

loway Creek Restoration at Brookside



Public Meeting

March 21, 2022



CONFLUENCE



Welcome



Public Works Department

Tracy Peterson, Liz Calhoun, Cesar Cintron

Parks and Recreation Department

Keith Abraham, Paul Tauke



WHKS Inc.

Derek Thomas, Amber Hershey

CONFLUENCE

Confluence

Matt Carlile, Denise Hurt, Madison Dierks



Friends of Brookside Park

Lori Biederman

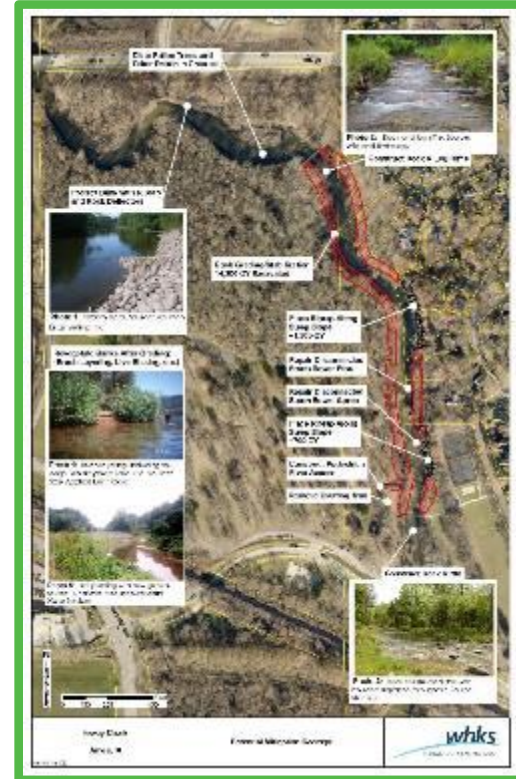
Project Goals

- Stabilize east slope and stream banks and reduce erosion
- Restore stream function
- Improve water quality
- Remove invasive plants
- Increase habitat and plant diversity
- Reduce flow from top of east slope
- Provide recreational opportunities/access to stream



2021 Concept

- Stream bank grading
- Rip-rap on slope and at tennis courts
- Repair of storm sewer outlets
- Access to the creek
- In stream rock riffles



Feedback Received



- Construction impacts
- Tree impacts
- Project aesthetics, i.e. natural features vs. rip-rap
- Degraded water quality and habitat
- Public access to creek and recreational opportunities
- Invasive species
- Habitat protection
- Revegetation and maintenance

Responses to Feedback

- Incorporate Landscape Features
- Enhance Conservation of Habitat
- Include Iowa DNR Rivers and Fisheries
- Realign the stream to the west
- Reduce tree clearing



Expanded Team

- River experts
- DNR Fisheries experts
- Water quality stakeholders
- Biologists
- Ecologists/pollinator experts
- Landscape Architects



Fall and Winter



- ❑ Met with IowaDNR to discuss options using IRRT
- ❑ Met with Iowa DNR Fisheries and ecologists about habitat opportunities
- ❑ Updated City Council and Parks and Recreation Commission
- ❑ Located and mapped trees
- ❑ Revised design with expanded team



Public Outreach

March 10 - Stream alignment, hydraulics, Iowa River Restoration Toolbox, improving water quality, oxbow restoration opportunities, DNR Fisheries

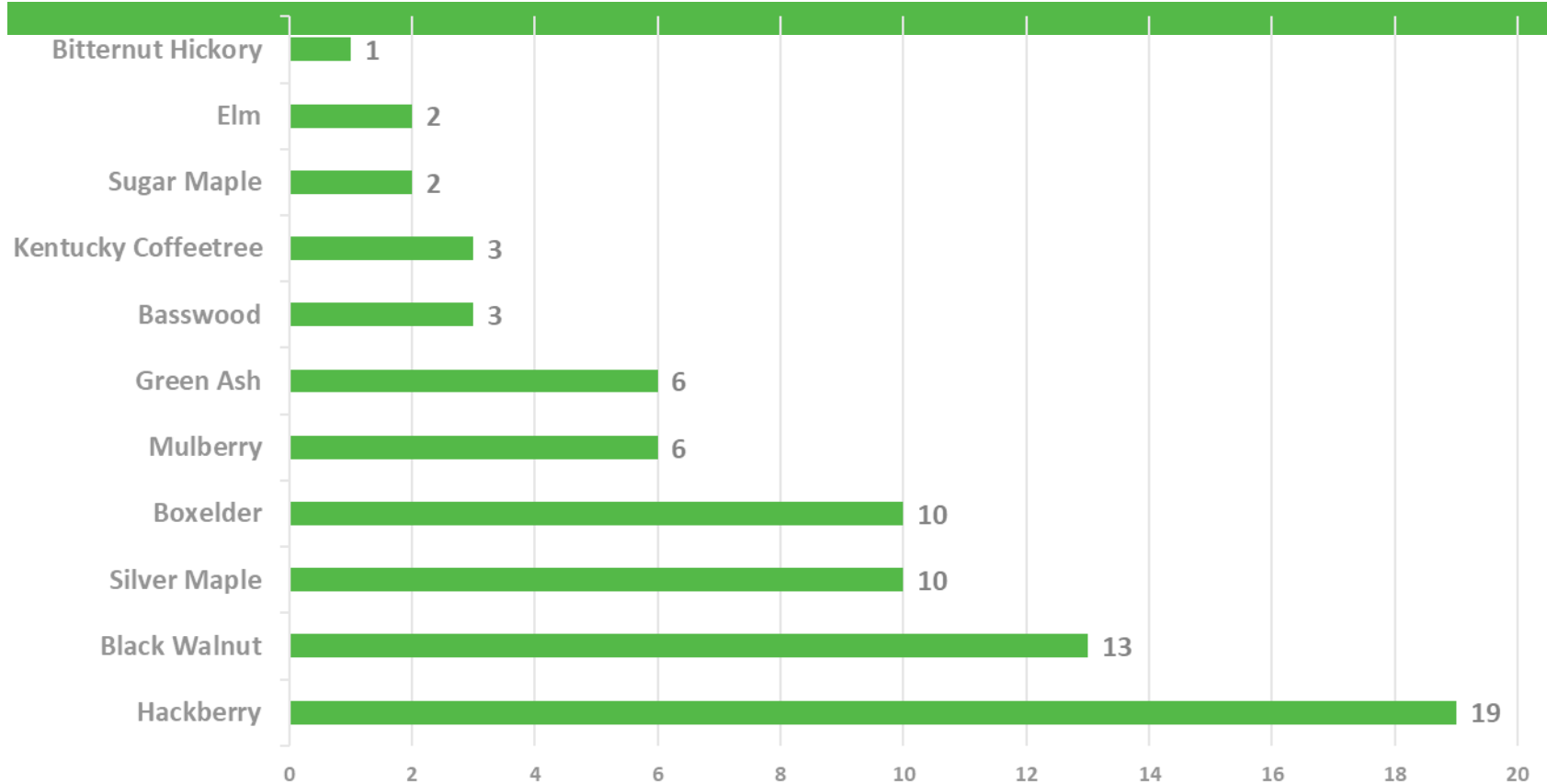
March 21- Invasive species, options for re-vegetation, discussion of trees to be removed and protected, habitat restoration and enhancement, educational and recreational opportunities

April 5 – General meeting to provide input before final design

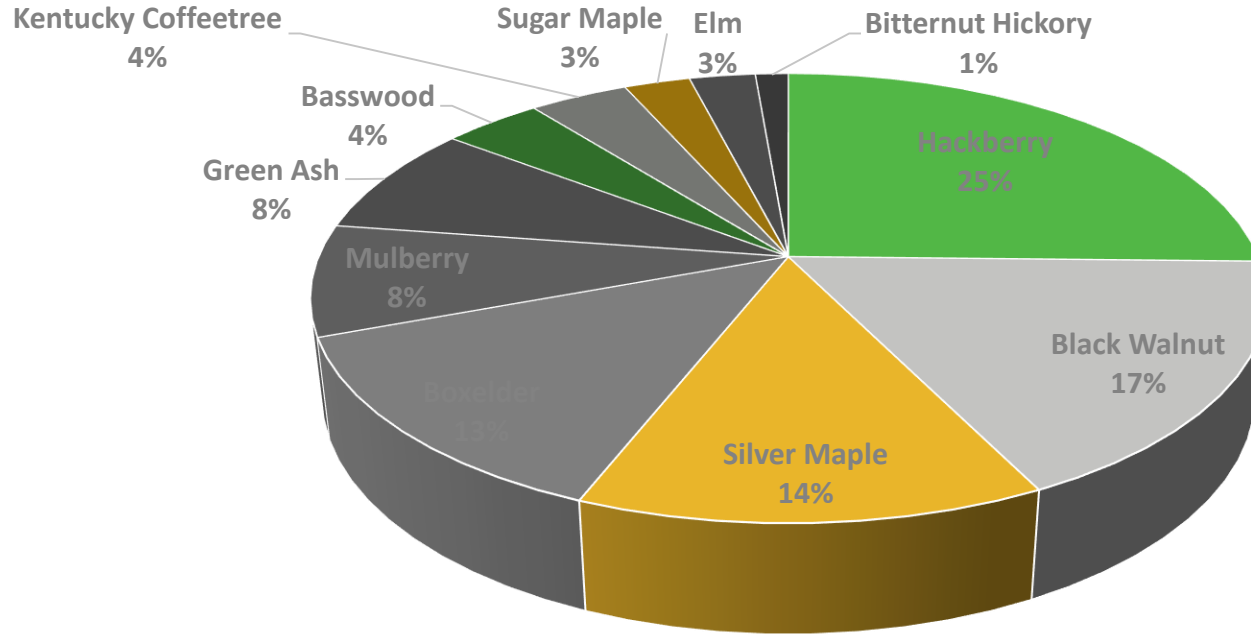
All meetings held in City Auditorium starting at 5:30 PM



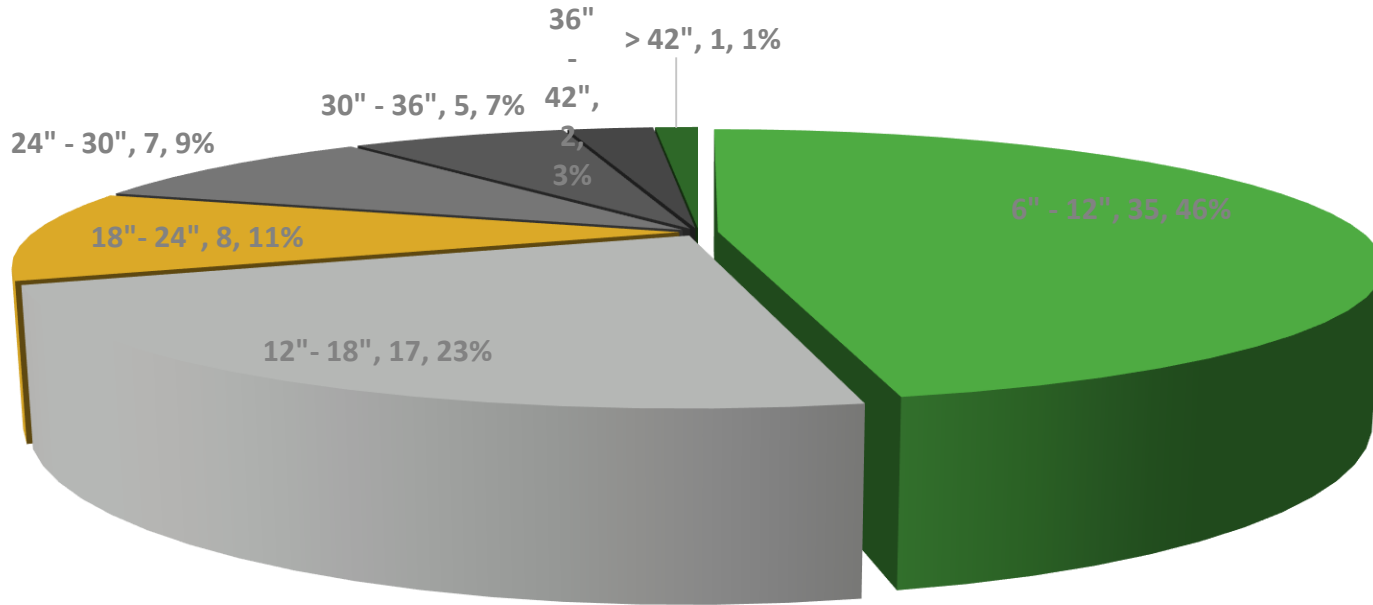
Trees Larger than 6" DBH to be Removed



Species to be Removed by Percentage



Percentage of Trees Larger than 6" DBH to be Removed by Diameter Class







1930



2019





- **1314 – Hanlon-Spillville Complex:**

This complex is fifty percent Hanlon soil and forty percent Spillville soil.

Hanlon soils are very deep, moderately well drained flood plain soils that formed in alluvium. They are frequently flooded. This complex is suitable for a wide variety of hardwood trees and shrubs. It is also quite suitable for tall grass prairie plants.



Vegetation Re-Establishment

- Site Preparation
 - Decompaction
 - Finish grading
 - Soil condition review
 - Soil amendments (as needed)
 - Avoid fertilizers with P and N
 - Topsoil
 - Compost
 - Mycorrhizal spores



Vegetation Re-Establishment

□ Erosion Control

■ Physical

- Erosion Control Matting
- Hydro-seeding tackifier

■ Vegetative

- Live staking
- Seeding
- Planting



Vegetation Re-Establishment

Erosion Control Examples



Vegetation Re-Establishment

Erosion Control Examples



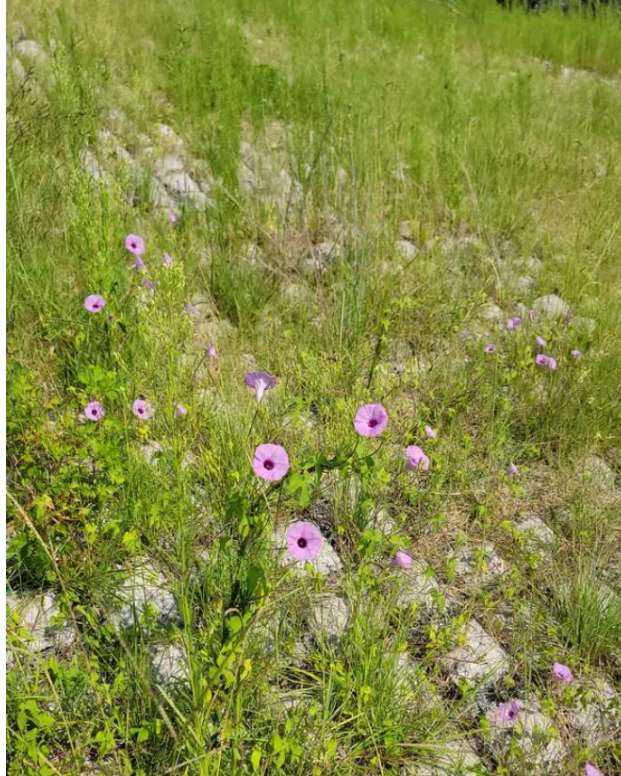
Vegetation Re-Establishment

Erosion Control Examples



Vegetation Re-Establishment

Erosion Control Examples



Vegetation Re-Establishment

□ Plantings

■ Cover Crops (establishment only)

■ Plant types

- Trees
- Shrubs
- Grasses, sedges, rushes
- Forbs

■ Zones

- Top of Bank
- Side Slope
- Bankfull
- Water's Edge

■ Sun/Shade Conditions

■ Construction timing

Trees (Top of bank PART-SHADE)									
*Boxelder	<i>Acer negundo</i>	Top shade, bankfull	Cold, moist stratification for a minimum of 60 days, or fall planting	N/A	N/A				
Black ash	<i>Fraxinus nigra</i>		Room temperature, moist stratification for a minimum of 60 days followed by cold, moist stratification for a minimum of 90 days, or fall planting. Make take 2 years for germination.	N/A	N/A				
Wet conditions; shallow, widespread root system; self-seeding; tolerant of seasonal flooding		FACW	Full to partial sunlight	Loam, sandy loam, clay loam, peat, muck	Swamps, streambanks, seeps, springs, woody bogs, floodplain woodlands, ravines, terraces				
Kentucky Coffeetree	<i>Gymnocladus dioica</i>		Scarify seeds in an acid bath for 4-6 hours.	N/A	N/A				
Moist, well-drained conditions; seed or root cutting propagation are successful; sometimes colonies can form from root suckers; many parts of the tree are poisonous		N/A	Full to partial sunlight	Fertile soil; loamy, sandy loam soils	Floodplain woodlands, riverbanks, woodlands, lowland slopes				
Butternut	<i>Juglans cinerea</i>		Cold, moist stratification for a minimum of 90 day, or fall planting.	N/A	N/A				
Moderately moist to slightly dry conditions; deep and widespread roots, with deep taproot; rapid growth rate; short-lived; mature trees are shade intolerant		FACU	Full sun to light shade	Well-drained, loose soils	Streambanks, coves, slopes, talus rock ledges, floodplain woodlands				
Black walnut	<i>Juglans nigra</i>		Cold, moist stratification for a minimum of 90 days, or fall planting.	N/A	N/A				
Moist conditions; wide spreading roots with a deep taproot; self-seeding; propagation through seeds most successful;		FACU	Full to partial sunlight	Loam, silty-loam, sandy loam	Floodplain woodlands, valleys, streambanks, bluff or slope bases				
*Swamp White Oak	<i>Quercus bicolor</i>	*Top shade, top sun, bankfull	No seed pretreatment necessary. Best results if planted immediately after collection.	N/A	N/A				
Wet to moist conditions; wide, woody root system with taproot; fast growth rate; best propagation through seeds		FACW	Full sun	Moist acidic soils, can survive in a variety of soil types	Floodplain woodlands, riverbanks, streambanks, pond edges, swamp and lake edges, lowland areas				
*Bur oak	<i>Quercus macrocarpa</i>	* Top sun, top shade	No seed pretreatment necessary. Best results if planted immediately after collection.	N/A	N/A				
Moist conditions; deep taproot with wide horizontal roots; drought tolerant; slow growth rate; seed and cutting of smaller pole-sized trees propagation are successful; fire tolerant; older trees are susceptible to bur oak blight (BOB), a fungal disease		FAC	Full to partial sunlight	Can survive in a variety of soil types, prefers alluvial soils	Savannas, streambanks, floodplain woodlands, upland woodlands				

Iowa Riverside Plant Selection Guide

https://www.iowadnr.gov/Portals/idnr/uploads/RiverRestoration/riverside_plants.pdf

Invasive Species Control

- Bush Honeysuckle
- Garlic Mustard
- Burdock (nuisance plant)
- Others of high concern?



OVERALL PLANTING

TREES

Silver Maple
Ohio Buckeye
Bitterbark Hickory
Shagbark Hickory
Common Hackberry
Eastern Redbud
Downy Hawthorn
Kentucky Coffeetree
Butternut
Black Walnut
Sycamore
Eastern Tiptop(Eastern Cottonwood)
Black Cherry
Swamp White Oak
Bur Oak
American Linden
Black Willow
American Baldernut
American Elm
Sloopy Elm

SHRUBS

Fase Indigo Bush
Common Buttonbush
Rough Leaved Dogwood
Gray Dogwood

Swamp Dogwood
Red-osier Dogwood
American Filbert
Eastern Wahoo
Common Ninebark
Chokecherry
Wild Black Currant
Hoo Sedge
Peach-leaf Willow
Pussy Willow
Sandbar Willow
Western Snowberry
Buckbrush
Nannyberry

GRASSES/SEDGES/RUSHES

Sweetflag
Shortstem Foxtail
Big Bluestem
Early Leaf Broms
Bluejoint Grass
Yellow Headed Fox Sedge
Wheat Sedge
Bebb's Sedge
Common Woodsedge
Soft Fox Sedge
Crested Sedge
Arnica Grassleaf Sedge

Gray's Sedge
Wood Gray Sedge
Hayden's Sedge/Could Sedge
Panicum Sedge
James' Sedge
Lake Sedge
Plains Slough Sedge
Hoo Sedge
Palm Sedge/Muskungum Sedge
Greater Straw Sedge
Woolly Sedge
Prairie Straw Sedge
Axi Fruited Sedge
Straw Colored Flatsedge
Blunt Brown Sedge
Hairy Tufted Sedge
Fox Sedge
Woodruff
Yellow Nur Sedge
Rusby Flat Sedge
Beakgrass
Flat Stemmed Spike Rush
blunt Spikerush
Common Spikebush
Canada Wild Rye
Mottlegrass Grass
Riverbank Wild Rye
Silky Wild Rye

Virginia Wild Rye
Frank's Lovegrass
Pony Grass
Foxi Mare Grass
Dudley's Rush
Torrey's Rush
White Grass
Hoe Cut Grass
Western Multy (CommonSatin Grass)
Switchgrass
White grass
River Bulrush
Slender Bulrush
Dark Green Bulrush
Wood Grass
Cup Plant
Inclangrass
Giant Bur Reed
Prairie Cordgrass

FORBS

American Maidenhair Fern
Giant Yellow Hyssop
Purple Giant Hyssop
White Snakeroot
American Water Plantain

Large-Flowered Water Plantain
Wild Leek
Scarlet Toothcup
Canada Anemone
American Columbine
Green Dragon
Jack in the Pulpit
Prairie Indian Plantain
Prairie Sage
Swamp Milkweed
Prairie Milkweed
Common Milkweed
Wild Ginger
Henry Wood Mint
Nodding Ragwort (Dun Margold)
False Nettle
False Aster
Marsh Margold
American Bellflower
Spring Cross
Cutleaf Toothwort
Blue Cohosh
White Turtlehead
Water Hemlock
Spring Beauty
Canadian Hoewort
Dutchman's breeches
Wild yam
Waterpod
False Rue Anemone
Cinnamon Willow-Herb
Peabody
White Trout Lily
Common Boneset
Grassleaved Goldenrod
Scotted Joe-Pye Weed
Joe-Pye Weed
Bluntleaf Bodstraw
Cream Gentian
Bottle Gentian
Fringed Fentian

Spotted Geranium
Yellow Avena
White Avena
Rough Avena
Hedge Hyssop
Ox-Eye
Common Sneezeweed
Sharplobe-Heptica
Halberd-Leaved Rose Mallow
Virginia Waterleaf
Giant St. John's Wort
Spotted Touch Me Not "Orange Jewelweed"
Pale Touch me Not "Yellow Jewelweed"
Nodding Ragwort (Dun Margold)
Purple Rocket
Blue Rag Iris
Marsh Yetching
Prairie Blazingstar
Michigan Lily
False Pimpernel
Cardinal Flower
Great Blue Lobelia
Purple Hocket
False Loosestrife
Water horehound
Northern Bugjeweed
Fringed Loosestrife
Prairie Loosestrife
Swamp Loosestrife
Winged Loosestrife
Field Mint
Virginia Bluebell
Monkey Flower
Wild Bergamot/Beebalm
Sweet Cicely
Anise Root
Cowbane
Balsam Hogwort
Swamp Loosewort
Ditch Stonecrop
Dotted Smartweed

Woodland Phlox
Marsh Phlox
Frogbit
Obedient Plant
Clearweed
Purple Flattensake Root
Common Mayapple
Jacob's Ladder
Pickered Weed
Norwegian cinquefoil
Brook Cinquefoil
Mountain Mint
Kidney Leaf Buttercup
Coursed Crowfoot
Swamp Buttercup
Yellow Coneflower
Marsh Grass
Black Eyed Susan
Tall Coneflower
Sweet Coneflower
Brown Eyed Susan
Greater Water cock
Swamp Dock
Short Beak Arrowhead
Common Arrowhead
Bloodroot
Common Black Snakeroot
Mad dog Skullcap
Fase Solomon's Seal
Upright Cannon Flower
Water persnip
Giant Goldenrod
Rice's Goldenrod
Smooth Hogstrandre
Heath Aster
Panicled Aster
Calico Aster
Ontario Aster
Crooked Stem Aster
New England Aster
Willow Aster
Swamp Aster
American Germander
Purple Meadow Rue
Meadow Parsnip
Big Merrybells
Wingsstem

Blue Vervain
White Vervain
Ironweed
Smooth Speedwell
Yellow Violet
Common Blue Violet
Cupper's Physics Root
Golden Alexanders



TOP OF BANK PLANTING

TREES



SHRUBS



GRASSES/SEDGES/RUSHES



FORBS



TREES

Silver Maple
Ohio Buckeye
Common Highberry
Eastern Hawthorn
Downy Hawthorn
Kentucky Coffeetree
Butternut
Black Walnut
Swamp White Oak
Bur Oak
American Linden

SHRUBS

Rough Leaved Dogwood
Gray Dogwood
Eastern Wahoo
Chokecherry
Wild Black Currant
Eldersberry
Western Snowberry
Buckbrush
Nannyberry

GRASSES/SEDGES/RUSHES

Big Bluestem
Early Leaf Brome
Common Woodsedge
Soft Fox Sedge
Crested Sedge
Awned Gracelul Sedge
Gray's Sedge
Wood Gray Sedge

SHRUBS

Hayden's Sedge/Could Sedge
Lains Slough Sedge
Greater Straw Sedge
Woolly Sedge
Prairie Straw Sedge
Woodruff
Besgrass
Canada Wild Hye
Bottlebrush Grass
Riverbank Wild Rye
Silky Wild Rye
Virginia Eric Rye
Dudley's rush
Fow Mania Grass
Switchgrass
White grass
Indiangrass

FORBS

Giant yellow Hyssop
Wild Leek
Green Dragon
Jack in the Pulpit
Wild Ginger
Hairy Wood Mint
American Bellflower
Blue Cohosh
Common Woodcock
Dutchman's Breeches
Purple Giant Hyssop
White Shakeroot
Ox-eye daisy
Wild yam

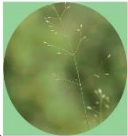
TREES

False Rus Anemone
Yellow Asters
White Asters
Giant St. John's Wort
Spotted Touch Me Not "Orange Jewelweed"
Pale Touch me Not "Yellow Jewelweed"
Purple Pooket
Carolina Flower
Great Blue Lobelia
Fringed Loosestrife
Virginia Bluebell
Wild Bergamont/Beebalm
Sweet Cicely
Anise Foot
Dotted Smartweed
Woodland Phlox
Clearweed
Jacob's Ladder
Kidney Leaf Buttercup
Swamp Buttercup
Black Eyes Susan
Tall Coneflower
Brown Eyed Susan
Bloodroot

Common Black Shakeroot
False Solomon's Seal
Upright Cannon Flower
Smooth Hedge-nettle
Panicled Aster
Calico Aster
Ontario Aster
Crowded Stern Aster
American Comandra
Meadow Parsnip
Wingsstem
Blue Verbain
Yellow Violet
Common Blue Violet
Canada Anemone
Prairie Indian Plantain

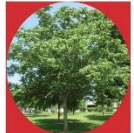
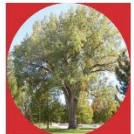
Swamp Milkweed
Prairie Milkweed
Common Milkweed
Grassleaved Goldenrod
Bluntleaf Bestwax
Buttle Gentian
Marsh Verbening
Prairie blazingstar
Prairie Loosestrife
Field Mint
Balsam Ragwort
Marsh Ploc
Obedient Plant
Purple Parshepsack Root
Mountain Mint
Yellow Coneflower

Sweet Coneflower
New England Aster
Willow Aster
Purple Meadow Rue
Ironweed
Golden Alexanders



SIDE SLOPE PLANTING

TREES



SHRUBS



GRASSES/SEDGES/RUSHES



FORBS



- TREES**
 Green Maple
 Bitternut Hickory
 Shagbark Hickory
 Sycamore
 Eastern Poplar/Caddis Cottonwood
- SHRUBS**
 Swamp Dogwood
 Eastern Whiteoak
 Wild Black Currant
 Elderberry
 Sandbar Willow
- GRASSES/SEDGES/RUSHES**
 Shortlawn foxtail
 Big Bluestem
 Early Leaf Brome
 Bluejoint Grass
 Avonard Grass
 Gray's Sedge
 Lutescent Sedge
 Greater Green Sedge
 Hairy fruited Sedge
 Canada Wild Rye
 Riverbank Wild Rye
 Silky Wild Rye
 Purple Rucker
 Dudley's Rush
 Torrey's Rush
 Fowl Man's Grass/White Grass
 Western Tufted White grass

- Inlandgrass
 Prairie Cordgrass
- FORBS**
 American Madhair Fern
 Wild Look
 Common Milkweed
 Hairy Wood Mint
 Spring Cress
 Cutleaf Toadwort
 Blue Cuckoo
 Dutchman's Breeches
 False Rue Anemone
 Cream Centaury
 Giant St. John's Wort
 Sweet Clove
 Anise Root
 Purple Rattlesnake Root
 Black-eyed Susan
 Tall Coneflower
 Sweet Coneflower
 Giant Goldenrod
 New England Aster
 Meadow Parrot
 Blue Yarrow
 Ironweed
 Yellow Violet
 Common Blue-Violet
 Golden Alexanders

BANKFULL ZONE PLANTING

TREES



SHRUBS



GRASSES/SEDGES/RUSHES



FORBS



TREES

Silver Maple
Sycamore
Swamp White Oak
Black Willow

SHRUBS

False Indigo Bush
Common Buttonbush
Swamp Dogwood
Red-osier Dogwood
Common Ninebark
Wild Black Currant
Ederbury
Peach-leaf Willow
Pussy Willow
Sandbar Willow

Awl-fruited Sedge
Blunt Broom Sedge
Hairy fruited Sedge
Blunt Spike-rush
Common Spike-rush
Riverbank Wild Rye
Virginia Wild Rye
Fowl Mania Grass
Dudley's Rush
Torrey's Rush
White Grass
Rice Cut Grass
Switchgrass
Slender Bulrush
Dark Green Bulrush
Wool Grass
Prairie Cordgrass

FORBS

American Water Plantain
Large-Flowered Water Plantain
Canada Anemone
Swamp Milkweed
False nettle
False Aster
Marsh Milkgold
Spring Grass
White Turtlehead
Water Hemlock
Chimney Willow-Herb
Palm Sedge/Muskgrass Sedge
Spotted Joe-Pye Weed

Swamp Dock
Meadow Skullcap
Water Parsnip
Giant Goldenrod
Riddell's Goldenrod
Smooth Hedge-nettle
New England Aster
Swamp Aster
Purple Meadow Rue
Blue Verbain
Owlver's Physics Root

Vegetation Re-Establishment



Before



1 Year after planting

Vegetation Re-Establishment



At installation of stream-barbs



After 5 years of establishment

Vegetation Re-Establishment



After 10 years of establishment

Vegetation Establishment and Management

- Develop management plan for each landscape zone
- Contract with contractor specialized in establishing natives for 3-5 years
- Train staff in management
- After establishment manage with staff



Habitat Enhancement

- Construct deeper pools for fish and turtles
- Construct root wads in stream bank for additional habitat and to encourage diversity
- Install permanent logs and rocks in creek for basking and sunning spots
- Install hibernaculum for turtles, snakes and amphibians
- Keep downed trees
- Plant variety of native plants including fruiting shrubs and trees for bird habitat and food source

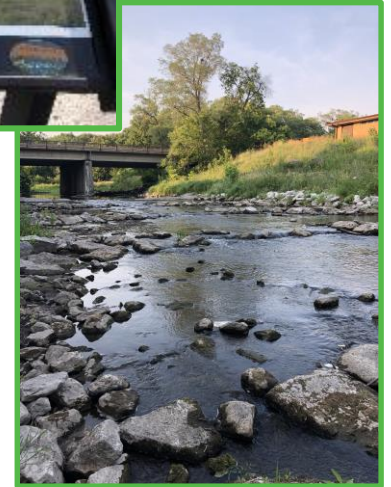


Logs and rocks placed in the water... provide ground basking platforms and shelter from the midday sun."



Education and Recreation

- Formalize access to the creek under 6th Street bridge
- Informal trail to creek
- Stepping stones in creek
- Benches at overlooks
- Educational signage about habitat and landscape



Thank you!

April 5 – General meeting before final design in city auditorium starting at 5:30 PM

Questions?

Please visit a station for further discussion and input

Contact: Liz.Calhoun@cityofames.org

