Engineering Stormwater Utility
Vegetation Management

Public Listening Session #1
Hawthorne Library

City of Madison Engineering Division

November 1, 2023

Welcome! We will begin shortly…

Meeting Schedule	
5:30 – 5:40	Welcome
5:40 – 6:40	Presentation and iClicker Voting
6:40 – 7:00	Small Group Discussions
7:00	Come Back Together/Q&A & Wrap-Up

City of Madison Staff at Tonight's Meeting

- **Sarah Lerner, PLA, LEED AP, ENV SP** is a licensed professional landscape architect with a degree in Landscape Architecture from UW-Madison. Currently pursuing a graduate certificate in Sustainable Cities and Communities from Harvard Extension School.

- **Maddie Dumas, Stormwater Vegetation Coordinator** has a Master's of Science from UW-Madison. She joined the City of Madison in 2018, and previously managed 660 acres of restored prairie and wetland for a non-profit.

- **Emily Jorgensen, Conservation Technician** as an Environmental Studies degree from UW-Madison. Her career in ecological restoration has involved work with multiple local non-profits, a private ecological restoration firm, the Lakeshore Nature Preserve, and UW-Arboretum where she leads volunteer workdays.

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Meeting facilitation asks

- Ask clarifying questions as we go.

  (e.g. explain a term, or repeat a statement).
- Save discussion questions for the end.
- Practice putting yourself in others' shoes, but speak from your own experience.
- Be respectful. Be open to listening. Respect others in this meeting the way you wish to be respected.
- Recognize that personal opinions differ, there are often competing priorities, differing values, and perspectives.

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Today's Agenda

- Provide background on stormwater utility owned ponds and greenways
- Discuss the relationship between vegetation and stormwater
- Public Engagement. We want your thoughts!
  - Identify communities values and priorities on vegetation.
  - Gauge community perceptions of different vegetation.
  - Identify community concerns, worries, and what the community would like to learn more about or hear from technical experts.

City of Madison Stormwater Utility Retention Pond

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Your feedback is important!

- Focus Topic Workshops: Asking for experts to speak/present on specific information as part of larger educational series
- Sending a technical questionnaire to professionals in land management, water resources, ecology, climate change, etc.
- Issuing a Request for Proposal for a consultant review of data, science, and trends related to the top public concerns based on feedback

Plan purpose

- Create **a framework for vegetation management** for City of Madison Stormwater Utility Ponds and Greenways that is **resilient, sustainable, and aligns with stormwater utility goals** while providing **multiple ecosystem services**.
- Informs **financial budgeting and planning**.
- Establish priorities for land management activities specific to **invasive species, biodiversity, plantings and vegetation type.**
- Provides **transparent framework for maintenance**.
- Support justification for new requirements for new ponds and greenway restoration in areas of **future growth**.

What IS included in this plan.

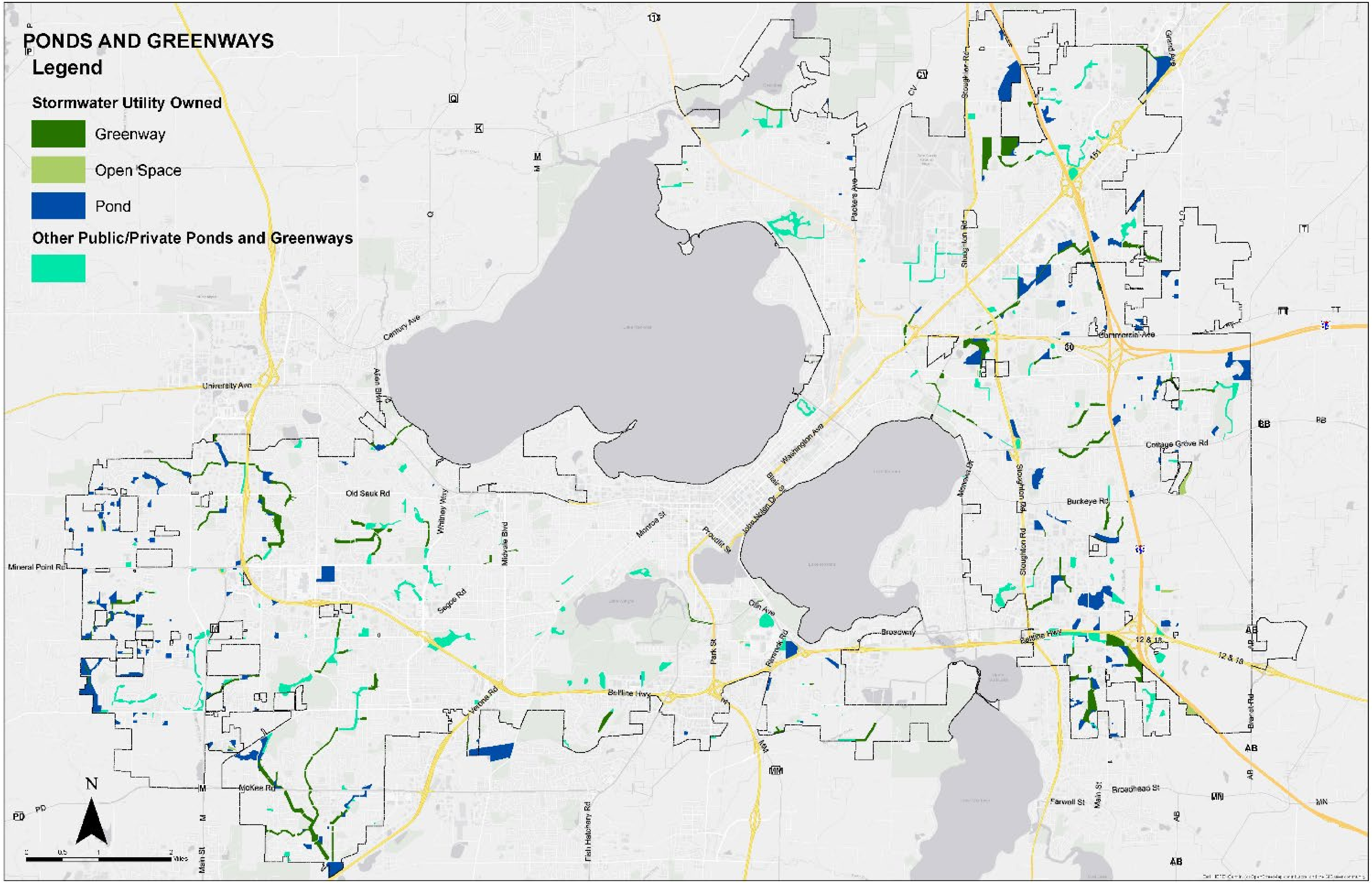
- Community identified values and priorities.
- Big picture goals and strategies related to vegetation management on ponds and greenways.
- Identification of priorities for fiscally and environmentally sustainable vegetation management.
- Input from ecologists, stormwater engineers, and other experts in the field of climate change, land management, and ecological restoration.

What IS NOT included in this plan.

- Specific improvements to individual ponds or greenways.
- Recommendations for implementing green infrastructure, or larger sustainability initiatives outside of management of vegetation in stormwater utility owned lands.
- Overall vegetation within the city and road right of way.
- Vegetation on park land.
- Citywide Urban foresty goals.
- Will not dictate a specific design, but will be a companion document guiding the process for long term vegetation management and goals.
- This plan will not determine new land to acquire or new reconstruction projects.

Definitions

- Public Stormwater System: Includes everything – public stormwater pipes, private easements, green infrastructure, parkland that conveys water, drainage ways, etc.
- Stormwater Utility Lands: all lands owned and controlled by the stormwater utility.
- Detention Pond aka “Dry Detention Pond”: Typically dry large area designed to “detain” or hold water during flood events, but they are not designed to retain water.
- Retention Pond aka “Wet Detention Pond”: A large area designed to hold water during flood events, but has a permanent pool of water that helps remove sediment and nutrients from stormwater typically used as a water quality practice.
- Infiltration or Bioinfiltration Basin: Designed to infiltrate, or soak stormwater into the ground or through an engineered soil mix to filter the stormwater.
- Greenways: An open area of land or drainageway, the primary purpose of which is to carry storm water on the ground surface in lieu of an enclosed storm sewer pipe. In addition to their principal use for storm drainage, greenways may serve multiple purposes including vehicular and/or pedestrian traffic, sanitary sewer, water main or, storm sewer corridor's, stormwater basins, open space, park development and other related uses.


PONDS AND GREENWAYS
Legend
Stormwater Utility Owned
Greenway
Open Space
Pond
Other Public/Private Ponds and Greenways
N
Miles
Century Ave
University Ave
Allen Blvd
Old Sauk Rd
Whitney Way
Midvale Blvd
Mineral Point Rd
Segoe Rd
Monroe St
Proudfit St
John Nolen Dr
Blair St
Washington Ave
Olin Ave
Park St
Rimrock Rd
Broadway
Beltline Hwy
Verona Rd
McKee Rd
Main St
Fish Hatchery Rd
Packers Ave
Stoughton Rd
Grand Ave
Commercial Ave
Cottage Grove Rd
Buckeye Rd
Monona Dr
12 & 18
Farwell St
Broadhead St
Bremel Rd

Definitions

- Multiple ecosystem services: Multiple goods or services that produce the life-sustaining benefits from nature such as clean air and water, pollination, flood control, biodiversity, habitat, etc.
- Novel ecosystem: human-built or modified.

Definitions from Missouri Invasive Plant Council

- Native Plant: Native plants originally occur within a region as the result of natural processes and are adapted to local climate and soils. They have co-evolved with native insects and wildlife and are critical to ecosystem functions. For this conversation, native plants are those species present prior to wide-spread European settlement. Map of Wisconsin Original Vegetation
- Non-native: Non-native plants are those introduced (intentionally or accidentally) to a new place or new type of habitat. Historically, most of these introductions have resulted from human activities. Since they did not evolve locally over thousands of years, their presence can often have negative impacts on endemic ecosystems. The words “exotic,” “alien,” and “introduced” are synonyms for “non-native.”
- Aggressive Plant: In today’s conversation, this is usually because of human-caused disturbances, spread rapidly and can out compete other plant species. Aggressive plants can be native or non-native, and they may be aggressive in some situations but not others.
- Invasive Plant: An invasive plant species is an aggressive, non-native species whose presence causes or is likely to cause economic harm or environmental harm. These species grow and reproduce rapidly.

Why are plants on stormwater lands important?

- These lands are connected to our water resources.
- How we manage vegetation within them can have implications to water quality, flooding, erosion, and other environmental impacts.

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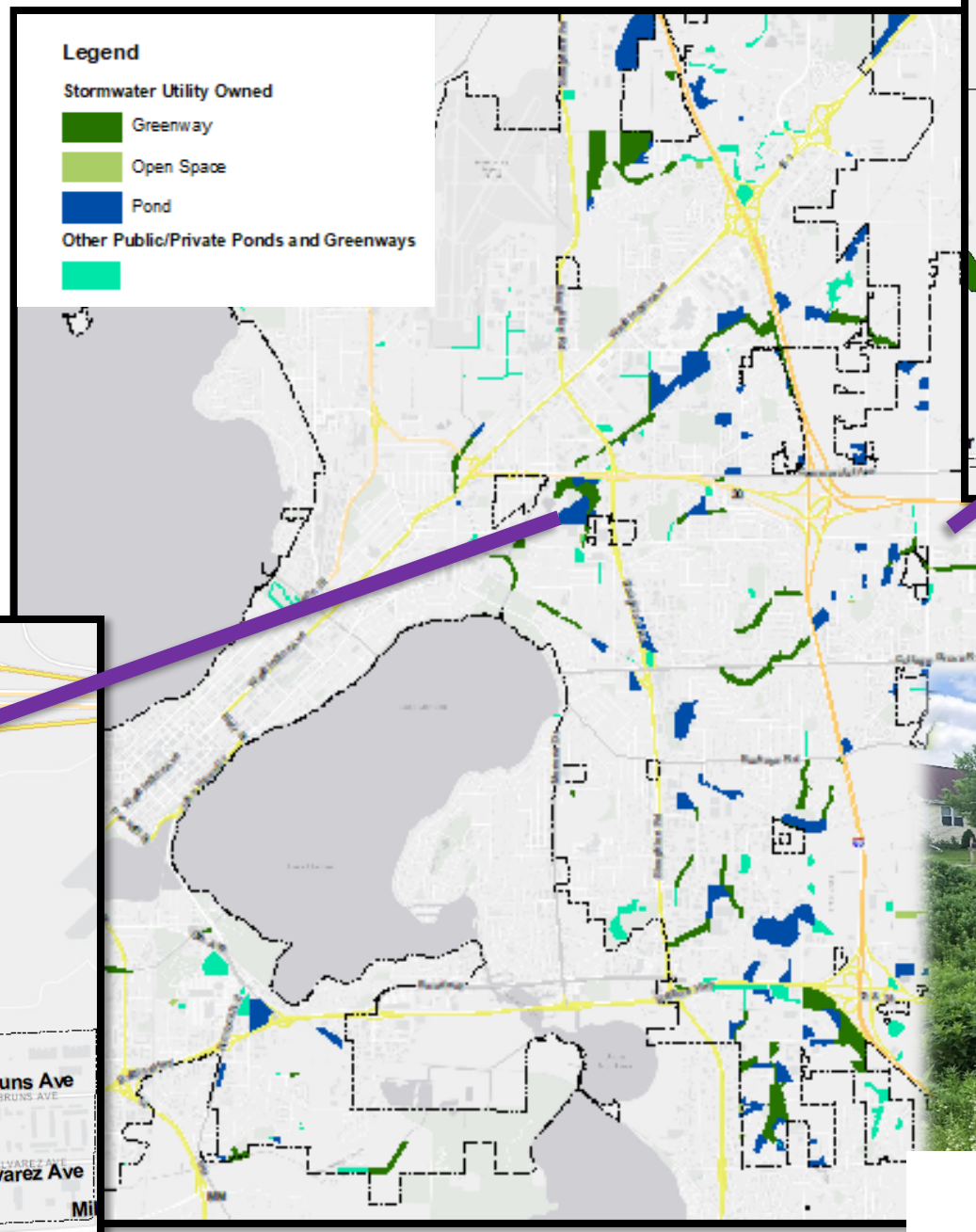
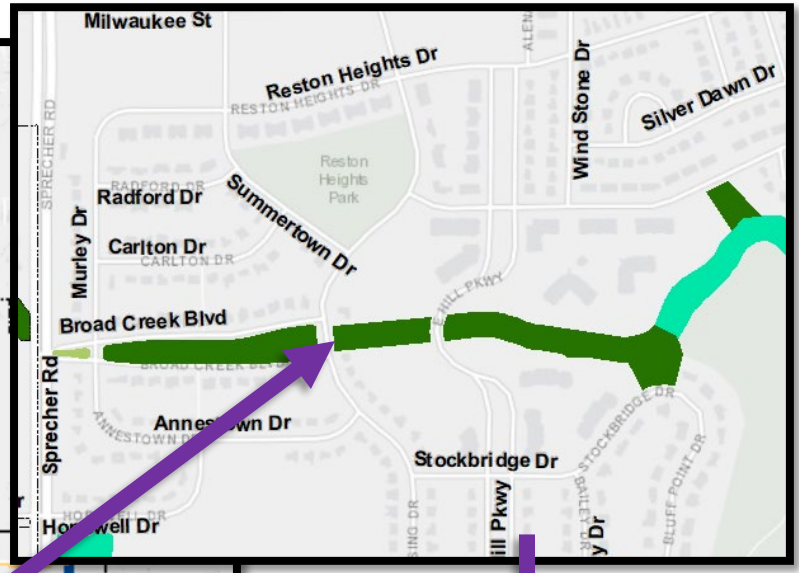
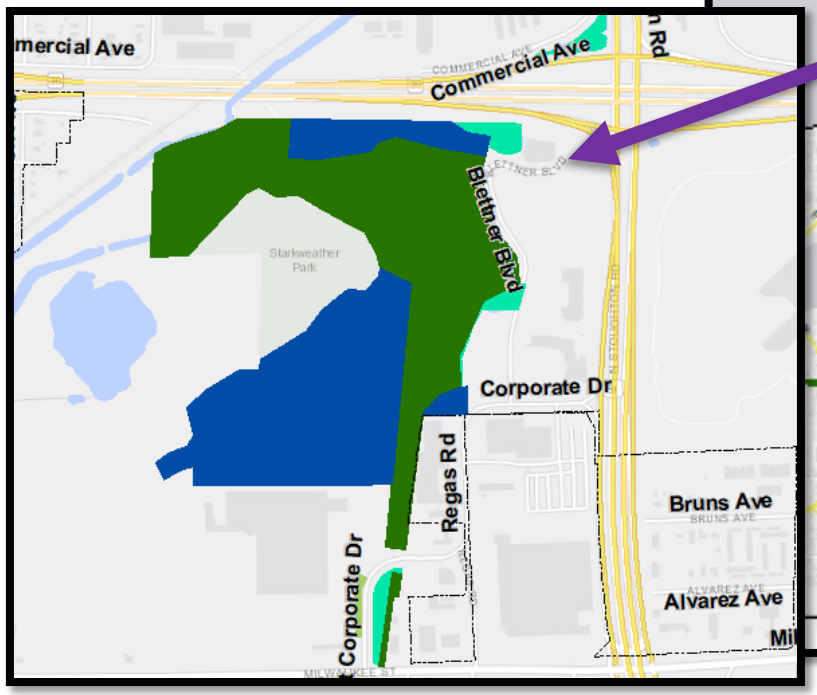
What is a pond and greenway?

What land are we talking about?



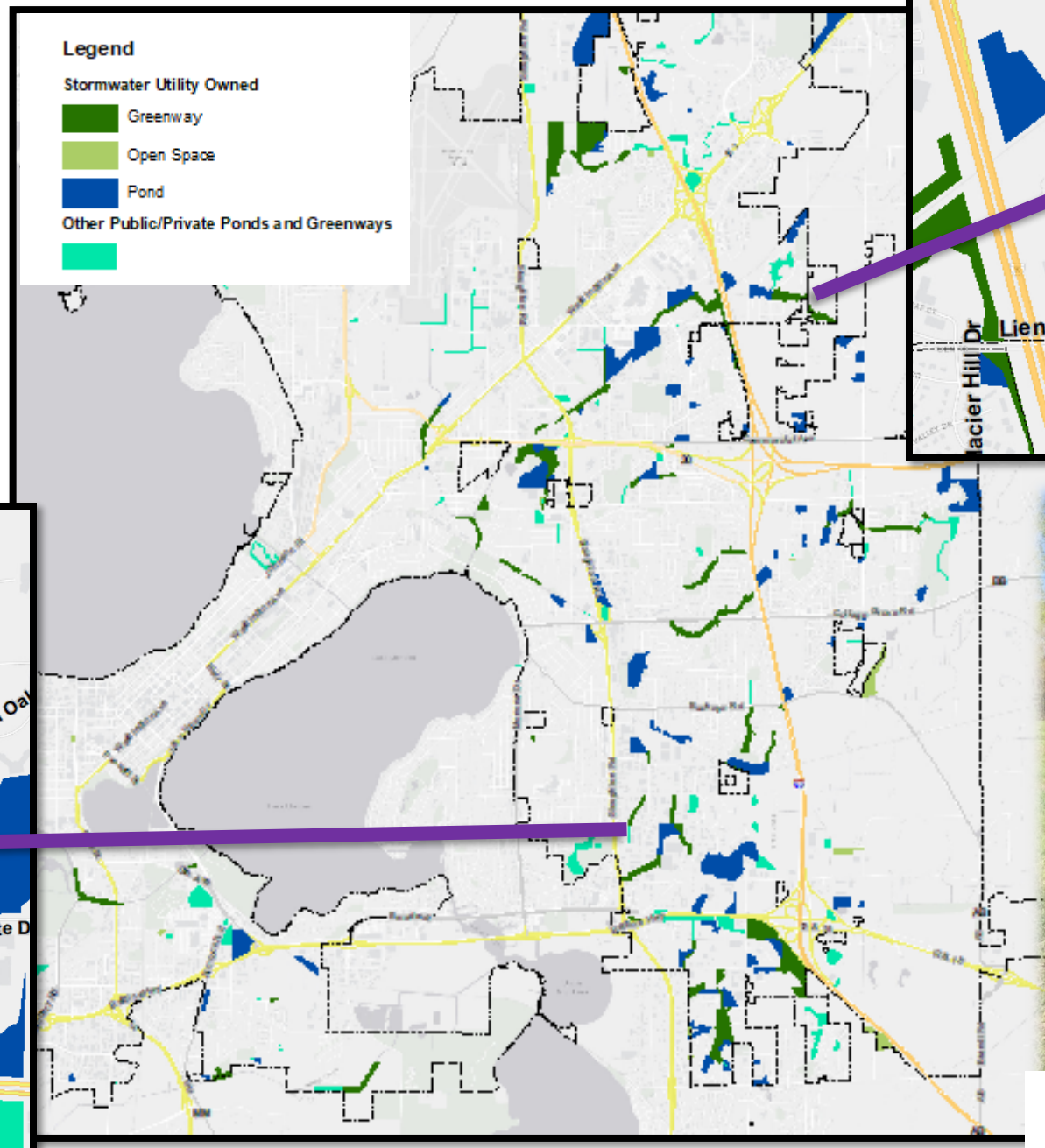


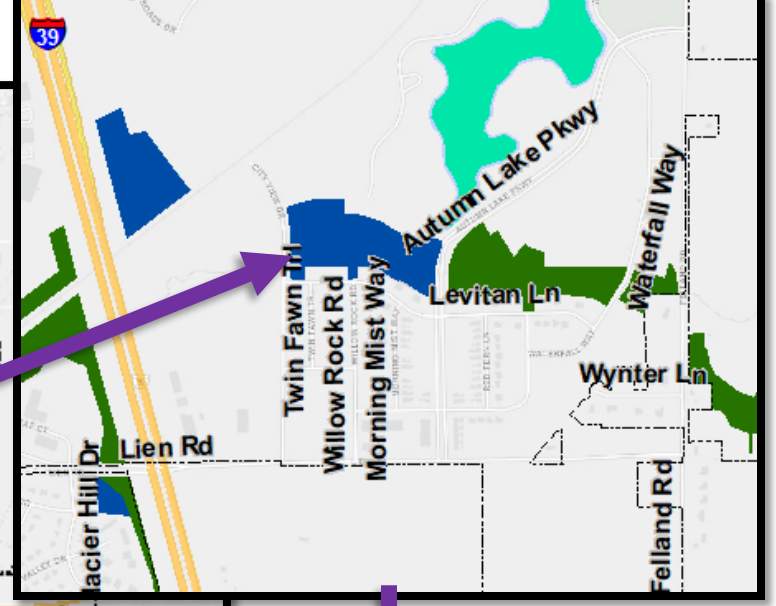


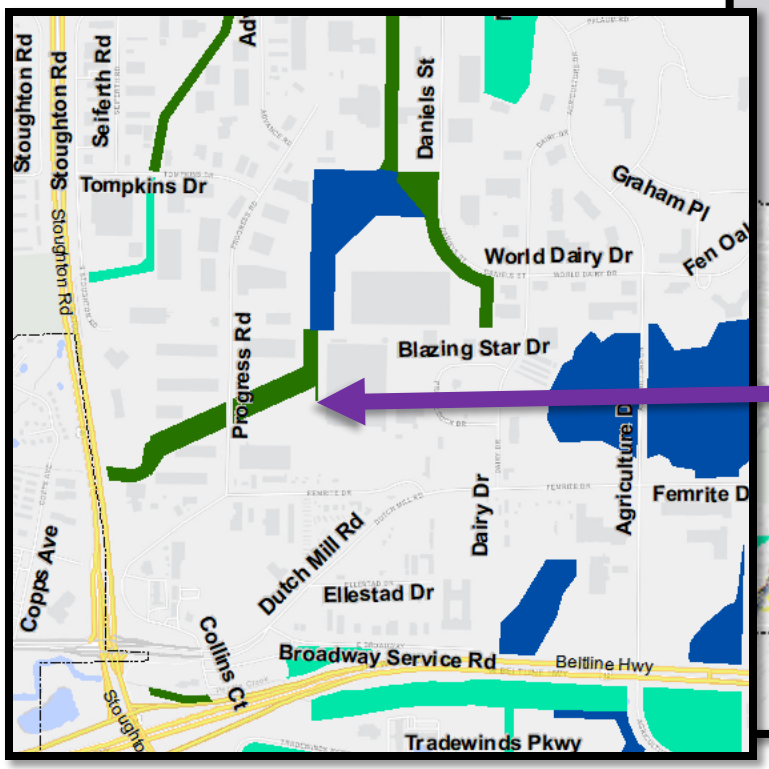
City of Madison Stormwater Utility Greenway

What is a pond and greenway?

What land are we talking about?







City of Madison Stormwater Utility Greenway

Background and History

- 1970’s - open drainage ways conveyed water directly to wetlands or waterways, seeded with turf and grass and mowed
- 1983 - first stormwater ordinance required detention
- 1995 – engineering required ponds and greenways planted with native prairie and wetland species and had varied success
- 1990’s - trees and shrubs were discouraged because they create bare groundlayer
- Prior to 2003 – vegetation maintenance limited to mowing by the Parks Division, and many areas became woody, urban woodlots with aggressive shrubs and trees
- 2003 – Engineering assumed routine maintenance and initiated program to improve overgrown ponds and greenways by removing invasive trees and shrubs with brush clearing and helped return land to mowable conditions
- 2011 – Selective Prairie Management Program to mow only targeted weed areas to preserve prairies and improve invasive control – proved to be cost effective and better option for species preservation
- 2017 – The design philosophy changed and considered including trees within greenway, as well as tree preservation
- 2018 – Greenway Vegetation Coordinator position created to manage all engineering stormwater utility lands
- 2019 – Seasonal trainee positions created for summer work
- 2022 – Conservation Technician position created to help coordinate specialized vegetation work
- 2023 – Mapped all vegetation in GIS maintained by Engineering Stormwater and developed a Tier System as part of a comprehensive analysis of all lands within the stormwater utility and their various levels of health and ecological integrity

Where are we today?

- > 1,500 acres of land. Native restoration efforts managed by two full time ecology staff, two interns, eng mowing crews, & assistance from Operation Fresh Start.
- 82 acres of these are maintained by developers based on new requirements for establishing native ecosystems which began in 2019.
- 9,000 acres of future park and open space (includes ponds and greenways) in adopted future land use plans still to come into the City of Madison.

City of Madison Stormwater Utility
Retention Pond

Vegetation maintenance is now…

- Monitoring
- Mowing
- Targeted Invasives Control
- Prescribed Burns
- Browsing (Goats!)
- Ecological Restoration Contractors

- Native Seeding - Collected 275 lbs of native seed with over 90 different plant species in 2022!
- Planted over 7,000 native plants in 2022
- Propagation of our own plants

By the numbers….

- Stormwater modeling data shows there is approximately **42,600 acres of landscaped areas in the City of Madison.**
- The stormwater utility owns approximately **1,500 acres of vegetated land (3.5%).**
- The Parks Division includes > 5,500 acres of parkland (12.9%)
- **85% of the trees in Madison are on private property** (Urban Forestry Task Force Report, 2019)

Vegetation on ponds and greenways

Type of Land	Acres
Mixed Herbaceous Vegetation	713
Native Vegetation	257
Other	<1
Turf	36
Unknown	145
Unmanaged Woods	237
Grand Total	1391

What status are they in?

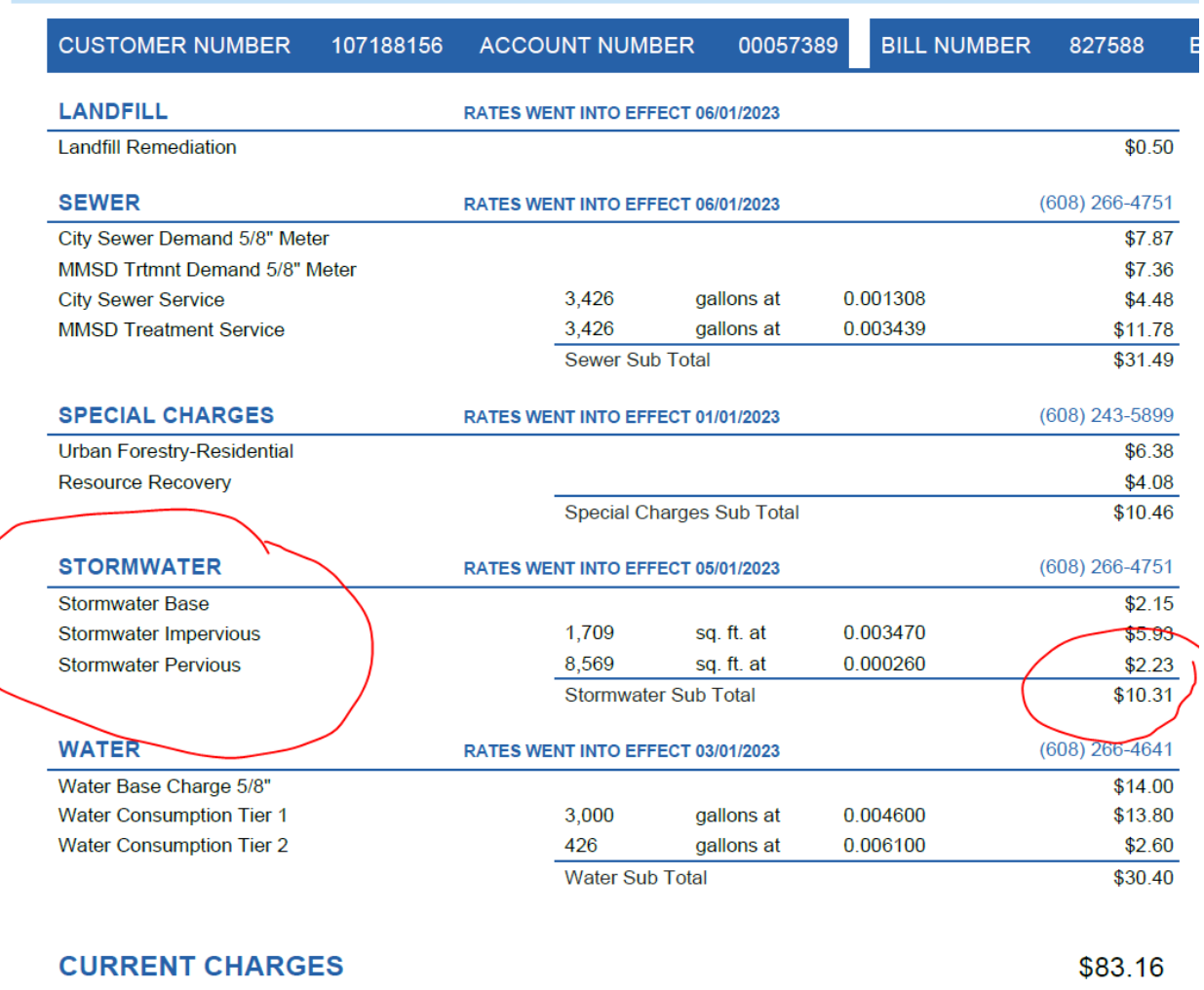
Tier 1: Most biodiversity and native ecosystem.

Tier 5: Invasive species monoculture.

Tier Category	Acres
Tier 1	7
Tier 2	120
Tier 3	106
Tier 4	227
Tier 5	924
Tier 6	2

Funding

- All stormwater related operations and capital expenses are funded through a charge on your monthly water bill called “stormwater”.
- The average single family house pays **$11/month** which is used to fund **ALL the operations of the entire stormwater sewer system as well as funding capital projects.**
- **Not funded from property taxes.**



CUSTOMER NUMBER	107188156	ACCOUNT NUMBER	00057389	BILL NUMBER	827588	E
LANDFILL	RATES WENT INTO EFFECT 06/01/2023					
Landfill Remediation						$0.50
SEWER	RATES WENT INTO EFFECT 06/01/2023					(608) 266-4751
City Sewer Demand 5/8" Meter						$7.87
MMSD Trtmnt Demand 5/8" Meter						$7.36
City Sewer Service	3,426	gallons at	0.001308			$4.48
MMSD Treatment Service	3,426	gallons at	0.003439			$11.78
	Sewer Sub Total					$31.49
SPECIAL CHARGES	RATES WENT INTO EFFECT 01/01/2023					(608) 243-5899
Urban Forestry-Residential						$6.38
Resource Recovery						$4.08
	Special Charges Sub Total					$10.46
STORMWATER	RATES WENT INTO EFFECT 05/01/2023					(608) 266-4751
Stormwater Base						$2.15
Stormwater Impervious	1,709	sq. ft. at	0.003470			$5.93
Stormwater Pervious	8,569	sq. ft. at	0.000260			$2.23
	Stormwater Sub Total					$10.31
WATER	RATES WENT INTO EFFECT 03/01/2023					(608) 266-4641
Water Base Charge 5/8"						$14.00
Water Consumption Tier 1	3,000	gallons at	0.004600			$13.80
Water Consumption Tier 2	426	gallons at	0.006100			$2.60
	Water Sub Total					$30.40
CURRENT CHARGES						$83.16

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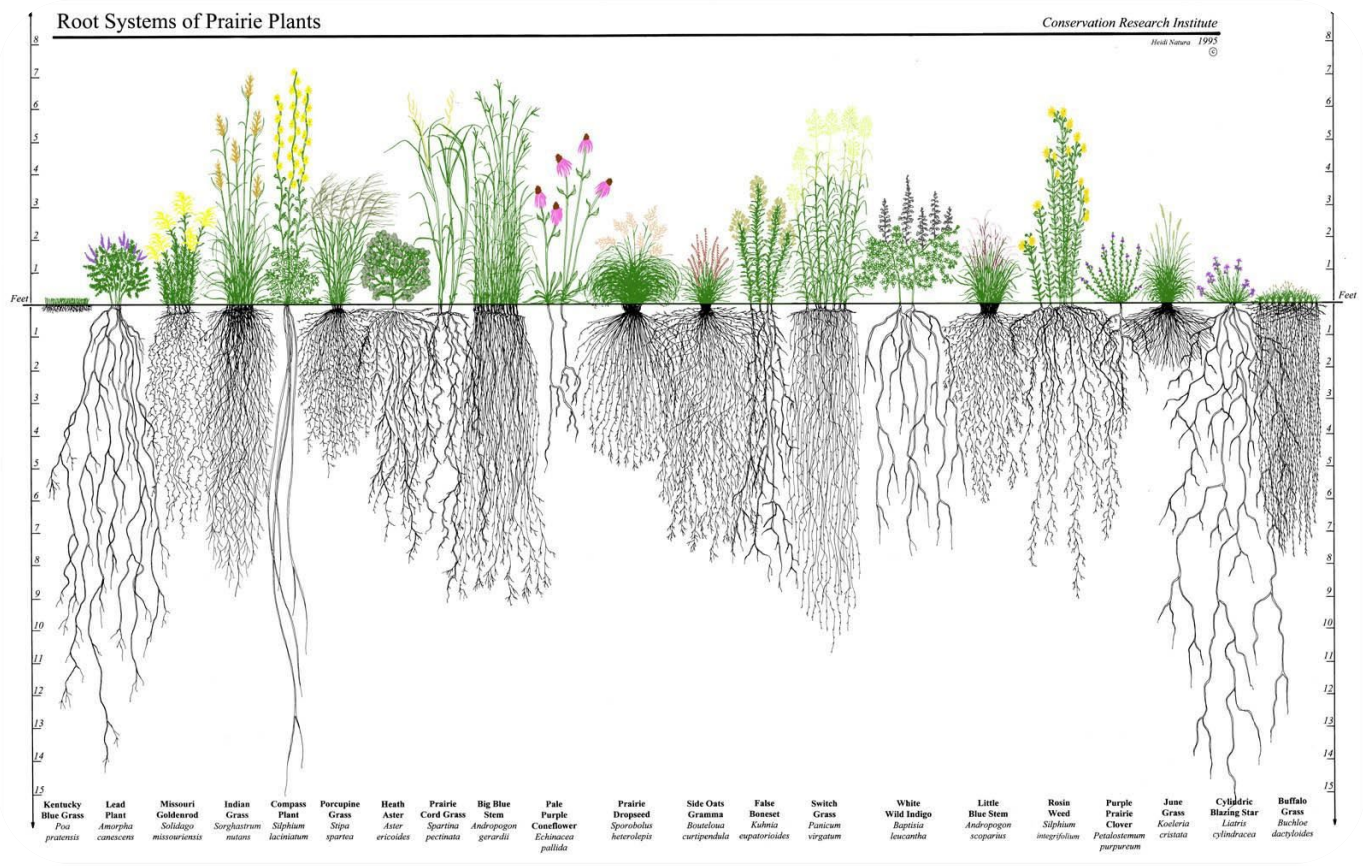
Why are plants important in the stormwater lands?

- Infiltration
- Slope Stabilization and Erosion Control
- Decreasing Flooding (increased stormwater concentration time)

City of Madison Stormwater Utility
Retention Pond

Infiltration

- Deep root systems improve the soil's ability to infiltration stormwater. Prairie root systems can grow up to 16' deep!
- Lots of fibrous roots create channel through the soil increasing soil porosity.
- Reduces compaction.
- Native switchgrass 7.5in/hr compared to urban turf at .29 in/hr



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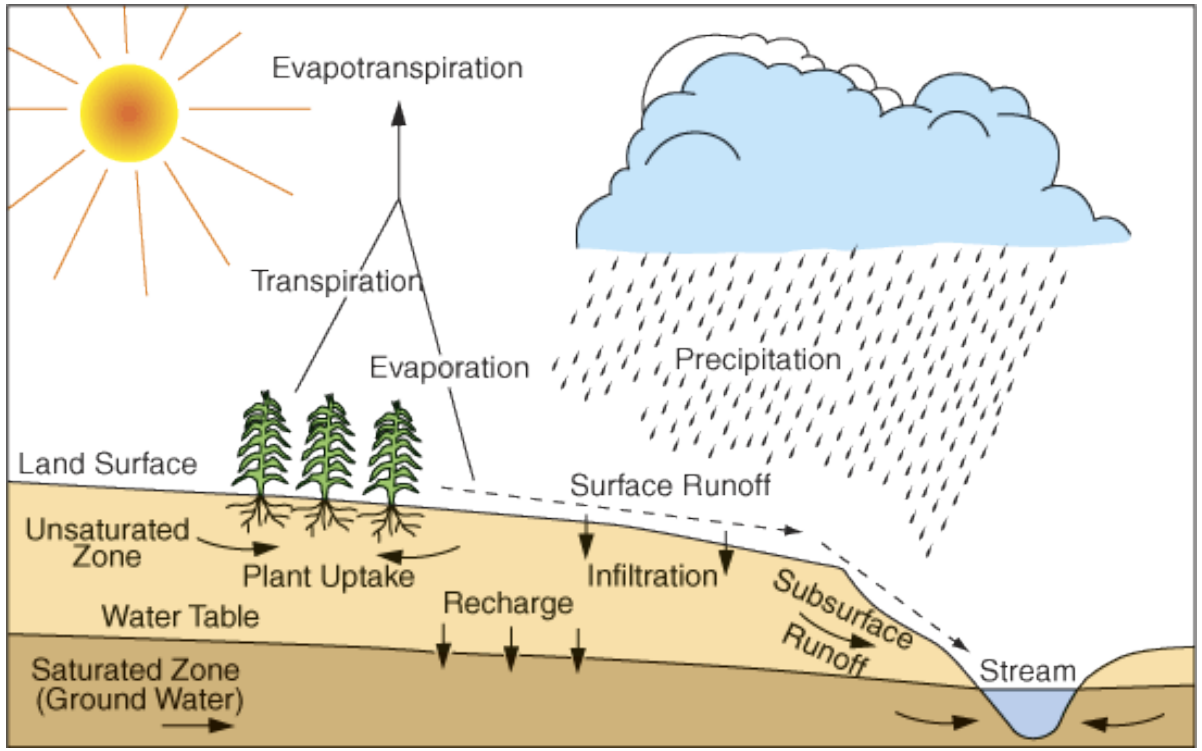
Why this is important.

- Decreases stormwater runoff flow rates = how much & how fast runoff moves
- Decreases the volume of stormwater runoff = how much is runoff
- Preserves stream base flows
- Reduces thermal impacts of runoff
- Reduces pollutant loading directly into waterways from runoff
- Recharges groundwater
- Promotes retention and breakdown of contaminants in soil, before entering aquifer or waterway
- Reduces soil erosion which leads to decreased water quality



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Slope Stabilization and Erosion Control

- Deep root systems stabilize soil and erosion.
- Root systems hold onto soil.
- Herbaceous groundlayer can hold together soils on slopes, with low susceptibility to uprooting.
- Dense heavily wooded woodlots that do not let light reach the understory are not good for stormwater. The increase erosion and sediment loss – contributing to nutrient loading in our waterways.

Tenney Park Lagoon Shoreline Erosion

City of Madison Stormwater Utility Greenway

Decreasing Flooding by Increasing Storm Concentration Time

- Vegetation intercepts water, and slows the velocity.
- This increases the amount of water that will infiltrate soil, compared to runoff.
- This also allows particulates to settle out of the water, keeping them from entering our waterways.

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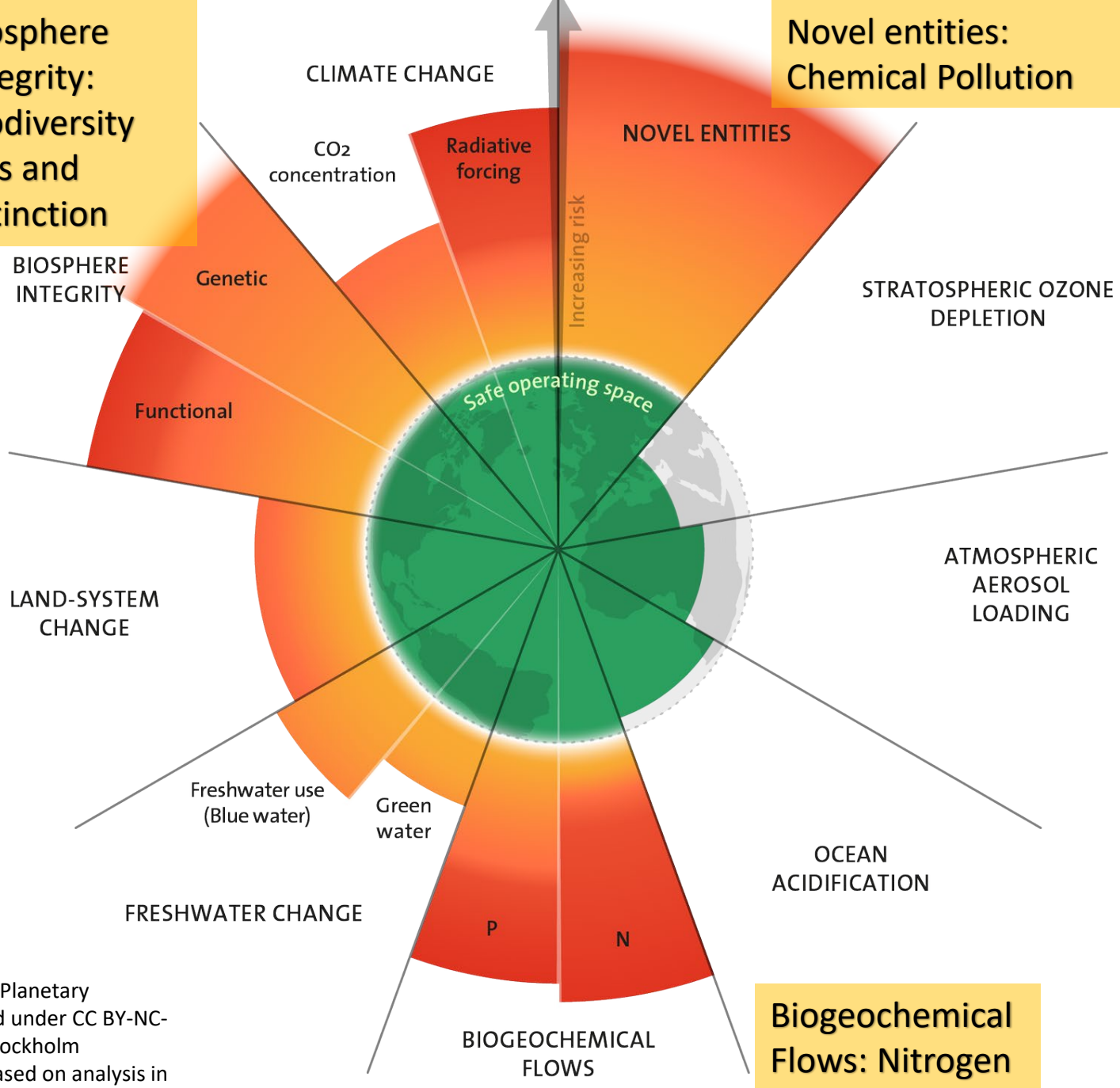
What are other ecosystem services they provide?

- Urban Canopy: Dane County Office of Energy & Climate Change Tree Working Group created online mapping tool to identifies communities that could most benefit from increased tree canopy
- Pollinator Habitat: The greatest threat to native pollinators is habitat loss, degradation and fragmentation – Wisconsin DNR
- Carbon storage: prairie systems contain more soil organic carbon than any other ecosystem – MN Board of Water and Soil Resources
- Biodiversity – United Nations Climate Action Group calls Biodiversity "our strongest natural defense against climate change"
- Wildlife Habitat – Urban Refuge: How Cities Can Help Solve the Biodiversity Crisis - Yale Environment 360

We live in an increasingly more complex world.

Planetary Boundaries

"Crossing boundaries increases the risk of generating large-scale abrupt or irreversible environmental changes. Drastic changes will not necessarily happen overnight, but together the boundaries mark a critical threshold for increasing risks to people and the ecosystems we are part of."



The 2023 Update to Planetary Boundaries. Licensed under CC BY-NC-BY 3.0. Azonte for Stockholm Resilience Centre, based on analysis in Richardson et all 2023.

We live in an increasingly more complex world.

- What is the most important local environmental priority? There are many and they sometimes seem to contradict each other. Not necessarily always a good vs bad option. Examples:
  - Maximize trees as carbon storage.
  - Remove invasive and non native aggressive trees to restore biodiverse ecosystems – which impacts soil carbon storage.
  - Establish urban canopy throughout the city to improve air quality.
  - Reduce the amount of leaves that enter our waterways to improve water quality.
  - Expand beekeeping ordinances to increase honeybees for food systems.
  - Expand habitat for native pollinators that are competing with honeybees.

How can we move forward?

Your help!

- We will ask a series of questions related to community values and priorities.
- We will break out into groups to discuss concerns, issues and report out.

Feedback from these meetings will be used to seek additional expertise on the communities top concerns.

Breakout Discussion – 20 Minutes

- Issues and Opportunities – 20 minutes
  - At each table, fill out the large poster, what is working, what concerns you the most, what do you want to hear about.
- Report Out

What's working well?	What concerns you the most?	What aren't you sure about? Or want to hear more about from experts?

Next Steps

- Please fill it out the comment card, asking you to rate how this meeting and so we know what to work on, also let us know what you would like to hear more about..

- Online Survey
- Comment Form – Please Complete and Turn In
- Staff will Review “What we Heard”
- Update the Board of Public Works
- Solicit Input from Technical Experts in the field of ecology, stormwater, climate change, vegetation, land managers, etc.

Contact

- ENland@cityofmadison.com

- Project Webpage:
https://www.cityofmadison.com/engineering/projects/StormVMP

- Public Information Officer: Hannah Mohelnitzky, hmohelnitzky@cityofmadison.com
- Sign-up for project email updates on the website
- Everyday Engineering Podcast
- Facebook – City of Madison Engineering
- Twitter – @MadisonEngr

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