

# 2013-2023 Crow Wing County Water Plan Update

Presented to:

*BWSR Academy*

Presented by:

*Mitch Brinks*

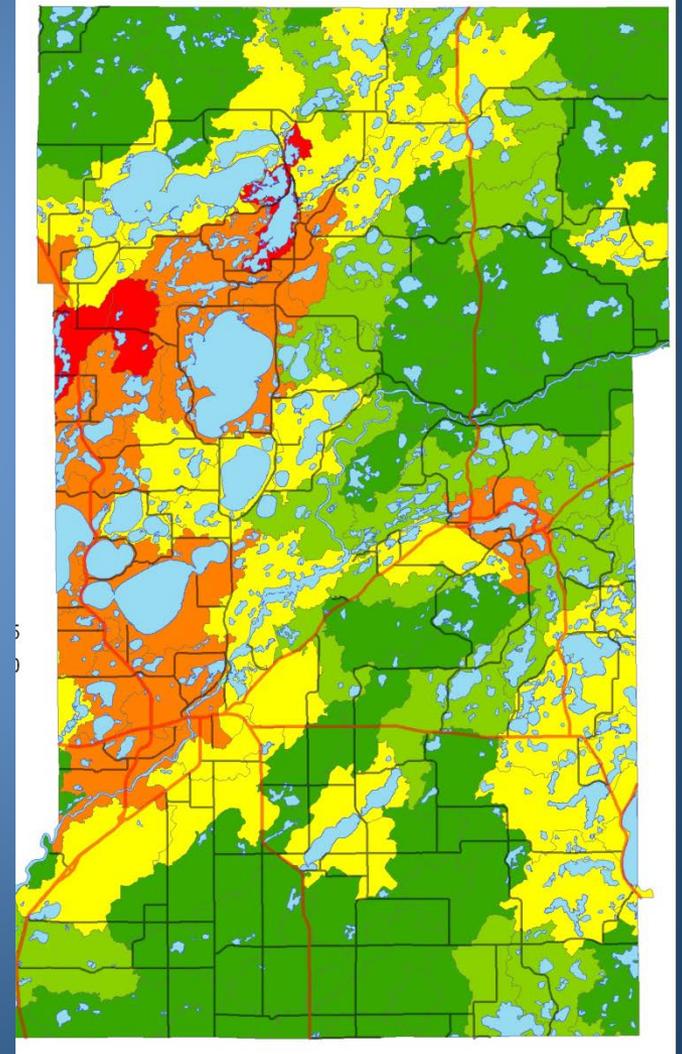
Crow Wing County Land Services

Date:

*October 29, 2013*



# Crow Wing County



## Woods, Water, & Wetlands:

- Forest: 38%
- Wetland: 26%
- Open Water: 14% (564 Lakes)
- Grass/Pasture/Shrub: 14%
- Developed: 4%
- Agriculture: 4%

*From National Land Cover Dataset (2006)*

## Growing Population:

- 1990: 44,249
- 2000: 55,099 (+ 24.5%)
- 2010: 62,500 (+ 13.4%)

# Crow Wing County Water Plan 2013 - 2023

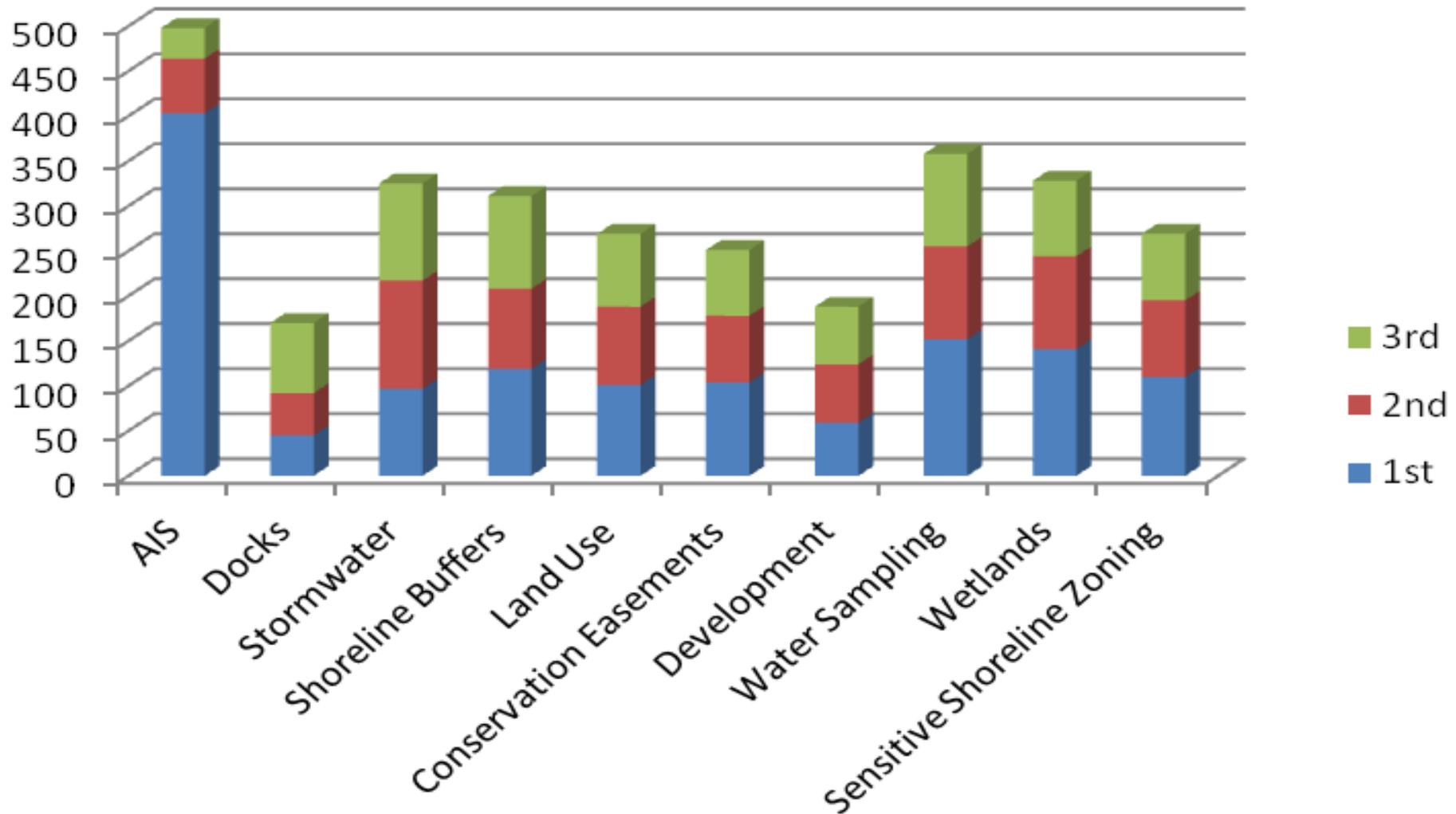
## Goals:

- Include numerous opportunities for public input
  - Riparian letter w/ survey to over 12,000 landowners
  - Survey
    - Stakeholders
    - County Fair
    - Newsletter
- Science Based / Data Rich
- Watershed Approach
- Include Chapter on Mississippi River
- Grant Friendly
- Integrate with Land Use Ordinance

# Water Plan Integration with Land Use Regulation

- Consistent policy & procedures since 2009
- Onsite based land use permit model
  - Includes follow-up
- Performance Standards
  - Impervious Surface Coverage
  - Septic Inspections / Assessments
- Development Review Team (DRT)
- Conservation Development Standards
- New Land Use Map (Created Shoreland District)
- Education / Outreach

# Survey Results: Surface Water Priorities



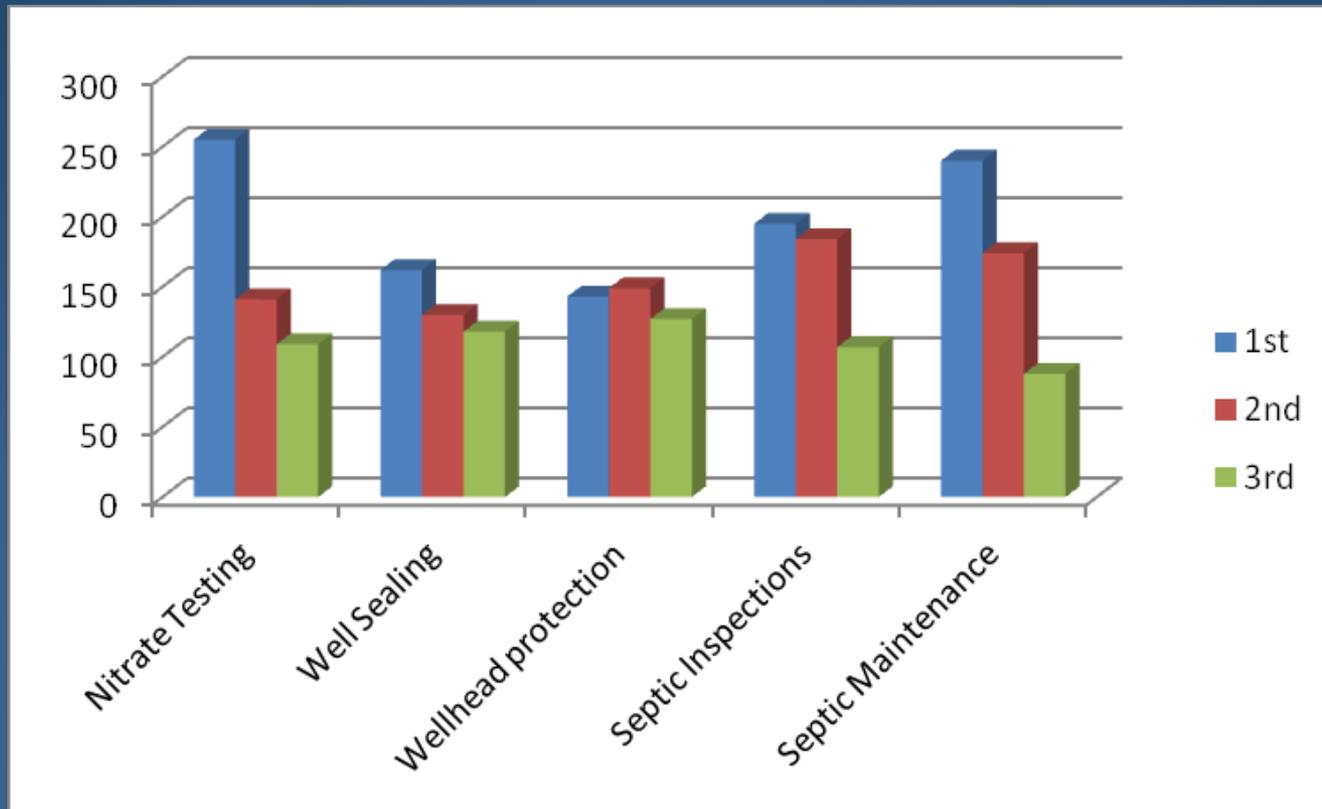
# 2013-2023 Priority Concerns

## 1. Aquatic Invasive Species

- Lake Association Coordination
- Watercraft Access Management
- Lake Improvement District Management
- Education & Outreach

## 2. Surface Water

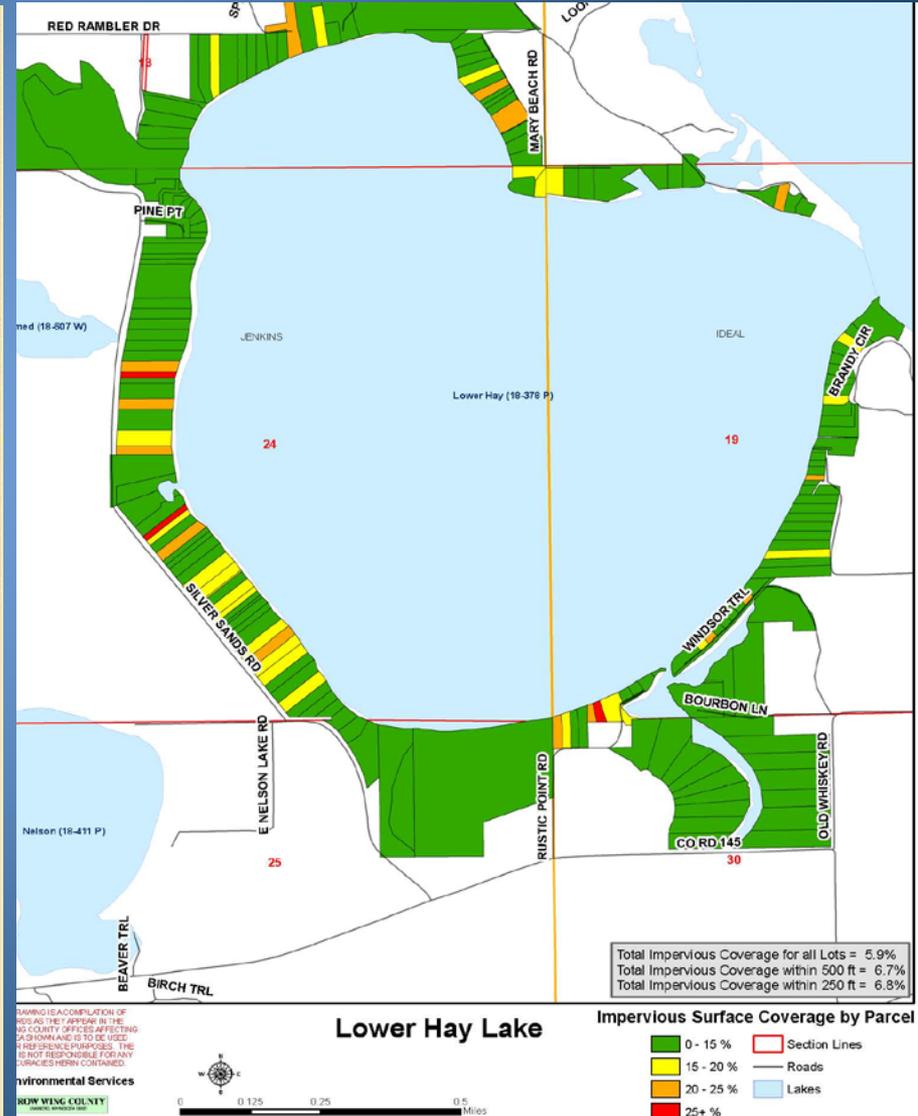
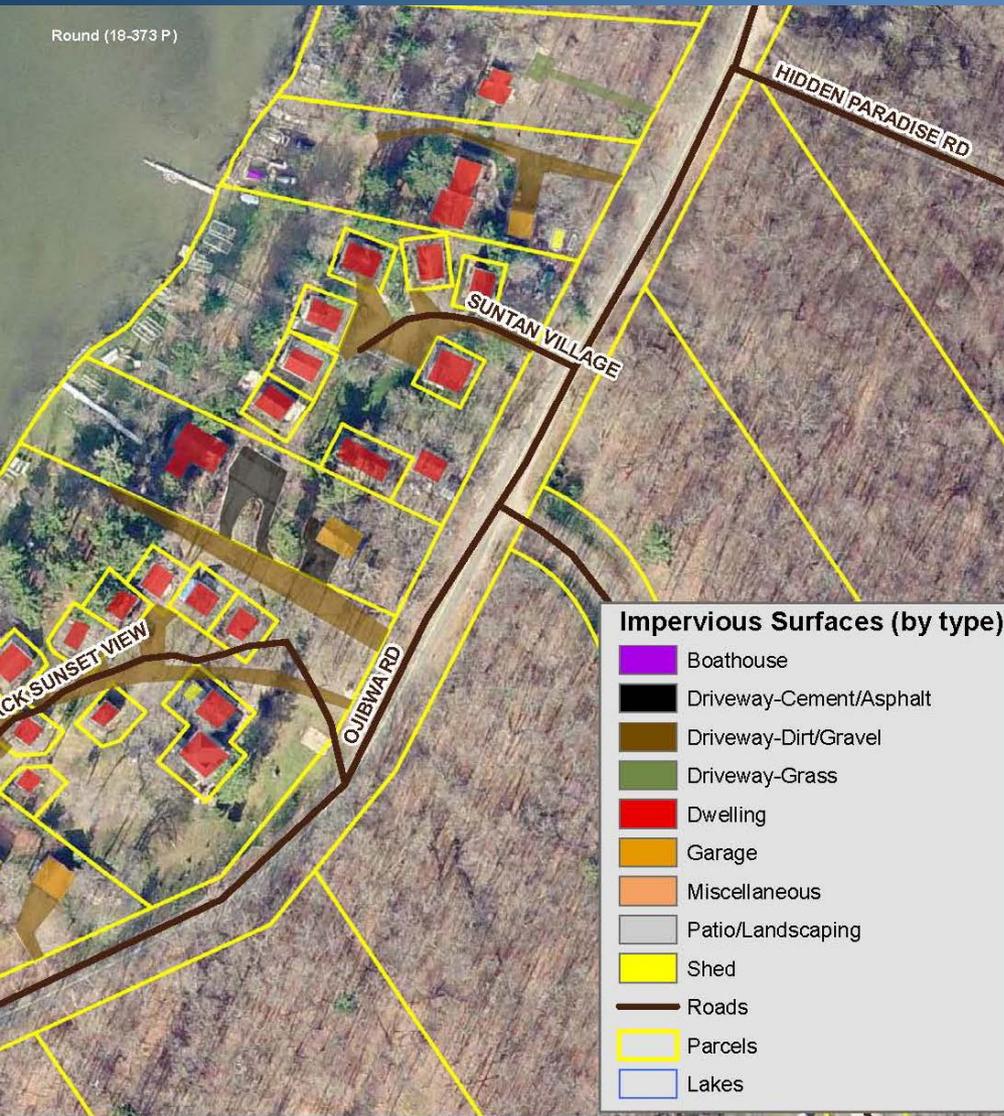
- Stormwater Management (incl. temp erosion/sediment control)
- Shoreline Buffers
- Wetland Protection
- Land Use and Development
  - Ordinance development
  - Conservation easements
  - Identifying sensitive shorelines
  - Public and private forest management / protection
- Measure Water Quality Data & Assess Trends
- Agricultural Best Management Practices



### 3. Groundwater

- Septic system maintenance and inspection
- Testing for nitrates and other contaminants
- Wellhead and drinking water source protection
- Well sealing of unused / abandoned wells
- Solid & hazardous waste disposal

# Becoming Data Rich: Impervious Surface Study



# Impervious Study Results

Arrowhead	= 1.7%	Ossawinnamakee	= 7.6%
Bay	= 7.2%	Pelican	= 5.5%
Bertha	= 10.5%	Pig	= 1.9%
Big Trout*	= 5.4%	Platte	= 2.3%
Borden	= 2.8%	Portage	= 6.4%
Camp	= 3.4%	Rabbit*	= 6.5%
Clearwater	= 2.7%	Red Sand	= 4.8%
Crooked	= 3.8%	Round*	= 14.5%
Edward	= 6.0%	Rush*	= 13.7%
Gilbert*	= 3.5%	Serpent*	= 14.5%
Hanks	= 4.4%	Smith	= 2.2%
Hubert*	= 6.4%	South Long	= 5.7%
Lower Hay	= 5.9%	Upper Hay	= 5.6%
Lower Mission	= 2.2%	Upper Mission	= 5.2%
Nokay	= 3.1%	Upper South Long	= 7.1%
North Long	= 6.2%	Whitefish*	= 4.8%

\* indicates lakes that have some parcels located within city limits (not included)

# Becoming Data Rich...

- Impervious Surface Data
- Phosphorous Tracking for Permits
- Abundant GIS Data
  - Local
    - Ownership
    - Infrastructure
  - State
    - DNR / MPCA / MDH
  - Federal
    - Census Data
    - National Land Cover Dataset
- Large Lake Assessments

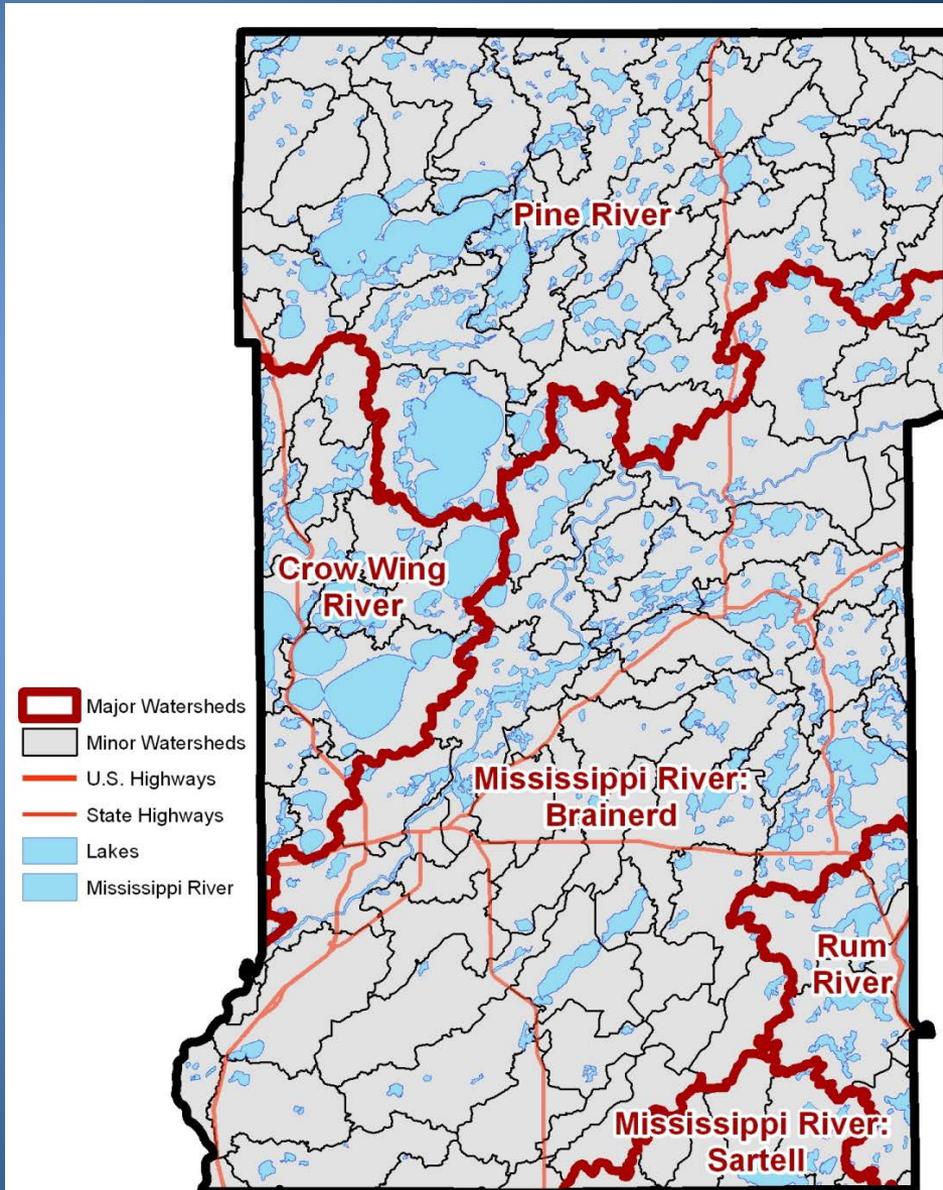
# Specific Target Resources:

- Larger Lakes (> 400 acres)
  - 11 = improving trend
  - 24 = no change in trend
  - 13 = declining trend
  - 3 = insufficient data for trend analysis
- Lakes with High Impervious
- 6 Impaired Lakes, 1 Impaired River Stretch:
  - Platte, Crow Wing, Kego, Mayo, Sibley, Jail & Little Buffalo Cr.
- Mississippi River: Mississippi Headwaters Board (MHB)
  - “Prioritizing Conservation Project Implementation”

# Watershed Approach

## Focus: Minor Watersheds

- 125 minor watersheds in CWC
  - Not created equal!
- Major watershed level is unmanageable at local level
- Relies on existing data
- Water plan priorities applied to each minor watershed
- Local priorities = local implementation
- Includes Mississippi River



# “Protection” Model

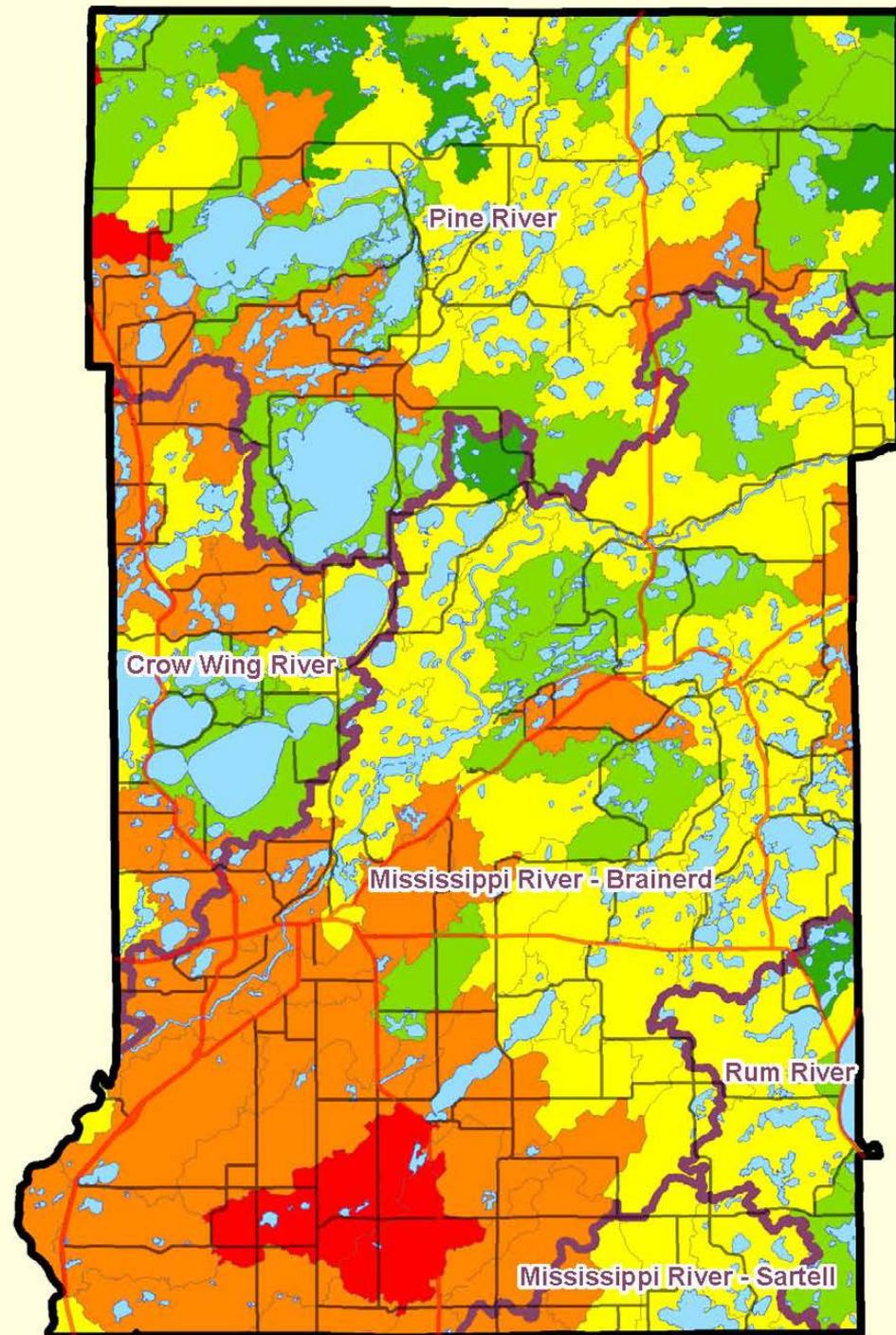
(from large lake assessments)

	Private (55%)					19%	Public (26%)		
	Developed	Agriculture	Forested Uplands	Other	Wetlands	Open Water	County	State	Federal
<b>Land Use (%)</b>	3%	4.5%	27%	18.5%	2%	19%	1%	24%	1%
<b>Runoff Coefficient</b> Lbs of phosphorus/acre/ year	0.45 - 1.5	0.26 - 0.9	0.09		0.09		0.09	0.09	0.09
<b>Description</b>	Focused on Shoreland	Cropland	Focus of development and protection efforts	Open, pasture, grassland, shrubland	Protected				
<b>Potential Phase 3 Discussion Items</b>	Shoreline restoration	Restore wetlands; CRP	Forest stewardship planning, 3 <sup>rd</sup> party certification, SFIA, local woodland cooperatives		Protected by Wetland Conservation Act		County Tax Forfeit Lands	State Forest	National Forest

# Protection Strategy... Applied to Watersheds

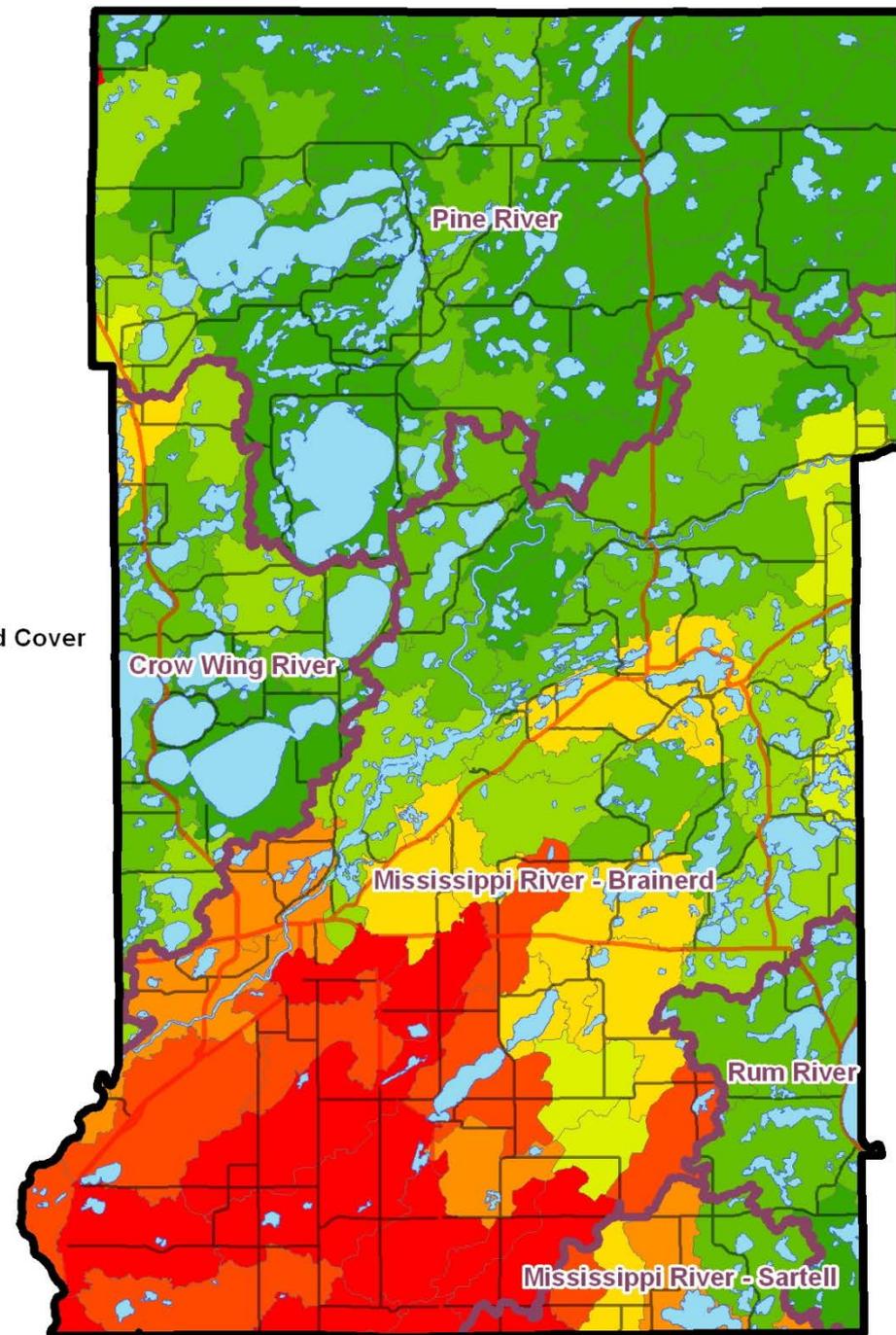
“Protected” =

- Public Ownership
- Public Waters (Lakes / Streams)
- Permanent Conservation Easements
- Wetlands (private lands)



# Land Cover Disturbance

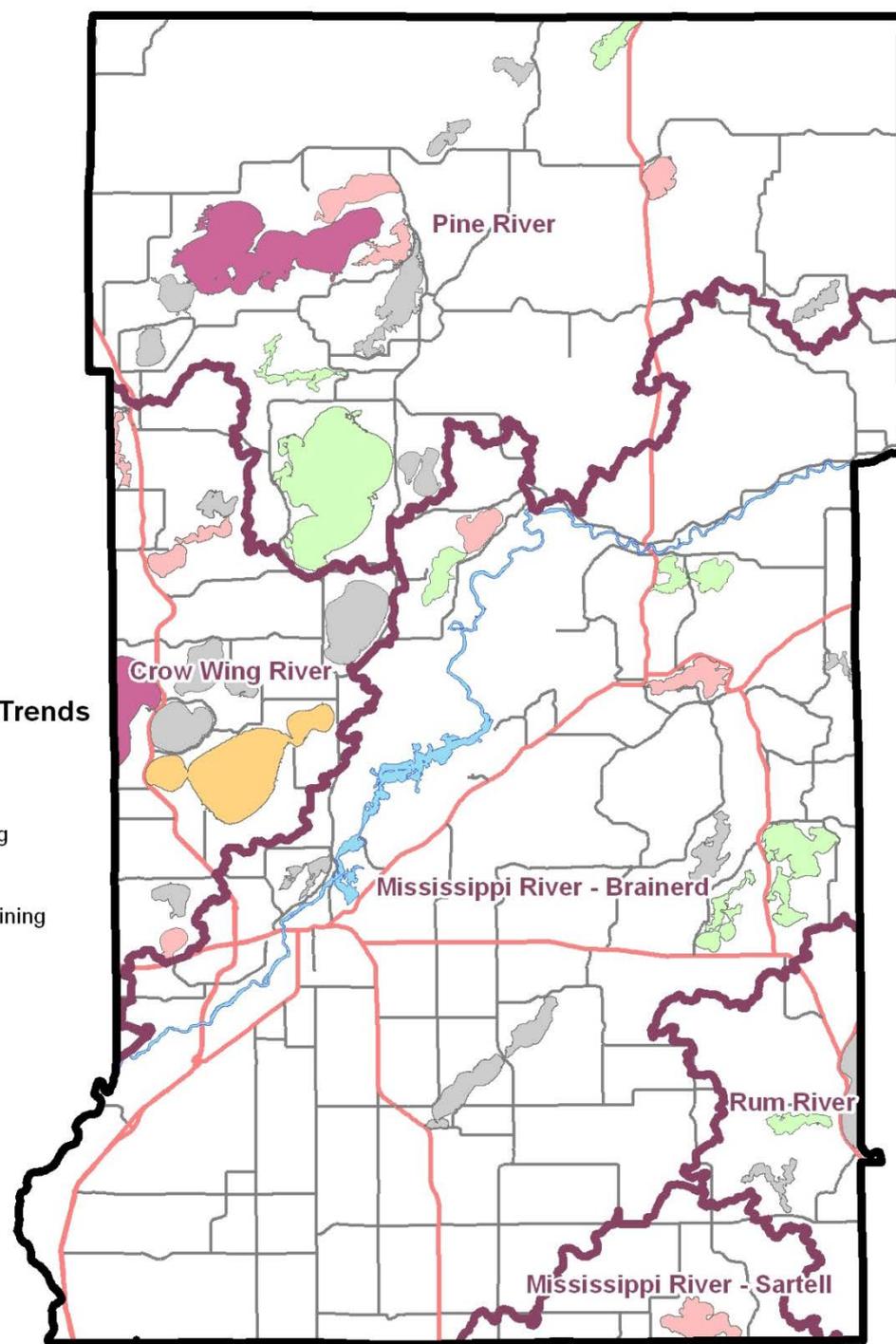
% Disturbed Land Cover



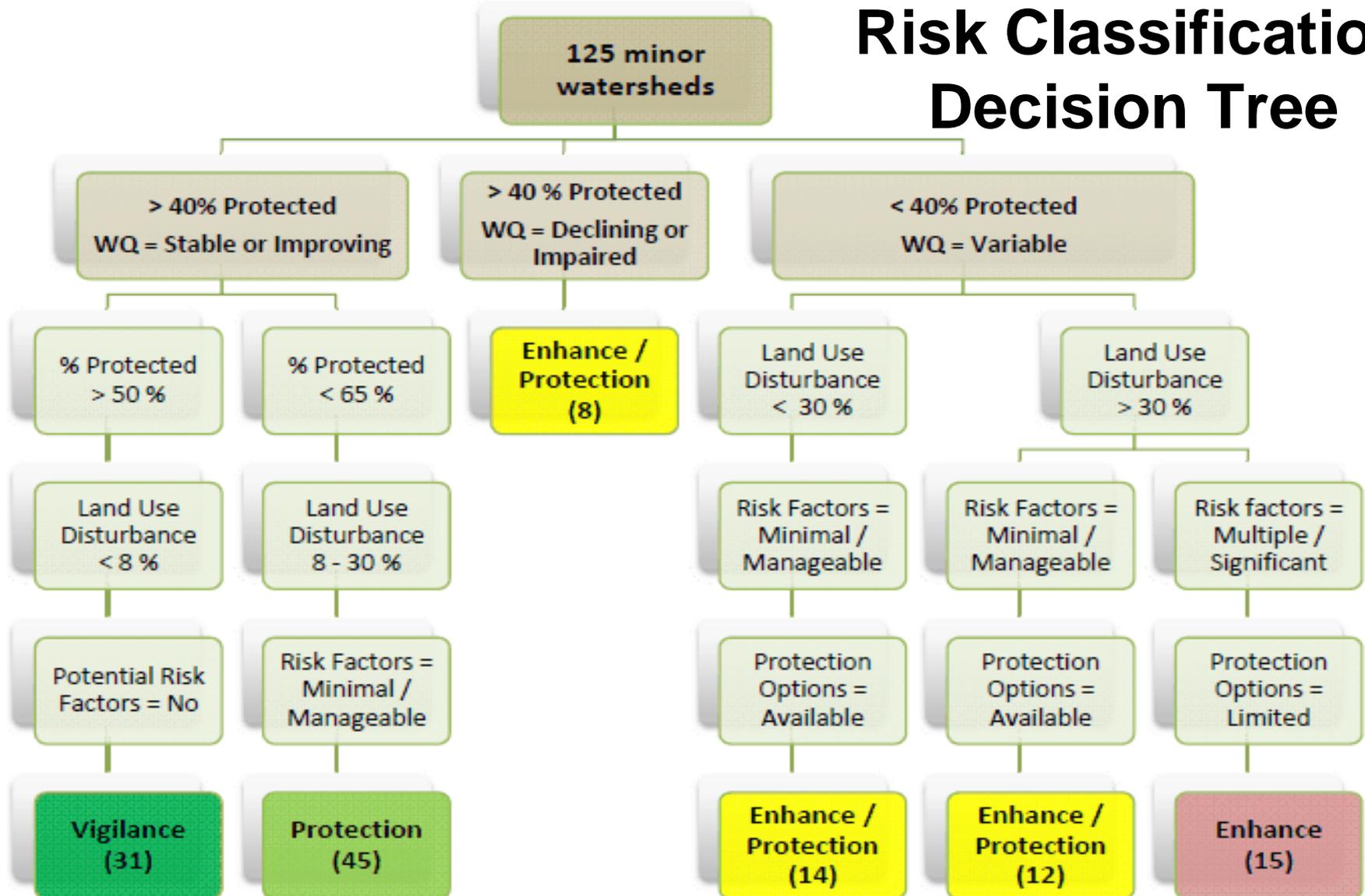
Disturbed Land Cover = Developed, Cultivated, Pasture, & Grassland

# Lake Water Quality Trends

## Lake Water Quality Trends



# Risk Classification Decision Tree

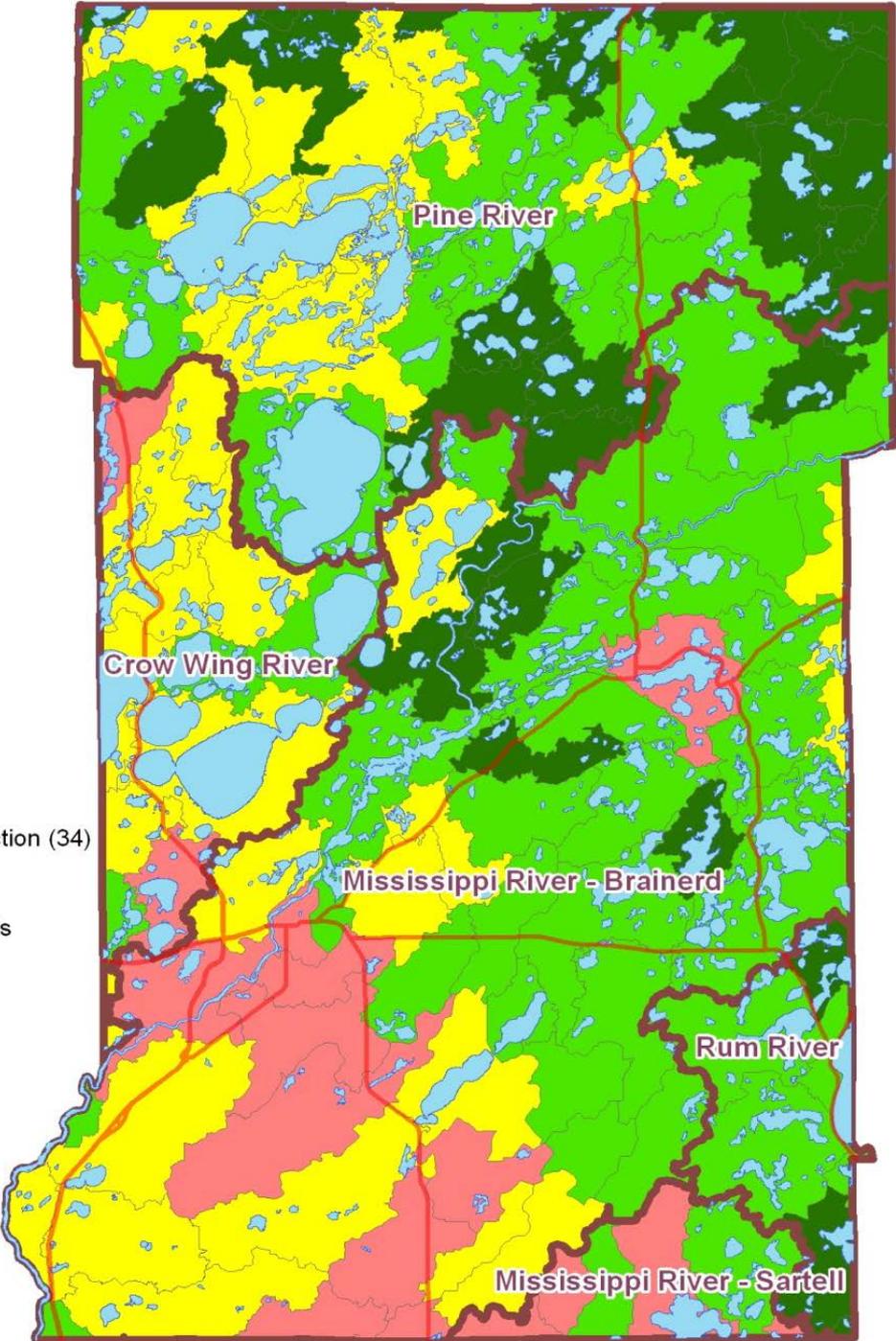


Protected = Total % of public ownership, permanent conservation easements, lakes, rivers, wetlands (private property)

Land Use Disturbance = Source 2006 National Land Cover Dataset (includes: *development, cultivated, pasture, grassland*)

Possible Risk Factors Include = Agriculture (measured by # of animal units), development, ditching / drainage, extractive use

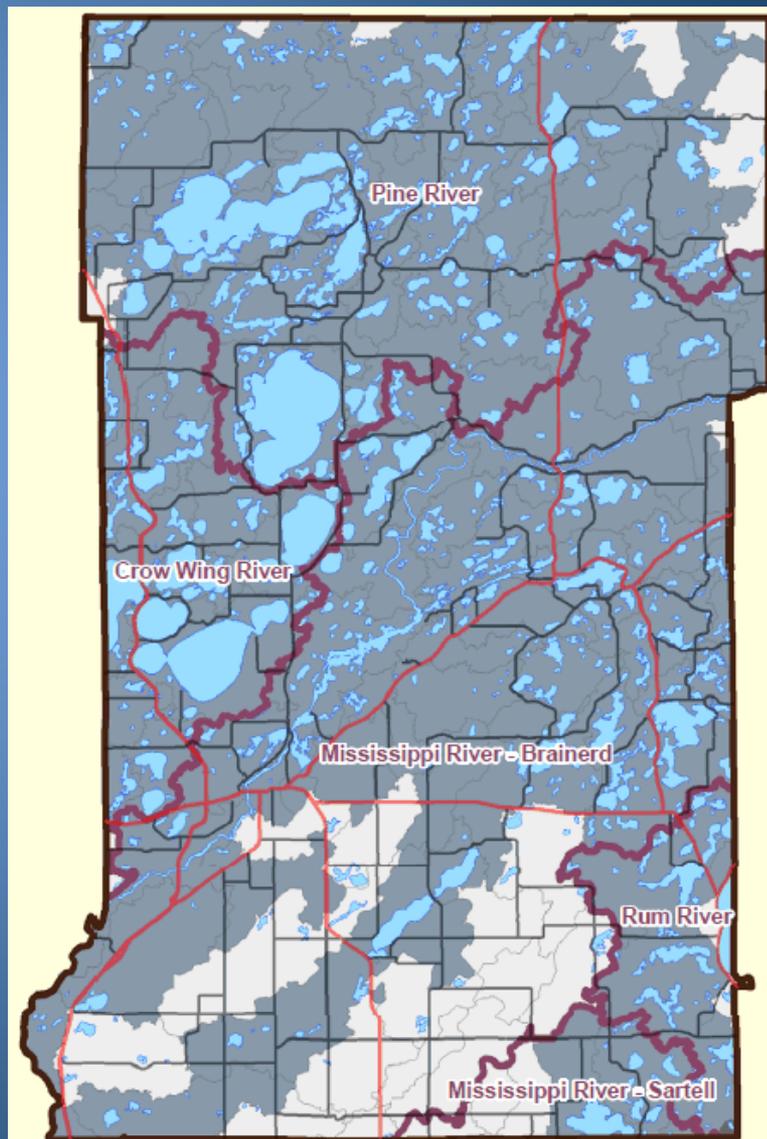
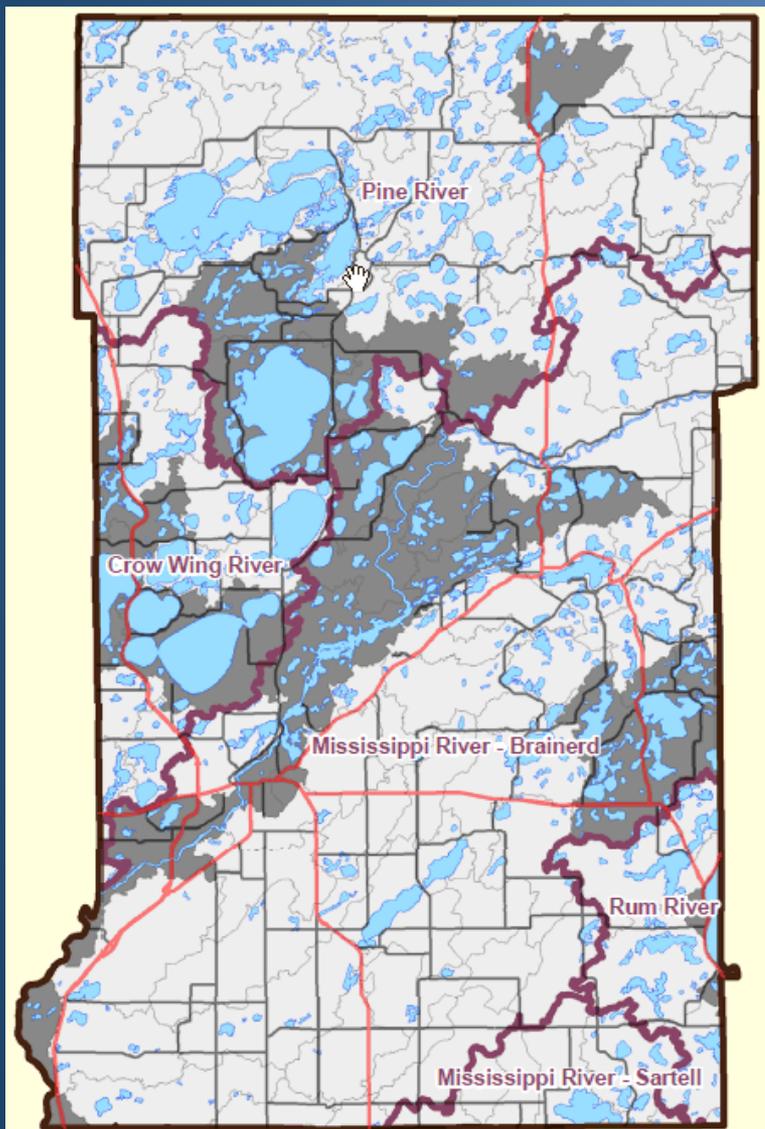
# Risk Classification



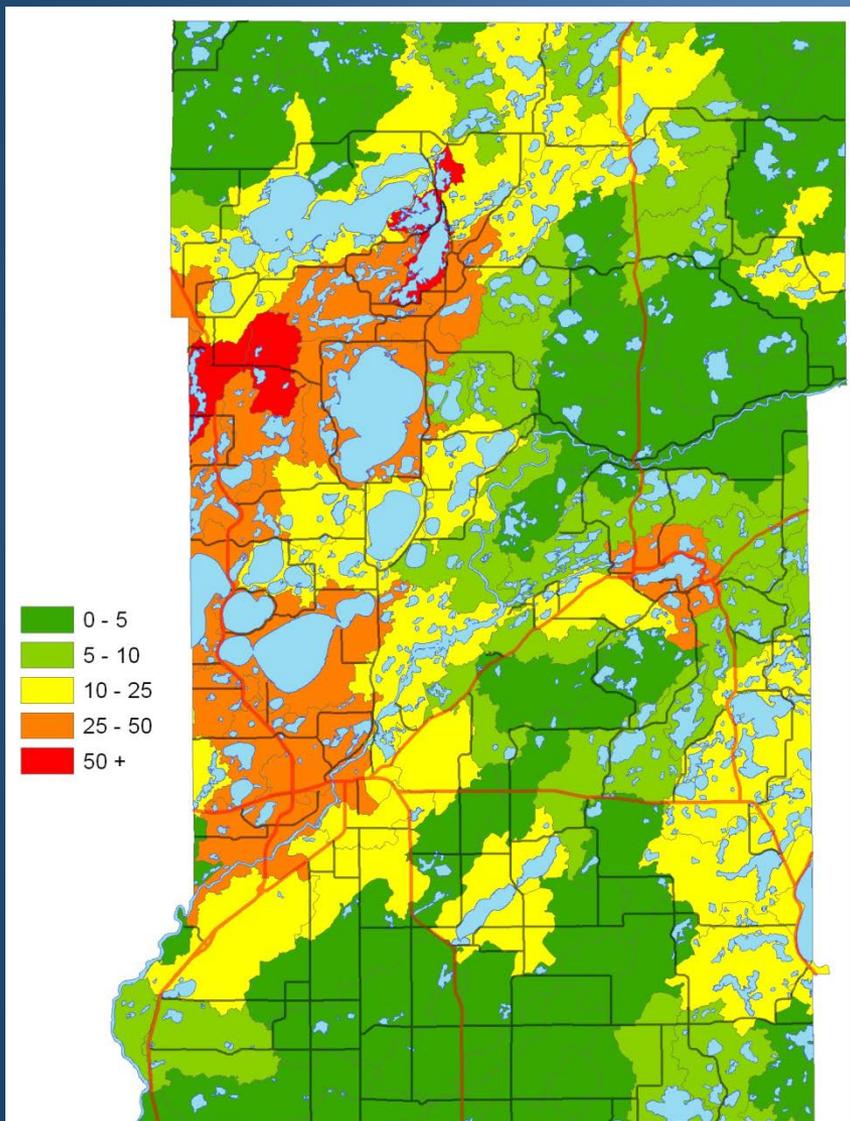
# Priority Concerns:

AIS

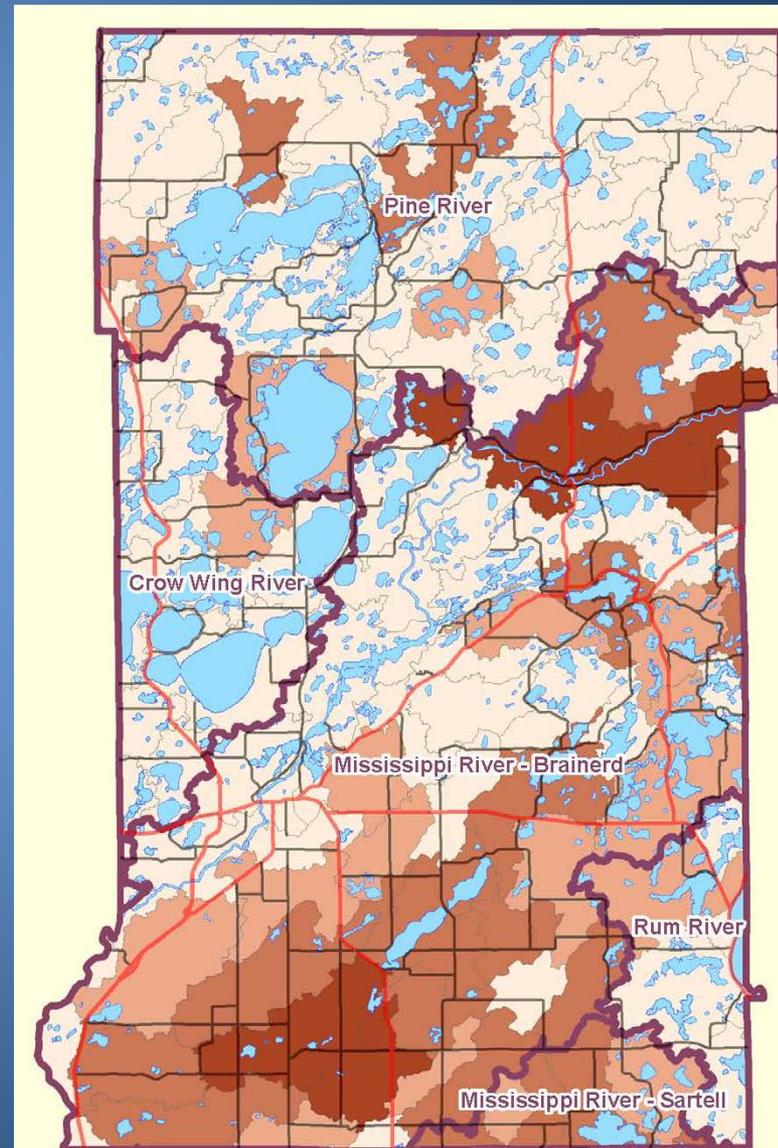
Stormwater / Buffers



# Priority Concerns: Development



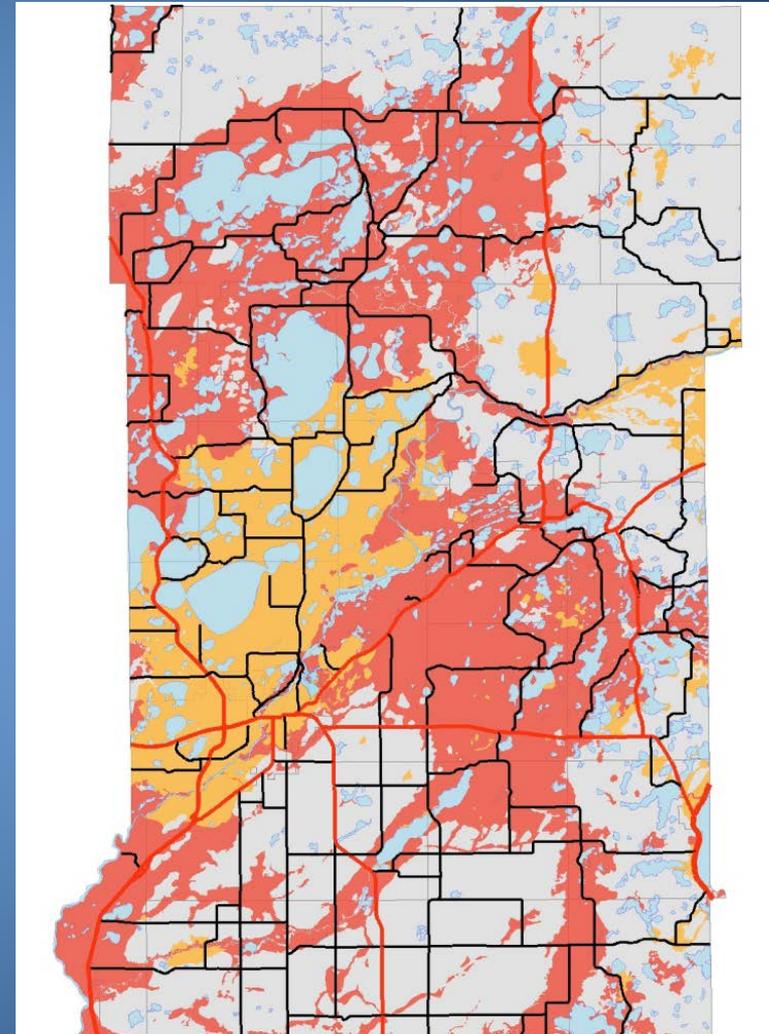
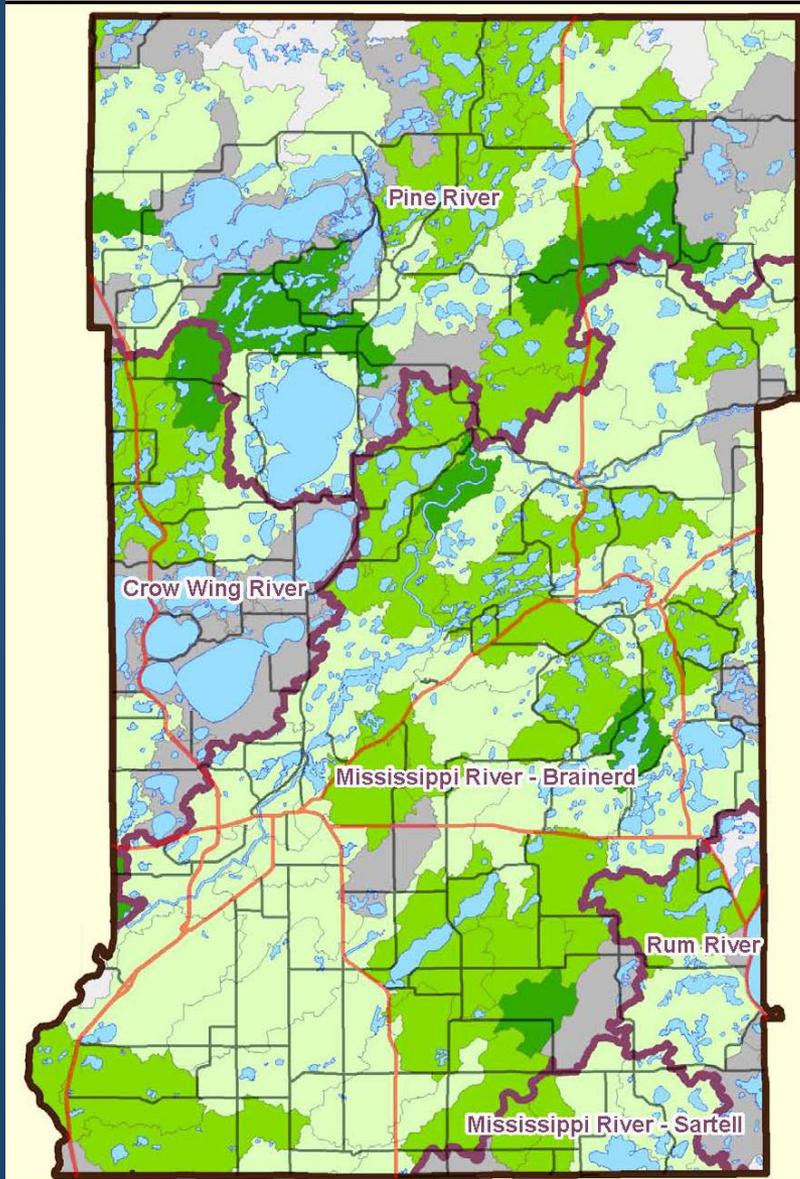
# Ag BMPS



# Priority Concerns:

Forest Stewardship

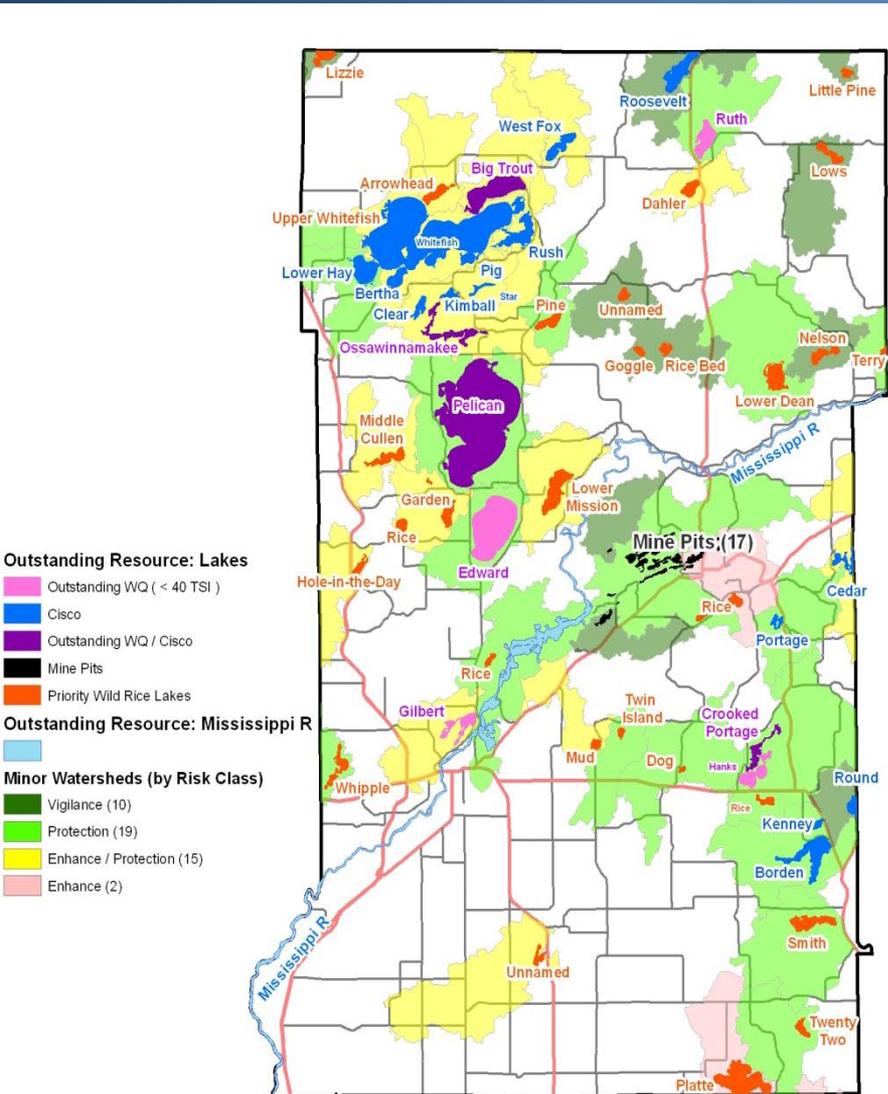
Groundwater Sensitivity



**Surfacial sand aquifer sensitivity**

- Very High
- High

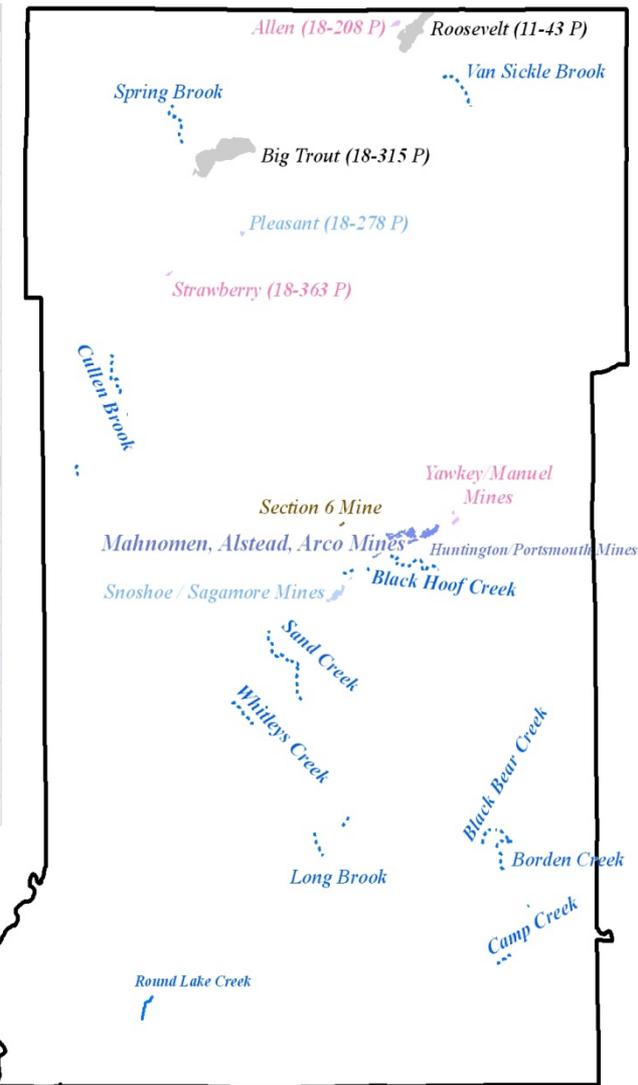
# Outstanding Surface Water Resources



Trout Lakes:	DNR ID:
Allen	18-208
Big Trout	18-315
Huntington Mine	18-441
Mahnomen, Alstead, Arco	18-440
Manuel Mine	18-435
Pennington Mine	18-439
Pleasant	18-278
Portsmouth Mine	18-437
Roosevelt	011-43
Sagamore Mine	18-523
Section 6 Mine	18-667
Snoshoe Mine	18-524
Strawberry	18-363
Yawkey Mine	18-434

Trout Streams:	DNR ID:
Barbour Creek	020R
Black Bear Creek	016R
Black Hoof Creek	045R
Borden Creek	018R
Camp Creek	001R
Cullen Brook	059R
Long Brook	023R,026R
Round Lake Creek	
Sand Creek	033R
Spring Brook	087R
Van Sickle Brook	081R
Whitleys Creek	036R

- Trout Lakes (by species)**
- Brook
  - Brown
  - Lake
  - Rainbow
  - Rainbow, Brook
  - Trout Streams



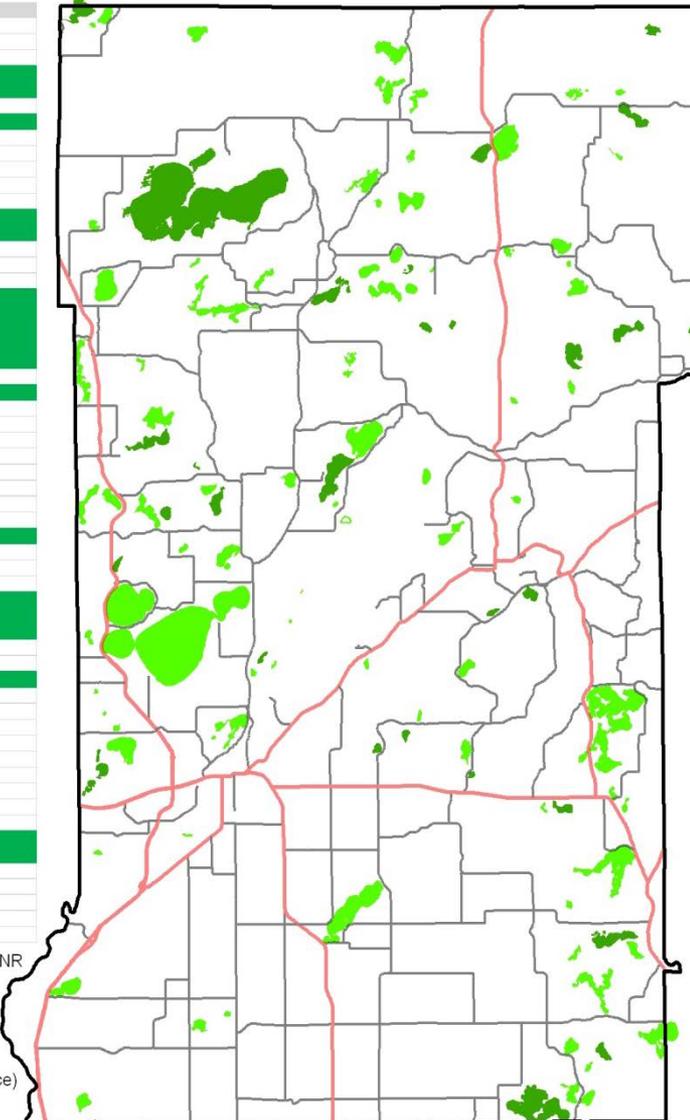
# Outstanding Surface Water Resources

Lake Name	
Arrowhead	Mitchell
Bass (18-11)	Mollie
Bass (18-229)	Mud (18-094)
Bay	Mud (18-137)
Big Bird	Mud (18-329)
Birchdale	Mud (18-198)
Borden	Nelson
Buffalo	Nisawa
Bulldog	North Long
Butterfield	Olson
Camp	Ossawinamakee
Caraway	Perch
Carson	Pine
Clark	Platte
Cole	Pointon
Crow Wing	Rat
Cubler	Red Sand
Deadman's	Rice (18-53)
Deer	Rice (18-66)
Dog	Rice (18-121)
Duck (18-178)	Rice (18-316)
Duck (18-314)	Rice (18-327)
Eagle	Rice (18-405)
Emily	Rice Bend
Erskine	Rock
Faupel	Rogers
Flanders	Round (18-373)
Garden	Round (18-147)
Gilbert	Boy
Goggin	Sebie
Goodrich	Sewell's Pond
Grass (18-230)	Sisley
Grass (18-362)	Smith
Green	South Long
Greer	Stewart
Half Moon	Tamarack
Happy	Terry
Hay	Twenty Two
Hole-in-the-Day	Twin Island
Holt	Unnamed (18-55)
Horseshoe	Unnamed (18-201)
Island	Unnamed (18-228)
Island	Unnamed (18-413)
Jail	Unnamed (18-543)
Johnson	Unnamed (18-544)
Uly Pad	Unnamed (18-550)
Little Pine (18-176)	Upper Cullen
Little Pine (18-266)	Upper Dean
Lizzie	Upper Hay
Long (18-031)	Upper Mission
Love	Velvet
Lower Dean	Whipple
Lower Mission	Whitefish (18-310)
Lows	Whitefish (18-1)
Mahomen	Williams
Mallard	Wilson
Maple	Wolf
Middle Cullen	

Source: Minnesota DNR

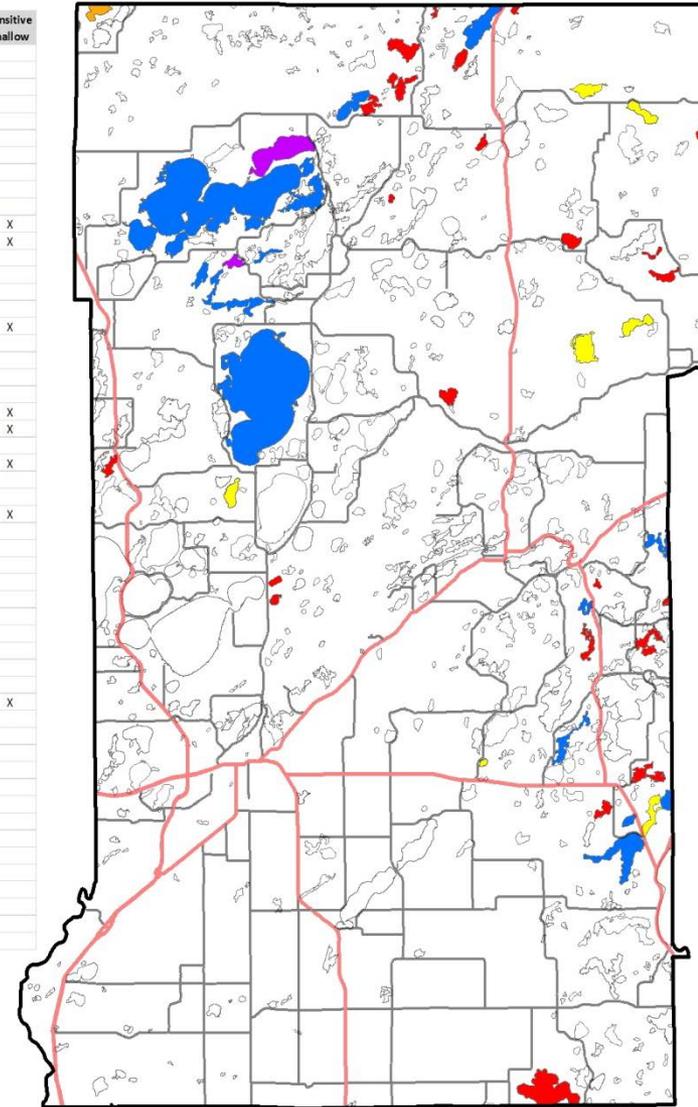
## Wild Rice Lakes

- Priority (> 40 acres of rice)
- Other wild rice lakes



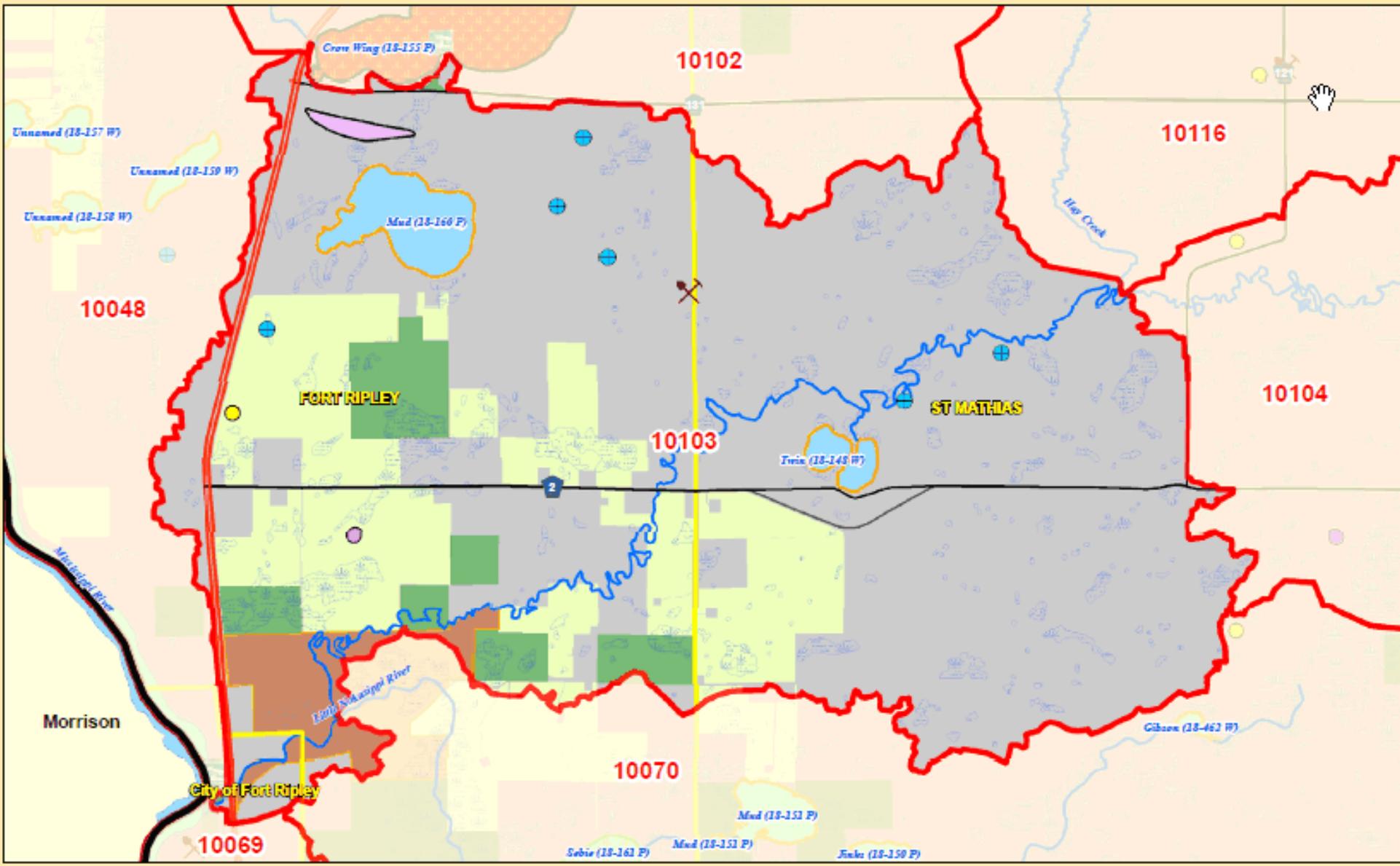
Lake Name	DNR ID:	Cisco	MCBS	Sensitive Shallow
Ann	18-65		X	
Arbor	18-80		X	
Bertha	18-355	X		
Big Trout	18-315	X	X	
Blue	18-211		X	
Borden	18-20	X		
Cedar	1-209	X		
Clear	18-364	X		
Crooked	18-41	X		
Cryстал	18-341		X	
Dog	18-107			X
Duck	18-178			X
Eagle	18-296	X		
East Fox	18-298	X		
Edna	18-396	X		
Fool	18-224	X		
Garden	18-329			X
Island	18-269	X		
Kenney	18-19	X		
Kimball	18-361	X	X	
Lily Pad	18-275	X		
Lizzie	18-416	X		X
Lower Dean	18-181			X
Lower Hay	18-378	X		
Lows	18-180			X
Mitchell	18-294		X	
Moulton	1-212	X		
Nelson	18-164			X
Ossawinamakee	18-352	X		
Pelican	18-308	X		
Pig	18-354	X		
Partridge	18-48		X	
Placid	18-76		X	
Platte	18-88		X	
Portage	18-69	X		
Rogers	18-184		X	
Roosevelt	11-430	X		
Round	1-204	X		
Round	18-32			X
Rush	18-311	X		
Scott	18-33		X	
Shirt	18-72		X	
Smokey Hollow	18-220		X	
Sorenson	18-323		X	
Star	18-359	X		
Stark	18-169		X	
Townline	1-207		X	
Trout	18-218		X	
Turtle	18-47		X	
Twin	18-167		X	
West Fox	18-297	X		
Whitefish	18-310	X		
Wood	18-222		X	

- Cisco Lakes
- MCBS Lakes
- Shallow Lakes
- MCBS / Shallow Lakes
- Cisco / MCBS Lakes
- Other Lakes



Data Source: Minnesota Department of Natural Resources (DNR) / Minnesota County Biological Survey

# Individual Watershed Maps



# Watershed Basics / Priorities

<b>Minor Watershed #</b>	<b>10103</b>
<b>Major Watershed Name</b>	Mississippi River - Brainerd
<b>Area (sq. miles)</b>	14
<b>Population 2010</b> (persons per sq. mile)	23
<b>Population Change 2000 to 2010</b> (persons per sq. mile)	3
<b>Surficial Geology</b>	Upper Terrace / Brainerd Till
<b>% Slope (avg.)</b>	8
<b>% Forested (private)</b>	35
<b>% Disturbed Land Cover</b>	44
<b>% Developed</b>	4
<b>Extractive Uses</b>	Minimal
<b># of Animal Units</b>	208
<b>Biological Diversity</b>	Partially Moderate
<b>% Public Land</b>	4
<b>% Easements</b>	19
<b>% Lakes</b>	2
<b>% Streams</b>	0
<b>% Wetlands (private)</b>	7
<b>% Protected</b>	<b>33</b>
<b>Assigned Risk Level</b>	<b>Enhance / Protection</b>

<b>Implementation Priorities</b>	
Top 24 Priority Watershed	
<i>Surface Water</i>	
Aquatic Invasive Species	
Stormwater	x
Shoreline Buffers	x
Lake Focus: Recreational Use & Development	
Lake Focus: Wild Rice / Wildlife	
Rivers / Floodplains	x
Agricultural BMPs	x
Ecological Sensitive Areas	
Bluffs & Steep Slopes	
Public & Private Drainage	
Development (existing and potential)	
Private Forest Stewardship	x
<i>Ground Water</i>	
Septic Systems	x
Wellhead Protection	x

# Mississippi River Catchments

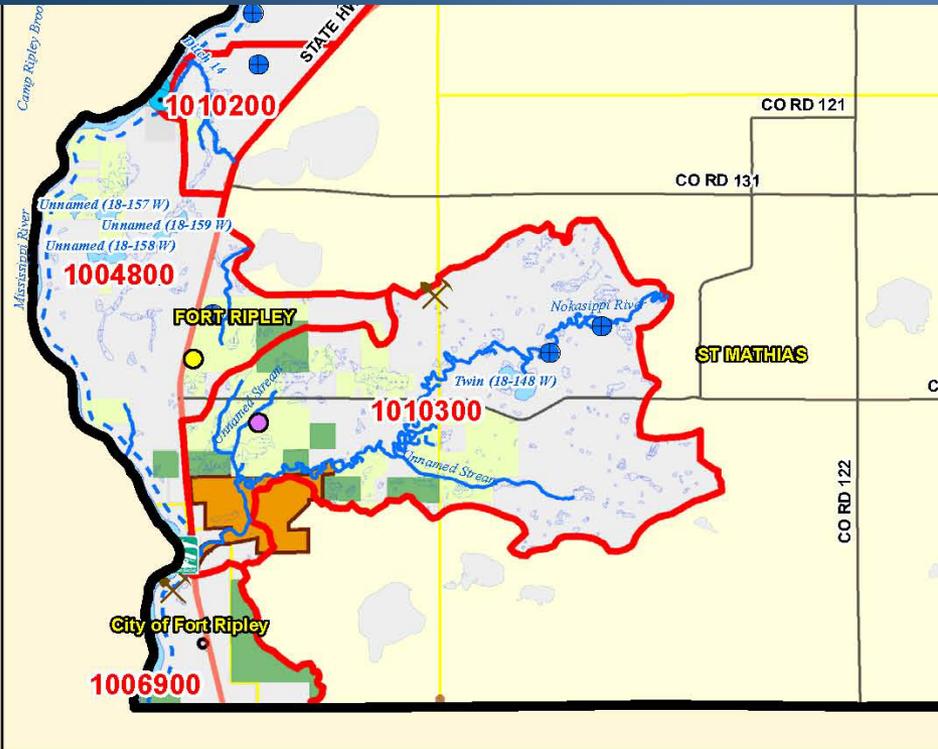


Figure 71: Mississippi River Catchment Map 3

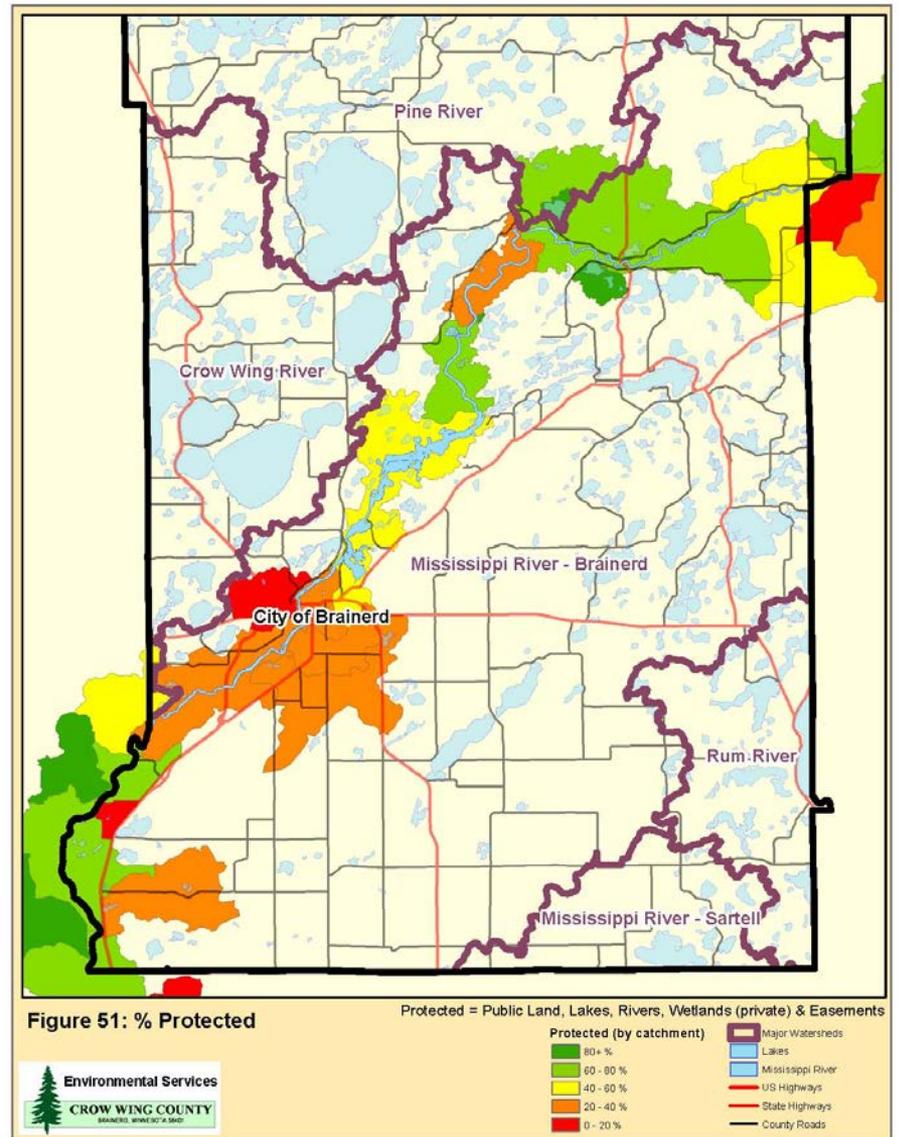
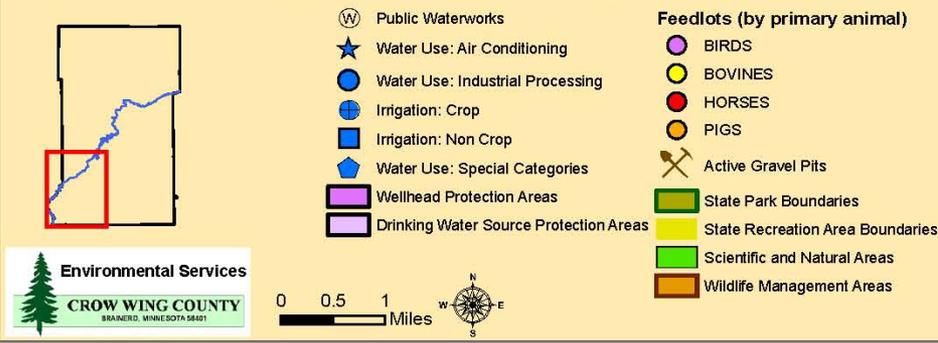


Figure 51: % Protected



# Implementation Examples

- Stormwater management / buffers on targeted parcels
  - Partners: SWCD, 30 Lakes Watershed
- Develop private forest management plans in target, forested watersheds
  - Forest Resources Council
  - DNR
- Pursue conservation easements in watersheds with a low “protected” score
  - DNR
  - BWSR
  - Minnesota Land Trust

# Questions?

Contact: Mitch Brinks

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Website: [www.crowwing.us](http://www.crowwing.us)

