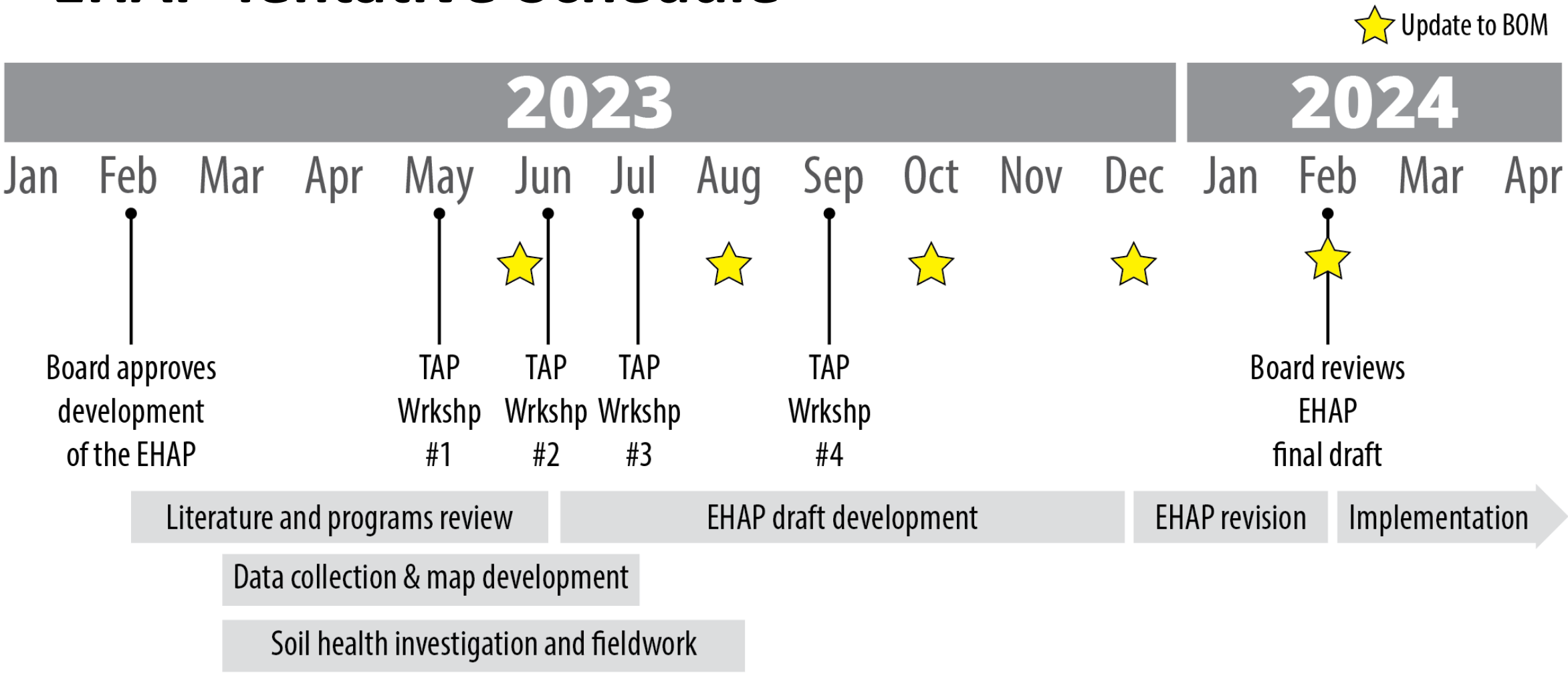
RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT

Ecosystem Health Action Plan

Board of Managers Workshop

August 17, 2023

EHAP Tentative Schedule



Technical Advisory Panel

Cities

City of Chanhassen

City of Chaska

City of Eden Prairie

City of Minnetonka

City of Bloomington

City of Shorewood

Counties

Hennepin County

Carver County

State

MN Board of Water and Soil Resources

MN Department of Natural Resources

Federal

Natural Resources Conservation Service

US Fish and Wildlife Service

Consultants

EntoVentures (Dr. Ann Journey)

BARR Engineering consultants

Districts

Carver Soil & Water Conservation District

Nine Mile Creek Watershed District

RPBCWD Citizen Advisory Committee

RPBCWD manager (Jill Crafton)

RPBCWD staff

Technical Advisory Panel – Workshop Series

Workshop 1 – May 18

- Define a healthy urban ecosystem
- Identify primary challenges to a healthy urban ecosystem

Workshop 2 – June 15

- What are we currently doing to achieve a healthy urban ecosystem?
- What's not being addressed?

Workshop 3 – July 20

- How can we address gaps in ecosystem protection/improvement?
- Where can we be most effective?

Workshop 4 - TBD

- How will we work together?

What is a healthy urban ecosystem?

Workshop 1 Results

A Healthy Urban Ecosystem is a balance of natural and developed spaces.

Biologically diverse, layered, and connected aquatic, terrestrial, and subterranean habitats and wildlife.

Resilient to climate change including intense storm events and warming average temperatures.

Functional ecosystem services such as water cycling, nutrient cycling, and food webs.

Native wildflowers, grasses, shrubs, and trees are incorporated into the built environment.

Integrates people into the natural environment through trails, parks, & natural spaces for leisure, recreation, and travel.

Ecologically knowledgeable population of residents, business owners, and property managers.

Lawns are minimized and alternative lawns such as bee lawns and meadow lawns are more common than turfgrass.

Developed spaces incorporate green infrastructure to mimic natural ecosystem functions.

What are the barriers to a healthy urban ecosystem?

Workshop 1 Results

Summary of identified barriers

Development

- Pressure to develop remaining open land to maximize profit and tax revenue
- Conflicting development priorities
- Housing demand
- Lack of enforcement to protect natural areas

Regulations/Policies

- Ineffective or lack of protective regulations
- Oppositional ordinances
- Competing regulations and policies
- Inconsistent approaches across boundaries

Habitat/Ecosystem Concerns

- Climate change – increased rainfall intensity, warmer average temps
- Altered hydrology
- Fragmented habitats
- Terrestrial and aquatic invasive species

Resource Availability

- Lack of funding, staff, & contractors to manage or maintain natural spaces and green infrastructure
- Lack of information or research

Society/Knowledge

- Apathy toward healthy ecosystems
- Lack of awareness, knowledge, understanding
- Differing generational priorities & values
- Social norms & resistance to change
- Societal divisiveness & trust in science

Government Organization

- Resistance to change within organization
- Competing priorities within organization
- Lack of coordination & cooperation within and between organizations
- Lack of leadership/decisionmaker support
- Lack or unwillingness for long-term planning

What are the gaps in what we're doing?

Workshop 2 Results

Summary of identified gaps

Policies & Regulations

- Need ecosystem focused policies
- Need climate change focused policies
- Policies are typically focused on development rather than ecosystem protection
- Utilize overlay districts as a tool
- Revise rules/ordinances that require extents of impervious surface (streets, parking spaces, sidewalks)
- Potential new regulations on pesticide use, native plant requirements, groundwater protection, soil health, and mitigation of impacted upland habitats

Projects

- Underfunded
- Poorly designed
- Developers motivated by profit and not ecological protection

Planning

- Need long-term ecosystem and climate change planning
- Developers plan developments not anyone looking out for ecological values
- Need effective plans with boldness and vision
- Need better communication
- Purchase ecologically high value land

Education & Outreach

- Educate policymakers
- Teach about heat island, dark skies, ecosystems, perfect lawn impacts
- Teach the real estate community about regulations
- Reach a diversity of groups
- Incentivize interest and participation

What should we be doing?

Workshop 3 Results

Summary of identified solutions (part 1)

Policies & Regulations

- Review impervious surface requirements
- Provide a credit for restoring/protecting habitat
- Require heat island mitigation
- Regulate irrigation use
- Require percent native plantings in green spaces
- Establish stricter project design standards
- Better define steep slopes and regulate
- More stringent shoreline regulations
- Develop better enforcement tools
- Relax policies for “weed” tolerance
- Develop a creek overlay district
- Require licenses for chloride applicators
- Develop a pesticide use ordinance

Planning

- Use an ecosystem approach to planning
- Develop climate mitigation & adaption plans
- Explore alternative development designs
- Develop overlay districts for natural areas, habitat corridors, heat islands, etc.
- Trading program for impervious surface for green space
- Referenda for voters to approve land purchases
- Develop long-term natural area management plans
- Develop public-private development projects
- Set regional ecological goals
- Create commissions for sustainability/environment

What should we be doing?

Workshop 3 Results

Summary of identified solutions (part 2)

Projects

- Require developers to fund ecological improvements
- Work with partners to fund functional improvements
- District-funded & implemented demonstration projects
- Easement compliance checks at time of sale
- Early design coordination for better rules compliance
- Identify natural assets on site to inform design
- Incentivize developers to do ecological improvements
- Implements certification for developers such as LEED, Sites, and Envision
- Establish long-term maintenance funding as part of project approval
- Develop clear, detailed maintenance plans

Education & Outreach

- Educate policymakers
- Offer realtor CEU classes & materials for clients
- Volunteer, hands-on habitat events
- Native landscaping maintenance workshops
- Native landscaping tours
- Demonstrate cost savings with lawn reduction
- Bluffs/steep slopes education offerings

Landcover in the District can be categorized into:

Green

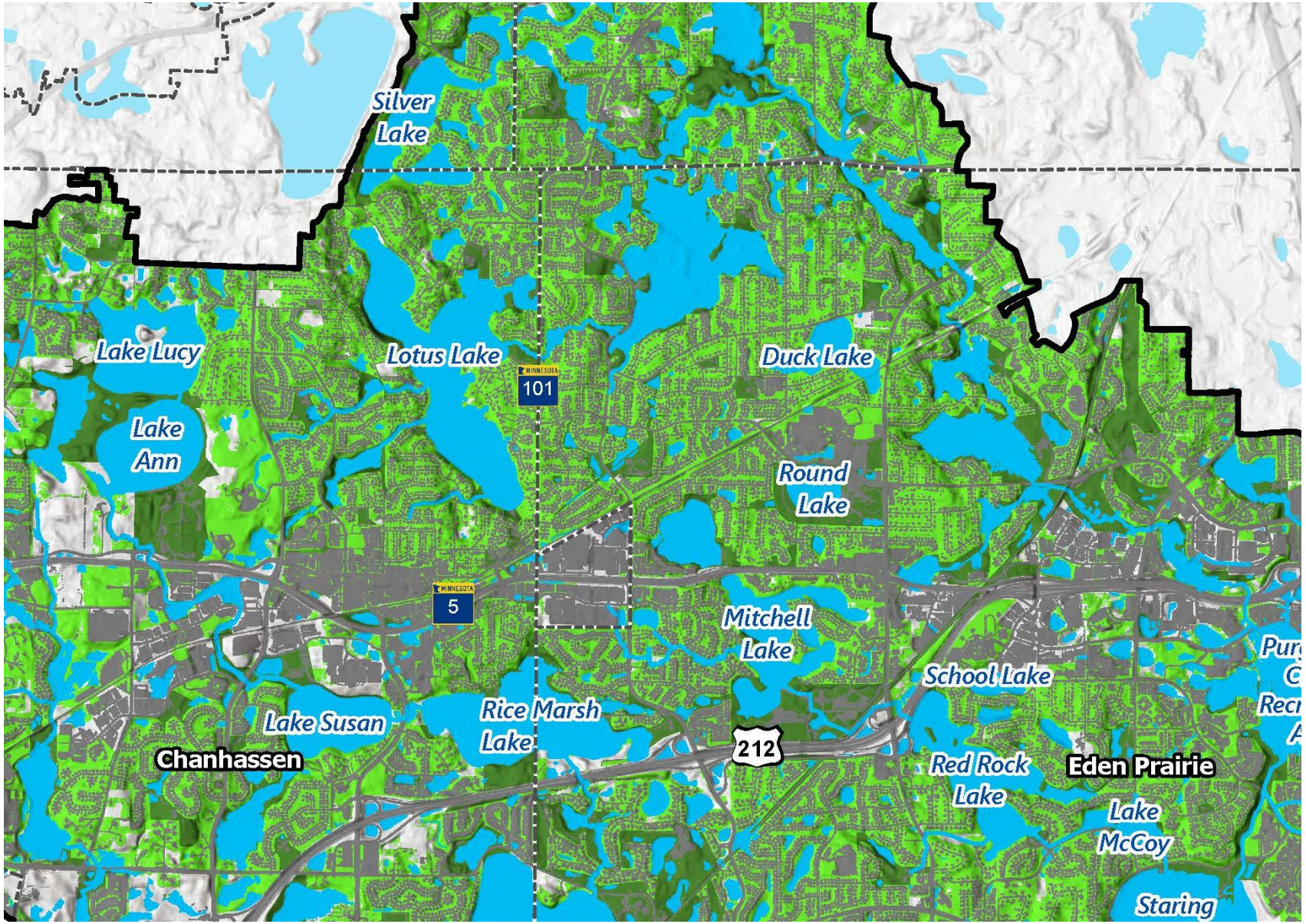
- Lawn
- Woodlands
- Old field vegetation
- Agriculture

Gray

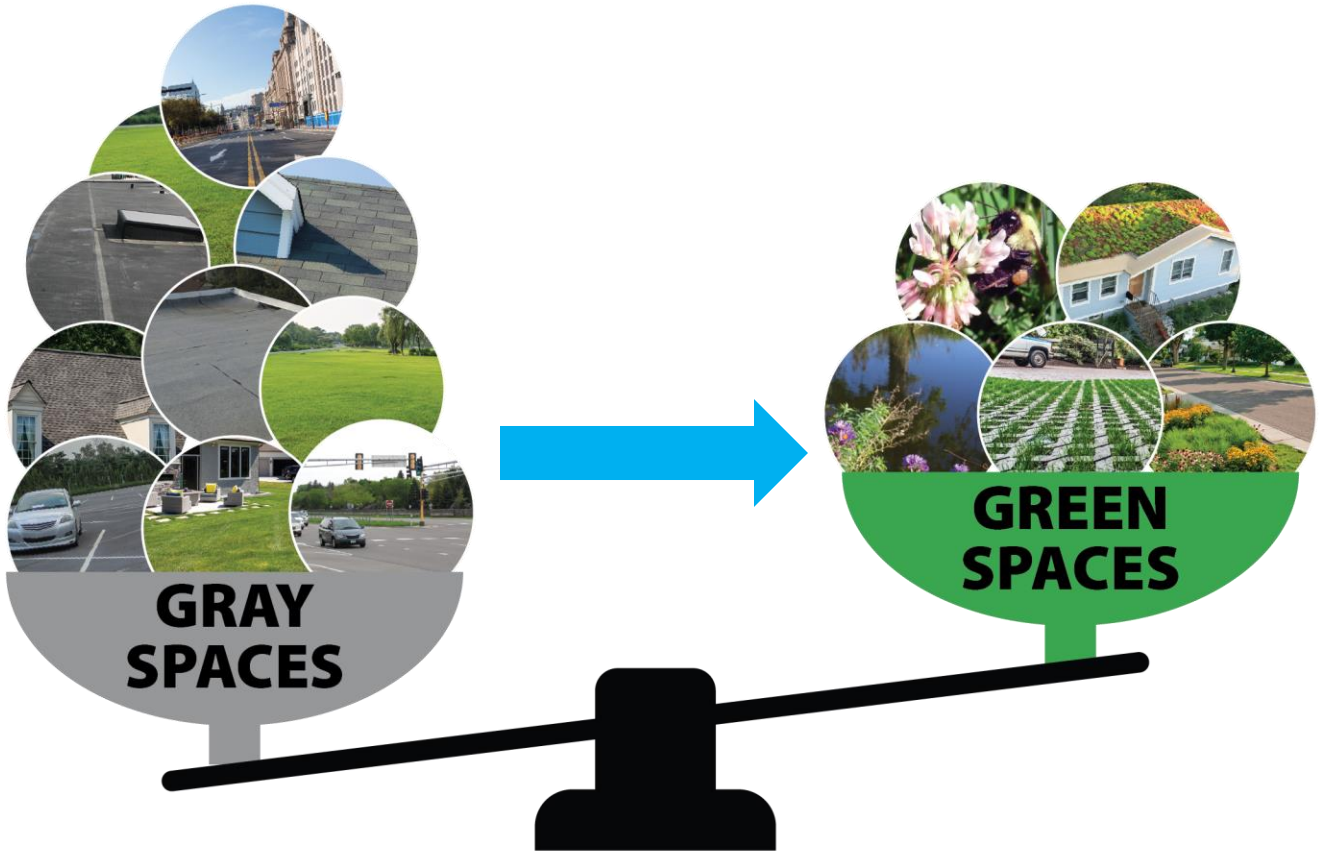
- Streets, highways
- Parking lots, driveways
- Buildings, homes

Blue

- Streams
- Lakes
- Wetlands



Goal: Expand the green and cover/shrink the gray to protect the blue.



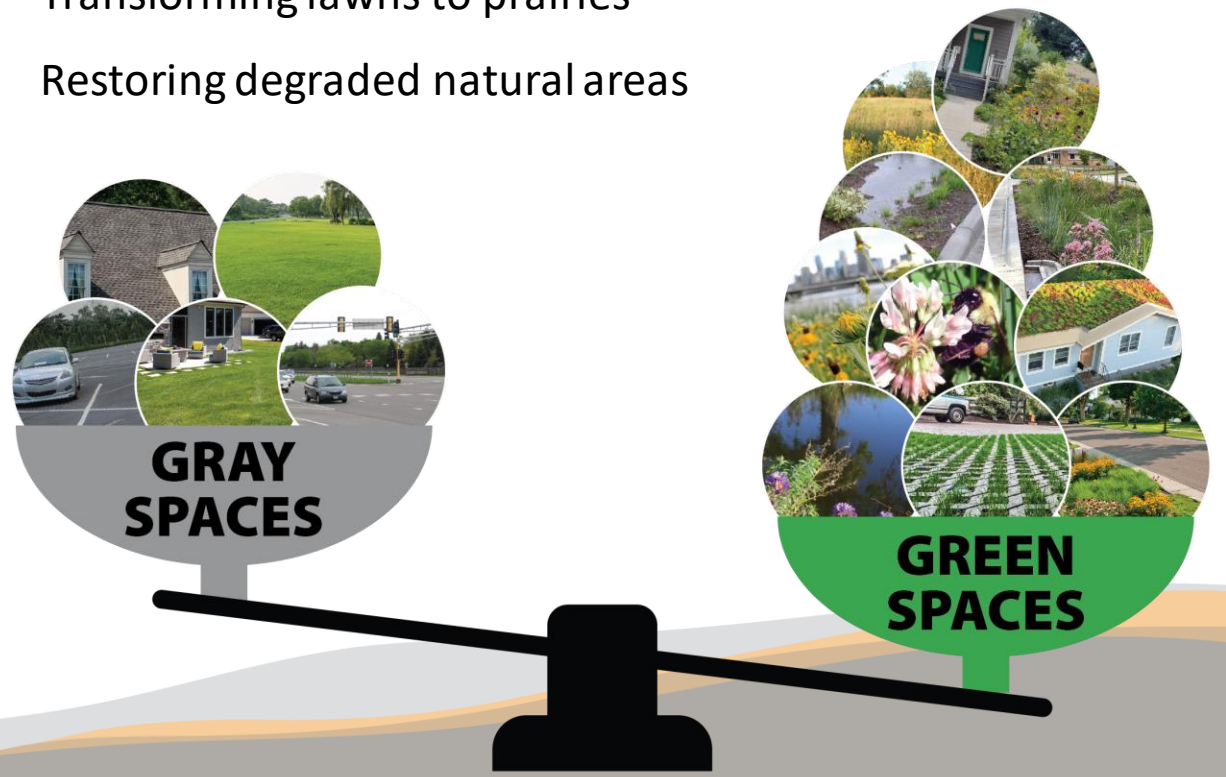
How do we meet this goal?

Cover/shrink the gray

- Implementing low impact development
- Implementing conservation design practices
- Building walkable communities
- Transitioning to green roofs
- Reducing impervious surfaces
  - Smaller parking lots
  - Narrow streets
  - Taller, not wider buildings

Expand the green

- Preserving existing open space
- Transforming lawns to prairies
- Restoring degraded natural areas



Tools at our disposal. Are there others?

Policy and Regulation

- Development regulations
- Landscape ordinances
- Runoff treatment requirements and permits

Planning

- City Comprehensive Plans
- Watershed District Ten Year Plan
- State agencies
- Federal agencies

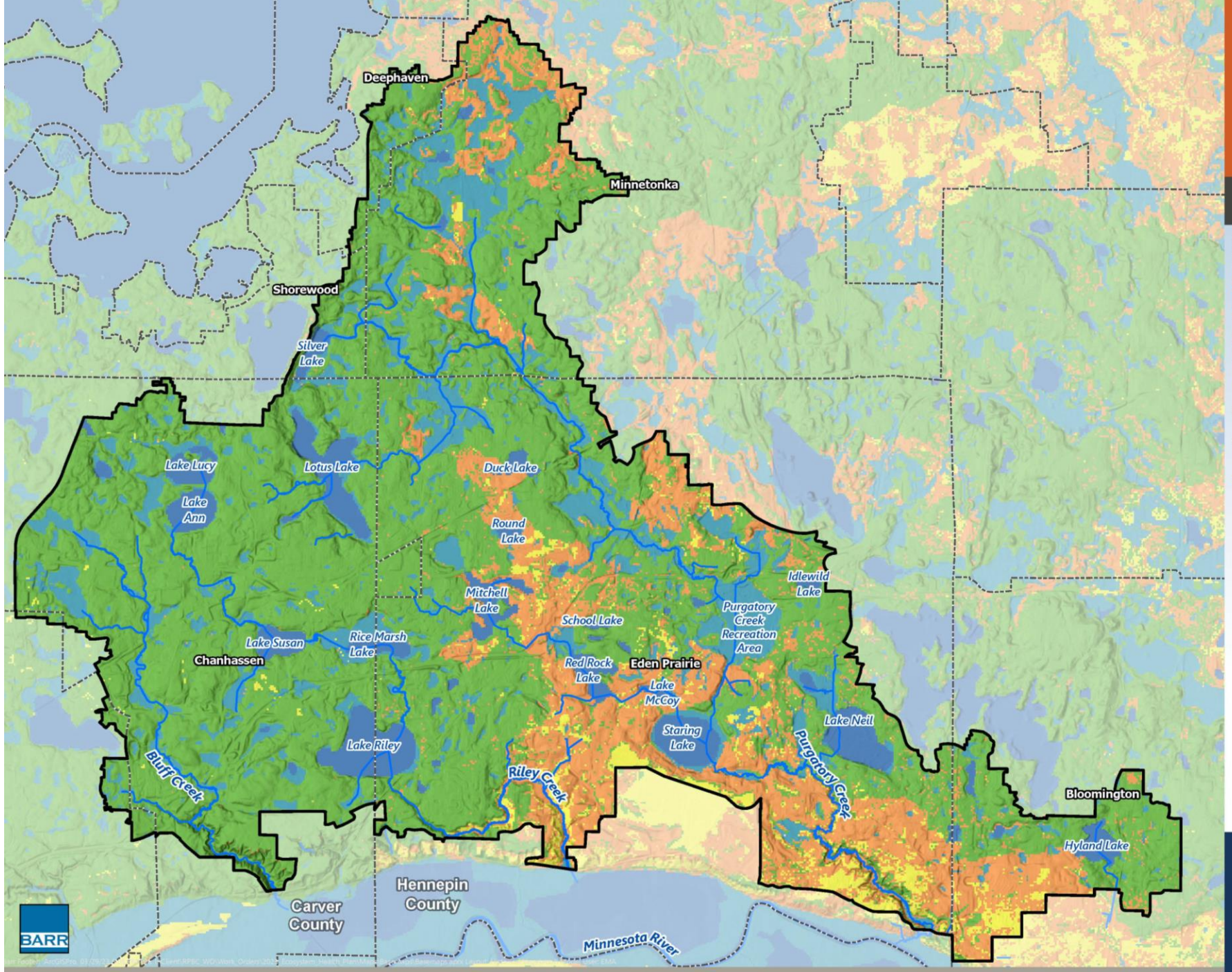
Publicly Funded Projects

- City facilities, streets, and park projects
- Watershed District stormwater management

Education and Outreach

- Classes and trainings
- Grants
- Cost share

Existing Ecological Conditions



HISTORICAL VEGETATION MODEL

Historical Vegetation Potential Classes

- Deciduous Forest
- Deciduous Savanna
- Surface Water
- Historic Wetlands
- Prairie
- District Legal Boundary
- Municipal Boundary
- Streams/Creeks

Data Source: MnModel Historical Vegetation Model, MnDOT, 2018

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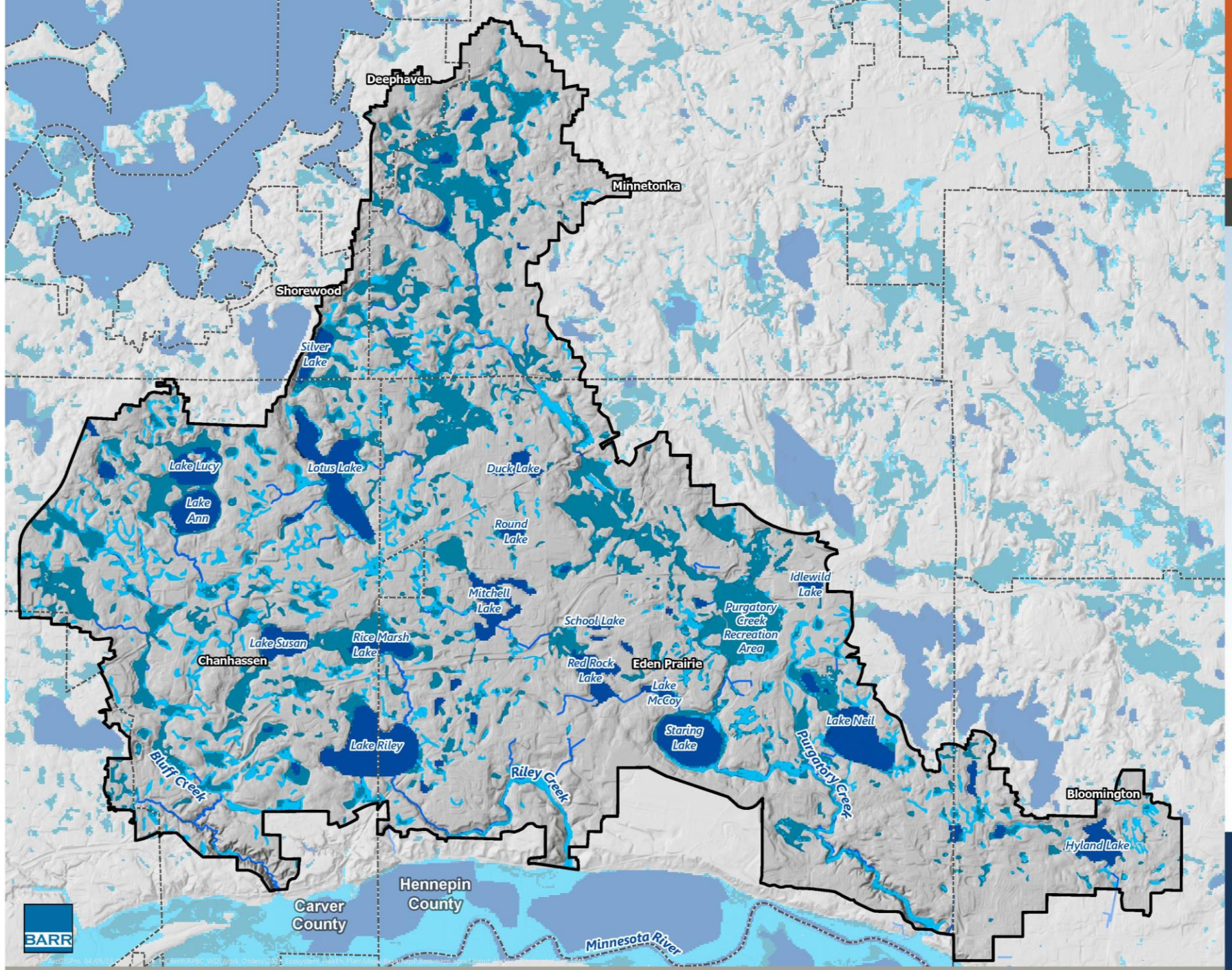
Miles

RILEY PURGATORY BLUFF CREEK
WATERSHED DISTRICT



HISTORIC WETLANDS

Historic Wetlands
- Surface Water
- Permanent Wetlands
- Seasonal Wetlands
- Streams/Creeks
- District Legal Boundary
- Municipal Boundary

Data Source: MnModel Historical Vegetation Model, MnDOT, 2018; USDA NRCS, 2022

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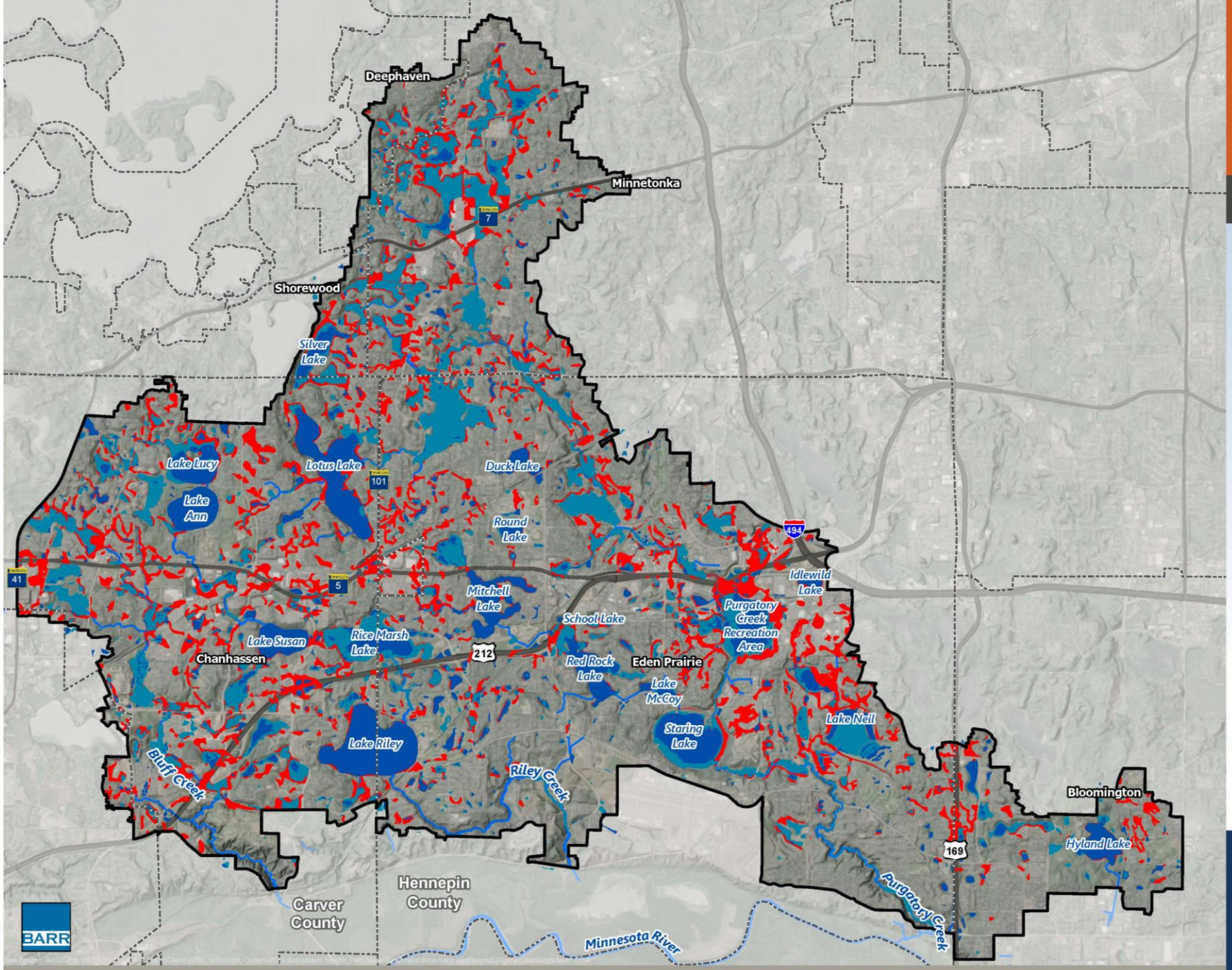

DRAINED WETLANDS

- Current Surface Water
- Current Wetland
- Drained Wetland
- District Legal Boundary
- Municipal Boundary
- Streams/Creeks

Data Source: MnModel Historical Vegetation Model, MnDOT, 2018; USDA NRCS, 2022; MnDNR, 2019

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RILEY PURGATORY BLUFF CREEK
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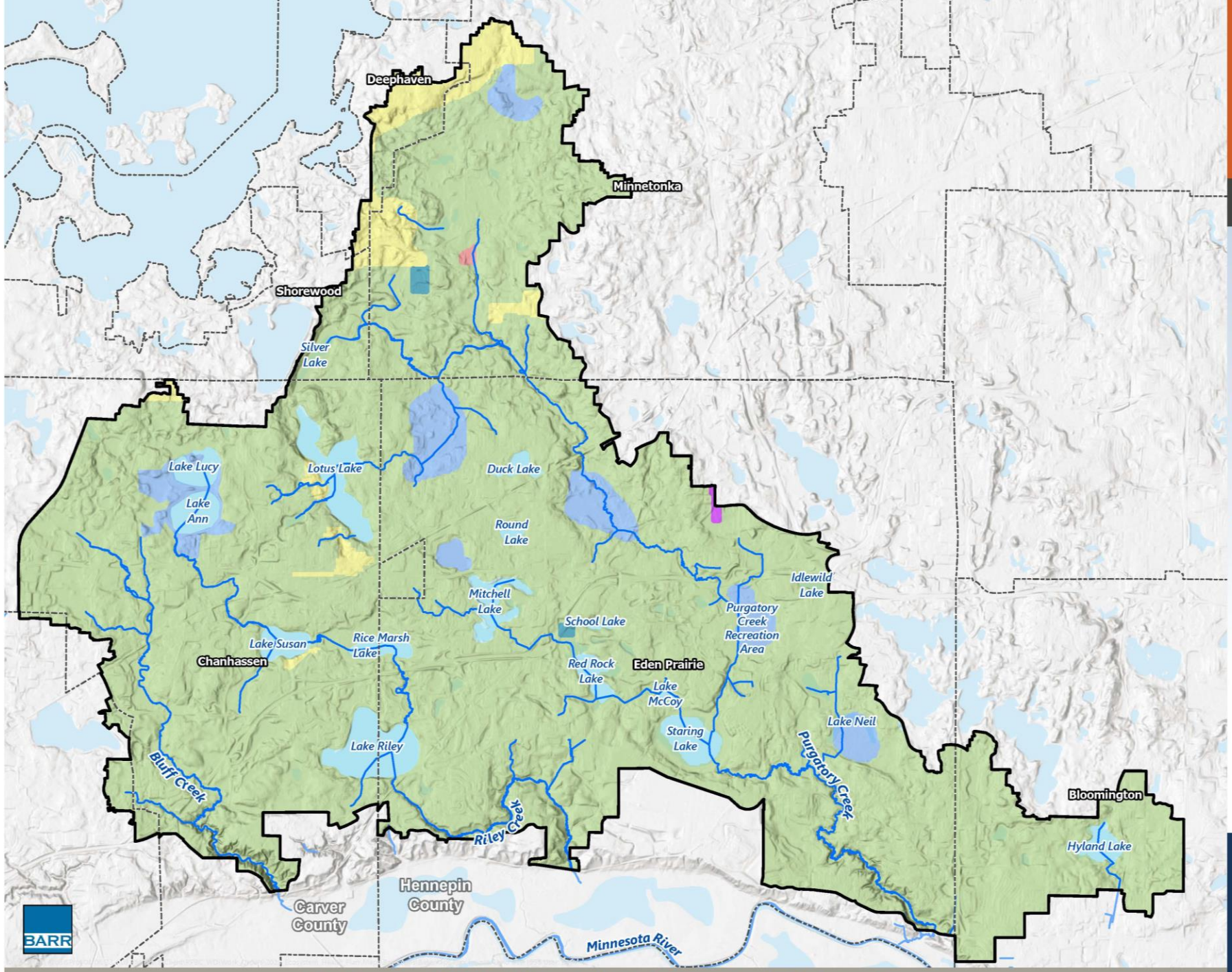

LAND USE 1958

1958 Land Use

- Single Family Residential
- Agricultural and Vacant Land
- Water
- Marshland
- Commercial
- Industrial
- Institutional
- District Legal Boundary
- Municipal Boundary
- Streams/Creeks

Data Source: University of MN, 2013

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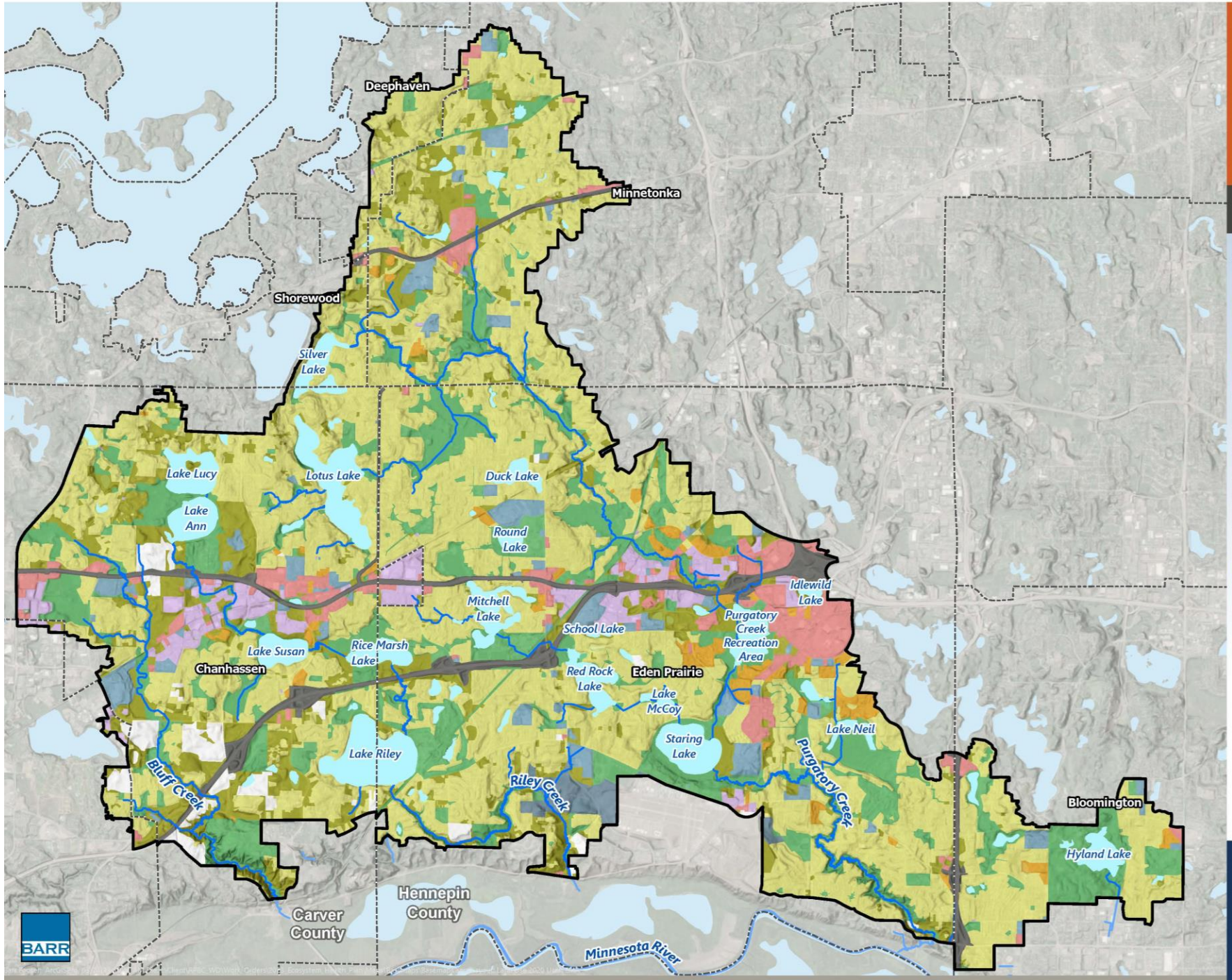
RILEY PURGATORY BLUFF CREEK
WATERSHED DISTRICT



LAND USE 2020

District Legal Boundary

2020 Land Use (MetCouncil)

- Single Family
- Multifamily & Mixed Use Residential
- Commercial
- Industrial
- Institutional
- Park, Recreational, or Preserve
- Major Highway
- Airport
- Agricultural
- Undeveloped
- Water

Data Source: MetCouncil, 2020

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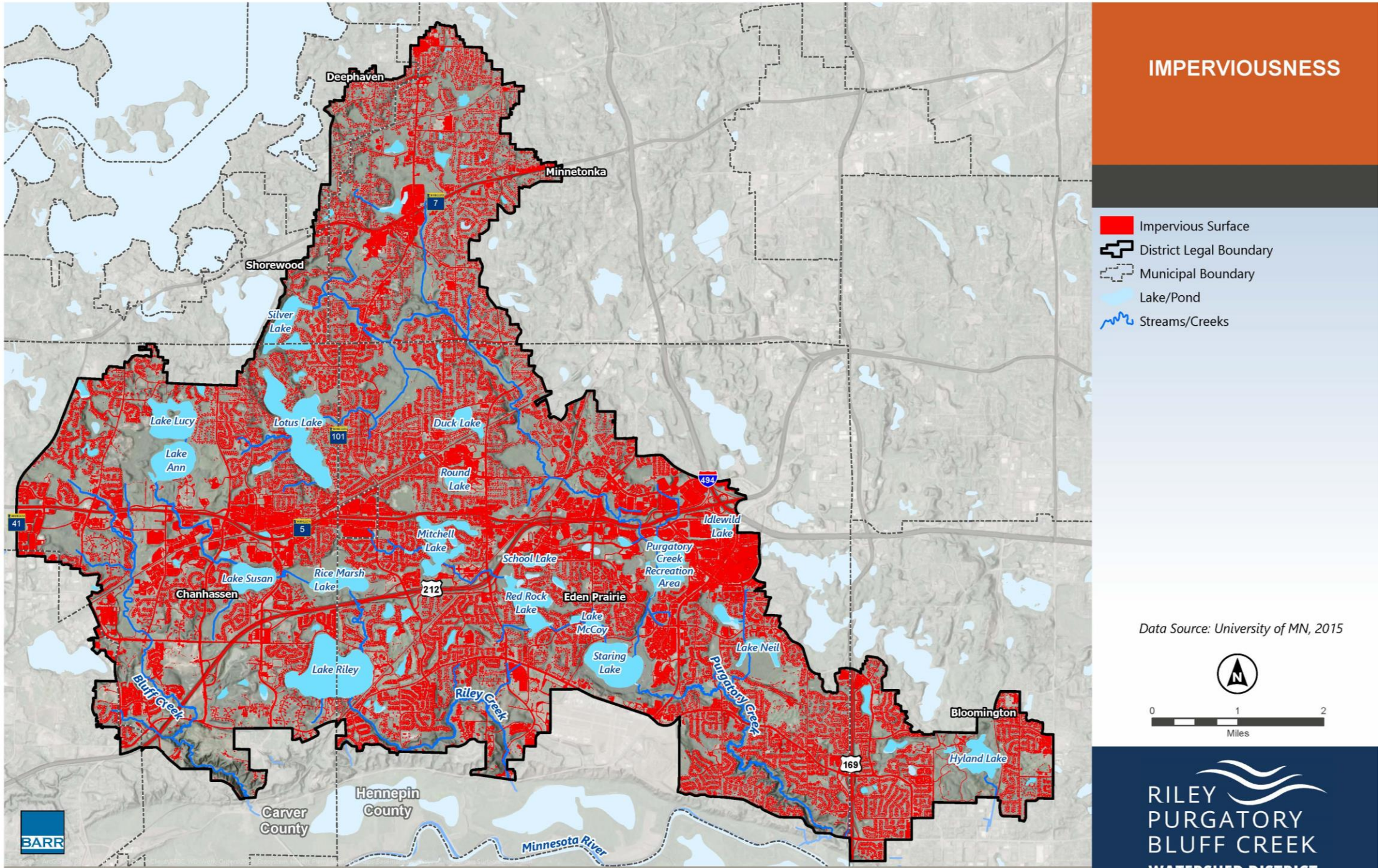
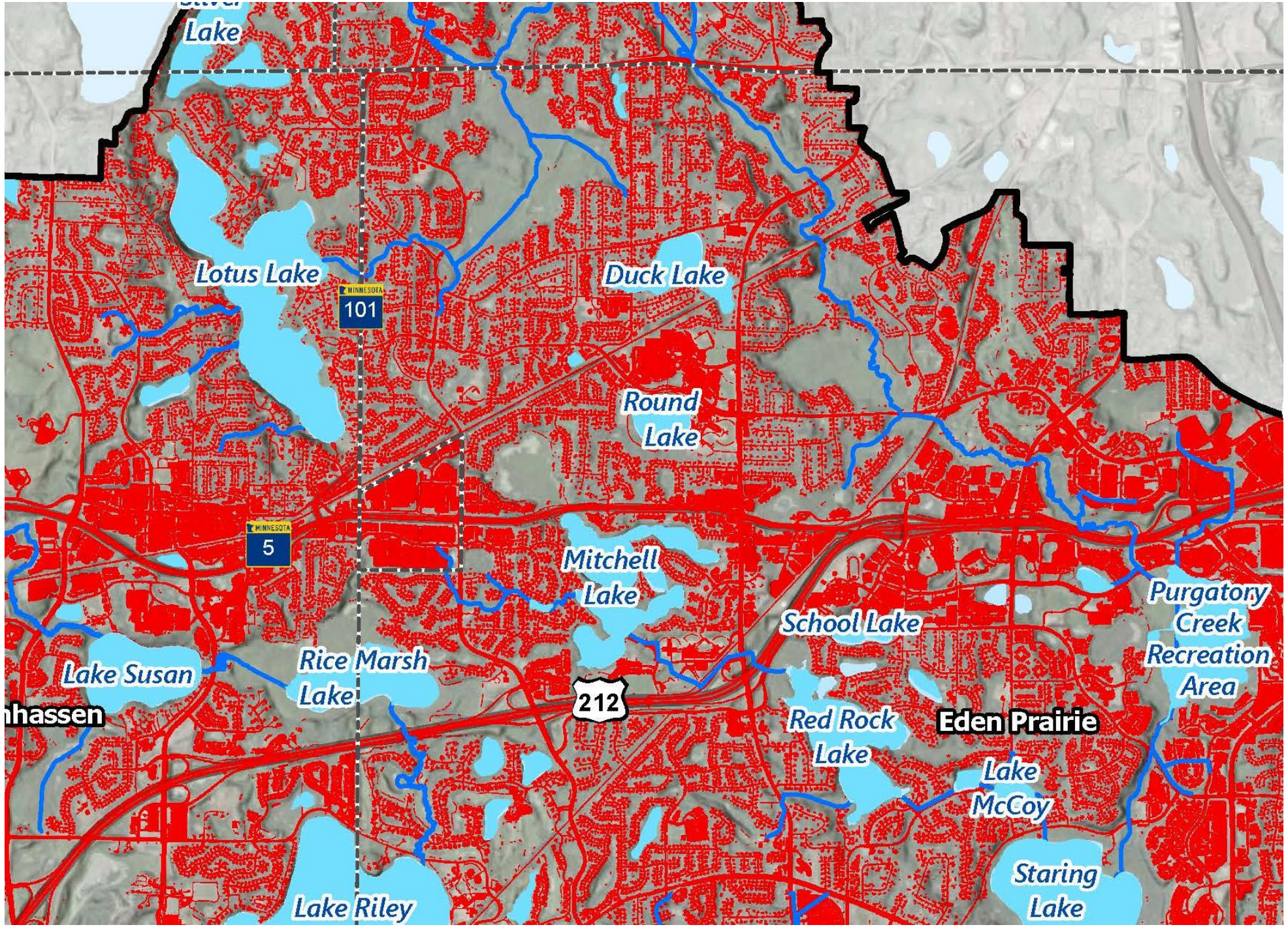
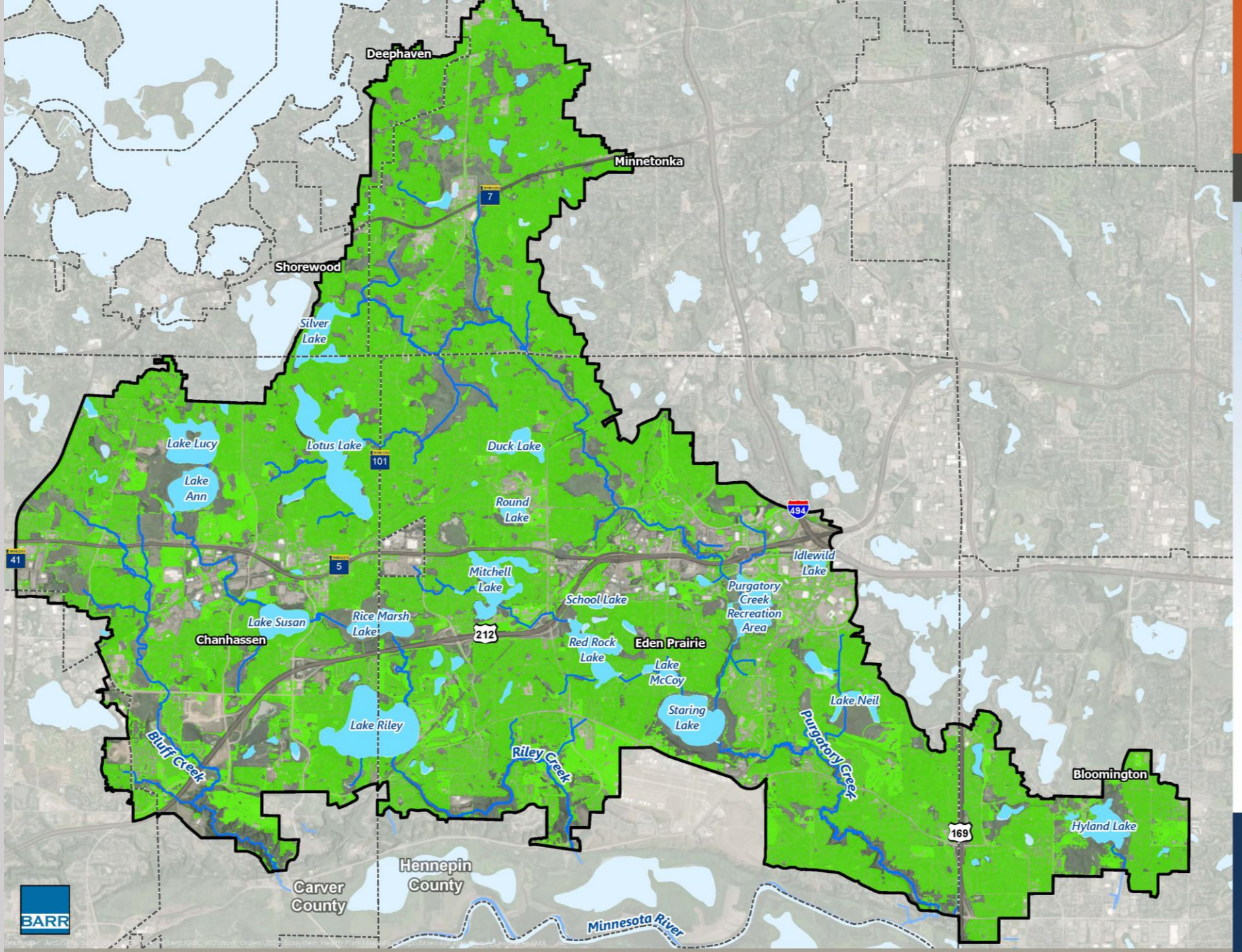
RILEY PURGATORY BLUFF CREEK
WATERSHED DISTRICT



Riley Purgatory Bluff Creek Watershed District - Ecosystem Health Action Plan


Lake
Lotus Lake
MINNESOTA
101
Duck Lake
Round
Lake
MINNESOTA
5
Mitchell
Lake
School Lake
Purgatory
Creek
Recreation
Area
Lake Susan
Rice Marsh
Lake
212
nhassen
Red Rock
Lake
Eden Prairie
Lake
McCoy
Staring
Lake
Lake Riley



LAWN 2020

- 2020 Lawn (Approximate)
- District Legal Boundary
- Municipal Boundary
- Lake/Pond
- Streams/Creeks

Data Source: Met Council, 2020; University of MN, 2015

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RILEY PURGATORY BLUFF CREEK
WATERSHED DISTRICT

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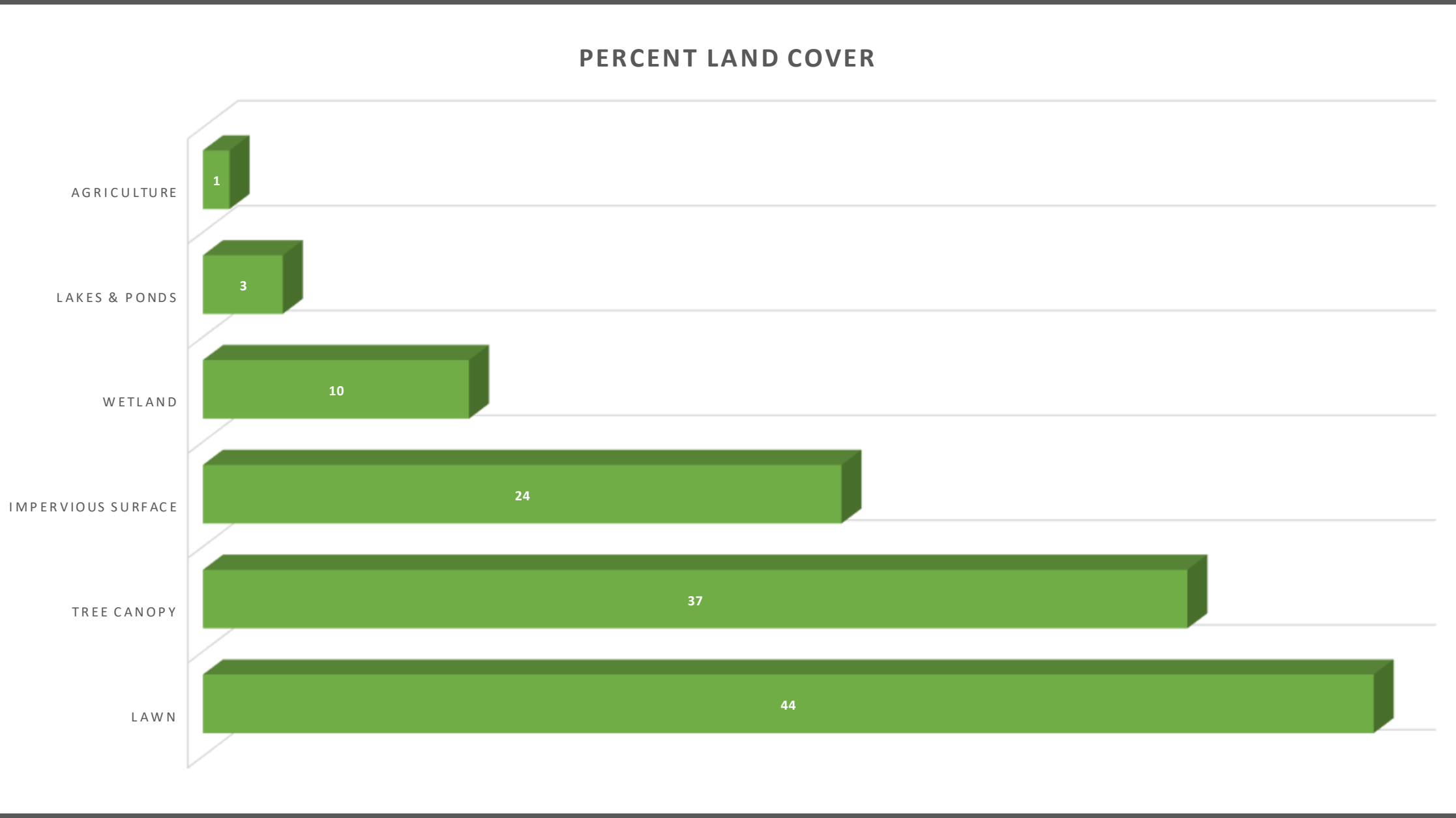
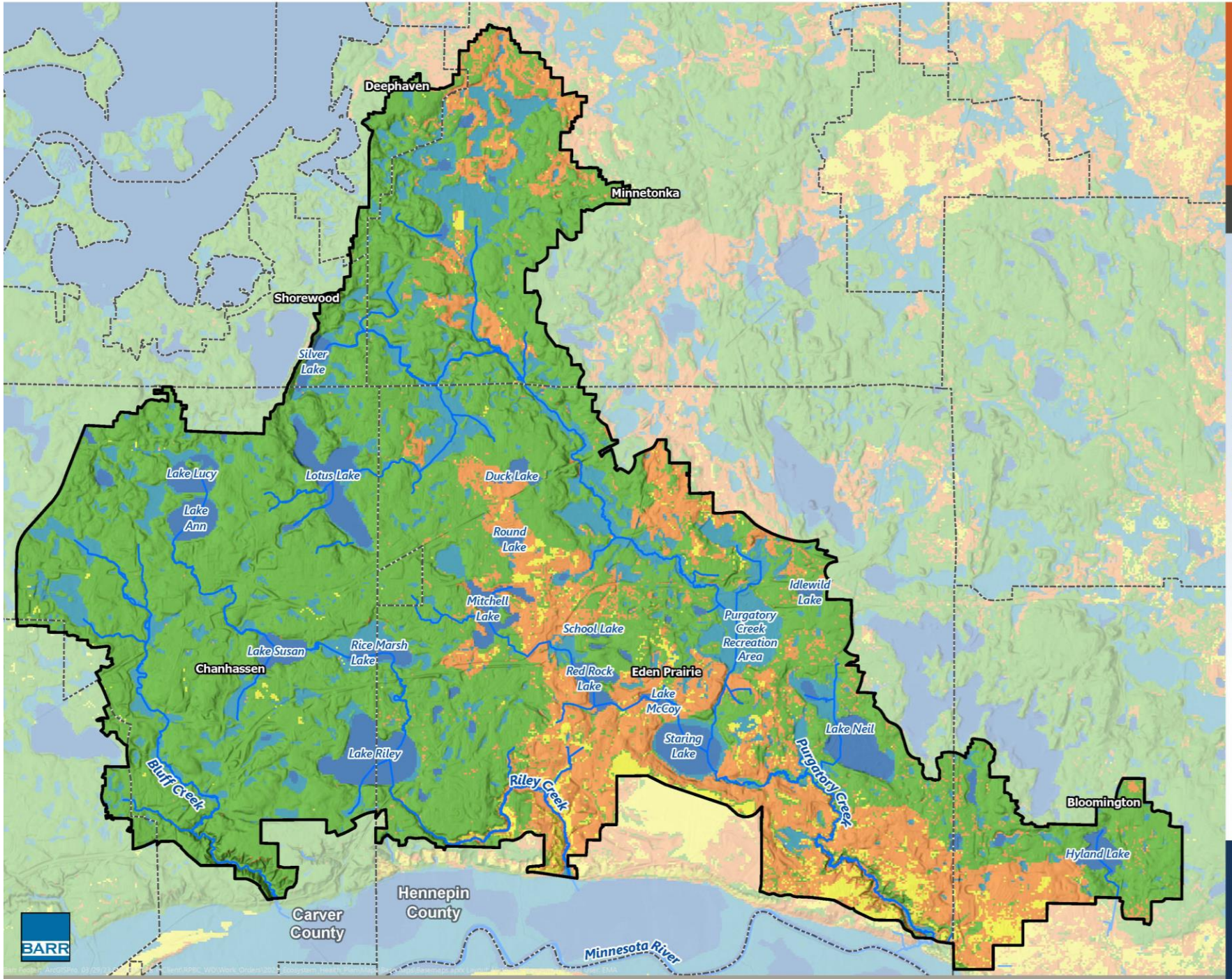
Riley Purgatory Bluff Creek Watershed District - Ecosystem Health Action Plan


PERCENT LAND COVER
AGRICULTURE
1
LAKES & PONDS
3
WETLAND
10
IMPERVIOUS SURFACE
24
TREE CANOPY
37
LAWN
44



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Data Source: MnModel Historical Vegetation Model, MnDOT, 2018

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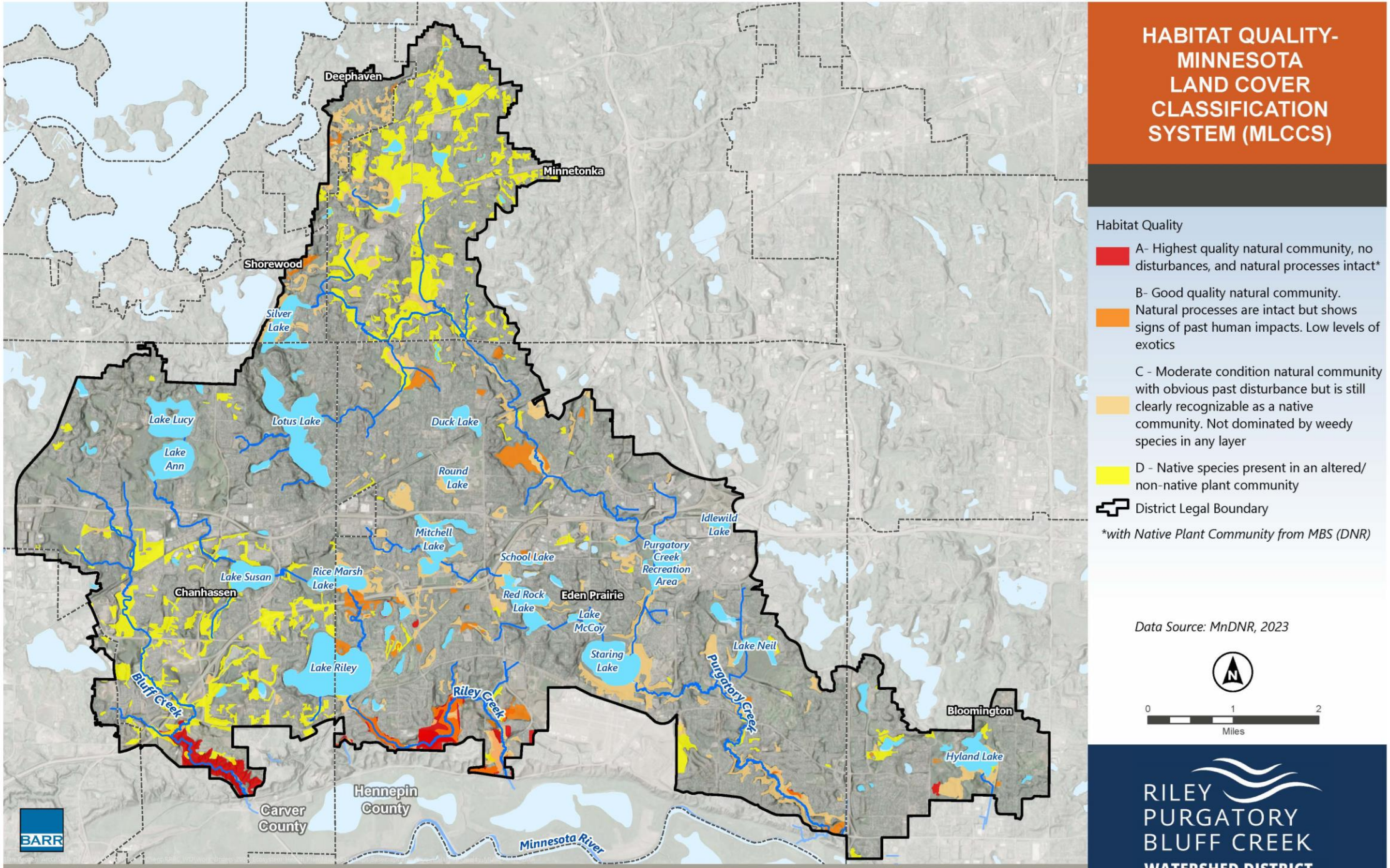

HABITAT QUALITY- MINNESOTA LAND COVER CLASSIFICATION SYSTEM (MLCCS)

Habitat Quality

- A- Highest quality natural community, no disturbances, and natural processes intact*
- B- Good quality natural community. Natural processes are intact but shows signs of past human impacts. Low levels of exotics
- C - Moderate condition natural community with obvious past disturbance but is still clearly recognizable as a native community. Not dominated by weedy species in any layer
- D - Native species present in an altered/ non-native plant community
- District Legal Boundary

with Native Plant Community from MBS (DNR)

Data Source: MnDNR, 2023

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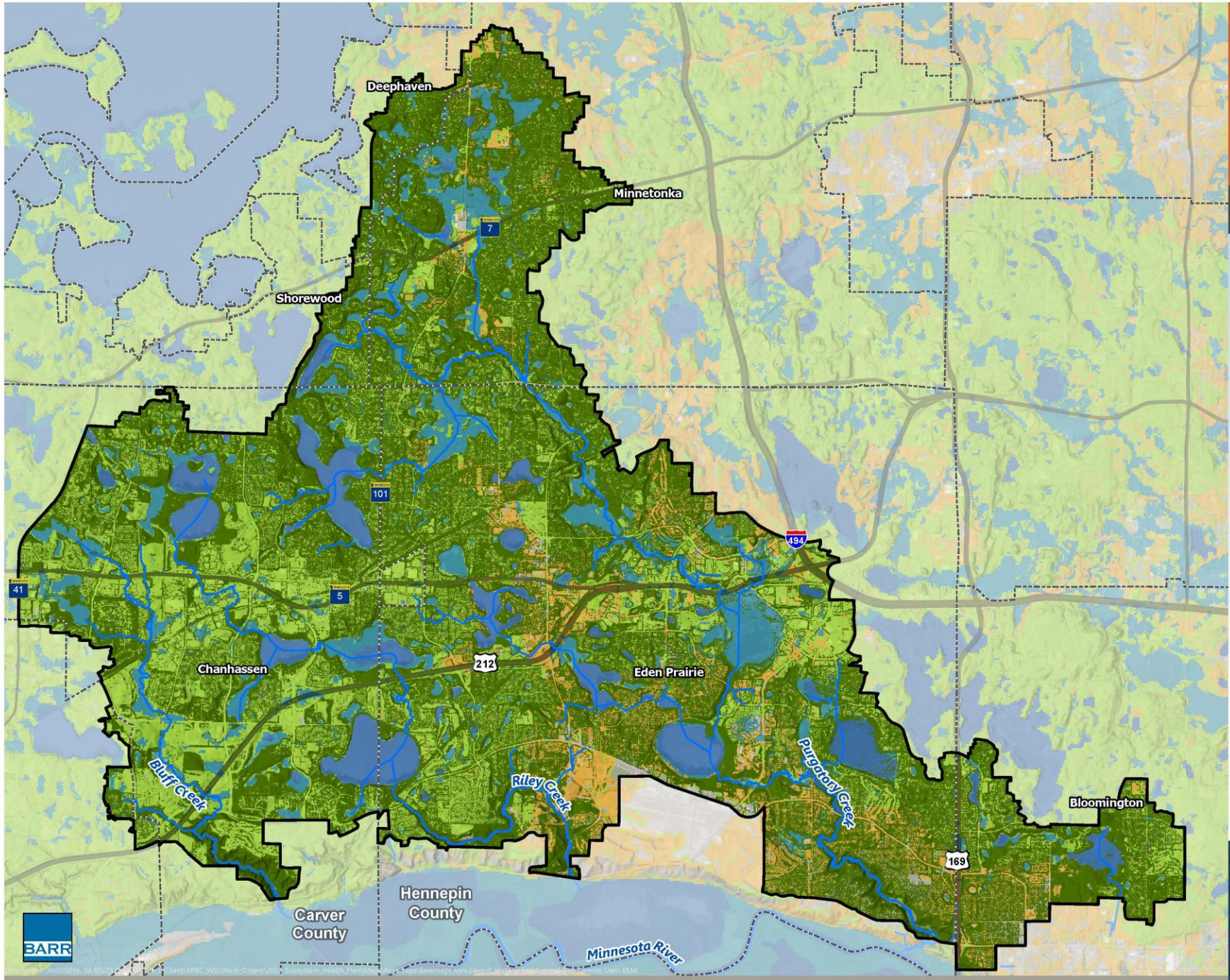
RILEY PURGATORY BLUFF CREEK
WATERSHED DISTRICT



HISTORIC & CURRENT TREE CANOPY

- Current Tree Canopy

Historic Tree Canopy

- Deciduous Forest
- Deciduous Savanna
- Streams/Creeks
- Current Wetlands
- Current Surface Water
- District Legal Boundary
- Municipal Boundary

Data Source: MnModel Historical Vegetation Model, MnDOT, 2018; University of MN, 2015

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RILEY PURGATORY BLUFF CREEK
WATERSHED DISTRICT

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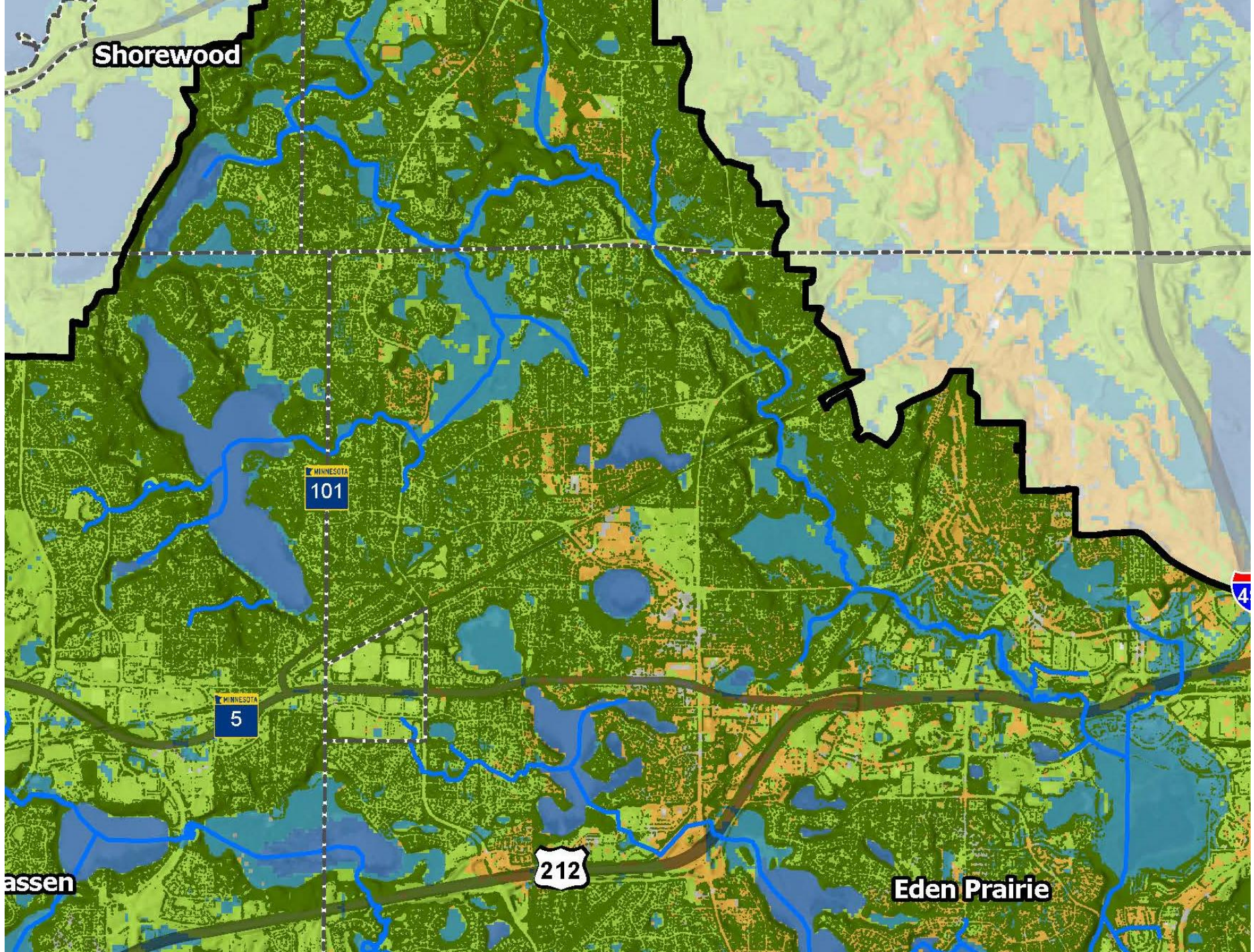
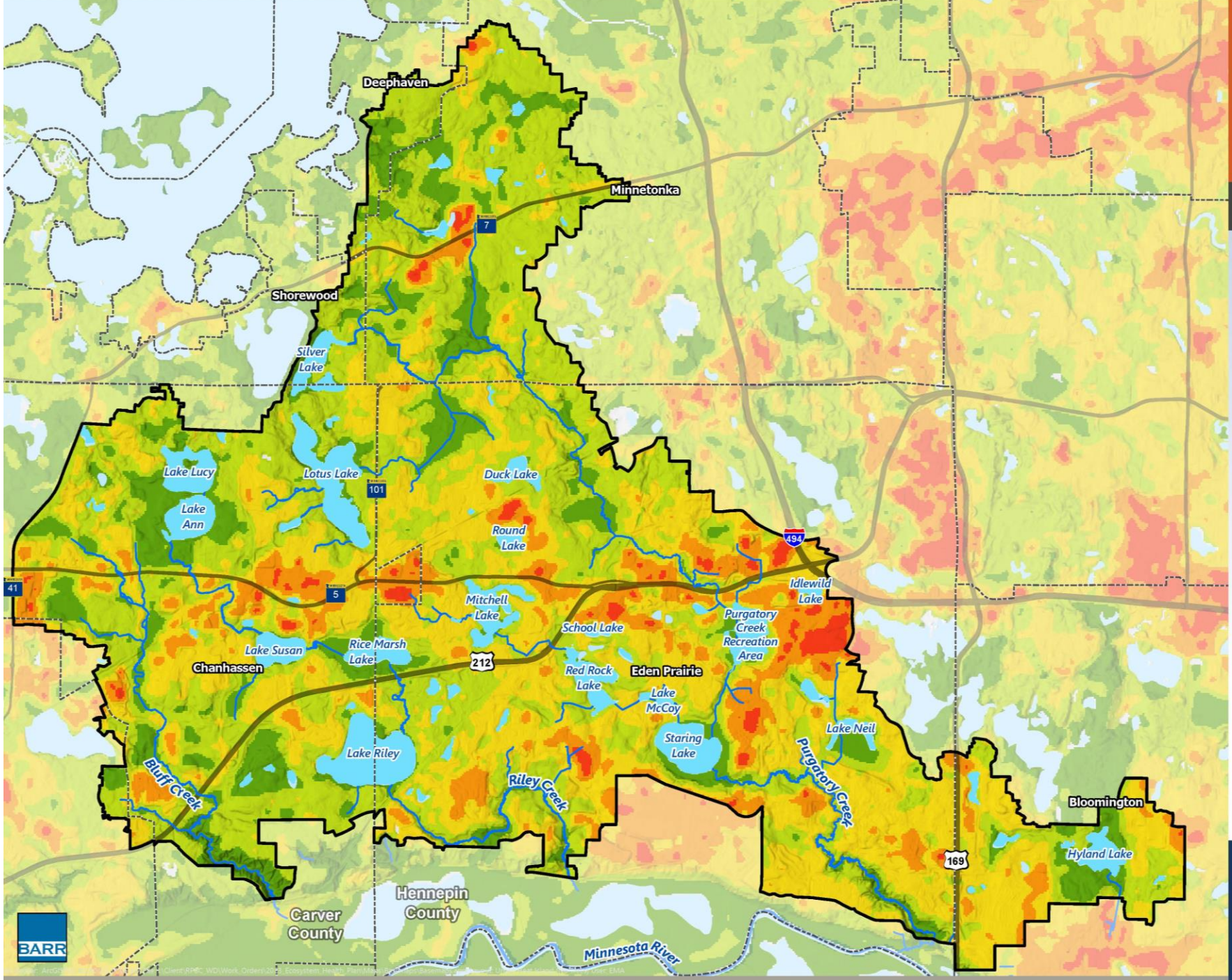

Shorewood
MINNESOTA
101
MINNESOTA
5
212
Eden Prairie



URBAN HEAT ISLAND

Land Surface Temperature (°F)*

- >100°
- 95 - 100°
- 90 - 95°
- 85 - 90°
- 80 - 85°
- <80°
- Streams/Creeks
- Lake/Pond (non-soil map)
- District Legal Boundary
- Municipal Boundary

*Land Surface Temperature satellite image taken at noon on July 22, 2016. Air temperature at MSP was 90° F.

Data Source: Met Council, 2016

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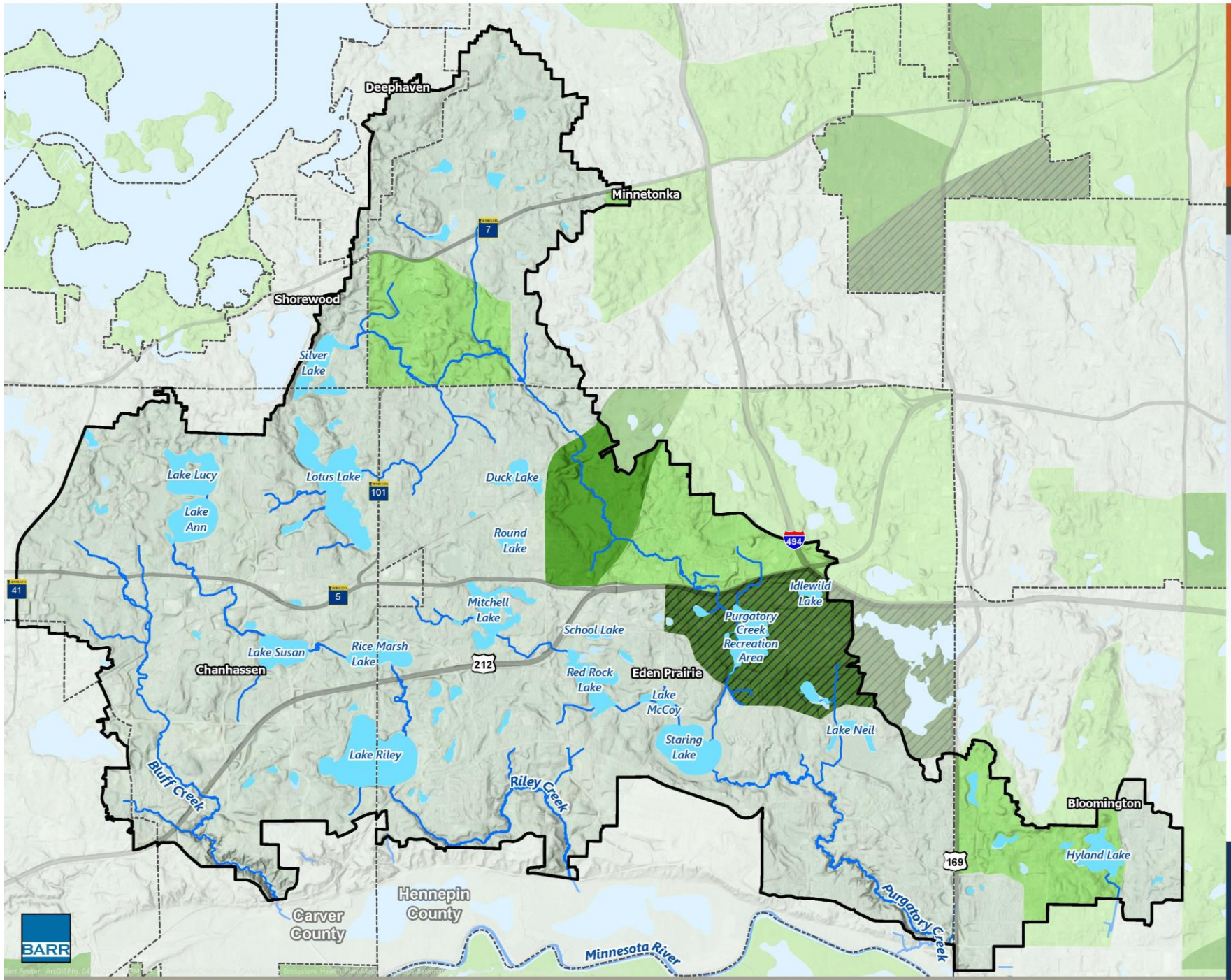
RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT



POPULATION VULNERABILITY (CDC)

Population Vulnerability Composite Score

- 0.0 - 0.25
- 0.26 - 0.50
- 0.51 - 0.75
- 0.76 - 2.00

least vulnerable → most vulnerable

- District Legal Boundary
- Municipal Boundary
- Lake/Pond
- Streams/Creeks

Data Source: The Agency for Toxic Substances & Disease Registry (ATSDR) at the Centers for Disease Control (CDC), 2018

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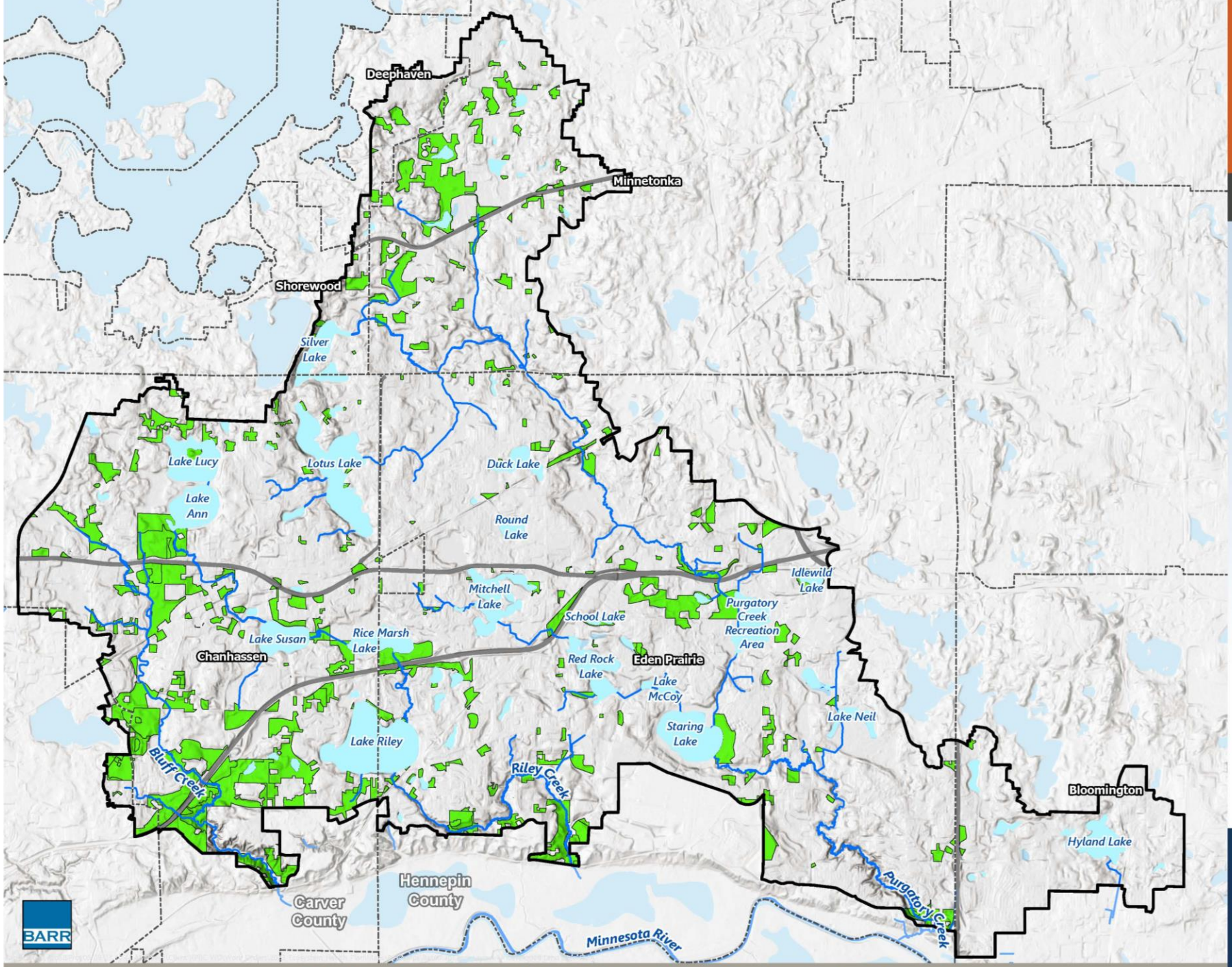
RILEY PURGATORY BLUFF CREEK
WATERSHED DISTRICT



Riley Purgatory Bluff Creek Watershed District - Ecosystem Health Action Plan

UNDEVELOPED LAND

Undeveloped Land

District Legal Boundary

Data Source: MetCouncil, 2020

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RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT

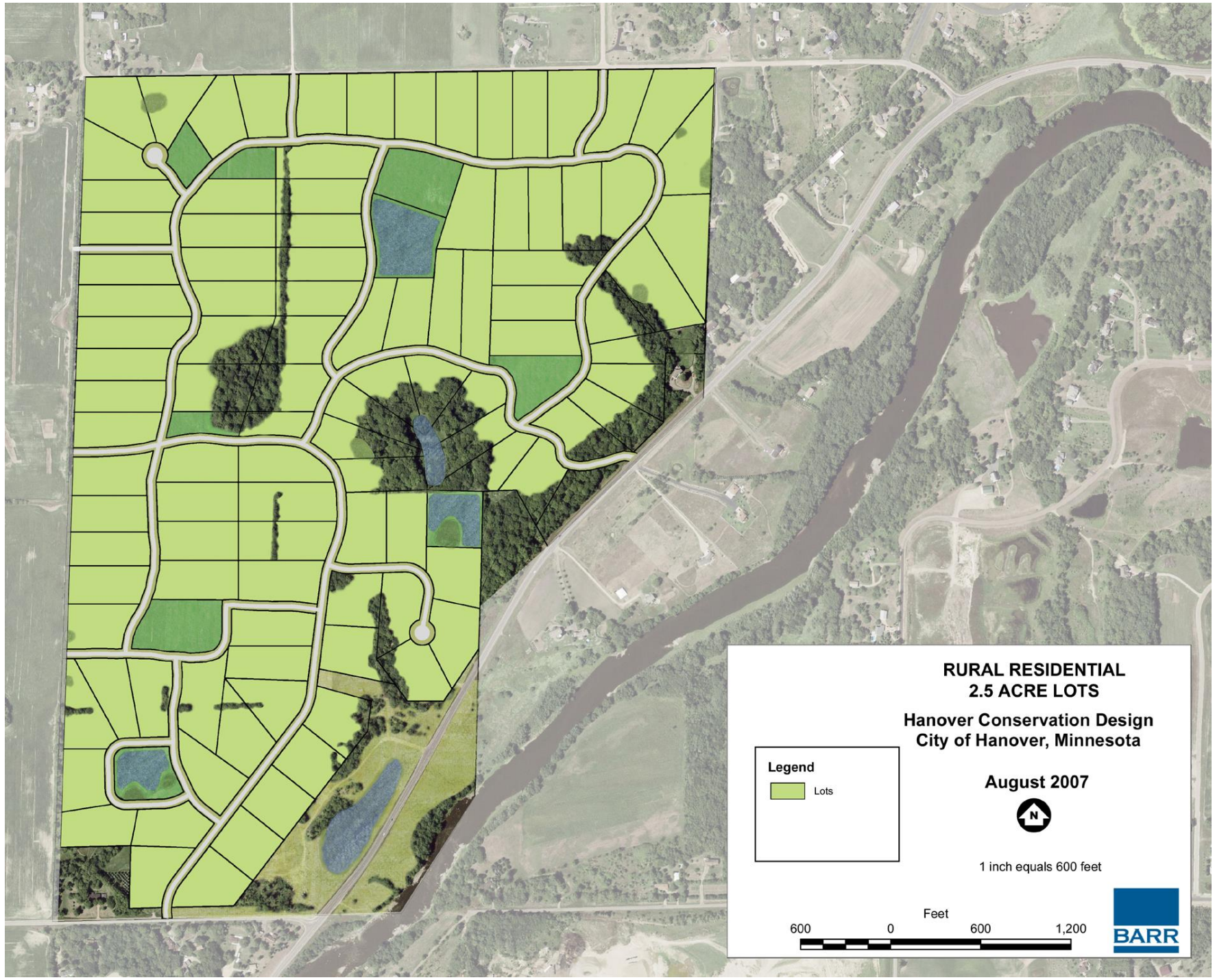
Urban Ecology Examples

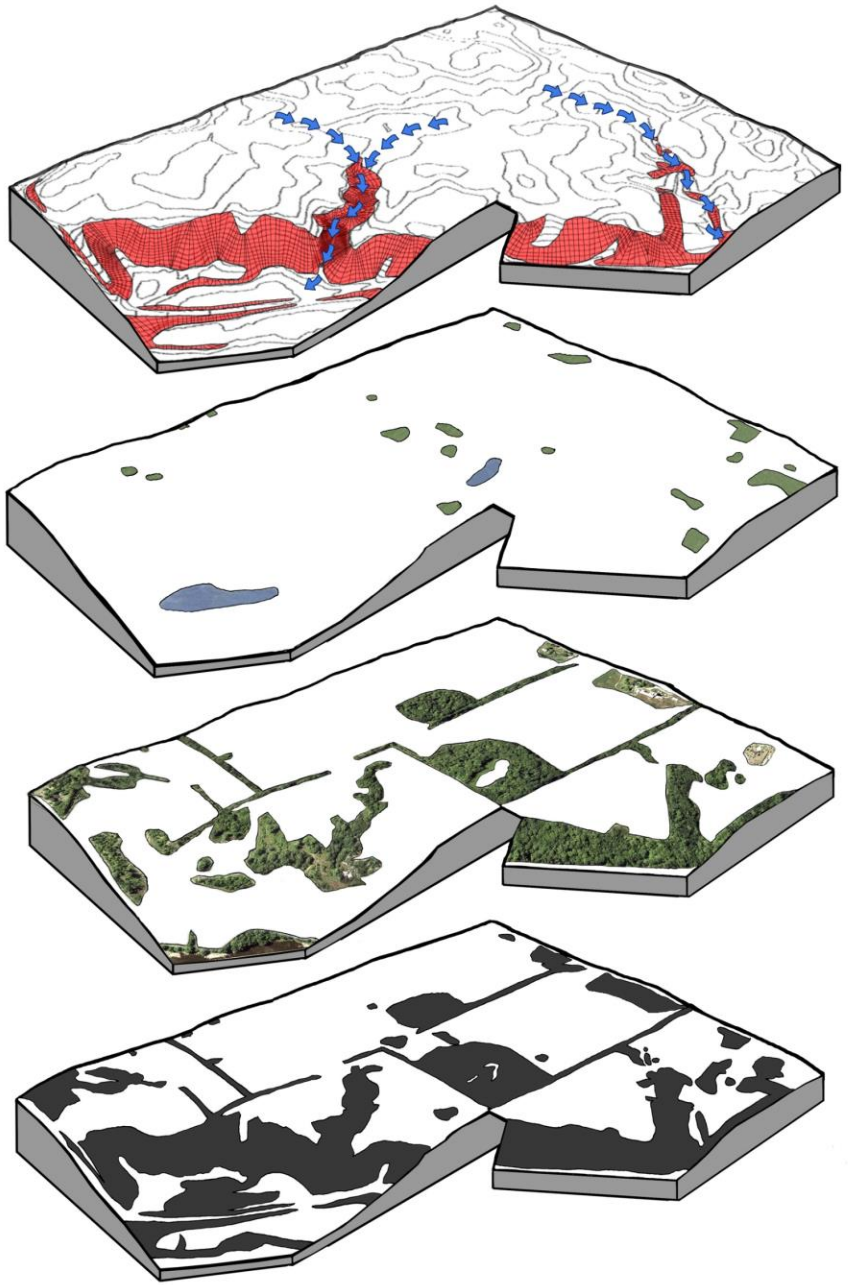
Low Impact Development

**(District rules don't direct how land is developed.
How can we get this to happen?)**

Conservation Design Development for
Hanover, MN

Sponsored by the MN Pollution Control Agency


RURAL RESIDENTIAL
2.5 ACRE LOTS
Hanover Conservation Design
City of Hanover, Minnesota
August 2007
Legend
Lots
N
1 inch equals 600 feet
Feet
600
0
600
1,200
BARR



COMPOSITE

Development Analysis

		CONVSERVATION DESIGN	
	Rural Residential Design	**Scenario 1:** **100-Foot Frontage**	**Scenario 2:** **80-Foot Frontage**
Total Area	380 acres	380 acres	380 acres
Total Buildable Area	329 acres	329 acres	329 acres
Average Lot Size	2.82 acres	0.33 acres	0.26 acres
Lots per Acre (Buildable area)	0.31 lots/acre	0.88 lots/acre	1.13 lots/acre
Total Lots	103 lots	289 lots	373 lots
Road Miles	4.6 miles	6.6 miles	6.6 miles
Total Road Hard Surface	19.5 acres	20.8 acres	20.8 acres
TOTAL HARD SURFACE	42.2	53.3 acres	62.7 acres
Open Space	50.5 acres	211 acres	210 acres
Open Space Percentage of Total Area	13%	56%	56%
Walking/Biking Trails	0.7 miles	9.4 miles	9.4 miles

Cost Comparison of Rural Residential and Conservation Design Scenario 1, 100-Foot Frontage

	Rural Residential	Conservation Design, Scenario 1
Roads	$1,275,918	$1,357,824
Sanitary	$1,103,310	$1,566,720
Water	$858,130	$1,218,560
Storm Sewer	$108,150	$85,050
Walking/Biking Trails	$32,525	$436,762
Total	**$3,378,033**	**$4,664,916**
Cost Per Lot	$32,796	$16,142

Jackson Meadow
Conservation Design Development


Jackson Tr
Kingfisher Ln

Replace large lawns with native plantings

- Reforest
- Native grasses & wildflowers

Replace large lawns with native plantings

- Reforest
- Native grasses & wildflowers

Macalester College Landscape Master Plan

Macalester College Landscape Master Plan

Minnetonka City Hall Landscape Master Plan

Transit Oriented Design
Walkable/Livable Communities

Source: SB Architects

Source: Sawmut Design and Construction

Highland Bridge (Ford Site)

Highland Bridge (Ford Site)

Highland Bridge (Ford Site)