

# Protecting the Sponge:

## *Ramping up lake protection strategies for the forested zone of Minnesota*

Presented at  
State of the Water Conference

Presented by:  
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(BWSR Watershed/PFM Coordinator)  
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(GIS Mapping Specialist for SWCD Area 8)

Date:  
4-13-18

# Presentation Breakdown:

- **Forest Protection Background**

Forests + sandy soil = groundwater = good lake water quality

- **Protection Methodology**

What tools can we use to achieve forest protection?

- **Forest Stewardship Meets Water Planning**

Can forest stewardship influence water planning?

- **Ramping up Efforts to Protect Lakes through Forest Stewardship**

How can we ramp up efforts to ensure Minnesota's unique quality of life for future generations?











Bill Linder Photography

# High Value of Forest and Fisheries Resources

- Annual direct expenditures by anglers in Minnesota = \$2.4 billion
- Annual direct economic contribution of Minnesota forest products = \$9.0 billion
- Indirect economic impacts are much greater for both industries



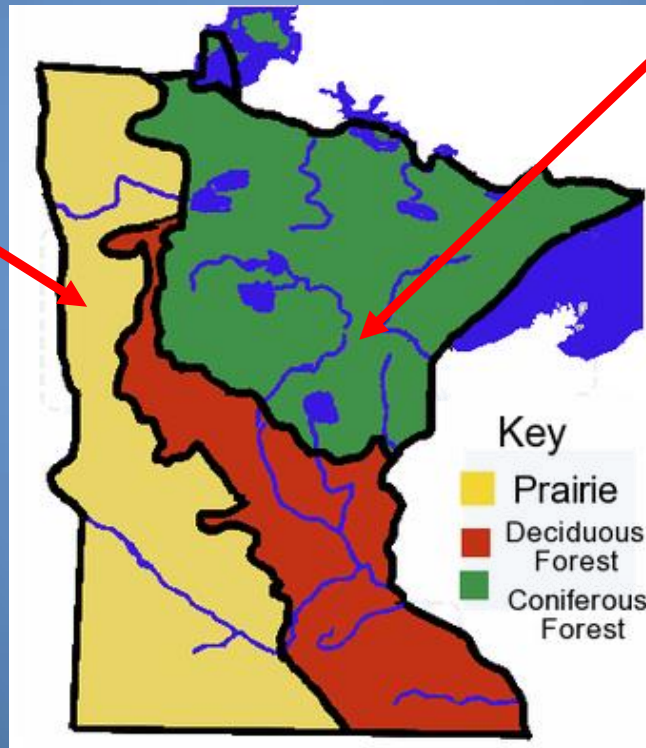




# Context for Watershed Planning in Minnesota

## Restoration

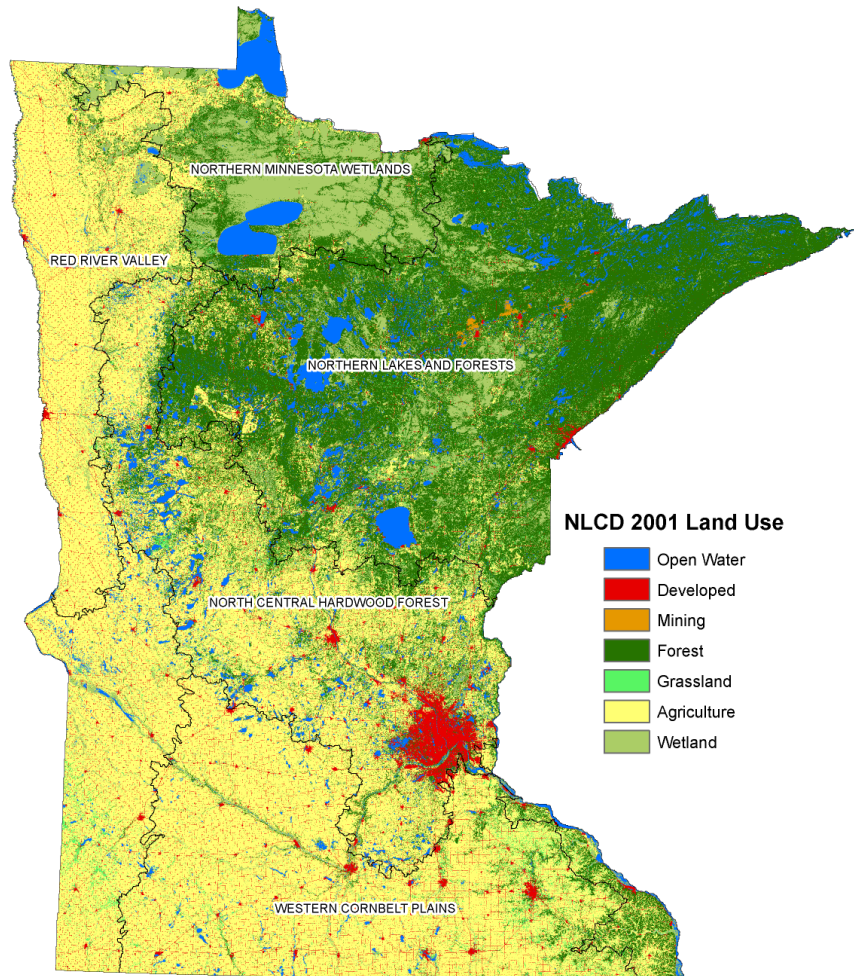
- Water Quantity Drivers
- Streams/ Ditch Based
- Ag Based
- Lake-bed Clay Soils
- High Land Disturbance
- Little Public Land
- Watershed Districts
- **High Land Values**



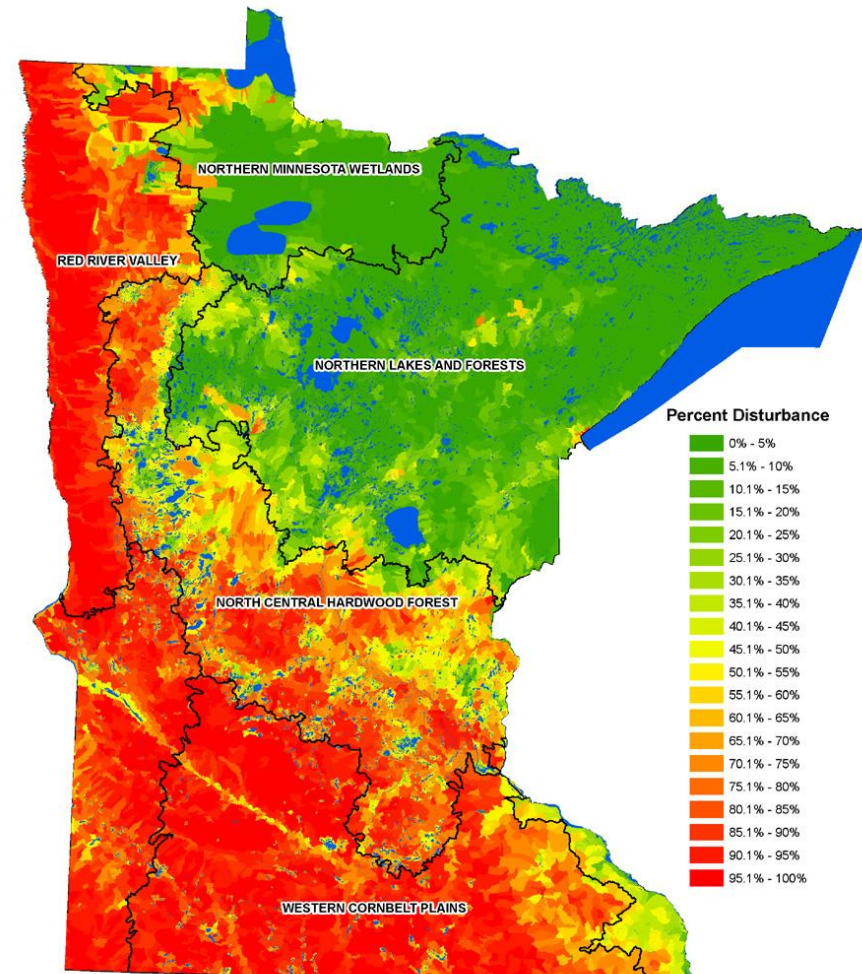
## Protection

- Water Quality Based
- Lake Based
- Forest Based
- Outwash/Till Soils
- Low Land Disturbance
- Lots of Public Land
- Lake Associations
- **Low Land Values**

## Minnesota Land Use



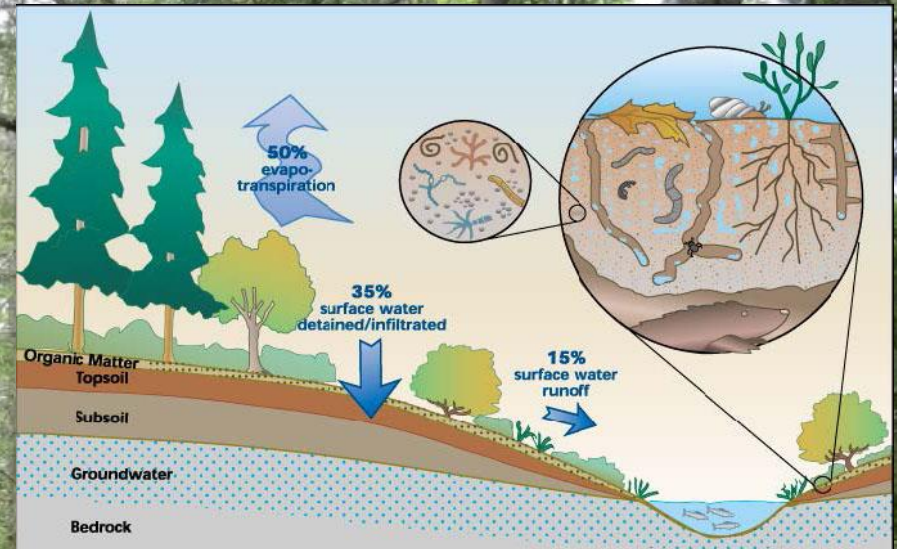
## Land Use Disturbance within Local Watershed Catchments



**Undisturbed lands in the forested ecoregion provide excellent water quality in lakes**



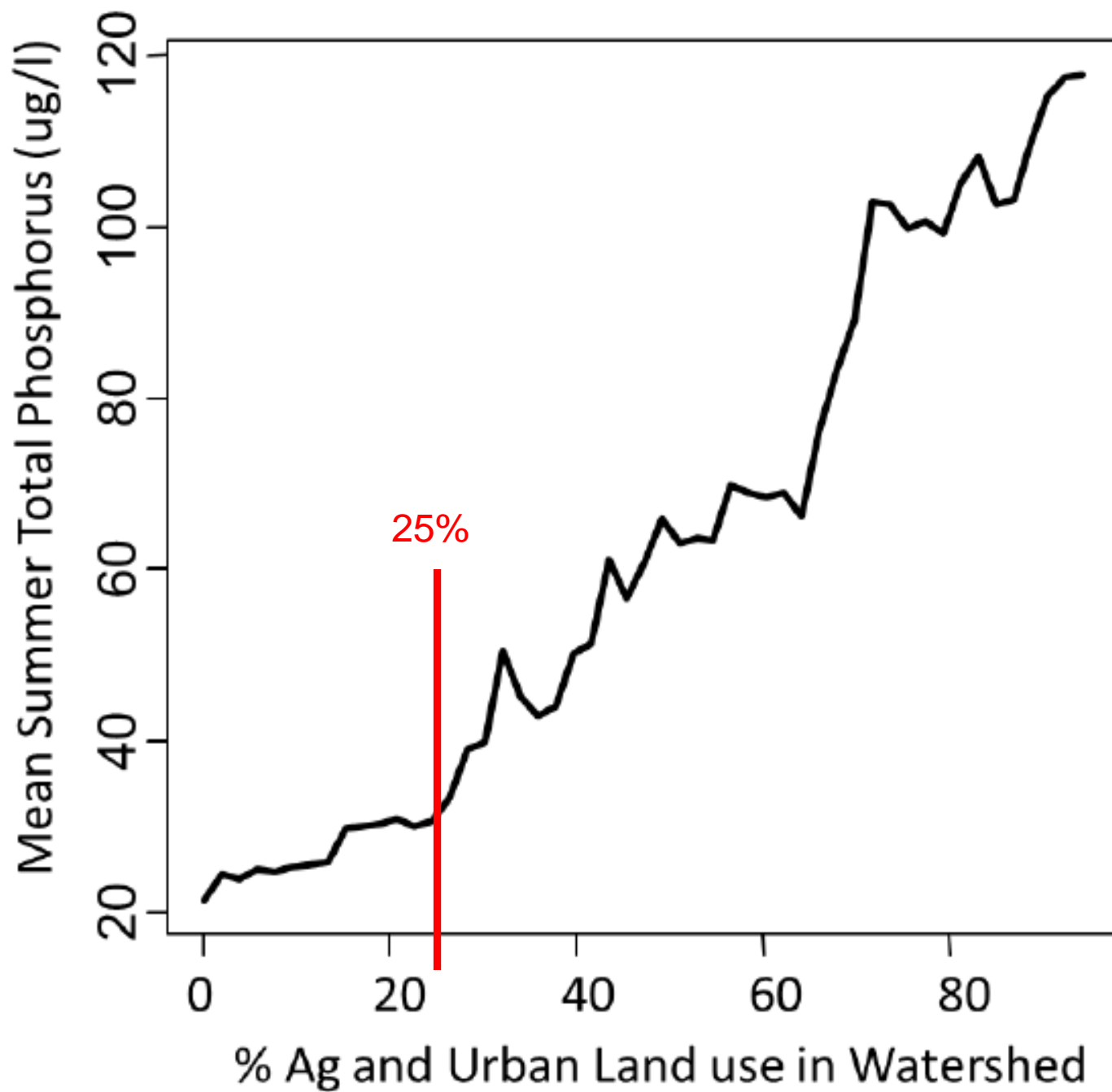
# Protect the sponge!





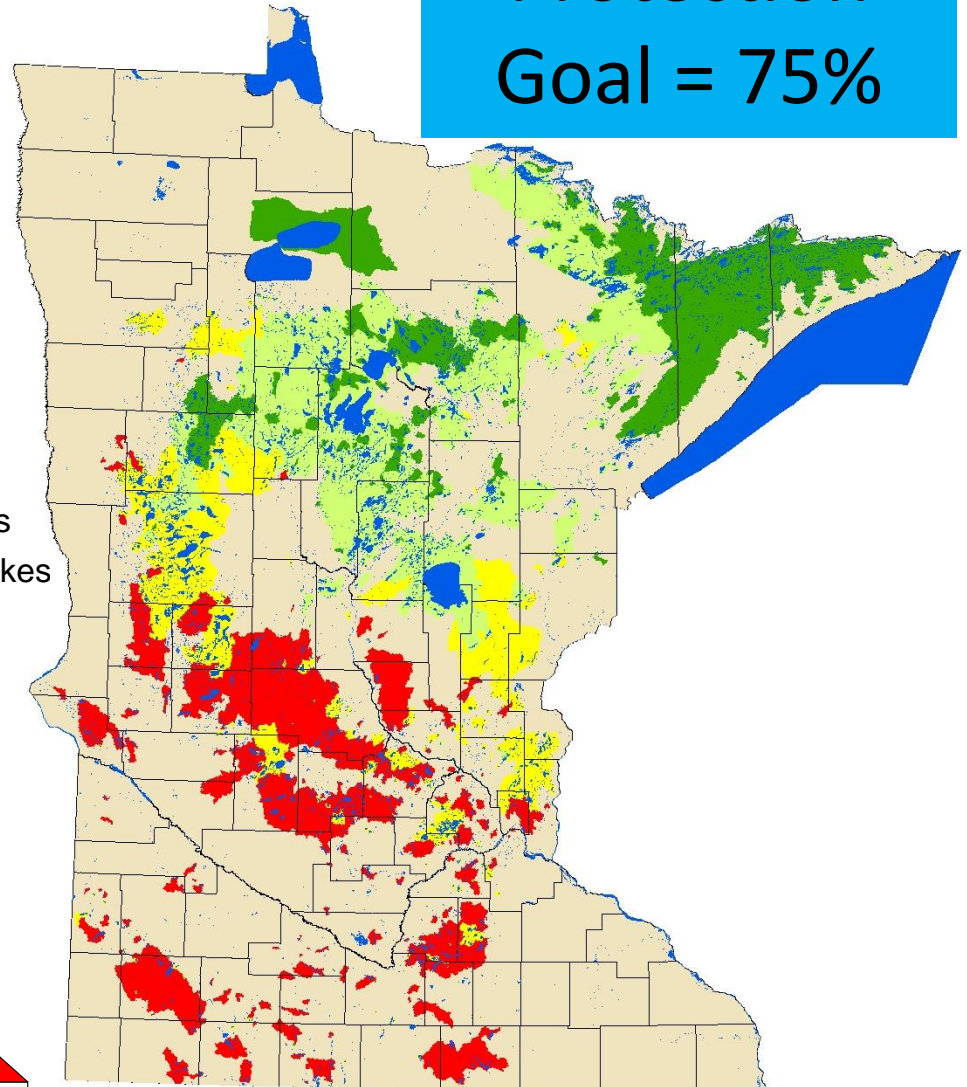
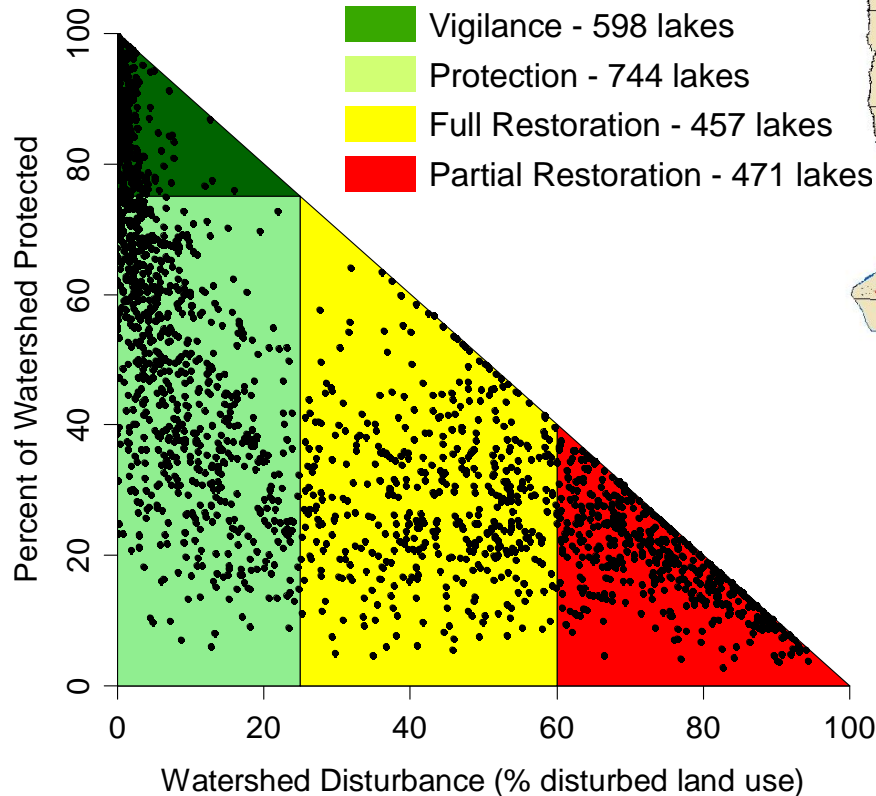




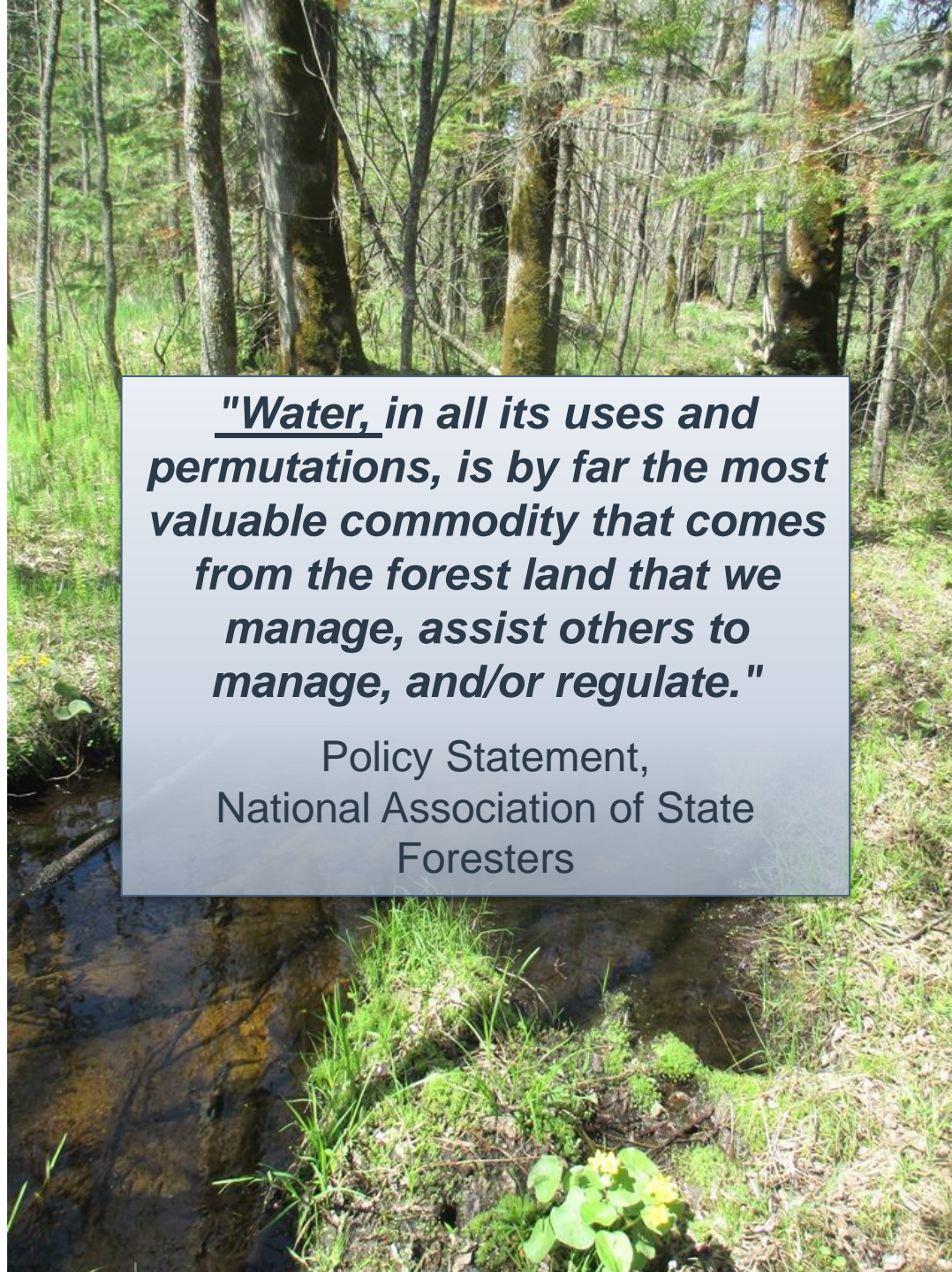


# Suggested approaches for watershed protection and restoration of DNR managed fish lakes in Minnesota

Protection  
Goal = 75%







***"Water, in all its uses and permutations, is by far the most valuable commodity that comes from the forest land that we manage, assist others to manage, and/or regulate."***

Policy Statement,  
National Association of State  
Foresters

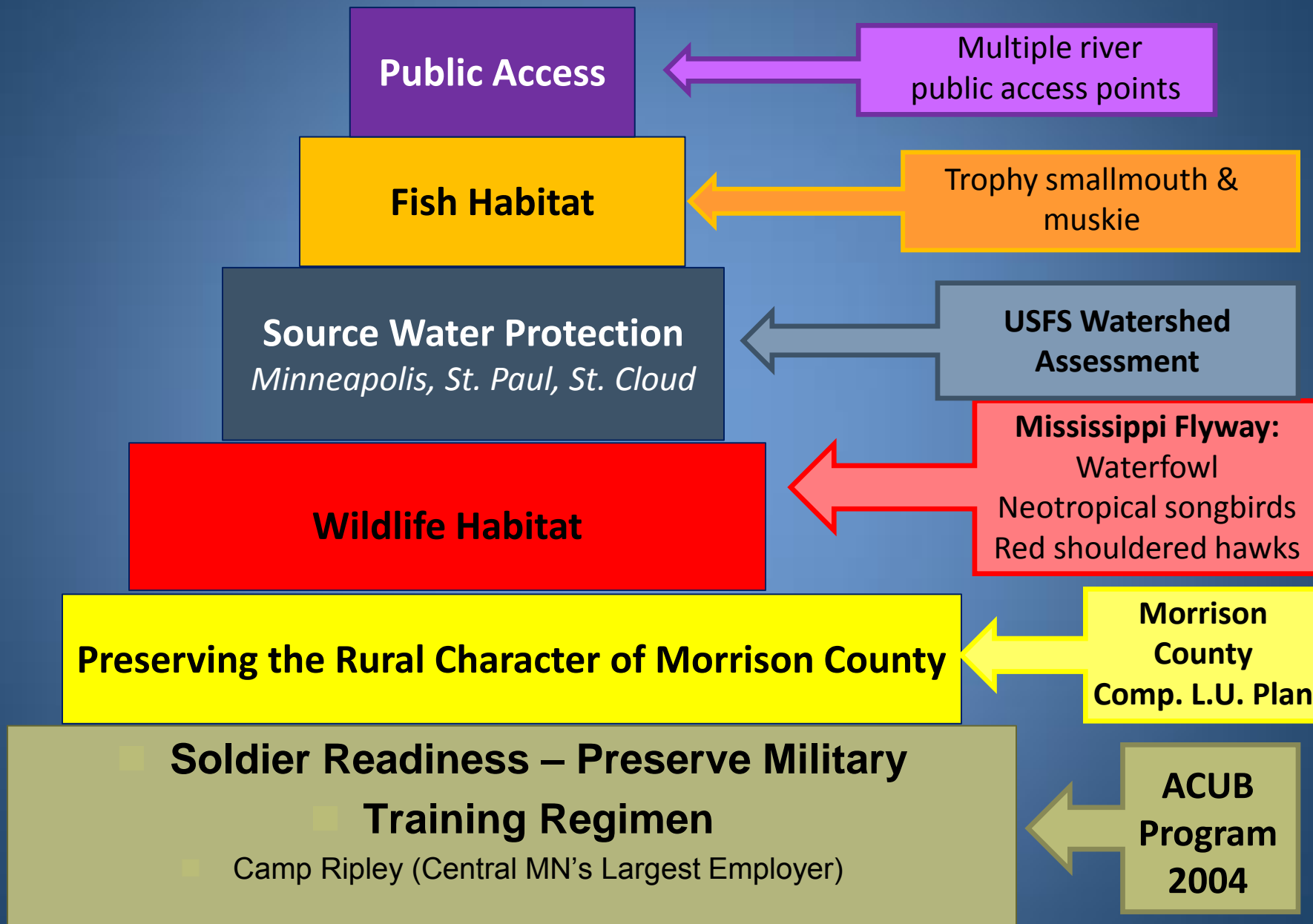




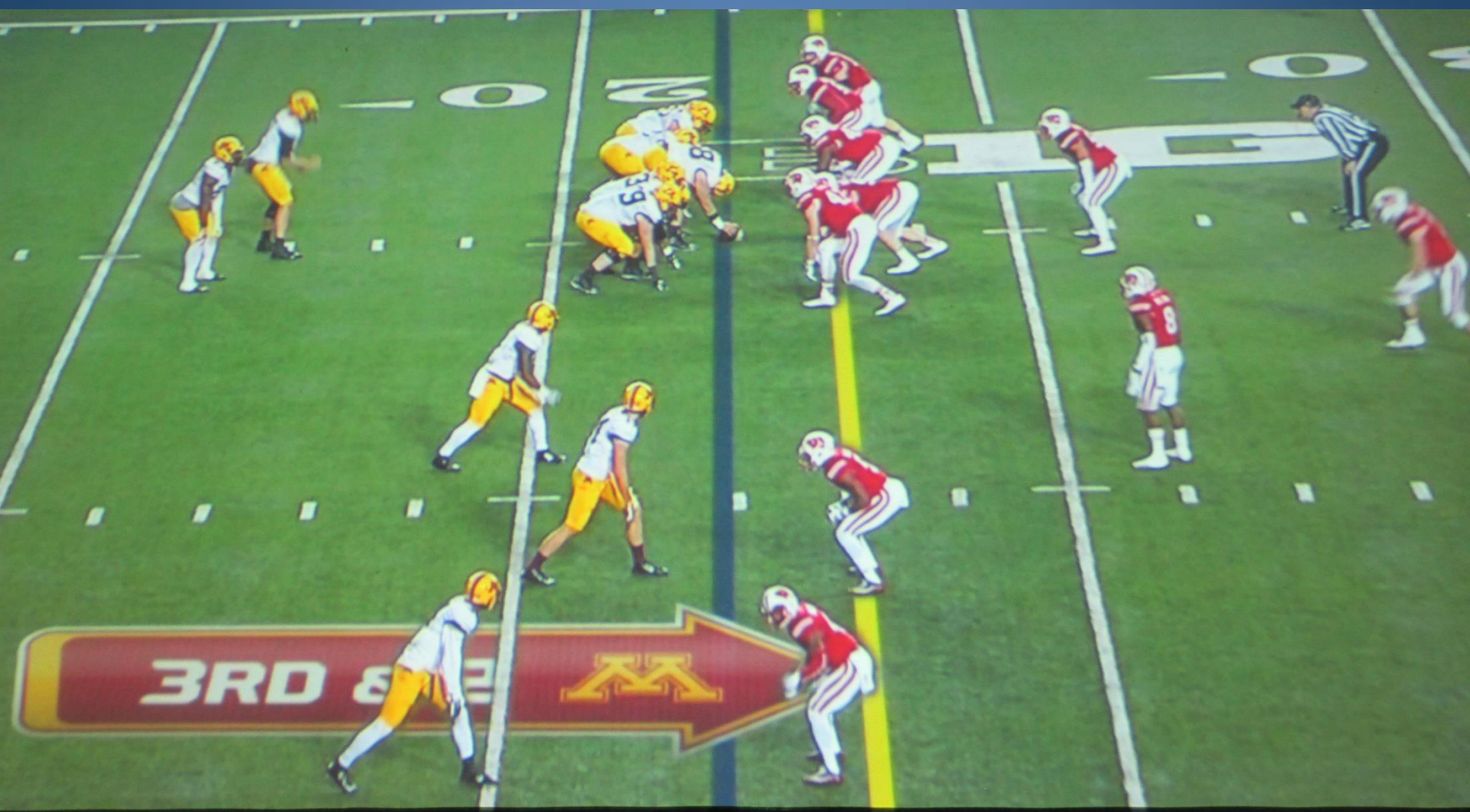
# Key Concepts (Values)

- **Keeping Forested Lands Forested** (Forest cover provides ecological, economic, and social benefits.)
- **Keeping Forest Lands Working** (Forest protection allows for productive forests too.)
- **Follow the Risk** (Focus on Private Forest Lands – PFM Program is critical to success.)
- **Stack Public Benefits** (Water Quality and Habitat + Source Water and Jobs).
- **Build in Resilience to Public Lands** (Large tracts of permanently protected forest land are important for future tourism and timber industries. Use SFIA and conservation easements to extend existing conservation impact of public lands.)
- **Find Priority Conservation Investments** (Priority is at the intersection of quality and risk.)
- **Landowners Deserve Service** (Making the conservation options clear and accessible to the conservation minded private landowner.)
- **Major in the Minors**

# Stacking Public Benefits















Decision Making Process  
The Conservation North Central Landscapes Plan

**Key Points:**

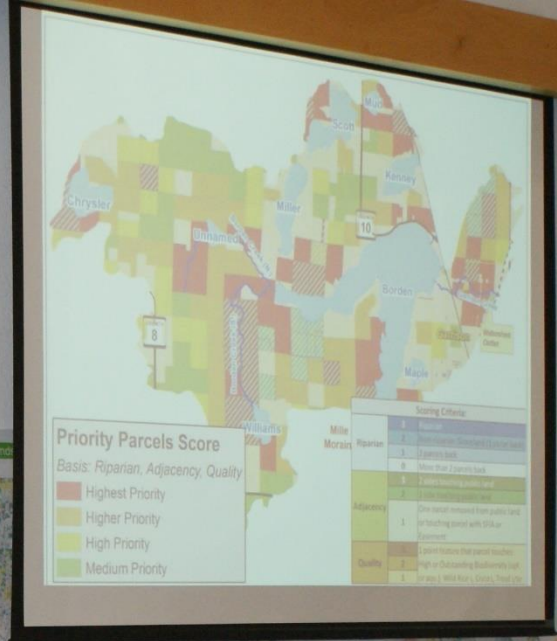
- 1. The plan is a result of a collaborative effort. The plan will serve as the basis for the development of a conservation strategy for the North Central region.
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**Next Steps:**

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Itasca County PRIM - North Central Land





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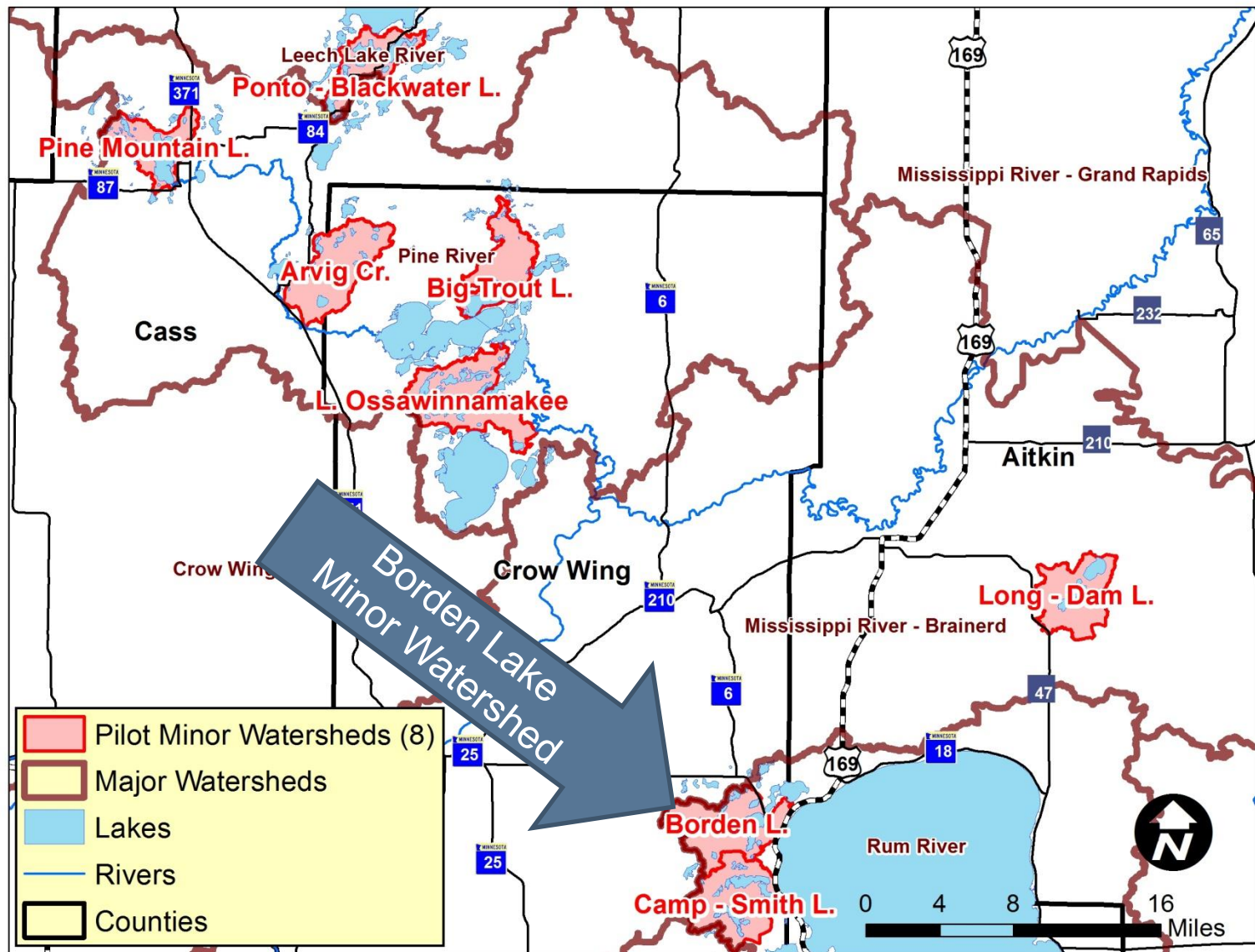
- Forest Stewardship Meets Water Planning

Can forest stewardship influence water planning?

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How can we ramp up efforts to ensure Minnesota's unique quality of life for future generations?

# PFM by PTM in Minor Watersheds: Pilot Areas



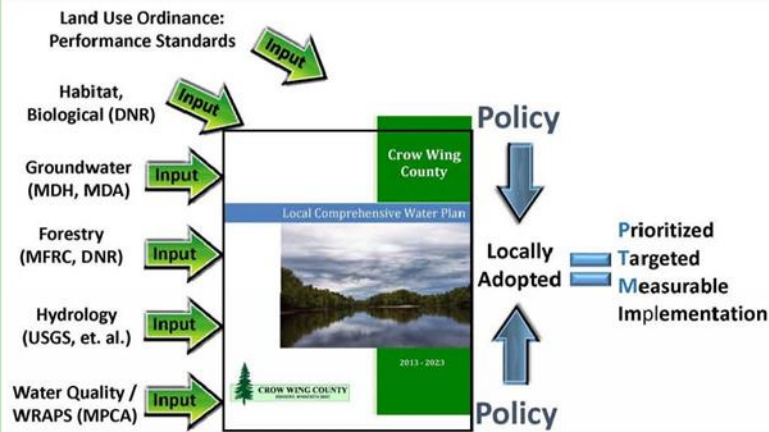


# Once a Priority Minor Watershed Has Been Identified, How Can Local Units Implement?

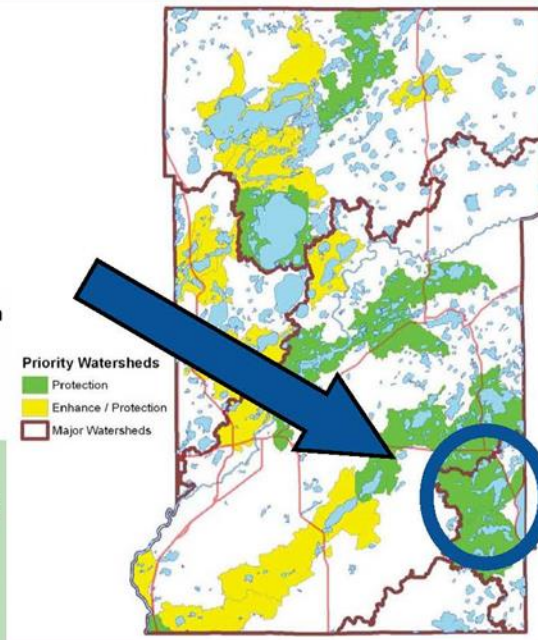


*How has Crow Wing County Prioritized Minor Watersheds??*

## *2013-2023 Crow Wing County Water Plan*



## State & Local Priority



## Why Borden Lake Minor Watershed?

- + Trout Stream
- + Cisco/Tullibee Lake
- + Outstanding Biodiversity
- Steeper Topography/Heavier Soil  
(= more runoff potential)
- Unprotected Lands (= Higher Risk)

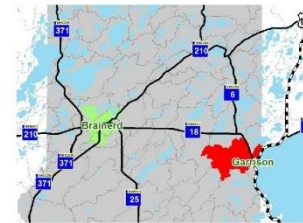
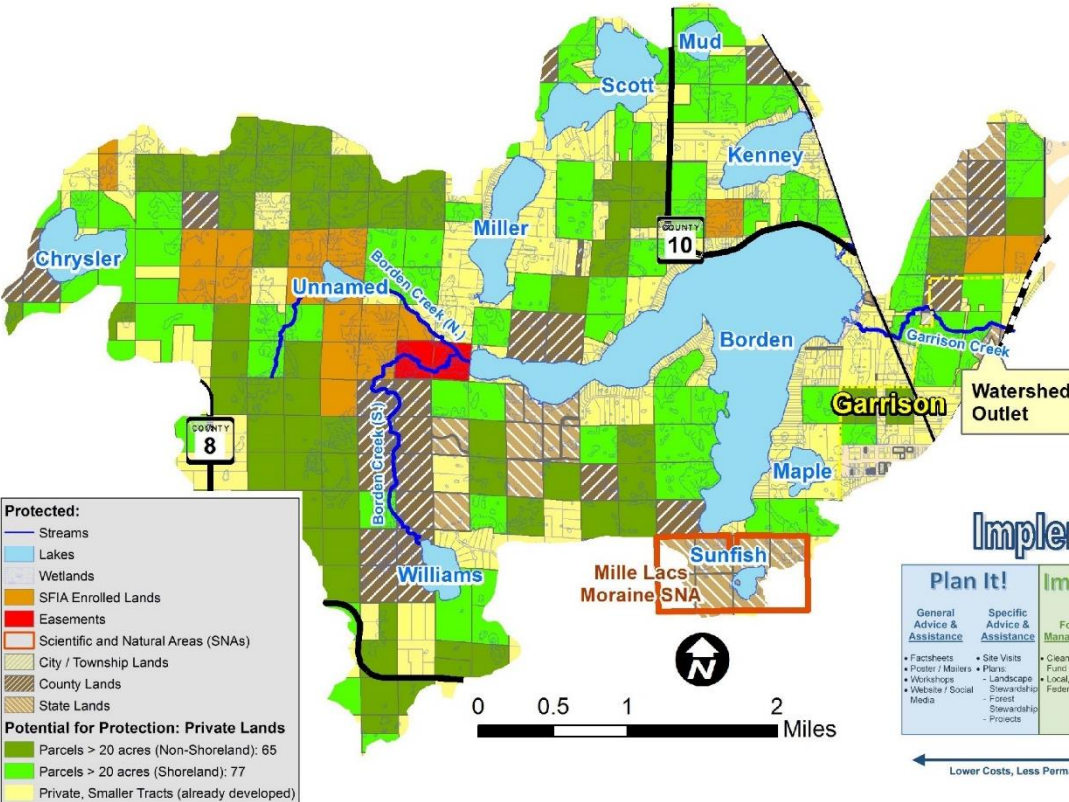




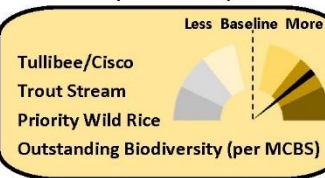


# Is there potential to reach 75% Protection?

## What is the Potential to Protect the Borden Lake Minor Watershed into the Future?



### Habitat Quality Meter (Habitometer):



### Implementation Toolbox

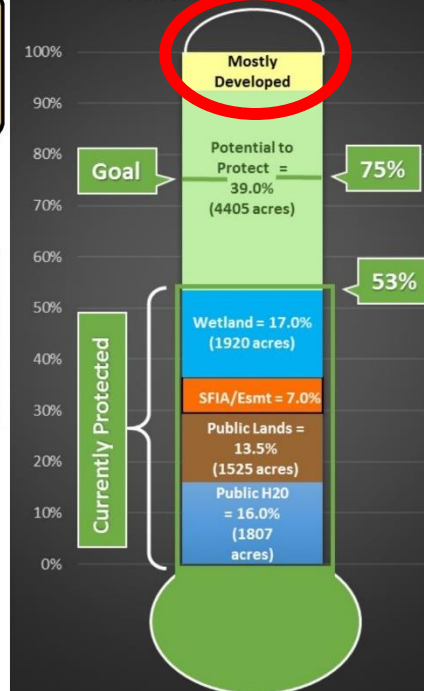


Watershed Protection Goal:	75%	Acres Needed: 2440	
Possible Scenarios:	Acres:	Cost Basis:	Total Cost:
Conservation Easements:*	1220	60% of Value (avg. \$1208/acre)	\$1,473,760
SFIA:**	1220	\$7 per acre	\$68,320
<b>Total:</b>	<b>2440</b>	<b>acres</b>	<b>\$1,542,080</b>

\*Conservation easements are working lands where timber management is encouraged. Land remains on the tax rolls and does not require public access.

\*\*SFIA stands for Sustainable Forest Incentives Act (SFIA) and provides incentive payments to encourage sustainable use of forest lands of greater than 20 acres. Enrollees must remain in the program for 8 years and have a forest stewardship plan in place.

### Borden Lake Watershed Protection Status



### Risk Classification \*

Protection

\* Protection Model & Risk Classification Adapted from 2013-2023 Crow Wing Water Plan

Protection

Land Use Disturbance

Water Quality Trend

# Many Legislatively-Created Options Available

## Private Forest Landowner Implementation Toolbox

### Plan It!

General  
Advice &  
Assistance

Specific  
Advice &  
Assistance

### Improve It!

Grants &  
Cost-share  
Projects

Forest  
Management

### Manage It!

Local  
Land Use

Incentive  
Programs to  
Enroll Land

### Buy It!

Conservation  
Easements

Fee Title  
Public Land  
Acquisition

- Donated
- Purchased

- Federal
- State
- County

**Already Paid For!**

Stewardship  
- Projects

• Zoning &  
Official  
Controls

**Options**

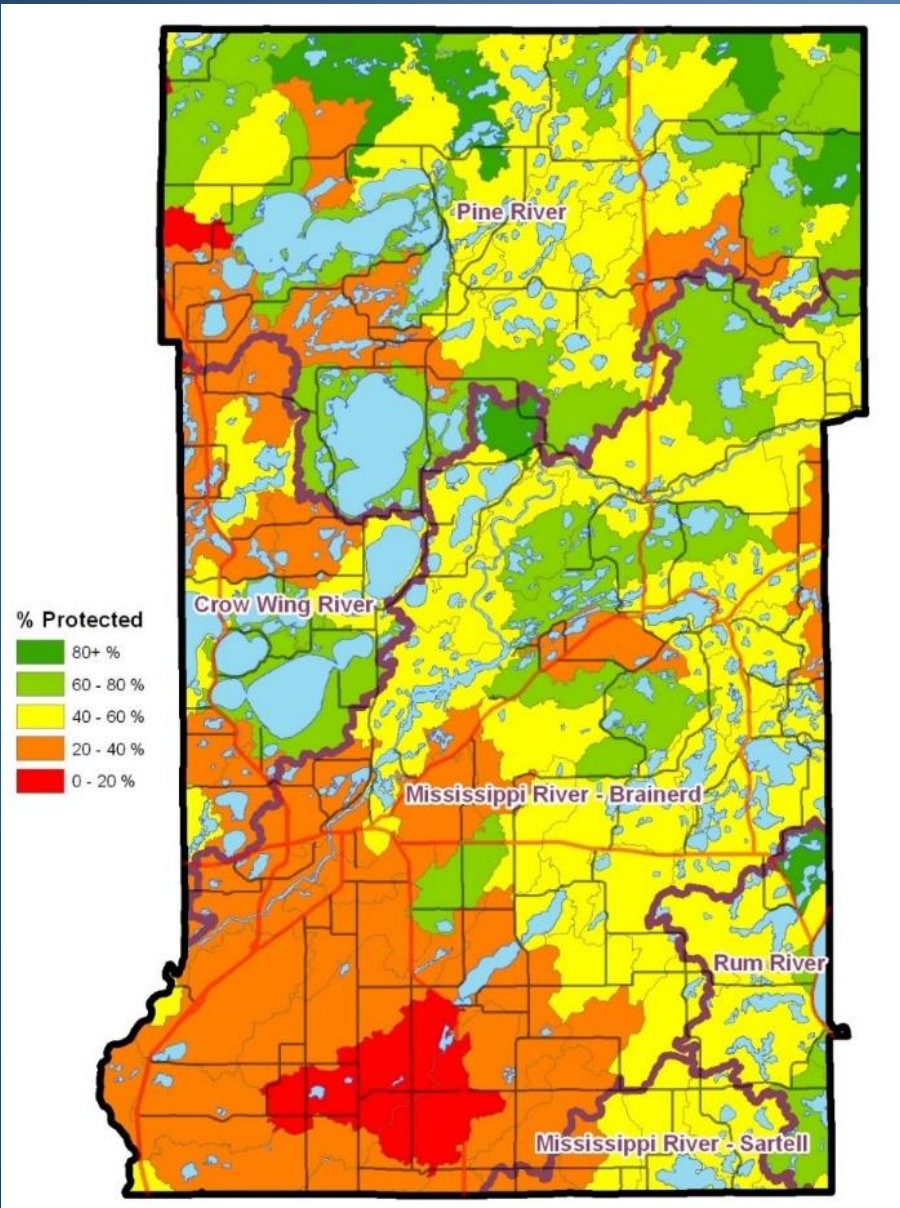
Lower Costs, Less Permanent

Higher Costs, More Permanent

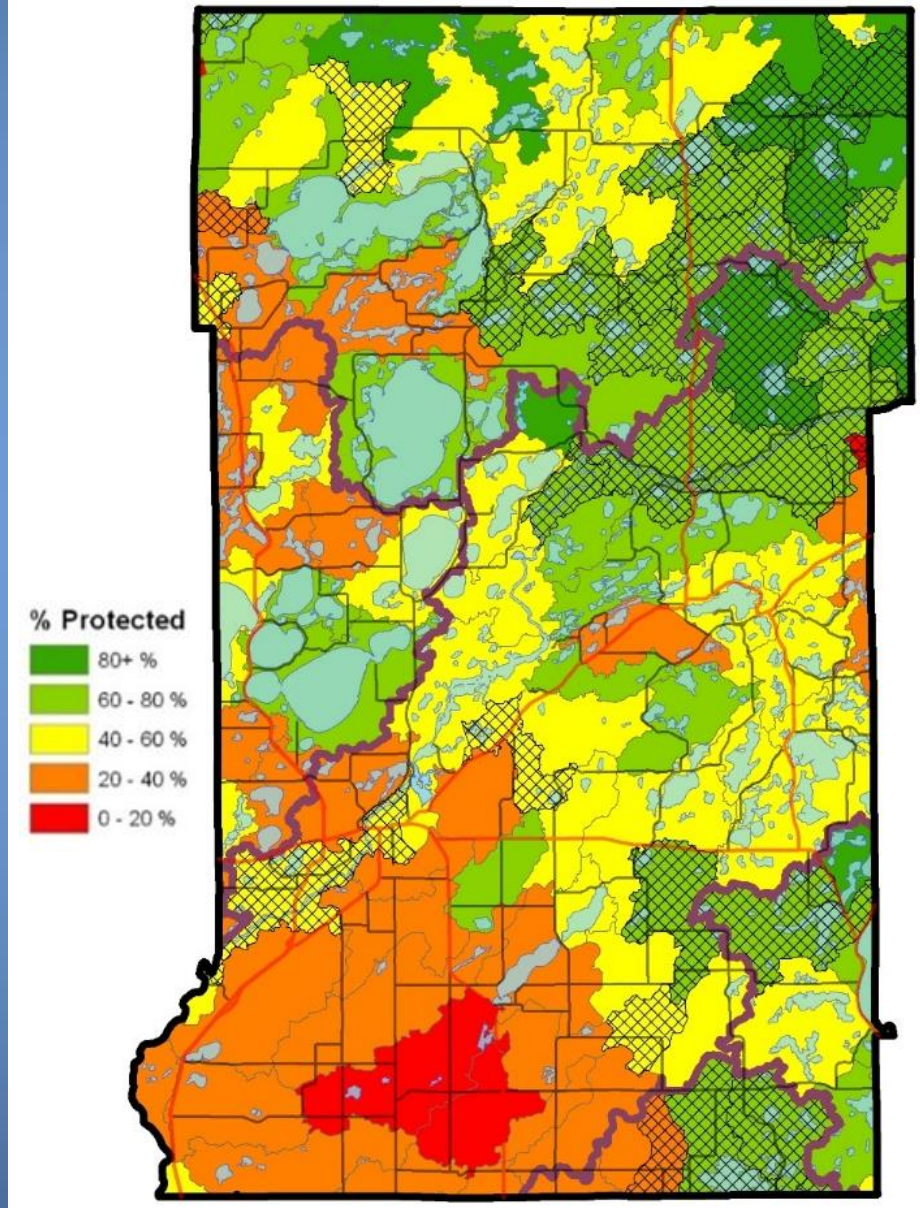
**Landowners Choose!**



## % Protected before SFIA



## % Protected with SFIA



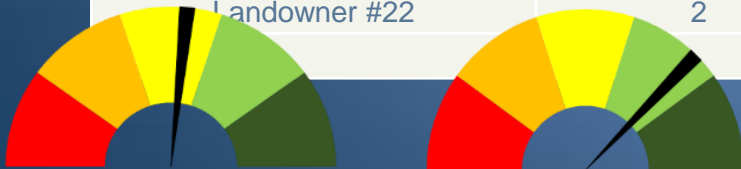
# Local Decision Maker Table

Minor Water-shed	Cisco / Tullibee Lakes (DNR)	Lakes of Biodiversity Significance (DNR)	Trout Lake (DNR)	Trout Stream (DNR)	MCBS Terrestrial Biodiversity (DNR)	Priority Wild Rice Lakes	# of Animal Units	Phosphorous Sensitivity Significance (DNR)	Water Quality Trend(s)	% Protected	Cost \$	"Forests for the Future" Composite Score
L. Ossi	Yes	Yes	No	No	Moderate	Yes	0	Higher or Highest	Stable to Improving	35%	\$3.6 - 5.3M	92
Big Trout L.	Yes	Yes	Yes	No	Moderate	No	0	Higher or Highest	Stable w/ Declining	53%	\$1.3 – 5M	97
Borden L.	Yes	Yes	No	Yes	Mod-High-Outstanding	Yes	57	Higher or Highest	Stable / No Trend	53%	\$1.2 – 1.5M	98
Camp / Smith L.	No	Yes	No	Yes	Outstanding	Yes	0	Higher or Highest	Stable to Improving	59%	\$1.0 – 1.2M	104



# The Shortest Route to 75% = by Size!

Landowner	# of Parcels	Acres (total)	% of Goal	% of Total
Landowner #1	7	277.3	11.4%	2.5%
Landowner #2	4	151.8	6.2%	1.3%
Landowner #3	4	148.5	6.1%	1.3%
Landowner #4	3	137.6	5.6%	1.2%
Landowner #5	3	120.0	4.9%	1.1%
Landowner #6	3	119.5	4.9%	1.1%
Landowner #7	3	119.1	4.9%	1.1%
Landowner #8	3	118.3	4.8%	1.0%
Landowner #9	3	115.3	4.7%	1.0%
Landowner #10	3	114.6	4.7%	1.0%
Landowner #11	3	100.4	4.1%	0.9%
Landowner #12	1	91.5	3.7%	0.8%
Landowner #13	2	89.6	3.7%	0.8%
Landowner #14	2	87.5	3.6%	0.8%
Landowner #15	1	87.0	3.6%	0.8%
Landowner #16	2	83.6	3.4%	0.7%
Landowner #17	2	82.3	3.4%	0.7%
Landowner #18	2	81.7	3.3%	0.7%
Landowner #19	2	81.6	3.3%	0.7%
Landowner #20	2	81.2	3.3%	0.7%
Landowner #21	2	80.8	3.3%	0.7%
Landowner #22	2	80.7	3.3%	0.7%
			<b>100.0%</b>	<b>22.0%</b>



22 Landowners needed to meet 75% goal

## Scoring Criteria:

## Compos

Quality	3	1 point feature that parcel touches: High
	2	or Outstanding Biodiversity (upl. or
	1	aqu.), Wild Rice L, Cisco L, Trout L/Stream

**“Quality” can be...**

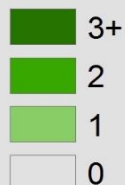
**Anything Locally Important, such as:**

- Cisco
- Trout
- Outstanding Terrestrial Biodiversity
- Wild Rice
- Rare Species
- Old Growth
- Important Bird Areas
- Mussel Habitat
- Fisheries Habitat: native muskies, walleye spawning, smallmouth
- MN Wildlife Action Network data



### Priority Parcels Score

Basis: Quality





# Borden Lake Protection Scenario:

Scoring					Property / Landowner Information				and
Acres	Total Score	Riparian Adjacency Quality			Parcel #	Owner Name	Land Value	Cost for 8 yr Contract	ost!
34.7	5	3	0	2	660151105000009	VICTORSEN, JON R DEMARS & JAI	\$239,500		0
66.8	6	3	1	2	660151304000009	BAKKEN, JUANE M ET AL	\$175,700		
62.8	7	3	2	2	660154203000009	VICTORSEN, JON R DEMARS	\$152,100		
40.2	4	1	2	1	660153100000009	BENSON, JACK D	\$73,700		
40.3	4	1	2	1	660153400000009	HUTCHISON, GERALD D & KIM	\$70,400		
39.9	5	2	2	1	660143400000009	KIMBLE, ZACHARY L	\$58,200		
							\$769,600		
38.5	2	0	2	0	660064300000009	KUNDE, DANIEL D JR & KARI	\$29,800	\$2,158	
38.4	3	1	1	1	660071100000889	HADACHEK, NANCY ELLEN T	\$72,900	\$2,146	
38.3	3	1	1	1	660074200000009	LAVENDER SPRINGS TREE FA	\$73,200	\$2,144	
32.4	0	0	0	0	660033200A00009	ANDERSON, JEFFREY GUY	\$36,600	\$1,814	
30.5	2	1	1	0	660072300B00009	ROLFSON, DOUGLAS A	\$63,000	\$1,707	
26.3	0	0	0	0	660033300A00889	EMSTAD-LINDBORG, DAWN	\$62,700	\$1,472	
25.1	5	3	1	1	660081300A00009	WOIZESCHKE, KEVIN R	\$25,100	\$1,406	
20.2	3	0	2	1	660204200AA0009	HEINRICH, ROBERT S & LOLI	\$41,000	\$1,133	
20.1	0	0	0	0	660291300B00009	BERNSTROM, DEVON A & SA	\$54,200	\$1,125	
20.1	0	0	0	0	660291300A00009	SUTHERLAND, JOSEPH A JR I	\$24,400	\$1,124	
							\$103,134		
26.8	3	3	0	0	760014301A00009	SICHAK, JAMES	\$38,900	\$23,340	
							\$1,293,840		

%

40

61%

3,134

FIA: 73%

600

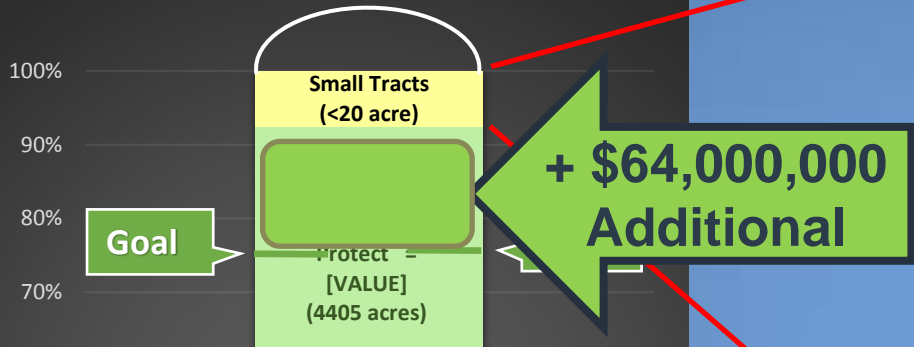
Acquisition:

al met)

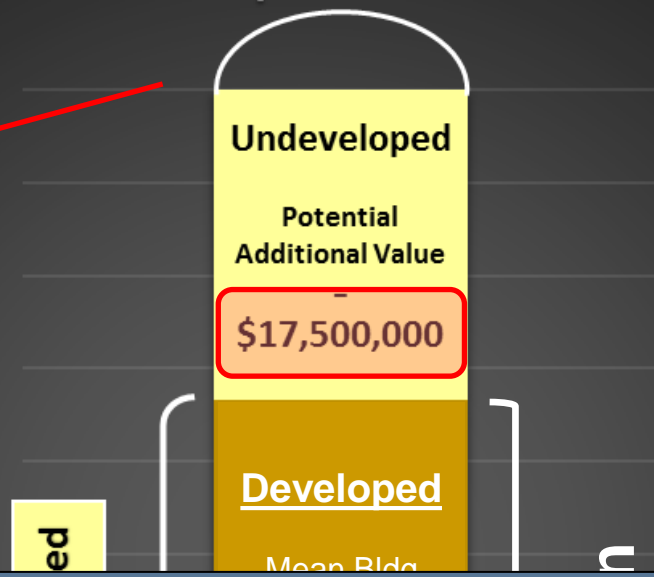
\$33 M = Exi  
+ \$17 M =D  
+ \$64 M =D  
+ \$18 M = R

= 132,000,000  
Additional (4x)

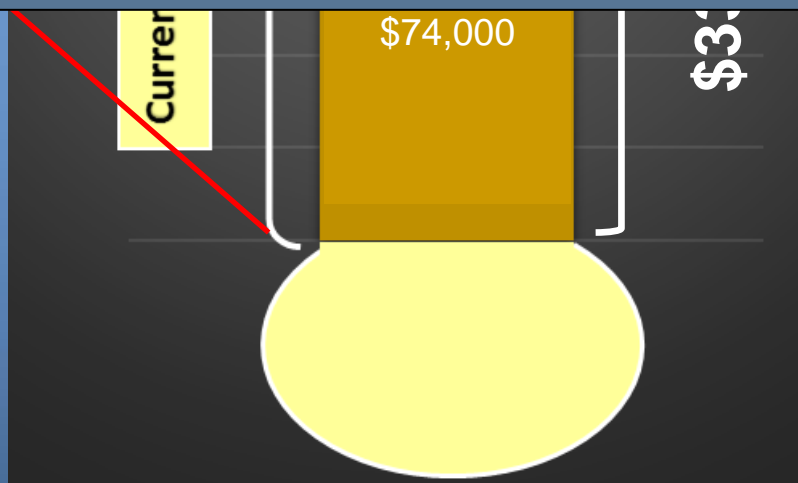
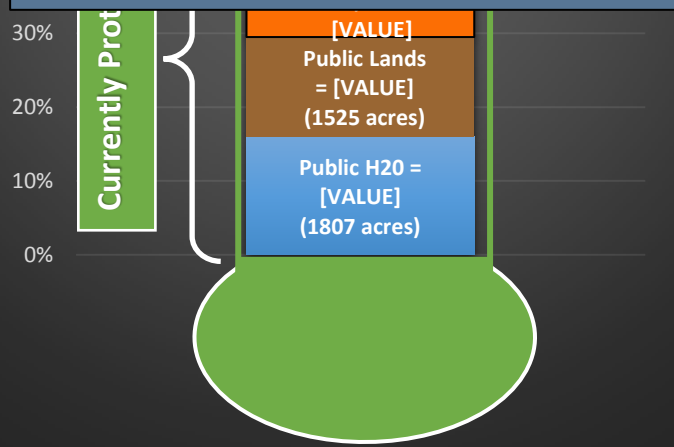
Borden Lake Watershed  
Protection Status



Smaller Tract  
"Developed" Status



Lake Protection with Room to Grow!









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# Forest & Water Plans Coming Together

**Implementation: Clean Water /  
Maintain Tourism Economy \$\$**

**DNR Lake Protection-  
Disturbance Framework**

**2013 CWC  
Water Plan**

**Cass/ CWC  
Water Plan  
Updates**

**Toward Future Implementation**

**Pine River  
Landscape**

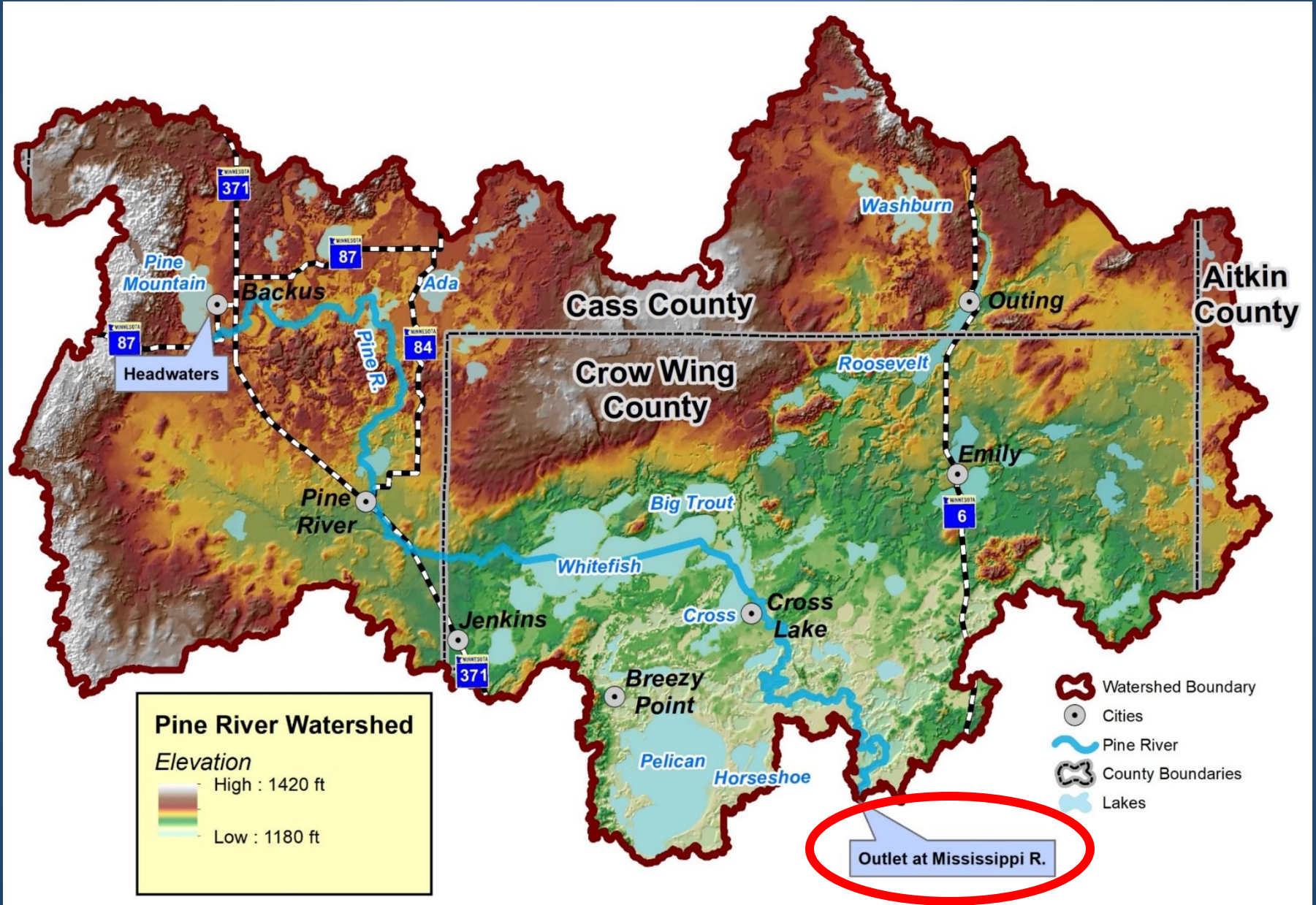
**Implementation: Protected  
Forested Watersheds /  
Forest Economy \$\$**

**Pine River  
1 Watershed  
1 Plan**

PTM

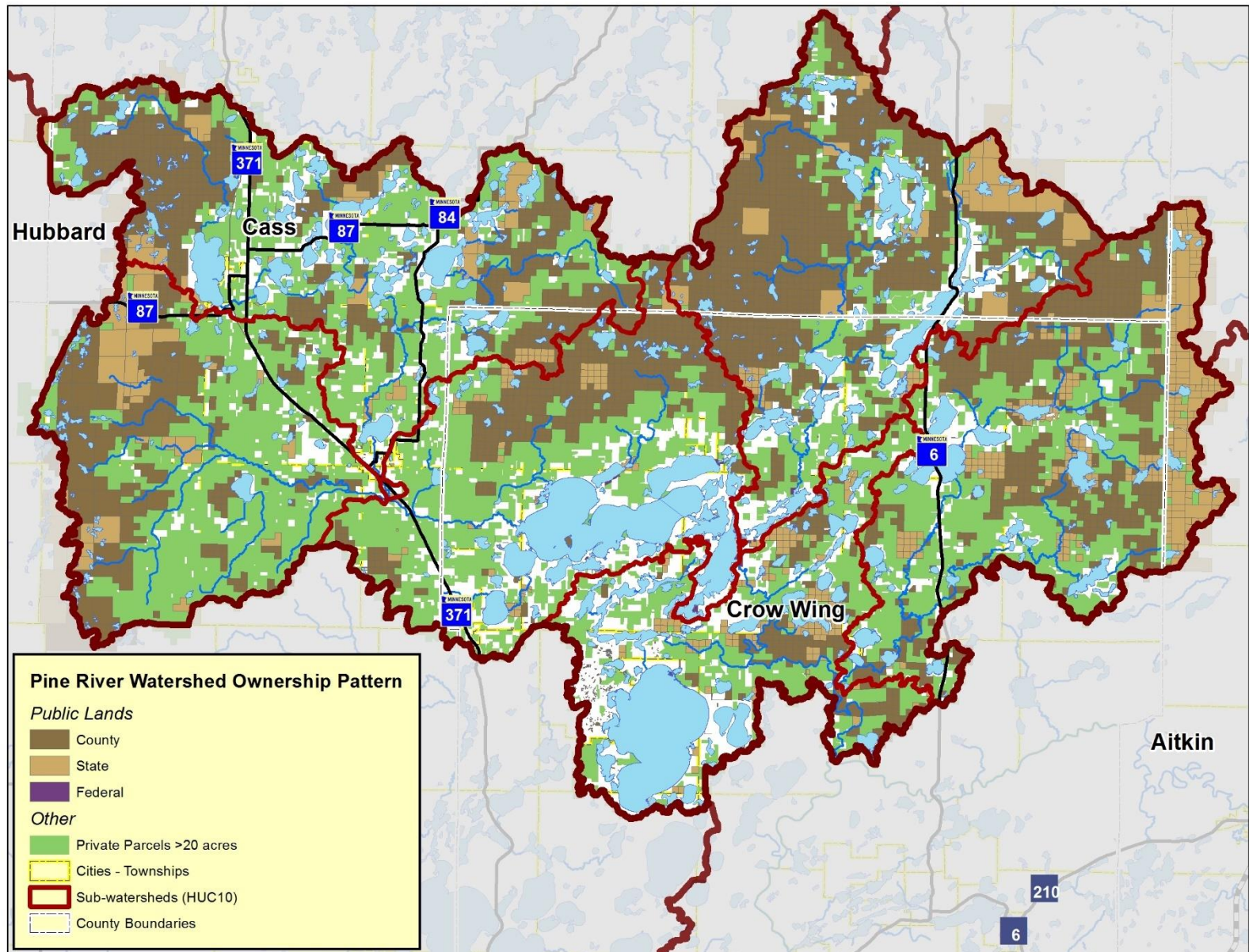
PTM

# Pine River Watershed





# Pine R. Landscape: Complex Ownership Pattern



# Protect the Sponge

## Forests, Water and People

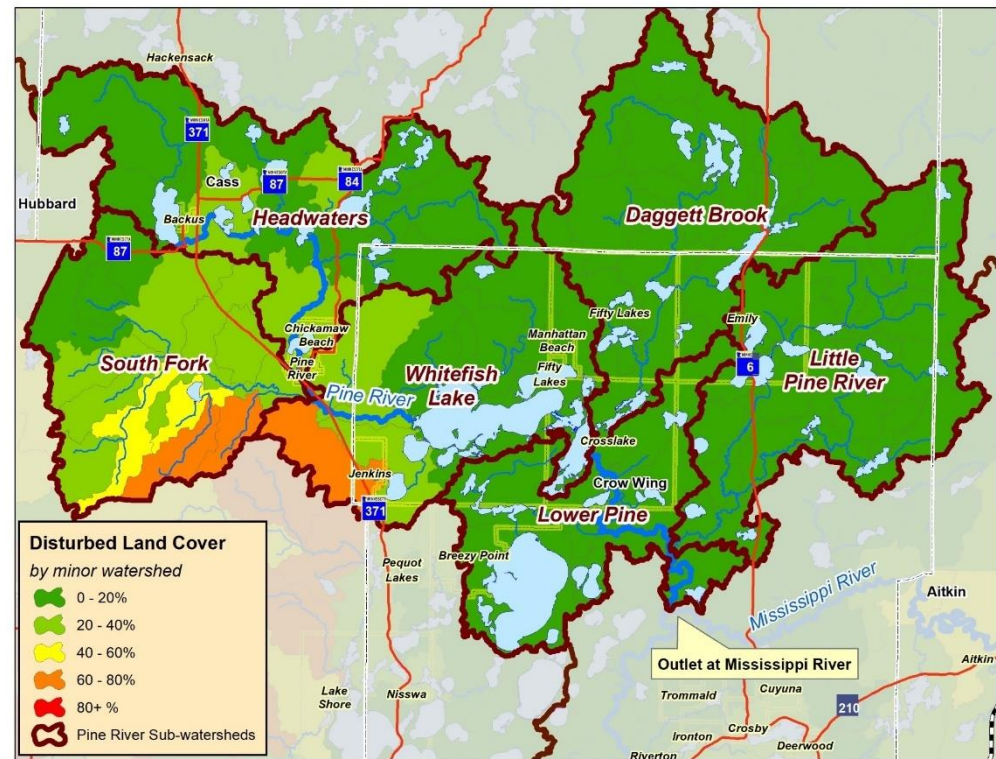
Drinking water supply and forest lands in Minnesota

USDA Forest Service  
Northeastern Area  
State and Private Forestry



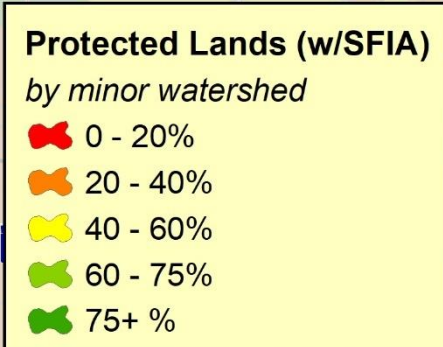
**Table 1.** Watershed results for Minnesota

Watershed Name	Hydrologic Unit Code	Mean APCW for watersheds
Pine	07010105	9 of 10
Rum	07010207	6 of 10
Clearwater-Elk	07010203	5 of 10





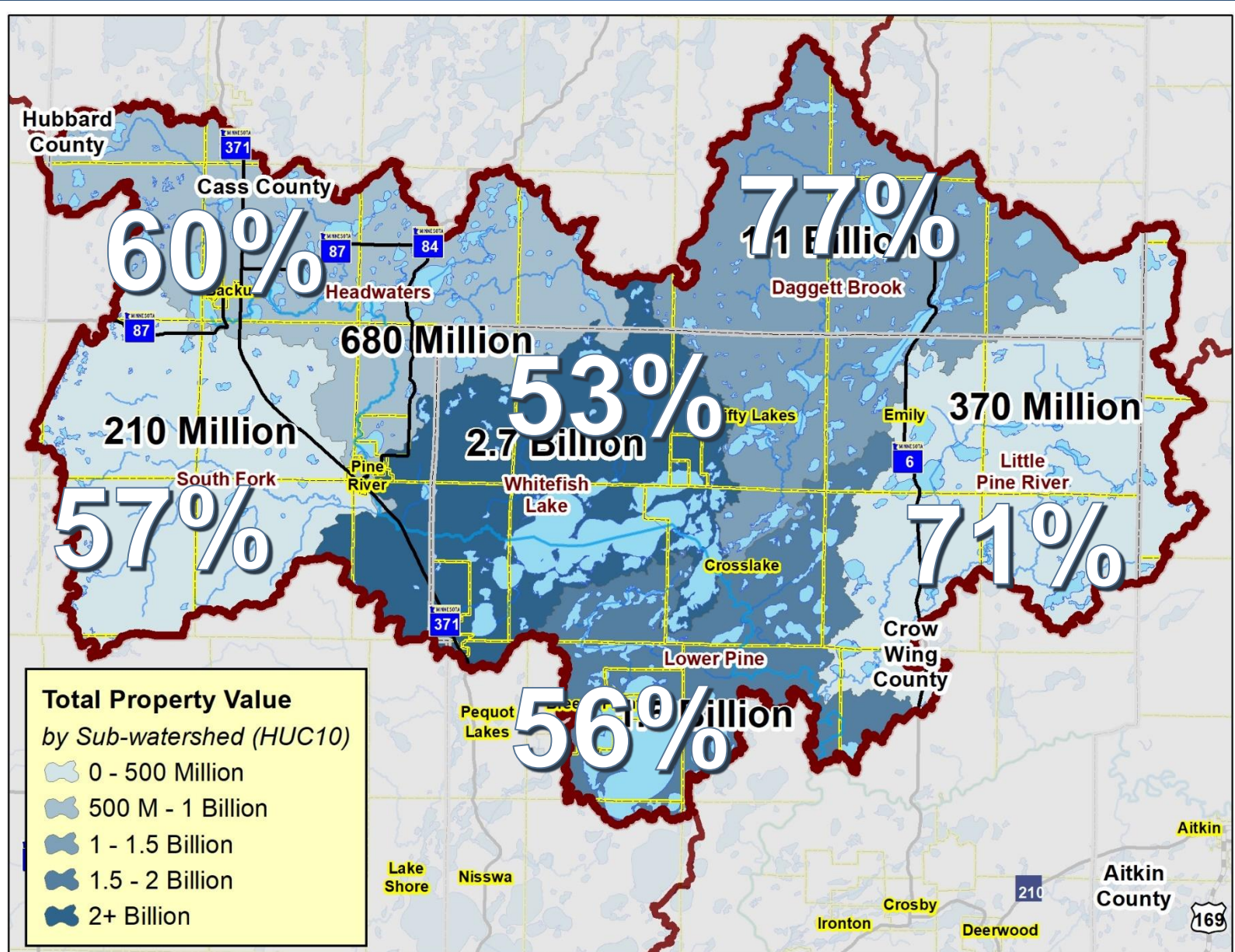
## Public Lands/Waters, Easements, Private Wetlands, SFIA





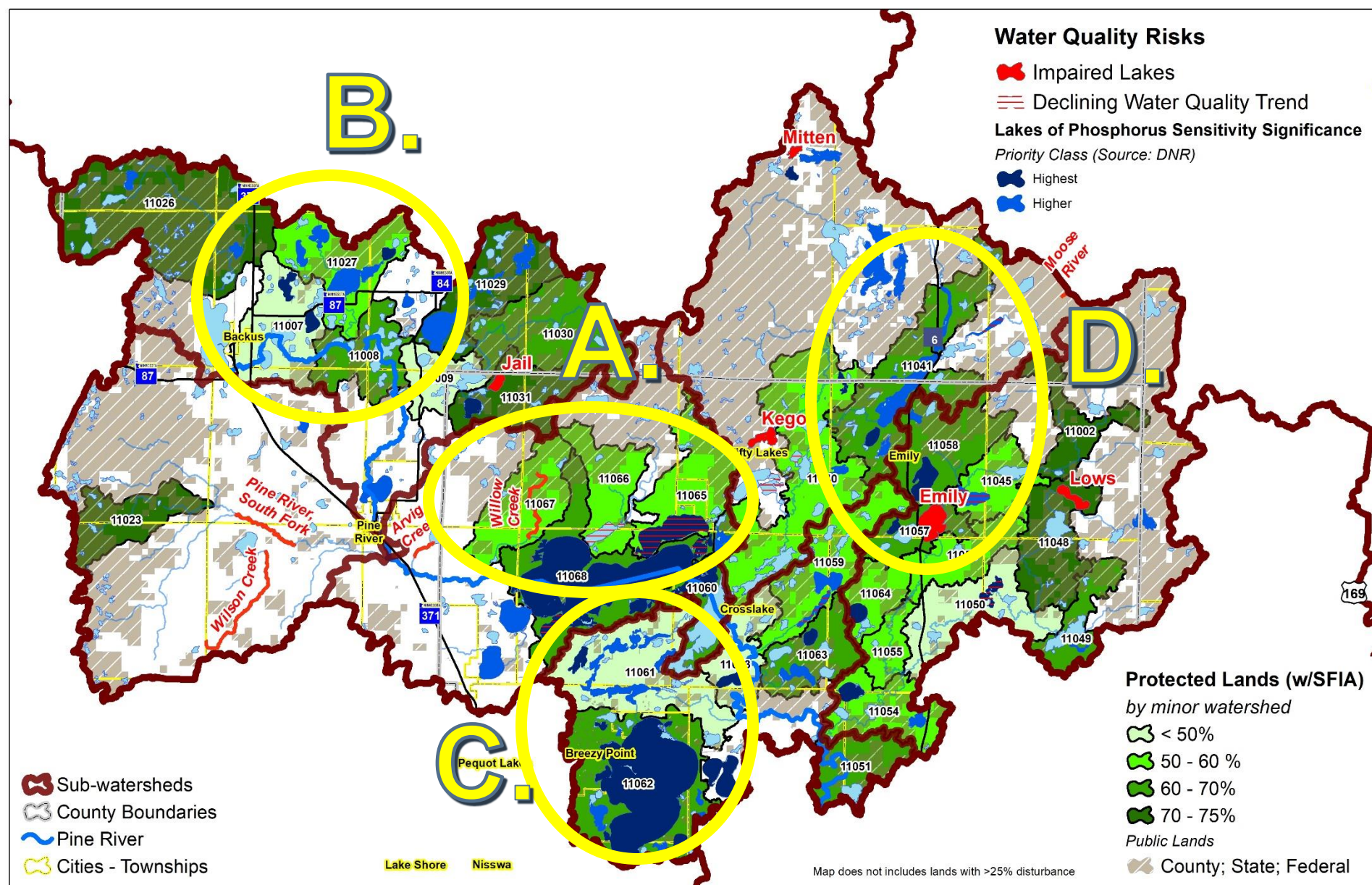
# Value to County:

## Total Property Values (Land + Building)



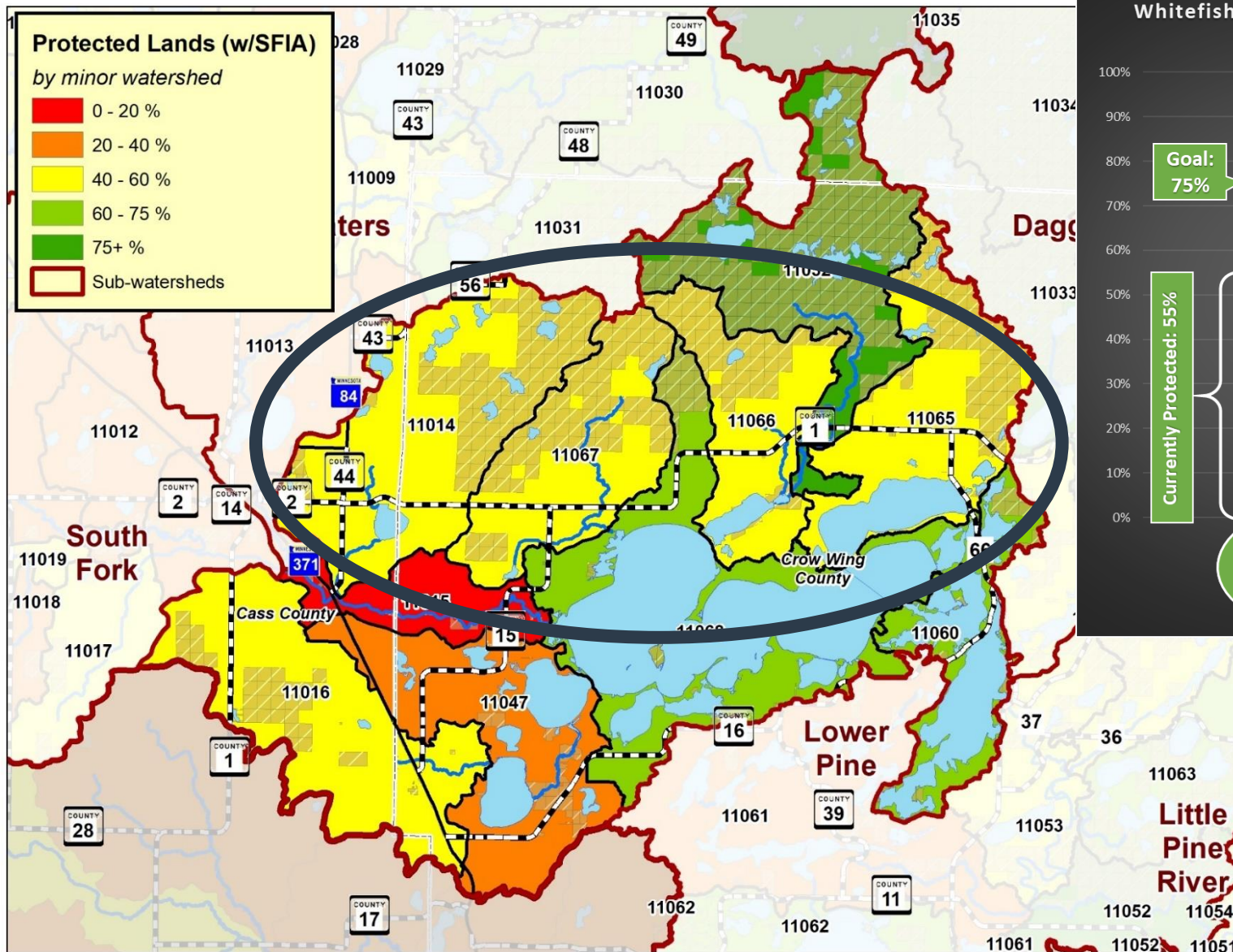


# Starting Point: <75% protection, <25% disturbance

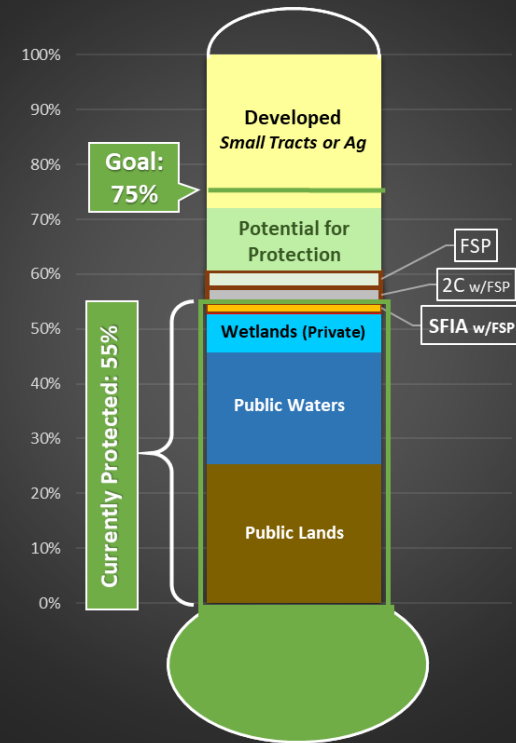




# Cluster A: Whitefish Sub-watershed

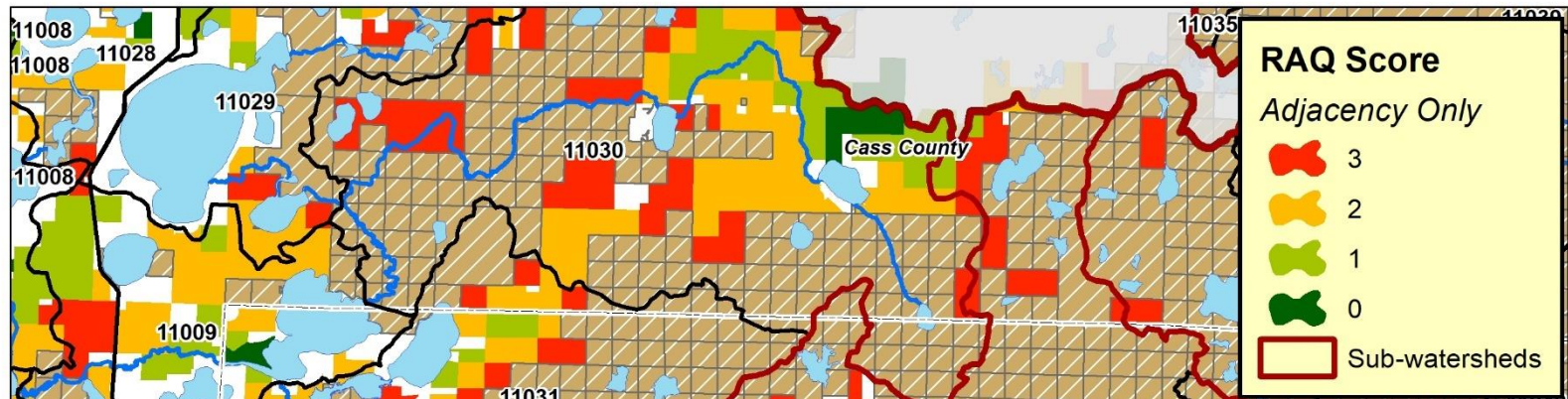


## Watershed Protection Status Whitefish Chain Sub-watershed





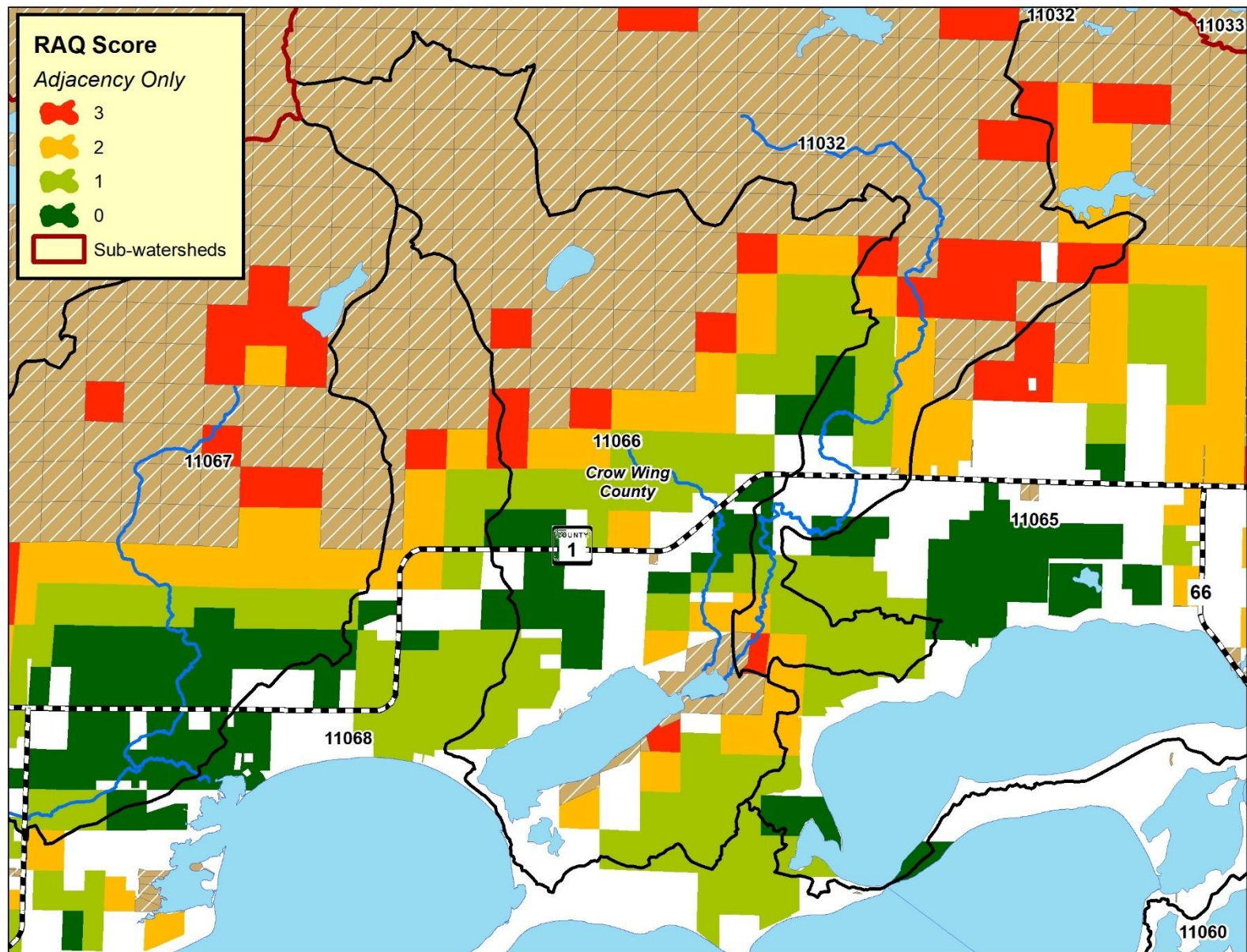
# RAQ Scoring: Sub-Watershed Scale



## Scoring Criteria:

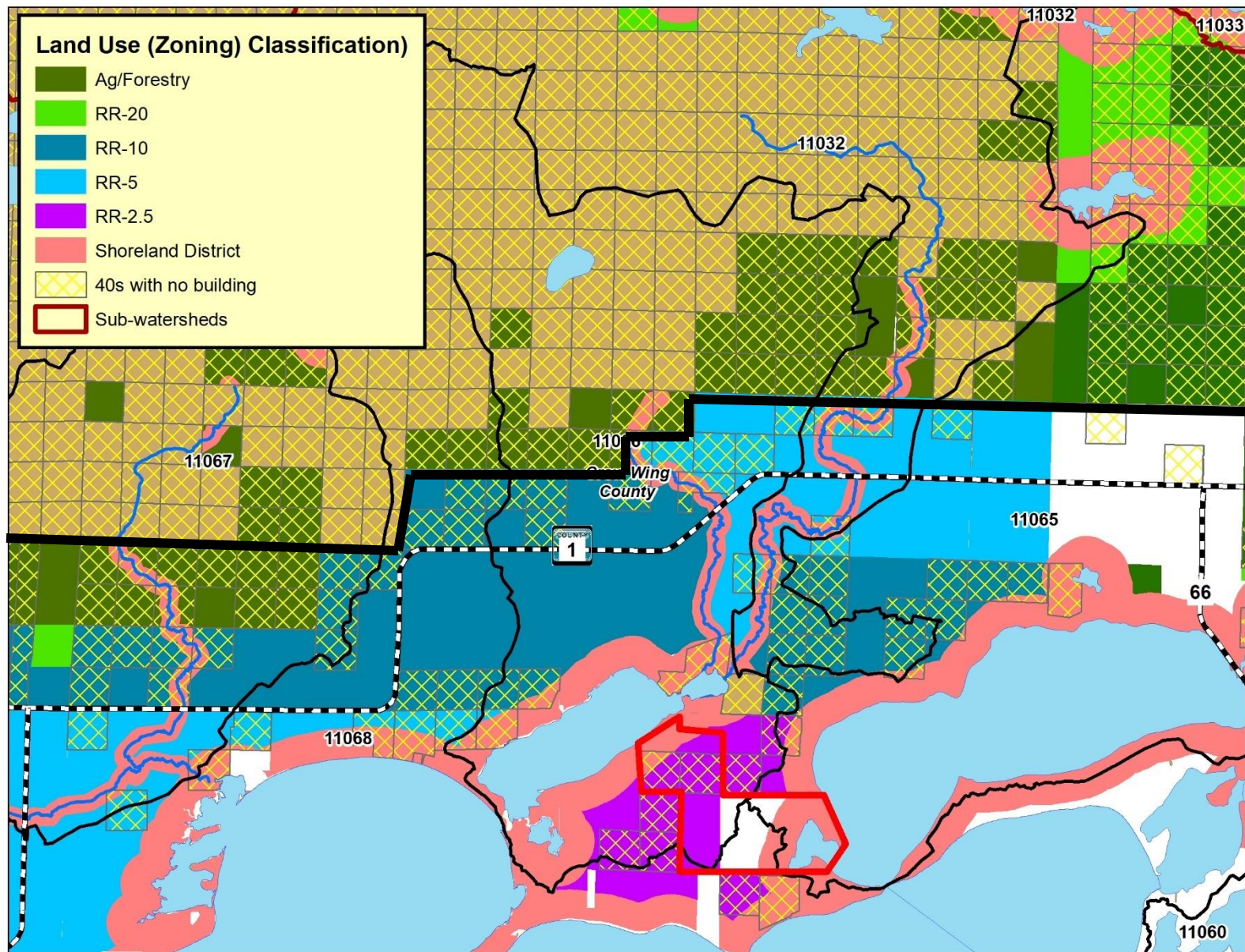
Riparian	3	Riparian
	2	Non-riparian: Shoreland (1 parcel back)
	1	2 parcels back
Adjacency	3	2 sides touching public land
	2	1 side touching public land
	1	One parcel removed from public land or touching parcel with SFIA or Easement
Quality	3	1 point feature that parcel touches: High or
	2	Outstanding Biodiversity (upl. or aqu.), Wild
	1	Rice L, Cisco L, Trout L/Str

# RAQ Scoring: Minor Watershed Scale





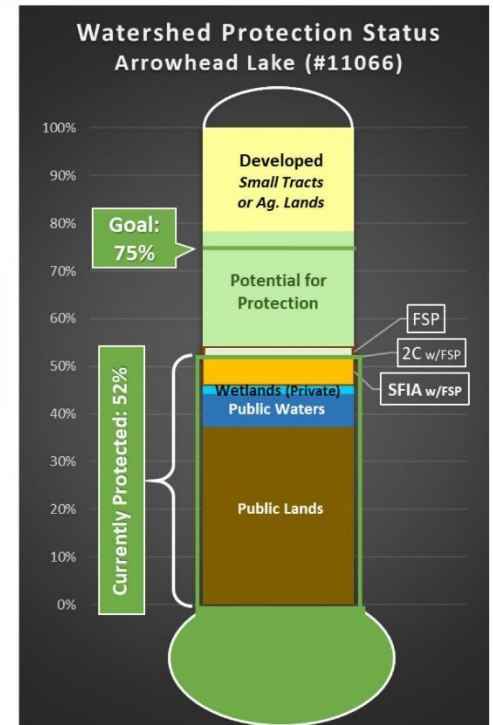
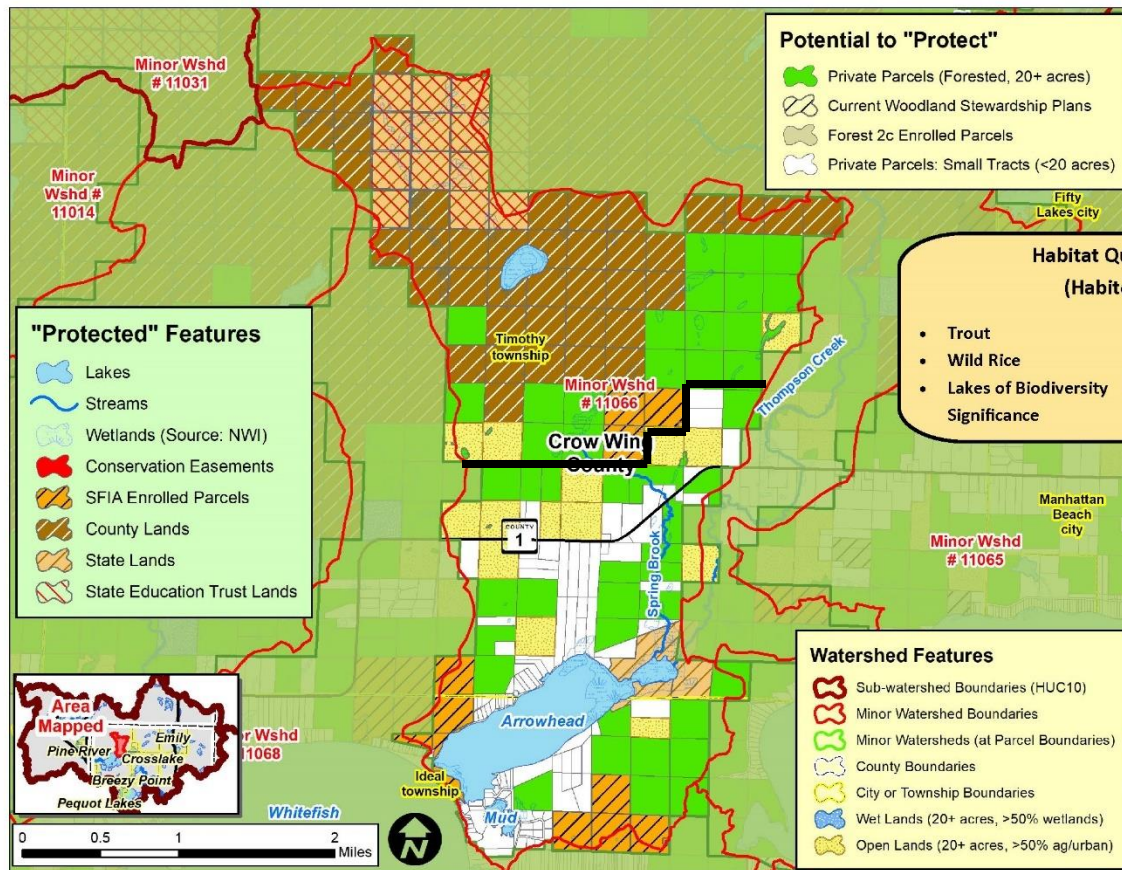
# Importance of Land Use Planning





# Arrowhead Lake / Spring Brook Minor Watershed

## What is the Potential to Protect the Arrowhead Lake Minor Watershed (Minor 11066) ?



**Water Quality Trends / Impairments:**

**Improving:** None  
**Declining:** None, **Impaired:** None  
**Stable (No Trend):** None



## Implementation Toolbox

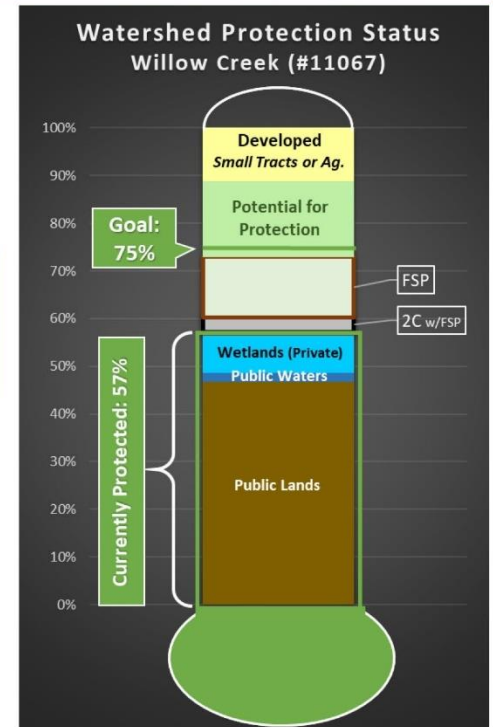
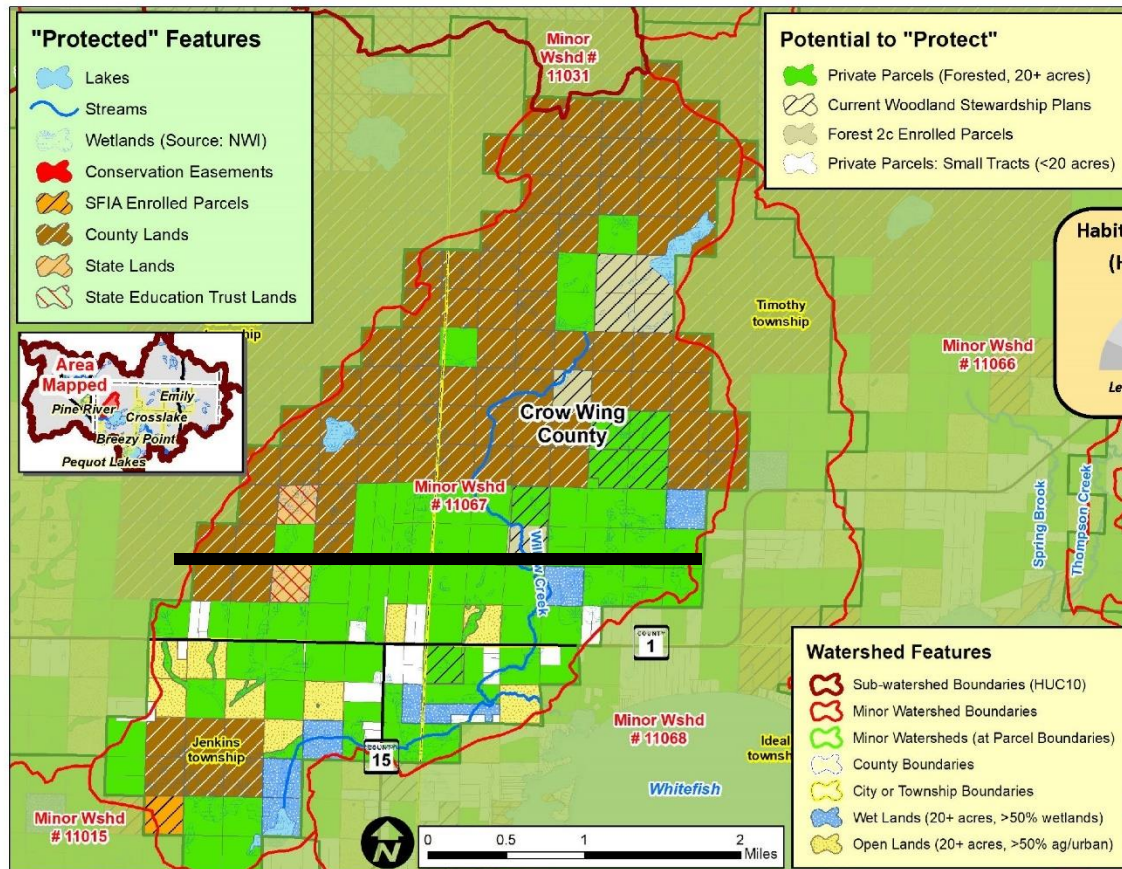
Plan It!	Improve It!	Manage It!	Buy It!
<b>General Advice &amp; Assistance</b> <ul style="list-style-type: none"> <li>Fact sheets</li> <li>Posters / Materials</li> <li>Workshops</li> <li>Website / Social Media</li> </ul>	<b>Specific Advice &amp; Assistance</b> <ul style="list-style-type: none"> <li>Site Visits</li> <li>Plan:</li> <li>Landscape Stewardship</li> <li>Forest Stewardship Projects</li> </ul>	<b>Grants &amp; Cost-share Projects</b> <ul style="list-style-type: none"> <li>Tree Planting</li> <li>Butt Capping</li> <li>Timber Stand Improvement (Thinning)</li> </ul> <b>Forest Management</b> <ul style="list-style-type: none"> <li>Timber Sales</li> <li>High Priority Areas</li> <li>Clean Water</li> <li>Habitat Fund</li> </ul>	<b>Local Land Use</b> <ul style="list-style-type: none"> <li>Riparian Buffers</li> <li>Voluntary Site Land Guidelines</li> <li>Zoning &amp; Critical Controls</li> </ul> <b>Incentive Programs to Enroll Land</b> <ul style="list-style-type: none"> <li>SFIA</li> <li>2C Forest</li> <li>CRP</li> </ul> <b>Conservation Easements</b> <ul style="list-style-type: none"> <li>Donated</li> <li>Purchased</li> </ul> <b>Fee Title Public Land Acquisition</b> <ul style="list-style-type: none"> <li>Federal</li> <li>State</li> <li>County</li> </ul>

Lower Costs, Less Permanent → Options → Higher Costs, More Permanent



# Willow Creek Minor Watershed

## What is the Potential to Protect the Willow Creek Minor Watershed (Minor 11067) ?



**Water Quality Trends / Impairments:**

Improving: None

Declining: None, Impaired: Willow Cr.

Stable (No Trend): None



## Implementation Toolbox

Plan It!	Improve It!	Manage It!	Buy It!
<b>General Advice &amp; Assistance</b> <ul style="list-style-type: none"> <li>Fact sheets</li> <li>Poster / Materials</li> <li>Workshops</li> <li>Website / Social Media</li> </ul>	<b>Specific Advice &amp; Assistance</b> <ul style="list-style-type: none"> <li>Site Visits</li> <li>Plan:</li> <li>Landscape Stewardship</li> <li>Forest Stewardship Projects</li> </ul>	<b>Grants &amp; Cost-share Projects</b> <ul style="list-style-type: none"> <li>Tree Planting</li> <li>But Capping</li> <li>Timber Stand Improvement (Thinning)</li> </ul> <b>Forest Management</b> <ul style="list-style-type: none"> <li>Timber Sales</li> <li>High Priority Areas</li> <li>Coastal Water Habitat Fund</li> </ul>	<b>Local Land Use</b> <ul style="list-style-type: none"> <li>Riparian Buffers</li> <li>Voluntary Site Level Guidelines</li> <li>Zoning &amp; Critical Controls</li> </ul> <b>Incentive Programs to Enroll Land</b> <ul style="list-style-type: none"> <li>SFIA</li> <li>2C Forest</li> <li>CRP</li> </ul> <b>Conservation Easements</b> <ul style="list-style-type: none"> <li>Donated</li> <li>Purchased</li> </ul> <b>Fee Title Public Land Acquisition</b> <ul style="list-style-type: none"> <li>Federal</li> <li>State</li> <li>County</li> </ul>

Lower Costs, Less Permanent Options Higher Costs, More Permanent



# Cluster 2: Headwaters

B.

## Water Quality Risks

Impaired Lakes

Declining Water Quality Trend

## Lakes of Phosphorus Sensitivity Significance

Priority Class (Source: DNR)

Highest

Higher

## Protected Lands (w/SFIA)

by minor watershed

< 50%

50 - 60 %

60 - 70%

70 - 75%

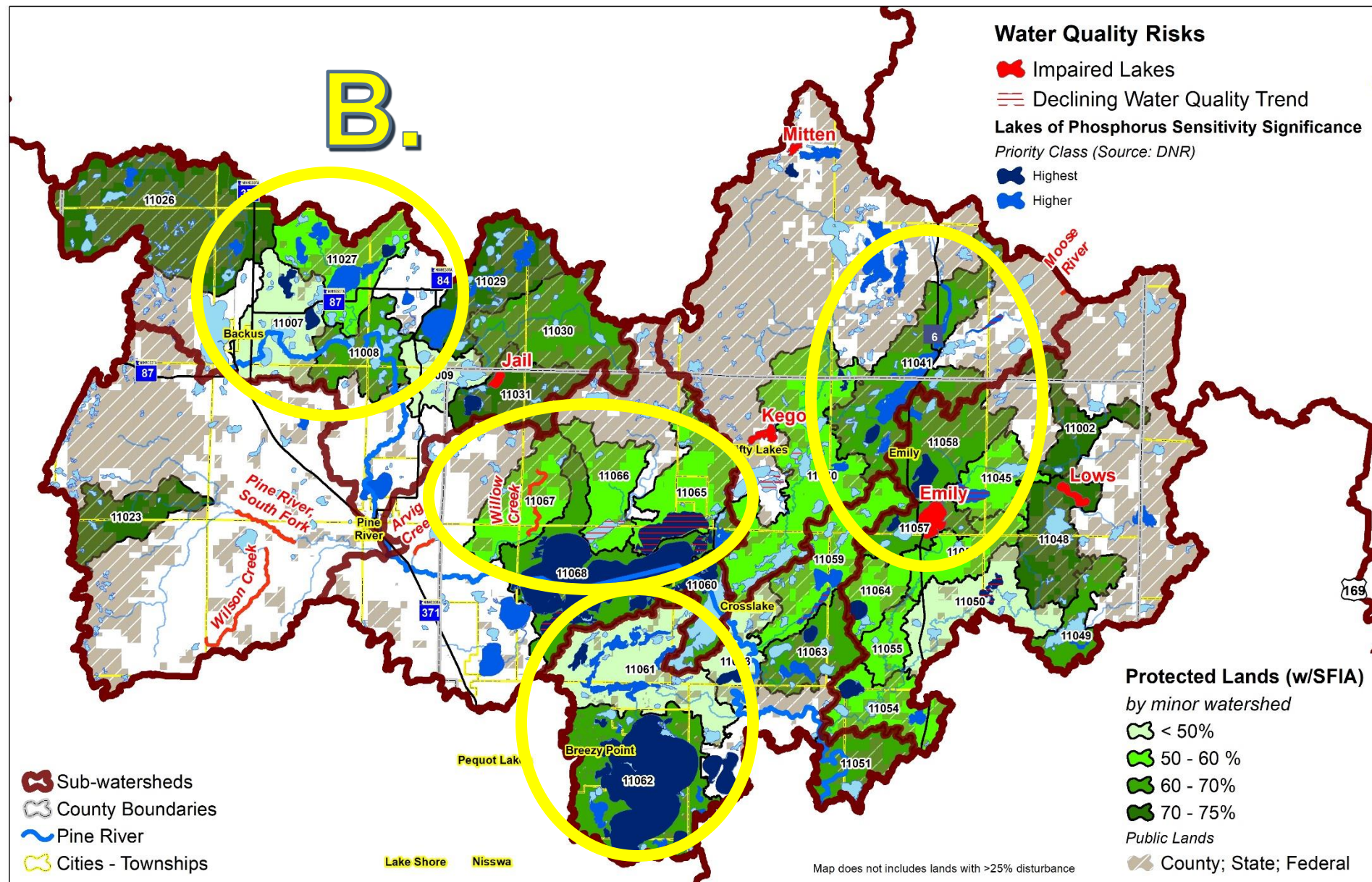
Public Lands

County; State; Federal

Sub-watersheds  
County Boundaries  
Pine River  
Cities - Townships

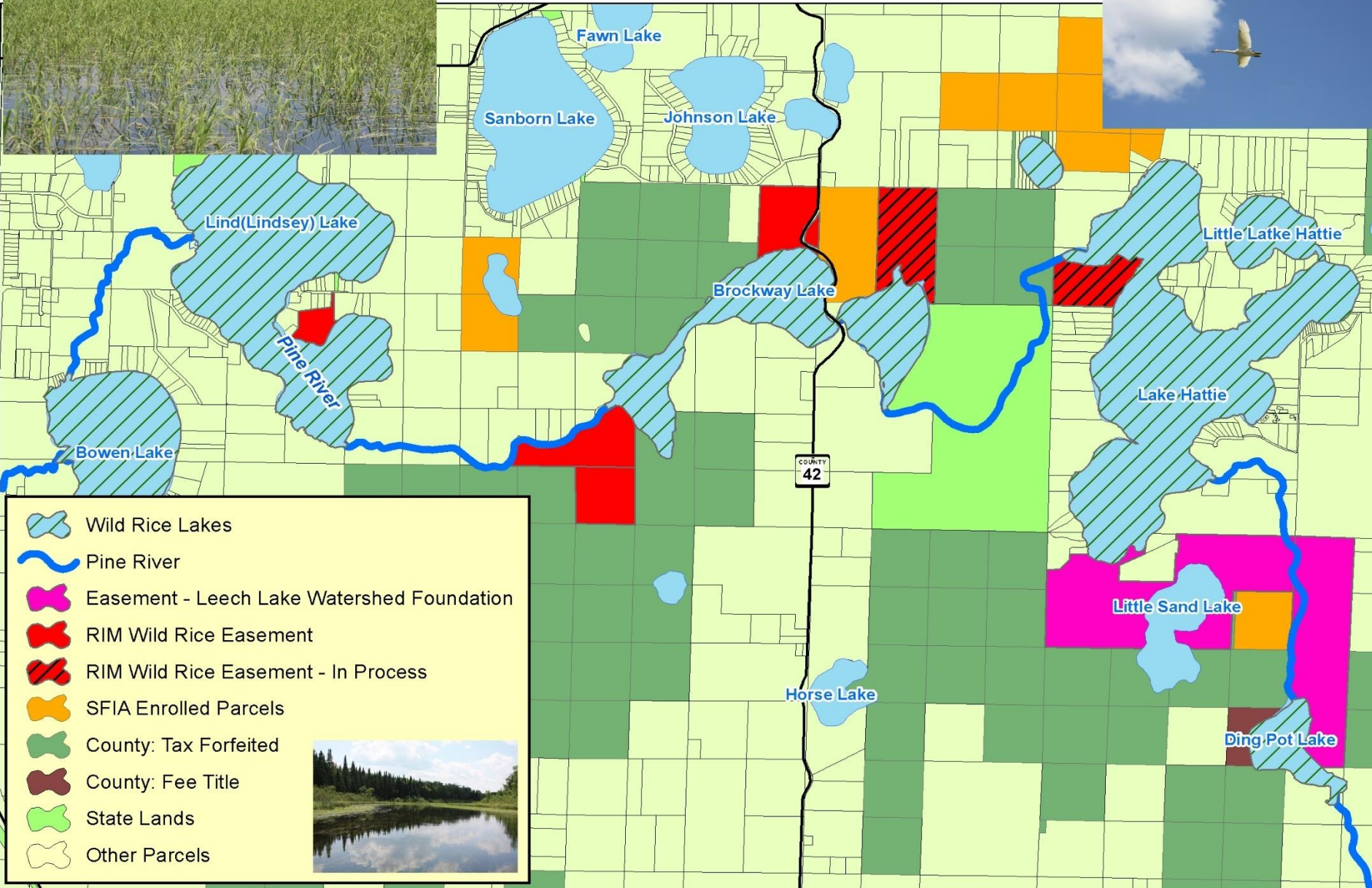
Lake Shore Nisswa

Map does not include lands with >25% disturbance



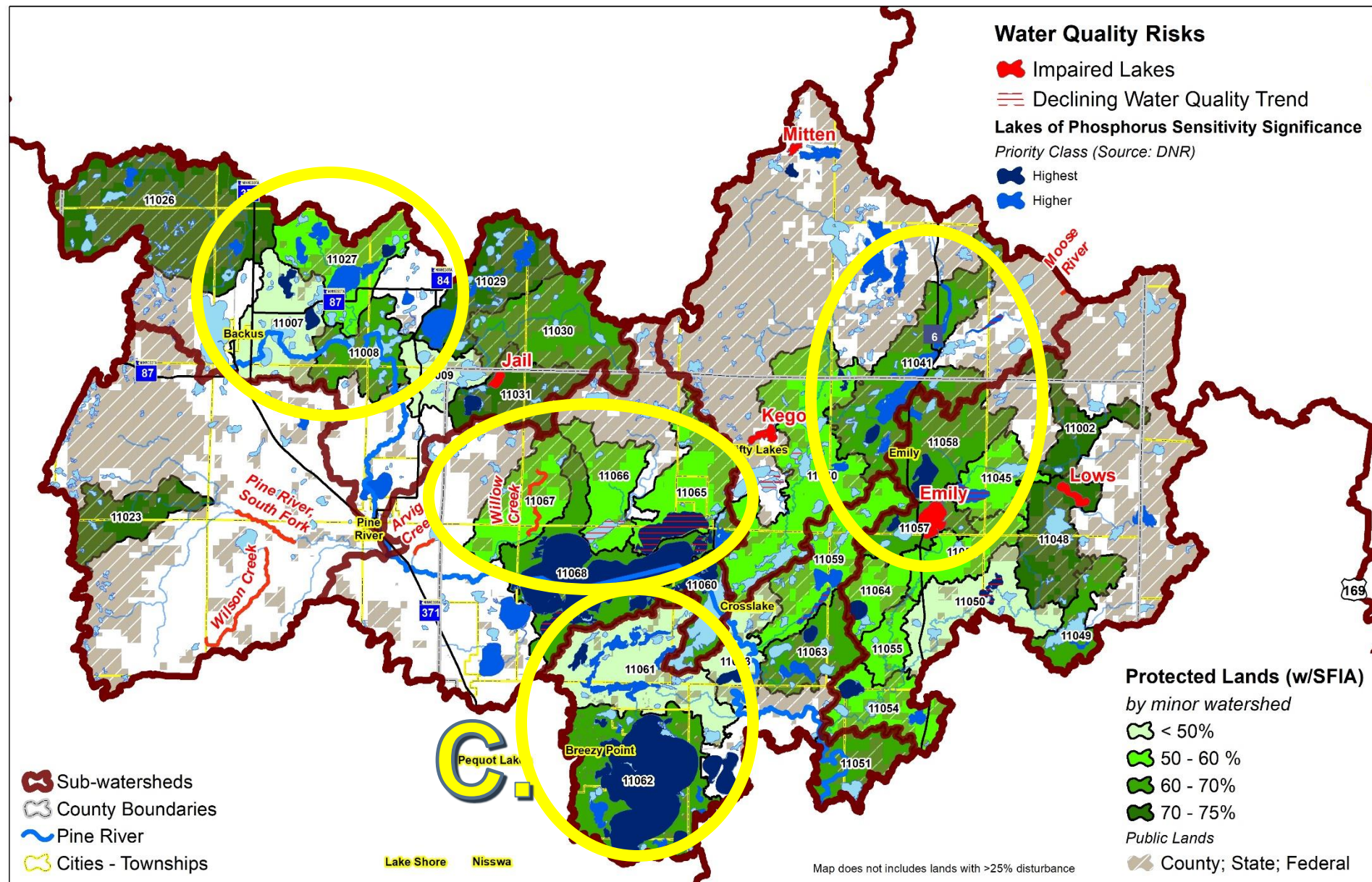


# Protecting High Quality Wild Rice Habitat: Pine River Corridor





# Cluster 3: Pelican / Ossawinnamakee





# Sample watershed: Lake Ossie

Lake Ossawinnamakee: Heavily forested | low “protected” lands | Cisco refuge lake

## Heavily Forested areas around the watershed

Lake Ossawinnamakee boasts one of the most heavily forested areas around a watershed in Crow Wing County. 92% of the area around the lake is still forested or un-disturbed.



## Protection from development

Alarminglly, Only 20 to 40% of the forested area is protected from development.



Lake Ossawinnamakee

## Risk Classification

### Enhance/Protection

Although over 90% of the area around Lake Ossawinnamakee is carpeted in a relatively natural condition (forest and water), only about 33% of this land is protected from future development. This is one reason why this watershed was classified as having opportunities for further enhancement and protection. Because nearly half of the forests in this watershed are privately owned, one potential strategy is to work with landowners to develop and implement forest stewardship plans.



## What is the importance of Cisco?

The presence of Cisco or Tullibee in a watershed is simply a good indicator of the good health of that lake. These bait-fish thrive best in deep, well oxygenated, lakes. Cisco represent a great food source for a host of game fish.

## Forest Stewardship Plan

Forest stewardship management planning assistance for clean water protection.

Private forest landowners can look to Crow Wing County and the Crow Wing Soil & Water Conservation District to provide assistance for tree planting, forest stand improvement, invasive species control, forest habitat improvements, and erosion control near riparian areas. Various tax incentives exist to preserve forest lands in addition to programs that can offer up to 50% financial assistance for developing and implementing forest stewardship plans.



# Key: Local Technical Team





# Presentation Breakdown:

- **Forest Protection Background**

Forests + sandy soil = groundwater = good lake water quality

- **Protection Methodology**

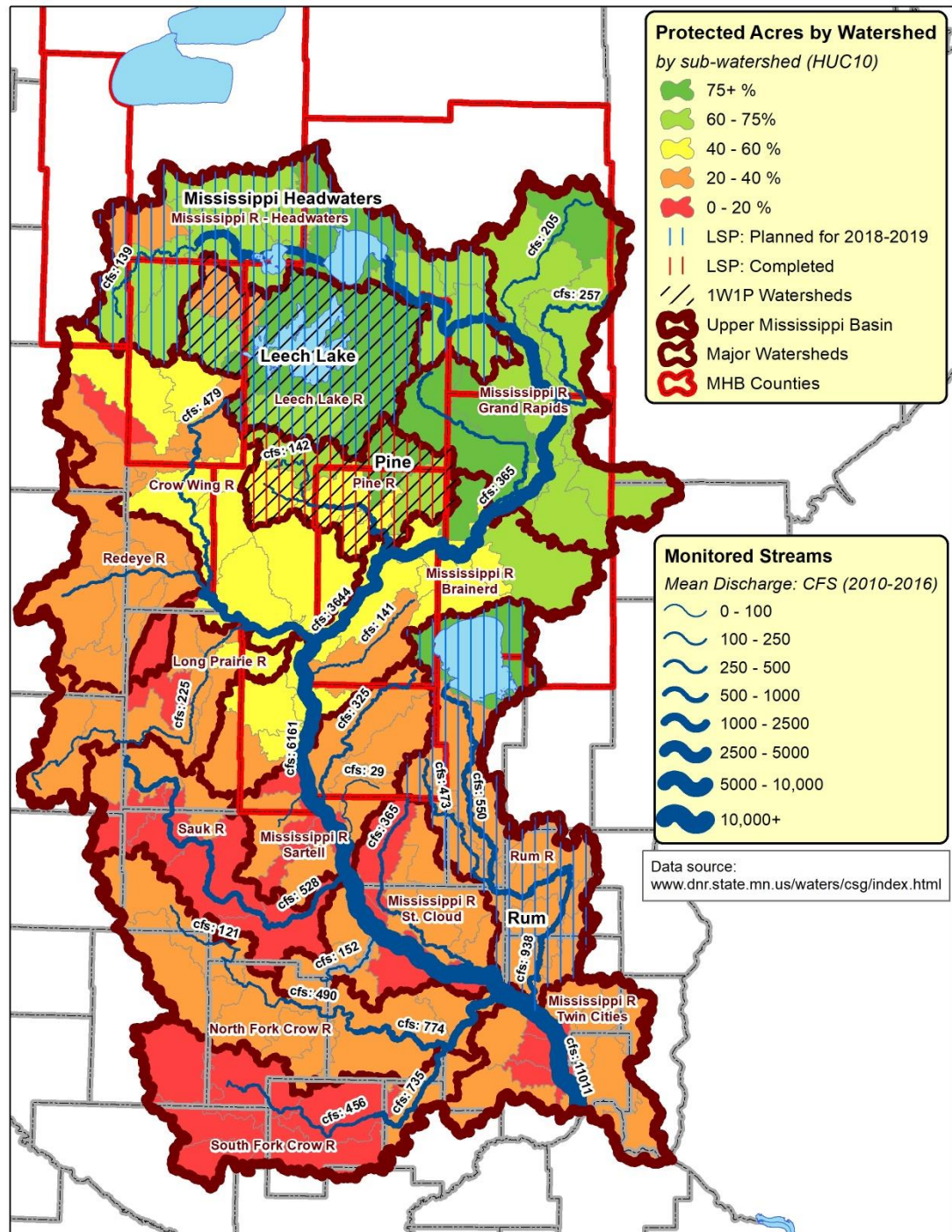
What tools can we use to achieve forest protection?

- **Forest Stewardship Meets Water Planning**

Can forest stewardship influence water planning?

- **Ramping up Efforts to Protect Lakes through Forest Stewardship**

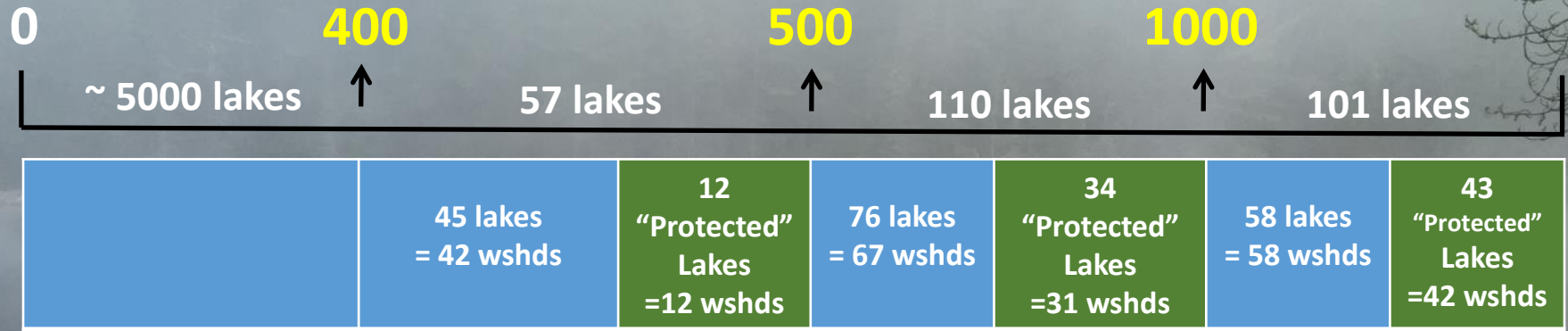
How can we ramp up efforts to ensure Minnesota's unique quality of life for future generations?





# # of Lakes in Mississippi headwaters Counties > 400 acres: 268

Size in acres:



**179/268 lakes (146 watersheds)**

**- 6 Wildlife Lakes**

**- 8 Impaired Lakes (to TMDL process)**

**= 165 Lakes (130 watersheds)**

*After setting aside the protected lakes,  
where do we go from here?*

## FFF Composite Score

$Econ + Ecol + Rec$

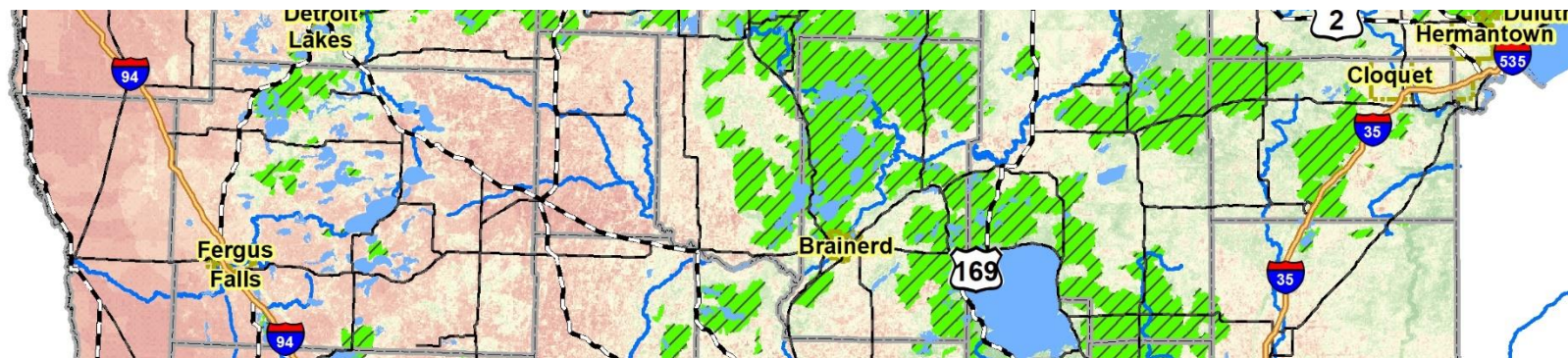
High : 173.75

Low : 11



# Identification of Priority Forests for the Minnesota Forests for the Future Program

*A GIS-based identification of priority private forestlands with high recreational, economic, and ecological values*





# Priority = Intersection of *Quality* & *Risk*

Local Decision Makers Table (watersheds w/400-1000 acre lakes)			Important State Priorities					Score (out of 5)
			Aquatic			Terrestrial		
Minor Watershed (Huc 14)	County	% Protected	Coldwater (Tullibee, Trout)	Phosphorous Sensitivity Significance (DNR)	Water Quality Trend(s)	“Forests for the Future” Composite Score	MCBS Terrestrial Biodiversity (DNR)	
			Quality	Risk (Long Term)	Risk (Short Term)	Quality	Quality	
			Yes = 1	Highest = 1, Higher = 0.66, High = 0.33	Declining Trend = 1	1 = Above Mean for MHB Wshds (93.8)	Outstanding = 1, High = 0.66, Mod. = 0.33	
Big Portage	Cass	57.9%	Yes	Higher and Highest	Stable w/Declining	97.1	Moderate-High	4.66
Roosevelt	Cass-Crow Wing	62.0%	Yes	Highest	Stable w/Improving	100.7	Moderate-High	3.66
Upper Gull	Cass	34.7%		Higher and Highest	Stable w/Declining	98.0	Moderate-High	3.66
Woman	Cass	72.7%	Yes	Higher	Improving	100.3	Moderate-High	3.33
Thunder	Cass	66.2%	Yes	Higher	Stable w/Improving	106.5	Moderate-High	3.33
Blackwater-Mule	Cass	51.1%		Higher and Highest	Improving, Declining	99.1	Moderate	3.33
Induadona	Cass	62.8%		High	Stable w/Declining*	98.7	Moderate-High	3
Sylvan	Cass	50.0%		Highest	Stable	107.2	High	2.66
Ada	Cass	69.4%		Higher	Stable w/Improving	95.0	Moderate-High	2.33
+ Local Priorities, including: Wild Rice, Source Water, Natural Muskie, Sturgeon, Groundwater Sensitivity, Multiple Benefits,								
Lind (Linseey)	Cass	40.5%		Higher	Stable	96.6	Moderate	2.33
Leech-Steamboat Bay	Cass-Hubbard	66.2%		Higher	Stable	104.0	Moderate	2
Wabedo	Cass	67.3%		Higher	Stable	96.4	Moderate	2
Hattie	Cass	59.8%		High	Stable	98.3	Moderate-High	2
Vermillion	Cass	61.2%	Yes	High	Stable	86.3	Moderate-High	2
Pleasant	Cass	43.0%		Higher	Stable	95.5	Moderate	2
Swamp	Cass-Hubbard	62.8%				99.3	High	1.66
Lizzie	Cass-Crow Wing	41.4%		High		98.4	Moderate	1.66
Gull	Cass-Crow Wing	66.9%		Higher	Improving	89.3	Moderate-High	1.33
Gull River (backwaters	Cass-Crow Wing	33.8%		Higher		84.5	Moderate-High	1.33
Norway	Cass	29.7%		Higher	Stable	89.9	Moderate-High	1.33
Webb	Cass	51.1%		Higher	Stable w/Improving	91.2	Moderate	1
Placid	Cass-Morrison	29.2%		High		79.6	Moderate-High	1

Local Decision

(watersheds w/40

Minor Watershed  
(Huc 14)

Big Portage  
Big Trout  
Whitefish  
Little Sand  
Camp-Smith  
Pokegama  
Borden

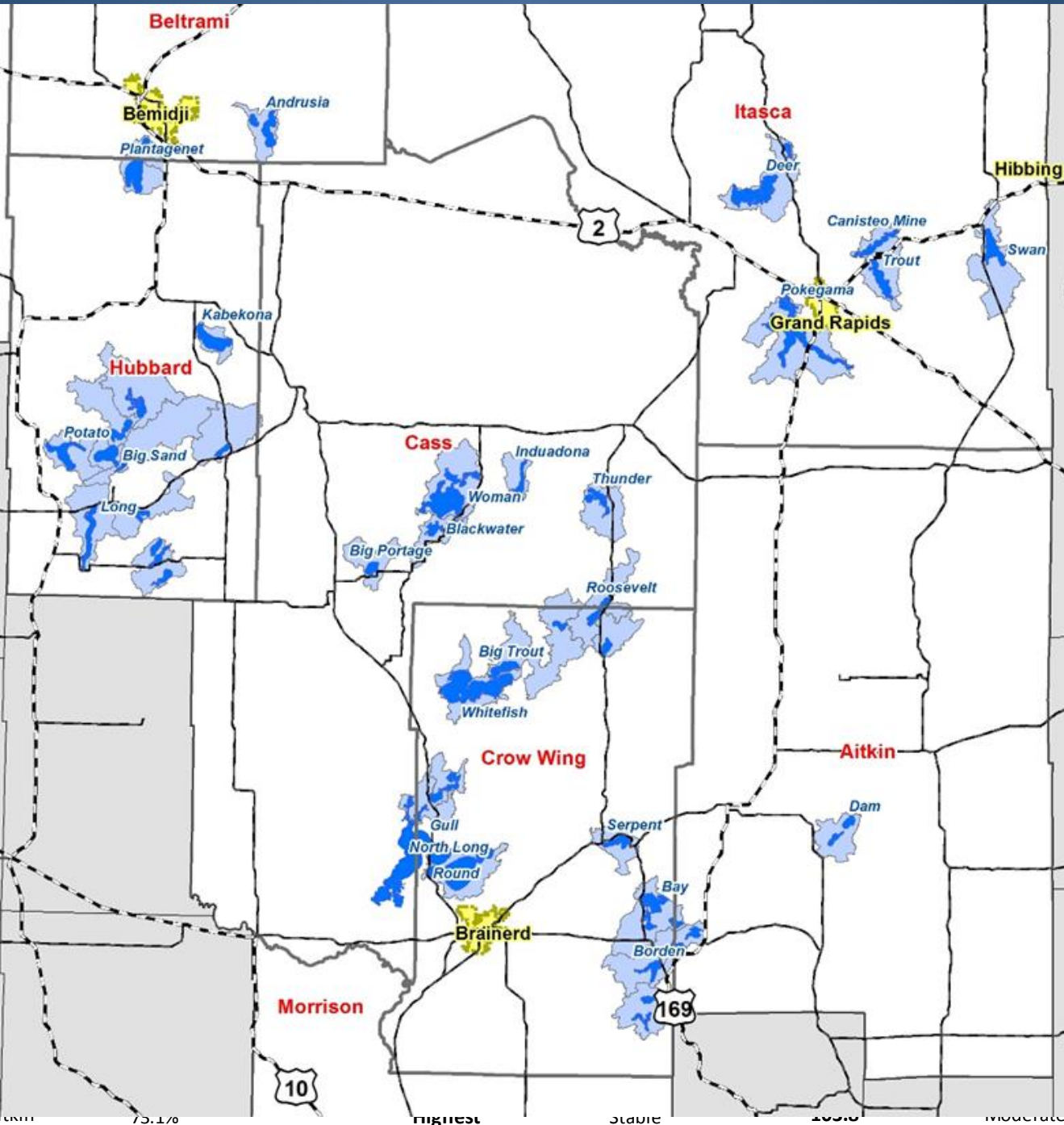
Roosevelt  
Round-Big Pine  
Ruth  
Deer  
Bottle  
Serpent  
Upper Gull

Woman  
Kabekona  
Thunder  
Swan  
North Long-Round  
Andrusia  
Dam-Long  
Blackwater-Mule  
Third Crow Wing  
Mantrap  
Mitchell  
Trout (Coleraine)  
Cullen Chain  
Potato  
Marquette  
Fifth Crow Wing

Induadona  
Little Mantrap  
Bay  
Big Sand  
Plantagenet  
Long (Hubbard)

Round Lake (Aitkin)

Ca  
Cr  
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Cr  
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Al



estrial (DNR)	Score (out of 5)
ty	
1, High = 0.33	Scoring Basis
-High	4.66
ate	4.33
tstanding	4
ate	4
ding	4
resent	4
resent	4
-High	3.66
-High	3.66
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ate	3.33
-High	3
resent	3
resent	3
ate	3
ate	3
ate	3
-High	2.66



# Example Scenario:

- **Score = 3 out of 5**

- 53 Lakes
- 36 Watersheds



- **Total Needed to get to 75%?**

- 89,824 acres
- / 36 = mean: 2495 acres

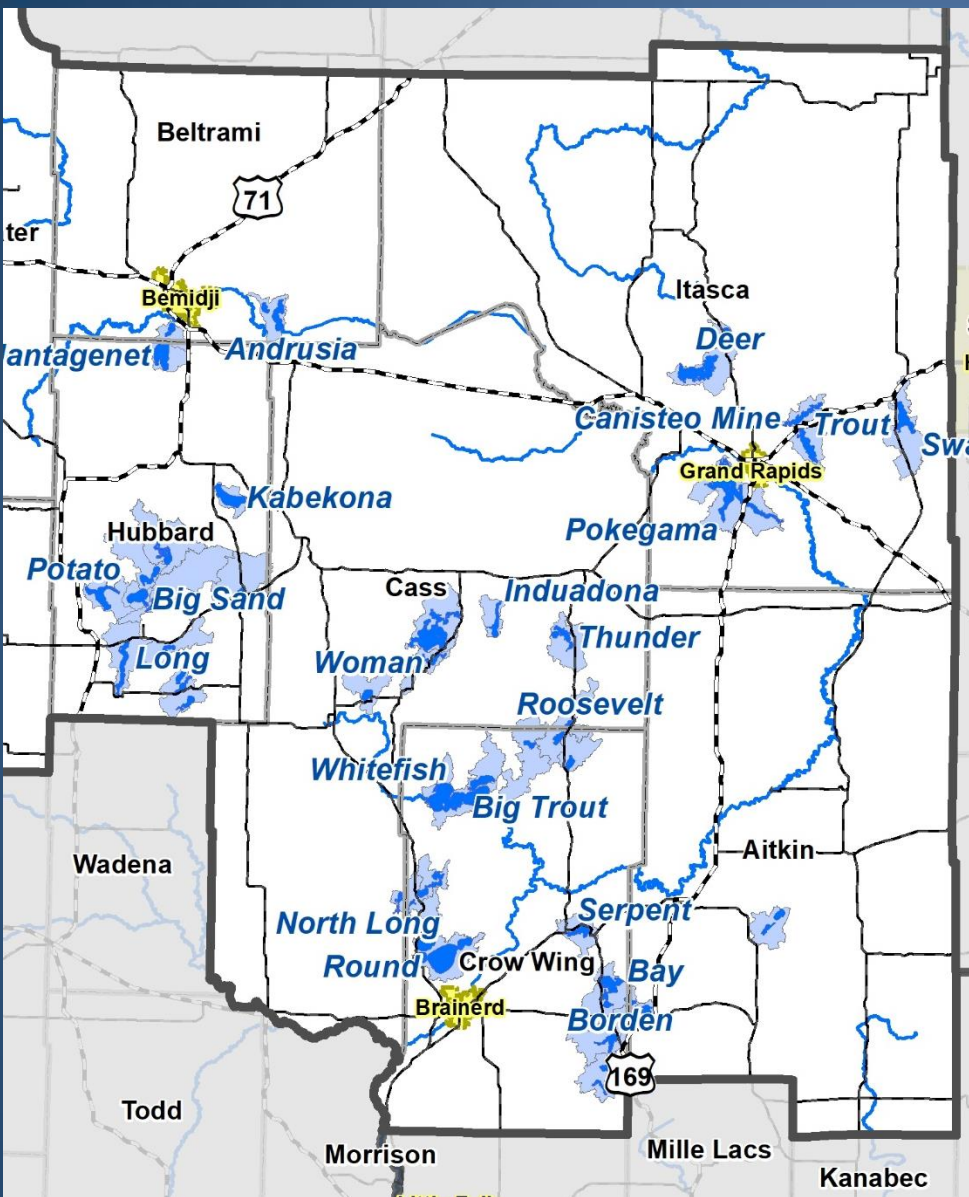


- **Cost (50/50 @ \$1500/ac)?**

- SFIA = \$2,500,000
- +Easements = \$40,500,000  
= \$43,000,000

- **Taxable Market Value =  
\$5,100,000,000**

*Keep Forested Lands Forested, Follow the Risk,  
Sell the Whole Toolbox (landowners decide)*





**Quality Forest +  
Quality Water =  
Quality of Life!!**

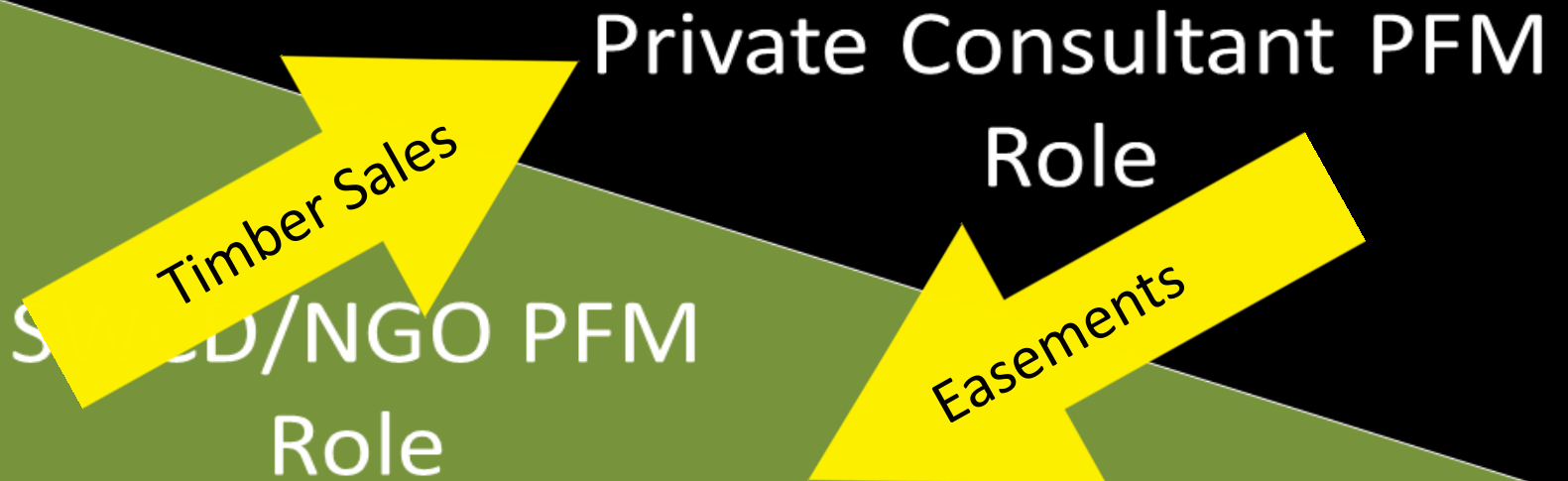




*The End!*



## DNR Forestry Leadership

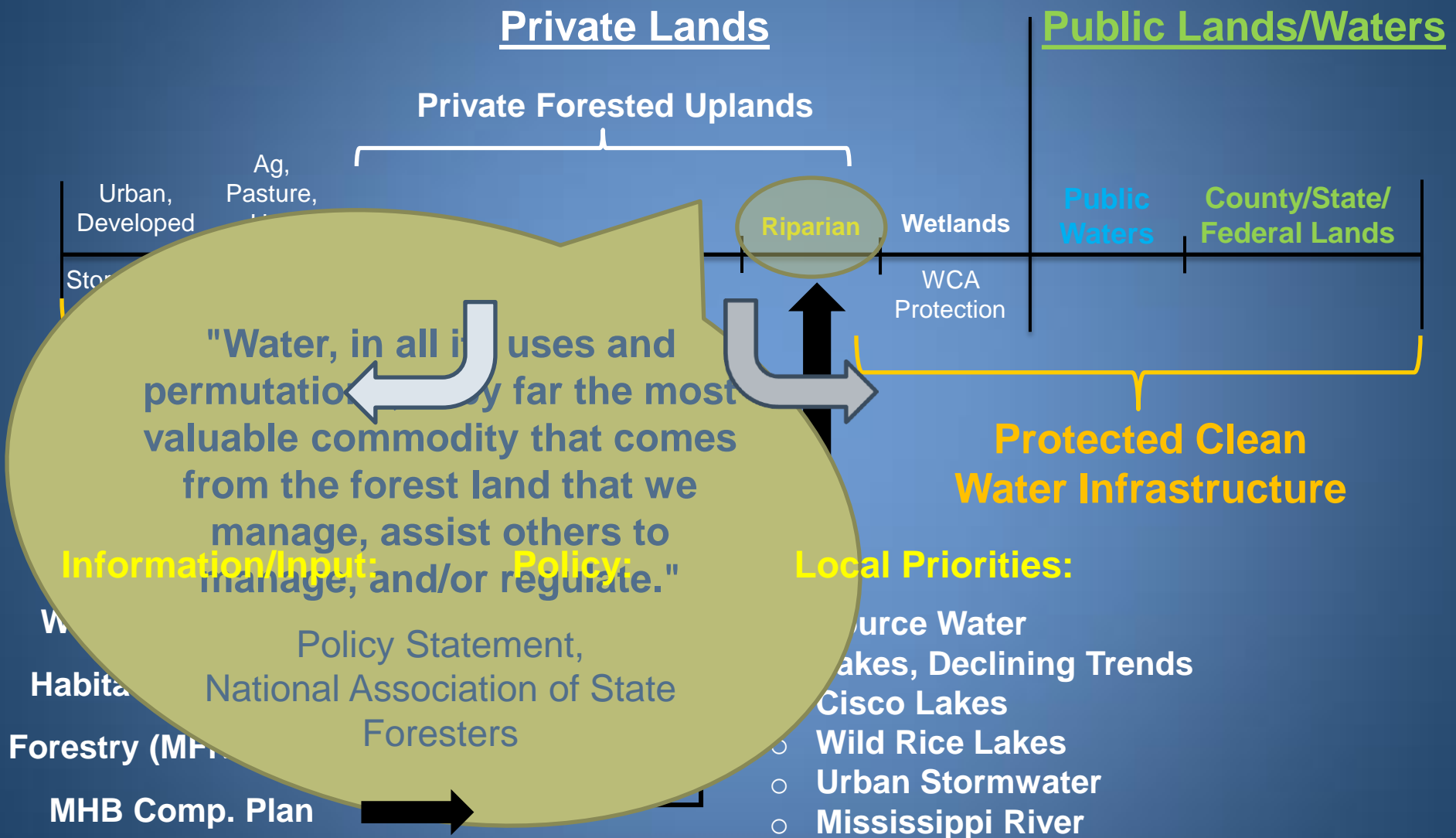


- **Smaller tracts**
- **Riparian**
- **WQ practices**
- **WQ protection**
- **Corridor oriented**

- **Larger tracts**
- **Non-Riparian**
- **Timber sale oriented**
- **Large scale forest management**



# Generalized Landscape Protection Model



*Protecting habitat as well as water quality!*

**PFM  
Expansion  
2016**



**SWCD  
Capacity  
2015**



**1 Water  
1 Plan  
2014**



**Forests for the  
Future  
2008**



**LWP  
1985**



**RIM  
1986**



**PFM  
1991**



**Tower-Soudan School**

A wonderful little elementary school serving the Tower-Soudan areas.

**SFIA  
2002**



**Referendum  
2008**

