



Minnesota Biological Survey

Upland Prairie System – Condition Ranking Guidelines

(This is a working document that is periodically revised as new information is available)

September 2014 version

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 degraded by recent human activity or invasive species.
- B-rank occurrences have good ecological integrity. They include plant communities with modest degradation or that were degraded 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-caused degradation, 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-caused degradation or invasion by exotic species. They have little chance of recovery to their natural or historic condition.

-
- The Upland Prairie System contains the following native plant community classes and types:
 - UPn12 Northern Dry Prairie
 - UPn12a Dry Barrens Prairie (Northern)
 - UPn12b Dry Sand – Gravel Prairie (Northern)
 - UPn12c Dry Sand – Gravel Brush Prairie (Northern)
 - UPn12d Dry Hill Prairie (Northern)
 - UPn13 Northern Dry Savanna
 - UPn13a Dry Barrens Jack Pine Savanna (Northern)
 - UPn13b Dry Barrens Oak Savanna (Northern)
 - UPn13c Dry Sand-Gravel Oak Savanna (Northern)
 - UPn13d Dry Hill Oak Savanna (Northern)
 - UPn23 Northern Mesic Prairie
 - UPn23a Mesic Brush-Prairie (Northern)
 - UPn23b Mesic Prairie (Northern)
 - UPn24 Northern Mesic Savanna
 - UPn24a Mesic Oak Savanna (Northern)
 - UPn24b Aspen Openings (Northern)
 - UPs13 Southern Dry Prairie
 - UPs13a Dry Barrens Prairie (Southern)
 - UPs13b Dry Sand – Gravel Prairie (Southern)
 - UPs13c Dry Bedrock Bluff Prairie (Southern)
 - UPs13d Dry Hill Prairie (Southern)
 - UPs14 Southern Dry Savanna
 - UPs14a Dry Barrens Oak Savanna (Southern)
 - UPs14a1 Jack Pine Subtype

- UPs14a2 Oak Subtype
 - UPs14b Dry Sand-Gravel Oak Savanna (Southern)
 - UPs14c Dry Hill Oak Savanna (Southern)
 - UPs23 Southern Mesic Prairie
 - UPs23a Mesic Prairie (Southern)
 - UPs24 Southern Mesic Savanna
 - UPs24a Mesic Oak Savanna (Southern)
- For information on the plant community classes, types, and subtypes in this System, please refer to the Upland Prairie System in the *Field Guide to Native Plant Communities of Minnesota: The Prairie Parkland and Tallgrass Aspen Parklands Provinces* (MNDNR 2005) or the *Field Guide to Native Plant Communities of Minnesota: The Eastern Broadleaf Forest Province* (MNDNR 2005). Native plant community class fact sheets from the field guides are available on-line at: <http://www.dnr.state.mn.us/npc/classification.html>
- For checklists and distribution maps of native plant species in Minnesota, refer to the MNDNR's State Checklists on the MNDNR website at: http://www.dnr.state.mn.us/eco/mcbs/plant_lists.html

1) What is an A-rank Occurrence?:

- Site has structure and composition free of human-caused degradation, including overgrazing, poorly-timed haying, fire suppression and forest/woodland succession, herbicide application/drift, invasive species invasion, fertilizer drift, tree planting, excessive burning, and ATV use. A-rank occurrences are considered high-quality prairie and typically have the following conditions:
 - A diverse assemblage of native species is present, including “decreaser” species (see Weaver 1954) that decline with persistent moderate to heavy grazing (Table 1).
 - A-rank prairies properly managed with light or periodic grazing for conservation, in combination with controlled burns and rest, will likely have greater overall species richness (number of species) than ungrazed sites, but will also contain a full complement of decreaser species appropriate for the prairie type and geographic region. Though species richness is high, many decreaser and increaser species are naturally not abundant. Some decreaser species increase in abundance with light grazing (e.g., prairie plum [*Astragalus crassicaarpus*]) but decrease with heavier grazing.
 - The vegetation often has heterogeneous patterns of species composition and structure, typically including distinct patches or zones that correlate with variation in microenvironmental conditions, fire frequency, or other disturbances such as grazing. Different dominant species and floras will occur in wet-mesic, mesic, dry-mesic, and dry microhabitats. Vegetation structure and species abundances may also vary from year to year, due to variation in management practices and weather conditions.
 - Non-native, invasive species are absent or are minor components. Kentucky bluegrass (*Poa pratensis*) and/or Canada bluegrass (*Poa compressa*) are present in nearly all prairies and savannas remaining today but in high-quality prairies are sparse and do not displace native species.
 - For prairies, overall tree cover is generally <10% and limited to fire-tolerant species. Fire-sensitive woody species are restricted to naturally fire-protected microsites.
 - For savannas, total tree cover averages 10 to 70%, with trees scattered and/or in small to large clusters. Trees have open-grown growth form and are fire-tolerant/dependent species, such as bur oak and northern pin oak.

2) What is a B-rank Occurrence?:

- Site has structure and composition similar to that of an A-rank occurrence, but has altered species abundances and richness due to moderate levels of degradation from overgrazing, poorly-timed haying, woody plant invasion, minor wetland drainage, fertilizer drift, minor herbicide exposure, invasive species, tree planting, or low to moderate ATV use. B-rank occurrences are considered high-quality prairie and typically have the following conditions:
 - Site has high native species richness but some decreaser species appropriate to the site are missing, and other decreaser species are much more uncommon than in A-rank sites (Table 1).
 - Some prairies are in this condition as a result of past land use and not present management.
 - In savannas, total tree cover averages 10 to 70%, with trees in scattered and/or clumped patterns. Fire-tolerant/dependent species with open-grown growth form predominate, but fire-sensitive native woody species have become well-established.
 - Low to moderate levels of invasive species may be present.
 - In sites that have been grazed, compaction and hummocking of the ground surface is minimal to moderate.

3) What is a C-rank Occurrence?:

- Site is still dominated by native species, but has undergone moderate to heavy degradation from overgrazing, wetland drainage, fire suppression, repeated herbicide treatment, siltation, invasive species invasion, or tree planting. C-rank occurrences are considered fair-quality prairie and typically have the following conditions:
 - Native graminoids and shrubs still dominate throughout most of the site, but overall plant species richness and diversity is low due to loss of most decreaser and many increaser species (Tables 1 and 2). Portions of the site (such as mesic toe slopes on hillsides) may be dominated by exotic species.
 - In persistently heavily grazed prairies and savannas, dominance shifts to native graminoids that are more resilient to heavy grazing, including species of grama grass (*Bouteloua* spp.), three-awn (*Aristida* spp.), Scribner's panic grass (*Dichanthelium oligoanthos*), Wilcox's panic grass (*Dichanthelium wilcoxianum*), western wheatgrass (*Pascopyrum smithii*), purple lovegrass (*Eragrostis spectabilis*), and, in shaded areas, Pennsylvania sedge (*Carex pennsylvanica*). Grass species that are less resilient to persistent heavy grazing may be somewhat sparse, including prairie dropseed (*Sporobolus heterolepis*), big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), junegrass (*Koeleria pyramidata*), and Canada wild rye (*Elymus canadensis*).
 - In savannas, enough structure remains so that the community is still recognizable as savanna. In most cases, succession to woodland/forest is progressing, and often is quite far along, although some patches still retain the native prairie flora of open savanna.
 - Invasive species are often abundant, including smooth brome (*Bromus inermis*), Kentucky bluegrass, Canada bluegrass, timothy (*Phleum pratense*), black medic (*Medicago lupulina*), red clover (*Trifolium repens*), or redtop (*Agrostis gigantea*) (Table 3).
 - In persistently overgrazed sites, the ground surface is compacted and slopes are terraced.

4) What is a D-rank Occurrence?:

- Site has been highly degraded and the native vegetation has been severely altered, but enough native species are present that the occurrence can still be recognized as the community type it was prior to being degraded. D-rank occurrences are considered poor-quality prairie and typically have the following conditions:
 - Open areas in the site are dominated by exotic species, typically smooth brome, Kentucky bluegrass, Canada bluegrass, quackgrass (*Elymus repens*), and/or redtop (Table 3), but native graminoids are common enough for the occurrence to be recognized as native prairie or savanna and not old field. Buckthorn (*Rhamnus cathartica*) may be abundant in shaded portions of savannas.
 - Overall native species richness is very low.
 - Generally a few, highly disturbance-tolerant increaser species, such as Canada goldenrod (*Solidago canadensis*), wolfberry (*Symphoricarpos occidentalis*), or rough fleabane (*Erigeron strigosus*) are highly abundant (Table 2). Pennsylvania sedge and armed shrubs often dominate shaded areas in savannas.
 - In overgrazed sites, the ground surface is often highly compacted and slopes are often highly terraced.
 - D-rank occurrences include sites dominated by native grasses where herbicide has repeatedly been applied and all forbs and shrubs are absent.

5) Mapping notes:

- Mesic Oak Savanna: map all occurrences, as this community is all but extirpated from the state.
- All other communities:
 - Map A- to D-rank occurrences that are 5 acres or larger.
 - Map smaller occurrences if they meet one of the following exceptions:
 - It is within a larger area of native plant communities important for conservation action.
 - It is part of a series of small occurrences—such as numerous small dry prairies along a valley slope.
 - It is habitat for a rare species.
 - It is one of very few occurrences of the type in an LTA.
 - It is A- or B-rank.
- On rare occasions, a reconstructed or restored prairie may be sufficiently diverse—consisting of species and ecotypes appropriate for its location—to be ranked as a native plant community. If such a site is virtually indiscernible from a native occurrence, it may be mapped and ranked according to the criteria in these guidelines, but polygon attributes and other database entries should note that it is restored/reconstructed.
- Generally, small (2-acre) dry prairie openings in savanna-dominated landscapes are mapped as savanna, though larger areas of prairie have been mapped as dry prairie apart from adjacent savanna.

Reference:

Weaver, J.E. 1954. North American Prairie. Johansen Publishing Co., Lincoln, NE.

Table 1. Examples of grazing decrease¹ in Upland Prairie System communities:

Common Name	Scientific Name	Limited Distribution
Glaucous false dandelion	<i>Agoseris glauca</i>	Western MN
Prairie wild onion	<i>Allium stellatum</i>	
Leadplant	<i>Amorpha canescens</i>	
Fragrant false indigo	<i>Amorpha nana*</i>	Rarely seen in SW MN
Big bluestem	<i>Andropogon gerardii</i>	
Bearberry	<i>Arctostaphylos uva-ursi</i>	Dunes, sand-gravel
Woolly milkweed	<i>Asclepias lanuginosa</i>	Dry prairie
Oval-leaved milkweed	<i>Asclepias ovalifolia*</i>	
Showy milkweed	<i>Asclepias speciosa</i>	Wet to mesic prairie, Western MN
Prairie milk-vetch	<i>Astragalus adsurgens</i>	
Canada milkvetch	<i>Astragalus canadensis</i>	
Ground plum	<i>Astragalus crassicaerpus</i>	
False boneset	<i>Brickellia eupatorioides</i>	
Toothed-leaved evening primrose	<i>Calylophus serrulatus</i>	
American New Jersey tea	<i>Ceanothus americanus</i>	Southern MN
Irish moss	<i>Cetraria arenaria (a lichen)*</i>	
Reindeer lichens	<i>Cladina spp.*</i>	
Bird's foot coreopsis	<i>Coreopsis palmata*</i>	Southern MN & S end of NW MN
White prairie clover	<i>Dalea candida var. candida*</i>	
Purple prairie clover	<i>Dalea purpurea</i>	
Silky prairie clover	<i>Dalea villosa*</i>	Dunes
Canada tick trefoil	<i>Desmodium canadense</i>	
Leiberg's panic grass	<i>Dichanthelium leibergii*</i>	
Narrow-leaved purple coneflower	<i>Echinacea angustifolia</i>	Western MN
Canada wild rye	<i>Elymus canadensis</i>	
Rattlesnake master	<i>Eryngium yuccifolium*</i>	Southeastern MN
Blanket-flower	<i>Gaillardia aristata</i>	Sand-gravel prairie in NW MN
Bottle gentian	<i>Gentiana andrewsii</i>	
Downy gentian	<i>Gentiana puberulenta</i>	
Stiff gentian	<i>Gentianella quinquefolia</i>	SE MN
Canada frostweed	<i>Helianthemum canadense*</i>	SE MN, sand-gravel savanna
Stiff sunflower	<i>Helianthus pauciflorus</i>	
Ox-eye	<i>Heliopsis helianthoides</i>	
Porcupine grass	<i>Hesperostipa spartea</i>	
Alumroot	<i>Heuchera richardsonii</i>	
Long-bearded hawkweed	<i>Hieracium longipilum</i>	SE MN sand-gravel prairie
Rough blazing star	<i>Liatris aspera</i>	
Cylindric blazing star	<i>Liatris cylindracea</i>	SE MN & Ordway Prairie
Northern plains blazing star	<i>Liatris ligulistylis*</i>	Wet-mesic prairie
Wood lily	<i>Lilium philadelphicum*</i>	
Plains muhly	<i>Muhlenbergia cuspidata</i>	Dry hill prairie
Rhombic-petaled evening primrose	<i>Oenothera rhombipetala</i>	SE MN dunes
Silver-leaved scurfpea	<i>Pedimelum argophyllum</i>	
Prairie turnip	<i>Pedimelum esculentum</i>	
Prairie phlox	<i>Phlox pilosa*</i>	Southern MN & southern end of UPn23
Tall cinquefoil	<i>Potentilla arguta</i>	
Smooth rattlesnakeroot	<i>Prenanthes racemosa*</i>	
Little bluestem	<i>Schizachyrium scoparium</i>	
Rock spikemoss	<i>Selaginella rupestris*</i>	Dunes, rock outcrops
Compass plant	<i>Silphium laciniatum*</i>	Southernmost 2-3 tiers of counties in MN
Upland white aster	<i>Solidago ptarmicoides</i>	
Showy goldenrod	<i>Solidago speciosa</i>	
Indian grass	<i>Sorghastrum nutans</i>	
Prairie dropseed	<i>Sporobolus heterolepis*</i>	
Western spiderwort	<i>Tradescantia occidentalis</i>	Dunes, sand-gravel prairie
Heart-leaved alexanders	<i>Zizia aptera*</i>	

¹ species that appear to decrease in abundance with persistent moderate to heavy grazing

* species that appear to be the most sensitive to grazing

Table 2. Examples of grazing increasers² in Upland Prairie System communities:

Yarrow	<i>Achillea millefolium</i>	Fall witch grass	<i>Digitaria cognata</i> (E MN)
Rough false foxglove	<i>Agalinus aspera</i>	Ridge-seeded spurge	<i>Euphorbia glyptosperma/geyeri</i>
Ragweed species	<i>Ambrosia spp.</i>	Grass-leaved goldenrod	<i>Euthamia graminifolia</i>
Western androsace	<i>Androsace occidentalis</i>	Western sunflower	<i>Helianthus occidentale</i> (SE MN)
Pasqueflower	<i>Anemone patens var. multifida</i>	Hairy golden aster	<i>Heterotheca villosa</i>
Pussytoes species	<i>Antennaria spp.</i>	Baltic rush	<i>Juncus arcticus v. balticus</i> (w.mesic)
Three-awn species	<i>Aristida spp.</i>	Eastern red cedar	<i>Juniperus virginiana</i>
Sage species	<i>Artemisia spp.</i>	Stiffstem flax	<i>Linum rigidum</i>
Whorled milkweed	<i>Asclepias verticillata</i>	Green-flowered peppergrass	<i>Lepidium densiflorum</i>
Sideoats grama	<i>Bouteloua curtipendula</i>	Skeletonweed	<i>Lygodesmia juncea</i> (W MN)
Blue grama	<i>Bouteloua gracilis</i>	Wild bergamot	<i>Monarda fistulosa</i>
Hairy grama	<i>Bouteloua hirsuta</i>	Horsemint	<i>Monarda punctata</i> (dunes SE MN)
Threadleaf sedge	<i>Carex filifolia</i> (dry prairie)	Green needle grass	<i>Nasella viridula</i>
Sun-loving sedge	<i>Carex inops</i>	Common evening primrose	<i>Oenothera biennis</i>
Pennsylvania sedge	<i>Carex pensylvanica</i> (shade)	False gromwell	<i>Onosmodium molle</i>
Dry spike sedge	<i>Carex siccata</i> (dunes, sand-gravel)	White beard tongue	<i>Penstemon albidus</i> (W MN)
Spikerush sedge	<i>Carex duriuscula</i> (dry prairie)	Slender beard tongue	<i>Penstemon gracilis</i>
Field chickweed	<i>Cerastium arvense</i>	Pennsylvania cinquefoil	<i>Potentilla pensylvanica</i> (W MN)
Nuttall's groundrose	<i>Chamaerhodos erecta</i> (NW MN, snd-g)	Virginia mountain mint	<i>Pycnanthemum virginianum</i>
Toadflax	<i>Comandra umbellata</i>	Prairie coneflower	<i>Ratibola columnifera</i> (W MN)
Slender nut-sedge	<i>Cyperus lupulinus</i> (dunes)	Gooseberry species	<i>Ribes spp.</i> (shade)
Schweinitz's nut-sedge	<i>Cyperus schweinitzi</i> (dunes)	Blackberry species	<i>Rubus spp.</i> (shade)
Scribner's panic grass	<i>Dichanthelium oligosanthes</i>	Canada goldenrod	<i>Solidago canadensis</i>
Wilcox's panic grass	<i>Dichanthelium wilcoxianum</i> (sand)	Missouri goldenrod	<i>Solidago missouriensis</i>
Yellow whitlow grass	<i>Draba nemorosa</i>	Gray goldenrod	<i>Solidago nemoralis</i>
Carolina whitlow grass	<i>Draba reptans</i>	Stiff goldenrod	<i>Solidago rigida</i>
Western wheatgrass	<i>Pascopyrum smithii</i> (W MN)	Rough dropseed	<i>Sporobolus compositus</i>
Field horsetail	<i>Equisetum arvense</i>	Sand dropseed	<i>Sporobolus cryptandrus</i> (dunes)
Daisy fleabane	<i>Erigeron strigosus</i>	Wolfberry	<i>Symphoricarpos occidentalis</i>
Flowering spurge	<i>Euphorbia corollata</i> (SE MN)	Heath aster	<i>Symphytotrichum ericoides</i>
Ridge-seeded spurge	<i>Euphorbia glyptosperma/geyeri</i>	Hoary vervain	<i>Verbena stricta</i>
Grass-leaved goldenrod	<i>Euthamia graminifolia</i>	Ironweed	<i>Vernonia fasciculata</i> (wet-mesic)
Prairie smoke	<i>Geum triflorum</i>	Prairie bird's foot violet	<i>Viola palmata var. pedatifida</i>
Mock pennyroyal	<i>Hedeoma hispida</i> (SE MN)	Prickly ash	<i>Zanthoxylum americanum</i> (shade)
Giant sunflower	<i>Helianthus gigantea/grosseserratus</i>		

² species that appear to increase in abundance with persistent moderate to heavy grazing

Table 3. Examples of invasive species in Upland Prairie System communities:

Redtop	<i>Agrostis stolonifera/ gigantea</i>	Curly cup gumweed	<i>Grindelia squarrosa</i>
Absinthe wormwood	<i>Artemisia absinthium</i>	Stickseed species	<i>Lappula spp.</i>
Hoary alyssum	<i>Berteroa incana</i>	Butter-and-eggs	<i>Linaria vulgaris</i>
Smooth brome	<i>Bromus inermis</i>	Tartarian honeysuckle	<i>Lonicera tatarica</i>
Japanese brome	<i>Bromus japonicus</i>	Black medic	<i>Medicago lupulina</i>
Cheatgrass	<i>Bromus tectorum</i>	Sweet clover species	<i>Melilotus spp.</i>
Plumeless thistle	<i>Carduus acanthoides</i>	Wild parsnip	<i>Pastinaca sativa</i>
Nodding (musk) thistle	<i>Carduus nutans</i>	Timothy	<i>Phleum pratense</i>
Spotted knapweed	<i>Centaurea maculosa</i>	Common plantain	<i>Plantago major</i>
Canada thistle	<i>Cirsium arvense</i>	Pursh's plantain	<i>Plantago patagonica</i>
Bull thistle	<i>Cirsium vulgare</i>	Canada bluegrass	<i>Poa compressa</i>
Horseweed	<i>Conyza canadensis</i>	Kentucky bluegrass	<i>Poa pratensis</i>
Crown vetch	<i>Coronilla varia</i>	Buckthorn	<i>Rhamnus cathartica</i>
Orchard grass	<i>Dactylis glomerata</i>	Russian thistle	<i>Salsola iberica/ tragus</i>
Wild carrot	<i>Daucus carota</i>	Dandelion	<i>Taraxacum spp.</i>
Russian olive	<i>Eleagnus angustifolia</i>	Clover species	<i>Trifolium spp.</i>
Quack grass	<i>Elymus repens</i>	Stinging nettle	<i>Urtica dioica</i>