Riparian Ecosystem Health: How would restoration benefit KC?
Toward a Kansas City Metropolitan Conservation Plan
Point #0. KC Region has a large riparian system.
Upland Resources
Water Resources
Parks and Open Space
Protected Riparian Buffers Now Need Management

~90,000 acres
Point #1. Riparian ecosystem health has changed over time.
Healthy Historic Landscapes

Diverse
Dynamic
Productive
Stingy
Upland, Riparian and Stream Ecosystem Degradation Trends

**HIGH FLOWS**
- High flows have doubled
- From 1886-1904, 1.5 high flows/yr
- Presently, 3-5 high flows/yr

**MEDIAN FLOWS**
- Median flows are 400 times higher

**LOW FLOWS**
- Low flows are 250 times higher
Point #2. Land-use changes have contributed significant changes in upland, riparian and stream ecosystem health.
Historic River Swale
DEGRADATION OF WETLANDS
Point #3. Remaining upland riparian ecosystems have really changed!
Healthy & Degraded Oak Savanna
Trends in Tall Grass Savanna Degradation

pre-1820

1950±

1970±

1989-2000

BIRD RICHNESS

4± (n=5)

VEGETATION RICHNESS

<25

28+ (n=1)

300±

22± (n=2)

150±

15± (n=2)

<50
Point #4. Riparian Ecosystem Restoration is a well established science.
Erosion Control
North Avenue Dam
Shoreline Stabilization
Point #5. Projects focused on Riparian Ecosystem Restoration often start with reducing runoff.
CONCEPTUAL PLANS
Otter Creek Bend Wetland Park
EXCAVATING THE HISTORIC SWALES
SEEDING AND PLANTING
Wetland Restoration and Mitigation
And,

Point #6.--- Restoring streams and floodplain environments.
Creating Developments that contribute to Watershed Restoration
Day-lighting historic riparian areas

Ecological Design

- Woodland restoration
- Wetland restoration
- Shore edge restoration
- Meadow restoration
- Formal native plantings
And,

Point #7.—Converting high maintenance landscapes, into restored riparian habitats.
HOW TO MAKE IT HAPPEN?

Site Analysis, Design, and Planning Process
Naturalizing Parks

COMMUNITY ENGAGEMENT AND PUBLIC EDUCATION
PLANTING RIPARIAN HABITAT (PRAIRIE)

Construction and Long-Term Maintenance
Langendorf Park
Illinois

A high Maintenance (costly) lawn converted to a passive nature park. This change has saved ~ $500,000 annually.
King’s Brook Crossing
Illinois

Before

After

Restoring eroded shoreline saved $350,000 in rip rap costs.
And,

Point #8.—Converting high maintenance landscapes, into restored habitats has been done at Church’s, Schools, National Parks, Mined Lands, and residential yards and corporate campuses.
National Park Restoration
Mined (Brownfield) Land Reclamation

Before

After
Rain Garden Design Alternatives
Design Guideline & Principles

- Reduce the size and cost of the main detention basin
- Create attractive low maintenance landscapes and stormwater management features
- Allow room for water quality
- Disperse water treatment & detention throughout site as amenities
- Minimize damage to key trees
- Focus buildings on natural resources
- Restore landscape

Conceptual Stormwater & Landscape Plan
And,

Point #9.—Some cities are restoring entire systems.
Toronto Riverfront Revitalization

[Map diagram with various ecological zones and restoration elements such as marsh, bio-engineered soils, dunes, wet prairie, oak savanna, coastal forest, naturalized parkland, green fingers, and playfields.]

[Typical restoration cross section showing erosion control, stormwater treatment, and green infrastructure.]
Toronto, Don River
Avian System Restoration
Bird Habitat Restoration

1. Open Water/Aquatic
   - Herons
   - Waterfowl
   - Cormorants
   - Terns

2. Sedge Meadow
   - Rails
   - Song Sparrow
   - Waterfowl
   - Redwing Blackbird
   - Warblers
   - Henslow's Sparrow
   - Sedge Wren

3. Marsh/Emergent Wetlands
   - Herons
   - Grebes
   - Bitterns
   - Flycatchers
   - Gallinules

4. Seepage System, Sedge, Emergent, Rivulet System
   - Wrens
   - Redwing Blackbird
   - Rails
   - Piping Plover

5. Riparian/Savanna/Forest
   - Warblers
   - Vireos
   - Owls
   - Raptors
   - Orioles
   - Flycatchers
   - Tanagers

Great Blue Heron
Amphibian and Reptile Habitat Restoration

1. Open Water/Aquatic
   - Mud Pupae
   - Eastern Smilesnout Snapping Turtle
   - Female's Toad
   - Green Frog
   - Green Tree Frog

2. Sedge Meadow
   - Blanding's Turtle
   - Eastern Smooth Green Snake
   - Female's Toad
   - Green Frog
   - Garter Snake
   - Northern Water Snake

3. Marsh/Emergent Wetland
   - Northern Leopard Frog
   - Mink Frog
   - Red Spotted Newt
   - Red Spotted Eft
   - Bull Frog
   - Northern Map Turtle
   - Wood Frog
   - Scaled Salamander
   - Western Chorus Frog
   - Tiger Salamander

4. Seepage System, Sedge, Emergent, Rivulet System
   - Ringneck Snake
   - American Toad
   - DeKay's Brown Snake
   - Blue Spotted Salamander
   - Green Tree Frog
   - Eastern Red Backed Salamander

5. Riparian/Savanna/Forest
   - Northern Leopard Frog
   - American Toad
   - DeKay's Brown Snake
   - Blue Spotted Salamander
   - Green Tree Frog
   - Eastern Red Backed Salamander
Fisheries System Restoration

Existing Water Edge Conditions

Restored Fish Habitat/Spawning Grounds

Re-establishment of Fish Populations
And,

Point #10.—Transitioning to restored riparian systems can use O and M money for parks.
Break Even Analysis: Lawns vs Restoration ($/acre-year) Costs

Low Restoration cost range

Average Restoration cost range

High Restoration cost range
What is included in Cost?

Lawn maintenance = $12,500 per acre/year

- Labor, training, gas, turf repair, leaf collections, fertilizer, herbicide, maintenance of equipment, staff labor costs, equipment mobilization to and from parks, overhead, depreciation, insurance, benefits ....
And,

Point #11.—Most concerns are **not** real!
Addressing Perceptions and Risks

- Produce a new generation in about 2 weeks
- Generally need stagnant shady water to breed
- Prime breeding habit includes storm sewers, bird baths, old tires, and anywhere water pools and sits protected from wind
What is Acceptable Urban Ecological System

“Low (cost)” Maintenance?
Can we restore habitat for rare species?
And,

Point #12.—Beauty, lower costs, quickly trump concerns.
Aesthetic and Functioning Stormwater Management Systems

NURP Pond

Vegetated Biofilter Wetland
Riparian Buffer Restoration--only vegetation management

Before Brushing

Two Years Later