

COHABITATION



A more connected and accessible network of paths with a diversity of habitats and spaces for both humans and wildlife.

Pros:

- Universally accessible permeable pavement
- Diverse seating areas
- Preserves river views
- Centrally located facilities

Cons:

- Expensive installation
- Permitting
- Long-term maintenance

PRELIMINARY DESIGN CONCEPTS RESOURCEFUL RESILIENCE



Maximize local resources to protect riparian zones, create gathering places, demonstrate the aesthetics of native plants, and increase education opportunities.

Pros:

- Repurposes site materials
- Electricity generation
- Riverfront restoration
- Improved lines of site

Cons:

- Invasive species management may require chemical application
- Reduced views of river
- Reduction of open space for events

EDUCATION FOR ALL



Create innovative educational opportunities with a sustainable focus without compromising key features of the park.

Pros:

- Increases educational components for students
- Gathering areas with shaded seating are moved to be more visible
- Unwanted views are buffered with shrubs and trellises
- Least cost and maintenance intensive

Cons:

- No additions or changes to existing garden beds
- Could deter visitors who do not go to the park for education

Not for construction. Part of a student project and not based on a legal survey.

PRELIMINARY DESIGN CONCEPTS

A MASTER PLAN FOR ASHUELOT RIVER PARK
FOR THE CITY OF KEENE, NEW HAMPSHIRE

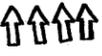
DESIGNED BY: KATHERINE HOLDER, SAMANTHA
PEIKES AND AMANDA SMITH

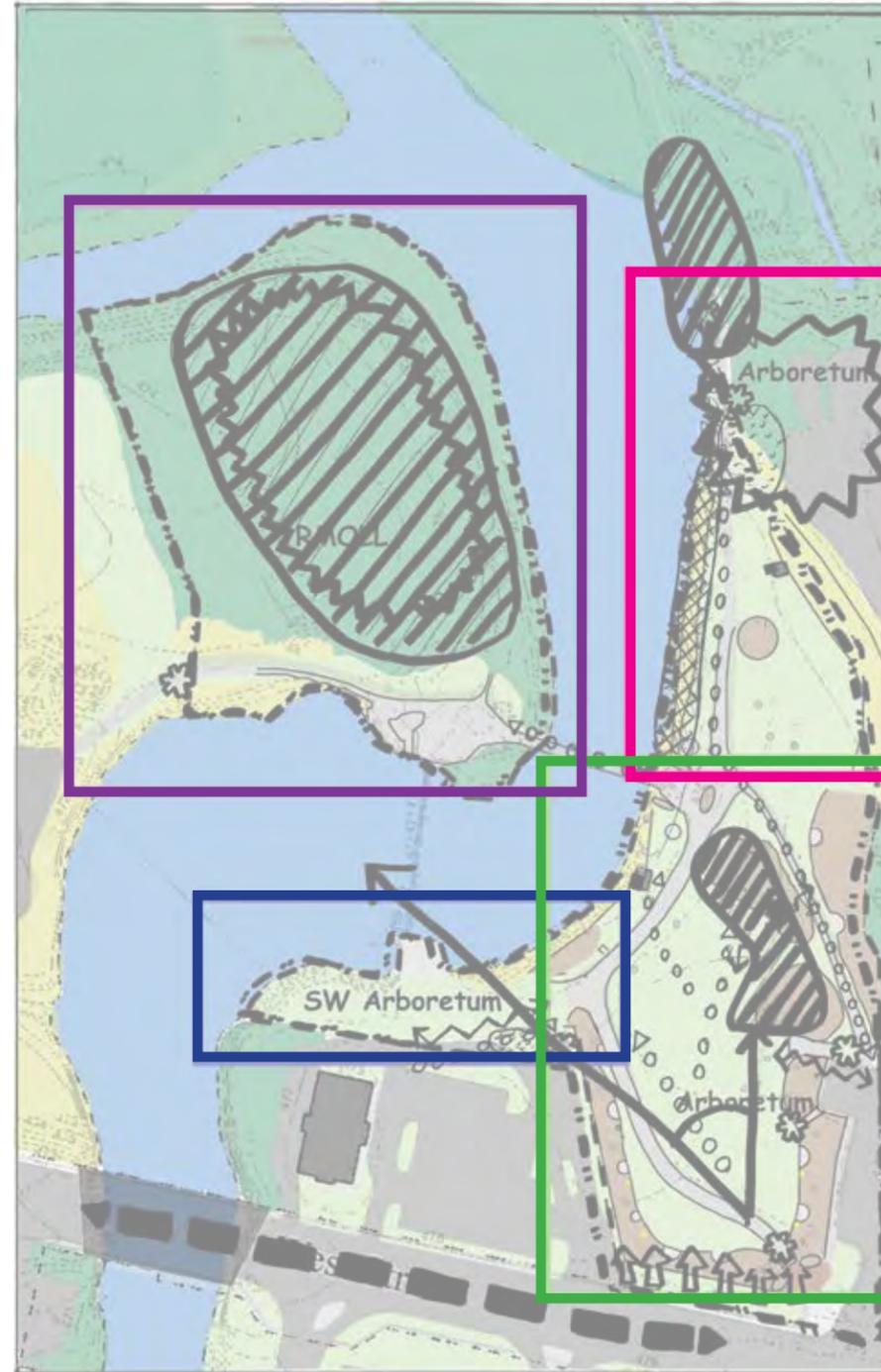
SPRING, 2020

Graduate Program in Sustainable
Landscape Planning • Design
the Conway School
88 Village Hill Rd. Northampton, MA 01060
413-369-4044
www.csid.edu

SCHEMATIC DESIGN

This schematic design presents the characteristics, challenges, and design criteria associated with different areas, or zones, within the Arboretum and Rachel Marshall Outdoor Learning Laboratory. The different zones shown here include the Main Arboretum, North Arboretum, Southwest Arboretum, and Rachel Marshall Outdoor Learning Laboratory. The design proposals on the following pages seek to create a cohesive experience for visitors to these spaces, while also celebrating the park's unique assets. All design explorations increase educational signage, tree and garden bed labels, and improve access in both the Arboretum and RMOLL.

-  = LOW VISIBILITY AREA
-  = FLOODABLE
-  = WET AREA
-  = PEDESTRIAN TRAFFIC
-  = VEHICLE TRAFFIC
-  = NOISE
-  = VIEWS IN
-  = LOW ACCESSIBILITY AREA
-  = ENTRANCE POINT
-  = BANK STABILIZATION



- Rachel Marshall Outdoor Learning Laboratory Criteria:**
- Increase educational signs.
 - Improve accessibility and safety along the trail.
 - Increase shade and seating options on the platform north of the dam. Any structures in these areas will likely need permitting.

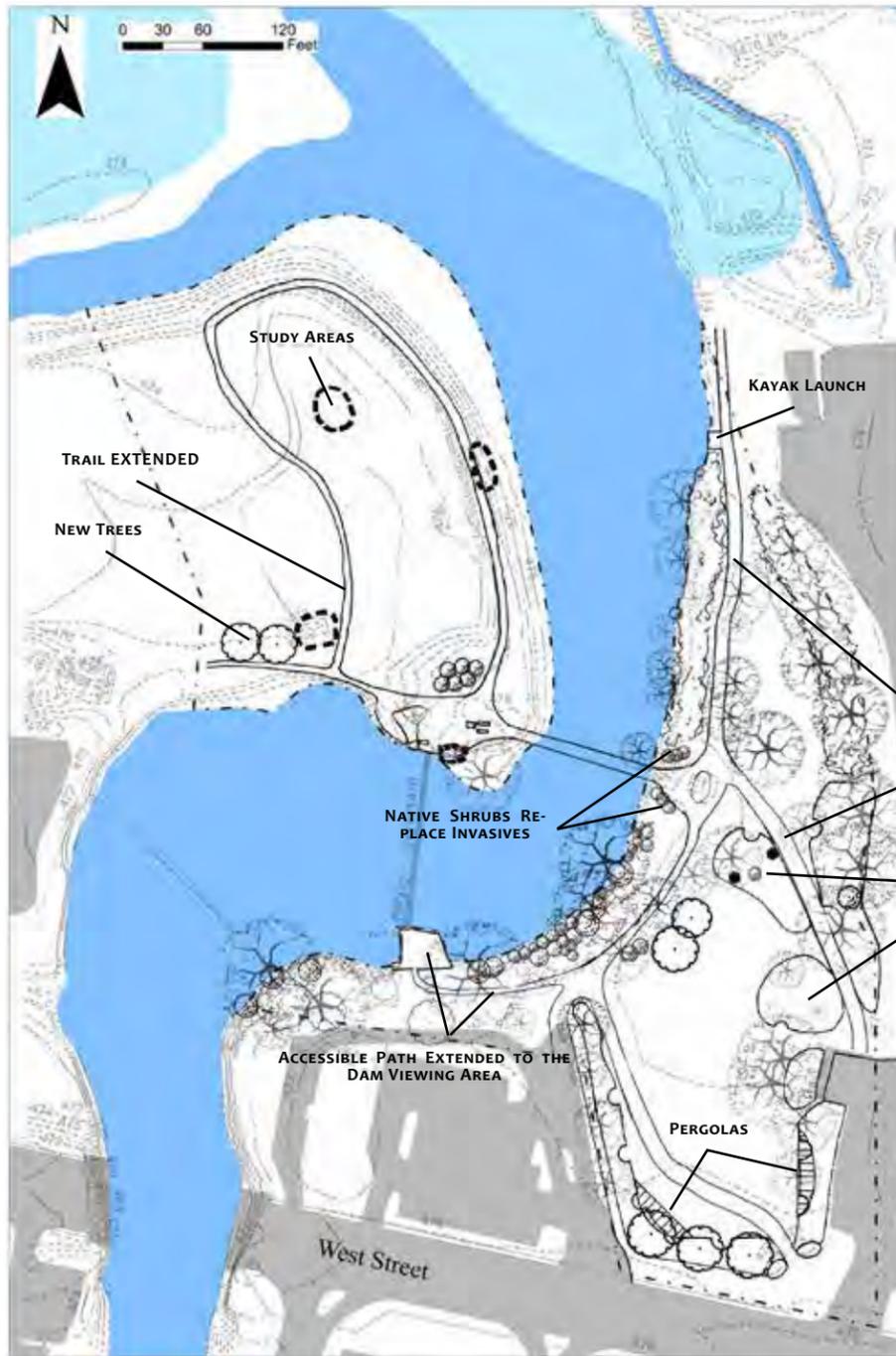
- North Arboretum Criteria:**
- Mitigate areas of compaction and erosion.
 - Improve lines of sight.
 - Explore ways to integrate the park with the adjacent parking lot which will eventually be transformed into a public green space.
 - Explore methods for bank stabilization.

- Main Arboretum Criteria**
- Increase shaded and sheltered seating areas that are accessible to all and do not block lines of sight.
 - Enhance garden beds in the front by increasing native plant communities, increasing plant diversity (color, size, texture, etc.), and replacing trees that are in fair or poor condition and threatened by climate change.
 - Add vegetation to create a greater sense of separation between the park and West Street.
 - Remove conifers that interfere with lines of sight into the park to improve safety.
 - Consider removing the old gazebo.
 - Create an ADA accessible path from the accessible parking lot.

- Southwest Arboretum Criteria**
- Create an accessible entrance point and trail from Starbucks to the park.
 - Manage pooling water north of the Starbucks parking lot.
 - Limit structures and use within the 50-foot buffer zone to minimize degradation of the riverbank.
 - Add vegetation to create comfort and shade

FINAL DESIGNS

LEAST INTENSIVE OPTION



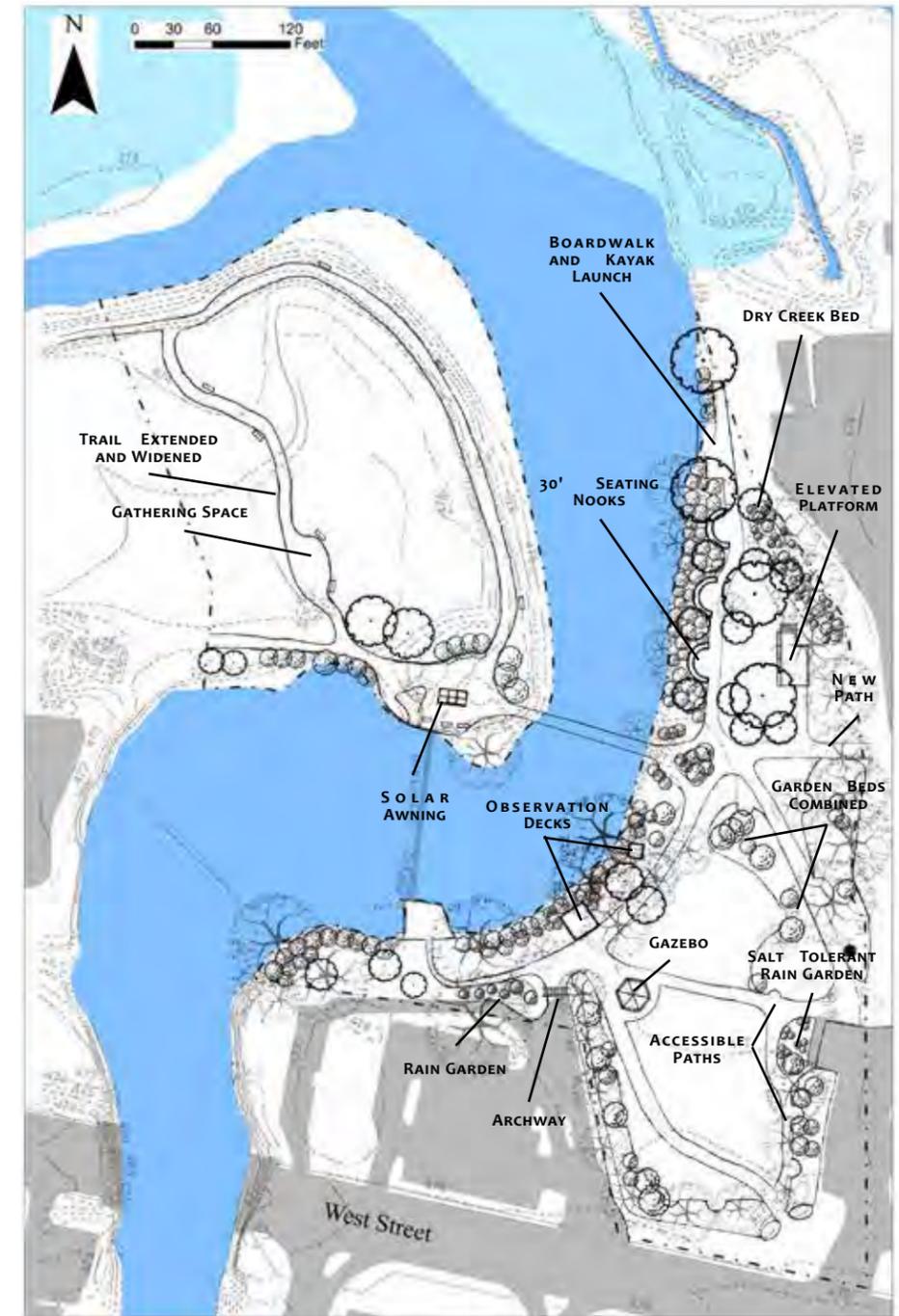
Due to its ecological context and history, portions of the Ashuelot River Park are vulnerable to flooding, particularly the northern portion of the Arboretum and the RMOLL. As climate change escalates, the flooding in the park will become worse and more frequent. Instead of trying to prevent flooding in the park, both of these designs employ strategies that will allow park features to withstand flooding, such as increasing vegetation along the riverbanks to stabilize the bank, building elevated structures that remain accessible during flood events, and infiltrating runoff with green infrastructure, such as swales, rain gardens, and dry creek beds. Educational features, such as interactive informative maps and signs, encourage visitors to learn about floodable park features, green infrastructure and native plants.

CONIFERS REMOVED AND LOW HEIGHT PLANTS ADDED

This option increases comfort, accessibility, and lines of sight in the park, while enhancing overall ecosystem services. Much of the vegetation and garden bed additions could be maintained by volunteers or students, which would ensure less money spent on maintenance and upkeep.

Main Features: Shaded pergola seating nooks are added in the front portion of the Arboretum to allow visitors to admire the garden beds from a comfortable place. The gazebo is removed and the conifer bed is replaced with a low height perennial pollinator garden to open up lines of sight. The two large trees across from the accessible parking lot have been removed to improve access into the park. In the southwest portion of the Arboretum, a path connects from the Starbucks entrance to the main trail hub and a rain garden is added to infiltrate pooling water. In the kayak launch area, coconut coir logs are added to stabilize the riverbanks. Native grasses and wildflowers are planted along the riverbanks extending south from the kayak launch area to the pedestrian bridge. A no mow ground cover replaces some of the lawn areas in the areas in the park. In the Rachel Marshall Outdoor Learning Laboratory, the footpath is extended to create a trail loop, vegetation is limbed up to increase visibility and designated research areas for students are marked.

MOST INTENSIVE OPTION



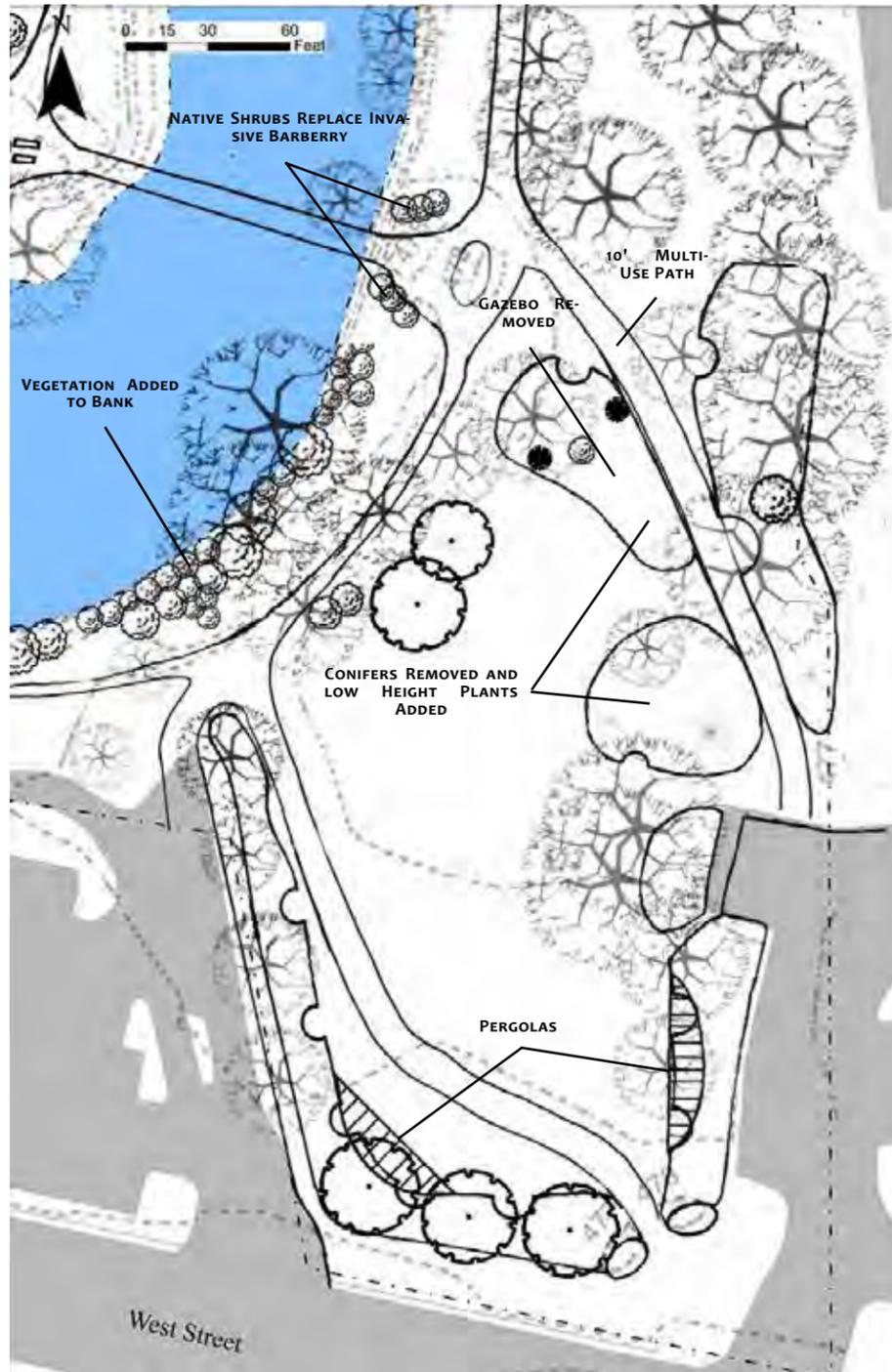
Improvement and enhancement of distinctive resources and features of the Arboretum and RMOLL is achieved through more intensive planting and the addition of structures. Both volunteers and master gardeners would most likely be needed to maintain the new features.

Main Features: Ground cover, perennials, and shrubs have been added to the garden beds to increase planting diversity. A gazebo has been added along the intersection of the new east-west accessible path and the original north-south path. The entrance from Starbucks has been enhanced with both the new path and the arch and vine trellises to entice visitors. A viewing platform has been added to replace the maintenance shed and provide a location for visitors to enjoy views of the river. In the northern arboretum, an elevated platform, with stumps for children to play on has been added along with a large deck for the kayak launch area. These platforms concentrate human activity to a few locations along the riverbank leaving large stretches of the riverbank in-between are densely vegetated to prevent erosion. The trail along the Rachel Marshall Outdoor Learning Laboratory has been widened and a solar awning has been added to the seating area across from the dam.

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MAIN ARBORETUM DESIGNS

LEAST INTENSIVE OPTION



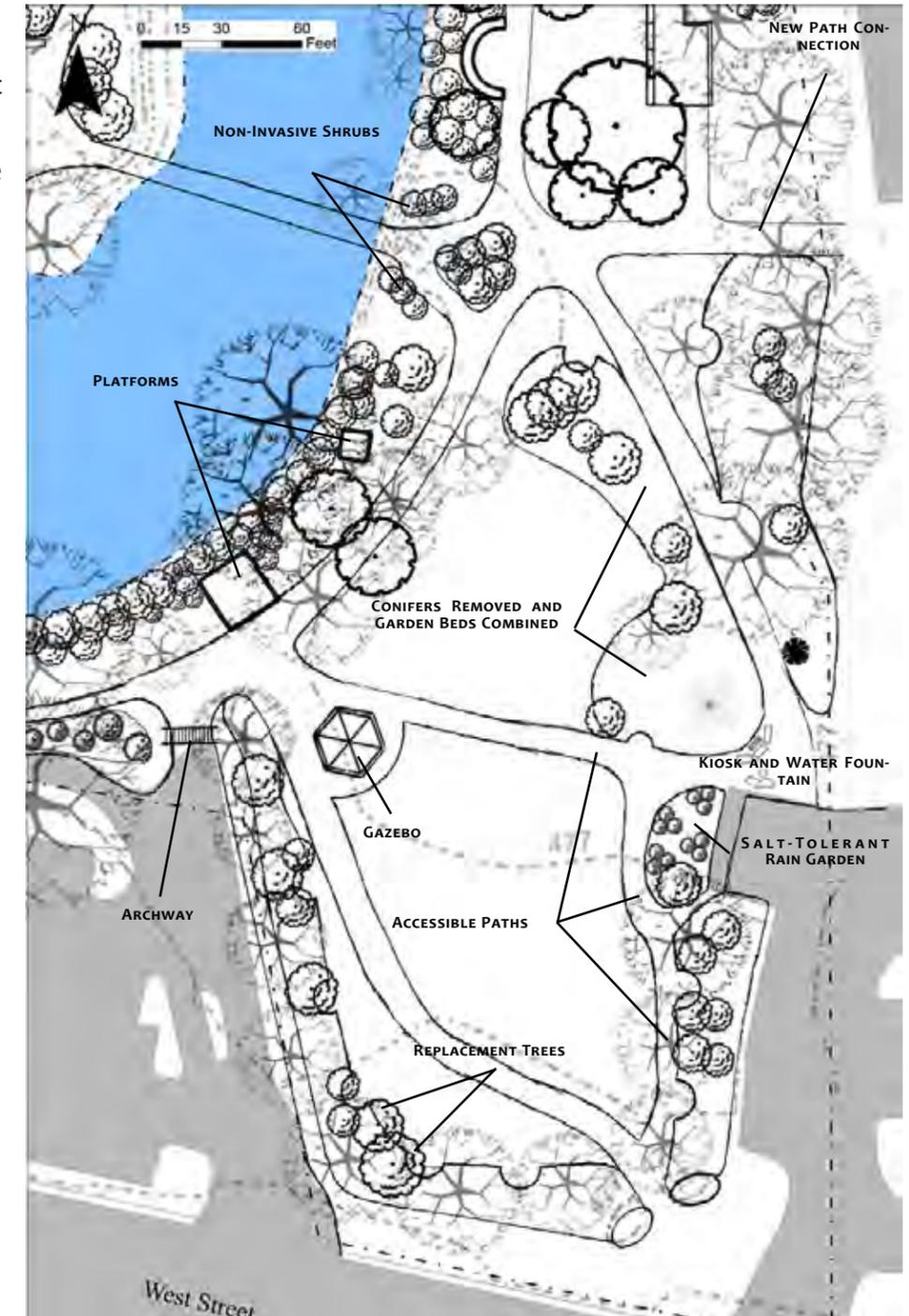
Pergola seating areas in the front add shade and comfort, without blocking views into the park. Trees in the conifer bed are limbed up, transplanted, or removed. A path connects from the accessible parking lot to the pedestrian bridge and the other paths. Low ground cover is added to existing plant beds, using plugs to quickly vegetate the gardens.

Resilient Design Elements

Designs increase views into the park from the accessible parking lot and trail entrance by limbing up the pine and magnolia trees and removing large conifers. Accessibility to the park from the accessible parking area is increased by improving the trail extending to the north. In the most intensive alternative, two accessible paths are added to the west and south.

Both plans increase native vegetation in the garden bed areas where there is already mulch and trees are removed. Native plants support native pollinators and are well suited for local climate conditions. A salt tolerant rain garden is installed in the most intensive option by the handicap parking lot where to capture stormwater from the parking lot and trail (snow is also stored here in winter).

MOST INTENSIVE OPTION



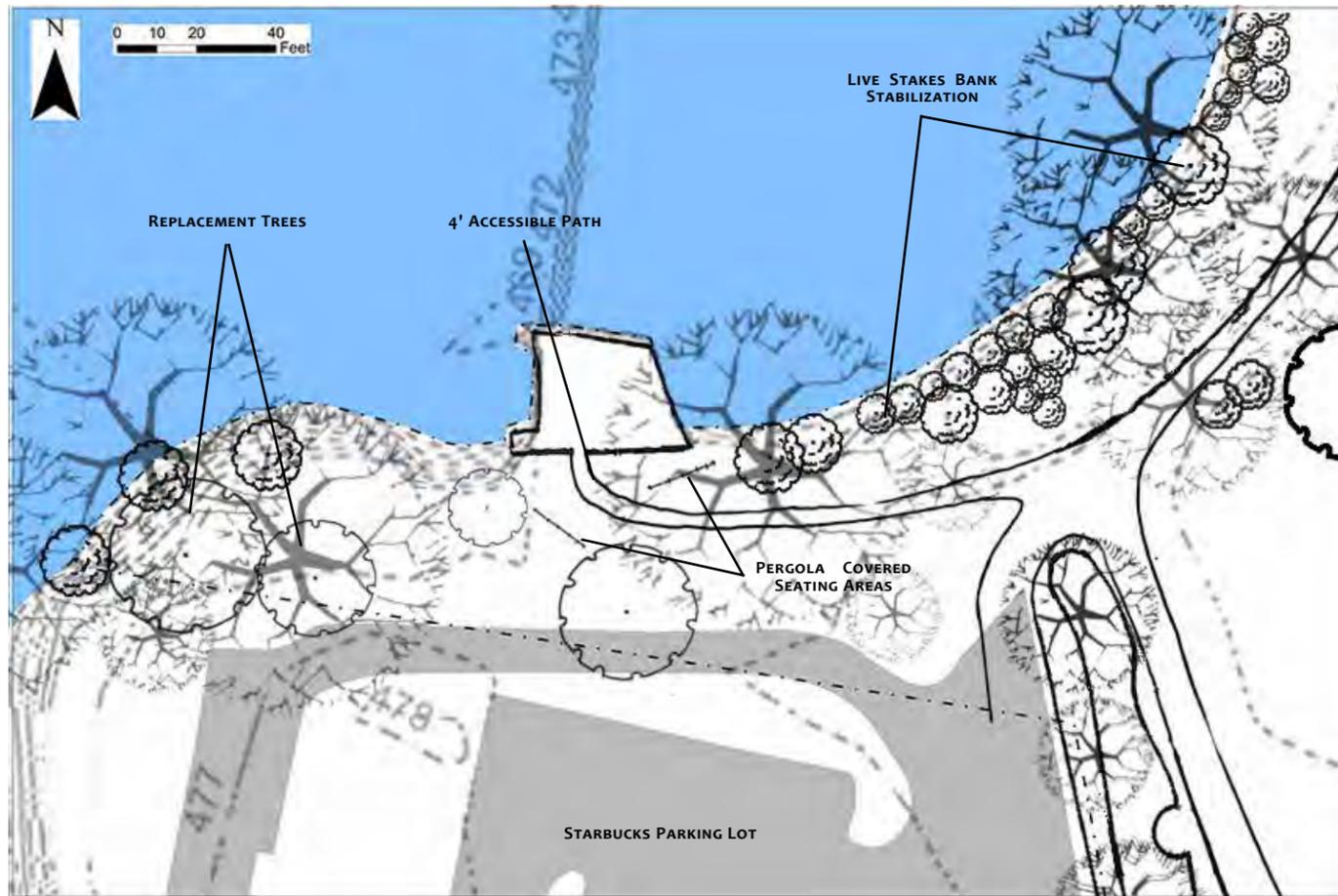
Ground covers and low perennials are planted densely to cover mulched areas and increase diversity in the garden beds. The gazebo is removed and a new, slightly larger gazebo with a pollinator garden is added at the path intersection. Seating areas and low ground cover fills space in between the beds. A rain garden with salt tolerant plants replaces the bed in front of the accessible parking lot.

SOUTHWEST ARBORETUM DESIGNS

Resilient Design Elements

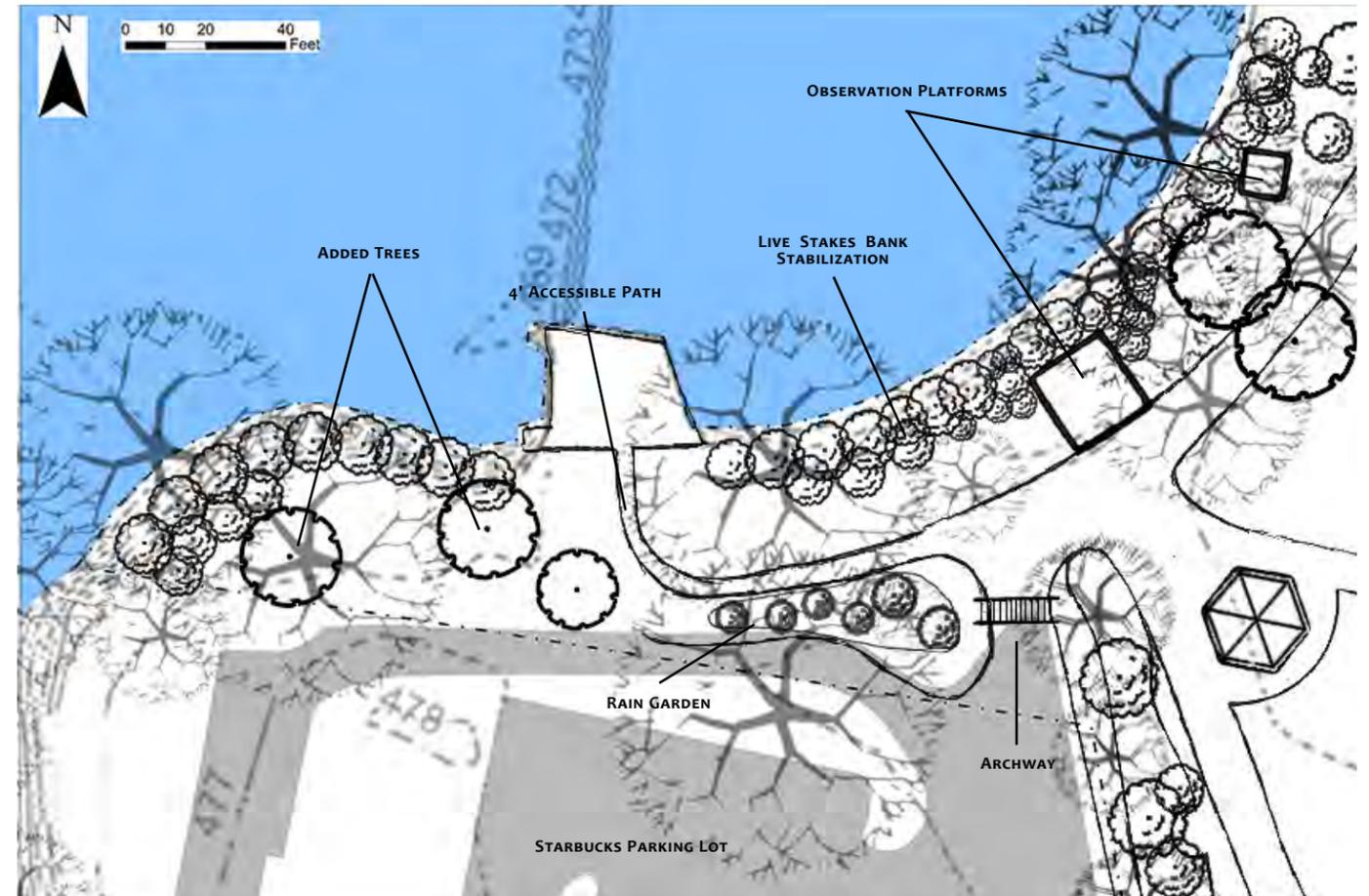
Designs look at alternative ways to infiltrate and store water in order to reduce runoff and increase native vegetation in the area of the park north of the Starbucks parking lot. From a more formally designated entrance near this parking lot, a new accessible path provides a direct connection into the Arboretum. In the more intensive design option, coconut fiber rolls and additional edible shrubs are added along the riverbank to decrease erosion, stabilize banks, further increase biodiversity, and provide increased shade and comfort for those who like to sit and admire views of the river.

LEAST INTENSIVE OPTION



A path connects from the Starbucks entrance to the existing gravel trail. Trees in fair condition along the banks (silver maples and the eastern poplar) are removed and replaced. Small shaded pergola seating areas are added for visitors to admire views of the river and dam from a comfortable shaded location. A bioswale infiltrates runoff north of the Starbucks parking lot. Live stakes are used to establish native shrubs along the riverbank.

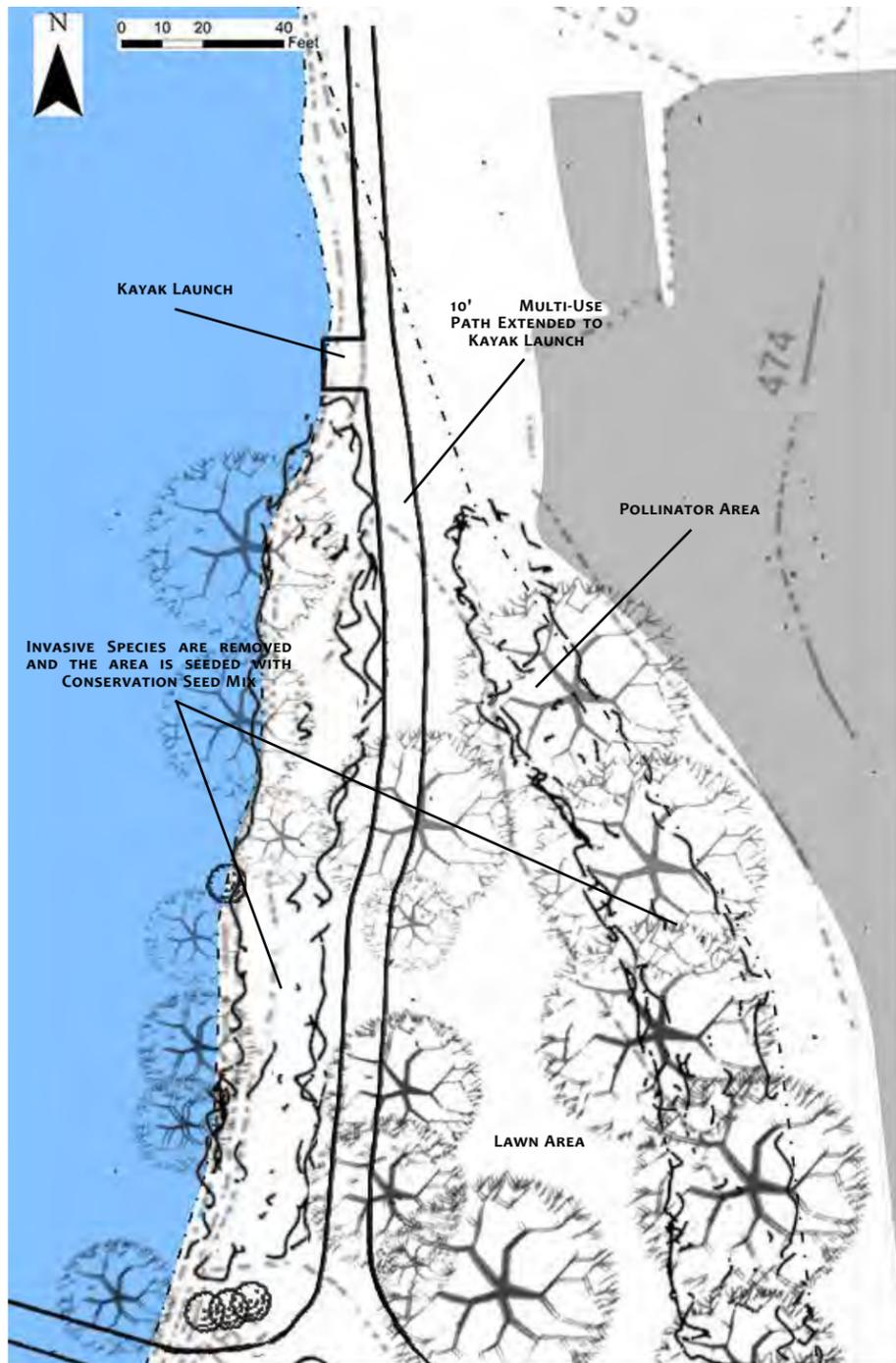
MOST INTENSIVE OPTION



Included in the new path from the Starbucks entrance is an arch and lattice trellises with vines to mimic the beauty of the front entrance on West Street. A rain garden is added to infiltrate and store the pooling water north of the parking lot. Accessible lookout platforms are added north to replace the maintenance shed and across from the trail junction. Coconut fiber rolls and shrubs with edible berries are added to stabilize the riverbanks and increase aesthetic and ecological value.

NORTHERN ARBORETUM DESIGNS

LEAST INTENSIVE OPTION

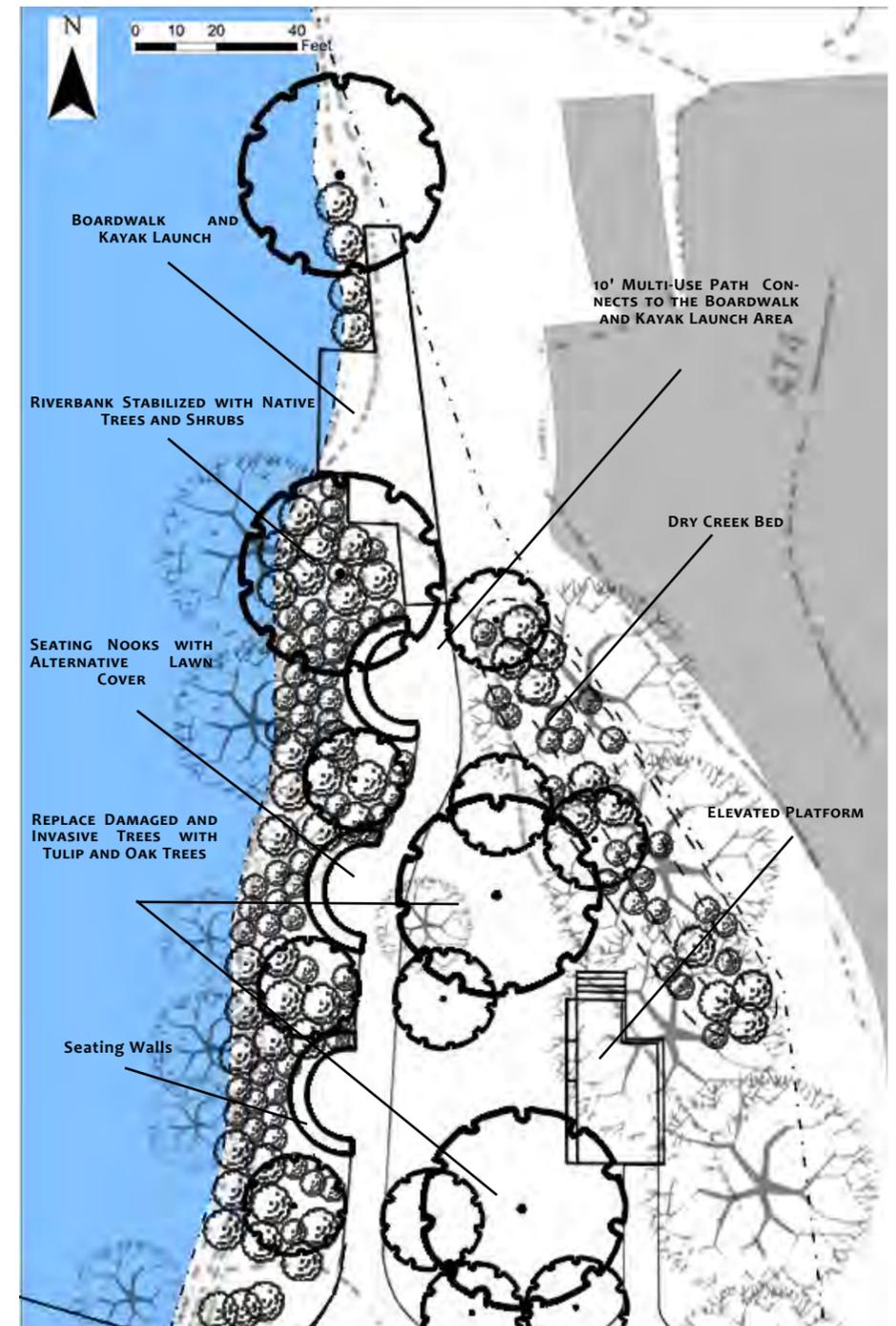


Native grasses and wildflowers are planting along the riverbanks. Trees are underplanted with no-mow ground covers to lessen soil compaction. Coconut coir logs provide bank stabilization along the kayak launch.

Resilient Design Elements

Designs stabilize the riverbank with native grasses, wildflowers, and pruned trees and shrubs. Some existing lawn is replaced with no-mow, drought-tolerant ground cover, thus lessening watering and mowing. Granite blocks from the dam are repurposed and incorporated into an elevated platform for events and a natural play area is created using locust trees that were removed west of the new platform. A dry creek with educational signs runs along the north-eastern portion of the site to capture, hold, and filter stormwater from the trail and to act as a naturalized play space. The native vegetation creates wildlife and pollinator habitat which is highlighted with education signs.

MOST INTENSIVE OPTION



Live stakes are used in conjunction with invasive species removal to revegetate the riverbank with native trees and shrubs. Thirty-foot wide seating nooks are defined with seating walls that discourage access to the bank and vegetation is pruned to preserve views of the water. An elevated platform area is added on the east side of the trail along with a boardwalk, observation deck and kayak launch on the west side. A dry creek bed mitigates stormwater runoff, and offers additional flood storage.

RACHEL MARSHALL OUTDOOR LEARNING LABORATORY DESIGNS

LEAST INTENSIVE OPTION

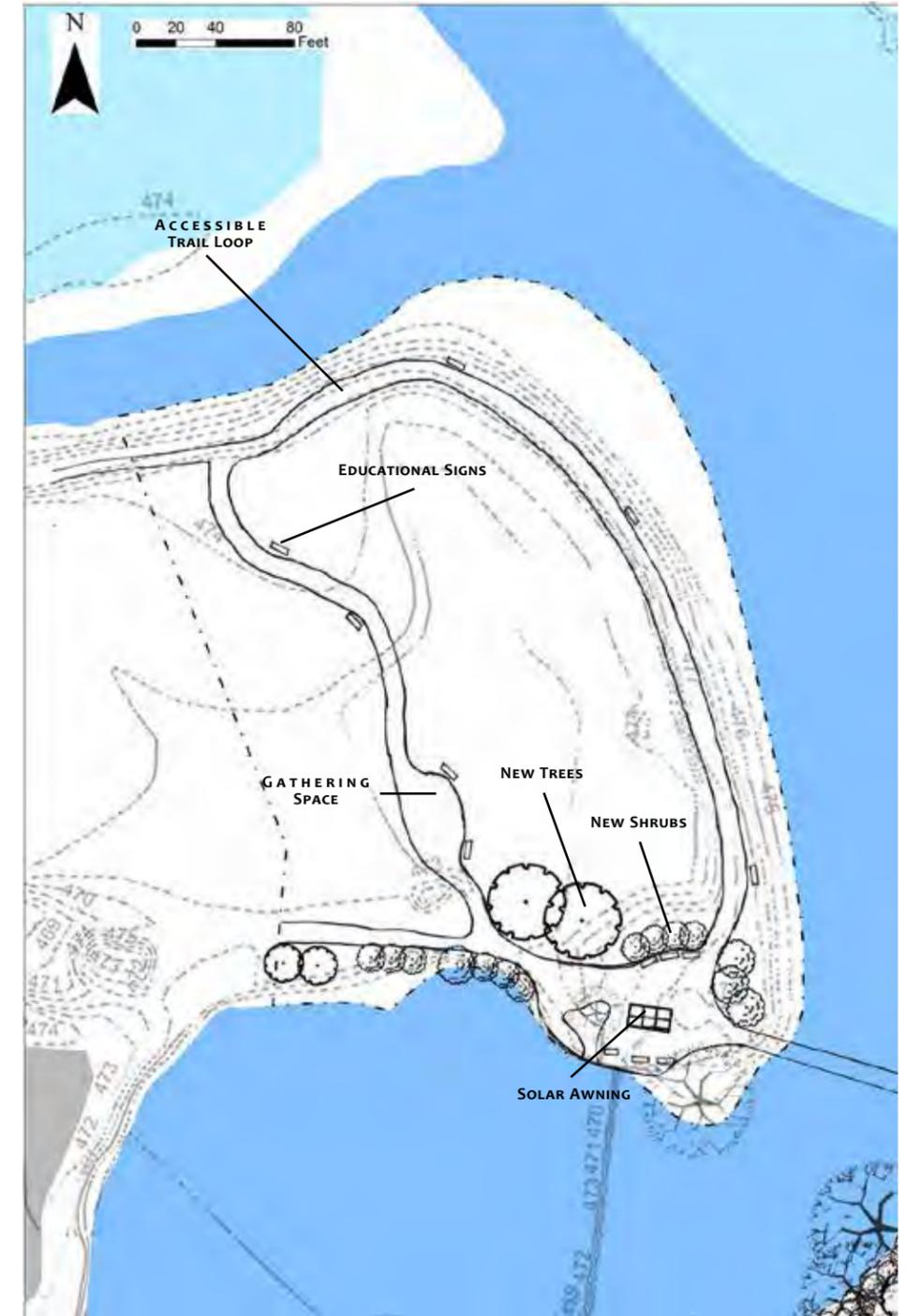


Vegetation along existing trails is limbed up to increase visibility along the paths. The trail is extended on the western portion of the parcel to loop back to the dam area. Educational signs are installed into existing posts (where original signs had been taken out) that explain views, wildlife, and native plants. Study areas are identified throughout that highlight key and interesting features of native wildlife or habitat.

Resilient Design Elements

Designs increase educational signage and designate areas for student research. The RMOLL trail is extended and expanded in the more intensive option to increase safety and access and allow visitors to explore more of the natural wooded areas. In the more intensive option, a solar awning both acts as a shaded seating area and a renewable energy source. Minimal structures are added to avoid disturbance of the floodplain.

MOST INTENSIVE OPTION



The trail is widened with a larger gather space. Informational signs are added throughout. Vegetation is increased near the seating area north of the dam to provide shade. A solar awning provides shade while also acting as a renewable energy source where people can charge their cell phones. Granite blocks taken from the dam could be repurposed to provide additional seating.

MATERIALS AND PRECEDENTS

STRUCTURES: SEATING



Pergola (yardcraft.com)



Gazebo (wayfair.com)



Retaining wall seating area (sitefurnishings.com)



Large pavilion (medium.com)

STRUCTURES: PATHS



Deck (shutterstock.com)



Kayak launch dock (pinterest.com)



Pine needle path (pinterest.com)



Gravel path (www.houzz.ie/photos)

STRUCTURES: SOLAR BENCHES



Soofa solar bench acts as both a bench and charging station for phones. (wtop.com)



Solar-powered bench monitors air quality as part of an EPA pilot project called the 'Village Green Project'. (epa.gov/air-research)



Solar bench seating option to offset park electricity costs. (solarbench.com)



Solar bench with interactive street map from EngoPlanet equipped with LED lights, charging stations, and smart sensors. (engoplanet.com)

STRUCTURES: SOLAR BENCHES



Solar power generation can be artful: this solar tree functions as a source of energy and as a sculptural artwork. (designboom.com)



Cobra head solar light to replace current lights in front Arboretum. (homedepot.com)

STRUCTURES: SIGNS



Welcome kiosk near the new entrance. (thewest-erlysun.com)



Interpretive signs can be used to educate park visitors about the different garden beds, wildlife habitats and native plants. (vacker-signs.com)



Students engaging with an interactive sign. (pinterest.com)



Trail sign that encourages people to stay on the trails to protect the microbial ecosystem. (westseatleblog.com)



Sheltered kiosk provides shade and park information. (sunshade.com)



Park directory illustrates and describes the different spaces the park. (external-worksindex.co.uk)



Education sign about wetlands with diagram emphasis. (coastalzone.com)



Tree Identification Tags with QR Codes (nationalband.com)

RECOMMENDED PERENNIALS

Common Name	Botanical Name	Flower color	Bloom Time	Size	Light	Water	Zone Hardiness	Other
Yarrow	<i>Achillea millefolium</i>	white	summer	2-3'	sun	ave	3-9	P
Northern Maidenhair	<i>Adiantum pendatum</i>	-	-	8-15"	ps/shd	moist	3-8	
Agastache	<i>Agastache foeniculum</i>	lavender	summer	2-4'	sun/ps	dry/ave	4-8	P, W, B
Nodding Onion	<i>Allium cernuum</i>	pink	summer	1-1.5'	sun/ps	ave	4-8	B
Pearly Ever Lasting	<i>Anaphalis margaritacea</i>	white	summer	3'	sun/ps	dry/ave	3-8	P, B
Big Bluestem	<i>Andropogon gerardii</i>			5-6'	sun	ave	4-9	E
Colombine	<i>Aquilegia canadensis</i>	pink/yellow/red	spring	1-3'	sun/ps	dry/ave	3-8	
Swamp Milkweed	<i>Asclepias incarnata</i>	pink	summer	4-5'	sun	ave/wet	3-6	B, R
Milkweed	<i>Asclepias tuberosa</i>	orange	summer	3'	sun	dry	3-9	P, B
Lady Fern	<i>Athyrium filix-femina</i>	-	-	1-3'	sun/ps	ave	4-8	
Yellow wild indigo	<i>Baptisa tinctoria</i>	yellow	spring	2-3'	sun/ps	dry/ave	3-9	P
Fireweed	<i>Chamerion angustifolium</i>	purple	summer	2-5'	sun/ps	ave	2-7	P
Turtlehead	<i>Chleone glabra</i>	pink/white	summer	2-3'	ps	moist, acidic	3-8	P, B
Sweet Fern	<i>Comptonia Peregrina</i>	green	spring	2-5'	sun/ps	dry - moist	2-6	B
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>	yellow	spring, summer	3'		dry		P
Hayscented Fern	<i>Dennstaedtia punctilobula</i>	-	-	1.5-2'	shd/ps	ave	3-8	
Bleeding Heart	<i>Dicentra eximia</i>	pink	spring, summer	1-1.5'	ps	ave	3-9	
Echinacea	<i>Echinacea purpurea</i>	purple pink	summer	2-5'	sun/ps	dry	3-9	P, B, W
Spotted Joe Pye	<i>Eupatoriadelphus maculatus</i>	pink	summer	4-6'	sun/ps	moist	4-9	P, B, W, R
Joe Pye	<i>Eupatoriadelphus purpureus</i>	pink	summer	5-7'	sun	wet	4-9	P, W, R, B
Bonset	<i>Eupatorium perfoliatum</i>	white	summer	4-5'	sun/ps	moist	3-8	B, R
Indian Blanket Flower	<i>Gaillardia aristata</i>	red,yellow	spring, summer	.75-1'	sun	dry/ave	3-8	P, B
Blanket Flower	<i>Gaillardia pulchella</i>	red,yellow	spring, summer	2'	sun	dry/ave	2-11	P, B
Swamp mallow	<i>Hibiscus moscheutos</i>	white/pink	summer	3-7'	sun	ave/wet	5-9	R
Blazing Star	<i>Liatris spicata</i>	red purple	summer	2-4'	sun	ave	3-8	P, R, W, B
Lobelia	<i>Lobelia cardinalis</i>	red	summer	2-4'	sun/ps	ave/wet	3-9	P, W, R
Lupine	<i>Lupinus perennis</i>	blue purple	spring	2-3'	sun	dry/ave	3-8	P, B
Ostrich Fern	<i>Matteuccia struthiopteris</i>	-	-	3-6'	shd/ps	ave-wet	3-7	
Scarlet Beebalm	<i>Monarda didyma</i>	Red	summer	3'	sun/ps	wet		P
Bee Balm	<i>Monarda fistulosa</i>	pink lavender	summer	2-4'	sun/ps	dry/ave	3-9	P, R, W, B
Switch grass	<i>Panicumvirgatum</i>	pinkish	summer	3-6'	sun/ps	ave/wet	5-9	R, W
Beard Tongue	<i>Penstamon digitalis</i>	white	spring	3-5'	sun	ave	3-8	B, W, R
Obedient Plant	<i>Physastegia virginiana</i>	pink/white	late summer	2-4'	sun	ave/moist	3-9	P, R, W
Jacobs Ladder	<i>Polemonium caeruleum</i>	pale blue	spring	2'	ps/shd	ave	4-8	
Solomon's Seal	<i>Polygonatum biflorum</i>	green white	spring	1-3'	ps/s	moist	3-8	R
Christmas Fern	<i>Polystichum acrostichodes</i>	-	-	1-2'	shd/ps	dry - ave	3-9	
Appalachian Mountain Mint	<i>Pycnanthemum flexuosum</i>	white	summer	2-3"	sun	ave	5-8	P
Pincushion Flower	<i>Scabiosa</i>	lavender blue	april-frost	1-1.5'	sun	ave	5-9	B
Little Bluestem	<i>Schizachyrium scoparium</i>	green blue	summer/fall	3'	sun/ps	dry-ave	3-9	P
Golden Rod	<i>Solidago canadensis</i>	yellow	summer	4-5'	sun/ps	ave	2-8	P, B, W, R
Indian Grass	<i>Sorghastrum nutans</i>	light brown	summer/fall	3-5'	sun	ave	4-9	
Smooth Aster	<i>Symphotrichum laeve</i>	violet	fall	2-4'	sun	dry/ave	3-8	B
New Enland Aster	<i>Symphotrichum novae-angliae</i>	purple	fall	6'	sun/ps	ave	4-8	P
Meadow Rue	<i>Thalictrum rocheburianum</i>	lavender	summer	4-6'	sun/ps	ave	4-7	
Ironweed	<i>Veronia noveboracensis</i>	purple	late summer	4-6'	sun	ave/wet	5-9	P, R
Culver's Root	<i>Veronicastrum virginicum</i>	white	summer	4-7'	sun	ave/wet	3-8	B, R

KEY:

P = Pollinator

B = Butterfly

W = Wildlife

E = Edible

R = Rain Garden



Yellow wild indigo



Yarrow



Ironweed



New England aster



Turtlehead



Blanket flower



Bee balm



Bleeding heart



Solomon seal



Jacobs ladder



Spotted joe pye



Pincushion flower

RECOMMENDED TREES

Common Name	Botanical Name	Flower color	Bloom Time	Size	Light	Water	Zone Hardiness	Other
Shadblow Serviceberry	<i>Amerlanchier canadensis</i>	white	spring	10-20'	sun/ps	moist/ave	4	
American Hornbeam	<i>Carpinus carolinianus</i>	white/green	-	20-35'	shd/ps	ave	3-9	
Shagbark Hickory	<i>Carya ovata</i>	green yellow	spring	70-90'	sun/ps	ave	4-8	E, F
Northern Catalpa	<i>Catalpa speciosa</i>	white	spring	40-70'	sun/ps	ave	4-8	
Common Hackberry	<i>Celtis occidentalis L.</i>	green	spring	65'	sun/ps	moist	3-9	E, W, FP
Redbud	<i>Cercis canadensis</i>	pink	spring	20-30'	sun/ps	ave	4-8	
Fringe Tree	<i>Chionantus virginianus</i>	cream	spring	12-20'	sun/ps	ave	3-9	W
Butternut	<i>Juglans cinerea</i>	yellow green	spring	40-60'	sun	ave-wet	3-7	E, W
American larch	<i>Larix laricina</i>	-	-	40-80'	sun/ps	ave	2-5	R
Tupelo, Black Gum	<i>Nyssa sylvatica</i>	green white	spring	30-50	sun/ps	ave/wet	3-9	P, R
Eastern Poplar	<i>Populus deltoides</i>	-	spring	75-100'	sun	moist/wet	3-9	FP, W
American Plum	<i>Prunus americana</i>	white	spring	15-25'	sun/ps	dry/ave	3-8	W, E
Swamp White Oak	<i>Quercus bicolor</i>	yellow green	spring	50-60'	sun/ps	ave/wet	3-8	
Red Oak	<i>Quercus rubra</i>	-	spring	50-75'	sun/ps	dry/ave	4-8	
Peach-Leaf Willow	<i>Salix amygdaloides</i>	-	spring	30-50	sun/ps		3-5	P
Willow	<i>Salix nigra</i>	-	spring	30-60'	sun	moist/wet	4-9	P, W
White Cedar	<i>Thuja occidentalis</i>	-	-	20-40'	sun/ps	ave	2-7	
America Linden/Basswood	<i>Tilia americana</i>	white yellow	spring	50-70'	sun/ps	ave/moist	2-8	B, W

KEY:
 P = Pollinator
 B = Butterfly
 W = Wildlife
 E = Edible
 R = Rain Garden



White cedar



Basswood



Redbud



Butternut



Northern catalpa



Common hackberry



American plum



American hornbeam



Fringe tree



Serviceberry



Swamp white oak



Shagbark hickory



Tupelo



Willow

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RECOMMENDED TREES
 A MASTER PLAN FOR ASHUELOT RIVER PARK
 FOR THE CITY OF KEENE, NEW HAMPSHIRE

RECOMMENDED SHRUBS

Common Name	Botanical Name	Flower color	Bloom Time	Size	Light	Water	Zone Hardiness	Other
Buttonbush	<i>Cephalanthus occidentalis</i>	white	spring	5-12'	sun/ps	moist /wet	5-9	B, W
Summer sweet	<i>Clethera alinifolia</i>	white	summer	3-8	sun/ps	ave/wet	3-8	
Summer sweet	<i>Clethera alinifolia</i>	white	summer	3-8'	sun/ps	moist /wet	3-9	B, W
Red Osier dogwood	<i>Cornus stolonifera</i>	white	spring	6-9'	sun/ps	ave/wet	3-8	W, B, R
Dwarf fothergilla	<i>Fothergilla gardenii</i>	white	spring	1.5-3'	sun/ps	ave	5-8	F
Large fothergilla	<i>Fothergulia major</i>	white	spring	6-9'	ps/sun		4-8	H, F
Huckleberry	<i>Gaylussacia dumosa</i>	white pink	spring	2'	sun/ps	moist	5-9	W, E, P, H
Witch hazel	<i>Hamamelis virginiana</i>	yellow	late fall	15-20'	sun/ps	ave	3-8	W, R,
Oak Leaved Hydrangea	<i>Hydreangea quercifolia</i>	white pink	spring summer	6-8'	sun/ps	ave	5-9	H
Winterberry	<i>Ilex verticillata</i>	green white	late spring	3-12'	sun.ps	ave/wet	3-9	W,R,H
Mountain laurel	<i>Kalmia latifolia</i>	rose to white	spring	5-15'	ps/shd	ave	4-9	
Spicebush	<i>Lindera bezoin</i>	green yellow	early spring	6-12'	sun/ps	ave/wet	4-9	W, B, R
Coastal Azalea	<i>Rhododendron atlanticum</i>	white	spring	3-6'	sun/ps	ave/moist	5-8	P, W
Fragrant sumac	<i>Rhus aromatica "Grow Low"</i>	yellow	spring	1.5-2'	sun/ps	dry/ ave	3-9	W, B
Purple Willow	<i>Salix purpurea</i>	white	spring	10'-15'	sun/ps	wet	4-8	P
Elderberry	<i>Sambucus canadensis</i>	white	spring	6'-12'	sun/ps	wet or dry	3-9	E, P, W
Nannyberry	<i>Viburnum lentago</i>	white	spring	14-16'	sun/ps	ave	2-8	W, B, E
Arrowwood	<i>Vuburnum dilatatum</i>	white pink	spring	8-10'	sun/ps	ave	5-8	W, B



Oak leaved hydrangea



Arrowwood



Purple willow



Buttonbush



Elderberry



Summer sweet



Red osier dogwood



Nannyberry



Dwarf fothergilla



Huckleberry

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KEY:
 P = Pollinator
 B = Butterfly
 W = Wildlife
 E = Edible
 R = Rain Garden
 H = Hedge

RECOMMENDED SHRUBS

A MASTER PLAN FOR ASHUELOT RIVER PARK
 FOR THE CITY OF KEENE, NEW HAMPSHIRE

DESIGNED BY: KATHERINE HOLDER, SAMANTHA
 PEIKES AND AMANDA SMITH

SPRING, 2020

Graduate Program in Sustainable
 Landscape Planning + Design
Conway School
 88 Village Hill Rd. Northampton, MA 01060
 413-369-4044
 www.csid.edu

RECOMMENDED GROUND COVERS

Common Name	Botanical Name	Flower color	Bloom Time	Size	Light	Water	Zone Hardiness	Other
Bearberry	<i>Arctostaphylos uva-ursi</i>	white	spring	.5-1'	sun/ps	ave	2-6	
Pennsylvania edge	<i>Carex pensylvanica</i>	greenish	spring	6-12"	shade	moist/ave	4-9	R
Green and Gold	<i>Chrysogonum virginianum</i>	yellow	spring-fall	.5-1'	shd/ps	ave/wet	5-9	R
Bunchberry	<i>Cornus canadensis</i>	white	spring/early summer	.25-.75'	shd	ave	2-6	B
Wild Stawberry	<i>Fragaria virginiana</i>	white	spring	2-9"	sun	dry/ave	5-9	E, B
Wintergreen	<i>Gaultheria procumbens</i>	white	late spring	.5-1'	ps/shd	ave	3-8	WD, E
Longflower Alumroot	<i>Heuchera longiflora</i>	yellow	spring	8-14"	shd/ps	ave/wet	4-8	
Golden Seal	<i>Hydrastis canadensis L.</i>	white	spring	.75-1'	ps/shd	moist	3-7	
Partridge Berry	<i>Mitchella repens</i>	white	spring	.5-1'	ps/shd	ave	3-8	E
Golden Ragwort	<i>Packera aurea</i>	yellow	spring	.5-2.5'	sun/ps	ave/wet	3-8	R
Primrose	<i>Primula Spp</i>	various	spring	.75-1'	ps/shd	moist	3-9	W
Foam Flower	<i>Tiarella cordifolia</i>	white/pink	spring	.75-1'	ps/shd	ave/wet	4-9	F

KEY:

P = Pollinator

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WD = Woodland



Bearberry



Foam flower



Bunch berry



Primrose



Wild strawberry



Golden ragwort



Pennsylvania sedge



Green and gold



Wintergreen



Goldenseal



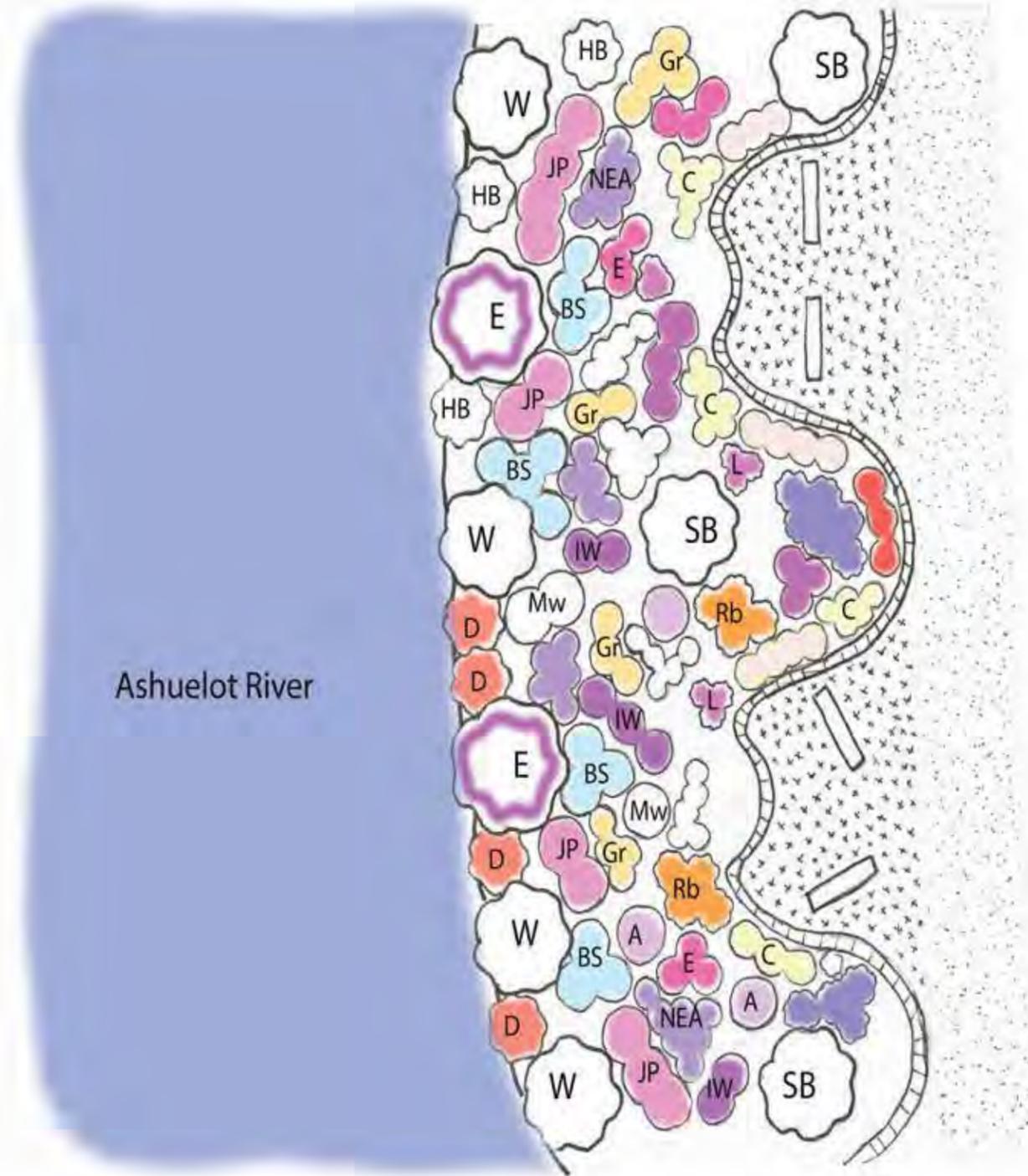
Longflower alumroot

COST ESTIMATES

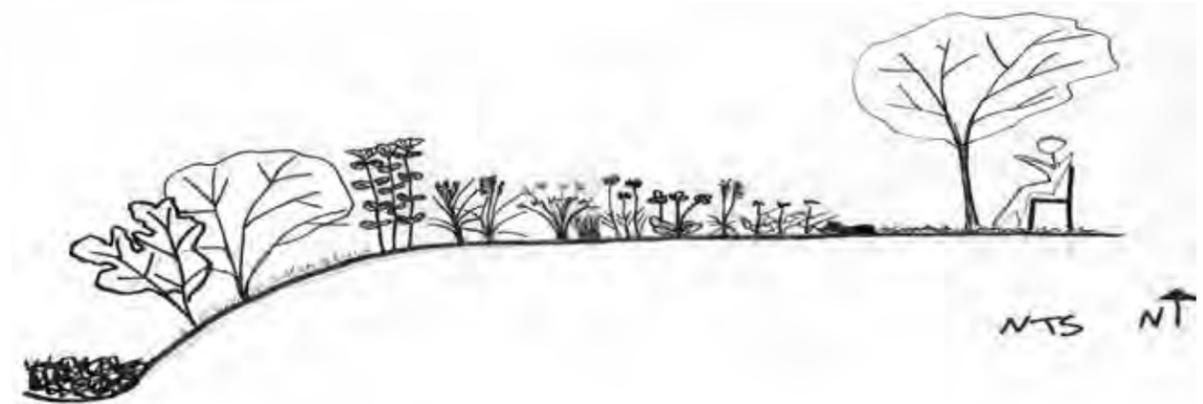
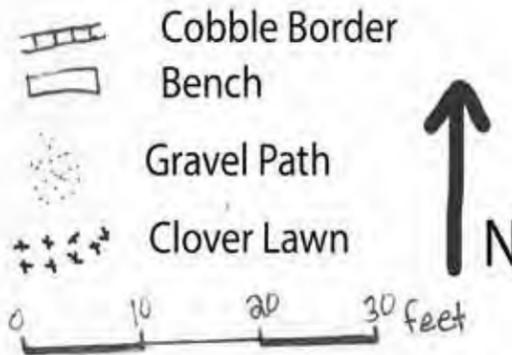
Cost Item	Description	Unit	Quantity	Low Cost	High Cost	Low Subtotal	High Subtotal
Demolition							
Deciduous Tree Removal	2 Red Maple, 2 Black Locust, 1 River Birch	Lump Sum	1	\$ 1,000.00	\$ 1,800.00	\$ 1,000.00	\$ 1,800.00
Coniferous Tree Removal	dwarf speciemens, 1ea 6"dbh Spruce & Hemlock	Lump Sum	1	\$ 300.00	\$ 500.00	\$ 300.00	\$ 500.00
Coniferous Transplant	Dwarf Specimens 5	Lump Sum	1	\$ 1,400.00	\$ 1,800.00	\$ 1,400.00	\$ 1,800.00
Lightpost Removal	Handicap	Lump Sum	1	\$ 200.00	\$ 400.00	\$ 200.00	\$ 400.00
Clearing and Grubbing	RMOLL	acre	0.25	\$ 750.00	\$ 1,500.00	\$ 187.50	\$ 375.00
Asphalt Removal	Starbucksand/or Handicap Spaces 40'x40'sqft	square foot	1600	\$1.50	\$2.50	\$ 2,400.00	\$ 4,000.00
Old Gazebo Removal		Lump Sum	1	\$ 400.00	\$ 600.00	\$ 400.00	\$ 600.00
						\$ -	\$ -
						\$ -	\$ -
Site Improvements							
Grading	Trails, 2' either side of trails	square foot	7696	\$ 0.15	\$ 0.25	\$ 1,154.40	\$ 1,924.00
Topsoil Type A (6" depth)	Conifer+Gazebo Bed 50'x30'	cubic feet	3000	\$ 40.00	\$ 60.00	\$ 120,000.00	\$ 180,000.00
Rain Garden: Gravel Stone	N Arboretum - 2400sqft	square foot	2400	\$ 4.50	\$ 10.00	\$ 10,800.00	\$ 24,000.00
Rain Garden: Gravel Stone	2nd Entrance - 2400sqft	square foot	2400	\$ 4.50	\$ 10.00	\$ 10,800.00	\$ 24,000.00
Rain Garden: Gravel Stone	SW Arboretum -2800 sqft	square foot	2800	\$ 4.50	\$ 10.00	\$ 12,600.00	\$ 28,000.00
Trails: Gravel	Assessible new trails: RMOLL (10' width)	linear foot	9400	\$ 50.00	\$ 80.00	\$ 470,000.00	\$ 752,000.00
Trails: Gravel	N Arboretum (10' width)	linear foot	2800	40.00	60.00	\$ 140,000.00	\$ 224,000.00
	Assessible new trails: EW across Arboretum (6'						
Trails: Gravel	width)	linear foot	960	40.00	60.00	\$ 38,400.00	\$ 57,600.00
Trails: Gravel	Assessible new trails: S to Arch (6' width)	linear foot	866	40.00	60.00	\$ 34,640.00	\$ 51,960.00
Trails: Gravel	Assessible new trails: SW (4' width)	linear foot	800	40.00	60.00	\$ 32,000.00	\$ 48,000.00
Trails: Repurpose - Gravel	N from Jonathan Daniels Trail Head 200'x 4'	linear foot	200	\$ 8.00	\$ 12.00	\$ 1,600.00	\$ 2,400.00
Pergola - wood	2@ 30'x6'	each	2	4500	6000	\$ 9,000.00	\$ 12,000.00
Pergola	1@20'x6'	each	1	4500	6000	\$ 4,500.00	\$ 6,000.00
Granite Blocks	salvaged from dam / purchased	each	3			\$ -	\$ -
Stone seating wall	20x36" (incl subgrade) x2'	square face foot	60	40	60	\$ 2,400.00	\$ 3,600.00
Accessable seating nooks: gravel	17; ~5338sqft total	each	17	\$ 1,300.00	\$ 1,900.00	\$ 22,100.00	\$ 32,300.00
Water Line	Junction box to fountain	linear foot	125	\$ 30.00	\$ 40.00	\$ 3,750.00	\$ 5,000.00
Drip Irrigation	Arboretum, Main	linear foot	2130	\$ 0.75	\$ 1.50	\$ 1,597.50	\$ 3,195.00
Gazebo/Pavillion	20'-diameter	Lump Sum	1	\$ 15,000.00	\$ 30,000.00	\$ 15,000.00	\$ 30,000.00
Gazebo Access: Gravel	Area Around gazebo; (6' width)	linear foot	870	40.00	60.00	\$ 34,800.00	\$ 52,200.00
Parking Lot: Pourous Pavement	Starbucksand/or Handicap Spaces 40'x40'sqft	square foot				\$ -	\$ -
Safety Railings by Dam						\$ -	\$ -
						\$ -	\$ -
Landscaping							
Compost	(from Keene ?)	cubic yard		\$ 40.00	\$ 60.00	\$ -	\$ -
Trees (3-4" caliper)	N Arboretum	each	12	\$ 600.00	\$ 800.00	\$ 7,200.00	\$ 9,600.00
Trees (3-4" caliper)	SW Arboretum; Arboretum	each	25	\$ 600.00	\$ 800.00	\$ 15,000.00	\$ 20,000.00
Shrubs (average 4' centers)	N Arboretum	1 gallon	12	\$ 15.00	\$ 20.00	\$ 180.00	\$ 240.00
Live Stakes			500			\$ -	\$ -
Tall Grasses		Flat (50 plugs)				\$ -	\$ -
Seed White Clover	N Arboretum, Alternate groundcover: 1059qft	acre	0.25	\$ 3,000.00	\$ 5,000.00	\$ 750.00	\$ 1,250.00
Groundcover	1qt - 500	acre	0.25			\$ -	\$ -
Wildlife or Conservation Seed Mix	N Arboretum - 6259sqft least	acre	0.25			\$ -	\$ -
Wildlife or Conservation Seed Mix	N Arboretum - 5200sqft most		0.25			\$ -	\$ -
Perennials	1 gal		300			\$ -	\$ -
Perennials	plugs		5000			\$ -	\$ -
Coir Logs	N Arboretum	linear foot	120			\$ -	\$ -
Coir Logs	SW Arboretum	linear foot				\$ -	\$ -
Invasive Species Management: Chemical	Arboretum; consult with professional	Lump Sum				\$ -	\$ -
Invasive Species Management: Manual	Volunteer?	Lump Sum				\$ -	\$ -
Amenities							
Bench: Granite	North Arboretum: 9 benches,	each	1	\$ 1,000.00	\$ 2,000.00	\$ 1,000.00	\$ 2,000.00

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POLLINATOR STREAM BANK GARDEN



- A - Agastache
- BS - Bluestem
- C - Coreopsis
- D - Red Osier Dogwood
- E - Echinacea
- Gr - Goldenrod
- HB - Highbush Blueberry
- IW - Ironweed
- JP - Joe Pye Weed
- L - Liatris
- Mw - Milkweed
- NEA - New England Aster
- Rb - Rudbeckia
- SB - Serviceberry
- W - Purple Osier Willow



Pollinator friendly shrubs and perennials provide habitat and stabilize the riverbank. The plant selection focuses on native species that are of high value to native pollinators including specialist species. Season long blooms offer visual interest to the garden. Serviceberry trees offer shade, fruit, and foliage. Cuttings from the willow shrubs along the water could be used for a basket making class in the park. Two thirty-foot seating areas have room for two benches each and are seeded with white clover to reduce mowing requirements. Vegetation is lowest along the seating area edges and increases in height to the waters edge.

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