

Chapter 4

Framework: Goals, Challenges, and Priority Conservation Actions

Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife (referred to in this document as Minnesota's Comprehensive Wildlife Conservation Strategy or CWCS) provides a strategic framework to guide the investment of organizational and individual energy to better manage species in greatest conservation need (SGCN). We hope this framework will help practitioners focused on SGCN to identify the most important conservation actions, given their unique organizational and geographic contexts. Additionally, we hope members of the CWCS partnership (e.g., the Minnesota DNR, The Nature Conservancy, Minnesota Audubon, the U.S. Fish and Wildlife Service) will be able to use this framework as a decision-making tool when creating operational plans and annual budgets. The framework will be used to guide investment of State Wildlife Grant monies.

This chapter describes the components of the strategic framework developed by the CWCS. We discuss the planning logic and how that logic links knowledge to action. We address the progression from goals to priority conservation actions, giving background on why the various components are important to the CWCS. This strategic framework is used in each of the [subsection profiles](#) in chapter 5 of the CWCS. This chapter provides more detail about some of the priority conservation actions.

Planning Logic

Like most planning efforts, the CWCS created a logical structure to move from the big picture to discrete actions. The CWCS logical structure encompasses purpose, time frame, geographic scope, goals, management challenges and strategies, and priority conservation actions.

Purpose

The purpose of the CWCS is to maintain the species composition of Minnesota's native fauna. The CWCS defines the native fauna as those species present in the geographic area of Minnesota at the point of statehood (1858). Unfortunately, a number of native fauna have already been extirpated from the state. The purpose of the CWCS is to ensure that no more species are lost, that species with very low populations increase to self-sustaining levels, and that other SGCN populations are maintained at self-sustaining levels over time. Over the past 20 years, two species have been successfully reintroduced, trumpeter swans and peregrine falcons. The 2005 CWCS is not calling for further reintroduction efforts.

Time Frame

The 2005 CWCS is a 10-year strategy. The CWCS partnership intends to revise the CWCS in 2015. However, a longer time frame helps place this first 10 years in context. For example, the 2005 CWCS articulates action for the first 10 years of a 100-year effort to secure a sustainable future for native fauna in Minnesota. This is a more realistic time frame given the nature of conservation work. Thus, conservation stakeholders should recognize that during this initial 10 years we are taking first steps at the beginning of a 100-year journey to manage a wide array and diversity of species without as much information and experience as we would want.

Geographic Scope

There are many layers to the CWCS geographic scope. The explicit geographic scope of the CWCS is the state of Minnesota. Within that large frame the [Ecological Classification System](#) (ECS) of Minnesota delineates 4 provinces, 13 sections, 25 subsections, and many smaller land-type associations (see Figure 5.1). The 2005 CWCS uses the province and the subsection scales to present the conservation actions needed to better manage SGCN. However, many of the native fauna of Minnesota migrate to other parts of the region, continent, and world. This suggests that the geographic scope of the CWCS might include action in another part of the world to maintain the sustainability of a species “native” to Minnesota. In the 2005 CWCS, we have not explored these larger ecological scales, but perhaps the 2015 CWCS will be able to encompass them.

Goals

Three goals are articulated in the 2005 CWCS:

- I. Stabilize and increase SGCN populations
- II. Improve knowledge about SGCN
- III. Enhance people’s appreciation and enjoyment of SGCN

Each goal helps organize a series of management challenges, strategies, and priority conservation actions that can better focus investment in SGCN management. At present, State Wildlife Grant funds can be used to fund actions that accomplish Goals I and II but not Goal III. These goals set forth outcomes that can be evaluated to determine the progress (and, hopefully, the success) of the CWCS Partnership.

Management Challenges and Strategies

The management challenges articulate the central problems the partnership faces in accomplishing the goals, and the strategies establish the basic approaches to addressing the challenges. Within the subsection profiles, the goals, management challenges, and strategies provide the structure for setting the subsection-specific priority conservation actions. The management challenges and strategies, within each goal, are as follows:

Goal I	Stabilize and increase SGCN populations
Management Challenge 1	There has been significant loss and degradation of habitat
Strategy I A	Identify key SGCN habitats and focus management efforts on them
Management Challenge 2	Some SGCN populations require additional management attention
Strategy I B	Manage federal and state listed species effectively
Strategy I C	Manage emerging issues affecting specific SGCN populations
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
Strategy II B	Research populations, habitats, and human attitudes/activities
Strategy II C	Monitor long-term changes in SGCN populations and habitats
Strategy II D	Create performance measures and maintain information 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

Priority conservation actions articulate the specific management actions that practitioners may undertake to better manage SGCN. Decision makers will be using the priority conservation actions as a framework for allocating state wildlife grant dollars to ensure successful CWCS implementation. Field practitioners can look to the priority conservation actions as a guide to setting their own SGCN-related work priorities, regardless of funding sources used. The categories of priority conservation actions are as follows: habitat management, species management, survey, research, monitoring, performance measures and information systems, and outreach and recreation. Within each of the [subsection profiles](#) found in chapter 5, the priority conservation actions articulate the work to be done in that subsection and are broadly tailored to the key habitats of each subsection.

Goal I: Stabilize and increase SGCN populations

The purpose of the CWCS is to sustain the species composition of Minnesota's native fauna. There are 292 species included in [Minnesota's set of species in greatest conservation need](#). These are species whose populations have been determined to be rare, vulnerable, or declining. The set includes species from all the major taxa and all the geographic areas of Minnesota. It includes species that are listed as endangered, threatened, or of special concern and some species that are recreationally harvested.

The first goal of the CWCS is to stabilize and increase SGCN populations. In many cases, the first step is halting further population declines. To accomplish Goal I, it is essential to understand why SGCN populations are rare, vulnerable, and declining.

Management Challenge 1 – There has been significant loss and degradation of habitat

The CWCS examined problems that might be negatively affecting SGCN populations. Project staff reviewed the published literature (such as Partners in Flight documents, Shorebird Plan, Waterbird Plan, NatureServe Web site) and discussed the issue with taxonomic experts. Nine factors that might be creating problems for each species were assessed:

- Habitat loss in Minnesota
- Habitat degradation in Minnesota
- Habitat loss/degradation outside of Minnesota
- Invasive species and competition
- Pollution
- Social tolerance/persecution/exploitation
- Disease
- Food source limitations
- Other (e.g., peripheral species, road kills, communication towers)

Table 4.1 shows the results of the species problem assessment. The results indicate that habitat loss and degradation in Minnesota are the most serious challenges facing SGCN populations. This assessment confirmed what most managers and stakeholders have told CWCS staff: It's a habitat challenge.

Table 4.1. Results of Species Problem Assessment

Type of Problem	Percentage of SGCN for Which This Is a Problem	Percentage of SGCN for Which This May Not Be a Problem or for Which There Is No Information
Habitat loss in Minnesota	76	24
Habitat degradation in Minnesota	83	17
Habitat loss/degradation outside of Minnesota	24	76
Invasive species and competition	24	76
Pollution	32	68
Social tolerance/persecution/exploitation	21	79
Disease	3	97
Food source limitations	3	97
Other	18	82

These results have led the CWCS to focus this first 10-year plan primarily on habitat loss and degradation in Minnesota. By choosing this focus, the CWCS does not mean to ignore other serious problems. For example, the loss and degradation of habitat outside of Minnesota constitute a serious challenge. The CWCS Partnership hopes that efforts in other states to manage species in greatest conservation need will address some of these habitat problems. High visibility of CWCS efforts might lead to additional international focus on habitats in other countries that support Minnesota's SGCN.

Some of the problems, such as invasive species and pollution, can be viewed as habitat degradation. The CWCS identifies priority conservation actions that address invasive species, especially terrestrial invasive plants that are degrading key habitats. The CWCS also identifies priority conservation actions that address water quality in key stream habitats.

Other species problems, such as disease outbreaks or social tolerance, might demand attention. Priority conservation actions under Strategies IB and IC address how the CWCS will approach species-specific management challenges.

Strategy I A – Identify key SGCN habitats and focus management efforts on them

To address the management challenge of habitat loss and degradation in Minnesota, the CWCS identified key habitats in each subsection that are important for the SGCN that occur within that subsection. The CWCS used the following analyses to delineate key habitats:

A: Terrestrial habitat use analysis - terrestrial habitats that represent more than 5 percent of 1890s or 1990s land cover and are modeled to have the most SGCN using them on a 99th percentile z-statistic;

B: Specialist terrestrial habitat use analysis - terrestrial habitats that represent more than 5 percent of 1890s or 1990s land cover and have more than 15 species, 20 percent of which use two or fewer habitats (specialist species);

C: Terrestrial habitat change analysis - terrestrial habitats that represent more than 5 percent of the 1890s land cover and have declined by more than 50 percent in the 1990s land cover. For wetlands this change was based on an analysis done by Anderson and 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 99th percentile z-statistic 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. (The results of Analysis E are presented as a list of key rivers/streams in Appendix I. Chapter 7, Methods and Analyses, provides a more detailed explanation of the five analyses.)

Applying these criteria in each subsection resulted in the identification of key habitats for each subsection as shown in Table 4.2.

Table 4.2. Key Habitats by Subsection

Subsection	Total habitats	Forest-Upland Deciduous (Aspen)	Forest-Upland Deciduous (Hardwood)	Forest-Upland Coniferous	Shrub/woodland-Upland	Prairie	Forest-Lowland Deciduous	Forest-Lowland Coniferous	Wetland-Nonforest	Grassland	Shoreline-dunes-cliff/talus	Lake-Shallow	Lake-Deep	River-Headwater to Large	River-Very Large
Agassiz Lowlands	4							X	X		X			X	
Anoka Sand Plain	7				X	X			X	X	X	X		X	
Aspen Parklands	6				X	X			X	X		X		X	
Big Woods	9	X	X		X				X	X	X	X		X	X
Blufflands	6				X	X			X		X			X	X
Border Lakes	5			X	X			X					X	X	
Chippewa Plains	4			X	X				X					X	
Coteau Moraines	3					X			X					X	
Glacial Lake Superior Plain	4	X	X	X										X	
Hardwood Hills	8	X	X		X	X			X	X		X		X	
Inner Coteau	3					X			X					X	
Laurentian Uplands	4			X	X			X						X	
Littlefork Vermilion Uplands	3			X				X						X	
Mille Lacs Uplands	9		X	X	X			X	X		X		X	X	X
Minnesota River Prairie	6					X			X		X	X		X	X
Nashwauk Uplands	5		X	X	X			X						X	
North Shore Highlands	5			X				X			X		X	X	
Oak Savanna	5				X	X			X	X				X	
Pine Moraines and Outwash Plains	4			X	X				X					X	
Red River Prairie	5					X	X		X					X	X
Rochester Plateau	5				X	X			X	X				X	
St. Louis Moraines	3			X									X	X	
St. Paul-Baldwin Plains	10	X	X		X	X			X	X	X	X		X	X
Tamarack Lowlands	4			X				X	X					X	
Toimi Uplands	4			X	X			X						X	
Total subsections		4	6	12	15	11	1	9	17	7	8	6	4	25	6

Priority Conservation Actions to Maintain and Enhance the Key Habitats

Within each subsection profile, the key habitats for SGCN are identified. Maintaining and enhancing these key habitats is a priority conservation action. A series of specific conservation actions that could be applied to maintain and enhance the key habitats in each subsection is delineated. For example, in the [Blufflands Subsection](#), four priority conservation actions are identified to maintain and enhance oak savanna habitats:

- a. Manage invasive species
- b. Use prescribed fire and other practices to maintain savanna (keeping in mind invertebrates sensitive to fire)
- c. Encourage oak savanna restoration efforts
- d. Provide technical assistance to interested individuals and organizations.

In each of the subsection profiles, the phrase “actions include,” precedes each series of specific actions. There may be many additional important conservation actions that could be implemented to maintain and enhance the key habitat; however, the actions listed are likely to be the most prominent over the next 10 years.

The primary audiences for the subsection profiles are field-level SGCN managers and their middle- and upper-level supervisors in the CWCS partnership organizations. Because the subsection profiles are intended to be easily accessible and useful, information is presented in a condensed fashion and the priority conservation actions listed for each key habitat are relatively terse. Therefore expanded descriptions of several priority conservation actions found in many of the subsection profiles are listed below. (Note: there are management options listed in [Chapter 6](#) that can inform implementation of priority conservation actions for the key habitats.)

Provide technical assistance to interested individuals and organizations

In many ways, this is the most prominent priority conservation action to be undertaken during the first 10 years of the CWCS. This conservation action is listed for every key habitat. Most public land managers and private landowners are not experts in the management of rare wildlife. They need advice and assistance in voluntarily managing key habitats to benefit SGCN that fall within their management purview. Providing effective technical assistance is time-consuming and entails much more than simply supplying information. It requires building relationships with individual land managers and landowners to understand their needs, opportunities, and constraints. Field staff from the CWCS Partnership will offer such advice and assistance.

Incorporate SGCN habitat concerns in existing forest management planning

This priority conservation action is also prominent and is a special case of providing technical assistance. In Minnesota, there are several important forest management planning initiatives. Both national forests (Chippewa and Superior) have ongoing management planning activities within which SGCN habitat concerns can be addressed. The state forest system is undergoing several forest management planning processes,

such as Subsection Forest Resource Management Planning, Off Highway Vehicle Recreation Planning, and Forest Certification, through which SGCN habitat concerns also can be addressed. Subsection Forest Resource Management Planning is especially well suited to incorporate CWCS key habitat concerns because it too is structured around ECS subsections. In addition, The Nature Conservancy is leading a forest collaborative initiative in northern Minnesota, and the Minnesota Forest Resources Council is leading a landscape-level management initiative. All of these initiatives offer opportunities to incorporate key habitat concerns into larger management contexts.

Manage invasive species

Invasive species continue to expand and degrade key SGCN habitats. Notorious invasives, such as purple loosestrife, buckthorn, and zebra mussels, are being joined by numerous lesser known invasive terrestrial and aquatic plants and animals. One of the first steps in managing invasives, particularly terrestrial invasive plants, is to survey the extent of their presence in a given habitat. Once the extent of the invasive population is known, actions to remove, destroy, and/or control the invasives can be initiated.

Use prescribed fire and other practices to maintain habitat (keeping in mind invertebrates that are sensitive to fire)

Prescribed fire is an important habitat conservation action in traditionally fire-dependent systems. Savanna and prairie habitats are two prominent SGCN fire-dependent habitats in the southern and western subsections of Minnesota. Prescribed fire and other brush removal practices are essential to keep the savanna and prairie from being encroached upon by woody plants. However, prescribed fire requires special planning in places where invertebrate SGCN are present that are susceptible to fire. Other alternatives may be necessary to protect small, isolated populations of rare invertebrates.

Encourage habitat restoration efforts

A sometimes controversial priority conservation action is the restoration of key habitats. The dramatic loss of native prairie, oak savanna, and wetland habitats necessitates some level of restoration over the next 100 years. Unfortunately, restoration of these and other key habitats is difficult, expensive, and time-consuming. During the first 10 years of CWCS, some restoration work will be undertaken, but most of the effort will be focused on maintaining existing key habitats. Existing habitats harbor the raw materials (e.g., genetic material of native plants) without which successful restorations are impossible. During the next 30 to 40 years, restoration will likely become a larger component of the CWCS initiative.

Maintain stream integrity

Stream habitats are the most widely distributed key habitat in the state; they occur in every subsection. Stream integrity results from a complex combination of forces that shape stream habitat: hydrology, geomorphology, connectivity, water quality, and

biology. In any given location, these forces will need to be managed to maintain and enhance key SGCN habitat.

Enhance adjacent habitats

All the key habitats identified by the CWCS exist in a large landscape context within each subsection. They are like key pieces in the jigsaw puzzle of Minnesota's rare wildlife ecology. But just like key puzzle pieces (for example the corners), each is recognizably important in isolation but makes functional sense only when connected to adjacent pieces. Similarly, the key SGCN habitats are recognizably important in isolation, but each makes functional ecological sense only when connected to adjacent habitats. For example, wetland habitats in central and southern Minnesota can have adjacent grassland habitats. It is important to enhance the adjacent grassland habitats to increase the functional value of the wetlands. Adjacent habitats are particularly important for native prairie, wetland, and grassland habitats, and for riparian areas along identified priority stream reaches.

Enforce existing laws

A number of important laws and regulations support the conservation of key habitats. For example, there are water-quality laws, lakeshore and stream shore development regulations, local land-use development regulations, and invasive species laws and regulations that help conserve key habitats. One of the most important laws to conserve key SGCN habitats is the [Wetlands Conservation Act](#). This law and its attendant regulations help ensure that Minnesota retains existing wetlands and mitigates unavoidable consequences of necessary land-use development.

Provide protection opportunities - selective acquisition of key habitats

Purchase of private land (either easement or fee title) for the express purpose of conserving critical natural resources is an important conservation action. The Nature Conservancy, the Minnesota DNR, and the USFWS purchase land to protect critical habitat and enhance habitat values of adjacent public lands, but this is always done with willing sellers who want the natural resource values of their land to be sustained for future generations. CWCS Partners may provide such protection opportunities to individuals and organizations to protect key SGCN habitats.

Management Challenge 2 – Some SGCN populations require additional management attention

Because there are 292 species in greatest conservation need, the 2005 CWCS promotes a habitat-oriented focus rather than a species-specific focus. Some species, however, will require specific management action. Species identified as endangered or threatened are at greater risk of extirpation than other SGCN and thus should receive particular management attention. Some SGCN populations need attention because they are recreationally or commercially harvested. Other species may require special attention

because of emerging circumstances, such as a disease outbreak or a threat from an invasive species. The following strategies and priority conservation actions respond to this management challenge.

Strategy I B – Manage federal and state listed species effectively

Species identified as endangered or threatened by the federal or state governments receive special management. Both federal and state laws protect these species and, in some cases, their habitats from destruction. In Minnesota, detailed federal recovery plans have been written for some species, such as the eastern timber wolf, the bald eagle, the piping plover, the Karner blue butterfly, and the Higgins eye and winged mapleleaf mussels. Developing these federal recovery plans is time consuming. The plans provide information about the species and specific steps needed to recover them to stable levels. A streamlined process for creating abbreviated recovery plans for other state endangered and threatened species, such as the Blanding’s turtle, the wood turtle, and the timber rattlesnake, has been proposed and would provide guidance on management needs and priorities. During the first year of operational planning, a group of managers will convene to decide whether such a streamlined recovery planning process should be initiated and, if so, what species should be its focus. In addition, the DNR and other partners are already developing and delivering technical assistance to land managers for listed species management. Some priority conservation actions listed in the subsection profiles focus on listed species.

Strategy I C – Manage emerging issues affecting specific SGCN populations

Other SGCN populations that are not listed as endangered or threatened may require species-specific management. For example, several SGCN that are recreationally harvested need specific attention (e.g., northern pintail, American black duck, lesser scaup). The DNR and the USFWS have legal jurisdiction, regulations, and management plans for all waterfowl and for other SGCN that are recreationally or commercially harvested. In addition to harvesting, emerging issues, such as disease outbreaks, may require special management action directed toward specific SGCN. Priority conservation actions listed in the subsection profiles focus on these circumstances.

Goal II: Improve knowledge about SGCN

The second goal of the 2005 CWCS is to improve the scientific knowledge and management understanding of the 292 species in greatest conservation need. One of the central responsibilities of government is to provide the public with information and knowledge about natural resources held in trust for it. This requires not only the collection and creation of knowledge through survey and research work but also the maintenance, analysis, and publication of that knowledge, ensuring that residents and managers have access to and understanding of important information.

Management Challenge 1 – More information about SGCN and SGCN management is needed

As much as we know about rare wildlife, there is so much more that we do not know. Some of the species in greatest conservation need, especially the birds, are well known. For other SGCN, especially the invertebrates, little information is available. Through survey, research, and monitoring strategies, the CWCS intends to improve knowledge about SGCN over the next 10 years so that the 2015 CWCS has a greater body of knowledge to use in evaluating the first 10-year strategy and in developing the second 10-year strategy.

Strategy II A – Survey SGCN populations and habitats

Surveys are an essential tool for gaining greater knowledge about SGCN. They are generally one-time efforts to collect meaningful information about populations or habitats in a specific geographic area. Surveys provide managers with immediate information that is relevant to implementing other conservation actions. The subsection profiles contain several important priority conservation actions pertaining to surveys, including those described below.

Continue MCBS rare animal surveys

The [Minnesota County Biological Survey](#) (MCBS) is one of the most crucial SGCN-related conservation actions being undertaken in Minnesota. MCBS animal survey professionals are painstakingly surveying each county in Minnesota for rare animals and their habitats. They begin with aerial analysis to locate likely remaining habitats and then do on-the-ground surveys to locate species and habitats. Their data are maintained in the Minnesota Natural Heritage Information System Rare Features Database. Approximately two-thirds of Minnesota's 87 counties have been surveyed. It is vital that the MCBS animal surveys be completed in the remainder of the state.

Survey SGCN populations related to key habitats

It is very important over the next 10 years that surveys are directed toward SGCN using key habitats. With so much to learn, there must be a systematic approach to investing scarce resources in gathering information. The key habitats are a priority for survey work. To the extent feasible, surveys should adhere to rigorous scientific standards so that data collected can be compared with other valid information and provide better management information.

Survey wildlife taxa underrepresented by MCBS animal surveys

Some wildlife taxa (for example, terrestrial and aquatic invertebrates) are not as thoroughly surveyed by MCBS as the CWCS project desires. Scientifically rigorous surveys of these taxa should be a priority during the next 10 years.

Assess the amount and quality of key habitats and map their locations

It is vital that managers understand the quantity and quality of key habitats within their work areas. Existing data on land cover and habitat location are often more than 10 years old. Little information is available on the quality of key habitats as it relates to SGCN, especially in forest habitats. Key habitat assessments should be a high priority during the next 10 years.

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

Research is obviously a vital tool in improving knowledge about SGCN. Research allows the CWCS Partnership to investigate the intricacies of relationships between SGCN and their habitats, as well as interspecific relationships between SGCN. Research also allows managers to understand human attitudes, values, and activities related to SGCN, which are so important to blending management of SGCN with other critical resource management objectives. Some examples of priority conservation actions found under the research strategy in the subsection profiles are described below.

Research important aspects of species populations

For many SGCN, information on life history and habitat requirements is limited. Researching the life histories of some SGCN, or groups of SGCN, that are closely tied to key habitats in particular subsections may provide essential information for management.

Research important aspects of SGCN habitats

The subsection profiles list a number of important aspects of SGCN habitats that would be valuable to research, including best management practices for key habitats, patterns and distributions of key habitat to better support SGCN, and functional components within key habitats. This type of information would greatly improve the ability of natural resource managers to maintain and enhance habitats for SGCN, as well as help them provide technical assistance to other land managers.

Research important aspects of people's understanding of SGCN

Human attitudes, values, and activities are at the heart of much of SGCN management. Human beings have the capacity to change the face of the landscape, often destroying species' habitats. In most cases, humans are unaware of the impacts their land use has on wildlife. Understanding how much people know about SGCN, how they value them, and how they might want to enjoy and appreciate them is important so that SGCN management can stay in step with and help shape people's understanding and appreciation of the natural environment.

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

The ability to monitor long-term changes in SGCN populations and habitats is critical to the success of CWCS efforts. If the 2005 CWCS is the first in a series of 10 strategies that will span 100 years, then creating a long-term monitoring system is extremely sensible. However, it is also very difficult for a number of reasons. First, information and research technologies are changing rapidly. Compatibility of new research information and new information technologies complicates managing long-term monitoring systems. Second, political and organizational support for long-term monitoring is difficult to maintain in the face of short-term crisis management and more exciting, immediately relevant information gathering. Nonetheless, long-term monitoring information is the only way to understand the trends that are affecting SGCN and SGCN habitats. In the first year of operational planning for CWCS (2006), the Partnership will create an operational plan for a robust monitoring system for the CWCS. Some examples of priority conservation actions that will be implemented by that operational plan for monitoring are described below.

Monitor long-term trends in SGCN populations

Because the long-term population trends for rare, vulnerable, or declining species in greatest conservation need are not positive, it is essential that we monitor them. However, we cannot, practically speaking, monitor all 292 SGCN to the same degree. Several population-monitoring efforts already exist in Minnesota, including those for breeding birds, forest birds, loons, frogs and toads, and waterfowl populations. A commitment has been made to begin monitoring mussel populations, building on the statewide mussel survey work. Additional population monitoring actions might be needed to ensure that adequate information about SGCN is available to evaluate the performance of the 2005 CWCS and to develop a new CWCS in 2015.

Monitor long-term trends in SGCN habitats

SGCN habitats are a central feature of the 2005 CWCS, especially key SGCN habitats. It is therefore essential that CWCS begin to monitor SGCN habitats. Fortunately, monitoring the 16 key SGCN habitats identified in the 2005 CWCS is easier than monitoring 292 species populations. There will be a need to update the land cover information at a statewide level, as well as develop information about quantity, quality, and location of habitats at finer levels of resolution. The Minnesota DNR is collaborating on a new wetlands monitoring program related to the Wetlands Conservation Act, and this work should provide valuable information on those key habitats. The monitoring group that will convene during the first year of CWCS operational planning will consider other habitat monitoring initiatives.

Strategy II D – Create performance measures and maintain information systems

Performance evaluation is a critical feature of an effective adaptive management system. For evaluation to be feasible, the CWCS partnership needs to develop and apply a set of performance measures. Information that is germane to the performance measures (e.g., survey, research, and monitoring) needs to be collected and analyzed. All of this must be stored in a state-of-the-art information management system. The 2005 CWCS is committed to creating performance measures and maintaining investment in information management systems. Some examples of priority conservation actions for the performance measures and information systems strategy are discussed below.

Create and use performance measures

Members of the CWCS Partnership are aware of the value of performance measures. The Nature Conservancy, Audubon Minnesota, the Minnesota DNR, USFWS, and the University of Minnesota already use measures to evaluate performance to determine how well (or poorly) they are doing. This partnership must take these experiences and the information generated through survey, research and monitoring, and direct them toward developing CWCS-related performance measures. In addition, individual CWCS-related projects should have explicit performance measures that allow evaluation of the projects and of the cumulative performance of related projects. These evaluations must be incorporated in field-level and upper-level adaptive management decisions that allow the CWCS to adapt and grow over the next 10 years.

Maintain and update information management systems

As was mentioned above, information management technology continues to develop at a rapid pace. The CWCS Partnership must be willing and able to invest in updating and maintaining the information systems upon which all other aspects of the CWCS depend.

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

It is essential that residents and visitors appreciate and enjoy Minnesota’s wonderful wildlife diversity, especially the species in greatest conservation need. Such appreciation and enjoyment will breed commitment to SGCN management. Such commitment also will translate into collaboration on SGCN habitat management, SGCN-based tourism and recreation, and political support for further investment in CWCS-related actions.

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

Recent polling data collected for a joint Nature Conservancy–International Association of Fish and Wildlife Agencies initiative suggest that average Americans do not think wildlife is in trouble. The analysis of SGCN populations and habitats suggests otherwise. Members of the CWCS partnership need to communicate effectively with people about SGCN so that they can appreciate the beauty and diversity of rare wildlife and better understand their precarious ecological situation. People need to understand the

connection between the viability of SGCN populations and the ecosystem services upon which humans depend (e.g., clean water, clean air, crop pollination,). It is also important to help them understand where and how they can personally enjoy rare wildlife species.

Strategy III A – Develop outreach and recreation actions

The 2005 CWCS articulates several priority conservation actions under this strategy. Partners will need to create new information about SGCN and communicate with people about them. The CWCS document itself represents new information about SGCN, but this document is intended for professional staff working in the field, not for average members of the public. Consequently, new and different information must be developed that is specifically targeted to other non-wildlife professional audiences. In addition, existing opportunities to enjoy SGCN-based recreation should be appropriately publicized, keeping in mind the risk of impacting scarce habitat by too much recreational activity. New opportunities to enjoy SGCN recreationally need to be developed as well. Priority conservation actions that address these ideas are included in the subsection profiles. Appendix J, Wildlife Recreation and Tourism Considerations, contains some additional ideas on how to stimulate SGCN-based recreation.

Conclusion

The Minnesota Comprehensive Conservation Strategy (CWCS) provides a strategic framework to guide the investment of organizational and individual energy in better management of species in greatest conservation need (SGCN). This framework consists of a purpose (sustain all native wildlife), a time frame and geographic scope (a 10-year strategy and subsection-level scope), goals (stabilize populations, improve knowledge, enhance appreciation), challenges (habitat and species information and awareness), strategies (key habitats, recovery plans, essential information, citizen awareness), and priority conservation actions (maintain and enhance key habitats, manage the most at-risk species, create meaningful information, communicate with residents). This framework will help practitioners identify the most important work for them to do, given their unique organizational and geographic context.

