

### 3.3.5 Regional Forester - Sensitive Species

The evaluation of effects to sensitive species is conducted in detail in the Biological Evaluation (USDA Forest Service 2004e, planning record). This section summarizes the key findings.

#### Indicator 18 – Sensitive Species

Between the two National Forests there are currently 107 terrestrial and aquatic animal, plant, and lichen species that are listed as Regional Forester Sensitive Species (RFSS). This includes 41 animal species and 66 plant and lichen species. Of the 107 species 26 are listed sensitive on both National Forests (14 animals, 12 plants). Listed species for each Forest include:

##### **Chippewa NF:** 47 species

- Animals: 27 species
- Plants: 19 species

##### **Superior NF:** 85 species

- Animals: 29 species
- Plants: 46 species
- Lichens: 11 species

One RFSS – northern goshawk – also serves as Management Indicator Species (36 CFR 219.19 (a)(1)) for both National Forests (See also Section 3.3.6.1).

RFSS are those species of highest viability concern on the National Forests. Information on how species were screened and selected is provided in (Appendix B: Wildlife), the planning record (Mighton *et al.* 2000), and on the Forest Service website for threatened, endangered, and sensitive species ([http://www.fs.fed.us/r9/wildlife/tes/tes\\_lists.htm](http://www.fs.fed.us/r9/wildlife/tes/tes_lists.htm)) In brief, the reasons for concern for viability for each species is a result of one or a combination of several factors: habitat and species rarity or poor distribution; population decline trend; risk to habitat integrity; and population vulnerability. Determination of risk to species considered the ecological requirements, life history and geographic range of the species.

As indicators RFSS do a good job at highlighting differences among the alternatives because each alternative will result in varying habitat conditions for many of the species. Because RFSS represent those species of highest viability concern, they allow us to evaluate the likelihood or degree to which alternatives address requirements (36 CFR 219.19) to maintain viability and well-distributed habitats and prevent a trend toward listing of any species. In addition, RFSS are species of management concern because they are high public interest because of their social, ecological, and economic values. Finally, Forest Service Policy (FSM 2671.1-2672.43) requires evaluation of impacts to RFSS from management activities.

#### Analysis Methods

Species were evaluated using a wide variety of quantitative and qualitative indicators and information. Information was collected from currently accepted and applicable scientific literature, other scientific sources, and from species experts, along with professional judgment of Forest Service biologists (see summary in Appendix B: Wildlife).

To briefly summarize the analysis methods of the Biological Evaluation, environmental conditions preferred by RFSS are addressed: by coarse filter indicators of major aquatic and terrestrial biological communities; by a variety of indicators of species-specific habitats and microhabitats; and by indicators of human activities (such as road or trail construction, timber harvest, prescribed burning, and other vegetation management activities, and recreation management activities). Where possible many RFSS have been evaluated using other vegetation and wildlife habitat indicators analyzed in the EIS. Other RFSS have been analyzed using other meaningful quantitative and qualitative indicators of species' required environmental or habitat conditions. Analysis indicators for each individual species are described in the Biological Evaluation. In brief, indicators included:

- *For forest-dependent species:* amounts and distribution of: management indicator habitats 1-13 for forest type, age, and spatial patterns (Section 3.3.1 – 3.3.2); vegetation composition, age, and spatial patterns (Section 3.2); or other forest type and age combinations that best represented suitable habitat for species
- *For species associated with aquatic and non-forest riparian habitats:* lake and stream health indicators (MIH 14 Section 3.3.3); watershed and riparian indicators (Section 3.6); or proposed management activities that pose risks to species (such as water access development or roads and stream crossings).
- *For species associated with cliff, rock, nonforest, or microhabitat features:* since these habitats are not predicted to measurably change in amounts due to management activities, indicators are used that represent differences among alternatives related to risks to species. Examples include amounts of trails and roads, (Appendix F, Section 3.3.4.1, 3.8.3) water accesses (3.8.4), stream crossings (3.6), timber harvest or other vegetation management activities (Section 3.4 and 3.5).

The Biological Evaluation draws conclusions about effects of alternatives and provides two different assessments of impacts to species that are explained below:

- Habitat Outcomes
- Determination of Effects.

### Habitat Outcomes

First, analysis determined habitat outcomes (also referred to as environmental condition outcomes) for historical, current, and likely future environmental conditions for sensitive species based on conditions on NFS land. “Historical” is defined as approximately 1600-1900AD, the same time frame used to develop information on the range of natural variability of ecosystems (see Appendix G). “Future” is defined as Decades 2, 5 and 10 of plan implementation. The outcomes are summarized below in Table WSS-1 for animals and WSS-2 for plants.

Analysis also determined habitat outcomes for historical, current, and likely future environmental conditions for sensitive species based on conditions on in the cumulative effects analysis area (See description in *Analysis Area*) below. These are summarized in Tables WSS-4 and WSS-5 in Section 3.3.5d.

An outcome for ecological conditions is an index of the capability of the environment to support population abundance and distribution. It is not an actual prediction of population occurrence, size, density or other demographic characteristics (Schenck *et al.* 2002).

Analysis focused on the predominant risk factors pertinent to the species (Biological Evaluation). Additionally, the assessment of environmental conditions, distribution and quality was based on the knowledge of species distributional range and life history. For example, some species occur naturally in a localized or patchy distribution, and thus, never would occur in the conditions described as Outcome A or B or C: their natural condition may be D or E. Because of lack of published information on many of the RFSS, Forest Service judgments acknowledge and document the degree of certainty involved in making outcome judgments.

Comparison of historical and current outcomes provides a reference or context within which to evaluate the impacts of the alternatives (Schenck *et al.* 2002). The definitions of outcomes vary slightly between direct and indirect effects and cumulative effects.

### *Direct and Indirect Effects: Outcomes Based on Conditions on National Forest Lands Only*

The following describe the likely outcomes for species that could be supported by conditions on NFS land or in the cumulative effects analysis area under each of the alternatives. Outcomes are based on likely effects on conditions that are under the control of management by the Forest Service. They have been determined by the Forest Service.

- Outcome A. Suitable ecological conditions are broadly distributed and of high abundance across the historical range of the species within the planning area. The combination of distribution

and abundance of ecological conditions provides opportunity for continuous or nearly continuous intraspecific interactions for the species.

- Outcome B. Suitable ecological conditions are either broadly distributed or of high abundance across the historical range of the species within the planning area, but there are gaps where suitable ecological conditions are absent or only present in low abundance. However, the disjunct areas of suitable ecological conditions are typically large enough and close enough to permit dispersal among subpopulations and potentially to allow the species to interact as a metapopulation across its historical range within the planning area.
- Outcome C. Suitable ecological conditions are distributed frequently as patches and/or exist at low abundance. Gaps where suitable ecological conditions are either absent, or present in low abundance, are large enough that some subpopulations are isolated, limiting opportunity for species interactions. There is opportunity for subpopulations in most of the species range to interact as a meta-population, but some subpopulations are so disjunct or of such low density that they are essentially isolated from other populations. For species for which this is not the historical condition, reduction in overall species range from historical within the planning area may have resulted from this isolation.
- Outcome D. Suitable ecological conditions are frequently isolated and/or exist at very low abundance. While some of the subpopulations associated with these ecological conditions may be self-sustaining, there is limited opportunity for population interactions among many of the suitable environmental patches. For species for which this is not the historical condition within the planning area, reduction in overall species range from historical condition within the planning area may have resulted from this isolation.
- Outcome E. Suitable ecological conditions are highly isolated and exist at very low abundance, with little or no possibility of population interactions among suitable environmental

patches, resulting in strong potential for extirpations within many of the patches, and little likelihood of re-colonization of such patches. There has likely been a reduction in overall species range from historical within the planning area, except for some rare, local endemics that may have persisted in this condition since the historical period.

*Cumulative Effects: Outcomes Based on Conditions on All Ownerships in the Cumulative Effects Area*

- Outcome A. The combination of environmental and population conditions provides opportunity for the species to be broadly distributed and of high abundance across its historical range within the cumulative effects analysis area. There is potential for continuous or nearly continuous intraspecific interactions at high population size.
- Outcome B. The combination of environmental and population conditions provide opportunity for the species to be broadly distributed and/or of high abundance across its historical range within the cumulative effects analysis area, but there are gaps where populations are potentially absent or present only in low density as a result of environmental or population conditions. However, the disjunct areas of higher potential population density are typically large enough and close enough to other subpopulations to permit dispersal among subpopulations and potentially to allow the species to interact as a metapopulation across its historical range within the cumulative effects analysis area.
- Outcome C. The combination of environmental and population conditions restrict the potential distribution of the species, which is characterized by patchiness and/or areas of low abundance. Gaps where the likelihood of population occurrence is low or zero are large enough that some subpopulations are isolated, limiting opportunity for species interactions. There is opportunity for subpopulations in most of the

species range to interact as a metapopulation, but some subpopulations are so disjunct or of such low density that they are essentially isolated from other populations. For species for which this is not the historical condition within the planning area, reduction in overall species range from historical condition may have resulted from this isolation.

- Outcome D. The combination of environmental and population conditions restrict the potential distribution of the species, which is characterized by areas with high potential for population isolation and/or very low potential abundance. While some of these subpopulations may be self-sustaining, gaps where the likelihood of population occurrence is low or zero are large enough that there is limited opportunity for interactions among them. For species for which this is not the historical condition within the planning area, reduction in overall species range from historical has likely resulted from this isolation.
- Outcome E. The combination of environmental and population conditions restricts the potential distribution of the species, which is characterized by high levels of isolation and very low potential abundance. Gaps where the likelihood of population occurrence is low or zero are large enough there is little or no possibility of interactions, strong potential for extirpations, and little likelihood of recolonization. There has likely been a reduction in overall species range from historical within the planning area, except for some rare, local endemics that may have persisted in this condition since the historical period.

### Determination of Effect

The “determination of effect” specifically provides the judgment of Forest Service biologists on which of four conditions (shown on the bottom row of Table WSS-3) are most likely from the impacts of the alternatives. These include:

1. No impact

2. Beneficial effects.

(This condition is used when proposed alternative is determined to be wholly beneficial without potential negative impacts as in 3. below.)

3. May impact individuals but is not likely to cause a trend to federal listing or loss of viability. (This condition may be used when it is determined the proposed alternative may cause some negative effects, even if overall effects to species may be beneficial.)

- 4a. High risk of loss of loss of viability in the planning area, but not likely to cause a trend toward federal listing

- 4b. Likely to result in a loss of viability and a trend toward federal listing

The determination addresses the question of whether alternatives would be likely to maintain species viability or prevent a trend toward listing during the next 20 years representing the plan implementation period and reasonably foreseeable future. Determinations are expressed as “likelihoods” or “risk” because of uncertainty inherent in evaluating both future scenarios and many sensitive species whose environmental conditions are often not well understood.

### Analysis Area

The area covered by analysis of direct and indirect effects generally includes all lands administered by the Chippewa and Superior National Forests. For some species with limited ranges on the National Forests, analysis areas are narrowed to address only the species’ range on the National Forest.

Unless otherwise noted in the Biological Evaluation, the area covered by the cumulative effects analysis for the Chippewa generally is land of all ownerships within the Drift and Lake Plains Section, and land of all ownerships within the Northern Superior Uplands for the Superior. Again, species’ ranges were considered and some cumulative effects areas were either narrowed or expanded to most appropriately address effects.

<b>Table WSS-1. Historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS animals on National Forest land.</b>																				
<p><b><i>Bold italicized</i></b> letter (<b>C</b>) represents a positive change to current conditions  <b><u>Bold underlined</u></b> letter (<b>C</b>) represents a negative change to current conditions.                      A summary of the changes is at the bottom of the table.</p>																				
Species	Historical	Current	Alt. A			Alt. B			Alt. C			Mod Alt. E			Alt. F			Alt. G		
			2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10
<b>MAMMALS</b>																				
Heather vole (SNF)	C	D	<u>E</u>	<u>E</u>	<u>E</u>	C	C	C	D	D	D	C	C	C	C	C	C	C	C	C
Northern bog lemming (CNF)	C	D	<u>E</u>	D	D	D	D	D	<u>E</u>	D	D	D	D	D	D	D	D	D	D	D
<b>BIRDS</b>																				
Trumpeter swan (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Northern goshawk (SNF)	A	C	<u>D</u>	<u>D</u>	<u>D</u>	C	<i>A</i>	<i>A</i>	<u>D</u>	<u>D</u>	<u>D</u>	C	<i>A</i>	<i>A</i>	<u>D</u>	C	C	C	C	C
Northern goshawk (CNF)	A	D	<u>E</u>	<u>E</u>	<u>E</u>	C	<i>A</i>	<i>A</i>	<u>E</u>	<u>E</u>	<u>E</u>	C	<i>A</i>	<i>B</i>	D	<i>C</i>	<i>C</i>	C	<i>B</i>	<i>A</i>
Red-shouldered hawk (CNF)	B	D	D	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	D	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	D	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
Peregrine falcon (SNF)	D	E	E	E	<i>D</i>	E	E	<i>D</i>	E	E	<i>D</i>	E	E	<i>D</i>	E	E	<i>D</i>	E	E	<i>D</i>
Sharp-tailed grouse (SNF)	C	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Sharp-tailed grouse (CNF)	C	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Spruce grouse (CNF)	B	E	E	E	E	<i>D</i>	<i>D</i>	<i>D</i>	E	E	E	<i>D</i>	<i>D</i>	<i>D</i>	E	E	E	<i>D</i>	<i>D</i>	<i>D</i>
Yellow rail (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Yellow rail (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Wilson's phalarope (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Wilson's phalarope (CNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Common tern (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Caspian tern (CNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Black tern (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Black tern (CNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Great gray owl (SNF)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Great gray owl (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Boreal owl (SNF)	C	D	D	D	D	<i>C</i>	<i>C</i>	<i>C</i>	D	D	D	<i>C</i>	<i>C</i>	<i>C</i>	D	D	D	D	D	D
Black-backed woodpecker (CNF)	C	D	D	D	D	<i>C</i>	<i>C</i>	<i>C</i>	D	D	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>
Three-toed woodpecker (SNF)	C	D	<i>C</i>	D	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	D	D	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>
Olive-sided flycatcher (SNF)	B	D	D	D	D	<i>C</i>	<i>C</i>	<i>C</i>	D	D	D	<i>C</i>	<i>C</i>	<i>C</i>	D	D	D	<i>C</i>	<i>C</i>	<i>C</i>
Olive-sided flycatcher (CNF)	C	D	D	D	D	<i>C</i>	<i>C</i>	<i>C</i>	D	D	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	D	D	D	<i>C</i>	<i>C</i>	<i>C</i>
Black-throated blue warbler (SNF)	B	C	<u>E</u>	<u>D</u>	<u>D</u>	C	<i>B</i>	<i>B</i>	<u>E</u>	<u>E</u>	<u>D</u>	C	<i>B</i>	<i>B</i>	<u>D</u>	<u>D</u>	<u>D</u>	C	C	C

**Table WSS-1. Historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS animals on National Forest land.**

***Bold italicized*** letter (**C**) represents a positive change to current conditions  
**Bold underlined** letter (**C**) represents a negative change to current conditions.

A summary of the changes is at the bottom of the table.

Species	Historical		Alt. A			Alt. B			Alt. C			Mod Alt. E			Alt. F			Alt. G					
	Historical	Current	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10			
Black-throated blue warbler (CNF)	B	D	<u>E</u>	D	D	<i>C</i>	<i>B</i>	<i>B</i>	<u>E</u>	D	D	<i>C</i>	<i>B</i>	<i>B</i>	D	D	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>	D	<i>C</i>	<i>C</i>
Bay-breasted warbler (SNF)	B	<i>C</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>C</i>	<i>B</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>C</i>	<i>B</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>B</i>
Bay-breasted warbler (CNF)	D	E	E	E	E	E	E	<i>D</i>	E	E	E	E	E	<i>D</i>	E	E	E	E	E	<i>D</i>	E	E	<i>D</i>
Connecticut warbler (SNF)	B	<i>C</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>C</i>								
Connecticut warbler (CNF)	B	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>C</i>	<u>D</u>	<i>C</i>	<i>C</i>	<u>D</u>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>
LeConte's sparrow (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
LeConte's sparrow (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Nelson's sharp-tailed sparrow (CNF)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
<i>HERPS</i>																							
Wood turtle (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Blanding's turtle (CNF)	C	C	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>
Four-toed salamander (CNF)	C	D	<u>E</u>	<u>E</u>	D	D	<i>C</i>	<i>C</i>	<u>E</u>	<u>E</u>	D	D	<i>C</i>	<i>C</i>	<u>E</u>	D	<i>C</i>	D	<i>C</i>	<i>C</i>	D	D	<i>C</i>
<i>FISH</i>																							
Lake Sturgeon (SNF)	B	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>										
Shortjaw cisco (SNF)	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Least darter (CNF)	A	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>	<i>C</i>	<i>B</i>	<i>B</i>
Northern brook lamprey (SNF)	C	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>										
Greater redbhorse (CNF)	B	<i>C</i>	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<i>B</i>	<i>B</i>	<i>C</i>	<u>D</u>	<u>D</u>	<i>B</i>	<i>B</i>	<i>B</i>	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>
Pugnose shiner (CNF)	B	<i>C</i>	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<u>D</u>	<u>D</u>	<i>C</i>	<i>C</i>	<i>C</i>
<i>MOLLUSKS</i>																							
Creek heelsplitter (SNF)	B	<i>C</i>	<i>C</i>	<u>D</u>	<u>E</u>	<i>B</i>	<i>B</i>	<i>B</i>	<u>D</u>	<u>E</u>	<u>E</u>	<i>B</i>	<i>B</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<u>D</u>	<u>E</u>	<i>C</i>	<i>C</i>	<i>C</i>
Creek heelsplitter (CNF)	B	<i>C</i>	<u>D</u>	<u>E</u>	<u>E</u>	<i>B</i>	<i>B</i>	<i>B</i>	<u>D</u>	<u>E</u>	<u>E</u>	<i>B</i>	<i>B</i>	<i>B</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<u>D</u>	<u>E</u>	<i>C</i>	<i>C</i>	<i>C</i>
Fluted-shell mussel (SNF)	C	E	E	E	E	<i>D</i>	<i>C</i>	<i>C</i>	E	E	E	<i>D</i>	<i>C</i>	<i>C</i>	<i>D</i>	E	E	<i>D</i>	<i>C</i>	<i>C</i>	<i>D</i>	<i>C</i>	<i>C</i>
Fluted-shell mussel (CNF)	C	E	E	E	E	<i>D</i>	<i>C</i>	<i>C</i>	E	E	E	<i>D</i>	<i>C</i>	<i>C</i>	<i>D</i>	E	E	<i>D</i>	<i>C</i>	<i>C</i>	<i>D</i>	<i>C</i>	<i>C</i>
Black sandshell (SNF)	B	D	D	D	<u>E</u>	<i>B</i>	<i>B</i>	<i>B</i>	D	D	<u>E</u>	<i>B</i>	<i>B</i>	<i>B</i>	<i>C</i>	<i>B</i>	<i>B</i>						

<b>Table WSS-1. Historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS animals on National Forest land.</b>																							
<p><b><i>Bold italicized</i></b> letter (<b><i>C</i></b>) represents a positive change to current conditions  <b><u>Bold underlined</u></b> letter (<b><u>C</u></b>) represents a negative change to current conditions.                      A summary of the changes is at the bottom of the table.</p>																							
Species	Historical	Current	Alt. A			Alt. B			Alt. C			Mod Alt. E			Alt. F			Alt. G					
			2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10			
Black sandshell (CNF)	B	D	D	D	<u>E</u>	<i>B</i>	<i>B</i>	<i>B</i>	D	D	<u>E</u>	<i>B</i>	<i>B</i>	<i>B</i>	<i>C</i>	<i>B</i>	<i>B</i>						
<b><i>BUTTER-FLIES</i></b>																							
Taiga alpine (SNF)	<i>C</i>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Red-disked alpine (SNF)	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>	<i>C</i>
Nabokov's northern blue (SNF)	D	E	E	E	E	E	E	<i>D</i>	E	E	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	E	<i>D</i>	<i>D</i>	E	<i>D</i>	<i>D</i>	E	<i>D</i>	<i>D</i>
Jutta arctic (SNF)	<i>C</i>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Grizzled skipper (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<b><i>OTHER INSECTS</i></b>																							
Vertrees's caddisfly (CNF)	<i>C</i>	D	D	D	D	D	D	D	D	D	D	<i>C</i>	<i>C</i>	<i>C</i>	D	D	D	D	D	D	D	D	D
Tiger beetle species (SNF)	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
Positive change from current outcome			1	1	5	17	22	25	0	1	7	22	26	28	7	8	12	13	16	19	8	15	19
Negative change from current outcome			9	11	11	0	0	0	9	10	10	0	0	0	3	5	4	0	4	3	0	0	0
No change from current outcome			46	44	40	39	34	31	47	45	39	34	30	28	46	43	40	43	36	34	48	41	37
TOTAL			56			56			56			56			56			56			56		
Source: Biological Evaluation for RFSS animals (USDA Forest Service 2004e, planning record)																							

**Table WSS-2. Historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS plants on National Forest land.**

***Bold italicized*** letters (***C***) represent a positive change to current conditions

**Bold underlined** (**C**) represents a negative change to current conditions.

A summary of the changes is at the bottom of the table.

Species	Historical	Current	Alt. A			Alt. B			Alt. C			Alt. D			Alt. E			Alt. F			Alt. G		
			2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10
<b>Guild 1. Shallow water/littoral zone – fluctuating shore</b>																							
Alpine milkvetch (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Katahdin sedge (SNF)	<b><i>C</i></b>																						
Creeping rush (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
American shore-grass (SNF)	<b><i>C</i></b>																						
Awlwort (SNF)	<b><i>C</i></b>																						
Awlwort (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<b>Guild 2. Riparian – aquatic, open marsh, and alder/shrub dominated</b>																							
Floating marsh Marigold (SNF)	<b><i>C</i></b>	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	D	D	D	D	D	D	D	D	D
Dwarf water-lily (SNF)	<b><i>C</i></b>	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	D	D	D	D	D	D	D	D	D
Auricled twayblade (SNF)	<b><i>C</i></b>	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	D	D	D	D	D	D	D	D	D
<b>Guild 3. Nonforest wetland, disturbed wetland, and fluctuating shore – predominantly open</b>																							
Swamp beggar-ticks (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Pond reedgrass (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Neat spike-rush (SNF)	<b><i>C</i></b>																						
Olivaceous spike-rush (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Few-flowered spike-rush (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Moor rush (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Vasey's rush (SNF)	<b><i>C</i></b>																						
Fall dropseed muhly (SNF)	<b><i>C</i></b>																						
Small green woodland orchid (SNF)	<b><i>C</i></b>																						
Small green woodland orchid (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Northern bur-reed (SNF)	<b><i>C</i></b>																						
Northern bur-reed (CNF)	<b><i>C</i></b>																						
Lance-leaved violet (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<b>Guild 4. Cliff, talus slopes, and exposed rock habitat</b>																							
<i>Arctoparmelia centrifuga</i> (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<i>Arctoparmelia subcentrifuga</i> (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Long-leaved arnica (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Maidenhair spleenwort (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E

**Table WSS-2. Historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS plants on National Forest land.**

***Bold italicized*** letters (**C**) represent a positive change to current conditions  
**Bold underlined** (**C**) represents a negative change to current conditions.

A summary of the changes is at the bottom of the table.

Species	Historical	Current	Alt. A			Alt. B			Alt. C			Alt. D			Alt. E			Alt. F			Alt. G		
			2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10
Ross' sedge (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<i>Cladonia wainoi</i> (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Large-leaved sandwort (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Sticky locoweed (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Nodding saxifrage (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Encrusted saxifrage (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
False-asphodel (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Smooth woodsia (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
<b>Guild 5. Upland disturbed, barrens, or early successional forest habitat</b>																							
Pointed moonwort (SNF)	D	D	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D
Common moonwort (SNF)	D	D	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D
Michigan moonwort (SNF)	D	D	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D
Pale moonwort (SNF)	D	D	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D
Pale moonwort (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Ternate grapefern (SNF)	D	D	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D
Ternate grapefern (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Least grapefern (SNF)	D	D	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D
Least grapefern (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Black hawthorn (SNF)	D	E	<b><i>D</i></b>																				
<b>Guild 6a. Forested wetland – black spruce, tamarack, and mixed conifer</b>																							
<i>Caloplaca parvula</i> (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
White adder's mouth (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Western Jacob's ladder (CNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Small shinleaf (SNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Cloudberry (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
<i>Sticta fuliginosa</i> (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
<b>Guild 6b. Forested wetland – white cedar dominated</b>																							
Fairy slipper (SNF)	C	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D
Fairy slipper (CNF)	C	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D	D	D	D
<i>Cetraria aurescens</i> (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Ram's-head lady's slipper (SNF)	C	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D

**Table WSS-2. Historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS plants on National Forest land.**

***Bold italicized*** letters (**C**) represent a positive change to current conditions  
**Bold underlined** (**C**) represents a negative change to current conditions.

A summary of the changes is at the bottom of the table.

Species	Historical	Current	Alt. A			Alt. B			Alt. C			Alt. D			Alt. E			Alt. F			Alt. G		
			2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10
Ram's-head lady's slipper (CNF)	C	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D	D	D	D
Limestone oak fern (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<i>Menegazzia terebrata</i> (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
<i>Ramalina thrausta</i> (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
<i>Usnea longissima</i> (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
<b>Guild 7. Mesic hardwood-dominated forest</b>																							
Moschatel (SNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Triangle grape-fern (SNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Triangle grape-fern (CNF)	B	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Goblin fern (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Goblin fern (CNF)	B	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D	D	D	D
Blunt-lobed grapefern (CNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
New England sedge (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Goldie's wood fern (CNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
White trout lily (CNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
One-flowered broomrape (CNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Chilean sweet cicely (SNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Braun's holly fern (SNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Rough-fruited fairy bells (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Canada yew (SNF)	B	D	D	<u>E</u>	<u>E</u>	D	<b>C</b>	<b>C</b>	D	<u>E</u>	<u>E</u>	D	<b>C</b>	<b>C</b>	D	D	<u>E</u>	D	D	D	D	D	D
Canada yew (CNF)	B	D	D	<u>E</u>	<u>E</u>	D	<b>C</b>	<b>C</b>	D	<u>E</u>	<u>E</u>	D	<b>C</b>	<b>C</b>	D	D	D	D	D	D	D	D	D
Barren strawberry (SNF)	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
<b>Unguided</b>																							
<i>Peltigera venosa</i> (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
<i>Pseudocypbellaria crocata</i> (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Positive change from current outcome			1	1	1	1	3	3	1	1	1	1	3	3	1	1	1	1	1	1	1	1	1
Negative change from current outcome			8	10	10	6	6	6	8	10	10	6	6	6	2	2	3	0	0	0	0	0	0
No change from current outcome			68	66	66	70	68	68	68	66	66	70	68	68	74	74	73	76	76	76	76	76	76
Total			77			77			77			77			77			77			77		

Source: Biological Evaluation (USDA Forest Service 2004e, planning record)

### **3.3.5.a Affected Environment for Sensitive Species (Indicator 18)**

Sensitive species occur on the National Forests in a wide variety of environmental conditions ranging from highly isolated and existing at very low abundance (Outcome E) to broadly distributed and abundant (Outcome A). For some species, these conditions may result from effects of past or current management practices that have led to reductions of habitat and opportunity for population interactions on the landscape. For other sensitive species, suitable environmental conditions may not be greatly influenced by management, but have probably historically always been naturally rare.

The affected environment of each individual sensitive species is documented in the Biological Evaluation. Additionally, Tables WSS-1 and WSS-2 display the environmental condition through current and historical outcomes within the National Forests. Tables WSS-4 and WSS-5 display the cumulative effects analysis area.

RFSS also occur in a wide variety of habitats that may be influenced by the full array of proposed and probable management activities and multiple uses. These influences can alter habitat and impact species either negatively or positively and can affect their risk and likelihood of viability and well-distributed habitats on the National Forests. Additionally, factors outside the control of the National Forests may affect the likelihood that rare species may remain viable within the planning area.

In the EIS, coarse filter habitat links are documented (and analyzed) for forest-dependent and aquatic sensitive species in the following sections:

- Forest Type and Age Management Habitat Indicators (1-10) Section 3.3.1. (See Tables WLD-1-10)
- Forest Spatial Patterns Management Habitat Indicators (11-13) Section 3.3.2. (See Tables WLD-11-13)
- Lake and Stream Health Indicators (14) Section 3.3.3. (See Table WLD-14)

In addition, Appendix D (Tables DEIS-8-13) provides status and habitat associations for many of the other RFSS that are nonforest associates.

### **3.3.5.b Environmental Consequences for Sensitive Species (Indicator 18)**

#### **Effects Common to All Alternatives**

##### **Resource Protections Methods**

All alternatives promote the protection, enhancement or maintenance of sensitive species and the habitats upon which these species depend. The alternatives identify the role the National Forests play in contributing to the conservation of sensitive species and the habitats upon which they depend. While that role may vary among alternatives (for example, different alternatives provide differing total amounts and quality of suitable habitat conditions), all proposed management activities were developed to provide a likelihood of maintaining viability and well-distributed habitats (consistent with the historical range of the species) in the planning area. Where negative impacts cannot be avoided, management must not result in a trend toward federal listing.

##### **General Effects Common to All Alternatives**

The proposed and probable management activities of the alternatives may have a wide variety of predictable effects on RFSS. The amount, timing, location, or intensity of the activities influence the degree to which they may impact species and their habitats. These activities and risk factors can all cause effects to species through the alternation of habitat composition, structure, and function:

- Vegetation management, including timber harvest, forest regeneration, prescribed fire, and natural processes: alters habitat structure, composition, and function. Refer to Section 3.3.1.b and 3.6.1.b.
- Recreation management - impacts to habitat from ground disturbance associated with recreation, such as boat wakes, trampling at

campsites or beaches, rock climbing, ATV use, driving on Forest Service roads impacts. Also refer to Section 3.3.8 and 3.6.1.b.

- Road and trail construction: positive and negative impacts to habitat from ground disturbance associated with construction and maintenance of permanent and temporary roads and trail construction and maintenance include: potential erosion/sedimentation, soil compaction, gravel extraction, trampling, new habitat creation for species that are associated with disturbed habitats, habitat fragmentation, changed climatic conditions to adjacent forested habitats, vector for non-native invasive species and predators, increased human access with potential for impacts to species from harm, poaching, collection. See also 3.3.8 and for impacts to watershed health Section 3.6.1.b
- Non-native invasive species – competition from non-native invasive plants and noxious weeds, and impacts to habitat from exotic earthworms. Refer also to 3.3.7.b.
- Hydrologic alteration – impacts to habitat caused by changes in hydrology, such as natural or human-made impoundments (which could alter levels of shoreline fluctuations), wetland draining, or increases in water yield due to upland timber harvest.
- Herbivory – impacts to plant populations caused by herbivory, such as deer herbivory on Canada yew seedlings
- Herbicide application – impacts to plant populations from intentional or unintentional herbicide application
- Insect and disease – impacts to plant species populations from herbivorous insects and plant pathogens; both beneficial and negative impacts to animals from insect and disease within forest habitats, as indirect effect of vegetation management.

Many other factors that are not directly under the control or authority of the National Forests from cumulative effects standpoint may also impact RFSS. Refer to Section 3.3.5.d below.

On the Superior NF, management of the Boundary Waters Canoe Area wilderness will result in effects common to all alternatives. However, the BWCAW

will play different roles for each – with greater or lesser percentages of total available suitable habitat or other environmental conditions being provided by the wilderness in each alternative.

Further analysis of effects common to all alternatives is found for each species in the Biological Evaluation in the Planning Record.

### **Direct and Indirect Effects for Sensitive Species (Indicator 18)**

Direct and indirect effects on RFSS are evaluated in the Biological Evaluation and habitat outcomes and determination of effects are summarized in this section. As noted above, species were evaluated using a wide variety of quantitative and qualitative indicators and other information. For outcomes for all alternatives refer to Tables WSS-1 and WSS-2. For determination of effect refer to Table WSS-3 below.

The assessment for each alternative that follows summarizes changed outcomes. Because each RFSS has unique and often complex habitat requirements and associations and because each is affected differently by the full array of proposed or probable management activities, this section provides brief summaries of the main reasons for changes. For this purpose, broad and simplified groups of habitats, risks, or benefits are highlighted. As noted, more detailed analysis is provided in the Biological Evaluation.

An unchanged outcome does not mean that alternatives would not have impacts. For many of the RFSS expected changes to habitat conditions would have either negative or positive impacts (or both) from the array of proposed and probable management activities and programs. However, these impacts would not be great enough to result in changed outcomes. For some species this may be a) because Forest Plan management objectives, standards, and guidelines would ensure management emphasis on improving habitats or b) because of mitigations would be adopted to eliminate or reduce potential negative impacts.

For other of species with unchanged outcomes, Forest Plan management activities may have no or very minor impacts on species and their habitats.

Management activities often have no or very minor potential for direct effects on some habitats and the sensitive species they harbor. These would include habitats such as cliffs, habitats of rare disjunct species whose are fully protected, and much of the nonforest habitat on the Forests. In other habitats, management activities may have the potential for indirect effects to sensitive species' habitats, but these may be very minor. Examples of these are many of the nonforest habitats, some aquatic habitats, or habitat for species that may tolerate a very wide array of disturbed and undisturbed conditions. Additionally, many of the sensitive plants are habitat specialists whose abundance and distribution have probably not changed dramatically since historical times and would not likely change in response to alternatives.

### Alternative A

Based on environmental conditions in the planning area, Alternative A is expected to result in a high risk of loss of viability and well-distributed habitat in the planning area for four Chippewa NF birds (northern goshawk, spruce grouse, black-throated blue warbler, and bay-breasted warbler) and two Superior NF birds (boreal owl and black-throated blue warbler). However, this is not expected to cause a trend toward federal listing based on the conditions on other ownerships and other parts of the species' ranges. Further discussion is provided for each of these species below following Table WSS-3.

Alternative A is also expected to lead to a decrease in outcomes from current conditions for 17, 21, and 21 species in Decades 2, 5, and 10, respectively. This includes the species noted above. The decreased outcomes are generally related to potential negative impacts of Alternative A's proposed management activities. The main reasons for declines are related, but not limited to, the following effects:

- Expected increase in deer populations and subsequent increased risk of herbivory to populations of some sensitive plants.
- Expected decreases in mature, old, old growth, and multi-aged forest conditions and subsequent declines in amounts, distribution, and quality of suitable and well-distributed habitat conditions for some sensitive species.

- Increase in habitat fragmentation and loss of large blocks of forest interior habitat and subsequent declines in amounts, distribution, and quality of suitable and well-distributed habitat conditions for some sensitive species.
- Relatively high amounts of timber harvest with expected decreases in native plant community structural and compositional complexity and the potential for soil compaction, erosion, sedimentation with subsequent declines in amounts, distribution, and quality of suitable and well-distributed habitat conditions for some sensitive species.
- Relatively low amounts of prescribed fire and low representation of ecological process of fire required by some sensitive species.
- Amount of trails and temporary and low standard roads constructed for management activities and the potential for ground disturbance, soil compaction, erosion, sedimentation, habitat fragmentation, vector for predator and nonnative invasive species invasion with subsequent potential negative impacts to terrestrial and aquatic habitat quality.
- Relatively high amounts of clearcutting timber harvest and resulting high amount of forest in young and open conditions with subsequent potential negative impacts to overall watershed health.
- Recreation impacts to habitat from ground disturbance associated with recreation, such as boat wakes, trampling at campsites or beaches, rock climbing, ATV use, or driving on Forest Service roads may have potential negative impacts to terrestrial and aquatic habitat quality.

Although these potential negative impacts are expected to lead to decreased habitat outcomes, plan objectives, standards, and guidelines are likely to mitigate these impacts to ensure that implementation of the plan is not the cause of a loss of viability or a trend toward federal listing.

Alternative A is expected to improve outcomes from current conditions for 2, 2, and 6 plant and animal species in Decades 2, 5, and 10, respectively. The increased outcomes are generally related to potential beneficial impacts of Alternative A's proposed

management activities. The main reasons for increases are related, but not limited to the following factors and effects:

- Increase in amount of mature, old and old growth lowland conifer forest with subsequent increase, especially by Decade 10, in suitable and well-distributed habitat.
- Increased number of large patches and acres of mature and older northern hardwood forest with subsequent increase in suitable and well-distributed habitat conditions.
- Increase in amount of disturbed (timber harvest) forest with subsequent increase in amount and distribution of suitable and well-distributed habitat conditions for species.

The majority of species are not expected to have changed outcomes: 114, 110, and 110 species in Decades 2, 5, and 10, respectively. See discussion above at the beginning of the Direct and Indirect Effects section.

### Alternative B

In the planning area based on environmental conditions in the planning area, Alternative B is not expected to result in a high risk of loss of viability and well-distributed habitat in the planning area for any plant or animal species on the Chippewa NF or the Superior.

Alternative B is expected to lead to a decrease in outcomes from current conditions for 6, 6, and 6 plant species only in Decades 2, 5, and 10, respectively. The decreased outcomes are generally related to an overall expected decrease in the amount of upland disturbed, barrens, or early successional forests due, for the most part, to a relatively low amount of timber harvest and road construction.

Although these potential negative impacts are expected to lead to decreased habitat outcomes, plan objectives, standards, and guidelines are likely to mitigate these impacts to ensure that implementation of the plan is not the cause of a loss of viability or a trend toward federal listing.

Alternative B is expected to improve outcomes from current conditions for 18, 25, and 28 plant and animal

species in Decades 2, 5, and 10, respectively. The increased outcomes are generally related to potential beneficial impacts of Alternative B's proposed management activities. The main reasons for increases are related, but not limited to the following factors and effects:

- Increased number of large patches and acres of mature and older forest with subsequent increase in suitable and well-distributed habitat conditions for most of the sensitive species. This includes an increase in interior forest and a decrease in edge habitat. These may lead to fewer deer and also decrease potential for herbivory harmful to some species.
- Increase in amount of mature, old and old growth forest with structural and compositional diversity with subsequent increases in suitable and well-distributed habitat for most of the sensitive species.
- Increase in the amount of upland conifer forest with subsequent increases in suitable and well-distributed habitat for many of the sensitive species.
- Decreased amount of road construction with subsequent decreased potential for habitat fragmentation, compaction, erosion, sedimentation, or vectors for predator and nonnative invasive species invasion with subsequent potential beneficial impacts to terrestrial and aquatic habitat quality.
- Increase in acres of prescribe burned forest and increase in acres of insect and disease-killed or damaged forest with subsequent increase in suitable and well-distributed habitat for several sensitive species.
- Improved watershed health indicators with decreased impacts to aquatic ecosystems with subsequent improved habitat quality for sensitive species associated with aquatic and riparian habitats.

The majority of species are not expected to have changed outcomes: 109, 102, and 99 species in Decades 2, 5, and 10, respectively. See discussion above at the beginning of the Direct and Indirect Effects section.

### Alternative C

In the planning area based on environmental conditions in the planning area, Alternative C is expected to result in a high risk of loss of viability and well-distributed habitat in the planning area for three bird species (northern goshawk, spruce grouse, and black-throated blue warbler) on the Chippewa NF and three birds (northern goshawk, boreal owl and black-throated blue warbler) on the Superior. However, this is not expected to cause a trend toward federal listing based on the conditions on other ownerships and other parts of the species' ranges. Further discussion is provided for each of these species below following Table WSS-3.

Alternative C is also expected to lead to a decrease in outcomes from current conditions for 17, 20, and 20 plant and animal species in Decades 2, 5, and 10, respectively. This includes the species noted above. The decreased outcomes are generally related to potential negative impacts of Alternative C's proposed management activities. Almost all RFSS with a decrease are the same species as those decreasing in Alternative A. The impacts causing decreased outcomes are also generally the same for these two alternatives. Please refer to the discussion under Alternative A above.

Although potential negative impacts are expected to lead to these decreased habitat outcomes, plan objectives, standards, and guidelines are likely to mitigate impacts to ensure that implementation of the plan is not the cause of a loss of viability or a trend toward federal listing.

Alternative C is expected to improve outcomes from current conditions for 1, 2 and 8 plant and animal species in Decades 2, 5, and 10, respectively. Most of RFSS with increases are the same species as those increasing in Alternative C. The impacts causing increased outcomes are also generally the same for these two alternatives, though Alternative A generally provides more of those positive conditions than C. Please refer to the discussion under Alternative A above.

The majority of species are not expected to have changed outcomes: 115, 111, and 105 species in Decades 2, 5, and 10, respectively. See discussion

above at the beginning of the Direct and Indirect Effects section.

### Alternative D

In the planning area based on environmental conditions in the planning area, Alternative D is not expected to result in a high risk of loss of viability and well-distributed habitat in the planning area for any plant or animal species on the Chippewa NF or the Superior.

Alternative D is expected to lead to a decrease in outcomes from current conditions for 6, 6, and 6 plant species in Decades 2, 5, and 10, respectively. The decreased outcomes are generally related to an overall expected decrease in the amount of upland disturbed, barrens, or early successional forests due, for the most part, to a relatively low amount of timber harvest and road construction. This would result in a decreased amount and distribution of habitat from both current and historical conditions on NFS land. This would result in a decreased amount and distribution of habitat from both current and historical conditions on NFS land.

Although these potential negative impacts are expected to lead to decreased habitat outcomes, plan objectives, standards, and guidelines are likely to mitigate these impacts to ensure that implementation of the plan is not the cause of a loss of viability or a trend toward federal listing.

Alternative D is expected to improve outcomes from current conditions for 23, 29 and 31 plant and animal species in Decades 2, 5, and 10, respectively. Most of RFSS with increases are the same species as those increasing in Alternative B. The impacts causing increased outcomes are also generally the same for these two alternatives, though Alternative D generally provides more of those positive conditions than B. Please refer to the discussion under Alternative B above.

The majority of species are not expected to have changed outcomes: 104, 98, and 96 species in Decades 2, 5, and 10, respectively. See discussion above at the beginning of the Direct and Indirect Effects section.

## Modified Alternative E

In the planning area based on environmental conditions in the planning area, Modified Alternative E is not expected to result in a high risk of loss of viability and well-distributed habitat in the planning area for any plant or animal species on the Chippewa NF or the Superior.

Modified Alternative E is expected to lead to a decrease in outcomes from current conditions for 5, 7, and 7 plant and animal species in Decades 2, 5, and 10, respectively. The decreased outcomes are generally related to potential negative impacts of Modified Alternative E's proposed management activities. All species with a decrease are a subset of those species decreasing in Alternative A. The reasons for decrease are also the same. Please refer to the list of reasons for decrease under Alternative A above. Overall, however, amounts and impacts on quality of those conditions that have led to decreases in Modified Alternative E are not as extensive as in Alternative A. Thus, fewer species reached a threshold of negative change.

Although these potential negative impacts are expected to lead to decreased habitat outcomes, Plan objectives, standards, and guidelines are likely to mitigate these impacts to ensure that implementation of the plan is not the cause of a loss of viability or a trend toward federal listing.

Modified Alternative E is expected to improve outcomes from current conditions for 8, 9, and 13 plant and animal species in Decades 2, 5, and 10, respectively. The increased outcomes are generally related to potential beneficial impacts of Modified Alternative E's proposed management activities. The main reasons for increases are related, but not limited to the following factors and effects:

- Improved watershed health indicators with decreased impacts to aquatic ecosystems with subsequent improved habitat quality for sensitive species associated with aquatic and riparian habitats.
- Increase in the amount of upland conifer forest with subsequent increases in suitable and well-distributed habitat for some sensitive species.

- Long term increased number of large patches and acres of mature and older forest with subsequent increase in suitable and well-distributed habitat conditions for most of the sensitive species.

The majority of species are not expected to have changed outcomes: 120, 110, and 113 species in Decades 2, 5, and 10, respectively. See discussion above at the beginning of the Direct and Indirect Effects section.

## Alternative F

In the planning area based on environmental conditions in the planning area, Alternative F is not expected to result in a high risk of loss of viability and well-distributed habitat in the planning area for any plant or animal species on the Chippewa NF or the Superior.

Alternative F is expected to lead to a decrease in outcomes from current conditions for 0, 4, and 3 animal species only in Decades 2, 5, and 10, respectively. The decreased outcomes are generally related to potential negative impacts of Alternative F's proposed management activities. The main reason for declines is related, but not limited to, the following effects:

- Gradually declining watershed health indicators with increased impacts to aquatic ecosystems with subsequent decline in habitat quality for sensitive species associated with aquatic and riparian habitats.

Although these potential negative impacts are expected to lead to decreased habitat outcomes, plan objectives, standards, and guidelines are likely to mitigate these impacts to ensure that implementation of the plan is not the cause of a loss of viability or a trend toward federal listing.

Alternative F is expected to improve outcomes from current conditions for 14, 17, and 20 plant and animal species in Decades 2, 5, and 10, respectively. The increased outcomes are generally related to potential beneficial impacts of Alternative F's proposed management activities. Most of RFSS with increases are the same species as those increasing in Alternative B. The impacts causing increased outcomes are also

generally the same for these two alternatives, though Alternative B generally provides more of those positive conditions than F. Please refer to the discussion under Alternative B above.

The majority of species are not expected to have changed outcomes: 119, 112, and 110 species in Decades 2, 5, and 10, respectively. See discussion above at the beginning of the Direct and Indirect Effects section.

### **Alternative G**

In the planning area based on environmental conditions in the planning area, Alternative G is not expected to result in a high risk of loss of viability and well-distributed habitat in the planning area for any plant or animal species on the Chippewa NF or the Superior.

Alternative G is also not expected to lead to a decrease in outcomes for any plant and animal species in Decades 2, 5, or 10.

Alternative G is expected to improve outcomes from current conditions for 9, 16, and 20 plant and animal species in Decades 2, 5, and 10, respectively. Most of RFSS with increases are the same species as those increasing in Alternative B. The impacts causing increased outcomes are also generally the same for these two alternatives, though Alternative B generally provides more of those positive conditions than G. Please refer to the discussion under Alternative B above.

The majority of species are not expected to have changed outcomes: 124, 117, and 113 species in Decades 2, 5, and 10, respectively. See discussion above at the beginning of the Direct and Indirect Effects section.

### **Determination of Effect**

Table WSS-3 displays the *determination of effects* of alternatives. As noted above, this determination specifically provides the judgment of Forest Service biologists on which of four conditions (shown on the bottom row of Table WSS-3) are most likely from the impacts of the alternatives. Determinations are expressed as “likelihoods” or “risk” because of uncertainty inherent in evaluating both future

scenarios and many sensitive species whose environmental conditions are often not well understood.

For most (102 of 107) sensitive species we determined that all alternatives would either 1) have no impact on species, 2) benefit species, or 3) impact individuals but not be likely to cause loss of viability on the National Forests or trend toward federal listing under the alternatives. No species were determined to be at a high risk of a trend toward federal listing. Five species were determined to have a risk of a loss of viability on the planning area in one or more alternatives: northern goshawk and black-throated blue warbler on the Chippewa and Superior; spruce grouse and bay-breasted warbler on the Chippewa, and boreal owl on the Superior. Northern goshawk is discussed in Section 3.3.6.1. The effects on other four species are summarized below.

<b>Table WSS-3. Summary of Determination of Effect for Sensitive Species.</b>								
<b>SPECIES</b>	<b>NF</b>	<b>Alternative</b>						
		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E*</b>	<b>F</b>	<b>G</b>
<b>Animals</b>								
Northern goshawk	Chip	4a	2	4a	2	3	2	3
Northern goshawk	Sup	3	2	4a	2	3	2	3
Red-shouldered hawk	Chip	3	2	3	2	3	2	2
Peregrine falcon	Sup	1	1	1	1	1	1	1
Sharp-tailed grouse	Both	1	1	1	1	1	1	1
Spruce Grouse	Chip	4a	2	4a	2	3	2	3
Boreal owl	Sup	4a	3	4a	3	3	3	3
Black-backed woodpecker	Chip	3	3	3	2	3	3	3
Three-toed woodpecker	Sup	3	3	3	2	3	3	3
Black-throated blue warbler	Chip	4a	2	4a	2	3	2	3
Black-throated blue warbler	Sup	4a	3	4a	3	3	3	3
Bay-breasted warbler	Chip	4a	3	3	3	3	3	3
Connecticut warbler	Both	3	3	3	2	3	3	3
Least darter	Chip	3	2	3	2	3	3	3
Creek heelsplitter	Both	3	3	3	2	3	3	3
Fluted-shell mussel	Both	3	3	3	2	3	3	3
Black sandshell	Both	3	2	3	2	3	3	3
All other Sensitive Animals	Both	3	3	3	3	3	3	3
<b>Plants</b>								
All Sensitive Plants	Chip	3	3	3	3	3	3	3
All Sensitive Plants	Sup	3	3	3	3	3	3	3
<b>Definitions</b> <b>1.</b> = No impacts <b>2.</b> = Beneficial effects <b>3.</b> = May impact individuals but is not likely to cause a trend to federal listing or loss of viability. <i>(This condition may be used when it is determined the proposed alternative may cause some negative effects, even if overall effects to species may be beneficial.)</i> <b>4a.</b> = High risk of loss of viability in the planning area, but not likely to cause a trend toward federal listing. <b>4b.</b> = Likely to result in a loss of viability and a trend toward federal listing Source: Biological Evaluation (USDA Forest Service, 2004e, planning record)								

### *Spruce Grouse (Chippewa)*

Spruce grouse is bird of coniferous forests, most closely associated with jack pine, lowland and upland black spruce and tamarack forests that provide suitable escape cover (adequate density of conifers). The Chippewa is at the southern edge of its range. Spruce grouse populations are difficult to monitor, but currently population is very low on the Chippewa. (USDA Forest Service 2002d, planning record)

All alternatives except for A and C may impact spruce grouse but are not likely to cause a trend toward federal listing or loss of viability. Risk factors that are judged to cause a high risk of loss of viability under Alternatives A and C include: species is on the edge of its range on the Chippewa and therefore is more vulnerable to reduction of suitable conditions than some other species that use similar habitat; Alternatives A and C generally provide low opportunity for restoration of fire as an ecosystem process and which helps maintain grouse habitat; and Alternatives A and C result in a relatively high fragmentation of large mature upland forest patches that are estimated to provide suitable habitat. More detailed analysis is provided in the Biological Evaluation.

### *Bay-breasted warbler (Chippewa)*

Bay-breasted warbler is a conifer-dependent species at the southern edge of its range in the sub-boreal coniferous forest zone (USDA Forest Service 2002d, planning record). It is highly associated with spruce budworm outbreaks. All alternatives except Alternative A may impact but are not likely to cause a trend to federal listing or loss of viability. Ninety percent of the bay-breasted warbler's breeding habitat is in Canada. At the edge of its range on the Chippewa, the species is likely more vulnerable to habitat loss than some other sensitive species that use similar conifer forest habitats. Alternative A may result in a decrease of well-distributed habitat for the bay-breasted warbler, and this may result in a risk of loss of viability. This loss of habitat well-distributed is a result of reduction from current conditions of future suitable mature spruce-fir forest habitat represented by Management Indicator Habitat 6b – conifer forest (Figure WLD-6b), Management Indicator Habitat 9b – mature lowland black spruce-tamarack forest (Figure WLD-9b), and Management

Indicator Habitat 13 – large patches of mature upland forest (Table FSP-1 in Chapter 3.2 Vegetation).

Although there is a risk of loss of viability on the planning area, with ninety percent of the bay-breasted warbler's breeding habitat in Canada, a healthy source population may help to keep the population on the Chippewa from trending toward listing. More detailed analysis is provided in the Biological Evaluation.

### *Boreal owl (Superior)*

The boreal owl is found at low population densities as a regular breeding species throughout northeastern Minnesota, which appears to be the southern extent of this species' breeding range in eastern North America (USDA Forest Service 2002d, planning record). The owl is associated with older trembling aspen and aspen-conifer mixed forest for nesting and nearby areas of mature and multiaged lowland black spruce for roosting and foraging (USDA Forest Service 2002d, planning record).

All alternatives except for A and C may impact individuals but are not likely to cause a trend to federal listing or loss of viability on the planning area. Alternatives A and C have a risk of loss of viability in the planning area.

Reduction in Forest-wide suitable owl habitat (mature upland forest in proximity to large patches or tracts of mature lowland conifer) is the reason for a risk of loss of viability and is related to loss of well-distributed habitat. Habitat in the BWCAW is likely to continue to provide sufficient amounts and distribution to provide for the owl, but reduced well-distributed habitat outside the wilderness is diminished enough in the first two decades that there is concern for viability. In Alternatives A and C, alternatives result in a Forest-wide reduction in upland nesting habitat of 20-32% in the second decade; 12-15% decrease Forest-wide in large upland forest patches (51-55% decrease outside the BWCAW); up to a 21% Forest-wide decrease in mature lowland conifer forest - including a 35% reduction in large lowland conifer patches outside of the BWCAW. This level of fragmentation is expected to increase predation levels as well as competitors. Cumulatively, the loss of habitat and edge effects are expected to be as great as or greater than our forest-wide predictions for these alternatives. More detailed analysis is provided in the Biological Evaluation.

### *Black-throated blue warbler (Chippewa and Superior)*

The black-throated blue warbler is on the western edge of its range in Minnesota. This warbler is associated with relatively large blocks of contiguous mature deciduous or mixed deciduous/coniferous forest with well-developed deciduous shrub understory. In addition, black-throated blue warblers are found only in relatively large blocks of contiguous mature forest (USDA Forest Service 2002d, planning record).

On the Chippewa, Alternatives B, D, and F are expected to have beneficial impacts on the black-throated blue warbler. Alternatives Modified E and G impact individuals but are not likely to cause a trend to federal listing or loss of viability on the planning area. On the Superior, all alternatives except A and C may impact individuals but are not likely to cause a trend to federal listing or a loss of viability on the planning area.

On both Forests Alternatives A and C have a high risk of loss of viability in the planning area, but are not likely to cause a trend toward federal listing. Risk of loss of viability is related to a loss of amounts and distribution of habitat in the planning area (Chippewa) and a loss of well-distributed habitat on the Superior. On the Chippewa these alternatives result in at least a 40% reduction in very large patches of habitat and over a 40% forest-wide reduction in mature or older forest that could potentially serve as habitat if aggregated spatially. On the Superior these alternatives would cause as much as a 65 to 75% reduction in very large patches of habitat. Management intensity outside the BWCAW would greatly reduce the distribution of this species' habitat. More detailed analysis is provided in the Biological Evaluation.

### **Cumulative Effects for Sensitive Species (Indicator 18)**

Cumulative effects for sensitive species are described in the Biological Evaluation and provided in Tables WSS-4 and WSS-5 below. For many species, in general, cumulative and direct/indirect effects are

similar among alternatives because, since historical times, similar types of disturbances and management practices and activities have occurred in the cumulative effects analysis area as have occurred in the direct effects analysis area. Refer to summary of indirect and direct effects in Section 3.3.5.b above. Similar actions on other ownerships have similar effects. However, for some species associated with mature and older deciduous and conifer upland forest, cumulative effects contribute to greater loss of habitat in Alternatives, A and C and sometimes Modified E, F, and G. Refer to

Many other factors that are not directly under the control or authority of the National Forests from cumulative effects standpoint may also impact RFSS. Refer to Section 3.3.5.d below. These include, but are not limited to:

- Collection – impacts to plant populations caused by plant collection.
- Development – impacts to habitat from ground disturbance caused by development, such as building construction, highway construction, mining, increased human development and access on private lands
- Pollution – impacts to habitat from pollution, such as acid rain, environmental contaminants, or eutrophication of lakes caused by nutrient enrichment,
- Climate – impacts to habitat and species populations from such factors as precipitation, drought, longer-term climate change.
- Erosion – impacts to habitat from large scale erosion events such as landslides
- Small population problems – impacts to population persistence caused by problems associated with small populations, such as genetic drift, inbreeding depression, and demographic stochasticity.

Cumulative effects described for northern goshawk in Section 3.3.6.1b provide a good indicator of cumulative impacts to other sensitive species require mature and older upland forests, because it is a “management indicator species”, indicating the effects of management on other species.

**Table WSS-4. Cumulative historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS animals.**

**Bold italicized** letter (***C***) represents a positive change to current conditions.  
**Bold underlined** letter (**C**) represents a negative change to current conditions.  
 A summary of the changes is at the bottom of the table.

Species	Historical	Current	Alt. A			Alt. B			Alt. C			Alt. D			Mod Alt. E			Alt. F			Alt. G			
			2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	
<b>MAMMALS</b>																								
Heather vole (SNF)	C	D	<u>E</u>	<u>E</u>	<u>E</u>	<i>C</i>	<i>C</i>	<i>C</i>	D	D	D	<i>C</i>	<i>C</i>	<i>C</i>	D	<i>C</i>								
Northern bog lemming (CNF)	C	E	E	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>											
<b>BIRDS</b>																								
Trumpeter swan (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Northern goshawk (SNF)	A	<i>C</i>	<u>D</u>	<u>D</u>	<u>D</u>	<i>C</i>	<i>A</i>	<i>A</i>	<u>D</u>	<u>D</u>	<u>D</u>	<i>C</i>	<i>A</i>	<i>A</i>	<u>D</u>	<i>C</i>								
Northern goshawk (CNF)	A	D	<u>E</u>	<u>E</u>	<u>E</u>	<i>C</i>	<i>B</i>	<i>B</i>	<u>E</u>	<u>E</u>	<u>E</u>	<i>C</i>	<i>B</i>	<i>B</i>	<u>E</u>	<i>C</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	D	<i>C</i>	<i>C</i>
Red-shouldered hawk (CNF)	B	D	D	D	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	D	D	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	D	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>	<i>B</i>	D	<i>C</i>	<i>B</i>	<i>B</i>
Peregrine falcon (SNF)	D	E	E	E	<i>D</i>	E	E	<i>D</i>	E	E	<i>D</i>	E	E	<i>D</i>	<i>D</i>									
Sharp-tailed grouse (SNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Sharp-tailed grouse (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Spruce grouse (CNF)	C	D	<u>E</u>	<u>E</u>	<u>E</u>	D	<i>C</i>	<i>C</i>	<u>E</u>	<u>E</u>	D	D	<i>C</i>	<i>C</i>	D	D	D	D	<i>C</i>	<i>C</i>	D	D	D	D
Yellow rail (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Yellow rail (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Wilson's phalarope (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Wilson's phalarope (CNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Common tern (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Caspian tern (CNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Black tern (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Black tern (CNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Great gray owl (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Great gray owl (CNF)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Boreal owl (SNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Black-backed woodpecker (CNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D

**Table WSS-4. Cumulative historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS animals.**

***Bold italicized*** letter (***C***) represents a positive change to current conditions.  
**Bold underlined** letter (**C**) represents a negative change to current conditions.  
 A summary of the changes is at the bottom of the table.

Species	Historical Current	Alt. A			Alt. B			Alt. C			Alt. D			Mod Alt. E			Alt. F			Alt. G		
		2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10
Three-toed woodpecker (SNF)	C D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Olive-sided flycatcher (SNF)	B D	D	D	D	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	D	D	D	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	D	D	D	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>
Olive-sided flycatcher (CNF)	B D	D	D	D	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	D	D	D	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	D	D	D	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>
Black-throated blue warbler (SNF)	B C	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	C	C	C	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	C	C	C	<b><u>E</u></b>	<b><u>D</u></b>	<b><u>D</u></b>	<b><u>D</u></b>	C	C	<b><u>D</u></b>	C	C
Black-throated blue warbler (CNF)	B D	<b><u>E</u></b>	<b><u>E</u></b>	D	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	<b><i>C</i></b>	<b><i>C</i></b>	<b><i>C</i></b>	<b><u>E</u></b>	D	D	D	<b><i>C</i></b>	<b><i>C</i></b>	D	<b><i>C</i></b>	<b><i>C</i></b>
Bay-breasted warbler (SNF)	B C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Bay-breasted warbler (CNF)	D E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Connecticut warbler (SNF)	C C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Connecticut warbler (CNF)	C C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
LeConte's sparrow (SNF)	D D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
LeConte's sparrow (CNF)	D D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Nelson's sharp-tailed sparrow (CNF)	C D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<b>HERPS</b>																						
Wood turtle (SNF)	D D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Blanding's turtle (CNF)	C D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Four-toed salamander (CNF)	C D	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	D	<b><u>E</u></b>	D	<b><i>C</i></b>	D	<b><i>C</i></b>	<b><i>C</i></b>	D	D	<b><i>C</i></b>
<b>FISH</b>																						
Lake Sturgeon (SNF)	A B C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Shortjaw cisco (SNF)	A B B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Least darter (CNF)	A C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Northern brook lamprey (SNF)	C C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Greater redhorse (CNF)	B C	<b><u>D</u></b>																				

**Table WSS-4. Cumulative historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS animals.**

***Bold italicized* letter (C)** represents a positive change to current conditions.  
**Bold underlined letter (C)** represents a negative change to current conditions.  
A summary of the changes is at the bottom of the table.

Species	Historical Current	Alt. A			Alt. B			Alt. C			Alt. D			<b>Mod Alt. E</b>			Alt. F			Alt. G		
		2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10
Pugnose shiner (CNF)	B C	C	<u>D</u>	<u>D</u>	C	C	C	C	<u>D</u>	<u>D</u>	C	C	C	C	<u>D</u>	<u>D</u>	C	<u>D</u>	<u>D</u>	C	C	C
<b>MOLLUSKS</b>																						
Creek heelsplitter (SNF)	B C	C	C	C	<b>B</b>	<b>B</b>	<b>B</b>	<u>D</u>	<u>D</u>	<u>D</u>	<b>B</b>	<b>B</b>	<b>B</b>	C	C	C	C	C	C	C	C	C
Creek heelsplitter (CNF)	B C	<u>D</u>	<u>D</u>	<u>D</u>	<b>B</b>	<b>B</b>	<b>B</b>	<u>D</u>	<u>D</u>	<u>D</u>	<b>B</b>	<b>B</b>	<b>B</b>	C	C	C	C	C	C	C	C	C
Fluted-shell mussel (SNF)	C E	E	E	E	<b>D</b>	<b>D</b>	<b>D</b>	E	E	E	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>
Fluted-shell mussel (CNF)	C E	E	E	E	<b>D</b>	<b>D</b>	<b>D</b>	E	E	E	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>
Black sandshell (SNF)	B D	D	D	D	<b>B</b>	<b>B</b>	<b>B</b>	D	D	D	<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>
Black sandshell (CNF)	B D	D	D	D	<b>B</b>	<b>B</b>	<b>B</b>	D	D	D	<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>
<b>BUTTERFLIES</b>																						
Taiga alpine (SNF)	C D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Red-disked alpine (SNF)	C C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Nabokov's northern blue (SNF)	D E	E	E	E	E	E	<b>D</b>	E	E	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	E	<b>D</b>	<b>D</b>	E	<b>D</b>	<b>D</b>	E	<b>D</b>	<b>D</b>
Jutta arctic (SNF)	D D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Grizzled skipper (SNF)	D D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<b>OTHER INSECTS</b>																						
Vertrees's caddisfly (CNF)	C D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Tiger beetle species (SNF)	B B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Positive change from current outcome		0	0	2	13	15	17	0	1	4	14	16	17	5	9	11	10	14	15	8	11	14
Negative change from current outcome		9	10	9	1	1	1	9	10	7	1	1	1	6	3	3	2	2	2	2	1	1
No change from current outcome		47	46	45	42	40	38	47	45	45	41	39	38	45	44	42	44	40	39	46	44	41

Source: Biological Evaluation for RFSS animals

**Table WSS-5. Cumulative historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS plants.**

***Bold italicized*** letter (C) represents a positive change to current conditions.  
**Bold underlined** letter (C) represents a negative change to current conditions.  
 A summary of the changes is at the bottom of the table.

Species	Historical	Current	Alt. A			Alt. B			Alt. C			Alt. D			Alt. E			Alt. F			Alt. G		
			2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10
<b>Guild 1. Shallow water/littoral zone – fluctuating shore</b>																							
Alpine milkvetch (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Katahdin sedge (SNF)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Creeping rush (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
American shore-grass (SNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Awlwort (SNF)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Awlwort (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<b>Guild 2. Riparian – aquatic, open marsh, and alder/shrub dominated</b>																							
Floating marsh Marigold (SNF)	C	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D	D	D	D
Dwarf water-lily (SNF)	C	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D	D	D	D
Auricled twayblade (SNF)	C	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	<u>E</u>	<u>E</u>	<u>E</u>	D	D	D	D	D	D	D	D	D	D	D	D
<b>Guild 3. Nonforest wetland, disturbed wetland, and fluctuating shore – predominantly open</b>																							
Swamp beggar-ticks (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Pond reedgrass (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Neat spike-rush (SNF)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Olivaceous spike-rush (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Few-flowered spike-rush (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Moor rush (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Vasey's rush (SNF)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fall dropseed muhly (SNF)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Small green woodland orchid (SNF)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Small green woodland orchid (CNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Northern bur-reed (SNF)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Northern bur-reed (CNF)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Lance-leaved violet (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<b>Guild 4. Cliff, talus slopes, and exposed rock habitat</b>																							
<i>Arctoparmelia centrifuga</i> (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<i>Arctoparmelia subcentrifuga</i> (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Long-leaved arnica (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Maidenhair spleenwort (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Ross' sedge (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<i>Cladonia wainoi</i> (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Large-leaved sandwort (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Sticky locoweed (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Nodding saxifrage (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Encrusted saxifrage (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
False-asphodel (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E

**Table WSS-5. Cumulative historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS plants.**

***Bold italicized*** letter (**C**) represents a positive change to current conditions.  
**Bold underlined** letter (**C**) represents a negative change to current conditions.  
A summary of the changes is at the bottom of the table.

Species	Historical	Current	Alt. A			Alt. B			Alt. C			Alt. D			Alt. E			Alt. F			Alt. G		
			2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10
			E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Smooth woodsia (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
<b>Guild 5. Upland disturbed, barrens, or early successional forest habitat</b>																							
Pointed moonwort (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Common moonwort (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Michigan moonwort (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Pale moonwort (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Pale moonwort (CNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Ternate grapefern (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Ternate grapefern (CNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Least grapefern (SNF)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Least grapefern (CNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Black hawthorn (SNF)	D	<b><u>E</u></b>	<b><u>D</u></b>																				
<b>Guild 6a. Forested wetland – black spruce, tamarack, and mixed conifer</b>																							
<i>Calopluca parvula</i> (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
White adder's mouth (CNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Western Jacob's ladder (CNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Small shinleaf (SNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Cloudberry (SNF)	D	<b><u>E</u></b>																					
<i>Sticta fuliginosa</i> (SNF)	D	<b><u>E</u></b>																					
<b>Guild 6b. Forested wetland – white cedar dominated</b>																							
Fairy slipper (SNF)	<b>C</b>	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	D	D	D
Fairy slipper (CNF)	<b>C</b>	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	D	D	D	D	D	D	D	D	D
<i>Cetraria aurescens</i> (SNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Ram's-head lady's slipper (SNF)	<b>C</b>	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	D	D	D
Ram's-head lady's slipper (CNF)	<b>C</b>	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	D	D	D	D	D	D	D	D	D
Limestone oak fern (CNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<i>Menegazzia terebrata</i> (SNF)	D	<b><u>E</u></b>																					
<i>Ramalina thrausta</i> (SNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
<i>Usnea longissima</i> (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
<b>Guild 7. Mesic hardwood-dominated forest</b>																							
Moschatel (SNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Triangle grape-fern (SNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Triangle grape-fern (CNF)	<b>B</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Goblin fern (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Goblin fern (CNF)	<b>B</b>	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	<b><u>E</u></b>	<b><u>E</u></b>	<b><u>E</u></b>	D	D	D	D	D	D	D	D	D	D	D	D
Blunt-lobed grapefern (CNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
New England sedge (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Goldie's wood fern (CNF)	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
White trout lily (CNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
One-flowered broomrape (CNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Chilean sweet cicely (SNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Braun's holly fern (SNF)	<b>C</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Rough-fruited fairy bells (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E

**Table WSS-5. Cumulative historical, current, and future (Decades 2, 5, and 10) outcomes for RFSS plants.**

***Bold italicized*** letter (***C***) represents a positive change to current conditions.  
**Bold underlined** letter (**C**) represents a negative change to current conditions.  
 A summary of the changes is at the bottom of the table.

Species	Historical		Alt. A			Alt. B			Alt. C			Alt. D			Alt. E			Alt. F			Alt. G		
	B	D	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10	2	5	10
Canada yew (SNF)	B	D	D	<u>E</u>	<u>E</u>	D	<u>C</u>	<u>C</u>	D	<u>E</u>	<u>E</u>	D	<u>C</u>	<u>C</u>	D	D	<u>E</u>	D	D	D	D	D	D
Canada yew (CNF)	B	D	D	<u>E</u>	<u>E</u>	D	<u>C</u>	<u>C</u>	D	<u>E</u>	<u>E</u>	D	<u>C</u>	<u>C</u>	D	D	D	D	D	D	D	D	D
Barren strawberry (SNF)	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
<b>Unguided</b>																							
<i>Peltigera venosa</i> (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
<i>Pseudocyphellaria crocata</i> (SNF)	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Positive change from current outcome			1	1	1	1	2	2	1	1	1	1	3	3	1	1	1	1	1	1	1	1	1
Negative change from current outcome			8	10	10	0	0	0	8	10	10	0	0	0	2	2	3	0	0	0	0	0	0
No change from current outcome			68	66	66	76	75	75	68	66	66	76	74	74	74	74	73	76	76	76	76	76	76
Total			77			77			77			77			77			77			77		

Source: Biological Evaluation (USDA Forest Service 2004e, planning record)