Memorandum

Rum River 1W1P

FRESHWATER ISG

To:	Technical Advisory Committee
From:	Julie Blackburn (ISG) and Jen Kader (Freshwater)
Date:	January 4, 2021
Subject:	Information for the January 11, 2021 Technical Advisory Committee Meeting

PRIORITY RESOURCES FOR THE NATURAL RESOURCES ISSUE STATEMENTS

Natural Resource Issue Statement #1: Restore Degraded and Protect High Quality Aquatic Habitat in Lakes, Streams, Rivers, and Wetlands

GOAL 1: PROTECT AND RESTORE CRITICAL AQUATIC AND SHORELAND HABITAT AREAS

Candidate resources to be considered for prioritization are listed in Tables 1 (lakes) and 2 (streams + rivers). Most of the criteria used for identifying candidates were identified in April 2020 by the Natural Resources subcommittee. These have been outlined in the Issue Statement Framework since that time. Additionally, any lake/stream/river resource that was identified as a priority resource for surface water protection or restoration was identified, along with the ranked tier. When completed, 6 out of 8 priority restoration lakes and 7 out of 10 priority protection lakes as well as 2 out of 6 priority restoration rivers and 7 out of 9 priority protection rivers were identified as candidates for this issue statement and goal. The TAC could prioritize these already identified priority resources, or select other resources based on the criteria, outlined below. Candidate wetland resources have not been identified as relevant and sufficient data is not available. However, BWSR indicated in their plan notification letter that the state is embarking on a new wetland prioritization plan to guide mitigation in the future and that wetland restoration and preservation priorities in this plan may be eligible for inclusion in this statewide plan in the future. They also commented that the plan should address effort to retain the intact and significant portion of the historic wetlands in the upper part of the watershed.

Lake Resource Criteria

- Biological Significance Rating
- DNR Identified Priority Resource (as outlined in their official comment letter)
- MPCA Lake Stressor IBI Report
- MPCA's Watershed Monitoring Report
- Trout/Cisco Designation
- Wild Rice Designation

Stream + River Resource Criteria

- DNR Identified Priority Resource (as outlined in their official comment letter)
- Wild & Scenic Designation
- Stream habitat and geomorphology assessment results
    - MPCA Stream Habitat Assessment (MSHA)
    - Channel Condition and Stability Index (CCSI)

Table 1: Candidate Lakes for Natural Resource Issue Statement #1, Goal 1.

Lake	Prioritized Surface Water Resource Tier	Biological Significance	DNR Identified Priority Resource	MPCA Lake Stressor IBI Completed	Trout/Cisco	Wild rice	Other [1]
Mille Lacs	Protect 1	Outstanding			Cisco		
Blue	Protect 1			Priority Protection Lake			Yellow Bullhead and common carp
George	Protect 1	High		Priority Protection Lake			Considered vulnerable due to overall fish diversity and abundance; exceptional plant community
Ogechie	Protect 2	Moderate				Yes	Exceptional Plant Community
Round (Aitkin Cty)	Protect 2	Outstanding			Cisco		Only lake in this GMZ that is oligotrophic
Spectacle	Protect 2	Moderate	Yes				Relatively diverse fish population; healthy aquatic plants
Lewis	Protect 3	High					Plant Community indicates healthy water quality
Shakopee	Restore 1	Outstanding				yes	Exceptional Plant Community
Green	Restore 1			Priority Impaired Lake			Poor fish community; lack of complex of nearshore habitat; poor aquatic vegetation
Skogman	Restore 1		Yes				Poor fish community; healthy aquatic vegetation
North Stanchfield	Restore 2		Yes				Shallow basin; poor aquatic plant community
Fannie	Restore 2		Yes				Low density fish population
Onamia	Restore 3	Outstanding				Yes	Exceptional Plant Community
Big Pine		Outstanding					
Borden		Outstanding			Trout	Yes	Fish survey did not collect any cisco for 1st time since 1972
East Hunter			yes				
Francis				Priority Impaired Lake			
Kenney					Cisco		
Little Stanchfield			Yes				Shallow basin; relatively diverse fish population; aquatic plants - rich taxa, poor quality index
Partridge		Moderate					
Sandy		High					Plant Community indicates healthy water quality
Scott		Moderate					
Smith		Outstanding			Cisco		
Twelve		Outstanding				Yes	Does not meet aquatic recreation standards
Twenty		Outstanding					
West Hunter			yes				
Whitefish					Cisco		

(1) MPCA Rum River Monitoring and Assessment Report, Oct 2016

Table 2: Candidate Streams and Rivers for Natural Resource Issue Statement #1, Goal 1.

Stream	Prioritized resource Tier	DNR Identified Priority Resource	Other [1]	MPCA Stream Habitat Assessment (MSHA)[1]	Channel Condition and Stability Assessment [1]
Rum River	Protection 1 – PC & St Francis Protection 2 – Onamia		Wild & Scenic	Headwaters: Good Middle Rum: Fair Lower: Good	Headwaters: Stable Middle Rum: Moderately Unstable Lower: Fairly Stable (station 13UM069 - severely unstable)
West Branch Rum	Protection 2 (Upstream) Restoration 1 (Downstream)			Headwaters: Good; Downstream: fair to poor	Fairly stable to moderately unstable
Cedar Creek	Protection 2 (Upstream)			Fair	Moderately Unstable
Tibbets Brook	Protection 1	Yes			
Stanchfield Creek	Protection 1 (Downstream) Restoration 1 (Upstream)			Fair	Fairly Stable
Prairie Brook (-684/685)	Restoration 3 *(potentially should be protect)*			Fair	Good cover for fish/ good riparian.
Unnamed Creek (-531/532/533)	Protection 3				
Tibbets Brook	Protect 3	Yes		Fair	Fairly stable
Estes Brook	Restore 2			Good	Moderately Unstable
Seelye Brook	Restore 2	Yes		Fair	Moderately Unstable
Trott Brook				Fair	Fairly stable
Vondell Brook				Fair	Moderately Unstable

(1) MPCA Rum River Monitoring and Assessment Report, Oct 2016

GOAL 2: INCREASE CONNECTIVITY FOR DESIRABLE AQUATIC SPECIES

Measure 1: Because the measure is to increase river miles without barriers and to remove human constructed obstructions, dams and culverts are the structures that are under consideration to address this goal.

- Candidate Dams: There are twenty-two dams in the watershed as identified in Figure 1 and Table 3, which also includes ownership and additional information. There were only two comments submitted regarding dams in the comment period:
    - MN DNR Priority Concerns Letter: the dam near the outlet of the Rum River in Anoka is a barrier to fish passage and the only impediment disconnecting the Mississippi River from Lake Mille Lacs. The DNR would like to encourage a feasibility study investigating strategies for dam removal or alteration to restore connectivity between the Rum and Mississippi Rivers.
    - Princeton kick-off: explore dam removal/replacement with arch ladder
- Candidate Culverts: The DNR has been working on the culvert inventory. So far two townships have been completed but the work was put on hold due to COVID-19. The project will be started up again, but there is uncertainty as to when that will be.

Measure 2: This measure is to increase baseflow for improved connectivity and habitat. There are 3 candidate resources that have been identified in existing research and studies. All 3 of these resources are already identified as priority surface water resources:

1. Tibbets Brook:
    a. the only stream in the WRAPS document and implementation table to have strategies listed to increase baseflow (page 35). However, feedback from Mille Lacs County SWCD indicated that there likely is low landowner support for implementing these actions to address this issue.
    b. Protection Priority Resource, Tier 1
2. West Branch Rum River:
    a. channelization in the upstream tributaries and row cropping which reduce recharge as crops become mature (Rum River Watershed Stressor ID Report).
    b. Protection Priority Resource, Tier 2 (upstream)
    c. Restoration Priority Resource, Tier 1 (downstream)
3. Stanchfield Creek:
    a. partially caused by ditching and the loss of wetland storage (Rum River Watershed Stressor ID Report).
    b. Protection Priority Resource, Tier 1 (downstream)
    c. Restoration Priority Resource, Tier 2 (upstream)

Figure 1: Candidate Dams for Resources Natural Resource Issue Statement #1, Goal 2 – Increase Connectivity.

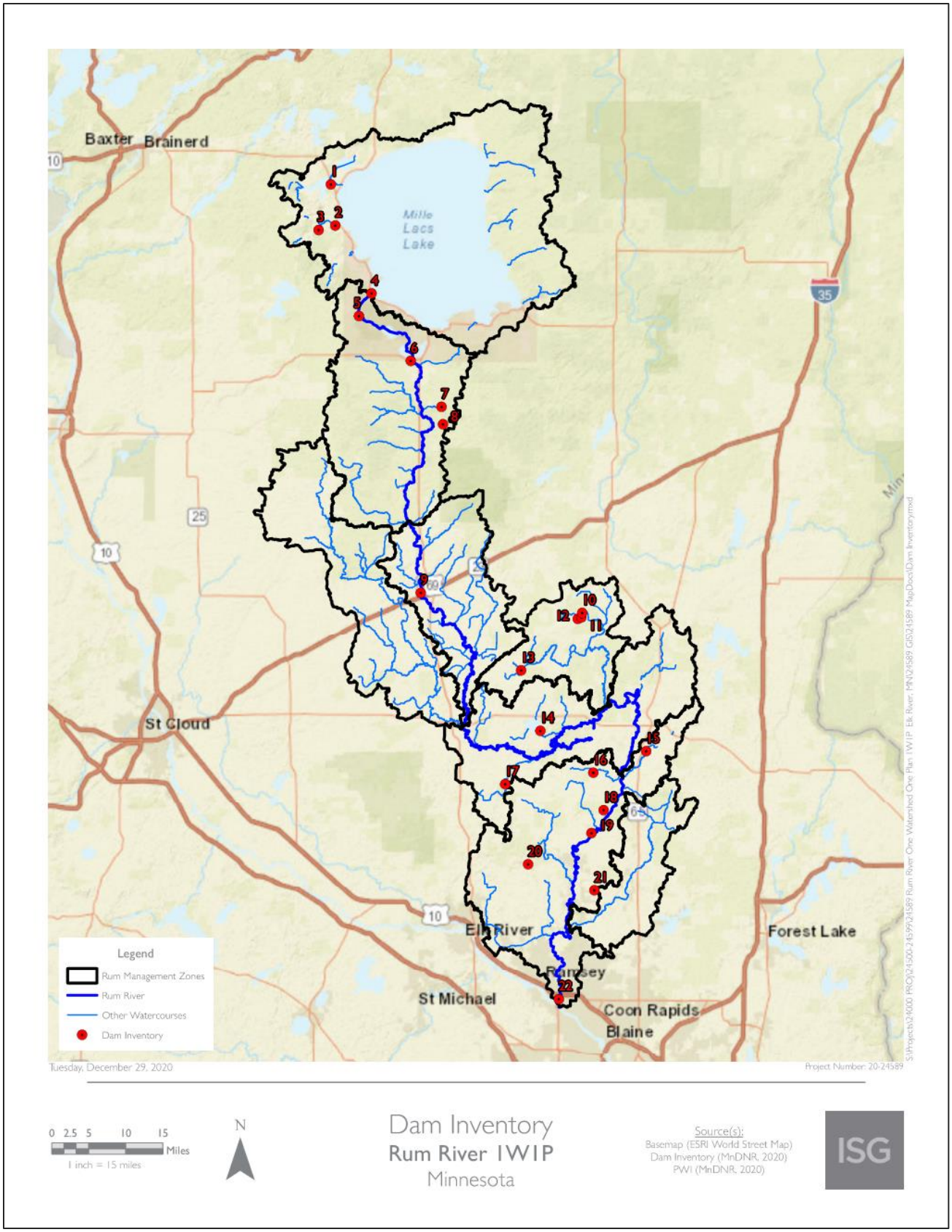


Table 3: Candidate Dams for Resources Natural Resource Issue Statement #1, Goal 2 – Increase Connectivity.

Map ID #	Name	Dam ID #	Owner	Watercourse	Drainage Area (Sq Mi)	Year Completed	Year Last Modified	Last Inspection Date	Condition	Comments	Next Inspection
1	Borden Lake	MN00239	MNDNR-Trails	Garrison Creek	26	1936		4/14/2015	Poor		2023
2	Holt Lake	MN00238	MNDNR	Sequchie Creek	17	1936	1985	6/28/2018	Satisfactory	WPA: Possible frost heave reported by Fisheries in Feb 2017. Recommend survey to verify/confirm.	2026
3	Camp-Humboldt	MN01098	MNDNR		10.5			11/17/2008			
4	Mille Lacs	MN01645	MNDNR	Rum River	415	2015		6/28/2018	Satisfactory	Contact Mille Lacs Band, Parks, and Wildlife prior to inspection	2026
5	Ogechie Lake	MN00250	MNDNR-Parks	Rum River	419	1952	1996	6/28/2018	Satisfactory	Contact Mille Lacs Band, Parks, and Wildlife prior to inspection; WPA	2026
6	Onamia Lake	MN00252	MNDNR-Wildlife	RUM RIVER	457.1	1938	1992	10/21/2007		WPA dam was replaced with a rock weir in 2007.	
7	Korsness Pool	MN00562	MNDNR-Wildlife	Rum River-TR	3.6	1959	2015	6/5/2019	Satisfactory	Other dams upstream of this dam may not be jurisdictional	2027
8	Mikkelson Pool	MN01858	MNDNR-Wildlife								2021
9	Rum River Milaca	MN01265	City of Milaca	RUM RIVER			2013	6/3/2009	Satisfactory	Modified location on 8/17/2011. plans not clear as record drawings but confirmed by Greg Lerud on 1/7/2016	
10	Cranberry WMA North Pool	MN01806	MNDNR-Wildlife	Stanchfield Creek-TR	4	1992	2017	8/21/2019	Satisfactory	Old dam had 1400' dike with 36" CMP and 9' high	2027
11	Cranberry WMA South Pool	MN00984	MNDNR-Wildlife	Stanchfield Creek-TR	6.9	1992	2017	10/20/2016	Poor	Left abutment partial washout in 2014. Repaired in 2017.	
12	Lory Lake Structure 1	MN00529	MNDNR-Wildlife	Ties Creek-TR	4	1962	1992	10/20/2016	Satisfactory		2024
13	South Stanchfield Lake	MN00528	MNDNR	Stanchfield Creek	10	1939		10/24/2012	Satisfactory		2020
14	Green Lake	MN00408	MNDNR	GREEN LAKE BROOK	827	1936	2003	5/23/2008		Dam rebuilt in 2003. The dam is a culvert through a road embankment with a small weir. Head water and tailwater for this dam would be minimal. Exempt the dam per Dan Z on 9/21/2012.	
15	Florence Lake	MN01144	MNDNR	Isanti Brook-TR	13.3			12/5/2016	Satisfactory	WPA:	2024
16	Lake Francis	MN01145	MNDNR		8.42	1938		6/5/2019	Poor	WPA:	2027
17	Blue Lake	MN01143	MNDNR	Spencer Brook-TR	11			12/5/2016	Satisfactory		2024
18	Margaret Lake	MN00475	MNDNR-Wildlife	Rum River-TR	1	1966		12/5/2016	Satisfactory		2024
19	Benson F	MN00476	Bauer, Jenny	RUM RIVER - OS	0.1	1966		12/9/2008			
20	Randy Hansen Wildlife Dam	MN01033	Hansen, Randy	Seelye Brook-TR	0.42	1989		12/5/2016	Fair		2024
21	Lake George	MN01070	MNDNR-Fisheries	COUNTY DITCH NO. 19	9.9	1967		10/11/2013	Fair	Sheet piling is deteriorating	
22	Rum River	MN00549	City of Anoka	Rum River	1590	1853	1969	8/21/2015	Satisfactory		2023

Natural Resource Issue Statement #2: Invasive Species

Goal 1: Reduction of acres and population size of current invasive species

Measure: number of invasive management plans established and implemented.

There are several potential considerations for determining candidate resources for this goal. Reported aquatic and terrestrial invasive species infestations are provided in Tables 4 and 5 and Figures 2 and 3. Reported AIS infestations are listed according to identified priority resources.

Goal 2: Reduce new infestations of invasive species

Measure: reduce new infestations of invasive species.

Table 4: Reported AIS Infestations (excluding Curly Leaf Pondweed, Purple Loostrife, Common carp)

Priority Resources	AIS Infestations
George	Eurasian Water-Milfoil
Green	Eurasian Water-Milfoil
Long	Eurasian Water-Milfoil
Mille Lacs	Eurasian Water-Milfoil, Spiny Water flea, Zebra Mussel
Ogechie	Zebra Mussel
Onamia	Zebra Mussel
Round (Aitkin Cty)	Zebra Mussel
Shakopee	Zebra Mussel
Skogman	Eurasian Water-Milfoil
Spectacle	Eurasian Water-Milfoil, Zebra Mussel
West Branch Rum River	Zebra Mussel

Other Resources	AIS Infestations
Bass	Flowering Rush
Baxter	Eurasian Water-Milfoil
Big Pine	Zebra Mussel
Mille Lacs Tributaries	Eurasian Water-Milfoil, Spiny Water flea, Zebra Mussel

Table 4: Reported Terrestrial Invasive Species Infestations

Type	Observation Total	Species	Observations	Percent Total
Disease	1373	Microsporidian	1	0.07%
		Oak Wilt	1372	99.93%
Insects	75	Brown-Legged Spurge Flea Beetle	9	12.00%
		Brown Marmorated Stink Bug	1	1.33%
		Emerald Ash Borer	8	10.67%
		Golden Loosestrife Beetle	1	1.33%
		Knapweed Root Weevil	6	8.00%
		Leaf Beetles	43	57.33%
		Lesser Knapweed Flower Weevil	7	9.33%
Plants	930	Absinth Wormwood	1	0.11%
		Amur Maple	15	1.61%
		Apple	1	0.11%
		Asparagus	3	0.32%
		Birdsfoot Trefoil	34	3.66%
		Bittersweet Nightshade	4	0.43%
		Black Locust	2	0.22%
		Black Medic	1	0.11%
		Bohemian Knotweed	7	0.75%
		Bouncingbet	2	0.22%
		Broadleaf Plantain	1	0.11%
		Buckthorn	1	0.11%
		Bull Thistle	27	2.90%
		Bush Honeysuckles (Exotic)	15	1.61%
		Canada Thistle	111	11.94%
		Carpetweed	1	0.11%
		Catnip	1	0.11%
		Common Burdock	2	0.22%
		Common Chickweed	1	0.11%
		Common Lilac	1	0.11%
		Common Mullein	15	1.61%
		Common Selfheal	4	0.43%
		Common St. Johnswort	4	0.43%
		Common Tansy	84	9.03%
		Common Yarrow	11	1.18%
		Cow Vetch	6	0.65%
		Creeping Bellflower	1	0.11%
		Creeping Bentgrass	1	0.11%
		Creeping Charlie	1	0.11%
		Dames Rocket	1	0.11%
		Dandelion	18	1.94%
		European Buckthorn	154	16.56%
		Field Bindweed	1	0.11%
		Garlic Mustard	4	0.43%
		Glossy Buckthorn	16	1.72%
		Greater Celandine	2	0.22%
		Ground Ivy	5	0.54%
		Hairy Galinsoga	1	0.11%
		Hairy Vetch	18	1.94%
		Himalayan Balsam	1	0.11%
		Hoary Alyssum	61	6.56%

Type	Observation Total	Species	Observations	Percent Total
		Japanese Barberry	1	0.11%
		Japanese Knotweed	22	2.37%
		Kentucky Bluegrass	5	0.54%
		Ladysthumb	1	0.11%
		Lambsquarters	1	0.11%
		Leafy Spurge	35	3.76%
		Longleaf Dock	1	0.11%
		Morrow'S Honeysuckle	1	0.11%
		Motherwort	2	0.22%
		Musk Thistle	1	0.11%
		Norway Maple	2	0.22%
		Orange Hawkweed	3	0.32%
		Oriental Bittersweet	2	0.22%
		Oxeye Daisy	4	0.43%
		Perennial Sowthistle	3	0.32%
		Purple Crown-Vetch	3	0.32%
		Rabbitfoot Clover	3	0.32%
		Red Clover	2	0.22%
		Red Sorrel	4	0.43%
		Redtop	3	0.32%
		Scots Pine	1	0.11%
		Siberian Elm	4	0.43%
		Siberian Peashrub	5	0.54%
		Silvery Cinquefoil	2	0.22%
		Smooth Brome	12	1.29%
		Sowthistle	3	0.32%
		Spiny Plumeless Thistle	4	0.43%
		Spotted Knapweed	45	4.84%
		Squill	1	0.11%
		Stinging Nettle	5	0.54%
		Sweetwilliam	1	0.11%
		Tansy	2	0.22%
		Tawny Daylily	1	0.11%
		Thistle	24	2.58%
		Western Salsify	7	0.75%
		White Campion	3	0.32%
		White Clover	1	0.11%
		White Mulberry	1	0.11%
		White Sweetclover	7	0.75%
		Wild Parsnip	34	3.66%
		Yellow Archangel	1	0.11%
		Yellow Rocket	1	0.11%
		Yellow Sweet-Clover	2	0.22%
		Yellow Toadflax	24	2.58%
Worms	4	Jumping Worm	4	100.00%

Figure 2: Aquatic Invasive Species Map for Prioritizing Natural Resource Issue Statement #2, Goal 1.

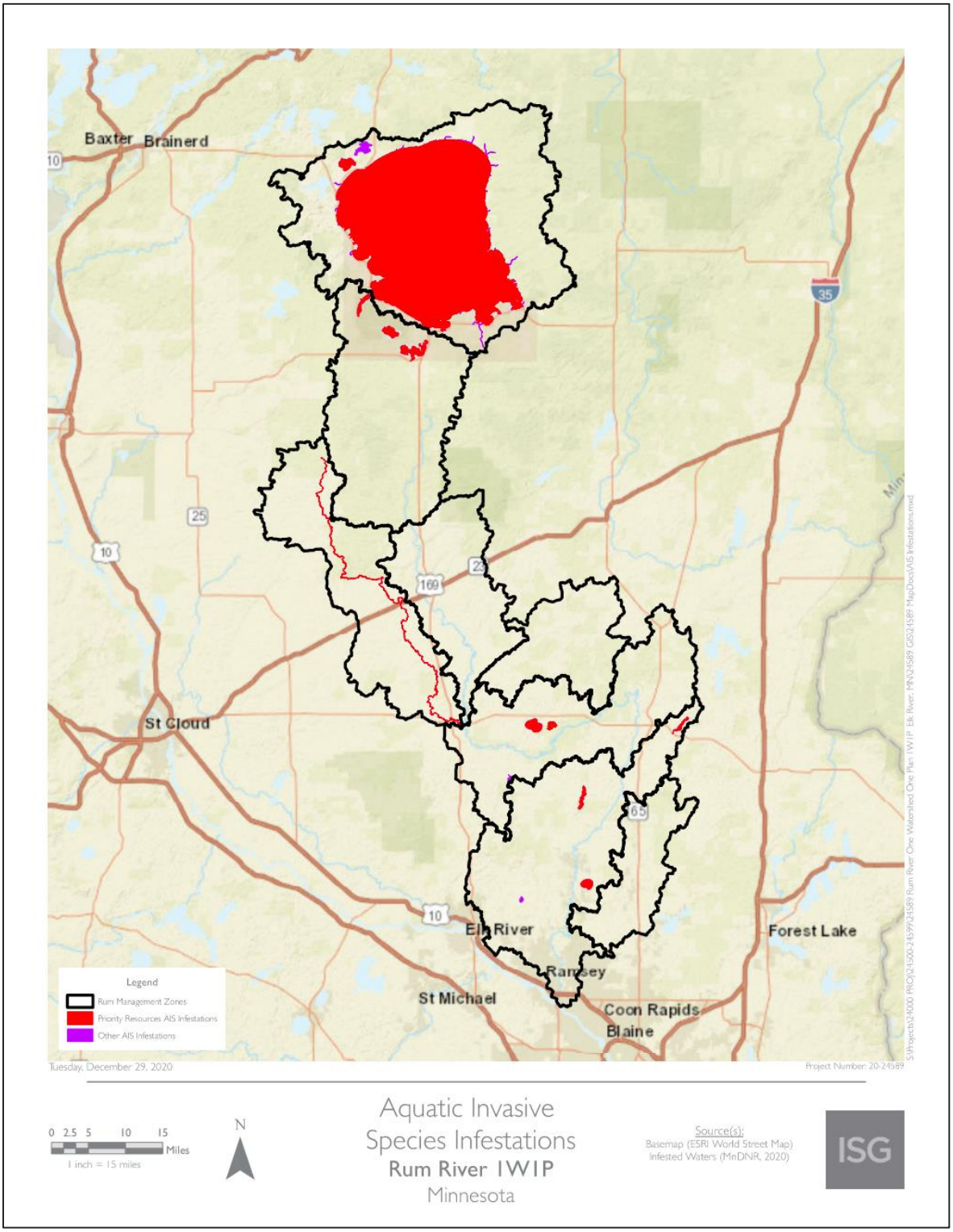
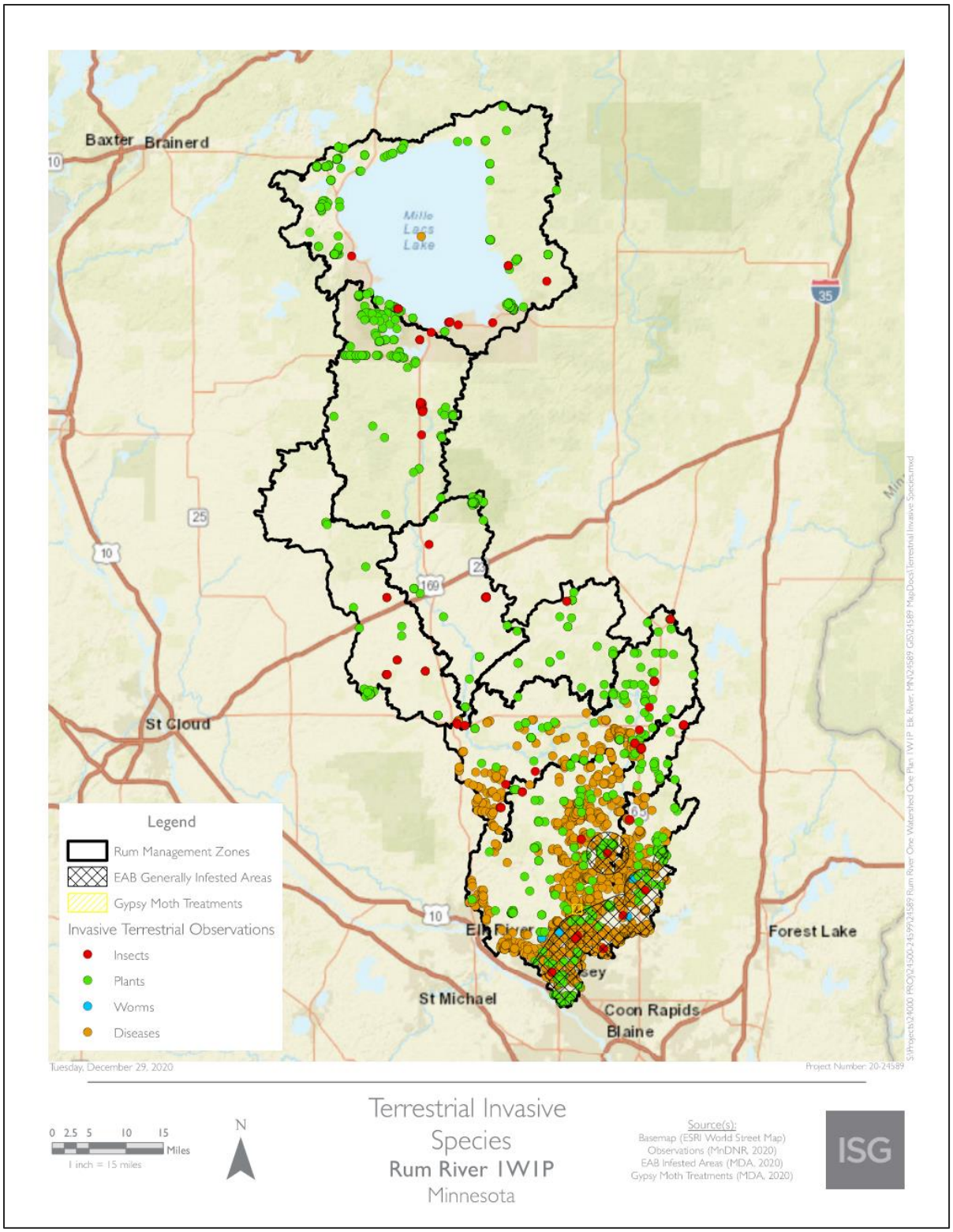


Figure 3: Terrestrial Invasive Species Map for Prioritizing Natural Resource Issue Statement #2, Goal 1.



Natural Resource Issue Statement #3: Protection, Management, and Restoration of Upland Habitat

Candidate resources and geographies are provided in Figures 4 through 6. Priority critical habitat was determined by using a filter of terrestrial habitat quality index value of greater 60 applied to the DNR's Regionally Significant Ecological Areas and Native Plant Communities data layers. Existing permanently protected habitat areas indicated on the map include lands owned or easements held by the state of Minnesota, non-profit easements, and Anoka County Parks. Other counties and local jurisdictions may hold land in permanent conservation, but the parcel size was too small to effectively map.

Goal 1: Define, identify, rank, and protect high value areas

Figures 4 through 6, and associated data, could be used in the interim, until the 'high value' areas are defined, identified, and ranked.

Goal 2: Increase habitat acreage, quality, and connectivity, as well as resilience to changing precipitation and climate patterns.

Figures 4 through 6, and associated data, can be used to identify priority locations. Other criteria that could be applied include the Rum River Landscape Stewardship Plan priorities that were adopted for Surface Water Protection, Goal 1: Maintain or enhance watershed based ecosystems to maintain water quality.

Figure 4: Candidate Resources and Geographies for Natural Resource issue #3, Protection, Management, and Restoration of Upland Habitat; northern watershed.

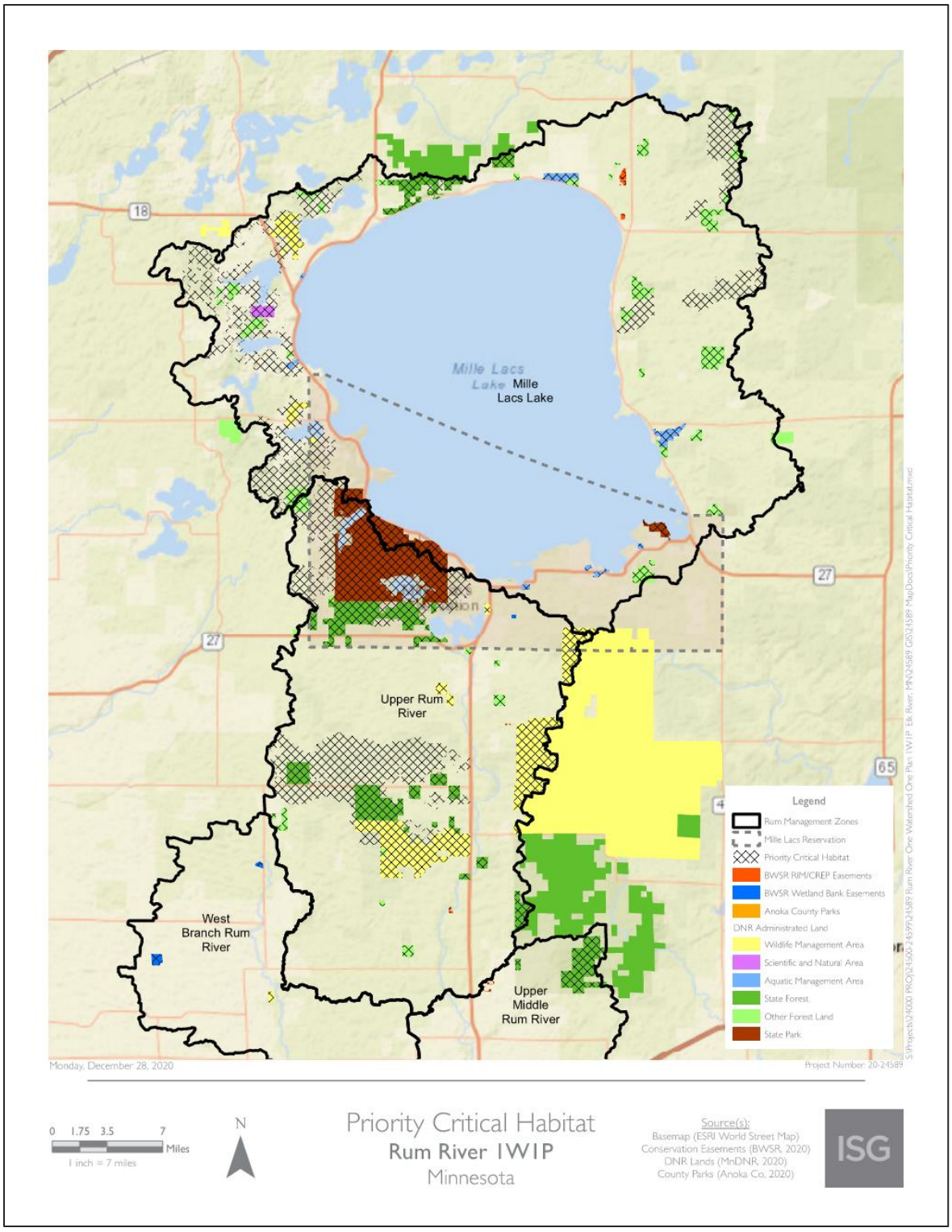


Figure 5. Candidate Resources and Geographies for Natural Resource issue #3, Protection, Management, and Restoration of Upland Habitat; middle watershed.

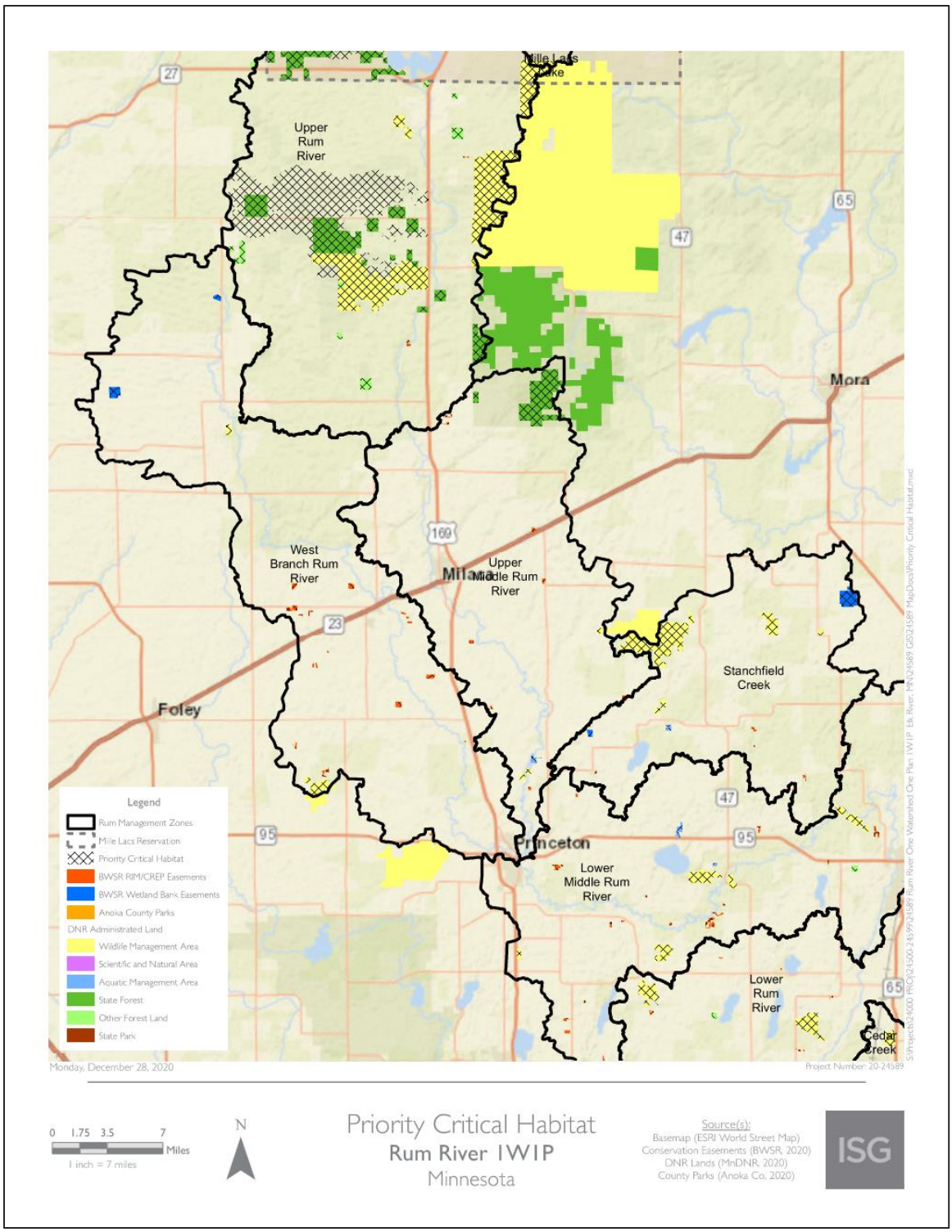
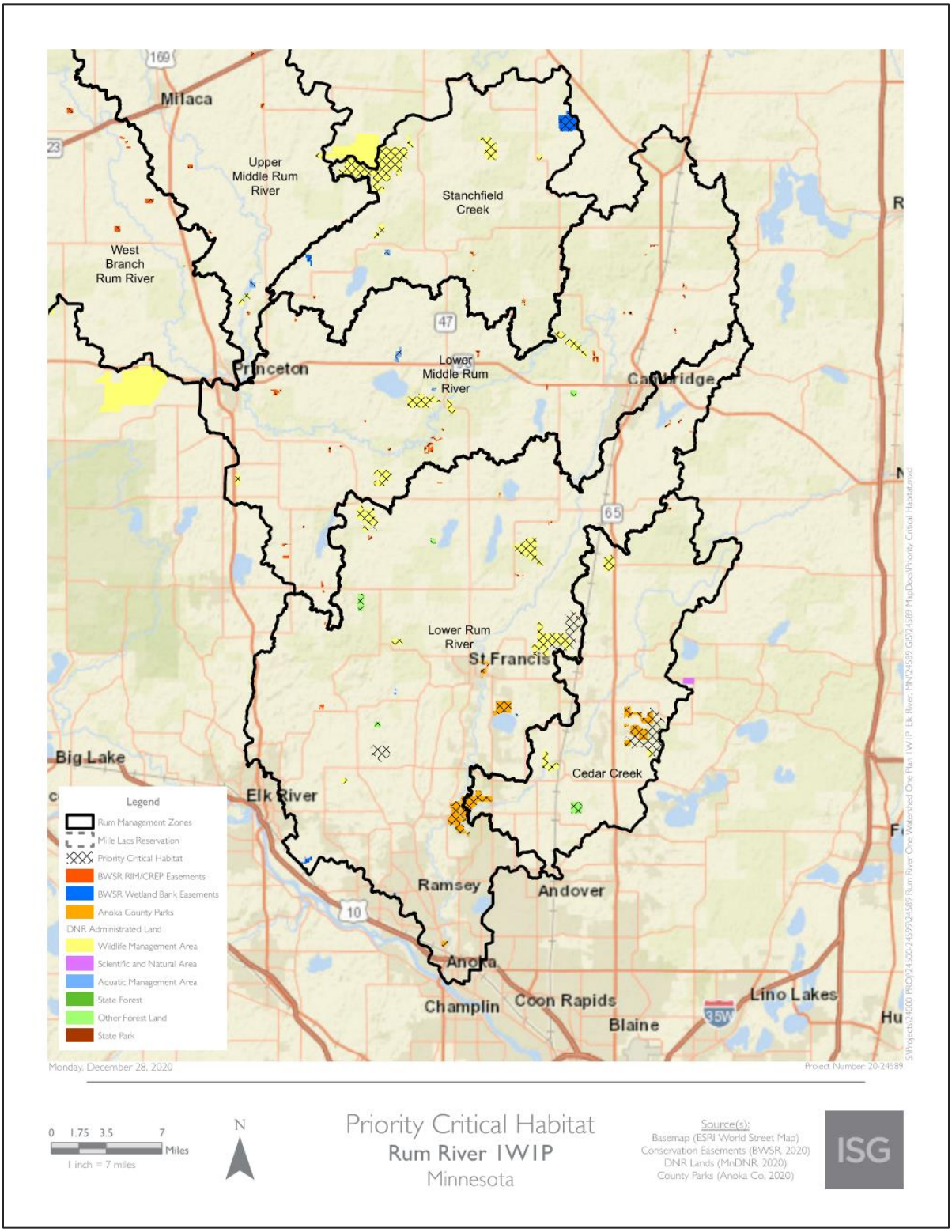


Figure 6. Candidate Resources and Geographies for Natural Resource issue #3, Protection, Management, and Restoration of Upland Habitat; southern watershed.



PRIORITIZATION OF GROUNDWATER RESOURCES

Groundwater Issue Statement #1: Groundwater and Drinking Water Quality

This is a watershed wide priority directed to locations that meet the criteria below. The geographical areas that correspond to criteria 1 through 3 are identified in Figure 7.

1. Drinking water supply management area (DWSMA) vulnerability is moderate, high, or very high; or
2. Pollution sensitivity to near surface materials is high; or
3. Well testing show ≥ 5 mg/L nitrate.
4. Lakes/shoreland areas (Goal 2 – Septics only).

Additionally, until the geologic atlas is completed for Mille Lacs County area, priority locations include those area where shallow bedrock is within 30 feet of the surface.

Goal 1: Decrease the risk of nitrate contamination in groundwater.

Target is agricultural land that is within in areas identified in the priority geographies.

Goal 2: Decrease the risk of groundwater contamination from septic systems.

Groundwater Issue Statement #2: Knowledge and Data Regarding Groundwater

Goal 1: Advance technical and scientific knowledge regarding groundwater availability and quality issues and implement programs that protect groundwater resources into the future.

Figure 7. Groundwater Issue Statement #1: Groundwater and Drinking Water Quality Priority Geographies.