Minnesota's Wildlife Action Plan 2015-25

Supplemental Document: The Eight Required Elements

Congress identified eight required elements for each State to address in the development of its Wildlife Action Plan. This document, a supplement to Minnesota's Wildlife Action Plan 2015-2025, explains the data and methodologies MN DNR staff used to address all eight elements and subelements. The document, along with the plan, was submitted to and approved by the US Fish and Wildlife Service. (*Note: Because the plan has been reformatted for web posting and printing, some page numbers referenced in this document may no longer be accurate.*)

Element one: Information on the distribution and abundance of species of wildlife, including low and declining populations as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State's wildlife.

A. The Strategy indicates sources of information (e.g., literature, data bases, agencies, individuals) on wildlife abundance and distribution consulted during the planning process.

The following sources of information were used in assessing the abundance and distribution of wildlife species in Minnesota

- Natural Heritage Information System
- DNR Observational Database
- Partners In Flight Data
- Breeding Bird Atlas
- Breeding Bird Surveys
- DNR Mussel Survey database
- DNR Fish Mapper
- Fish of Minnesota database
- MN Odonata Survey Project database
- Odonata Central database
- Statewide frog and toad calling survey
- Long-term common loon monitoring data
- Long-term northern goshawk monitoring data
- Long-term Topeka shiner monitoring data
- Butterflies and Moths of North America database
- University of MN/Bell Museum data
- Expert knowledge

B. The Strategy includes information about both abundance and distribution for species in all major groups to the extent that data are available. There are plans for acquiring information about species for which adequate abundance and/or distribution information is unavailable.

Abundance and distribution of state-listed species: Minnesota's list of endangered, threatened and special concern species was updated in 2013 which involved reviewing the distribution and abundance of species proposed for listing. Per Minnesota's SGCN criteria, species on the state and federal list are considered Species in Greatest Conservation Need.

Abundance and distribution of species that are not state-listed: For species that are not state-listed, Species Technical Advisory Team (STAT) members recommended species from the following groups that they thought met the SGCN criteria: mammals, birds, amphibians and reptiles, fish, mussels, butterflies and moths, dragonflies and damselflies, tiger beetles and bees. These species were vetted by each STAT utilizing the best available data listed in Element 1,A and expert opinion. Examples of data sources that provided information on abundance and distribution of species include the DNR Observation Database, Breeding Bird Atlas, Breeding Bird Survey and Partners In Flight data, the statewide Mussel Survey database, the statewide Odonata Survey database, the Fishes of Minnesota database and the DNR Fish Mapper among others.

Species Technical Advisory Teams were not organized for snails, caddisflies, leafhoppers, and jumping spiders due to the lack of known, available experts so the distribution and abundance for non-listed species in these groups was not reviewed. This is discussed in the section below: "*There are plans for acquiring information about species for which adequate abundance and/or distribution information is unavailable"***.**

<u>All major animal taxonomic groups were considered</u>:

Minnesota's 346 Species in Greatest Conservation Need include species from all major animal taxonomic groups. **Chapter 2, Table 2.1 (p. 23)** summarizes the Number of Species in Greatest Conservation Need Compared to All Species in Minnesota by Taxonomic Groups.

With the exception of mussels, which are relatively well-studied, the number of invertebrate species in Minnesota and the number identified on the SGCN list is most certainly underrepresented (Table 2.1). While we have reasonable estimates for the number of species in some of the lesser-studied invertebrate groups, we know very little about their rarity or population status. For example, we estimate that there are approximately 400 species of bees in Minnesota, but the small percent that are designated as SGCN is based on a lack of information about this taxon and not an accurate reflection of their true conservation status. More survey and research is clearly needed for these taxonomic groups, and we prioritize filling some of these knowledge gaps in our goals and objectives (Chapter 4).

Mapping the Distribution and Abundance of Species in Greatest Conservation Need. Data sources are listed in **Appendix E, Table E1 (p. E-3).** Appendix E also contains a detailed discussion of the mapping methodologies.

Once the 2015 list of SGCN was finalized, the distribution and abundance of these species across the landscape was further assessed through identifying and mapping the distribution of viable or persistent populations of SGCN. Teams of experts systematically worked through each SGCN individually and reviewed occurrence records to identify and score viable or persistent populations. Using available information, teams were able to develop viable/persistent population maps for 161 of the 346 SGCN (47%) within the following taxa: mammals, birds, reptiles, amphibians, fish and mussels (**Chapter 2, Table 2.2, p. 26**).

The population viability maps take into account abundance and distribution, as well as persistence, recruitment, and presence of suitable habitat which are all important for managing for SGCN. These layers also serve as important layers for the identification and scoring of a Wildlife Action Network identified in the plan.

Distribution of Viable Populations of SGCN: Examples of individual species population maps are shown in **Chapter 2, Figures 2.1 a-f (p. 27)**.

SGCN richness grids: **Chapter 2, Figures 2.2 (p. 28)**

Richness grids were mapped for all SGCN for which occurrence data was available and were used to identify richness hotspots outside of mapped population areas and for scoring the Wildlife Action Network. To identify areas of species richness, a grid containing 2.5 X 2.5 km blocks was created in ArcMap, and all SGCN observation points from the Natural Heritage Information System and other sources identified in Element 1,A were intersected with the grid. The number of unique species per grid block was then summarized.

The SGCN richness maps were used in two different ways. First, a statewide layer of SGCN richness per 2.5 sq. mi. grid provides distribution information on all of SGCN for which we have at least one occurrence record. This provided additional distribution information for those SGCN for which population viability maps could not be constructed for several reasons (see Appendix E). The SGCN richness grid was also used to identify richness "hotspots" in areas that were not identified through the population viability mapping. However, this hotspot layer was intended to fill gaps in the population viability maps and was not created comprehensively across the state.

The viable/persistent population and richness maps provide important information on the abundance and distribution of SGCN. Population viability maps will be available as shape files for use by partners in implementing the plan. Population viability maps may not be made available for a few species that could be at risk should their population locations be disclosed.

<u>There are plans for acquiring information about species for which adequate abundance and/or distribution information is unavailable.</u>

Wildlife data are limited for sections of five counties (Clearwater, Lake of the Woods, Beltrami, Koochiching, and St Louis) that have not yet been surveyed by the Minnesota Biological Survey animal team. The projected date for survey information to be obtained for these counties is 2021. As new survey data becomes available it will be entered into the Natural Heritage Information System and, following completion of surveys for the remaining five counties, will be used to update the viable population maps and richness hotspots, unless the data indicate that significant changes are required earlier.

Chapter 4, Objective 3.5 (p. 52), addresses enhancing and updating information on the status and distribution of SGCN in Minnesota by supporting the county-by-county survey efforts undertaken by the Minnesota Biological Survey, developing a strategy and time line for surveying underrepresented sites

and species, and identifying priorities for updating occurrence information that is more than 25 years old.

Species Technical Advisory Teams were not organized for snails, caddisflies, leafhoppers, and jumping spiders due to the lack of known, available experts. Given that Minnesota's state-list of endangered, threatened, and special concern species was updated in 2013, the decision was made to include only the 2013 state-listed species as SGCN for these groups.

STATs will be established for these groups under the 2015 plan, to the extent that available experts and other resources allow. DNR will also establish an invertebrate advisory team(s) to provide recommendations on how to most effectively implement invertebrate conservation including the development of guidelines for prioritizing survey and monitoring efforts. This is addressed in **Chapter 4, Objective 3.6** (**p. 53)** and **Chapter 6 (p. 70)**.

Finally, STAT experts lacked information to determine if the species listed below met the criteria to be identified as a Species in Greatest Conservation Need. Fifteen of these species (listed below in **bold**) were identified as a priority for acquiring more information. The methodology for selecting the 15 species is described in **Appendix F, 3b (p. F-4). Chapter 4, Objective 3.2 (p. 50),** sets a target of completing surveys by 2022 for at least 3 of the 15 species in order to have improved knowledge to assess their status as a SGCN for the 2025 SWAP revision.

Brown Creeper (*Certhia americana*)
Dark-eyed Junco (*Junco hyemalis*)
Gray Jay (*Perisoreus canadensis*)
Lincoln's Sparrow (*Melospiza lincolnii*)
Northern Flicker (*Colaptes auratus*)
Pine Siskin (*Spinus pinus*)
Red Crossbill (*Loxia curvirostra*)
Spotted Sandpiper (*Actitis macularius*)
White-winged Crossbill (*Loxia leucoptera)*
Common Musk Turtle (*Sternotherus odoratus*)
Ouachita Map Turtle (*Graptemys ouachitensis*)
Unisexual hybrid of Blue-Spotted Salamander (*Ambystoma laterale spp*)
Western Tiger Salamander (*Ambystoma mavortium*)Arctic Shrew (*Sorex arcticus*)
Flying Squirrels
Long-Tailed Weasel (*Mustela frenata*)
Pygmy Shrew (*Sorex hoyi*)
Rock Vole (*Microtus chrotorrhinus*)
Water Shrew *(Sorex palustris)*
Woodland Jumping Mouse (*Napaeozapus insignis*)
Diets of Small Mammals
Aurora Damsel (*Chromagrion conditum*)
Cyrano Darner (*Nasiaeschna pentacantha*)

Great Spreadwing (*Archilestes grandis*)
Harlequin Darner (*Gomphiaeschna furcillata)*
Stygian Shadowdragon (*Neurocordulia yamaskanensis*)
All Dragonflies and Damselflies
Larval dragonflies and damselflies
Bees: Sand specialists
Bees: Wetland specialists
Bees: Osmia proxima
Oil-collecting bees (Macropis spp)
All bees
A Species of Moth (*Agonopterix pergandeella*)
A Species of Moth (***Melaporphyria immortua***)
A Species of Moth (*Papestra cristifera*)
A Species of Geometrid Moth (Zenophleps alpinata)
Blazing Star Stem Borer (Papaipema beeriana)
All Prairie Leps
All Leps
Deertoe (*Truncilla truncata*)
Lake Floater (*Pyganodon lacustris*)
Largescale Stoneroller (*Campostoma oligolepis*)

C. The Strategy identifies low and declining populations to the extent data are available.

Minnesota defines Species in Greatest Conservation Need as: *native animals, nongame and game, whose populations are rare, declining, or vulnerable to decline and are below levels desirable to ensure their long-term health and stability. Also included are species for which Minnesota has a stewardship responsibility (defined in **Chapter 2, p. 18**).*

Criteria for identifying Species in Greatest Conservation Need are listed in **Chapter 2, (p. 19)**. The criteria include: A) Species for which a statistically valid decline throughout Minnesota has been documented, B) Species for which populations in Minnesota may be rare, have declined, or may decline within the next decade due to factors such as: terrestrial and aquatic habitat concerns, specific threats, and life-history characteristics, and C) Species for which Minnesota has a stewardship responsibility.

D. All major groups of wildlife have been considered or an explanation is provided as to why they were not (e.g., including reference to implemented marine fisheries management plans). The State may indicate whether these groups are to be included in a future Strategy revision.

All major groups of wildlife were considered as discussed under Element 1,B. above.

E. The Strategy describes the process used to select the species in greatest need of conservation. The quantity of information in the Strategy is determined by the State with input from its partners, based on what is available to the State.

Chapter 2 contains a detailed explanation of the criteria and the process the STATs used to determine the final proposed list of 346 SGCN.

Nine Species Technical Advisory Teams (STATs) met for over a year to review and revise the 2005 SGCN list. The STATs were organized by taxon and were composed of experts from agencies, organizations, colleges and universities. The teams focused on: mammals, birds, amphibians and reptiles, fish, mussels, butterflies and moths, dragonflies and damselflies, tiger beetles and bees. Each team met independently to review species. In determining the status of a species as a Species in Greatest Conservation Need, members relied on data, professional expertise, and consultation with others in their agencies or organizations. The names and affiliations of STAT members can be found in **Appendix B, (pp. B3-5).**

As discussed above, STATs were not organized for snails, caddisflies, leafhoppers, and jumping spiders due to the lack of known, available experts. Given that Minnesota's state-list of endangered, threatened, and special concern species was updated in 2013, the decision was made to include only the 2013 state-listed species as SGCN for these groups.

The proposed 2015-25 list of SGCN was distributed for comments to key partners within all MNDNR Divisions, conservation partner agencies, non-governmental organizations (NGOs) and tribal nations. **Appendix B, Table B1 (p. B-5)** presents the full list of federal and state agencies, NGOs, and tribal governments solicited to provide comments on the proposed 2015 SGCN list. Eleven comments were received. STATs evaluated the comments against the criteria, which resulted in the addition of the monarch butterfly and dusted skipper, and the removal of the deertoe mussel. It was also noted that the American white pelican met the criterion of a stewardship species. Additionally, the rufa red knot was listed as threatened by US Fish and Wildlife Service after the review period, so it was added to the SGCN list. The final tally of changes to the list of SGCN was 60 species removed (**Appendix G**) and 114 species added (**Appendix H**) for a total of 346 SGCN. The 2015-25 list of SGCN can be found in **Appendix C**.

<u>Element Two: Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in the 1st element</u>.

A. The Strategy provides a reasonable explanation for the level of detail provided; if insufficient, the Strategy identifies the types of future actions that will be taken to obtain the information.

B. Key habitats and their relative conditions are described in enough detail such that the State can determine where (i.e., in which regions, watersheds, or landscapes within the State) and what conservation actions need to take place.

The data listed below, along with expert knowledge, were used to model and map quality ["key"] habitat areas for SGCN with sufficient detail to identify and prioritize areas for developing and implementing conservation projects within a Wildlife Action Network **(Chapter 1, "Habitat Approach," pp. 5-14)**. These habitat areas, located within the Wildlife Action Network, represent a diversity of quality terrestrial and aquatic habitats that support Species in Greatest Conservation Need.

The following data were used to assess quality habitats:

- The presence of viable or persistent SGCN population derived from a number of data sources listed below. (The presence of viable or persistent SGCN populations indicates habitats of sufficient quality to allow for SGCN persistence over time.) *Discussed in Element 1,B*
- Locations within the landscape of SGCN richness "hotspots" (represent potentially important habitats for multiple taxa). *Discussed in Element 1,B*
- Minnesota Biological Survey, Sites of Biological Significance (ground-truthed areas that have been ranked as outstanding, high or moderate).
    - "Outstanding" sites contain the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest and most ecologically intact or functional landscapes.
    - "High" sites contain very good quality occurrences of the rarest species, high-quality examples of rare native plant communities, and/or important functional landscapes.
    - "Moderate" sites contain occurrences of rare species, moderately disturbed native plant communities, and/or landscapes that have strong potential for recovery of native plant communities and characteristic ecological processes.
- Streams with an exceptional Index of Biological Integrity (IBI) scores (indicator of stream quality)
- Lakes of Biological Significance (important habitats for lake species)

Data sources used to evaluate viable or persistent populations and species richness included **(Appendix E)**:

- Natural Heritage Information System
- DNR Observation database
- Partners In Flight Data
- Breeding Bird Atlas
- Breeding Bird Surveys
- DNR Mussel Survey database
- DNR Fish Mapper
- Fishes of Minnesota database (from J. Hatch)
- Minnesota Odonata Survey Project database
- Odonata Central database
- Butterflies and Moths of North America database
- University of Minnesota/Bell Museum data
- Streams with exceptional Index of Biological Integrity score
- Minnesota Lakes of Biological Significance
- Expert knowledge

Unavailable data included Sites of Biological Significance for the counties where the Minnesota Biological Survey is ongoing. Preliminary data was used when boundaries and rankings were not likely to change significantly.

*Mapping the habitat areas associated with viable/persistent populations and richness hotspots (A detailed methodology is provided in **Appendix E**)*

For both viable/persistent populations and richness hotspots of SGCN, we mapped areas that represented the habit used by the species. The approach varied between aquatic and terrestrial species, and also varied depending on the data that best represented a species' habitat.

For aquatic species habitat, we used lake polygons if the population was identified in a lake. If the population was associated with a stream or river, populations were first mapped at DNR Level 08 catchment basins and then centerlines of streams classified as order 3 were clipped from the catchment basin and buffered by half the average width of the given stream order as identified in Downing et al. (2012). The one exception to this was wood turtle. For this species, stream centerlines were buffered by a quarter mile to capture the adjacent terrestrial habitat used by this species.

For terrestrial species, several GIS layers were used. First priority was to use Sites of Biodiversity Significance (SOBS) polygons if they were available and adequately represented the species' habitat. If SOBS polygons could not be used, then other layers were used depending on what best captured the population and habitat. These included managed area boundaries (e.g. State Park), land cover from GAP or US Fish and Wildlife Service's Habitat and Population Evaluation Team (HAPET), Audubon MN Important Bird Area and/or Prairie Conservation Plan core boundaries, and DNR Level 08 catchment basins; in some cases habitat boundaries were manually drawn using aerial photography.

In addition, modeled habitat was available for some bird species: Northern Goshawk from the MNDNR Nongame Wildlife Program; Boreal Chickadee and Connecticut Warbler from the University of Minnesota's Natural Resources Research Institute (NRRI); and Grasshopper Sparrow and Le Conte's Sparrow from (HAPET).

To capture additional areas of high quality habitat, Sites of Biodiversity Significance, streams with an exceptional Index of Biological Integrity score, and Lakes of Biological Significance were added to the viable/persistent population and richness habitat layers based on methodology presented in Appendix E. These layers define the quality habitat areas within the larger Wildlife Action Network.

To build in habitat connectivity and identify a Wildlife Action Network, additional layers and methodologies were applied as described in Appendix E. These steps brought lesser quality habitats into the network, but added value through increasing connectivity. In addition, the lower quality habitats still have value for wildlife and could be restored or enhanced.

With the exception of the ground-truthed, ranked Sites of Biological Significance and stream IBIs where available, there are no available data or standard indices for reporting on the relative condition of the habitats within the Wildlife Action Network. The Wildlife Action Network was scored using data layers

that are indicators of habitat quality. The scores, high, medium-high, medium, low-medium, and low, are based on five scalable metrics: SGCN population viability scores, SGCN richness, prioritized Sites of Biodiversity Significance, ranks of Lakes of Biological Significance, and Stream Indices of Biological Integrity (IBI). **Chapter 1, Figure 1.4 (p. 12) and Appendix E** discuss the scoring methodology.

Once the Wildlife Action Network was identified, 36 Conservation Focus Areas were identified and mapped within the Network. These are priority areas for working with partners to identify, design, and implement conservation projects and actions that will benefit Species in Greatest Conservation Need and their habitats, and report on effectiveness. Conservation Focus Area Overviews include maps that show the scored habitats within the network.

Target habitats and SGCN were identified for each Conservation Focus Area, and were crosswalked with Minnesota's native plant community classification system when possible. The classification is hierarchical and has six levels: system group, ecological system, floristic region, and native plant community class, type and subtype, but does not include lakes, rivers, or surrogate grasslands. The DNR has developed *Field Guides to the Native Plan Communities of Minnesota* for each of Minnesota's four Provinces (Prairie Parkland, Tallgrass Aspen Parklands, Laurentian Mixed Forest, and the Eastern Broadleaf Forest Provinces). The DNR regional plant ecologists and nongame wildlife biologists jointly provide training to DNR divisions and programs and external conservation partners on the identification and ecological characteristics of these communities, including the SGCN that are associated with them. This information, as well as the Rare Species Guide, an online resource for information on state-listed SGCN and their habitats, which is currently being updated, http://www.dnr.state.mn.us/rsg/index.html, are resources available to conservation partners when implementing Minnesota's Wildlife Action Plan.

Wildlife Action Network and Conservation Focus Area maps are also found in **Chapter 1, Figs. 1.3 - 1.6, (pp. 11-14)** and **Conservation Focus Area Overviews (p. 76).** These maps will be available as shape files, allowing Minnesota Wildlife Action Plan users to determine where (i.e., in which regions, watersheds, or landscapes within the state) to focus conservation for SGCN and what conservation needs to address.

Element three: Descriptions of problems which may adversely affect species identified in the 1st element or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats.

A. The Strategy indicates sources of information (e.g., literature, databases, agencies, or individuals) used to determine the problems or threats.

Informational sources used to identify stressors that may adversely affect SGCN or their habitats included:

- Species Technical Advisory Teams
- Nongame Wildlife Program Biologists

- MNDNR expert-based habitat climate change vulnerability assessment: MNDNR conducted an expert-driven, habitat climate change vulnerability exercise on river and stream systems, and to a varying degree on lakes, forest, prairie-grassland, and wetlands. The purpose of the exercise was to explore how changes in temperature and precipitation under a changing climate could interact with other system factors to affect the health of the ecological system. Experts were instructed to identify factors they believed would have the greatest impact on the ecological systems' health over the next 50 years in a changing climate.
- Literature review of predicted MN climate trends and potential habitat impacts

B. The threats/problems are described in sufficient detail to develop focused conservation actions (for example, "increased highway mortalities" or "acid mine drainage" rather than generic descriptions such as "development", or "poor water quality").

Chapter 3 of Minnesota's Wildlife Action Plan discusses the stressors associated with SGCN population declines. A stressor is a condition that directly or indirectly negatively impacts a habitat or species. (The term *threat* has negative connotations for many of our conservation partners and so we avoid use of that term in the plan, and *problems* is an often overused word with a broad assortment of meanings.)

Many of the criteria STATs used to evaluate a species as a Species in Greatest Conservation Need represent stressors associated with population declines. Habitat-related stressors were identified as contributing to population declines for 70 percent of Species in Greatest Conservation Need (241 of 346 species), indicating that loss, degradation (including from contaminants), and fragmentation of habitats are the most serious challenges facing SGCN populations. Stressors not related to habitat also contribute to SGCN declines but do not impact as many species (**Chapter 3, Table 3.1**, **p. 30)**. However, stressors of all types may interact with each other and exert a cumulative impact on a species.

Chapter 3, Table 3.2 (p. 31), lists the life-history traits that were considered during the SGCN identification process. These traits may increase the vulnerability of species to stressors, including climate change, contributing to population declines.

Climate change stressors

Because habitat was identified as an important stressor contributing to SGCN population declines, and habitat stressors may be exacerbated by a changing climate, staff reviewed reports and journal articles to identify current or predicted climate change impacts on Minnesota's habitats and species. Information was also obtained from a habitat climate change vulnerability assessment exercise conducted by the DNR with habitat experts. Also, a number of reports have identified life-history characteristics that could increase the sensitivities of species or populations to climate change. Findings from the climate change review are summarized in **Chapter 3 (pp. 33-39)**.

Addressing Stressors through the Habitat Approach

The habitat approach for Minnesota's plan focuses on maintaining the resilience of the habitats that SGCN and other wildlife depend on within a mapped Wildlife Action Network **(Chapter 1, "Addressing Large-Scale Stressors," p. 7 and Chapter 4, Objectives 1.1, p. 45)**. Within this network the focus is on implementing conservation actions at a landscape scale that will address broadly defined habitat stressors that were identified as contributing to population declines of 70 percent of SGCN. Examples of actions to address these stressors include protecting large habitat areas from fragmentation, restoring natural levels of connectivity while maintaining natural barriers, reducing invasive species, managing habitats for biological and functional diversity (vs. single-species needs), minimizing pollution and impervious surfaces, restoring watershed hydrology, and reintroducing disturbance when appropriate. Chapter 4, Objective 1.1, gives priority to eight ecological communities that are thought to be most vulnerable to climate change: *prairie stream ecosystems, high-diversity native prairie complexes, grassland-wetland complexes, peatlands, priority cold-water cisco lakes, cool-/cold-water streams, lowland conifer forests, and mesic hardwood forests.*

Thirty-six Conservation Focus Areas have been identified within the network where, through working with existing and new conservation partners, specific stressors and other conservation issues will be identified and conservation actions will be implemented (**Chapter 4, Objective 1.2, p. 46**). Effectiveness reporting and adaptive management will also be implemented within the Conservation Focus Areas (**Chapter 5, "Monitoring and Adaptive Management"**). Chapter 4, Objective 1.2, calls for maintaining or enhancing habitat in at least six of these Conservation Focus Areas by 2025.

Addressing Stressors through the Species Approach

Chapter 3, Table 3.3 (p. 32) identifies a subset of species that are being affected by specific threats or have life-history traits for which a habitat approach alone is insufficient to maintain or increase populations. For these species **Chapter 4, Objective 1.1 (p. 45) and Objective 2, (p. 47)** identify specific conservation actions that have a high likelihood of being implemented and are believed to be effective in maintaining or increasing populations. These species, issues, and conservation actions are listed under Element 4.A.

C. The Strategy considers threats/problems, regardless of their origins (local, State, regional, national and international), where relevant to the State's species and habitats.

When compiling lists of species to evaluate as SGCN, STATs considered the status of species in the surrounding states when that information was available. STATs also considered issues outside of Minnesota if they were thought to have a significant impact on Minnesota's populations (e.g., wintering ground issues, climate change, white-nose, chytrid fungus, etc.).

Species Technical Advisory Teams (STATs) also considered stewardship species, as well as other regionally or nationally at-risk species such as pollinators. Stewardship species are defined as:

- species for which populations in Minnesota represent a significant portion of their North American breeding or wintering population, or
- species for which Minnesota populations are stable, but for which populations outside of Minnesota have declined or are declining in a substantial part of their range.

- species for which migrating populations congregating in Minnesota represent a significant portion of the North American population.

A review of the stewardship SGCN indicated that conservation actions implemented under the habitat approach identified in **Chapter 4,** (**Objectives 1.1, p. 45** and **Objective 1.2, p. 46)** would address the needs of most of these species. A conservation action under Objective 1.1 includes promoting the implementation of best management practices for the golden-winged warbler (a stewardship species), as well as for regionally and nationally important species such as the monarch butterfly and other pollinator species. **Objective 2, ("Issue: stewardship species with limited distribution," p. 48)**, addresses potential conservation actions for brook trout, southeastern Minnesota heritage strain.

Chapter 6, (**p. 71)** includes the continued participation, to the extent resources allow, in conservation partnerships and initiatives that address stressors and benefit SGCN and their habitats at multiple scales such as the multi-state SWG Competitive grants, the US Fish and Wildlife Service Landscape Conservation Cooperatives, the Midwest Association of Fish and Wildlife Agencies Midwest State Wildlife Action Plan Technical Committee, as well as international initiatives (such as Southern Wings), that sustain or enhance wintering habitats for Minnesota SGCN.

D. If available information is insufficient to describe threats/problems, research and survey efforts are identified to obtain needed information.

Species Technical Advisory Teams identified a number of species that are experiencing population declines, but the causes are unknown. Research will be undertaken to identify the cause or causes of population declines for one or more of these six species (Olive-sided Flycatcher, American Kestrel, Belted kingfisher, Longnose sucker, Redfin shiner and Suckermouth minnow). The methodology for identifying these species is found in **Appendix F, 3c (p. F-6)**. Conservation actions and performance measures are found in **Chapter 4, Objective 3.3 (p. 51)**.

Chapter 4, Objective 3.4 (p. 52) addresses survey and research projects to understand the cause(s) of pollinator declines.

E. The priority research and survey needs, and resulting products, are described sufficiently to allow for the development of research and survey projects after the Strategy is approved.

Experts to develop and implement research will need to be identified for **Objective 3.3 (p. 51)**. We believe there is sufficient need to include this objective in the plan even though there is uncertainty as to whether we will be able to identify and implement research for many of these species. That is why we have set the target low, at least one, and hope that over the course of the next ten years we will be able to exceed that target. **Objective 3.4** (**p. 52)** has already identified key partners and MNDNR is also conducting surveys on native bees, and that data is expected to inform research and additional survey efforts. Research and survey needs, including potential conservation action and performance measures are discussed in **Objectives 2 (p. 47)** and **Objective 3 (p. 49).**

Element Four: Descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions.

A. The Strategy identifies how conservation actions address identified threats to species of greatest conservation need and their habitats.

Habitat Approach

Many of the goals, objectives, and conservation actions in Minnesota's Wildlife Action Plan were developed to: 1) reduce the impacts of current stressors on habitats and species, 2) increase the resilience of species and habitats, and 3) address specific issues related to life-history characteristics that increase a species' vulnerability to stressors. **Chapter 3 (pp. 39-41),** provides examples of how the stressors are brought forward into the goals, objectives, and conservation actions presented in **Chapter 4**. A few examples:

Habitat degradation, loss, and fragmentation are the predominant stressors impacting SGCN populations. Habitats with higher biological diversity and habitats that are less fragmented are expected to have a greater resilience in a changing climate than are systems with lower biological diversity and greater fragmentation.

> **Objective 1 (p. 45)** focuses on maintaining and enhancing the resilience of habitats upon which SGCN and other wildlife depend. This will be accomplished by implementing conservation actions such as those identified under **Objectives 1.1 (p. 45)**, to "sustain and enhance species, habitat, and landscape biological diversity within the Wildlife Action Network" and **Objective 1.2 (p. 47)** to "maintain or enhance habitat in at least six Conservation Focus Areas". Examples of conservation actions for Objective 1 include maintaining and restoring terrestrial and aquatic habitat connectivity, expanding habitat cores, protecting and enhancing wetland, floodplain and shoreline habitats, and acquiring from willing sellers threatened sites providing exceptional habitat or ecological value.

Changes in Minnesota's climate are already impacting habitats, and future impacts are predicted. The habitats identified by the literature review or the DNR expert-based habitat vulnerability assessment as having higher vulnerability to these climate changes, or for which management knowledge is lacking, include wet forest systems; isolated, low-diversity mesic and wet prairie communities; floodplain forest; the peatland system, and the prairie stream ecosystem with altered hydrology. Communities where maintaining complexes or forest stands with high biological diversity is important to maintain adaptive capacity include mesic hardwood forest stands, high-diversity prairie complexes, wetland complexes, and cold-water lake and streams.

> **Objective 1.1 (p. 45)** prioritizes the habitats listed above for the implementation of conservation actions. In addition, a number of Conservation Focus Areas have been

identified with a watershed focus for the protection, enhancement or restoration of stream habitats (see Conservation Focus Area Overviews for more information).

Invasive species, insects, pest, disease and deer herbivory in forested systems are important stressors interacting with climate to reduce biological diversity.

Preventing new introductions and controlling the spread of invasive plants and animals is a conservation action under **Objective 1 (p. 45)**. **Objective 4 (p. 53)** addresses ensuring compliance with invasive species regulations to protect SGCN or their habitats.

Climate change is expected to affect surface and groundwater availability and flow regimes that are important factors for maintaining biological diversity in many habitats (mesic and wet prairies and forests, wetlands, and river, stream, and lake systems).

In addition to this impact being addressed by conservation actions for Objectives 1 and 4, two Conservation Focus Areas (Pine Sands – South and Bonanza Valley) include DNR groundwater protection management areas (See Conservation Focus Area Overviews for more information).

Species Approach

Chapter 4, Objective 2 (p. 47) identifies non-habitat related issues impacting Species in Greatest Conservation Need for which specific conservation actions were identified that have a likelihood of being effective in maintaining or increasing populations. Examples of the specific issues, target species and conservation actions identified in Objective 2 include:

- White-nose syndrome (northern long-eared bat, little brown myotis, big brown bat, tri-colored bat). Possible conservation actions: implement public education, protect vulnerable caves, and improve knowledge of summer habitat requirements.
- Species with a limited ability to recover on their own (freshwater mussels, wood turtle). Possible conservation actions: continue to implement the freshwater mussel propagation and implementation plan; develop and implement a statewide wood turtle management plan.
- Species with limited distribution (brook trout, southeastern Minnesota heritage strain). Possible conservation actions: propagate heritage-strain brook trout and reintroduce to former stream reaches in southeastern Minnesota.
- Deliberate killing, over-collecting, or unregulated take (gophersnake, plains hog-nosed snake, mudpuppy, hornyhead chub). Possible conservation actions: establish legal protection for snakes and salamanders, continue education efforts to address deliberate killing of snakes, and conduct a population structure study for hornyhead chub using Otter Creek as a reference site.

Objective 3 (p. 49) identifies specific species for which improved knowledge is needed and includes specific conservation actions such as survey and research.

Finally, **Objective 4 (p. 53)** includes a number of actions such as technical guidance, enforcement of wildlife, land, wetland and water laws and regulations, as well as the incorporation of information from

the Wildlife Action Plan into the Environmental Review process that will reduce the impacts of stressors on SGCN populations and their habitats.

Far more species were identified for the species approach than we have resources to address through the Wildlife Action Plan. Therefore a prioritization process was implemented which is described in **Appendix F**.

B. The Strategy describes conservation actions sufficiently to guide implementation of those actions through the development and execution of specific projects and programs.

Minnesota's 2015-2025 Wildlife Action Plan is a strategic-level plan that identifies and prioritizes important habitats and species upon which to focus conservation actions. A primary audience for the plan is conservation practitioners who manage conservation lands or work with regional or local governments or private citizens on conservation issues, including habitat and species management. Web-based maps and planning tools, such as shapefiles of the prioritized Wildlife Action Network and Conservation Focus Areas, will be available to assist partners with the implementation of the plan and reporting on its effectiveness.

Habitat areas identified within the Wildlife Action Network include a diversity of ownerships and stakeholder groups, and are managed for multiple objectives utilizing an assortment of funding strategies, each with specific requirements or expectations. Furthermore, Minnesota's Wildlife Action Plan is housed within DNR's Division of Ecological and Water Resources, which provides staff support and leadership for the implementation of the plan, but, with the exception of the Scientific and Natural Areas Program, does not own or manage conservation lands. Thus, the successful implementation of this plan will require partnership collaboration.

The plan is not designed to be prescriptive, but rather adaptive to ecological, economic, and social changes over the next ten years, while continually striving to meet the plan's goals and objectives, and monitor the performance and effectiveness of the plan. As described in **Chapter 6 (p. 69)**, biennial regional meetings with partners from within the DNR Divisions and other external agencies (such as Soil and Water Conservation Districts, US Department of Agriculture Natural Resources Conservation Service, Minnesota Pollution Control Agency, Bureau of Water and Soil Conservation, US Fish and Wildlife Service, US Forest Service), conservation organizations (such as The Nature Conservancy, The Wildlife Society, Ducks Unlimited, Audubon MN, etc.), and other land managers, including local and regional governments and tribal governments, will be held in each DNR region beginning in early 2016. These meetings, organized by Wildlife Action Plan staff in coordination with Division of Ecological and Water Resources regional managers and staff will accomplish the following (**Chapter 6, p. 69**):

- Provide opportunities to coordinate implementation of on-the-ground habitat conservation projects to meet the objectives of the Wildlife Action Plan.
- Identify, prioritize, and develop Wildlife Action Plan projects to be implemented within one or more of the mapped Conservation Focus Areas. This could include assessing available resources

needed to implement projects; selecting projects; establishing clear results specific to SGCN or their habitats; developing **S**pecific, **M**easurable, **A**ttainable, **R**esults-oriented and **T**ime-bound (SMART) objectives; identifying conservation issues and stressors, and conservation approaches (actions); defining project effectiveness; and implementing monitoring to evaluate and report on effectiveness (Chapter 5, Monitoring).

- Recommend new Conservation Focus Areas for the region or revise the boundaries of existing Conservation Focus Areas.
- Address opportunities for watershed/landscape project planning within Conservation Focus Areas or the Wildlife Action Network. This can include considering how management objectives and actions at the site level can be coordinated across sites to sustain or enhance landscape-scale biological diversity and improve the ecological functionality of conservation lands and waters.

C. The Strategy links conservation actions to objectives and indicators that will facilitate monitoring and performance measurement of those conservation actions (outlined in Element #5).

Chapter 4 identifies performance measures that will be used to assess the plan's overall success in implementing conservation actions that address the objectives. **Chapter 5**, **"Monitoring and Adaptive Management,"** discusses identifying and reporting on effectiveness measures to determine if a conservation action or suite of actions achieved the desired results for a specific target. Targets could be particular habitats, a group of species, or an individual SGCN, or an ecosystem function or condition, such as groundwater recharge or water quality. For example, monitoring will be used to assess if areas within the Wildlife Action Network continue to support viable SGCN populations, greater biological diversity, and higher-quality habitat, than areas outside the network.

D. The Strategy describes conservation actions (where relevant to the State's species and habitats) that could be addressed by Federal agency or regional, national or international partners and shared with other States.

Chapter 6 (p. 67) provides information on how the 2005 plan has been implemented by partners throughout Minnesota and continued partner involvement. Examples of specific conservation actions identified in Chapter 4 of this plan that could be addressed by partners are:

- Implementation of monarch butterfly and pollinator best management practices. Partners include the US Fish and Wildlife Service, the National Wildlife Federation, Natural Resources Conservation Services, University of Minnesota Monarch Lab, Monarch Joint Venture Partnership and Xerces Society.
- Continued implementation of Minnesota's mussel propagation and reintroduction plan: partners include the US Fish and Wildlife Service, US Army Corp of Engineers, and University of Minnesota.
- Implementation of conservation actions benefiting prairie habitats and Species in Greatest Conservation Need as part of the Minnesota Prairie Conservation Plan. This plan is implemented through a broad-based partnership that includes the MN DNR, US Fish and Wildlife Service,

Minnesota Prairie Chicken Society, The Nature Conservancy, Pheasants Forever, Audubon MN, The Conservation Fund, and Natural Resources Conservation Service (NRCS).

- Implementation of watershed conservation actions/practices to benefit aquatic Species in Greatest Conservation Need. Partners include US Fish and Wildlife Service, Minnesota Pollution Control Agency, Minnesota and Iowa Topeka shiner SWG competitive grant awardees, Soil and Water Conservation Districts, Minnesota Board of Soil and Water Resources, and NRCS.
- Implementation of habitat protection and restoration actions benefiting Southeast Minnesota Bluffland Species in Greatest Conservation Need includes a partnership between the National Wild Turkey Federation and between Minnesota and Wisconsin through a SWG competitive grant.
- Conservation actions benefiting the wood turtle and softshell turtle through a SWG competitive grant with Minnesota, Iowa, Michigan, and Wisconsin.

E. If available information is insufficient to describe needed conservation actions, the Strategy identifies research or survey needs for obtaining information to develop specific conservation actions.

Species Technical Advisory Teams identified a number of species that are experiencing population declines, but the causes are unknown. Research will be undertaken to identify the cause or causes of population declines for one or more of these 6 species (olive-sided flycatcher, American kestrel, belted kingfisher, longnose sucker, redfin shiner and suckermouth minnow). Conservation actions and performance measures are found under **Objective 3.3 (p. 51)** and **Appendix F (methodology).**

Objective 3.4 (p. 52) addresses survey and research projects to understand the cause(s) of pollinator declines.

F. The Strategy identifies the relative priority of conservation actions.

Objectives serve as the prioritization structure for determining conservation actions. The plan includes a discreet number of objectives that must be met if the goals of the plan are to be realized. Potential conservation actions are identified for each objective. Objectives and conservation actions are also associated with specific areas, such as the Wildlife Action Network, Conservation Focus Areas, or statewide.

Conservation actions for each of the objectives will be prioritized throughout the 2015-25 implementation period based on a number of factors that include obtaining new information from research, monitoring and adaptive management; resources available for implementing an action (staff, funding, knowledge), and in response to changing conditions (ecological, economic or social).

Element Five: Descriptions of the proposed plans for monitoring species identified in the 1st element and their habitats, for monitoring the effectiveness of the conservation actions proposed in the 4th element, and for adapting these conservation actions to respond appropriately to new information or changing conditions

A. The Strategy describes plans for monitoring species identified in element 1, and their habitats.

Chapter 5, Monitoring and Adaptive Management provides a detailed discussion of the plan's Habitat and Species Monitoring Approach. Excerpts or examples of the comprehensive approach are presented here for each sub-element.

The ability to monitor changes in populations of SGCN is critical to the success of the Wildlife Action Plan. However, because we cannot monitor all 346 SGCN, targeted monitoring efforts are essential to evaluate whether our conservation actions are effective in maintaining or increasing SGCN populations.

Performance measures for **Goal 1, Objective 1.1 (p. 45)** include monitoring populations of monarch butterfly and golden-winged warbler to evaluate the effectiveness of implementing Best Management Practices for these species.

The performance measures for **Goal 1, Objective 2 (p. 47)** include monitoring the population status or trends for at least three of the following species for which conservation actions will be implemented:

- northern long-eared bat
- freshwater mussels
- wood turtle
- brook trout, southeastern Minnesota heritage strain
- mudpuppy
- hornyhead chub

SGCN monitoring for effectiveness will be based on scientifically sound protocols as defined through literature, expert knowledge, and collaboration with existing monitoring projects. Existing sources of status and trend monitoring data will be used when available, or new monitoring efforts will be initiated as needed to evaluate the effectiveness of conservation actions and inform adaptive management (see **Chapter 5, Table 5.1, p. 61**), "SGCN for which population monitoring data are available or needed to evaluate the effectiveness of conservation actions under a species approach").

B. The Strategy describes how the outcomes of the conservation actions will be monitored.

*Wildlife Action Network Monitoring (**Chapter 5, pp. 56-58**)*

In addition to the species monitoring discussed above, monitoring will be implemented to assess if areas within the Wildlife Action Network continue to support viable SGCN populations, greater biological diversity, and higher-quality habitat than areas outside the Wildlife Action Network. Monitoring will occur both within (with emphasis on higher scoring areas where feasible, (**Chapter 1, Figure 1.3, p. 11**) and outside of the Wildlife Action Network to make these comparisons.

In addition to habitat monitoring efforts, several existing wildlife species monitoring efforts to determine status and trends could serve as indicators of habitat quality and provide information on biological diversity. For example, the Minnesota Frog and Toad Calling Survey includes monitoring points both within and outside of the Wildlife Action Network (**Chapter 5, Figure 5.2, p. 58**).

Several other existing long-term species monitoring efforts that could be used to evaluate the effectiveness of the Wildlife Action Network are listed in **Chapter 5 (p. 62)**.

Conservation Focus Area Monitoring ***(Chapter 5, pp. 58-60)***

Specific monitoring within Conservation Focus Areas will be defined once specific conservation projects with SMART (Specific, Measureable, Attainable, Relevant, Time-oriented) objectives and conservation actions are identified. In general, monitoring for Conservation Focus Areas will be used to answer these questions: What actions did we take? Were our actions effective? What do we need to do differently?

"What actions did we take?" Monitoring will include measures of conservation actions such as the number of acres protected by conservation easements, the number of acres burned, or the number of demonstration or research projects. Much of this information can be tracked using the Adaptive Management Spatial Database developed by the DNR that spatially tracks conservation actions using a consistent naming convention for actions.

"Were our actions effective?" Monitoring will include measures to evaluate if a conservation action or suite of actions achieved the desired results for a specific target. Targets are particular habitats, a group of species, an individual SGCN, or an ecosystem function or condition, such as groundwater recharge or water quality. Desired results are described using SMART objectives.

"What do we need to do differently?" Monitoring will seek to identify what we need to do differently to increase the effectiveness of the plan. This requires the use of an adaptive management framework which consists of assessing the problem, designing strategies to address the problem, implementing selected strategies, monitoring results, evaluating what those results mean, and adjusting management if monitoring suggests that changes are needed (**Chapter 5, Figure 5.3, p. 60**).

C. If monitoring is not identified for a species or species group, the Strategy explains why it is not appropriate, necessary or possible.

Resources, including staff, funding, monitoring protocols and data analysis and storage capacity are not available to monitor 346 Species in Greatest Conservation Need, nor would we consider this to be the best use of resources. When considering research and surveys (for species or groups of species identified in **Chapter 4, Objective 2, p. 47 and Objective 3, p. 49)** and the broader habitat species monitoring approach discussed in **Chapter 5**, we would expect that all species groups would be represented.

D. Monitoring is to be accomplished at one of several levels including, individual species, guilds, or natural communities

Minnesota's Wildlife Action Plan monitoring framework uses multiple scales to assess the effectiveness of the Wildlife Action Network and conservation actions and to identify trends in species populations and habitats. At the broadest scale monitoring efforts will assess the status of habitats and indicator species both within and outside of the Wildlife Action Network (**Chapter 5**).

Monitoring within Conservation Focus Areas will be designed to answer specific questions related to conservation actions and their effectiveness and to provide information for adaptive management as discussed in Element *5,B.*

Species monitoring will be implemented to provide information for specific species or groups of species as discussed in Element *5,A*.

E. The monitoring utilizes or builds on existing monitoring and survey systems or explains how information will be obtained to determine the effectiveness of conservation actions.

The existing Prairie Status and Trend Monitoring Project, (SPICE: Sustaining Prairies in a Changing Environment) will be assessed, analyzed, and modified if possible to allow comparisons between areas within and outside the Wildlife Action Network. Other existing broad-scale habitat monitoring efforts that could be used to evaluate the Wildlife Action Network include the Minnesota Pollution Control Agency's (MPCA) and Minnesota DNR's Wetland Status and Trend Monitoring Program, the MPCA's Stream Index of Biological Integrity (IBI) monitoring, the DNR's Lake IBI monitoring, and Minnesota Biological Survey relevés (**Chapter 5, p. 56).**

A number of current DNR long-term species monitoring projects will continue as part of the Minnesota Wildlife Action Plan. These projects include:

- statewide frog and toad call monitoring (**Chapter 5, Figure 5.2, p. 58**)
- statewide mussel monitoring
- common loon monitoring (**Chapter 5, Figure 5.4, p. 63**)
- northern goshawk monitoring
- Topeka shiner monitoring (**Chapter 5, Figure 5.5, p. 64**)

These monitoring projects not only contribute to our understanding of SGCN population status and trends but also serve as an indicator of the health of the habitats on which they depend. Therefore, information collected from these projects can potentially be used to evaluate aspects of the Wildlife Action Network and/or Conservation Focus Area approach. However, the design of these existing monitoring projects must be assessed to determine their robustness at different scales. Monitoring will be implemented by DNR staff, through contracts with universities and colleges, by volunteers, and by staff from other agencies and organizations as expertise and resources allow.

The DNR, other wildlife agencies, and many partner organizations are involved with long-term species population monitoring. For example, a few of the monitoring initiatives that will help assess the status of

SGCN and the Wildlife Action Network include breeding waterfowl population surveys, breeding bird surveys, monitoring of the annual furbearer harvest, and ecosystem measures in the Minnesota Prairie Conservation Plan (e.g., greater prairie-chicken, several prairie butterflies). Surveys for two of the stewardship species, American white pelican and trumpeter swan, will continue at approximately five-year intervals to assess distribution and abundance and to evaluate any changes in population status.

F. The monitoring considers the appropriate geographic scale to evaluate status of species or species groups and the effectiveness of conservation actions.

Minnesota's Wildlife Action Plan monitoring framework uses multiple scales to assess the effectiveness of the Wildlife Action Network and conservation actions and to identify broad trends in species populations and habitats (**Chapter 5, p. 56**). At the broadest scale, existing and new monitoring efforts will be analyzed and structured to assess the status of habitats and focal species both within and outside of the Wildlife Action Network. In addition, new efforts and approaches aimed at assessing ecosystem resiliency will be developed over the next 10 years. At the next scale, monitoring within Conservation Focus Areas will be designed to answer the questions: What actions did we take? Were our actions effective?, and What do we need to do differently? Monitoring of species will be used to address questions at both the Wildlife Action Network and Conservation Focus Area scales, as well as to provide information related to individual species performance measures identified in Chapter 4.

The plan recognizes that successful monitoring requires initial development of statistically valid designs, including defining the appropriate geographic scale. Statisticians familiar with developing conservation-related monitoring are consulted early on when developing monitoring and research projects. SGCN monitoring for effectiveness will be based on scientifically sound protocols as defined through literature, expert knowledge, and collaboration/consultation with existing, successful monitoring projects.

G. The Strategy is adaptive in that it allows for evaluating conservation actions and implementing new actions accordingly.

Desired results will be defined using SMART objectives. An adaptive management framework will then be used to assess the problem, design strategies to address the problem, implement conservation actions, monitor results, evaluate the results, and adjusting management actions accordingly (**Chapter 5, Figure 5.3, p. 60**). The Grassland Monitoring Team (GMT) and the Adaptive Forest Management Projects (AFMPs) are examples of adaptive management projects that can be used as guides for future endeavors (**Chapter 5, p. 60**). Some level of adaptive management should be incorporated into all actions implemented on Conservation Focus Areas.

Element Six: Descriptions of procedures to review the Strategy/Plan at intervals not to exceed ten years.

A. The State describes the process that will be used to review the Strategy within the next ten years

Chapters 1-6 provide information on actions that will be implemented throughout the 10-year implementation period that will either be used to update the plan during that period or will provide valuable data for the 2025 update. A few of these are reiterated in this section.

Wildlife Action Plan staff will work with conservation partners to update the Wildlife Action Network and Conservation Focus Areas over the next 10 years (**Conservation Actions under Objectives 1.1, p. 45 and 1.2, p. 46**) as new information becomes available using the methodology as described in **Appendix E.**

As discussed in **Chapter 2 (p. 22)**, if species are added to the federal list of endangered and threatened species or the state list of endangered, threatened, or special concern species during the period covered by the plan, those species will automatically be added to the SGCN list. Information obtained about the status of non-listed species (which are not automatically SGCN under Minnesota's criteria) will be used to inform updating the Species in Greatest Conservation Need list in 2025. Non-listed species will not be evaluated for addition to the list prior to the formal 2025 review and revision process. This is due to the time it takes for the Species Technical Advisory Teams to review and evaluate new data and apply that information to the criteria that is used to identify a species as a SGCN.

Chapter 3 (p. 41) includes an emerging issues section to allow for the allocation of resources to new issues.

Species Technical Advisory Teams (STAT) will continue to meet over the 10 years of the plan to provide expert knowledge on the status of species and the implementation of conservation actions, including surveys and monitoring. For species groups lacking a STAT for the 2015 revision, new teams will be organized as experts become available (**Chapter 4, Objective 3.6, p. 53).** Survey, research and monitoring at various scales will provide valuable information for an adaptive management approach that will inform the implementation of conservation actions and improve the effectiveness of the plan on a regular basis (**Chapter 5, Monitoring and Adaptive Management**). These efforts will provide valuable information for the review and updating of the plan in 2025.

The implementation of the 2015 Wildlife Action Plan will engage more partners at regional scales. These partners include state, federal and local conservation agencies, local and regional governments, tribal governments, and conservation organizations identified in **Chapter 6**, "Implementation of Minnesota's Wildlife Action Plan". The engagement of these partners in the implementation of conservation actions and effectiveness monitoring will result in a broader-base of experiential (hands on) knowledge of the strengths and weaknesses of the plan that can be applied to the review and updating of the 2025 plan.

Chapter 4 (Objective 2, p. 47 and Objective 3, p. 49) defines research and surveys that will be implemented to address data gaps and provide new information for updating the 2025 plan. These data gaps and needs for research, monitoring, and survey have been discussed in Elements 1-5.

Thus, we do not expect a formal review and update of the 2015 plan prior to the required 10-year review in 2025. The formal review process should begin around 2022 (approximately seven years into the implementation period) and should take a partnership approach similar to the 2015 review and update. STATs should review the criteria for evaluating a species status as a Species in Greatest Conservation Need, and revise the criteria if needed. Performance and effectiveness measures tracked during the first seven years of implementation should be reviewed and analyzed for information that would inform the 2025 revision.

Element Seven: Descriptions of the plans for coordinating, to the extent feasible, the development, implementation, review, and revision of the Plan-Strategy with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats

A. The State describes the extent of its coordination with and efforts to involve Federal, State, local agencies, and Indian Tribes in the development of its Strategy.

Appendix B identifies Minnesota's Wildlife Action Plan Project Structure and Partnership Involvement.

Wildlife Action Plan and Nongame Wildlife Program staff met with tribal representatives from Leech Lake, Red Lake, Mille Lacs, and White Earth on January 15, 2014 to share information on wildlife management and research initiatives, discuss the State and Tribal Wildlife Grants program, and update the tribal representatives on the review and revision of Minnesota's Wildlife Action Plan.

Major teams and workgroups, including members and their affiliations, identified in **Appendix B** include:

- Production Advisory Team
- Species Technical Advisory Teams
- Viable/Persistent SGCN Population Mapping Work Group

Table B1 (p. B-5) identifies the number and affiliations of people who were notified to review and comment on the revised list of SGCN.

Table B2 (p. B-12) identifies the number and affiliations of people who were notified to review and comment on the revised MN Wildlife Action Plan, 2015-2025. Comments received on the plan are also included.

The Wildlife Action Plan review process included the following steps

- Users of the 2005 plan were surveyed to obtain input and recommendations on what aspects of the plan worked well and what would enhance its usability. Increased prioritization, collaboration with other planning efforts that have taken place in recent years, and providing information in a Geographic Information System (GIS) format were the recurring recommendations we received and have been addressed in the 2015 plan.
- Species Technical Advisory Teams (STATs) met for over a year to review and revise the 2005 SGCN list. The proposed 2015-25 list of SGCN was distributed for comments to key partners within all MNDNR Divisions, conservation partner agencies, non-governmental organizations (NGOs) and tribal nations. **Appendix B, Table B1 (p. B-5)** presents the full list of federal and state agencies, NGOs, and tribal governments solicited to provide comments on the proposed 2015 SGCN list. Element 1.E provides information on the review process.
- The Production Advisory Team signed off on the plan in June 2015. Their final comments were addressed in the final plan that went out for review. The team was very pleased with the final plan.
- The plan and a brief survey were posted on a public website for three weeks from July 27 through August 14, 2015. The survey encouraged feedback by providing an easy way review the plan.
    - 64 people responded to the survey
    - 96 comments were provided on specific Chapters
    - Additional comments were made on figures and tables
    - Several new Conservation Focus Areas were recommended from the review process. Because the identification of Conservation Focus Areas was an iterative process, the decision was made not to include in the plan any CFAs recommended during the final review until they could be distributed for review in 2016. Language in the plan allows for the identification of new CFAs.
    - In addition to the survey responses there were a number of email comments from staff from DNR divisions of: Ecological and Water Resources, Forestry, Parks and Trails and Fish and Wildlife, as well as from external partners: The Nature Conservancy, UMN, Natural Resources Research Institute, Science Museum of Minnesota, Bell Museum, The Wildlife Society and Women Observing Wildlife. In addition to providing useful information on improving the plan, many comments also provided valuable information for plan implementation and indicated their support of the plan.

- The Commissioner's Advisory Committee on Natural Resources (CAC) conducted a four hour review of the plan on August 5, 2015. This 15-member citizens committee advises several programs within the Department of Natural Resources on issues related to sustaining the state's natural heritage and biological diversity. The committee was very supportive of the 2015 plan and noted that the addition of the Wildlife Action Network and Conservation Focus Areas were a significant improvement to the 2005 plan. They encouraged us to find ways to consistently report on performance over the next 10 years. In addition, committee members provided a number of suggestions related to clarifying key concepts, improving information presented in tables and maps, and strengthening the conservation actions which were incorporated into the final plan.

B. The State describes its continued coordination with these agencies and tribes in the implementation, review and revision of its Strategy.

Continued coordination with these agencies, tribes and organizations is described in "Implementation of the Minnesota Wildlife Action Plan" (**Chapter 6**), and is summarized in Element 4,B.

Element Eight: Descriptions of the necessary public participation in the development, revision, and implementation of the Plan.

A. The State describes the extent of its efforts to involve the public in the development of its Strategy.

Minnesota's Wildlife Action Plan is a strategic-level plan directed at the primary audiences identified in **Chapter 1, Conservation Approach**. These include:

- conservation practitioners who manage conservation lands or work with regional or local governments or private citizens on conservation issues;
- researchers who seek to improve our knowledge of Species in Greatest Conservation Need, their habitats and conservation issues, including emerging issues that could affect common species;
- governmental agencies and private organizations that make land use, land management, or policy decisions that may affect Species in Greatest Conservation Need and their habitats;
- members of the public who enjoy and appreciate wildlife and want to participate in its conservation; and
- managers of public and private conservation funds and other funding decision makers

Given the strategic nature of the Plan and the target audiences, staff defined "*necessary* public participation" to be staff of state, federal, tribal and local conservation agencies and organizations, the public represented through memberships or participation in organizations such as Audubon MN, regional parks and nature centers, MNDNR Parks and Trails programs, hunting and fishing organizations, Local Watershed Partnerships, Minnesota Forest Industries, and etc. Also considered were representatives from programs that provide technical guidance, including habitat management assistance, to private landowners. These entities were represented in the development and/or review of the plan (**Appendix B including Tables B1 and B2).**

Formal public notification of review of this level of plan is not required by the state.

B. The State describes its continued public involvement in the implementation and revision of its Strategy.

Minnesota's 2015 Wildlife Action Plan provides opportunities for involving the public in the implementation, and future revision, of the plan. The identification of a mapped Wildlife Action Network and Conservation Focus Areas will provide greater opportunities for private land managers to participate in the identification, development and implementation of conservation projects and actions identified in this plan (**Chapter 6, Implementing of the Minnesota Wildlife Action Plan**). Furthermore, **Goal 2, Chapter 4 (p. 53)** focuses on engaging the public in SGCN conservation through increasing the number and diversity of people participating in wildlife-related outdoor recreation and directly engaged in the conservation of SGCN. State Wildlife Grant funds will not be used for these education or recreation focused activities.