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Advancing Urban Watershed Renewal through the Benefits of Multi Purpose Stream and River Restoration Projects

5th National Conference on Ecosystem Restoration

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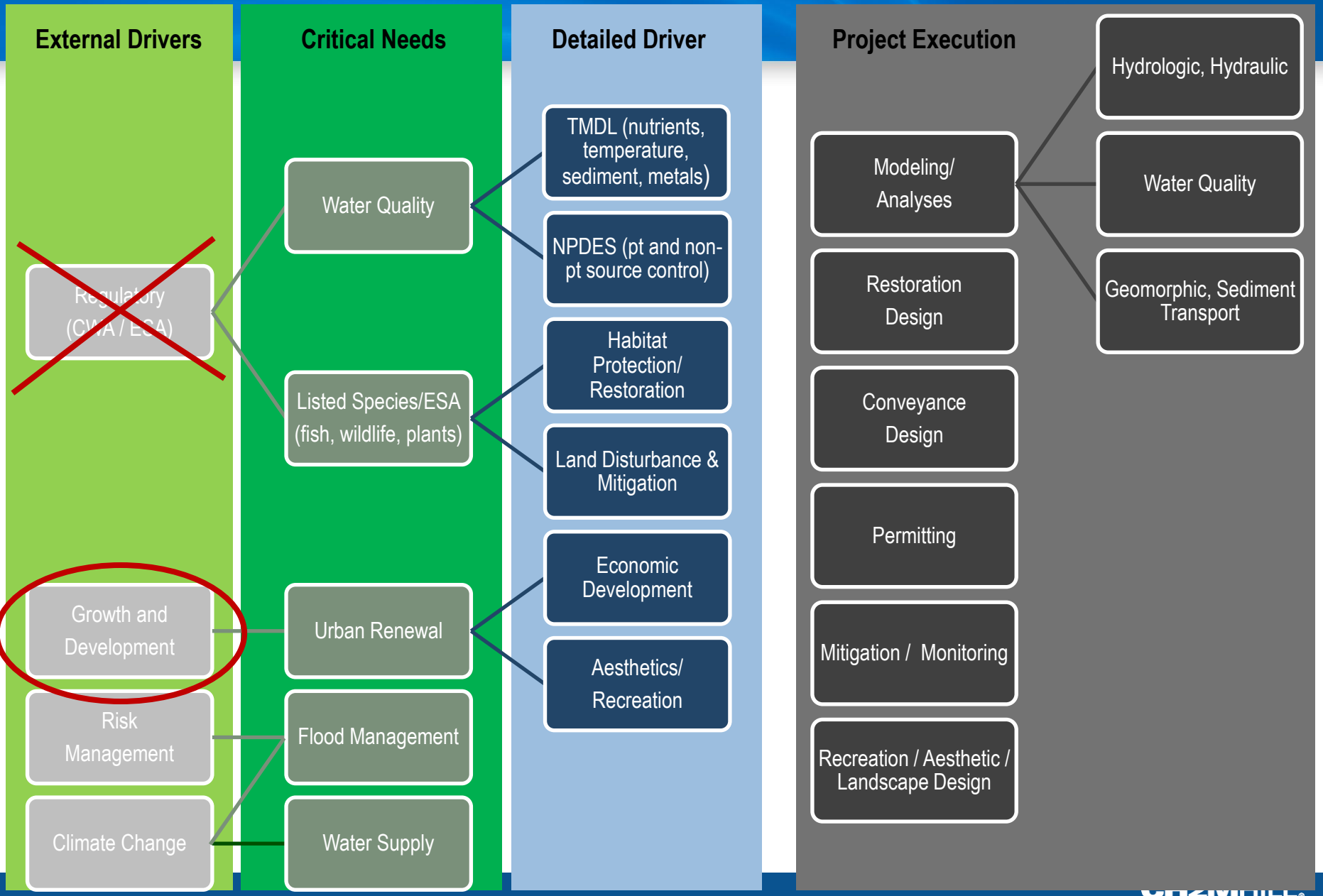
Clear Need for Restoration

- 2008 – 2009 National River and Stream Assessment (NRSA)
  - Nitrogen and phosphorus are at excessive levels
  - Streams and rivers are at an increased risk due to decreased vegetation cover and increased human disturbance
  - Increased bacteria levels
  - Increased mercury levels
  - Habitat rated as poor in over half of surveyed stream miles in 2008
  - Habitat declined 7% since 2004

"The health of our Nation's rivers, lakes, bays and coastal waters depends on the vast network of streams where they begin, and this new science shows that America's streams and rivers are under significant pressure," said Office of Water Acting Assistant Administrator Nancy Stoner. "We must continue to invest in protecting and restoring our nation's streams and rivers as they are vital sources of our drinking water, provide many recreational opportunities, and play a critical role in the economy."

Multiple Project Drivers Yield Project Execution



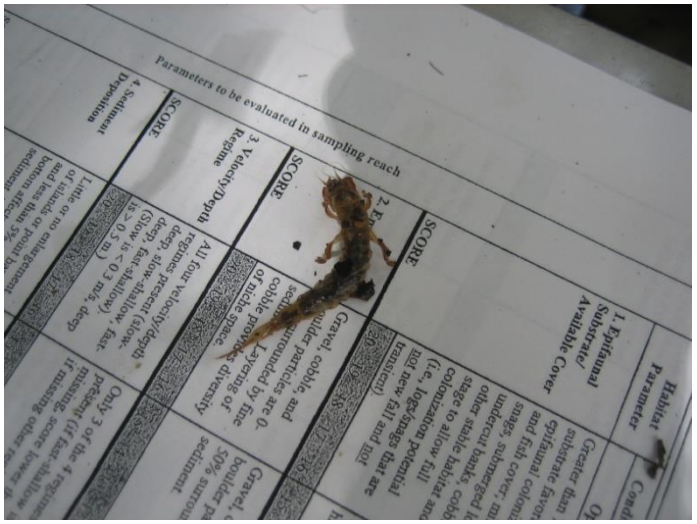
Finite Resources Available for Restoration

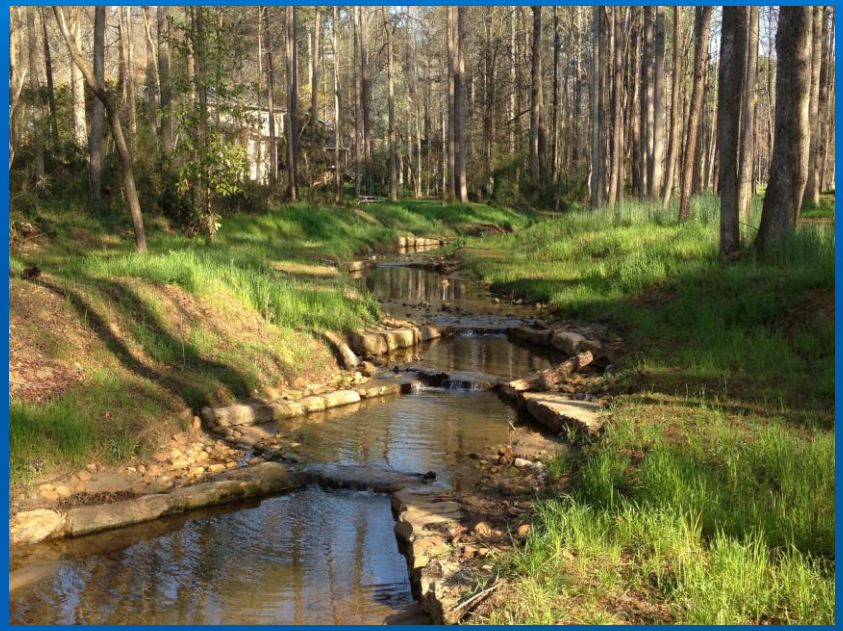
- Funding Programs
  - Federal (319h, USACE 206, FEMA HMGP, CDBG, Urban Waters Grants)
  - State (transportation)
  - Local (tax revenue, utility fees)
  - Nonprofit
  - Private
  - Community Improvement Districts (CIDs)
  - Mitigation Banking

Multi purpose / objective projects increase the priority for use of local funds.

Do the Benefits of Projects Justify Urban Restoration?

- Typical Goals of Urban Stream and River Restoration
  - Water quality improvement (nutrient reduction, TSS reduction)
  - Protecting infrastructure, reducing erosion
  - Improving habitat
  - Increasing biomass and biodiversity
  - Flood attenuation and reduced flood risk
  - Hydrologic improvements
  - Stream function (nutrient cycling, carbon sequestration)?





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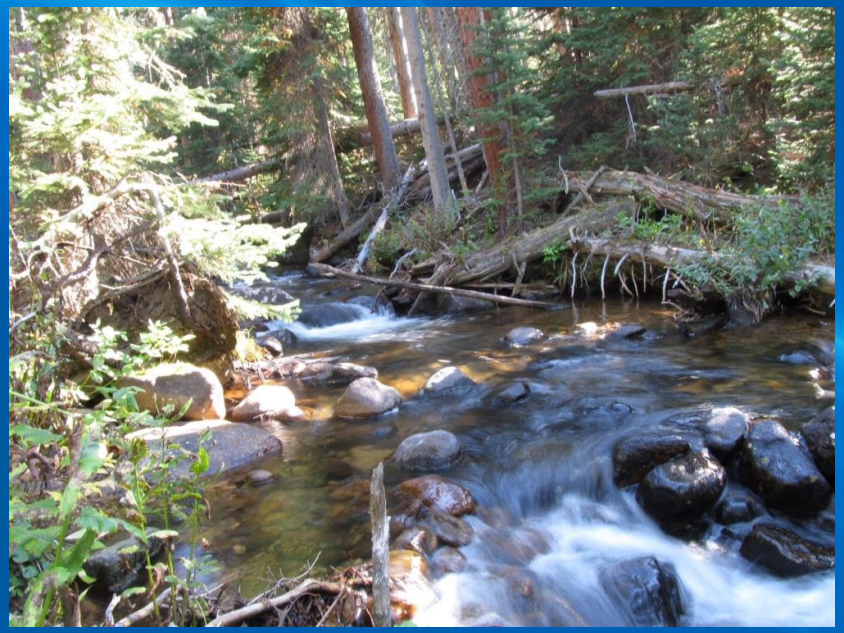
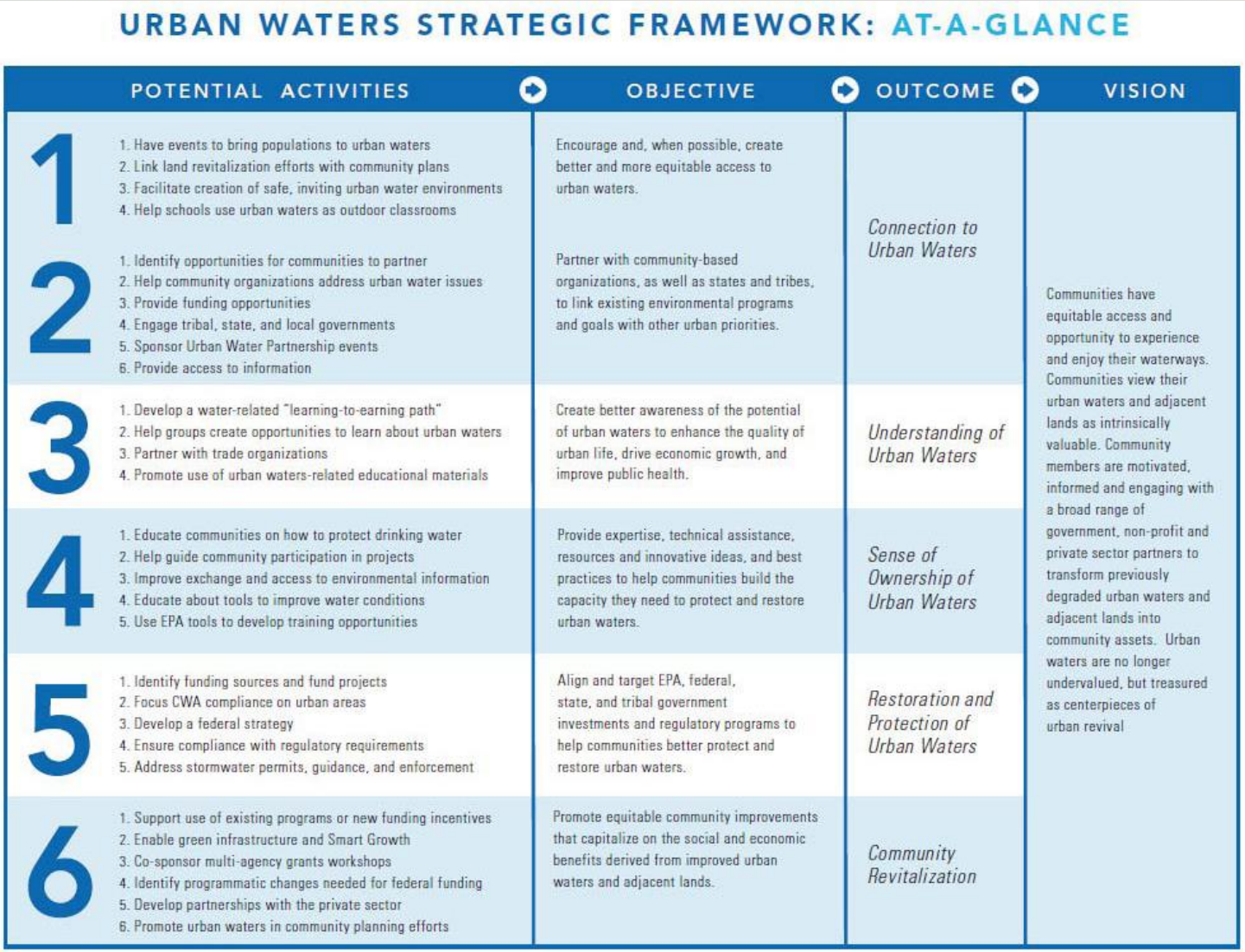


"…reach scale efforts do not appear to be effectively mitigating the physical, hydrological, or chemical alterations that are responsible for the loss of sensitive taxa and the declines in water quality that typically motivate restoration efforts." (Bernhardt and Palmer, 2011)

So Why Conduct Urban Restoration?

- Urban waterways are the most heavily impacted…
- Doing nothing not an option…
- Public education, partnerships,and a sense of community are required to have a lasting impact…
- Access and recreation opportunities are limited…
- Create economic growth opportunities…
- …
- …
- …
- *Cumulative benefits of multiple restoration projects become effective at the watershed scale*

EPA Urban Waters Program Adopts a Similar Approach



Valuing Economic Benefits of Urban Restoration

- **Damage Function Method** – An economic technique that quantifies the worth of potential improvements in environmental health by analyzing the economic damages caused in similar and already-degrade ecosystems.
- **Willingness to Pay (contingent valuation method)** – Value arrived at by surveying people, usually those who live within the area of restoration activities, and measuring how much they would be willing to pay for restoration
- **Political Referendum Method** – Local and state governments put fundraising measures such as general obligation bonds, in front of the public for approval. Occasionally, the public votes on measures to fund watershed restoration (i.e., stormwater utilities).
- **Averted Expenditure Method** – Quantifies the prevention of potential future damage (i.e., reduced erosion and maintenance of roadways)
- **Travel Cost Method** – Environmental valuation that examines people's travel expenses incurred in visiting natural areas
- **Hedonic Price Method (property values)** – Technique assumes that the implicit societal value for environmental / recreational amenities is manifested in real estate prices
- **Employment Opportunities** – during and after restoration
- **Population Growth and New Business Opportunities**

*Source: Hurd, Josh. 2009. Economic Benefits of Watershed Restoration. In The Political Economy of Watershed Restoration Series. Missoula, MT: Wildlands CPR. http://www.wildlandscpr.org/files/Economic_Benefits_0.pdf

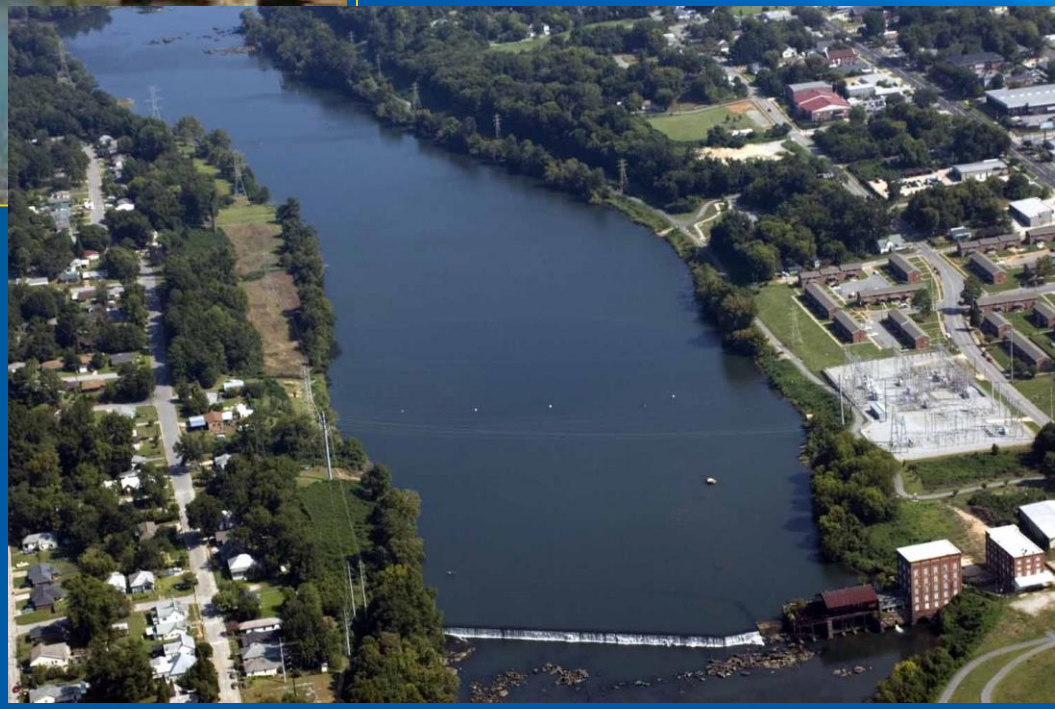
Economic Benefits of Urban Restoration

- Economic and societal benefits of stream and river restoration can provide the key link to execution of projects.
- Incorporating economic benefits / recreation / aesthetic features allows for multiple funding sources to be leveraged and to garner political support
- Contributes to benefit cost analysis (BCA)
- Economic benefits enable projects = ecological improvement
- Potential Drawbacks…
  - Prerequisite for economic benefit is to provide access / promote recreation
  - Additional features = additional cost $$$
  - Additional cost justified by return on investment

Project Examples


MILL CREEK
PHENIX CITY, ALABAMA
RIVER REACH PROPOSED TO BE RESTORED
(APPROXIMATELY 2 MILES)
EAGLE & PHENIX DAM
(REMOVAL PROPOSED)
OLIVER DAM
(GEORGIA POWER)
NORTH HIGHLANDS DAM
(GEORGIA POWER)
COWETA FALLS ~ HISTORICALLY THE FIRST
FALLS OF THE CHATTAHOOCHEE RIVER
BIBB CITY
CITY MILLS DAM
(REMOVAL PROPOSED)
COLUMBUS, GEORGIA

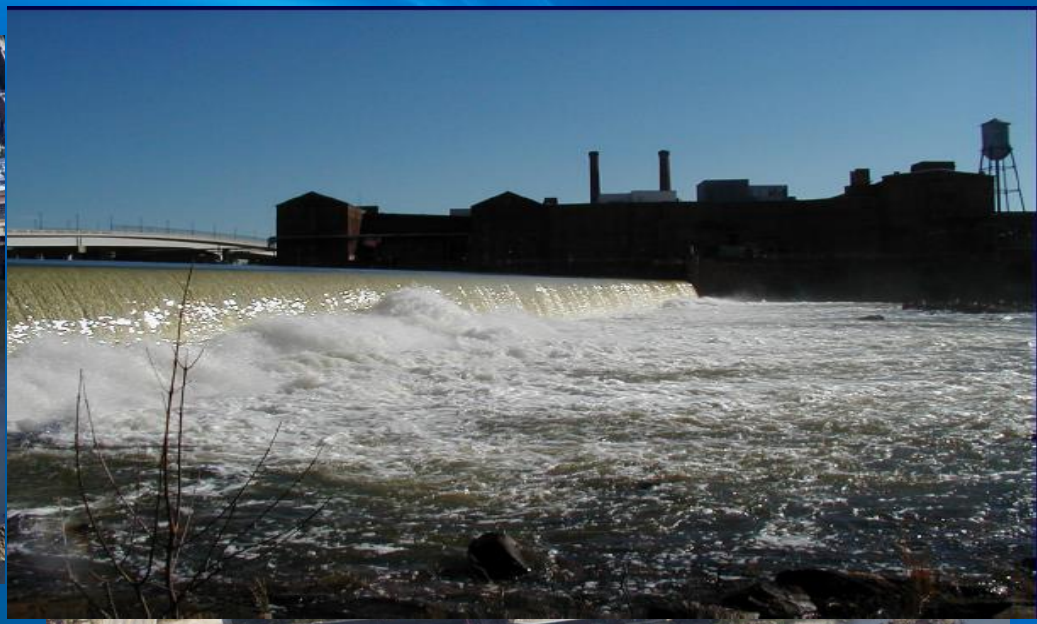
Chattahoochee River Restoration, Columbus, GA



City Mills Dam

850 ft long; 10 ft high; 1.4 mile, 110-acre run-of-river impoundment; normal pool elevation is 226 ft NGVD

Chattahoochee River Restoration, Columbus, GA



Eagle and Phenix Dam

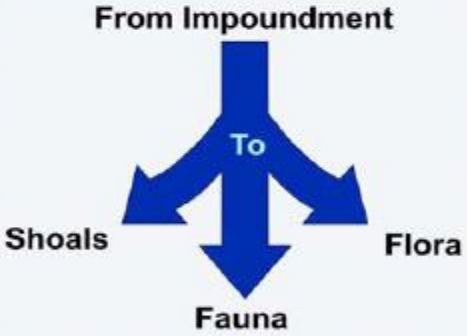
900 ft long – 512 ft overflow spillway; 17 ft high;
0.8 mile, 45-acre run-of-river impoundment;
normal pool elevation is 215 ft NGVD

Fall Line Shoals Habitat

Ecosystem Restoration Benefits

- Proposed restoration of a portion of the Chattahoochee River will create a habitat for unique fish, invertebrates, and plant communities adapted to Fall Line Shoals.

- Many of these plants and animals are intolerant of the impounded river conditions present today.

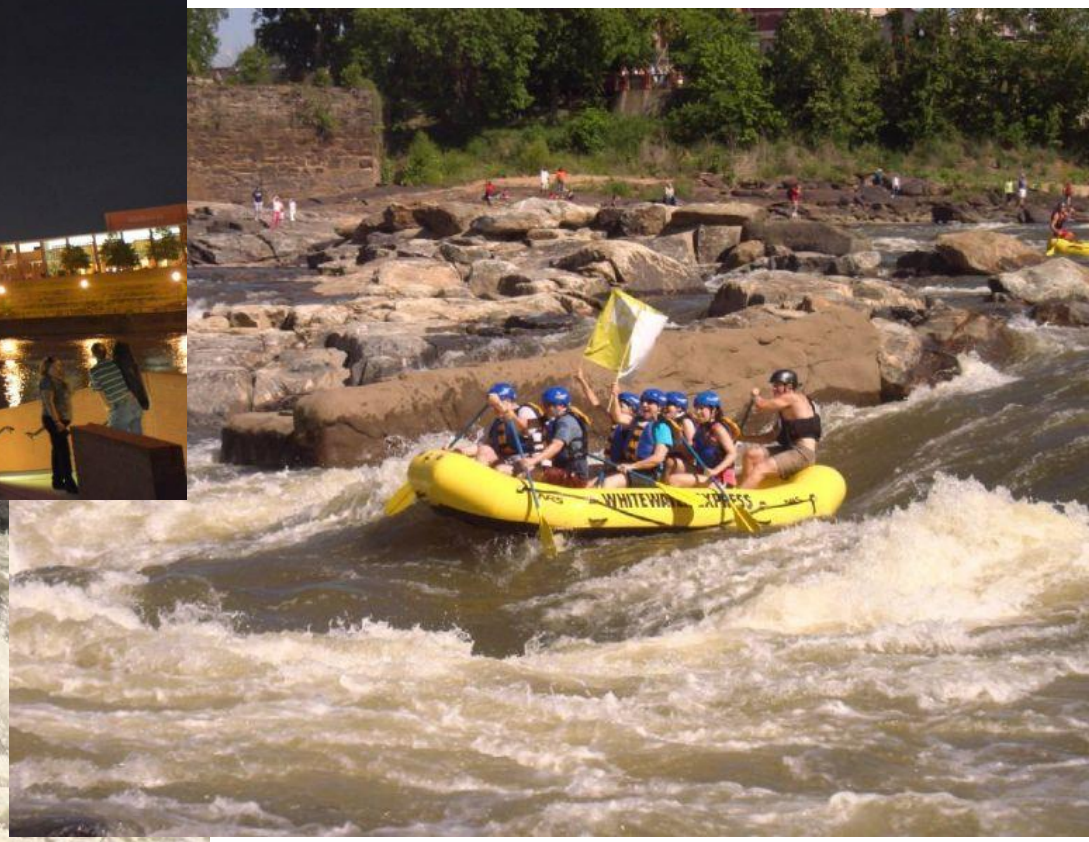


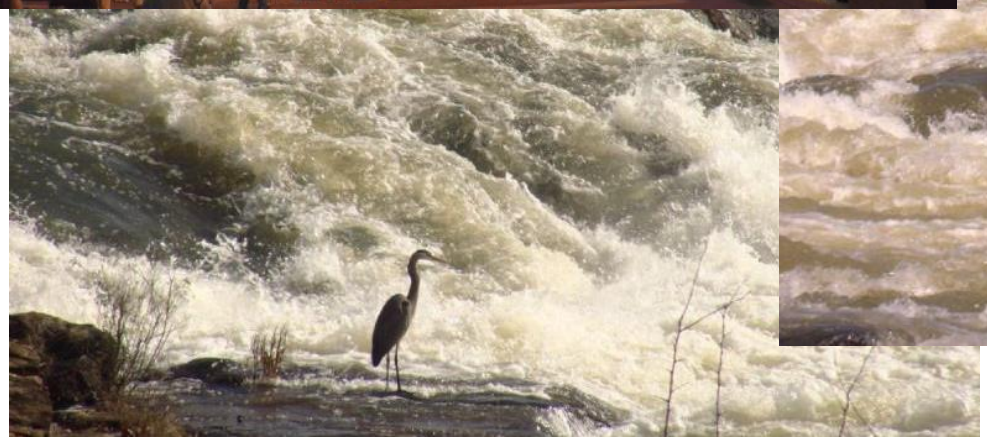
- Two of the most important species that will be restored to the Fall Line Shoals Habitat are the Shoal Bass and the Shoals Spiderlily.

- Lower water levels will expose rocky outcrops and result in the return of species like the Shoals Spiderlily.

Project Vision

Chattahoochee River Restoration, Columbus, GA





Trinity River Restoration, Dallas, TX

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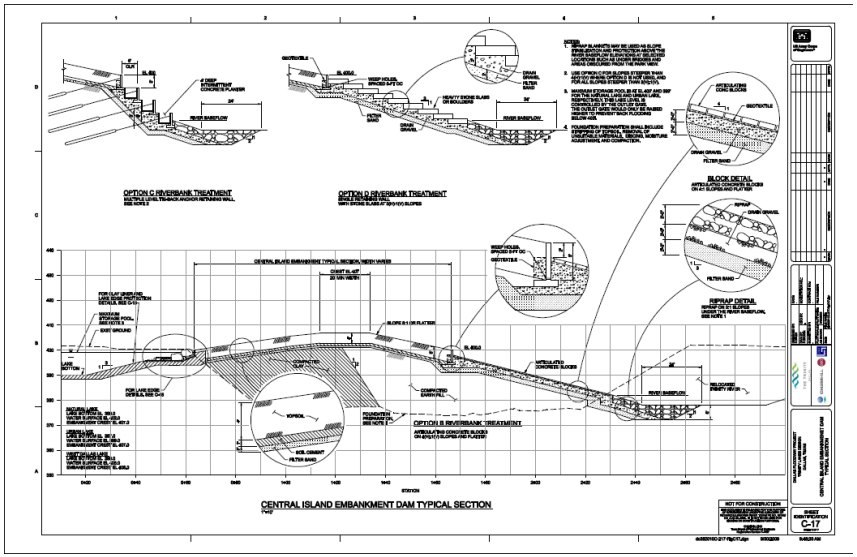
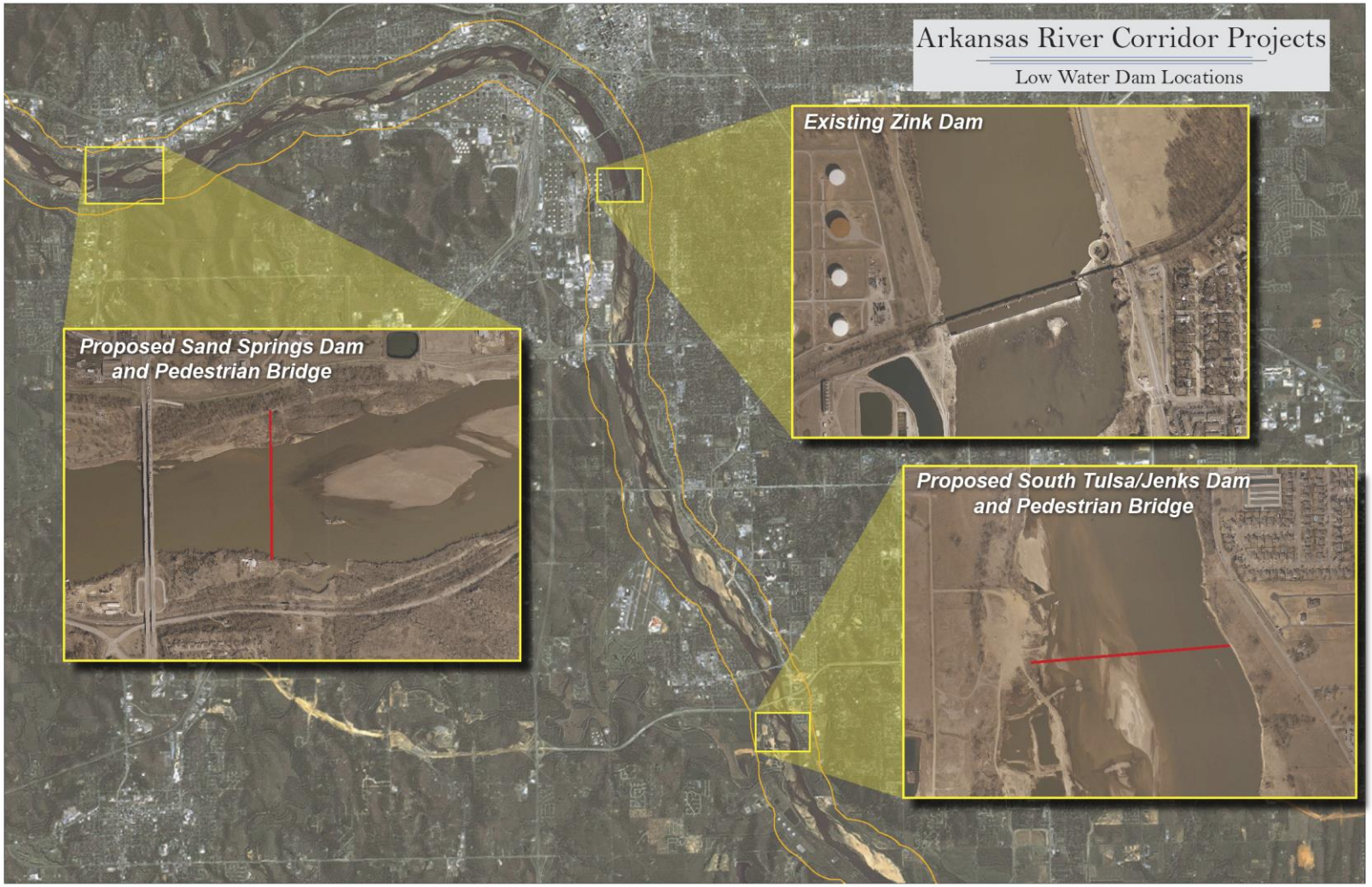
Trinity Lakes & Amenities



Arkansas River Corridor Restoration, Tulsa, OK



Arkansas River Corridor Restoration Project

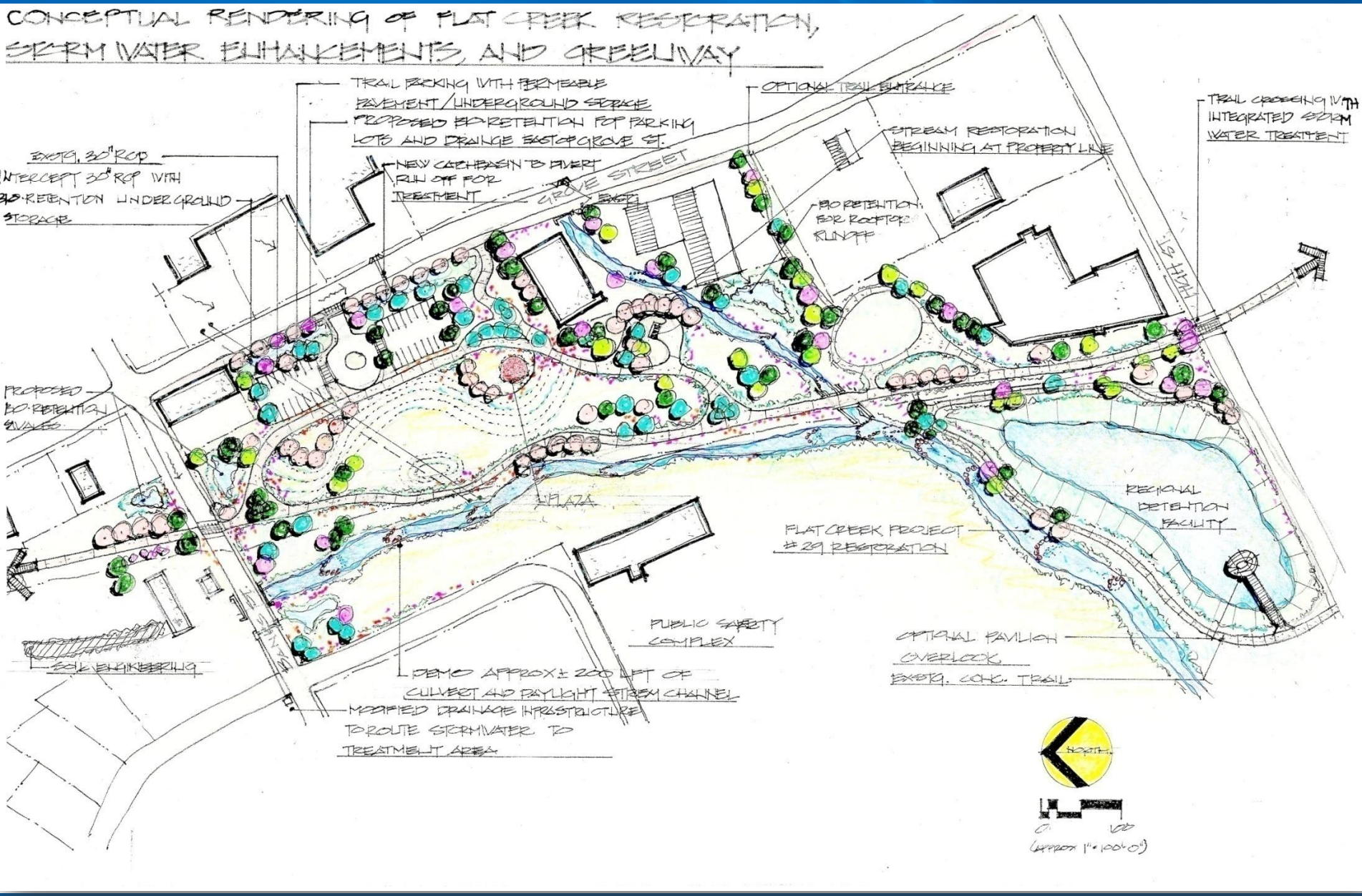
Kallang River – Bishan Park, Singapore

KALLANG RIVER BISHAN PARK

Kallang River
2008

SEPARATION BETWEEN
CANAL AND PARK

Flat Creek Restoration, Gainesville, GA




Midtown
Greenway

Multi Purpose Urban Restoration Projects have Multiple Benefits

- Projects were built
- Public was pleased
- Political support solidified
- Future projects were built
- Justified use of available funds by creating a human element
- Promoted green / sustainable city which attracts growth / redevelopment / stewardship of natural resources
- Created the opportunity for water quality and habitat improvement at reach and watershed scale
- Many others

Questions

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