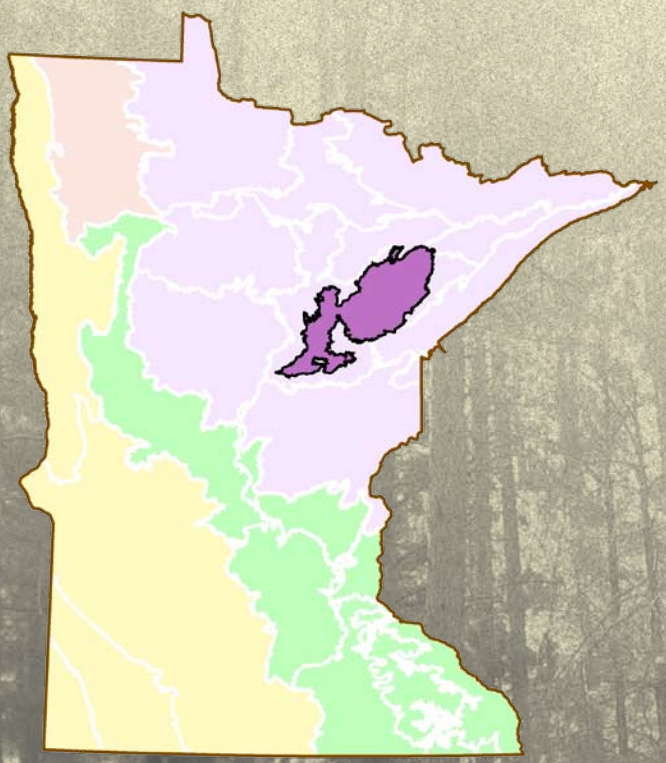
Tomorrow's Habitat for the Wild & Rare

An Action Plan for Minnesota Wildlife

Tamarack Lowlands

Subsection Profile



Minnesota's Comprehensive Wildlife Conservation Strategy

Minnesota Department of Natural Resources

Tamarack Lowlands

SUBSECTION OVERVIEW

The Tamarack Lowlands is a low-lying subsection that consists largely of a flat to gently rolling ancient lake plain known as Glacial Lake Upham. It is one of the top wildlife-watching sites in Minnesota and the nation due to its extensive wetland vegetation and high percentage of public land, including the Sax-Zim bog, McGregor Marsh Scientific and Natural Area, the Rice Lake National Wildlife Refuge, and many large DNR wildlife management areas, including Grayling and Moose-Willow. Numerous major rivers meander extensively through this subsection on the level landscape, including the Mississippi, St. Louis, Whiteface, East Swan, Savannah, and Willow. There are few lakes here. Before settlement by people of European descent, lowland conifer and aspen-birch were the most common forest communities.

Forestry, tourism, and outdoor recreation are the most common land uses in this subsection, along with some agriculture, primarily sod and wild rice, and peat mining. In the early part of the 20th century, homesteaders drained areas to create agricultural fields, but they were largely unsuccessful. Currently, the predominant forest type in this subsection is conifer in the lowland areas and aspen in the uplands.

Quick facts

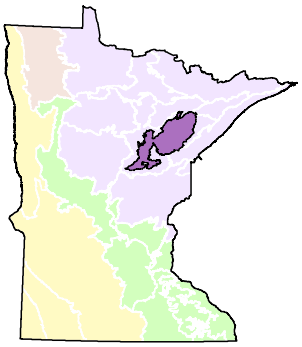
Acres: 1,513,319 (2.8% of state)

Ownership

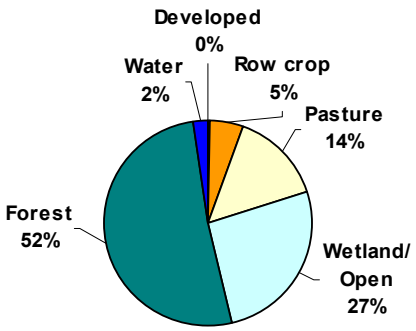
Public	Private	Tribal
52.1%	47.9%	0.0%

Population density (people/sq. mi.)

Current	Change (2000-2010)
15.6	+0.3



Current Land Use/Land Cover



SPECIES IN GREATEST CONSERVATION NEED

69 Species in Greatest Conservation Need (SGCN) are known or predicted to occur within the Tamarack Lowlands. These SGCN include 16 species that are federal or state endangered, threatened, or of special concern. The table, SGCN by Taxonomic Group, displays by taxonomic group the number of SGCN that occur in the subsection, as well as the percentage of the total SGCN set represented by each taxon. For example, 4 mammal SGCN are known or predicted to occur in the Tamarack Lowlands, approximately 18% of all mammal SGCN in the state.

SGCN BY TAXONOMIC GROUP

Taxa	# of SGCN	Percentage of SGCN Set by Taxon	Examples of SGCN
Amphibians	1	16.7	*None documented since 1990*
Birds	51	52.6	Veery
Fish	3	6.4	Lake Chub
Insects	5	8.9	Bog copper
Mammals	4	18.2	Gray wolf
Mollusks	2	5.1	Black sandshell
Reptiles	2	11.8	Wood turtle
Spiders	1	12.5	Jumping spider (*M. grata*)

HIGHLIGHTS

- Forests and associated rivers, lakes and wetlands provide habitat for gray wolves, bald eagles, sharp-tailed grouse, sandhill cranes, trumpeter swans, boreal chickadees, Nelson's sharp-tailed sparrows, and wood turtles.
- This is an important wintering area for boreal birds that move south from Canada in times of food shortage, including great gray owls, boreal owls, northern hawk-owls, pine grosbeaks, red crossbills, and pine siskins.
- Areas important for SGCN include the Rice Lake NWR; Moose-Willow and Kimberly Marsh WMAs; Hill River and Cloquet Valley SFs; Savanna Portage SP; and McGregor Marsh SNA.

SPECIES SPOTLIGHT

Yellow rail *(Coturnicops noveboracensis)*

Distribution Found in sedge meadows and wet, grassy, marshy, and peatland habitats from northwest MN, SE to Aitkin County and west to Becker and Ottertail counties.

Abundance Rare, but locally regular nesting species in selected marshy habitats. Secretive, nocturnal behavior makes this species very difficult to assess.

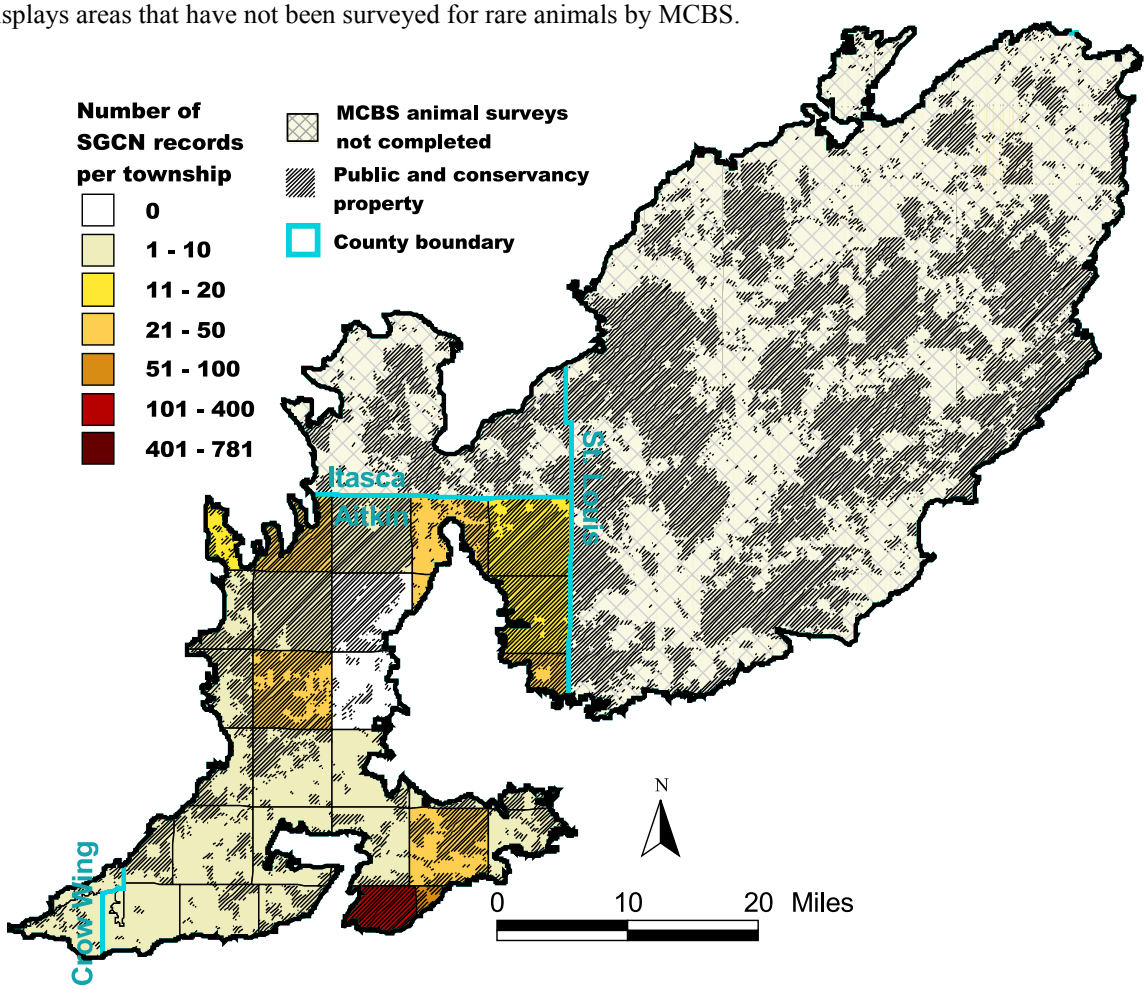
Legal Status State list-Special Concern.

Comments Population has declined in the past due to marsh and swampland drainage, but significant areas of protected state and federal lands, including SNAs, WMAs, and NWRs have helped stabilize remaining numbers.

Photo by Terry Johnson

SGCN ELEMENT OCCURRENCES BY TOWNSHIP

This map depicts the number of validated records of species in greatest conservation need since 1990 per township and public land/conservancy land. It suggests relationships between known SGCN occurrences and conservation management lands. It also displays areas that have not been surveyed for rare animals by MCBS.



Sources: MN DNR Natural Heritage database, MN DNR County Biological Survey (MCBS), MN DNR Statewide Mussel Survey, MN DNR Fisheries Fish database. Areas with no MCBS animal surveys may have had mussel and fish surveys, as well as reports of other species occurrences recorded in the MN DNR Natural Heritage database.

SPECIES PROBLEM ANALYSIS

The species problem analysis provides information on the factors influencing the vulnerability or decline of SGCN that are known or predicted to occur in the subsection. The table lists the nine problems, or factors, used in the analysis, and the percentage of SGCN in the subsection for which each factor influences species vulnerability or decline. The results of the species problem analysis indicate that habitat loss and degradation in the subsection are the most significant challenges facing SGCN populations.

NOTE: The inverse of the percentages for each problem does not necessarily represent the percentage of SGCN for which the factor is not a problem, but instead may indicate that there is not sufficient information available to determine the level of influence the factor has on SGCN in the subsection.

Problem	Percentage of SGCN in the Subsection for Which This Is a Problem
Habitat Loss in MN	83
Habitat Degradation in MN	90
Habitat Loss/Degradation Outside of MN	45
Invasive Species and Competition	26
Pollution	32
Social Tolerance/Persecution/Exploitation	23
Disease	3
Food Source Limitations	3
Other	6

KEY HABITATS - For Species in Greatest Conservation Need

The CWCS identified key habitats for SGCN within the subsection using a combination of five analyses, labeled A-E below. The table depicts the five analyses, and under which analyses the key habitats qualified. To qualify as a key habitat for the subsection, the habitat had to meet the criteria used in at least one of the five analyses, as specified in the descriptions to the right of the table. The graphs below depict results from four (A-D) of the five analyses used in determining key habitats. Those habitats that meet the criteria are highlighted in **RED** in the graph for that analysis. Those habitats that do not meet the criteria are shaded in **GOLD**. Analysis E is not represented by a graph; the results of this analysis are presented as a list of key rivers/streams in Appendix I. For a more detailed explanation of the five analyses used, see Chapter 7, Methods and Analyses.

	ANALYSIS				
KEY HABITATS	A	B	C	D	E
Forest-Upland Coniferous (Red-white pine)	X	X			
Forest-Lowland Coniferous		X			
Wetland-Nonforest	X	X			
River-Headwater to Large					X

Description of Analyses

A: Terrestrial habitat use analysis - terrestrial habitats that represent more than 5% of 1890s or 1990s landcover and are modeled to have the most SGCN using them based on a z-test with $p<0.01$.

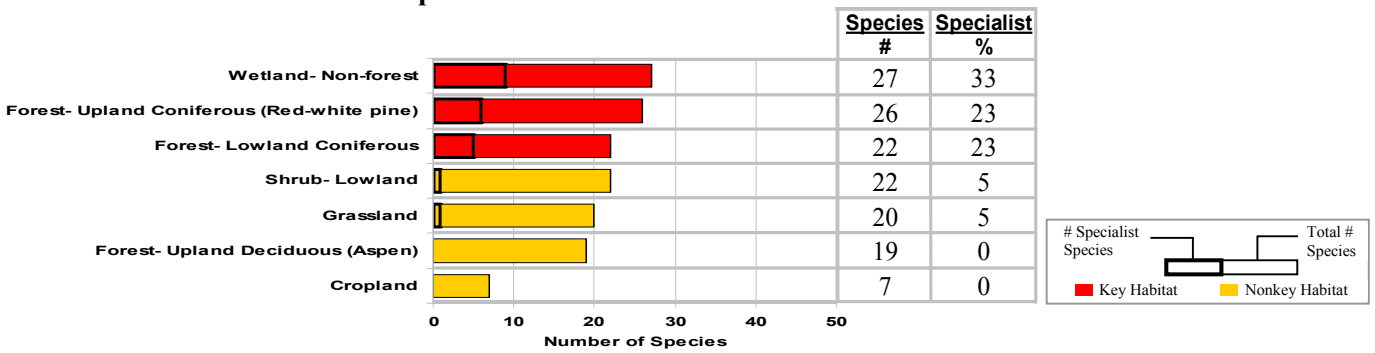
B: Specialist terrestrial habitat use analysis - terrestrial habitats that represent more than 5% of 1890s or 1990s landcover and have more than 15 species, 20% of which use 2 or fewer habitats (specialist species).

C: Terrestrial habitat change analysis - terrestrial habitats that represent more than 5% of the 1890s landcover and have declined by more than 50% in the 1990s landcover. For wetlands this change was based on an analysis done by Anderson & Craig in *Growing Energy Crops on Minnesota's Wetlands: The Land Use Perspective* (1984).

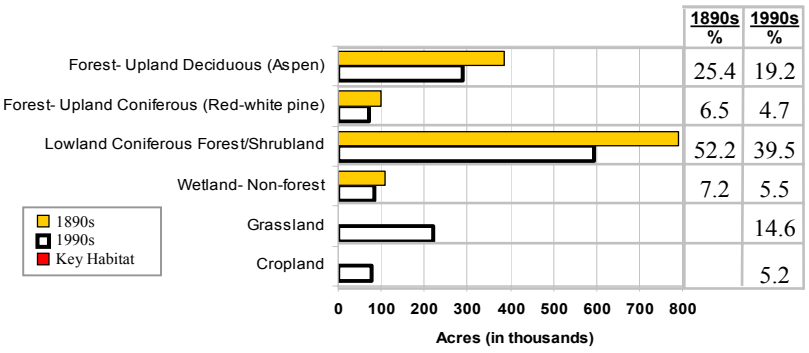
D: Aquatic habitat use analysis - lake or stream habitats that have the most SGCN use based on a z-test with $p<0.01$ of all subsections.

E: The Nature Conservancy/SGCN occurrence analysis - stream reaches identified in the Areas of Aquatic Biodiversity Significance in the four TNC Ecoregional Assessments and reaches with high SGCN occurrences (see Appendix I for list of stream reaches).

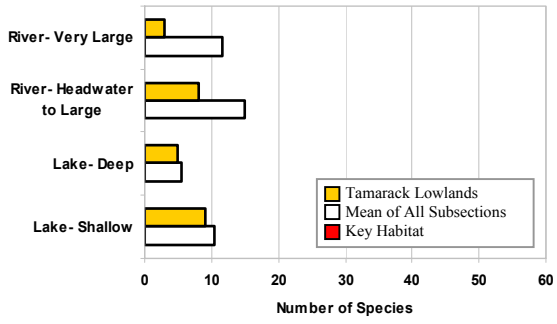
A/B – Terrestrial Habitat Use/Specialist Terrestrial Habitat Use



C – Terrestrial Habitat Change



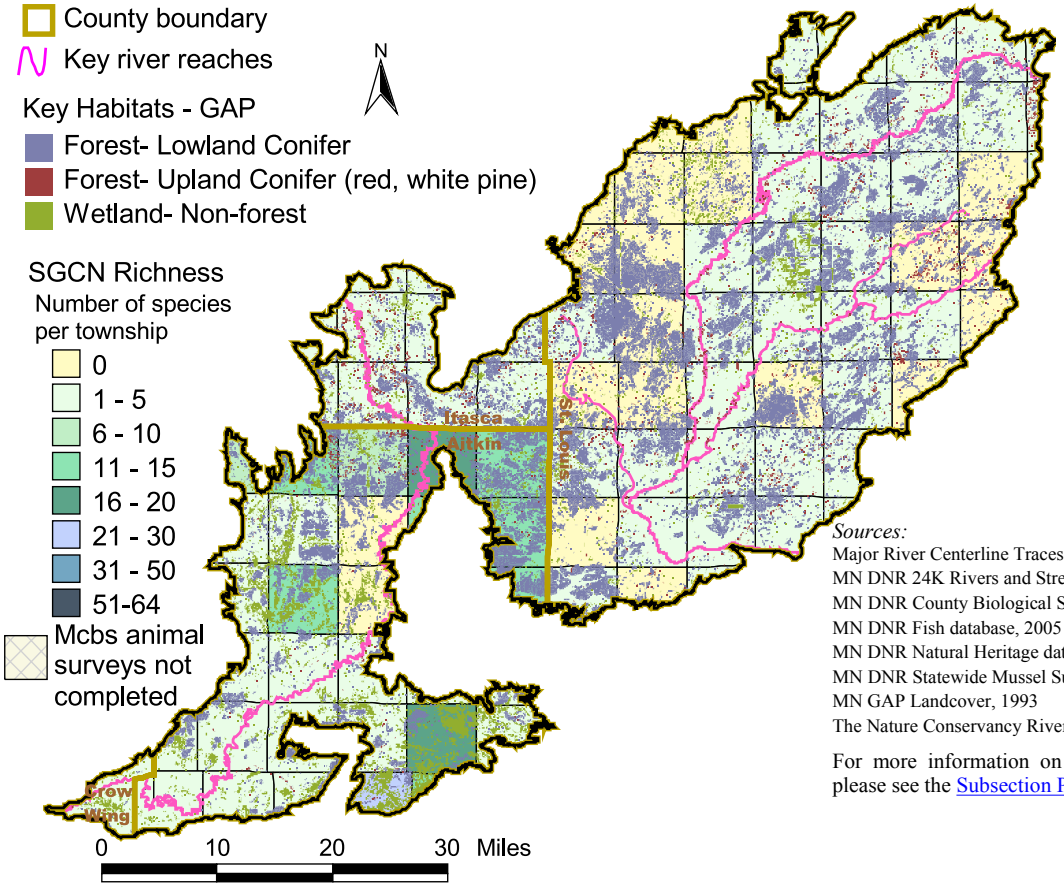
D – Aquatic Habitat Use



E – The Nature Conservancy/SGCN Occurrence

To reference the key rivers and streams for the subsection, see Appendix I.

DISTRIBUTION OF KEY HABITATS AND SPECIES RICHNESS BY TOWNSHIP



This map depicts key habitats and the number of species of SGCN per township based on the sources listed below. It suggests there is often a relationship between key habitats and species richness (i.e., the variety of species of SGCN in a township).

Sources:
Major River Centerline Traces in Minnesota, 1984
MN DNR 24K Rivers and Streams, 2005
MN DNR County Biological Survey (MCBS), 2005
MN DNR Fish database, 2005
MN DNR Natural Heritage database, 2005
MN DNR Statewide Mussel Survey, 2005
MN GAP Landcover, 1993
The Nature Conservancy Rivers and Streams combined dataset, 2005

For more information on how this map was constructed, please see the Subsection Profile Overview in Chapter 5.

SUBSECTION HABITAT PERCENTAGES AND HABITAT USE BY SGCN TAXA

This table presents information on the percentages for each habitat in the subsection (showing changes in coverage between the mid- to late 1800s and the 1990s), as well as habitat use by SGCN taxonomic group. Habitats are listed in ranked order for percent coverage within the subsection in the 1990s. Key habitats for the subsection (as identified on previous page) are listed in **BOLD**. SGCN habitat use is broken down by taxonomic group, with a total number of species for all taxonomic groups listed at the far right of the table.

			SGCN BY TAXONOMIC GROUP								
HABITAT	Percentage of Subsection (1890s)	Percentage of Subsection (1990s)	Amphibians	Birds	Fish	Insects	Mammals	Mollusks	Reptiles	Spiders	Total Number of Species
Forest-Lowland Coniferous	52.2	39.5		19		2	1				22
Forest-Upland Deciduous (Aspen)	25.4	19.2	1	16			2				19
Grassland	N/A	14.6		15			4			1	20
Wetland-Nonforest	7.2	5.5		23			2		1	1	27
Cropland	N/A	5.2		5			2				7
Forest-Lowland Deciduous	2.3	4.8		12			1				13
Forest-Upland Coniferous (Red-white pine)	6.5	4.7	1	20		2	3				26
Shrub/Woodland-Upland (Jack pine woodland)	1.8	3.0		13		2	4				19
Forest-Upland Deciduous (Hardwood)	2.1	1.7	1	15			3				19
Lake-Deep	N/A	1.0		2	2				1		5
Lake-Shallow	N/A	0.6		7					1		8
Developed	N/A	0.2		4			2				6
Shoreline-dunes-cliff/talus	N/A	N/A		6			1				7
Shrub-Lowland	N/A	N/A		18		1	3				22
River-Headwater to Large	N/A	N/A		2	2			2	2		8
River-Very Large	N/A	N/A			1			1	1		3

N/A: Insufficient data available to determine percent coverage within subsection. We have no data to indicate the existence of cropland, grassland, or developed land prior to settlement by people of European descent, although these land uses likely did occur at very low levels.
NOTE: 0.0 indicates less than 0.05 percent coverage.

Ten-Year Goals, Management Challenges, Strategies, and Priority Conservation Actions

Goal I: Stabilize and increase SGCN populations

Management Challenge 1 – There has been significant loss and degradation of SGCN habitat
Strategy I A – Identify key SGCN habitats and focus management efforts on them

Priority Conservation Actions to Maintain, Enhance, Protect the Key Habitats

1. **Upland coniferous red-white pine forest habitats**, actions include:
   a. Incorporate SGCN habitat concerns in forest management planning
   b. Provide technical assistance and protection opportunities to interested individuals and organizations
2. **Lowland coniferous forest habitats**, actions include:
   a. Incorporate SGCN habitat concerns in forest management planning
   b. Provide technical assistance and protection opportunities to interested individuals and organizations
3. **Nonforested wetlands**, actions include:
   a. Enforce the Wetlands Conservation Act
   b. Manage habitats adjacent to wetlands to enhance SGCN values
   c. Provide technical assistance and protection opportunities to interested individuals and organizations
4. **Stream habitats**, actions include:
   a. Maintain good water quality, hydrology, geomorphology, and connectivity in priority stream reaches
   b. Maintain and enhance riparian areas along priority stream reaches
   c. Provide technical assistance and protection opportunities to interested individuals and organizations

Management Challenge 2 – Some SGCN populations require specific management actions
Strategy I B – Manage federal and state listed species effectively

Priority Conservation Actions for Specific SGCN

1. Implement existing federal recovery plans
2. Develop and implement additional recovery plans
3. Provide technical assistance to managers, officials, and interested individuals related to listed species
4. Enforce federal and state endangered species laws, as well as other wildlife laws and regulations

Strategy I C – Manage emerging issues affecting specific SGCN populations

Priority Conservation Actions for Specific SGCN

1. Work with partners to effectively address emerging issues affecting SGCN populations
2. Enforce federal and state wildlife laws and regulations

Goal II: Improve knowledge about SGCN

Management Challenge 1 – More information about SGCN and SGCN management is needed
Strategy II A – Survey SGCN populations and habitats

Priority Conservation Actions for Surveys

1. Survey SGCN populations within the subsection, actions include:
   a. Continue MCBS rare animal surveys
   b. Survey SGCN populations related to key habitats
   c. Survey wildlife taxa underrepresented by MCBS animal surveys
2. Survey SGCN habitats within the subsection, actions include:
   a. Assess the amount and quality of key habitats and map their locations

Strategy II B – Research populations, habitats, and human attitudes/activities

Priority Conservation Actions for Research

1. Research important aspects of species populations within the subsection, actions include:
   a. Better understand the life history and habitat requirements of important SGCN
2. Research important aspects of SGCN habitats within the subsection, actions include:
   a. Identify best management practices for maintaining and enhancing key habitats
   b. Identify important patterns and distributions of key habitats to better support SGCN populations
   c. Identify important functional components within key habitats to support specific SGCN
   d. Explore important, emerging SGCN habitat management issues

Priority Conservation Actions for Research (continued)

3. Research important aspects of people's understanding of SGCN within the subsection, actions include:
   a. Identify people's attitudes and values regarding SGCN
   b. Identify places and ways people can enjoy and appreciate SGCN

Strategy II C – Monitor long-term changes in SGCN populations and habitats

Priority Conservation Actions for Monitoring

1. Monitor long-term trends in SGCN populations, actions include:
   a. Continue existing population monitoring activities
   b. Develop additional monitoring activities for specific SGCN populations
2. Monitor long-term trends in SGCN habitats, actions include:
   a. Develop long-term monitoring activities for important SGCN habitats

Strategy II D – Create performance measures and maintain information systems

Priority Conservation Actions for Performance Measures and Information Systems

1. Create and use performance measures, actions include:
   a. Develop partner-specific performance measures within the subsection
   b. Develop project-specific performance measures for SWG-funded projects
   c. Actively incorporate monitoring and performance measure information to enhance adaptive management
2. Maintain and update information management systems

Goal III: Enhance people's appreciation and enjoyment of SGCN

Management Challenge 1 – Need for greater appreciation of SGCN by people

Strategy III A – Develop outreach and recreation actions

Priority Conservation Actions for Outreach and Recreation

1. Create new information and communicate with people to enhance their appreciation of SGCN
2. Create opportunities for people to appropriately enjoy SGCN-based recreation

How to use this subsection profile

Intended audience: Natural resource professionals and interested stakeholders

- Identify how the priority conservation actions and key habitats intersect and inform your current and future priorities.
- Using your additional insights and local knowledge, "step-down" the priority conservation actions into more detailed actions and practical on-ground tasks.
- Use it to understand species in greatest conservation need priorities and tell a story about the subsection (its history, biology, ecology, demography) to other natural resource professionals, managers, decision makers and land owners.
- Visit our website, or give us a call, and tell us how you're using it, how others are using it, and ideas that "step-down" the priority conservation actions.

Website:

www.dnr.state.mn.us/cwcs

For more information, please contact:

Emmett Mullin, Project Manager, MN DNR, phone: 651-259-5566, email: emmett.mullin@dnr.state.mn.us

Daren Carlson, Ecologist/GIS Analyst, MN DNR, phone: 651-259-5079, email: daren.carlson@dnr.state.mn.us

Brian Stenquist, Strategic Planner, MN DNR, phone: 651-259-5144, email: brian.stenquist@dnr.state.mn.us

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Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155-4040
(651) 296-6157 (Metro Area)
1-888-MINNDNR (646-6367) (MN Toll Free)

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