovers	
Autumn bentgrass	*Agrostis perennans*
Broomsedge bluestem	*Andropogon virginicus*
Bluejoint	*Calamagrostis canadensis*
Partridge pea	*Chamaecrista fasciculata*
Switchgrass	*Panicum virgatum*
Woolgrass	*Scirpus cyperinus*
Great bulrush	*Scirpus lacustris*
Shrubs/Trees	
Red maple	*Acer rubrum*
Canada serviceberry	*Amelanchier canadensis*
Black chokeberry	*Aronia melanocarpa*
Ironwood	*Carpinus caroliniana*
Silky dogwood	*Cornus amomum*
Winterberry	*Ilex verticillata*
Sycamore	*Platanus occidentalis*
Pussywillow	*Salix discolor*
Black willow	*Salix nigra*
Common elderberry	*Sambucus canadensis*
American basswood	*Tilia americana*

General erosion control plant list

Erosion due to development is a major water quality and land loss issue. Where other development threatens to cause topsoil erosion for downstream or adjacent lands, these plants can help to mitigate soil loss in a variety of areas on the site.

General erosion control plant list	
Groundcovers/Grasses	
Wild ginger	*Asarum canadense*
Pennsylvania sedge	*Carex pensylvanica*
Poverty oatgrass	*Danthonia spicata*
Evergreen wood-fern	*Dryopteris intermedia*
Bottlebrush grass	*Elymus hystrix*
Shrubs	
Sweetfern	*Comptonia peregrina*
Smooth hydrangea	*Hydrangea arborescens*
Mountain laurel	*Kalmia latifolia*
Great rhododendron	*Rhododendron maximum*
Rose azalea	*Rhododendron prinophyllum*
Highbush blueberry	*Vaccinium corymbosum*
Blackhaw viburnum	*Viburnum prunifolium*
Trees	
Red maple	*Acer rubrum*
Serviceberry	*Amalanchier sp.*
Pignut Hickory	*Carya glabra*
Redbud	*Cerecis canadensis*
Persimmon	*Diospyros virginiana*
Beech	*Fagus grandifolia*
Witchazel	*Hamamelis virginiana*
White pine	*Pinus strobus*
Chestnut oak	*Quercus montana*
Black oak	*Quercus velutina*
Sassafras	*Sassafras albidum*

Meadow replacement plant list

Native meadows are declining in number all around the country. The species associated with these beautiful ecosystems are becoming less prevalent. This plant list below provides planting suggestions to include many of those species native to northern Virginia and the piedmont region.

Meadow Plant lists	
Grasses	
Big bluestem	*Andropogon gerardii*
Bushy bluestem	*Andropogon glomeratus*
Broomsedge	*Andropogon virginicus*
Bluejoint reedgrass	*Calamagrostis Canadensis*
Silky oatgrass	*Danthonia cericea*
Poverty oatgrass	*Danthonia spicata*
Variable panicgrass	*Dichanthelium commutatum*
Bottlebrush grass	*Elymus hystrix*
Virginia wild rye	*Elymus virginicus*
Red fescue	*Festuca rubra*
Little bluestem	*Schizachyrium scoparium*
Indian grass	*Sorghastrum nutans*
Gama grass	*Tripsacum dactyloides*
Wildflowers	
Field pussytoes	*Atennaria neglecta*
Butterfly weed	*Asclepias tuberosa*
Smooth aster	*Aster laevis*
New England aster	*Aster novae-angliae*
Yellow wild-indigo	*Baptisia tinctoria*
Threadleaf coreopsis	*Coreopsis verticilata*
Mistflower	*Conoclinum coelestinum*
Spiked blazing star	*Liatris spicata*
Wild bergamot	*Monarda fistulosa*
Sundrops	*Oenothera fruticosa*
Narrow-leaved mountain mint	*Pycnanthemum tenuifolium*
Early coneflower	*Rudbeckia fulgida*
Rough-stemmed goldenrod	*Solidago rugosa*