

Minnesota Biological Survey

Prairie Extremely Rich Fen – Condition Ranking Guidelines

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

February 2018 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.
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- The Prairie Extremely Rich Fen Class contains the following native plant community types:
 - OPp93a Calcareous Fen (Northwestern)
 - OPp93b Calcareous Fen (Southwestern)
 - OPp93c Calcareous Fen (Southeastern)
- For information on this plant community class, please refer to the material on the Open Rich Peatland 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). Ecological system summaries and native plant community class fact sheets from the field guides are available online 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. Disturbances affecting calcareous fens include: interruptions to subsurface groundwater flows (well pumping, gravel mining), interruptions to surface water infiltration within recharge zones (large-scale paving, wetland draining), grazing, draining, flooding, siltation, herbicide drift, invasive species invasion, fertilizer inputs, road-salt runoff, ATV use, and excavation/filling activities (dugout, stock pond, impoundment, road or berm construction). A-rank occurrences typically have the following conditions:
 - Site has a natural hydrologic regime in which upwelling groundwater flow in the fen has not been decreased or interrupted by human activities within the groundwater recharge area. Evidence of intact hydrology includes frequent groundwater pools and areas of calcium carbonate precipitates on the peat surface. (Few to no groundwater pools and high cover (>30%) of tall shrubs (>1.3m tall) are common indicators of decreased groundwater flow.)
 - A diverse assemblage of the characteristic native fen species is present. Specialist plants that are distinctive for calcareous fens are abundant (refer to *Field Guides to Native Plant Communities of Minnesota* listed above).
 - Vegetation does not have increased abundance of native species that increase in response to human-caused disturbance and degradation (see Table 1 below).
 - Invasive species are absent or at most barely present.
 - Site is not surrounded by cultivated or developed land (which leads to high probability of chemical- or silt-laden runoff into fen).
 - Site does not have hummocking from cattle or other grazers or compaction from ATV or other trails.

2) What is a B-rank Occurrence?

- Site has structure and composition similar to that of an A-rank community. The natural hydrology may have been slightly altered by human activity, and the fen may have experienced minor degradation from other disturbances, such as light to moderate grazing, minor wetland drainage, minor herbicide exposure, low levels of invasive species, or low to moderate ATV use. Typical conditions of B-rank occurrences:
 - Site has ample and sustained groundwater flows as demonstrated by the presence of open groundwater pools and calcium carbonate precipitates on the peat surface. Ditches, if present, are shallow and do not effectively drain the peat soils. Dugouts/ponds may be present at the perimeter of the fen, but have not significantly affected fen hydrology or resulted in the spread of invasive species into the fen.
 - Site may have evidence of having been eroded by ditches at the outer edges of the wetland or depleted by peat fires.
 - Site has nearly the full range of species present in an A-rank community, but some of the distinctive fen species are uncommon or sparse.
 - Native species that increase in response to human-caused disturbance and degradation may be moderately abundant.
 - Central area of fen is undisturbed and lacks invasive species but some disturbance has occurred to the margins, as indicated by the presence of invasive species such as *Typha angustifolia*, *Typha x glauca*, *Phalaris arundinacea*, *Phragmites australis*, or *Sonchus spp.*
 - In fens that occur within pastures, compaction and hummocking of the ground surface by livestock is minimal and confined to the outer edges of the fen.

3) What is a C-rank Occurrence?

- Site is still dominated by native species, but it has moderate to heavy degradation from moderate to heavy grazing; wetland drainage; haying; significant herbicide exposure; inputs of fertilizer, road salt, herbicides or silt from runoff; significant invasive species invasion; dugout, impoundment, or other berm construction; or flooding by beaver activity. The natural hydrology may have been moderately altered by human activity. Typical conditions of C-rank occurrences:
 - Specialist plant species that are distinctive for calcareous fens are present but many or all are not abundant. Some of these species may be absent due to loss of microhabitats such as open pools (although heavy grazing on the edges of perched fens may lead to an increase in the distinctive fen species *Rhynchospora capillacea* and *Triglochin palustris* by creating more of the exposed peat microhabitat these species occupy.)
 - Open groundwater pools are absent or much reduced due to decreased groundwater flow.
 - Organic substrate may be less than 0.5m deep, with evidence of being eroded by ditches at the outer edges of the wetland or depleted by peat fires, or having subsided due to decreased groundwater inputs.
 - Tall (> 1.3m) shrubs are dense (50% to 70% cover) due to lowered water table, although shrubs are patchy enough that there are still open areas dominated by narrow-leaved graminoids throughout the fen.
 - Native plant species that increase with disturbance may be abundant (see Table 1 below).
 - Invasive species may be present, but are localized, patchy, or sparsely distributed. *Typha angustifolia* or *T. x glauca* may be present across the fen but not dense enough to exclude distinctive fen species. Total cover of other species such as *Phalaris arundinacea* or *Phragmites* spp. is <10%.
 - In sites grazed by cattle, the ground surface may have moderate physical damage, compaction, and/or hummocking.
 - ATV or other trails may be present and causing localized alteration of the vegetation or substrate.
 - The site may be transected by existing utility lines (powerlines, phone lines, pipelines), but their impact on the fen is localized and does not affect the hydrology.
 - Any ditches that transect the area are shallow and do not effectively drain the peat soils.

4) What is a D-rank Occurrence?

Site has been highly disturbed and the native vegetation is severely altered, but enough native species are present that the wetland is still recognizable as a calcareous fen. Typical conditions of D-rank occurrences:

- Native species diversity is low due to loss of microhabitats such as open pools.
- Disturbance increasers are abundant (see Table 1 below).
- Invasive species are abundant throughout, and may dominate the fen.
- Tall shrub cover may exceed 70%.
- The area may be transected by numerous ATV trails or severely compromised by mining pits, ditching, pipelines, buried cables, powerlines, peat mining, or dugouts.
- Site is surrounded by cultivated or developed land and receives high amounts of chemicals or sediment in runoff.
- In grazed sites, the ground surface is strongly torn up, churned, and/or hummocked.
- In sites exposed to herbicides, native forb species are nearly or completely absent.
- Organic substrate is thin, patchy, or absent and may have been eroded or oxidized by past land use, ditches, peat fires, or dugouts.

5) Mapping notes:

- Map all A- to C-rank occurrences.
- Map D-rank occurrences that support populations of State Endangered or Threatened plant species.

Revised by Fred Harris February 2018

Table 1. Examples of disturbance increasers and invasive species in Prairie Extremely Rich Fen communities:

| Common Name (<i>Scientific Name</i>) | Common Name (<i>Scientific Name</i>) |
|--|---|
| Giant ragweed (<i>Ambrosia trifida</i>) | Purple loosestrife (<i>Lythrum salicaria</i>)* |
| Redtop (<i>Agrostis gigantea</i>)* | Nodding smartweed (<i>Persicaria lapathifolia</i>) |
| Clasping-leaved dogbane (<i>Apocynum sibiricum</i> , <i>A. cannabinum</i>) | Pennsylvania smartweed (<i>Persicaria pennsylvanica</i>) |
| Bog birch (<i>Betula pumila</i>) (when tall and dense) | Reed canarygrass (<i>Phalaris arundinacea</i>)* |
| Devil's beggarticks (<i>Bidens frondosa</i>) | Common reed (<i>Phragmites australis</i>) (both subspecies #) |
| Canada thistle (<i>Cirsium arvense</i>)* | Kentucky bluegrass (<i>Poa pratensis</i>)* |
| Red osier dogwood (<i>Cornus sericea</i>) (when tall and dense) | Quaking aspen (<i>Populus tremuloides</i>) |
| Quackgrass (<i>Elymus repens</i>)* | Silverweed (<i>Potentilla anserina</i>) |
| Field horsetail (<i>Equisetum arvense</i>) | Curly dock (<i>Rumex crispus</i>)* |
| Grass-leaved goldenrod (<i>Euthamia graminifolia</i>) | Willow species (<i>Salix spp.</i>)(when tall and dense) |
| Giant sunflower (<i>Helianthus gigantea</i>) | Tall/Canada goldenrod (<i>Solidago altissima/canadensis</i>) |
| Sawtooth sunflower (<i>Helianthus grosseserratus</i>) | Giant goldenrod (<i>Solidago gigantea</i>) |
| Foxtail barley (<i>Hordeum jubatum</i>) | Sow thistle (<i>Sonchus spp.</i>)* |
| Baltic rush (<i>Juncus arcticus var. balticus</i>) | Narrowleaf cattail (<i>Typha angustifolia</i>)* |
| Rough bugleweed (<i>Lycopus asper</i>) | Hybrid cattail (<i>Typha x glauca</i>)* |
| | Stinging nettle (<i>Urtica dioica</i>) |

* denotes non-native, invasive species

Minnesota has at least one non-native, invasive subspecies of *Phragmites australis* and a native subspecies.