



CITY OF ATLANTA

Implementing Beaver Dam Analogs in Atlanta's Nancy Creek Watershed

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CITY OF ATLANTA DEPARTMENT OF
**watershed
management**

Hazen

Mikita K. Browning, Interim Commissioner
Department of Watershed Management

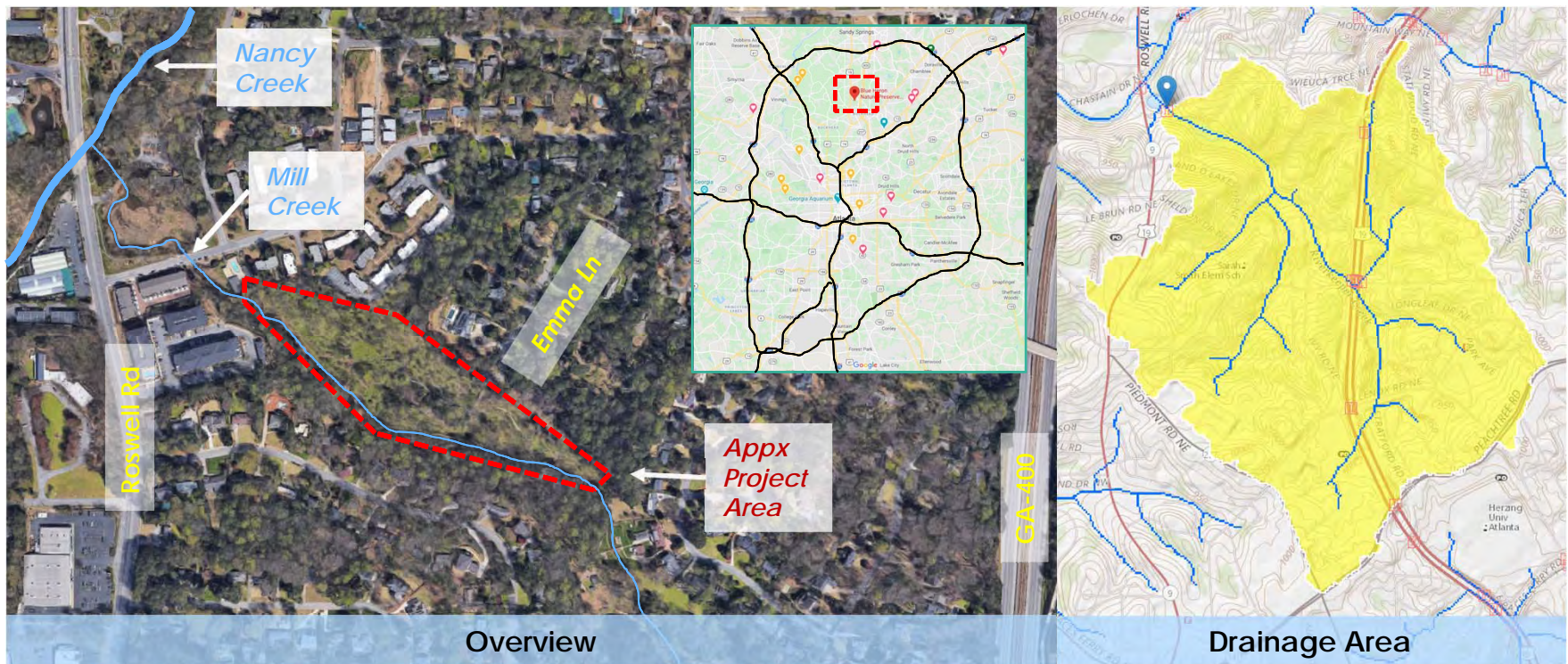
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Site Context

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Site History

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1938

Online Pond, Forested Watershed



1999

Dam Breached, Increased Urban Development



2020

Present Conditions, Nature Preserve



Historic Habitat Precedent

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Beaver activity naturally occurred on-site (~10 years ago)



Castor canadensis Distribution



Project Goals

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Implement 8.7 acres of wetland restoration via Beaver Dam Analogs (BDAs) in order to:

- Reduce urban sediment pollution to Nancy Creek
- Enhance riparian and aquatic habitat within the Preserve
- Increase flood attenuation through floodplain reconnection
- Reduced immediate site impacts during construction



Project Partners

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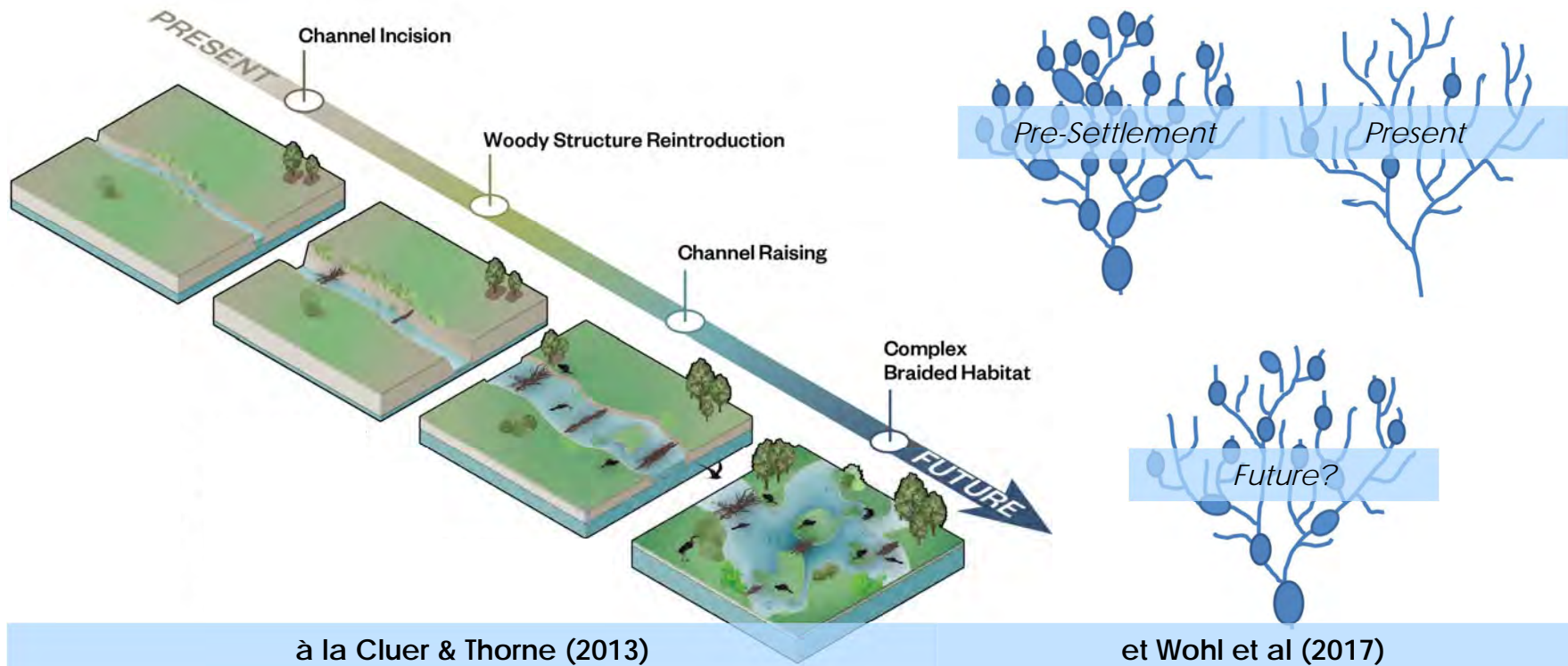


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Design Theory

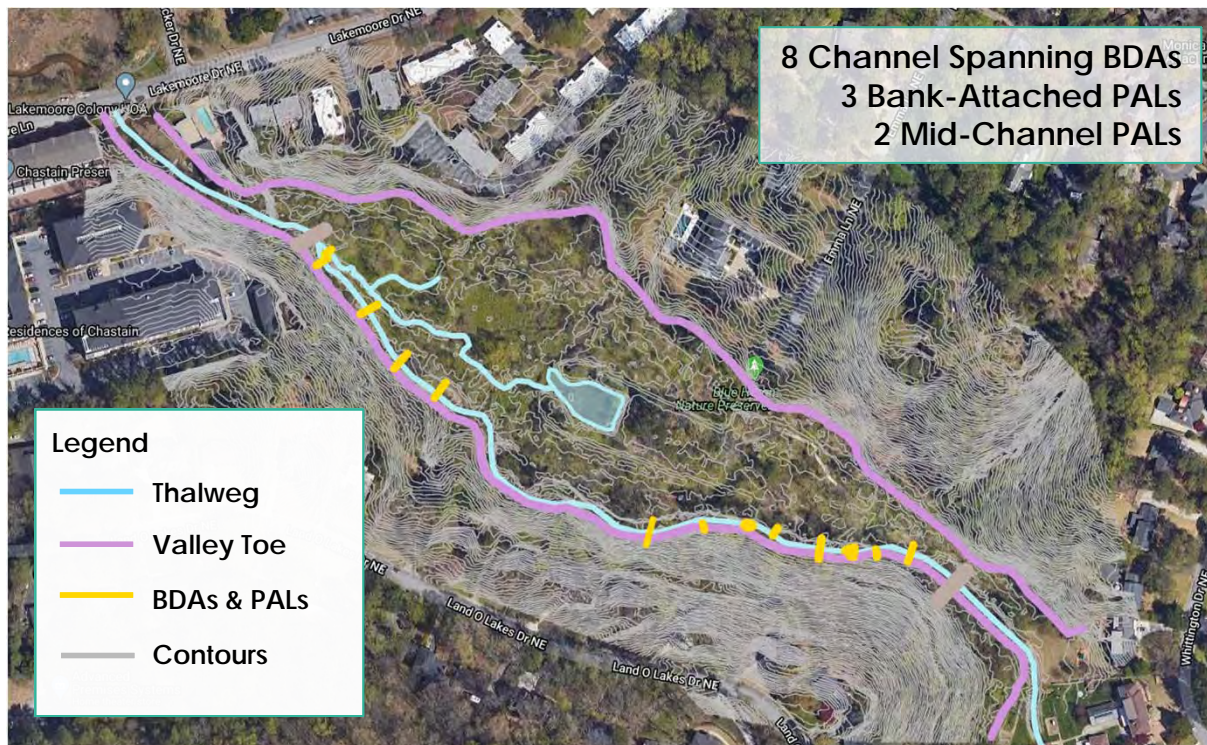
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Design Approach

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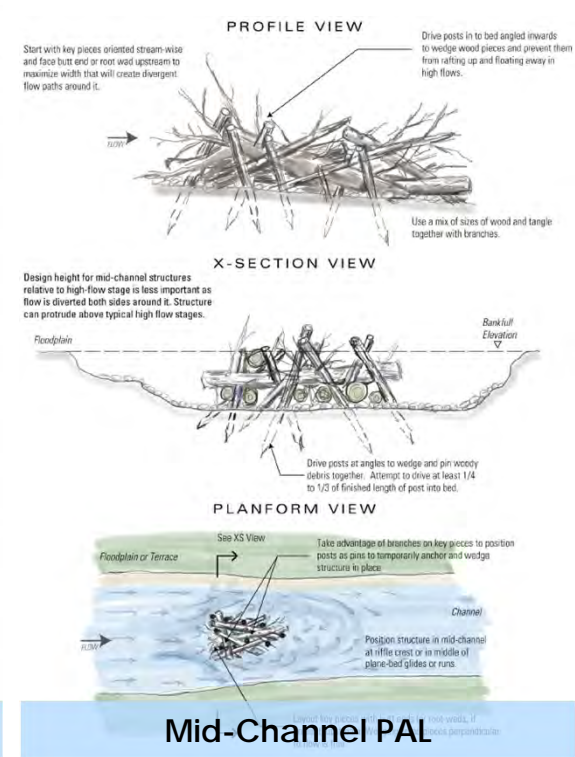
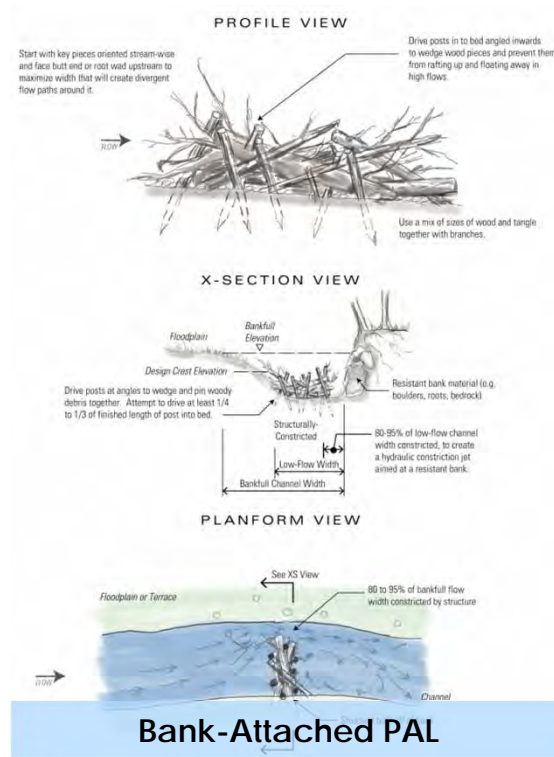
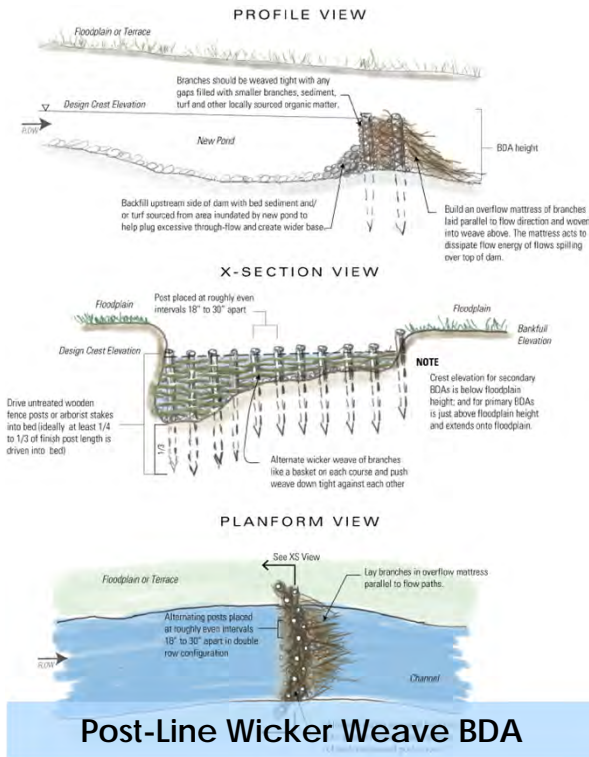
Key Steps

1. Base Mapping
2. Historic Aerial Imagery Review
3. Field Investigation & Characterization
4. Remote Monitoring Sensor Deployment
5. "Plan Set" Development
6. Permitting Agency Coordination
7. Construction & Field Engineering*



Structural Elements

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Has this been done before?

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Project Funding

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- Grant from GAEPD for US EPA 319(h)
- City of Atlanta DWM – Municipal Option Sales Tax (MOST) Match
- In kind donation
 - Blue Heron Nature Preserve Staff and Volunteers
 - University and Foundation Partners

Project Identification, Estimated Construction Fee: ~\$1,300,000

Selected Approach, Approximate Construction Fee: ~\$155,000



Permitting

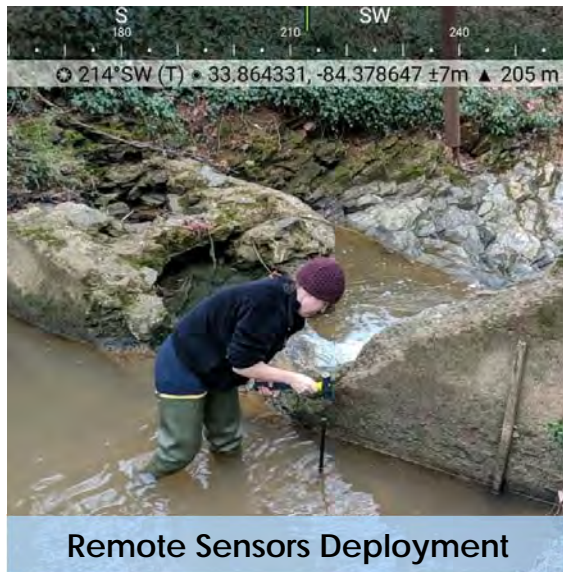
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- NWP27 Permit, Savannah District – authorization concurrence received
 - Permits **Not Needed:**
 - City of Atlanta Land Disturbance Permit
 - GA EPD Buffer Variance Permit
 - NPDES Construction Permit
- } Not a land disturbing activity



Monitoring

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Remote Sensors Deployment

Water Depth, Dissolved Oxygen, Conductivity, Temperature, Light



Visual Monitoring Stations

Time-lapse 360-Degree Imagery



Physical Monitoring

Aquatic Habitat & Geomorphic Surveys



Community Involvement

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Installing Live Stakes



Community Volunteering, Invasive Removal

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BDA Materials

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Locus & Other Hardwood for Posts



Pruning Limbs & On-site Scrub/Shrub for Weave

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BDA Construction Process

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1. Install post material via **pneumatic driver**.
2. Weave & pack material to **desired crest elevation**.
3. Plug upstream base with **mud & substrate to prevent leaks**.
4. **Repeat** Steps 2 & 3 in 6" to 12" lifts to achieve desired crest elevation.
5. Install downstream **scour mattress**.
6. Pack again. 😊



Post Installation Video



BDA Installation, Before

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BDA Installation, After

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Lessons Learned, Construction

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Structural Post Development Team

Sharpening posts can be a bigger challenge than expected



Lessons Learned, Construction

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Improperly Installed Channel-Spanning BDA

Ensure that each layer is properly woven, packed, and plugged.

Field Engineering recommended!



Lessons Learned, Construction

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Unwoven, Unpacked Material



Active End Cutting

Branches were not adequately attached to the bank contributing to end cut wash out.



Lessons Learned, Construction

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Poorly Packed Subbase at Posts



Structure Failure

Holes can lead to undermining posts and dam failure.



Lessons Learned, Construction

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Mounding with gradual increase can limit under cut forces which reduces holes and post failure potential.



Lessons Learned, Human Element

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Improper Connections to Sleepers



No Anchoring

Unintentional movement of boardwalk
Boardwalk construction was not coordinated with BDAs.



Maintenance

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On-going maintenance is necessary

- Trash removal
- Maintain desired height
- Correct/fill damage, if needed
- Ideally, beaver will adopt



Public and Stakeholder Outreach

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- Holistic thinking and strategic watershed management is crucial to realizing the benefits of stream uplift in more urbanized settings
 - Recognize and get concurrence from decision makers
 - Educate neighbors

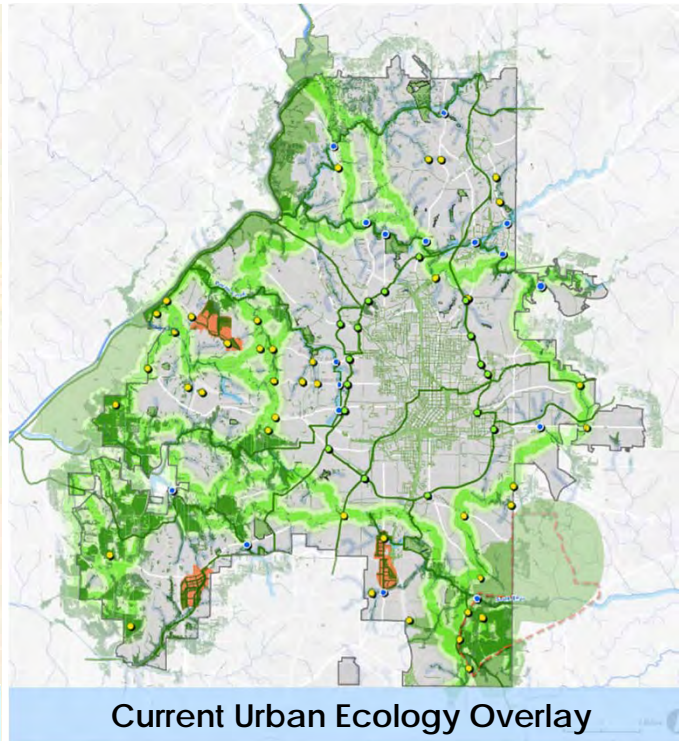


Urban Ecology Framework

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Atlanta's Core Values



Current Urban Ecology Overlay

The City of Atlanta is committed to urban ecology, tree canopy protection, & climate resilience.



Thank you to our Partners

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Q&A | Thank you!

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