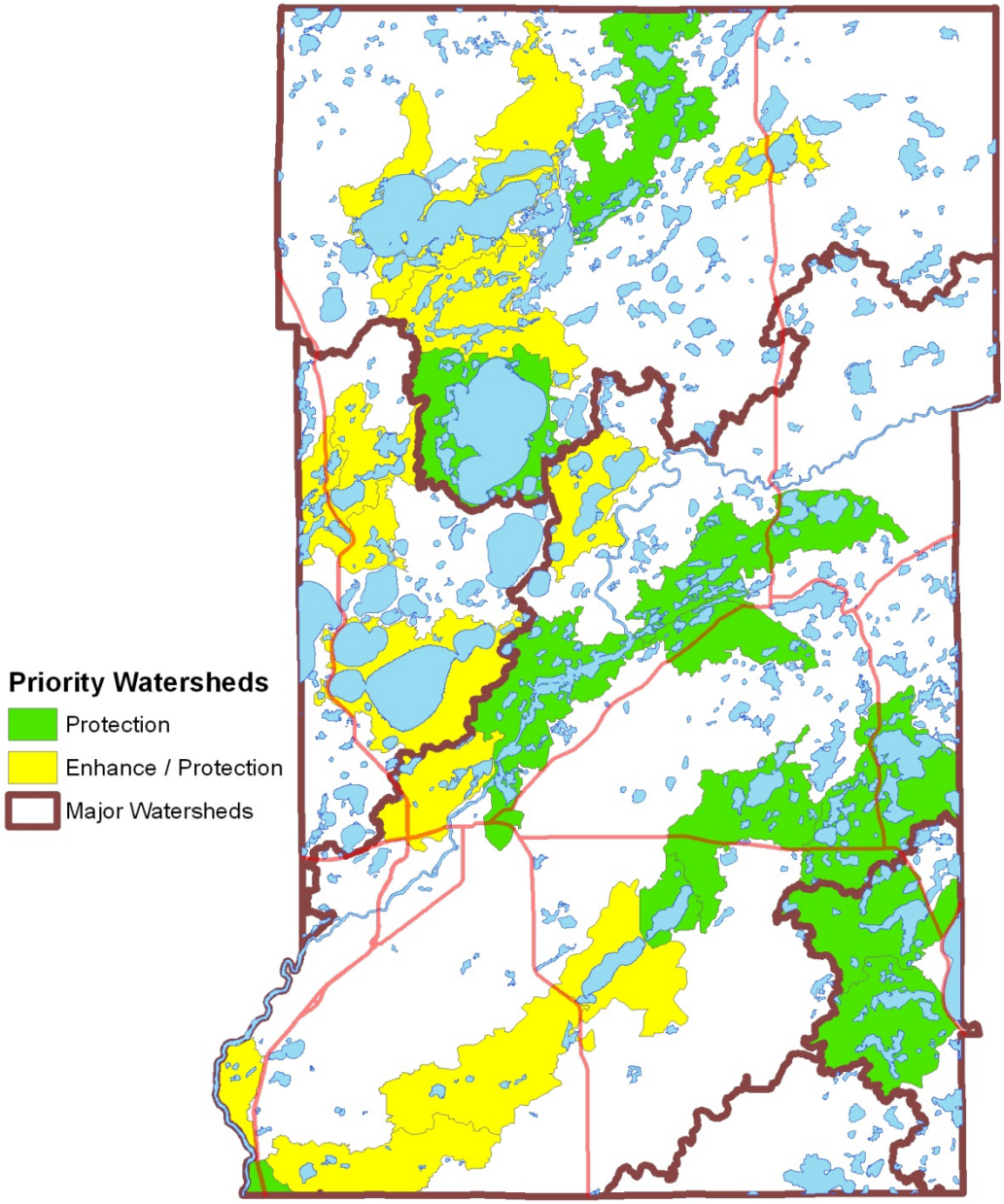
## IMPLEMENTATION: OTHER PRIORITY WATERSHEDS

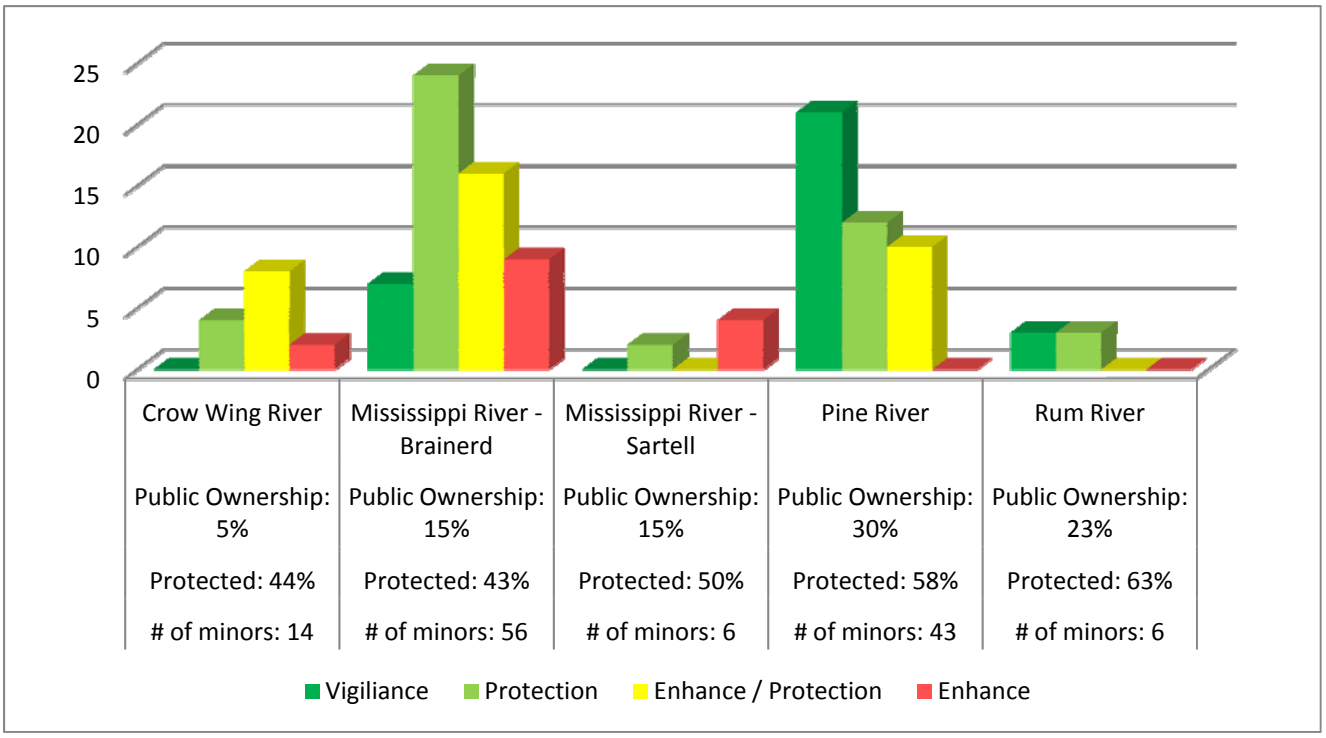
This analysis also revealed that there were 24 watersheds with the enhance / protection or protection classification that were unique in that they had a lot of attributes worthy of protection such as lakes and rivers (often with stable or improving water quality and/or wild rice), areas with biodiversity and ecological significance, bluffs or steep slopes, wetlands, and forested areas, but also had potential risk factors such as higher amounts of animal units, development/impervious, disturbed land cover classes, and extractive uses. Because of this unique status and the real threat that these watersheds could very easily change their risk classification in the future, these watersheds would be top overall priorities to focus water planning efforts on.

*Figure 30. Priority Watersheds (Enhance / Protection or Protection watersheds only)*



## IMPLEMENTATION: MAJOR WATERSHED SUMMARY

*Figure 31. Risk Classification & % Protected by Major Watershed (Crow Wing County only)*




*% Protection is sum of: % public ownership, % lakes, % rivers, % wetlands (on private prop), and % easements*

***Major Watershed Summaries (from MPCA data):***

*Crow Wing River Watershed*

*Basics:*
The Crow Wing River watershed is 1,245,214 acres (1,945 square miles) in size. It is located in the north central portion of the Upper Mississippi River Basin and includes all or parts of Becker, Cass, Clearwater, Crow Wing, Hubbard, Morrison, Otter Tail, Todd, and Wadena counties. Major cities include Park Rapids, Staples, and Nisswa. The Crow Wing River watershed includes over 627 lakes 10 acres in size or greater as well as 1,653 stream and river miles. The Crow Wing River flows into the Mississippi River at Crow Wing State Park. Land use in the Crow Wing River watershed is mostly forested and agriculture.

*Hydrologic Unit Code (HUC):* 07010106

*MPCA Intensive monitoring start year:* 2010

*Major lakes, rivers, and streams:* North Long, Gull, Big Sand, Badoura Bog, Edward, Potato, Shell, Crow Wing, Stoney Brook, Kettle River, Shell River, Swan Creek, Tower Creek

*Crow Wing County:*
The portion of Crow Wing County that flows into Gull Lake is part of the Crow Wing River Watershed. Most of the watershed that flows into Gull Lake from the east via Round Lake / Bishop Creek is flat, sandy, and lake-dominated. No impairments are present in this portion. The part of the watershed that flows into Gull from the north is the primary cause for concern. It includes Sibley and Mayo lakes which were just added to the Impaired Waters, list for high nutrients (joining Lake Margaret in Cass County). Although these lakes are within Crow Wing County, the majority of these watersheds are located in Cass County.

*Mississippi River – Brainerd Watershed:*

*Basics:*
The Upper Mississippi River - Brainerd watershed covers 1,079,950 acres (1,687 square miles) in the north central part of the Upper Mississippi River Basin in central Minnesota. The watershed boundary begins in Aitkin County where the river flows through the cities of Aitkin, Brainerd/Baxter, and Little Falls. The watershed encompasses all or parts of Aitkin, Cass, Crow Wing, Morrison and Todd counties. Almost half of the watershed is forested (42%), while grasslands and shrub wetlands make up 38%, row crops 10%, water 6%, and 4% is urban. The majority of the watershed is within the North Central Hardwood Forest with small sections in the Northern Lakes and Forests eco-region. The watershed has approximately 2,149 total river miles and contains 212 lakes greater than 10 acres in size. There are several impaired lakes and streams in this watershed.

*Hydrologic Unit Code (HUC):* 07010104

*MPCA Intensive monitoring start year:* 2015

*Major lakes, rivers, and streams:* Cedar, Farm Island, Bay, South Long, Rice, Mississippi, Spring Branch, Rice, Rabbit, Nokasippi

*Crow Wing County:*
The Mississippi River – Brainerd watershed is the largest of the watersheds in Crow Wing County. It includes the entire length of the Mississippi River that is located in Crow Wing County. The Nokasippi River is the major tributary in this watershed. The Little Buffalo Creek and Crow Wing Lake are the two impaired waters in this watershed in the County (excluding waters impaired for Mercury). Little Buffalo Creek is impaired for Invertebrates (Aquatic Life) and Crow Wing Lake is impaired for Nutrients.

*Mississippi River – Sartell Watershed:*

*Basics:*
The Mississippi River - Sartell watershed covers approximately 652,800 acres (1,020 square miles) in the central part of the Upper Mississippi River Basin. The watershed is also known locally as the Platte-Spunk Rivers watershed. The watershed includes parts of Benton, Crow Wing, Mille Lacs, Morrison, Stearns, and Todd counties. Major communities located in the watershed include Lastrup, Pierz, Buckman, Royalton, Upsala, Bowlus, Rice, Holdingford, Avon, St. Joseph, and Sartell. The Mississippi River - Sartell watershed has 879 total river miles and contains 232 lakes with a total acreage of 13,319. The Mississippi River - Sartell watershed is located in the North Central Hardwood Forest eco-

region of Minnesota. This watershed is primarily agricultural, with approximately 96% of the land in this watershed under private ownership. The predominate land uses are grass/pasture/hay (35%), row crops (29%), forest (19%), and wetlands (9%). The shorelines of the lakes within this watershed tend to be developed and the tributary streams primarily flow through areas of agricultural land use.

*Hydrologic Unit Code (HUC):* 07010201

*MPCA Intensive monitoring start year:* 2016

*Major lakes, rivers, and streams:* Big Watab, Pelican, Two River Lake, Platte, Sullivan, Little Rock, Spunk (Big, Middle, Lower), Mississippi River, Hillman Creek, Little Rock Creek, North Two River, South Two River, Platte, Skunk, Spunk Creek, Two River, Watab

*Crow Wing County:*
Only a small portion in the southeastern corner of Crow Wing County is within this watershed. Currently, there are two lakes and several streams within this watershed that do not meet Minnesota's surface water quality standards for conventional parameter (not including mercury) pollutants, one of which is Platte Lake, a heavily developed, shallow lake surrounded by agricultural areas.

*Pine River Watershed:*

*Basics:*
The Pine River is approximately 502,400 acres (785 square miles) in size. The watershed drainage for the Pine River contains parts of Aitkin, Cass, Crow Wing and Hubbard counties. Pine River and Crosslake are the major cities in the watershed. The Pine River watershed contains 586 stream and river miles of various sizes, and 441 lakes greater than 10 acres. Land ownership in the Pine River Watershed is 56% privately held and over 40% is state-owned land. The watershed is 51% forested, 21% wetlands, and 13% open water. The watershed contains numerous heavily developed lakes. The majority of the lakes are important recreational resources and economic benefits to the watershed. In addition, the Pine River serves as a source watershed for municipal drinking water supplies located further downstream as noted in the 2008 study "Forests, Water and People" by the USDA Forest Service. The Pine River ranked as the highest of the watersheds studied in Minnesota by the Forest Service in terms of which watersheds are the most important for drinking water supply and most in need of protection.

*Hydrologic Unit Code (HUC):* 07010105

*Intensive monitoring start year:* 2012

Major lakes, rivers, streams:
*Whitefish Chain of Lakes, Pelican Lake, Arvig Creek, Hay Creek, Daggett Brook, Pelican Brook*

*Crow Wing County:*
The Pine River watershed makes up the northern 1/3 of Crow Wing County and is dominated by the Pine River reservoir which makes up the Whitefish Chain of Lakes. Kego and Jail Lakes are the only impaired waters (nutrients). This watershed has the highest percentage of public land (30%) of the major watersheds in Crow Wing County.

*Rum River Watershed:*

*Basics:*
The Rum River watershed covers 997,060 acres (1558 square miles) in east-central Minnesota. The watershed lies within both the Northern Lakes and Forests and North Central Hardwoods Forest eco-regions. Parts of Aitkin, Crow Wing, Morrison, Mille Lacs, Kanabec, Benton, Isanti, Chisago, Sherburne, and Anoka counties are in the Rum watershed. The headwaters for the Rum begin at Mille Lacs Lake and the river flows 145 miles to its confluence with the Mississippi River at Anoka. The Rum River watershed includes 212 lakes that are over 10 acres in size. Land use in the Rum River watershed is 39% agricultural, 24% forested, 18% grass/shrub/wetland, and 15% water. The Rum River watershed includes 212 lakes that are over 10 acres in size. Land use in the Rum River watershed is 39% agricultural, 24% forested, 18% grass/shrub/wetland, and 15% water. Only a handful of lakes do not meet water quality standards for beneficial uses, such as aquatic recreation, drinking, and swimming. The main lake pollutant is phosphorus, causing algae blooms in summer months. The Rum River is designated as a "wild and scenic river." The upper river valley has one of the highest concentrations of prehistoric sites in Minnesota.

*Hydrologic Unit Code (HUC):* 07010207

*Intensive monitoring start year:* 2013

*Major lakes,rivers, and streams:* Mille Lacs, Onamia, Borden, Rum, Bogus Brook, Mike Drew Brook

*Crow Wing County:*
Only a small portion in the southeastern corner of Crow Wing County is within this watershed. It includes the portion of Mille Lacs Lake in Crow Wing County as well as Smith, Borden, and Camp lakes. Other than the city of Garrison, much of the portion of this watershed in the County is forested and undisturbed.

## IMPLEMENTATION: BORDER WATERSHEDS

Crow Wing County is bordered by Aitkin, Cass, and Morrison counties. Crow Wing County shares 14 lakes (of significant size) and 44 watersheds with these other counties. For this plan, analysis was limited to the portion of the watershed within Crow Wing County with the hope that future water plan updates in neighboring counties will also utilize a watershed approach and these watersheds can be fully analyzed.

*Figure 32. Border Lakes / Watersheds Map (special focus areas in blue)*

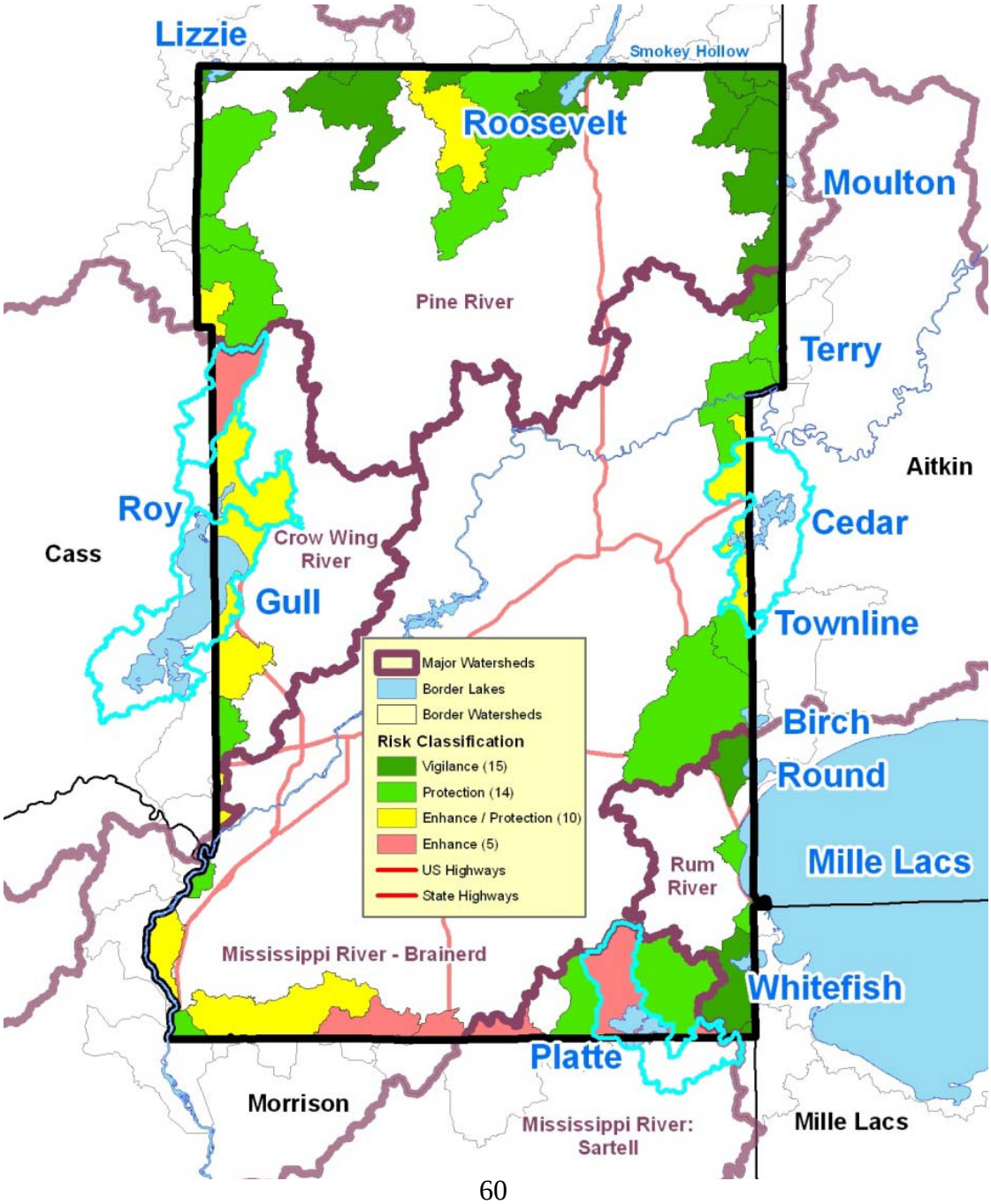


*Figure 33. Border Lakes / Watersheds Table (special focus in blue)*

| Lake Name | DNR ID: | County shared with: | Watershed: | Watershed Risk Classification: |
|---|---|---|---|---|
| Birch | 1-206 | Aitkin | 10035 | Protection |
| Cedar | 1-209 | Aitkin | 10033 | Enhance / Protection |
| Gull | 11-305 | Cass | 12106 | Enhance / Protection |
| Lizzie | 18-416 | Cass | 11009 | Vigilance |
| Mille Lacs | 48-2 | Aitkin, Mille Lacs | 21002 | Protection |
| Moulton | 1-212 | Aitkin | 11004 | Vigilance |
| Platte | 18-88 | Morrison | 15055 | Enhance |
| Roosevelt | 11-430 | Cass | 11041 | Vigilance |
| Round | 1-204 | Aitkin | 21001 | Vigilance |
| Roy | 18-398 | Cass | 12127 | Enhance / Protection |
| Smokey Hollow | 18-220 | Cass | 11041 | Vigilance |
| Terry | 18-162 | Aitkin | 10012 | Protection |
| Townline | 1-207 | Aitkin | 10033 | Enhance / Protection |
| Whitefish | 18-1 | Aitkin | 21011 | Vigilance |

| Other Border Watersheds: | | | |
|---|---|---|---|
| *Watershed w/risk (color):* | *County shared with:* | *Watershed:* | *County shared with:* |
| 10011 | Aitkin | 11016 | Cass |
| 10014 | Aitkin | 11030 | Cass |
| 10036 | Aitkin | 11032 | Cass |
| 10048 | Morrison | 11033 | Cass |
| 10069 | Morrison | 11034 | Cass |
| 10070 | Morrison | 11040 | Cass |
| 10071 | Morrison | 11046 | Cass |
| 10073 | Morrison | 11047 | Cass |
| 10137 | Aitkin | 12038 | Cass |
| 10139 | Cass | 12074 | Cass |
| 11001 | Cass, Aitkin | 12105 | Cass |
| 11002 | Cass | 12126 | Cass |
| 11003 | Aitkin | 15042 | Morrison |
| 11005 | Aitkin | 15056 | Morrison |
| 11014 | Cass | 15061 | Morrison |
| 11015 | Cass | 21012 | Morrison, Mille Lacs |

Watersheds highlighted in blue on the above map / table represent special focus areas:

*Gull Lake:* Inflow from Cass Counties. It includes Sibley/Mayo lakes which are impaired for nutrients.
*Platte Lake:* Outflow to Morrison County. Platte Lake is impaired for high nutrients.
*Cedar Lake:* Outflow to Aitkin County. While Cedar Lake has a stable water quality trend on the whole, it has shown a declining trend in the western bay, which is in Crow Wing County.

## IMPLEMENTATION: WATERSHED IMPLEMENTATION PRIORITY MAPS

As each watershed was analyzed by "protected" status and risk factors, it became clear as to which of the County's priority concerns could be a focal point in each watershed. These implementation priorities were put into a table along with a map specific for each of the 125 minor watersheds (Appendix 1) and were also mapped on a county-wide level (Figures 34 - 49 below).

| Map: | Figure #: |
|---|---|
| • % Protected (by watershed) | |
| o % Public Land | 34 |
| o % Lakes | 35 |
| o % Rivers | 36 |
| o % Wetlands | 37 |
| o Easements | 38 |
| • Implementation Priorities (by watershed) | |
| o Aquatic Invasive Species | 39 |
| o Stormwater & Shoreline buffers | 40 |
| o Surface Water | 41 |
| o Agricultural BMPs | 42 |
| o Ecologically Important Watersheds | 43 |
| o Bluffs & Steep Slopes | 44 |
| o Peak Flow Impacts on Stream Stability & Other Ditching / Drainage | 45 |
| o Peak Flow Model (from Sandy Verry) | 46 |
| o Growth & Development | 47 |
| o Private Forest Management | 48 |
| • Other considerations (by watershed) | |
| o Extractive Uses | 49 |

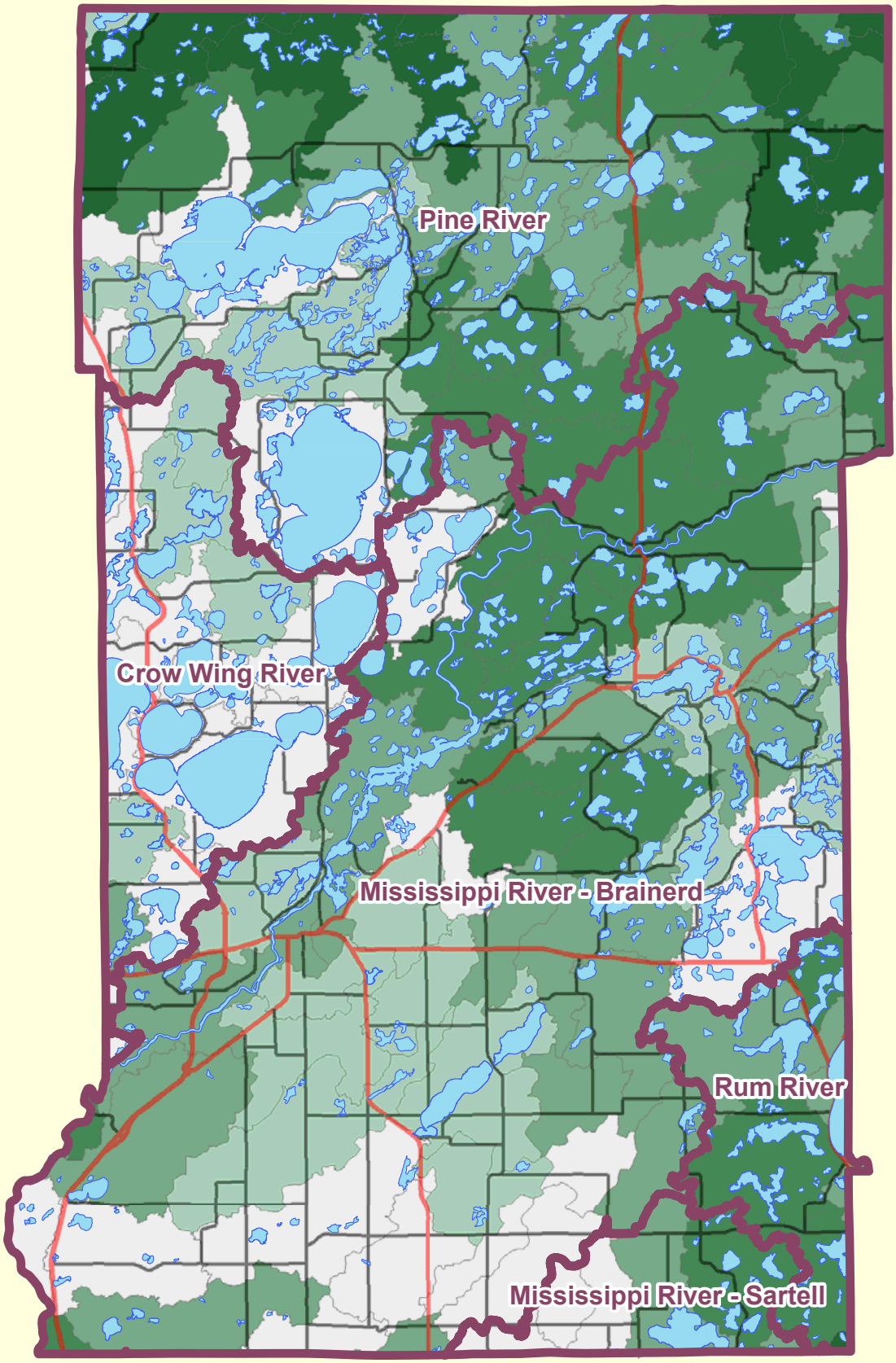



Figure 34: % Public Land

**County, State, & Federal Lands (by watershed)**

- 50+ %
- 25 - 50 %
- 10 - 25 %
- 5 - 10 %
- 0 - 5 %

- Major Watersheds
- Lakes
- Mississippi River
- US Highways
- State Highways
- County Roads

**Land Services**

**CROW WING COUNTY**

BRAINERD, MINNESOTA 56401

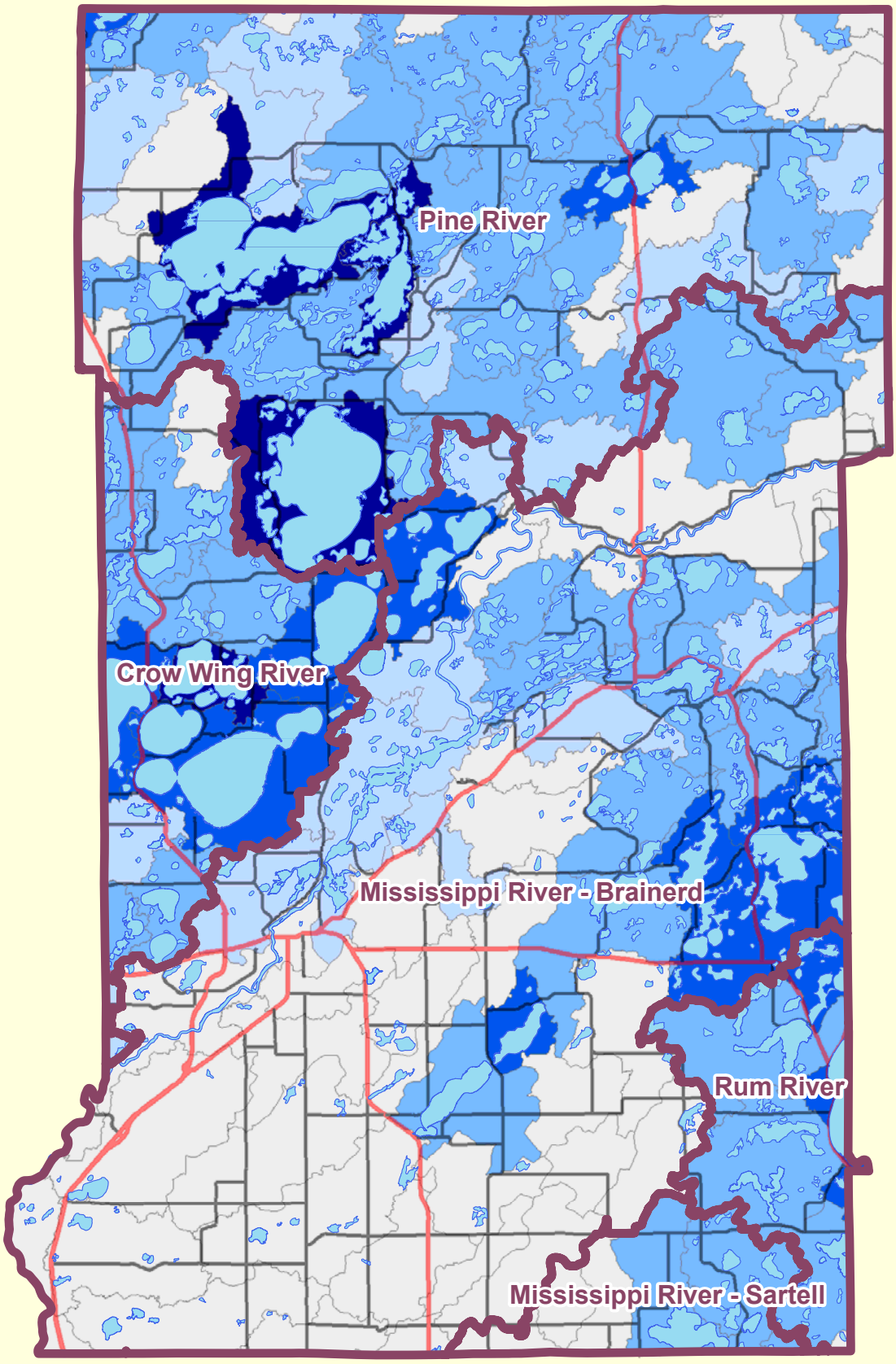



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Figure 35: % Lakes

% Lakes (by watershed)
- 50+ %
- 25 - 50 %
- 10 - 25 %
- 5 - 10 %
- 0 - 5 %

- Major Watersheds
- Lakes
- Mississippi River
- US Highways
- State Highways
- County Roads

Land Services
CROW WING COUNTY
BRAINERD, MINNESOTA 56401

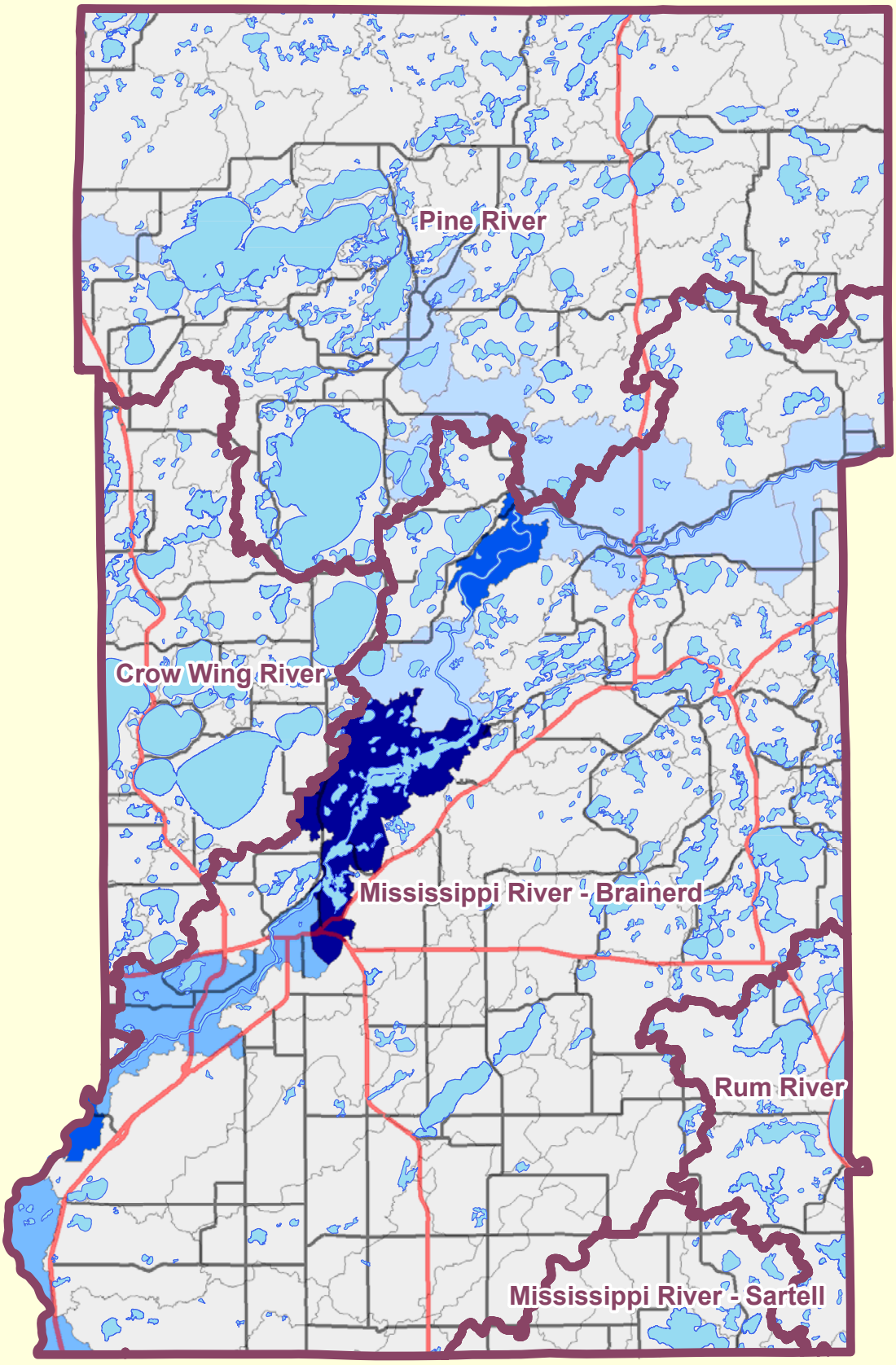



Figure 36: % Rivers

% Rivers (by watershed)
- 10 + %
- 5 - 10 %
- 3 - 5 %
- 1 - 3 %
- 0 - 1 %

- Major Watersheds
- Lakes
- Mississippi River
- US Highways
- State Highways
- County Roads

Land Services
CROW WING COUNTY
BRAINERD, MINNESOTA 56401

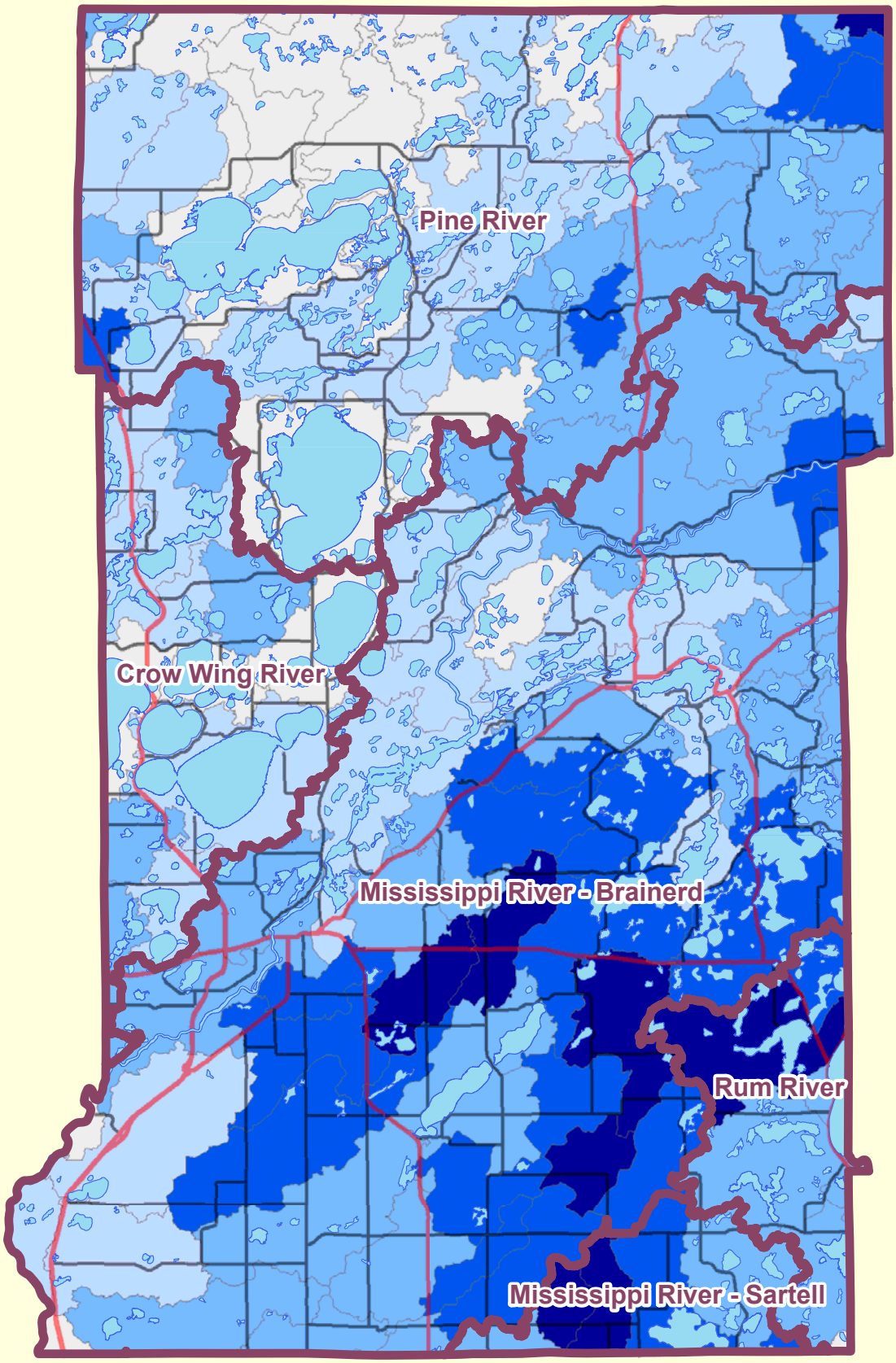


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Figure 37: % Wetlands

**% Wetlands (by watershed)**

- 30+ %
- 20 - 30 %
- 10 - 20 %
- 5 - 10 %
- 0 - 5 %

- Major Watersheds
- Lakes
- Mississippi River
- US Highways
- State Highways
- County Roads

Land Services
CROW WING COUNTY
BRAINERD, MINNESOTA 56401

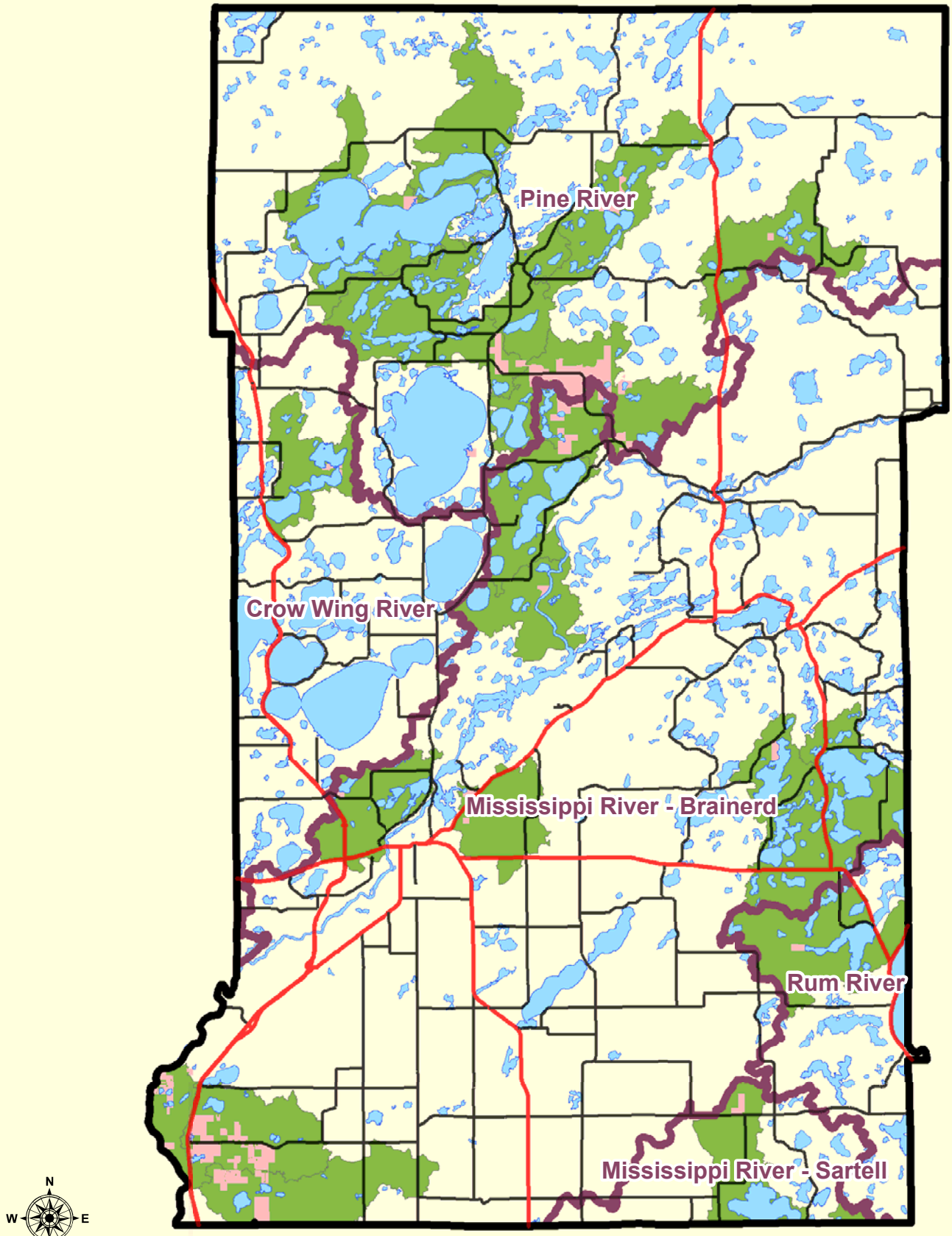


Figure 38: Easements

Land Services
CROW WING COUNTY
BRAINERD, MINNESOTA 56401

**Easement Land**
Includes: ACUB, RIM, MLT, STATE of MN
US Highways
State Highways
County Roads
Major Watersheds
Lakes
Mississippi River
Watershed with Easements