

## Guidelines for Assigning Statewide Biodiversity Significance Ranks to Minnesota Biological Survey Sites

Biodiversity significance ranks are a measure of the statewide importance of Minnesota County Biological Survey (MCBS) sites for native biological diversity. They are assigned by MCBS ecologists at the conclusion of work in a survey region and are based on the presence of rare species at a site, the size and condition of native plant communities (NPCs) within the site, and the landscape context of the site. Biodiversity significance ranks are used to prioritize and guide conservation and management of MCBS sites.

To assign biodiversity significance ranks, MCBS sites are grouped and rated for each of Minnesota’s ecological classification system (ECS) subsections. Ranking sites by subsection helps to highlight the best examples of Minnesota’s rare species and native plant communities in all of the state’s diverse landscapes. There are four biodiversity significance ranks—**outstanding**, **high**, **moderate**, and **below**—which are defined in the table below. Explanations of technical terms are provided on the following page.

	<b>OUTSTANDING</b>	<b>HIGH</b>	<b>MODERATE</b>
<b>Rare Species</b>	<p>Sites containing the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most intact functional landscapes. These sites are characterized by one or more of the criteria (I, II, III) below.</p> <p><b>I.</b> One of the best occurrences of a G1, G2, S1, or S2 species. <b>or</b> A concentration (four or more) of excellent or good occurrences (<b>A</b> or <b>B</b> rank) of S1, S2, or S3 species, at least one of which is an S1 or S2 species.</p> <p>These species occurrences must be in an NPC assigned a Condition Rank of <b>C</b> or above (except for special circumstances where plant communities are not present, such as a bat cave or mussel bed).</p>	<p>Sites containing very good quality occurrences of the rarest species, high-quality examples of rare NPCs, and/or important functional landscapes. These sites are characterized by one or more of the criteria (I, II, III) below.</p> <p><b>I.</b> A <b>B</b> or <b>C</b> rank occurrence of a G1, G2, S1, or S2 species. <b>or</b> A concentration (four or more) of <b>A</b> or <b>B</b> rank occurrences of S3 species.</p> <p>These species occurrences must be in an NPC assigned a Condition Rank of <b>C</b> or above (except for special circumstances where plant communities are not present, such as a bat cave or mussel bed).</p>	<p>Sites containing occurrences of rare species, moderately disturbed NPCs, and/or landscapes that have strong potential for recovery. These sites are characterized by one or more of the criteria (I, II, III) below.</p> <p><b>I.</b> A <b>C</b> or <b>D</b> rank occurrence of a G1, G2, S1, or S2 species. <b>or</b> A single <b>A</b> or <b>B</b> rank occurrence of an S3 species. <b>or</b> Two or more <b>BC</b> or <b>C</b> rank occurrences of an S3 species.</p> <p>These species occurrences must be in an NPC assigned a Condition Rank of <b>C</b> or above (except for special circumstances where plant communities are not present, such as a bat cave or mussel bed).</p>
<b>Native Plant Community</b>	<p><b>II.</b> One of the highest quality examples (based on Condition Rank, size, and context) in an ECS subsection of the rarest (i.e., S1, S2, or S3) NPCs. <b>or</b> A group of important NPCs (S1, S2, or S3) that together are of sufficient size and quality to constitute one of the highest quality natural areas in an ECS subsection.</p>	<p><b>II.</b> A high-quality example (based on Condition Rank of <b>B</b> or higher, size, and context)—though not among the best in an ECS subsection—of one of the rarest (S1, S2, or S3) NPCs.</p>	<p><b>II.</b> An occurrence of an NPC with a Condition Rank of <b>C</b> or above. <b>or</b> An occurrence of an S1 or S2 NPC with a Condition Rank of <b>CD</b> that is among the largest for the NPC type in an ECS subsection.</p>
<b>Landscape Context</b>	<p><b>III.</b> One of the largest, least-fragmented, least-developed landscape areas in an ECS subsection, with the full spectrum of matrix to small patch NPCs (any S rank; mostly <b>A</b> to <b>BC</b> Condition Ranks) and the highest potential for intact ecological functioning (e.g., fire, natural patch dynamics, natural water-level fluctuations).</p>	<p><b>III.</b> A little-fragmented, little-developed landscape area that has the full spectrum of matrix to small-patch native plant communities (any S rank), high potential for intact ecological functioning, <b>and</b> also fits one of the following descriptions:</p> <ul style="list-style-type: none"> <li>- It is mostly composed of <b>A</b> to <b>BC</b> Condition Rank NPCs but is not one of the largest landscape areas in the ECS subsection.</li> </ul> <p><b>or</b></p> <ul style="list-style-type: none"> <li>- It is one of the largest landscape areas in the ECS subsection but has significant amounts of human-induced disturbance such that the Condition Ranks of most NPCs are <b>BC</b> or less.</li> </ul>	<p><b>III.</b> A little-developed landscape area that is not among the largest in an ECS subsection and is not mostly composed of <b>A</b> to <b>BC</b> Condition Rank NPCs, but has high potential to recover the full spectrum from matrix to small patch NPCs and intact ecological functioning.</p>
	<p><b>BELOW</b></p> <p>Sites below the minimum threshold for statewide biodiversity significance. These sites lack occurrences of rare species and natural features, or do not meet MCBS standards for Outstanding, High, or Moderate rank. These sites may include areas of conservation value at the local level such as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, or areas with good potential for restoration of native habitat.</p>		

## Terms Used in Guidelines for Assigning Biodiversity Significance Ranks

### Native Plant Community

A native plant community (NPC) is a group of native plants that interact with each other and with their environment in ways not greatly altered by modern human activity or by introduced organisms. These groups of native plant species form recognizable units, such as oak savannas, pine forests, or marshes, that tend to repeat over space and time. Native plant communities are classified and described by considering vegetation, hydrology, landforms, soils, and natural disturbance regimes. Examples of natural disturbances include wildfires, severe droughts, windstorms, and floods. For an overview of Minnesota's NPCs, see <http://www.dnr.state.mn.us/npc/classification.html>.

### Ecological Classification System Subsection

An ecological classification system (ECS) subsection is a unit of the Minnesota Department of Natural Resources' hierarchical system for ecological mapping and landscape classification. Subsections are defined using glacial deposition processes, surface bedrock formations, local climate, topographic relief, and the distribution of plants, especially trees. Minnesota has 26 subsections. For more information, see <http://www.dnr.state.mn.us/ecs/index.html>.

### G-ranks and S-ranks for Rare Species and Native Plant Communities

The rare species and native plant communities documented by MCBS have been assigned conservation status ranks according to a method developed by the conservation organization NatureServe and its member natural heritage programs. These ranks reflect the relative imperilment of the world's species and native plant communities. Conservation status ranks are assigned on a scale of 1 to 5:

- 1 = critically imperiled
- 2 = imperiled
- 3 = vulnerable to extirpation or extinction
- 4 = apparently secure
- 5 = demonstrably widespread, abundant, and secure.

Assignment of these ranks is based on a variety of factors, including abundance, distribution, trends, and threats. Conservation status is determined at three geographic scales: global (G), national (N), and state or province (S). As a result, there are three sets of ranks, each consisting of a letter indicating the geographic scale of the assigned rank, followed by a number indicating the imperilment of the species or plant community at that scale. For example, a "G1" species or native plant community is critically imperiled across its entire range (i.e., globally) and is regarded as being at very high risk for extirpation. An "S3" species or community, in comparison, is vulnerable and at moderate risk within a particular state, although it may be secure elsewhere.

### Occurrence Ranks for Rare Species

Occurrence ranks for rare species are intended to reflect the likelihood that an occurrence or population of a rare plant or animal species will persist under current conditions. The criteria used in ranking rare species occurrences include population size and occupied area, habitat conditions, and landscape context. Ranks are assigned on a scale of A to D.

**A-rank** occurrences have large population size and occupy large areas of good quality habitat in favorable landscape settings and are therefore very likely to persist for the foreseeable future in their current condition or better.

**B-rank** occurrences have population size, area and quality of habitat, and landscape settings that make them likely to persist for the foreseeable future in their current condition or better.

**C-rank** occurrences are unlikely to persist under current conditions, or may persist for the foreseeable future with appropriate protection or management, or are likely to persist but may not maintain current or historical levels of population size or genetic variability.

**D-rank** occurrences have high risk of extirpation because of small population size or area of occupancy, deteriorated habitat, poor conditions for reproduction, inappropriate management, or other factors.

### Condition Ranks for Native Plant Communities

Condition Ranks for native plant communities reflect the degree of ecological integrity of a specific occurrence of a native plant community. Condition Ranks are assigned by considering species composition, vegetation structure, ecological processes and functions, level of human disturbance, presence of exotic species, and other factors. Condition Ranks are assigned on a scale of A to D.

**A-rank** occurrences have excellent ecological integrity. They have species composition, structure, and ecological processes typical of the natural or historic range of the community and have been little disturbed by recent human activity or invasive species.

**B-rank** occurrences have good ecological integrity. They include lightly disturbed plant communities and communities that were disturbed in the past but have recovered and now have relatively natural composition and structure. B-rank occurrences normally will return to A-rank condition with protection or appropriate management.

**C-rank** occurrences have fair ecological integrity. They show strong evidence of human disturbance, but retain some characteristic species and have some potential for recovery with protection and management.

**D-rank** occurrences have poor ecological integrity. The original composition and structure of the community have been severely altered by human disturbances or invasion by exotic species. They have little chance of recovery to their natural or historic condition.

### Native Plant Community Size

For a site to be ranked "OUTSTANDING" or "HIGH" based on a plant community occurrence, the community must be of sufficient quality and size that its long-term survival is likely. This means that the community is large enough to allow for continuation of the ecological processes that shaped the community or for their maintenance through management. Exemplary are fire-dependent communities that occur in landscapes still influenced by wildfires or in settings where it is possible to use fire as a management tool. Specific criteria for what constitutes large versus small for any given community type are not incorporated into these guidelines because community types occur in different sizes depending on the community and location in Minnesota. For example, a 20-acre mesic prairie in southeastern Minnesota is considered to be highly significant because of the near absence of that prairie type in the region and may be the largest and best example of the community in a given ECS subsection. A 20-acre prairie is less significant in parts of northwestern Minnesota where larger examples remain.

### Landscape Context

The viability of a given plant community or rare species population is highly dependent on landscape context (i.e., the condition of the surrounding landscape). Sites ranked "OUTSTANDING" or "HIGH" based on landscape context must have sufficient areas of native habitat surrounding the rare species or plant community occurrences that the long-term survival of these features is likely. These sites occur in intact, functional landscapes composed predominantly of native plant communities, including matrix and large-patch communities that cover large areas of the landscape as well as communities that develop in small patches on cliffs, in small wetlands, or in other localized habitats. Intact landscapes are characterized by ecological processes that have not been disrupted by modern human activity. For example, Minnesota's prairies historically were maintained by frequent wildfires but with land-clearing and habitat fragmentation, wildfires in prairie landscapes have greatly diminished in frequency. Prairies surrounded by cleared or developed land must be deliberately managed with fire to persist and are more vulnerable to being overrun by invasive species than prairies in intact landscapes.