North Dakota’s

100 Plant Species of Conservation Priority

North Dakota Natural Heritage Program
Appendix A

Level I

Plant Species of Conservation Priority

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**Scientific Name:** *Allium canadense*

**General Description:** Tall perennial forb standing 8-24in (20.32-60.96cm). Leaf is grass like clasping on lower third of stalk. White to pink umbel flower with six parts, ½ in (1.27cm) wide; ¼-1in (.64-2.54cm) stalks replaced by ¼ in (.64cm) bulblets; Blooms May-June.

**Natural Heritage State Status/NatureServe Global Status:** S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends from Maine, south to Florida and west to Texas, Oklahoma, Kansas, Nebraska, South Dakota, Montana and North Dakota.

**Primary Habitat:** Prairies, open woods; Moist to mesic black soil prairies, upland and floodplain woodlands, tall-grass prairie, moist meadows near rivers and woodlands, thickets, borders of lakes, edges of bluffs, abandoned fields and pastures, areas along.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- There is an insufficient amount of data relating to this species whereabouts in North Dakota. Only known documentation occurs in Sargent County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade factors**
- Logging and removal of the canopy are potential threats.
RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for *Allium canadense*. However, further research is always needed as it helps us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Asclepias lanuginosa*

**General Description:** Perennial forb standing weakly erect 6-12in (15.25-30.5cm) on a single stem with hairs. Plant is alternately leaved, lanceolate in shape with hairs umbel umbel umbel on each side. Flower has five parts and is umbel yellow green in color in an umbel formation. Flowers are present in June-July. Fruit is produced as a pod filled with many seeds attached to silky hairs to aid with wind dispersal.

**Natural Heritage State Status/NatureServe Global Status:** S1/G4? - Critically Imperiled/Apparently Secure Inexact Numeric Rank

**Federal Status:** Not listed

**Range:** Small range that includes North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Wisconsin, and Indiana.

**Primary Habitat:** Sandy or rocky calcareous prairie, dry upland woods, gravelly hillside prairies.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, this species has been documented in Dunn, Stark, Grant, Ward, Stutsman, and Pembina Counties.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Wooly Milkweed
Level I

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Asclepias lanuginosa*. However, further research is always needed as it helps us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
- Studies were conducted on flower, pod, and seed production in Wooly Milkweed, as well as about 20 other different species of Milkweed.
- Studies on reproductive phenology and pollinators have been conducted for this species.

MANAGEMENT RECOMMENDATIONS
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
REFERENCES


Cooper’s Milkvetch
Level I

Scientific Name: *Astragalus neglectus*

**General Description:** Semi-erect perennial forb 1-3ft (30-90cm) with a taproot. Stem is normally hollow. Has 11-23 pinnately divided leaflets 1/3-1in (1-2.5cm) long oblong in shape. Leaflets have long hairs on underside. Flowers occur during early June through-out July. Creamy white in color displayed in several clusters on a raceme. Flowers are five parted 1/2in (1cm) long.

**Natural Heritage State Status/NatureServe Global Status:** S1/G4 – Critically Imperiled/Apparently Secure

**Federal Status:** Not listed

**Range:** Occurs in North Dakota, South Dakota, Minnesota, Wisconsin, Michigan, Ohio, Pennsylvania, New York, Massachusetts, West Virginia, and Virginia.

**Primary Habitat:** Located in calcareous soils associated with a limestone base. These soils are located near water or what was historically water in a grassland setting.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

- **Preferred Habitat**
  - This species has been documented in Pembina County of North Dakota.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

- **Habitat**
  - The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

- **Other Natural or Manmade Fact**
  - Mostly unknown; however excessive shading from woody species is likely a hazard to this species.
Cooper’s Milkvetch
Level I

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
• Currently this species is poorly documented and little is known about its reproductive biology.

MANAGEMENT RECOMMENDATIONS
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.
• This species in particular requires natural disturbances associated with prairie habitat such as prescribed fire or brush removal to prevent woody plant succession.
• This species is often lost in the later stages of succession.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
REFERENCES


Scientific Name: *Botrychium campestre*

**General Description:** Small plant that stands roughly 1.5in (4cm) tall and .5in (1.3cm) wide. Very similar to other moonworts except it appears very early in the spring; early May-Early June. Displays very small propagules on the stem and leaves are sessile. Leaves are broken into small fan shaped segment.

**Natural Heritage State Status/NatureServe Global Status:** S1/G3G4 – Critically Imperiled/Vulnerable-Apparently Secure

**Federal Status:** Not listed

**Range:** Ranges from the Great Lakes, across Iowa and Nebraska to eastern Colorado, in Wyoming in the Black Hills, and Northward to Alberta and Saskatchewan.

**Primary Habitat:** Typically located in open dry upland prairie settings preferably in undisturbed virgin prairie settings.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- The prairie moonwort prefers well drained soils over bedrock in dry upland prairies. Primarily found in short and mid-grass prairies in the Missouri Coteau region of the state. Prairie moonwort doesn’t deal well with disturbances and is primarily found on high quality prairie habitat that has no history of agriculture practice.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat loss, habitat fragmentation, succession human disturbances and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for Botrychium campestre. However, further research is always needed as it helps us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Additional Research or Surveys Needed
- Long term habitat and population monitoring would likely be the most beneficial investigations at this time, in addition to continued inventory along coastal areas and potential inland habitats.

MANAGEMENT RECOMMENDATIONS
- Protect large tracts of grassland, particularly native prairie.
- Prevent encroachment of woody vegetation in grasslands.
- Encourage vegetative diversity.
- Practice rotational burning: intervals of 3-4 years in tallgrass prairie, 6 years in mixed-grass prairie, and 5-10 years in shortgrass prairie.
- Delay mowing until July 15.
- Prevent overgrazing.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
REFERENCES


6. Botrychium Campestre. Ames, IA: Iowa State University, ND PDF.


Scientific Name: *Carex formosa*

**General Description:** Tufted perennial that is 12-31.5in (30-80cm) tall. Leaves are basal sheaths and maroon at their bases. The stem has secondary branches which hold the 3-5 spikes that occur per stem; most easily identifiable in early June-July.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G4 – Critically Imperiled/Apparently Secure

**Federal Status:** Not listed

**Range:** Distribution is centered around the Great Lakes area and extends east to New England, west to North Dakota, north from Quebec and Ontario, and south to the Mid-Atlantic States.

**Primary Habitat:** Moist deciduous valleys and woodlands associated with rivers.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Handsome sedge is primarily located in the lowland woods surrounding the Sheyenne River in the Sand Deltas and Beach Ridges eco-region. It is found calcareous soils with varying levels of moisture but usually seasonally moist.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations. The areas this plant inhabits are very common for residential development. Another risk is livestock grazing in the wooded valleys leading to the river. Timber harvest practices also pose a threat by opening up the canopy and allowing more light penetration than this species desires.
RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for Carex formosa. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- Utilize best management practices for woodlands and moist prairies.
- Protect habitat this species relies upon.
- Prevent encroachment of invasive species.
- Any habitat that alters the specific light, temperature, and moisture regime would almost certainly harm C. formosa.
- Prevent overgrazing.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Chenopodium subglabrum*

**General Description:** Erect annual with 2-3 stems 12in(30cm). Leaves are alternate with a single vein and 1in (3cm) in length. Small flowers occur on spikes in June and fruiting in late June through July. Each flower produces a fruit that contains a jet black seed.

**Natural Heritage State Status/NatureServe Global Status:** S1/G3G4 - Critically Imperiled/Vulnerable-Apparently Secure

**Federal Status:** Not listed.

**Range:** Range includes Oregon, Washington, Nevada, Idaho, Montana, Utah, Wyoming, Colorado, Kansas, Nebraska, South Dakota, North Dakota, Michigan, Ohio, and Maryland.

**Primary Habitat:** Found in loose sandy soils in sparsely vegetated areas related to riparian areas; can be found on eroding south and west facing slopes of sandy soils.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Sandy soils in riparian areas along the Little Missouri River. Tends to occur in areas that get flooded annually for short periods. Prefers to be on flat surfaces but will occur at the base of slopes where sand is being deposited through erosion. Also sand dunes, sandy terraces, and river sandbars.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- Naturally occurring succession possess a large threat as it takes away the habitat which is crucial to smooth goosefoot. If natural annual flooding doesn’t occur it is possible that seeds will not be dispersed and the amount of suitable habitat would be reduced. Invasive plants such as leafy spurge and Canada thistle competing for resources.
Smooth Goosefoot
Level I

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Chenopodium subglabrum*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• A combination of fire and grazing during the appropriate seasons will keep blowouts active and provide habitat for this species.
• Controlling noxious weeds, especially leafy spurge.
• Lack of fire may increase vegetation and reduce suitable habitat for this species.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


White Lady’s-slipper
Level I

Scientific Name: *Cypripedium candidum*

General Description: Stands 4-15.5in (10-40cm) tall. Leaves number 2-5, are 2-6in (5-15cm) long, and very pubescent. Flowers usually number one and is present May-June. It is presented on a green bract 1.2-4.3in (3-11cm) long. Sepals are greenish yellow with purple lateral veins, ovate to elliptical, and .5-1in (1.2.5cm) long. Petals are the same color as sepals and .8-1.6in (2-4cm) long. The labellum is white in color with purple streaking on the inside and is .66-1.3in (1.7-3.3cm) long.

Natural Heritage State Status/NatureServe Global Status: S2/G4 - Imperiled/Apparently Secure

Federal Status: Not listed

Range: Extends from Manitoba to Connecticut, south to Ohio, Indiana, Missouri, and Nebraska.

Primary Habitat: Wet rich prairies and calcareous fens.

Climate Index Rank: Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- Primarily found in wet prairies, meadows, and bogs in the Eastern third of the state and expanding farther west in the north central part of the state. Some plants found on saline soils but typically associated with alkaline soils.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a significant threat due to changes in precipitation affecting the suitable habitat and growing conditions for this species. Suppression of fire, grazing, and noxious weeds have all been seen as a threat to the species. Fire and mowing during the right time period has been shown to reduce competition from other species. Livestock should be kept out of areas where the species is present because heavy grazing and trampling can occur.
White Lady's-slipper
Level I

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for Cypripedium candidum. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
- Protect current habitat known to support this species.
- Prevent heavy grazing.
- Avoid soil disturbance, incidental herbicide exposure, hydrologic alterations, competition from non-native species, and shading from encroaching shrubs.
- Encourage vegetative diversity.
- Practice sound prairie management techniques.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Dakota Buckwheat**

**Scientific Name:** *Eriogonum visheri*

**General Description:** Erect annual herb from a slender taproot and is widely branched resulting in a skeletal appearance. Several basal leaves are arranged in a rosette. Stem leaves are located on the lower portion of the stem and are more oblong and smaller than the basal leaves. Flowers are extremely small and pale yellow and appear from July through September.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G3 – Imperiled/Vulnerable

**Federal Status:** Not listed.

**Range:** Found in western South Dakota and western North Dakota to southeastern Montana.

**Primary Habitat:** Barren shale and clay outcrops of badlands, eroded hillsides, slopes of bluffs, and outwash fans at the base of slopes.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species predominantly grows on barren, highly erodible, rock outcrops in badlands habitats.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
Other Natural or Manmade Factors

- Invasion of introduced plants such as Russian thistle and Kochia.
- Extra sensitive to habitat alterations because it typically grows in areas where it is rich in minerals, oils, and gas.
- Genetic depression, seed bank decay, and habitat alteration from mining are also potential threats.

RESEARCH AND SURVEY EFFORTS

Previous Research or Surveys

- Target Plant Survey for *Eriogonum visheri* in the Little Missouri National Grasslands and Mountrail, Grant, and Sioux Counties of North Dakota.

Additional Research or Surveys Needed

- The following are some of the data needs to be considered for populations of *E. visheri*
  - Annual monitoring over a series of years to understand population responses to external factors.
  - Maintain viable populations. Define what a viable population is, given population fluctuations common to annual species.
  - Examine seed biology and demographic characteristics.
  - Verify/describe reproductive biology characteristics.
  - Plan a conservation strategy.
  - Genetic characteristics (including potential hybridization, genetic diversity among and between populations.)
  - Test the roles of herbivores, grazers, interspecific competition, disturbance, invasive species, fire, etc.
  - Identify habitat requirements.
  - Coordinate work with other state and federal agencies and private landowners.

MANAGEMENT RECOMMENDATION

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
REFERENCES


**Scientific Name:** Helianthemum bicknellii

**General Description:** Perennial forb standing 8-24in (20-61cm). Branching occurs once the plant reaches maturity. Leaves are triangular shaped. Has 2-10 stalked flowers appearing in June and July, arranged in a cyme five parted 2/3-1in (1.5-5cm) wide and are yellow.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 - Critically Imperiled/Secure

**Federal Status:** Not listed.

**Range:** Occurs from Maine, west to North Dakota, South Dakota, and Colorado; south to Maryland, North Carolina, Ohio, Indiana, Missouri, and Kansas.

**Primary Habitat:** Dry sandy soils located in open upland woods and prairies; Prefers ample sunlight.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- There have been five documented occurrences occurring in the sand deltas and beach ridges ecoregions of Ransom and Pembina counties. The Sheyenne Grasslands in Ransom County comprises a large area with suitable habitat. It is typically located in dry sandy soils in open prairies or open wood lots. Bicknell’s Sunrose is not a shade tolerant species.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The largest threat to this species is climate change because of its specific habitat requirements. With climate change a change in precipitation and temperature can be expected and with that the plants that exist will change. Increased precipitation and temperature would change the soil chemistry and the nutrients that are available. Loss of habitat poses the most immediate threat.
Bicknell’s Sunrose
Level I

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Helianthemum bicknellii*. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• Protect or create large tracts of grassland, particularly native prairie.
• Prevent encroachment of woody vegetation in grasslands.
• Encourage vegetative diversity.
• Practice rotational burning: intervals of 3-4 years in tallgrass prairie, 6 years in mixed-grass prairie, and 5-10 years in shortgrass prairie.
• Avoid soil disturbances that encourage erosion and invasive species introductions.
• Prevent overgrazing.
• Use native grasses when replanting grassland.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Mentzelia pumila*

**General Description:** Herbaceous biennial or short-lived perennial herb with branched, white stems that arise from a stout taproot. Lance-shaped leaves are 8-10 cm long and have short stems. The alternate leaves become sessile, smaller, and more deeply lobed the higher they are on the stem. The foliage is covered with short, barbed hairs. 1-3 flowers are borne on short stalks arising from the axils of the reduced upper leaves. Flowers have 10 yellow petals that are 9-15 mm long and numerous stamens.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G4 - Critically Imperiled/Apparently Secure

**Federal Status:** Not listed.

**Range:** Distributed throughout North Dakota, south-central Montana to Colorado, Utah, New Mexico, Arizona, Wyoming, and Nevada.

**Primary Habitat:** Open, usually sandy soil in desert shrubland and woodlands in the valley and foothill zones.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS):
Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Historical records in North Dakota show that this species has been limited to one location in Slope County, near the Limber Pines Area.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations.
RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for *Mentzelia pumila*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Western Prairie Fringed Orchid
Level I

**Scientific Name:** *Platanthera praeclara*

**General Description:** Single stemmed perennial that stands up to 85 cm tall. Has a showy open raceme of up to 24 white to creamy white flowers, each with a long nectar spur. The lip, or lower petal of each flower, is deeply three-lobed and fringed. Flowering plants have three or more smooth, elongate leaves.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G3 – Imperiled/Vulnerable

**Federal Status:** Threatened

**Range:** Range includes Iowa, Kansas, Minnesota, Missouri, Nebraska, and North Dakota.

**Primary Habitat:** Occurs in mesic upland tallgrass in the southern part of its range, often in swales, and wet-mesic tallgrass prairie and sedge meadows in the northern part of its range; also known from prairies and swales in sand dune complexes that are fed by shallow underground water.

**Climate Index Rank:** Extremely Vulnerable (EV): Abundance and/or range extent within geographical area assessed extremely likely to substantially decrease or disappear by 2050.

**Reason for Designation:** Habitat loss and degradation, mostly through conversion to cropland. Competition with invasive plant species and pesticide threats to pollinators.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, this species has been documented in Cass, Ransom, and Richland Counties in the southeastern part of the state. Currently restricted to Richland and Ransom counties.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Western Prairie Fringed Orchid
Level I

Other Natural or Manmade Factors
- Conversion of pasture and hayfield habitat to cropland.
- Fire suppression and woody plant encroachment.
- Invasion of noxious weeds.
- Herbicides and insecticides.
- Hydrologic changes.
- Intensive cattle grazing and trampling.
- Collecting plants from the wild.

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Platanthera praeclara*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
- Research on propagation, pollination, population genetics, and habitats requirements has been performed on this species.

MANAGEMENT RECOMMENDATIONS
- Determine the role of disturbance in maintaining population vigor.
- Protect and manage existing populations.
- Monitor pesticide use in orchid habitat.
- Monitoring of populations.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
REFERENCES


**Thin-fruited Knotweed**

**Level I**

**Scientific Name:** *Polygonum leptocarpum*

**General Description:** Annual, glabrous plant that stands very slender with an abundance of branches. Stands up to one foot tall and has a variety of different leaves. Leaves at the bottom are broader and have a reddish-brown color. Upper leaves are more slender and long. Flowers are sessile.

**Natural Heritage State Status/NatureServe Global Status:** S1/G2G4Q – Critically Imperiled/Imperiled-Apparently Secure Questionable Taxonomy

**Federal Status:** Not listed

**Range:** Range is small; includes Montana, North Dakota, South Dakota, and Kansas.

**Primary Habitat:** This species primary habitat is unknown.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- There is an insufficient amount of data relating to this species whereabouts in North Dakota.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**RESEARCH AND SURVEY EFFORTS**
- Currently there are no research or survey projects being conducted for *Polygonum leptocarpum*. However, further research is always needed as it will help us better understand a multitude of sensitive plant populations and their life cycle requirements necessary for survival.
MANAGEMENT RECOMMENDATIONS

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Sticky False-asphodel
Level I

Scientific Name: *Triantha glutinosa*

**General Description:** Perennial herb that is 4-20in (10-50cm) tall with a stem that is sticky. Leaves appear in a basal arrangement and are narrow and 2-18in (5-20cm) long. Flowers appear June-August are white and are arranged in raceme that is 1-2in (2-5cm) in length. Fruits are formed June-September and are yellow or red seeds.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not Listed.


**Primary Habitat:** Primarily moist bogs or fens with a calcareous soil.

**Climate Index Rank:** Extremely Vulnerable (EV): Abundance and/or range extent within geographical area assessed extremely likely to substantially decrease or disappear by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Only one physical occurrence has been documented in the state in the Drift Plains region in southwestern Benson County. Sticky false asphodel is primarily associated with bogs or fens with calcareous soils.
PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because the species needs continually moist conditions to thrive. With climate change precipitation occurrence and amount can be expected to change from what historically has occurred. If a drought occurs species that need drier conditions will encroach and take over the bog. Human activities in and around areas where the bogs are present also pose a threat. Diversion of ground water or surface water that flows into the bog can change the composition allowing other species to take over. Examples would include irrigation practices and impoundment creation. Other land practice such as logging, construction, and agriculture pose threats as well. Logging to close to a bog will allow sediments and nutrients into the ecosystem that are not normally present. Livestock allowed to travel through the bog could trample the habitat and deposit excrement high in nitrogen into the bog. Addition of fertilizers and other chemical could be carried by surface water into the bog also altering the composition and nutrient loads in the water.

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for *Tofieldia glutinosa*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
- Protect or create large tracts of grassland, particularly native prairie.
- Prevent encroachment of woody vegetation in grasslands.
- Encourage vegetative diversity.
- Practice rotational burning: intervals of 3-4 years in tallgrass prairie, 6 years in mixed-grass prairie, and 5-10 years in shortgrass prairie.
- Delay mowing until July 15.
- Prevent overgrazing.
- Use native grasses when replanting grassland.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
REFERENCES


Scientific Name: *Botrychium minganense*

**General Description:** Is a small perennial fern that stands 3-10 in (8-25 cm) tall. Has a fertile blade (sporophore) and a fertile blade (trophophore) which is yellow-green in color and has ten pairs of pinnae which are fan shaped. Can be easily identified June-August.

**Natural Heritage State Status/NatureServe Global Status:** S1/G4 – Critically Imperiled/Apparently Secure

**Federal Status:** Not listed

**Range:** Fairly large distribution; Extends from Oregon, south to California and east to Arizona and north to Montana. Also includes North Dakota, Minnesota, Wisconsin, Michigan, New York, Vermont, New Hampshire, and Maine.

**Primary Habitat:** Primarily found in mesic hardwood forests.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- The Mingan Moonwort is typically located in mesic hardwood forests, associated with the Turtle Mountains and Pembina Escarpment regions of the state. It is also commonly found in meadows, fens, and old disturbed sites such as road edges; grows in sunny to densely shaded areas that can range from dry to completely saturated.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threat to this species is habitat loss or degradation. Land use practices pose the largest threat such as cattle or other livestock trampling an area. Heavy equipment used in timber harvest or agriculture would also pose an immediate threat. Unregulated recreational use such as off trail use by ATV’s and OHV’s could also significantly disturb and degrade vital habitat.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- A paper that is currently being worked on is going to analyze the different plant communities where this *Botrychium* species occurs and to establish the best conservation and management strategies.

Previous Research or Surveys
- Detailed studies and follow-ups have been conducted in the last five years on the phenology of *Botrychium minganense*.

MANAGEMENT RECOMMENDATIONS
- Maintain deep shade.
- Avoid impacts caused by livestock such as trampling or grazing.
- Maintain existing hydrologic regime.
- Avoid disturbance of duff layer where this species occurs.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Botrychium multifidum*

**General Description:** Presents itself in two stages either fertile or sterile. The sporophore is the fertile part and when present the plant is 3-15.75 in (8-40 cm) tall. The trophophore is the sterile blade of the plant and always present and 2.5-12 in (6-30 cm) long green to reddish brown in color.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Circumboreal; extends south in North America to North Carolina and west to California.

**Primary Habitat:** Moist meadows and rich woods in the Eastern part of the state.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Leathery grapefern has been documented in Cavalier and Richland counties in the Pembina Escarpment and Sand Delta Beach Ridges eco-regions of the state. It is primarily located in moist meadows and rich woods with acidic sandy soils that are moist during wet periods of the year and dry out in the summer.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat degradation and invasive species. Recreational activities on the landscape are the largest threat for habitat degradation. Activities such as OHV and ATV riding be the largest through the construction of trails and the off trail use tearing up and compacting suitable soils. Noxious weeds pose a large threat because they can adapt easily and take over an area choking out the native vegetation.
Leathery Grapefern
Level II

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Botrychium multifidum*. However, further research is always needed and will allow us to better understand a multitude of sensitive plant species populations and their life cycle requirements that are necessary for survival.

Additional Research or Surveys Needed
- Monitoring study that compares reproductive and mortality rates of this species in burned vs. unburned, grazed vs. ungrazed, weedy vs. natural, and shaded vs. unshaded would answer many questions about this species and would be beneficial in determining management practices.
- Descriptive data for the habitat and community ecology of occurrences should be gathered whenever a new colony of this species is encountered.
- Research of the life history and demography is needed.
- Research is needed to determine the role of non-reproductive plants in the population biology of this species.

MANAGEMENT RECOMMENDATIONS
- Protect or create large tracts of grassland, particularly native prairie.
- Prevent encroachment of woody vegetation in grasslands.
- Encourage vegetative diversity.
- Practice rotational burning: intervals of 3-4 years in tallgrass prairie, 6 years in mixed-grass prairie, and 5-10 years in shortgrass prairie.
- Delay mowing until July 15.
- Prevent overgrazing.
- Use native grasses when replanting grassland.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
REFERENCES


**Scientific Name:** *Botrychium simplex*

**General Description:** Small, inconspicuous, fern with thin fleshy appendages. Up to seven pairs of well-developed lobes can form. Basal lobes are much larger and are fan shaped. The apex of the fern is usually rounded and undivided. Best time to identify is late June through early September.

**Natural Heritage State Status/NatureServe Global Status:** S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** *Botrychium simplex* is one of the most widely dispersed of all moonwort species. It occurs across the northern United States and southern Canada and southward at high elevations in the Appalachian Mountains to North Carolina and in western mountains south to New Mexico and southern Nevada and California. It also extends westward across the Great Plains and into the Rocky Mountains from New Mexico to Wyoming.

**Primary Habitat:** Primarily occurs in open sites such as prairies, wetlands, marshes, bogs, and swamps. Also found in low moist areas of deciduous hardwood and coniferous forests.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this fern has only been documented in the Sheyenne National Grassland along swale margins that are sometimes partially shaded by willows.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Other Natural or Manmade Factors
- There are a number of man-made and natural factors that affect this species of plant. Soil compaction, drying of habitat and removal of vegetation are all fairly common factors that would affect a particular species. Also documented to have a significant effect on the decline of *Botrychium simplex* includes, exotic earth worms, exotic plants, succession to a closed canopy forest, and canopy thinning. Things like domestic livestock, recreational activities, logging, road maintenance, fire, woody plant encroachment, pollution, and development also have significant impacts on *Botrychium simplex*.

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Establish population trends.
- Monitor fungal associates, their habitat requirements, and the role they play in the life history of each species.
- Establishing effective management areas (sizes) and habitat characteristics necessary to maintain known occurrences in project areas.
- Determine the short and long-term effects of timber harvest, grazing, recreation, fire, fire suppression, and exotic plants on the maintenance of known occurrences.
- Identification of high likelihood habitat to help prioritize surveys and ensure appropriate habitat conservation.

Additional Research or Surveys Needed
- Develop and implement inventory and monitoring protocols; establish priorities and inventory high likelihood habitats.

POPULATION ESTIMATES
- *Botrychium simplex* has been documented in 35 states and 10 provinces, as well as in Greenland and Sweden.

MANAGEMENT/ MONITORING RECOMMENDATIONS
- Management of suitable, unoccupied habitat that will be available for colonization of spores.
- Maintain existing populations of *Botrychium simplex*.
- Maintain light regime, hydrology, and microclimatic conditions.
- Maintaining conditions that sustain mycorrhizal diversity.
- Avoiding disturbance of above ground plants and the substrate in the area.
- Avoiding actions that would establish competing exotic vegetation.
- Avoiding excessive siltation or deposition of soil.
- Providing early to mid-stages of plant succession.
REFERENCES


**Scientific Name:** *Campanula aparinoides*

**General Description:** Inconspicuous perennial wetland plant. Produces small pale blue flowers and grows to 20-60 cm tall.

**Natural Heritage State Status/NatureServe Global Status:**
S2S3/G5 – Imperiled-Vulnerable/Secure

**Federal Status:** Not listed

**Range:** Fairly abundant. Range includes Nova Scotia west to Saskatchewan, south to Georgia, Kentucky, Missouri, and Nebraska.

**Primary Habitat:** Occasionally found in marshes, wet sunny meadows, swales, calcareous fens, and shrubby or boggy sites.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species occurs in fresh wet meadows and boggy places. It is also found in fens and in spring-fed sites on the Sheyenne National Grassland. On the Sheyenne National Grassland, this plant is found most often in shrub or graminoid dominated seepage peat lands, wetland thickets dominated by alder, dogwood, bog birch, or sedge meadows.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
RESEARCH AND SURVEY EFFORTS

- Studies have been done to develop a criterion for natural resource professionals when they are determining the best management strategies for a wetland habitat.

MANAGEMENT RECOMMENDATIONS

- Exact management needs for this particular species are not yet known. However, it is important to place emphasis on protecting this species habitat and keeping it intact.

REFERENCES


Scientific Name: Carex alopecoidea

General Description: Perennial, herbaceous grass-like plant that is densely tufted and soft but stout and grows to be 1-2.5 feet tall. Species also contains fruity stems that are usually shorter than the thin and soft leaves. Mature from mid-June through mid-August.

Natural Heritage State Status/NatureServe Global Status: S2/G5 – Imperiled/Secure

Federal Status: Not listed

Range: The documented range of Foxtail Sedge extends from Quebec and Maine west to Michigan and Minnesota and south to New Jersey, Indiana, and Iowa.

Primary Habitat: Found in calcareous wet meadows of river floodplains. In Great Plains regions Foxtail Sedge grows in wooded areas and swamps and may include springs and stream banks.

Climate Index Rank: Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

Reason for Designation: This species is considered a sensitive plant species, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- In North Dakota this species is documented from poplar swamps, wooded areas, and bog areas around swamps, creek banks, and mesic woodlands. It has also been documented on north-facing slopes under green ash, bur oak, and basswood.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Other Natural or Manmade Factors

- Loss of occurrences and alteration of the hydrology in the riparian areas where Foxtail Sedge occurs
- Grazing by cattle and other large herbivores
- Presence of invasive species
- Increased recreational traffic

RESEARCH AND SURVEY EFFORTS

- Additional research needs to be conducted on this species before any real management considerations can take place. Some research priorities include the following:
  - Monitor existing occurrences and inventory for additional occurrences; land use history and current management practices are important data to be recorded for each occurrence.
  - Investigate the hydrology where the species occurs.
  - Investigate the species response to disturbance.
  - Determine threats to the species persistence.
  - Develop and implement a monitoring program to identify population trends.
  - Investigate the habitat requirements for this species and its interactions with the surrounding plant community.

MANAGEMENT RECOMMENDATIONS

- Exact management needs for this particular species are not yet known. However, since this species requires floodplain habitat for survival, it is important to place emphasis on protecting the habitat and keeping it intact.
- The disturbance of seasonal flooding may be necessary to perpetuate Foxtail Sedge populations by limiting shrub and tree growth and maintaining an open community structure.
- Control of invasive plant species is especially important since they are often common in the same river floodplain environment as the Foxtail Sedge.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


5. Foxtail Sedge (Carex Alopecoidea). Westborough, MA: Massachusetts Division of Fisheries & Wildlife, 20 Jan. 2009. PDF.
Spiny Sedge
Level II

**Scientific Name:** *Carex echinata ssp. echinata*

**General Description:** Perennial herb standing 4-24in (10-60cm) with a fibrous root system. Two to four leaves for each flowering stem and leaves are slightly shorter than stems. Flowers occur in clusters on an inflorescence 1-4in (2.5-8cm) long with two to seven star shaped spikes.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5T5 – Critically Imperiled/Secure-Secure Infraspecific Taxon

**Federal Status:** Not listed

**Range:** Range includes most of the New England states, West Virginia, Virginia, North Carolina, Tennessee, the Great Lakes states, Iowa, North Dakota, and from Montana south to New Mexico, and westward to California, Oregon, and Washington.

**Primary Habitat:** Moist sandy soils along lakes, creeks, and rivers. Also occurs commonly in and around peat bogs and swamps.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- This species can occur in many places around North Dakota. Standing water, tributaries, wetland areas, and swamps are potential habitat for *Carex echinata*.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat fragmentation and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for Carex echinata. However, further research is always needed as it will give us a better understanding of a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• Protect wetland areas and avoid disturbances in these settings.
• Avoid overgrazing and trampling.
• Control noxious weeds.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** Carex leptalea

**General Description:** Densely clustered perennial plant that rises from a network of rhizomes. Typically grows 15-70 cm tall. Leaf blades are deep green and smooth and measure 0.5-1.33 mm wide. Sheaths are membranous and have a brownish tint when mature. This plant also bears solitary greenish-yellowish spikes that measure 4-16 mm long and 2-3 mm thick.

**Natural Heritage State Status/NatureServe Global Status:**
S3/G5 – Vulnerable/Secure

**Federal Status:** Not listed

**Range:** Very widespread over much of North America. Range includes Newfoundland to Alaska, south to Florida, Texas, and California. The only states where Delicate Sedge has not been documented are Nebraska, Kansas, Nevada, and Arizona.

**Primary Habitat:** has a very diverse range of habitats but occurs mostly in wetland areas. Other documented areas of habitat include mossy or wet woods, conifer swamps and bogs, wet and often calcareous fens and meadows, swales, lakeshores, stream banks, as well as damp, shaded rock ledges, marshy fields, and swampy ditches.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this plant species is found in dense alder and bog birch wetland thickets. It may also be found in shrubby fens or wetland thickets typically dominated by species such as willow, bog birch, and dogwood. This sedge may occupy the margins of these wetlands and extend up into low woodlands.
PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

Other Natural or Manmade Factors
- Hydrologic alteration
- Timber harvest
- Fire
- Roads and trails being established
- Peat Extraction
- Livestock grazing
- Recreational impacts
- Exotic species
- Atmospheric deposition of pollutants

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Research has been conducted, but there is a large amount of information that we don’t know about the habitats, populations, etc. Future research is being planned so that we can better understand rare plant species.

Previous Research or Surveys
- Some population research and restoration studies have been conducted.

MANAGEMENT RECOMMENDATIONS

- Species and habitat inventory
- Establishment of protected areas
- Presence/absence surveys should be conducted to better understand of habitat abundance and distribution
- Collection of basic hydrologic and sediment data

MONITORING PLANS

- Population and habitat monitoring would improve our knowledge of the population dynamics of Carex leptalea. Population monitoring is most productively conducted in junction with habitat monitoring. For example, by monitoring the water levels in wetlands, observed changes in the abundance of Carex leptalea can be more easily tied to changes in hydrologic drivers.
REFERENCES


**Scientific Name:** *Carex sterilis*

**General Description:** A perennial herb that rises from tufts and stands 8-27.5in (20-70cm) tall. Has many slender leaves that are 12in (30cm) long. Sterile sedge contains four spikelets per stalk.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G4 – Critically Imperiled/Apparently Secure

**Federal Status:** Not listed

**Range:** Range includes a majority of the New England and Great Lakes States. Also includes Montana, North Dakota, Iowa, Missouri, Alabama, Tennessee, Virginia, and West Virginia.

**Primary Habitat:** Fens, wet calcareous prairies, fresh interdunal meadows, calcareous seeps, lake and river shores, and wet sunny limestone outcrops.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Sterile sedge is primarily located near or around calcareous fens in the Glacial Lake Deltas and Glacial Lake Basins eco-regions in the north central part of the state. The habitat needed for sterile sedge to survive is considered one of the rarest types of wetlands in North America.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because the species is a wetland dependent species and is primarily supported by groundwater supplies. Livestock grazing or creation of ponds for livestock poses a threat to the plant. Lowering of the water table through drain tiling increases the risk that encroachment or invasive species could inhibit the plant from growing or existing. Any negative effects to the groundwater supply through artificial manipulation or tainting with chemicals will negatively affect sterile sedge.
RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for Carex sterilis. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements that are necessary for survival.

MANAGEMENT RECOMMENDATIONS
- The conservation is directly linked to the conservation of its habitat, especially fen wetlands.
  - Protect habitat from overgrazing and trampling.
  - Avoid any alteration in groundwater flow that feeds these fens.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES
Blue Cohosh
Level II

**Scientific Name:** *Caulophyllum thalictroides*

**General Description:** Perennial forb that is 1-3ft (30.5-91.5cm) tall. Leaves stem off the stalk from the middle of the stalk. They are three parted into leaflets then three parted again into sub-leaflets 1-3in (2.5-7.6cm) long that have 2-5 lobes. Green or yellow flowers are present April-May. They are six parted and presented in a cyme of 5-70 flowers that are about .5in (1.3cm) wide. The fruit is present in a dark blue berry.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G4G5 – Critically Imperiled/Apparently Secure-Secure

**Federal Status:** Not listed

**Range:** Range extends from Maine, south to Georgia and west to Oklahoma. From there it reaches north to North Dakota and Minnesota.

**Primary Habitat:** Rich woods in valleys, ravines, north-facing wooded slopes, moist base of bluffs.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

**Preferred Habitat**
- In North Dakota, all five species records are specimens from the Red River Valley in Cass and Richland Counties.
Blue Cohosh
Level II

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss.

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for Caulophyllum thalictroides. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
- Avoid timber harvesting or practices that would greatly alter woodlands.
- Reduce any off road vehicle use through known habitat.
- Avoid overgrazing in known habitat.
- Management goals need to be based on the current conditions.
- Gaining knowledge of population locations, extent, demographic characteristics, and changes in populations characteristics over time.
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With this information you can use population viability analysis to estimate the minimum population size to sustain the taxon which can help you establish management practices.
- Preserving habitat and restricting/limiting harvest would be beneficial while gathering population information.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Cheilanthes feei*

**General Description:** Short fern that stems off of a rhizome. Can stand erect or appear to be creeping. Fronds range from 2-10in (4-25cm) thin and dark brown or black in color; lanceolate in shape.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Widespread range from British Columbia and Alberta, south to Texas, north to Wisconsin and east to Kentucky and Virginia.

**Primary Habitat:** Typically found in open areas in the hills associated with calcareous soils and cliffs.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Occurring in the crevices of limestone or sandstone on sloping hills at 850-2650ft (259-808m) elevations.

**Key Areas and Conditions for Slender Lip fern in North Dakota**
- There is only one documented occurrence occurring in northeast Dunn County in the Missouri Plateau. A calcareous soil key to this species occurrence and on rocky slopes.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- With the recent boom in oil activity in western North Dakota where this species has been documented, mining and exploration for new wells sites and road construction poses the largest immediate threat. Other recreation activities such as hiking, biking, and climbing could cause damage to the plants and their surrounding habitats. Climate change also poses a threat due to changing precipitation levels and temperatures.
Slender Lip Fern
Level II

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for *Cheilanthes feei*. However, further research is always needed because it allows us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
- Protect habitat from destruction caused by road developments and oil pad wells.
- Avoid noxious weed establishment.
- Management goals need to be based on the current conditions.
- Gaining knowledge of population locations, extent, demographic characteristics, and changes in populations characteristics over time.
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With this information you can use population viability analysis to estimate the minimum population size to sustain the taxon which can help you establish management practices.
- Preserving habitat and restricting/limiting harvest would be beneficial while gathering population information.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Slender-lobed Clematis**  
*Scientific Name: Clematis columbiana var. tenuiloba*

**General Description:** Stems mainly subterranean, rhizomatous, aerial stems not viny, mostly less than 0.1m, tufted. Leaf blade mostly 3-ternate, leaflets or lobes 1.5 to 5 mm wide. Flowers: sepals violet-blue, 1.5-5cm.

**Natural Heritage State Status/NatureServe Global Status:**
- **S1/G5?T4? – Critically Imperiled/Secure Inexact Numeric**  
  - Rank: Apparently Secure Infraspecific Taxon Inexact Numeric Rank

**Federal Status:** Not listed

**Range:** Occurring in North Dakota, South Dakota, Montana, Wyoming, Utah, and Colorado.

**Primary Habitat:** Typically occurs in open sites or open pine forests on cliffs or exposed rocky areas. Likes full to partial sunlight.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Slender-lobed Clematis occurs in a limited range on open sites on cliffs and exposed rocky areas or open pine forests at altitudes of 3300-9900ft (1000-3000m). Clematis likes to be in full sun to partial shade in calcareous soils that are well drained. The only document occurrences were in the Killdeer Mountains of Dunn County. The first was in 1981 and a few others in the early 1980’s with the most recent in 2005.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- Minimally available habitat that is declining or threatened by human activities recreational or commercial is seen as the largest factor that could reduce or extirpate this species. Recent mining and oil exploration activity will be the largest threat. Any off trail recreation poses a threat as established plants could be disturbed or displaced by the activity. Invasive plant species that tend to be able to rapidly spread and utilize a wide variety of habitats could also encroach and out compete clematis for the available habitat.
Slender-lobed Clematis
Level II

RESEARCH AND SURVEY EFFORTS

• Currently there are no research or survey projects being conducted for *Clematis columbiana*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

• Prevent overgrazing and trampling by livestock.
• Avoid disturbance to habitat especially oil and gas exploration activities.
• Practice best management strategies for woodlands.
• Avoid the use of herbicides that would damage this species.
• Management goals need to be based on the current conditions.
• Gaining knowledge of population locations, extent, demographic characteristics, and changes in populations characteristics over time.
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With this information you can use population viability analysis to estimate the minimum population size to sustain the taxon which can help you establish management practices.
• Preserving habitat and restricting/limiting harvest would be beneficial while gathering population information.

MONITORING PLANS

• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: Collinsia parviflora

General Description: Ascending to erect annual herb. Stem is simple to branched. Leaves are opposite and cover the entire stem and are 1-3 cm long and 3-5 mm wide. Principal leaves generally have pointed end near the base and have a rounded or obtuse apex. Lower leaves almost circular and distinctly petiolate. The inflorescence is a raceme with foliaceous bracts, the flowers appear solitary in axils of leaves and sometimes in whorls in the upper axils. Fruit is a circular capsule 3-5 mm long and 2-3.5 mm wide.

Natural Heritage State Status/NatureServe Global Status: S2/G5 – Imperiled/Secure

Federal Status: Not listed

Range: Range extends from New Mexico, north to Colorado, Nebraska, South Dakota, North Dakota and includes all the states west of there. Blue Lips is also found in Michigan, Pennsylvania, Massachusetts, and Vermont.

Primary Habitat: Moderately moist slopes from sagebrush and pinyon-juniper foothills to subalpine sagebrush and conifer forests.

Climate Index Rank: Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- In North Dakota, this taxon is located most frequently on mesic slopes of buttes. It has been documented in Dunn, Billings, and Slope Counties.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for Collinsia parviflora. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Additional Research or Surveys Needed
- Gain a better understanding of site requirements, demographic characteristics, population viability, pollination mechanisms, and ecology.

MANAGEMENT RECOMMENDATION
- Management goals need to be based on the current conditions.
- Gaining knowledge of population locations, extent, demographic characteristics, and changes in populations characteristics over time.
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With this information you can use population viability analysis to estimate the minimum population size to sustain the taxon which can help you establish management practices.
- Preserving habitat and restricting/limiting harvest would be beneficial while gathering population information.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: Cryptantha torreyana

**General Description:** Annual standing 10-40 cm; Stems are simple or branched throughout; small to rough or bristly hairs ascending to spreading. Leaves are linear to oblanceolate with small hairs present. Inflorescence opens into a fruit that is smooth, black, and shiny and is ovate in shape.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range includes Alaska, Washington, Oregon, California, Nevada, Utah, Idaho, Montana, Wyoming, and North Dakota.

**Primary Habitat:** Open areas, slopes, generally coniferous forest.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species has been recorded once in Bowman County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for Cryptantha torreyana. However, further research is always needed as it gives us a better understanding of a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Cyperus bipartitus*

**General Description:** Tufted annual with slender stalks; Grows 2-8 inches tall with very few leaves. Leaves that do show are located near the base of the plant. Tiny clusters of spikelets are also present.

**Natural Heritage State Status/NatureServe Global Status:** S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Widespread over most of the United States. Also present in Quebec and Ontario. The only states where there is no documentation of this species is Nevada and Arizona.

**Primary Habitat:** This species is known for living in stream banks and other wet, low places in the valleys and lowlands. Vegetation where this plant species occurs is dense and tangled, forming a mat of vegetation often growing towards vegetated shorelines.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Habitat for this plant in North Dakota includes moist, exposed sandy areas along stream banks. Habitat in the Sheyenne sand hills includes banks along spring-fed tributaries. Other habitat that is suitable for this plant is described as saturated loamy soils along margins of spring-fed creeks.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Invasive exotic species are also a major threat to sand plain communities where *Cyperus bipartitus* is found.

**Other Natural or Manmade Factors**
- Changes in hydrologic regime
- Recreational trampling
- Cattle grazing
Brook Flatsedge
Level II

RESEARCH AND SURVEY EFFORTS
• Research is needed to better understand the natural erosion and deposition processes.
• Determine how these processes are affected by artificial and natural barriers.
• Determining the frequency of disturbances, the rate of movement of communities on the landscape, and the process of succession in plant communities is an important research tool.

MANAGEMENT RECOMMENDATIONS
• Stabilizing the shoreline and maintaining its natural flow is vital in developing and conserving the sand plain habitat that Cyperus bipartitus prefers.
• Remove large obstructions to keep the natural flow of the river and its sediments.

MONITORING PLANS
• Information about how the natural communities are affected by movement of substrate by wind, currents, storms, and by the changes in water levels over seasons and decades would be the best way to monitor this species.

REFERENCES


Small Yellow Lady’s-slipper Orchid
Level II

**Scientific Name:** *Cypripedium parviflorum*

**General Description:** Stands 6-16in (15-45cm) tall with the stem being slightly pubescent. Leaves are elliptic and broad 2.5-7in (6.3-17.75cm) long and 2.75in (6.5cm) wide also slightly pubescent; One flower present May-June that extends off a leaf like bract. Sepals and petals are purplish-brown and wavy or twisted in appearance and 1-1.66in (2.5-4cm) long. Labellum is presented in a pouch or “slipper” that is yellow and up to 1/75in (4.4cm) long.

**Natural Heritage State Status/NatureServe Global Status:** S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range is very broad; covers the entire United States with the exception of Nevada, Louisiana, and Florida.

**Primary Habitat:** A variety of wet situations in neutral or slightly alkaline substrates; wet openings and borders in fens and swamp forest; wet prairies; arbor vitae thickets.

**Climate Index Rank:** Extremely Vulnerable (EV): Abundance and/or range extent within geographical area assessed extremely likely to substantially decrease or disappear by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Bogs, fens, wet woods, and swampy areas or near the transition from wetland to upland ecosystems associated with the Glacial Lake Deltas, Glacial Lake Basins, End Moraine Complex, Glacial Outwash, Glacial Lake Agassiz Basin, and Sand Deltas and Beach Ridges eco-regions of the state. Prefers neutral to alkaline soils and will not be found in acidic sphagnum bogs.
Problems which may affect this species

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change is a threat due to the plants' requirements for ample water. With climate change too much or too little water could occur. Habitat degradation through agricultural practices and development pose a significant risk. Small yellow lady's slipper is less tolerant of disturbance than other lady's slipper species. Over collecting of species and fire suppression or prescribed fires during the growing season also pose a threat.

Research and survey efforts
- Currently there are no research or survey projects being conducted for *Cypripedium parviflorum*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Management recommendations
- Protect or create large tracts of grassland, particularly native prairie.
- Prevent overgrazing and trampling of this species during growing season.
- Avoid prescribed burning during the growing season.
- Avoid timber harvest in known habitat.
- Consider the timing of noxious weed spraying to avoid damage to the lady slipper.

Monitoring plans
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

References


5. Cusick, Allison W. *Cypripedium parviflorum*. N.P.: Division of Natural Areas and Preserves/Ohio Department of Natural Resources, Feb. 1980. PDF.

Showy Lady's-slipper
Level II

Scientific Name: *Cypripedium reginae*

**General Description:** Stands 10-35in (25-90cm) tall. Leaves number 3-5 and are ovate in shape and 4-10in (10-25cm) long and pubescent. Flowers number 1or 2 per plant presented on a lanceolate bract 2-5.5in (6-14cm) long. Petals are white about 1in (2-4cm) long and lanceolate in shape. A labellum is also presented in a pouch form and is magenta in color and 1-2in (2.5-5.5cm) long most often seen in June and July.

**Natural Heritage State Status/NatureServe Global Status:** S2/G4 – Imperiled/Apparently Secure

**Federal Status:** Not listed

**Range:** Range extends from Maine, south to North Carolina, west to Arkansas, and north to Minnesota and North Dakota.

**Primary Habitat:**Requires constant moisture primarily located in bogs, fens and damp deciduous forests.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Showy lady's slipper is located in the eastern third of the state in the Glacial Lake Agassiz Basin, Sand Deltas Beach Ridges, Glacial Outwash, and End Moraine eco-regions. It requires constant moisture with some sunlight. The plant grows in neutral soils and roots will go deep enough to reach neutral soils in acidic bog settings. Plants not exposed to enough sunlight will not produce flowers.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations, loss, and climate change. Climate change threatens this species because of its need to have constant moisture but not saturation.
- Habitat alterations in the form of many land use practices could pose a significant threat. The removal of trees around the area the plant is growing might cause too much sunlight to penetrate. Certain agricultural practices such as tiling and uncontrolled grazing around wetlands could damage the habitat or take away the essential water necessary.
Showy Lady’s-slipper
Level II

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for Cypripedium reginae. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.
• Avoid unnecessary disturbances to woodlands and woodland margins.
• Prevent overgrazing.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Leatherwood
Level II

Scientific Name: *Dirca palustris*

**General Description:** Frequently branched shrub that reaches a height of 3-4 meters with a basal diameter of 5-10 cm. Flowering occurs in perfect and borne clusters of 2-7 flowers from each conical bud.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G4 – Critically Imperiled/Apparently Secure

**Federal Status:** Not listed

**Range:** One of the most widely distributed American shrubs. *Dirca palustris* is native of Quebec south to the Appalachicola River in Florida and west as far as Missouri and Oklahoma.

**Primary Habitat:** Exclusively found in relatively rich hardwood forests and mixed conifer forests. Moist, rich, wooded slopes and bottomlands.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Found in many mixed hardwood and coniferous forests across the United States. Can grow in a variety of different soils and is common near water. In North Dakota it could be found in many different regions including Devils Lake Hills, Pembina Gorge, Turtle Mountains, along the Missouri River, and the conifer forests in the southwestern part of the state.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations. Full sun can stress this shrub.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
• Currently there are no research or survey projects being conducted for *Dirca palustris*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
• “Reproductive Ecology of *Dirca palustris*”
• “Variation in development and response to root-zone pH Among seedlings of *Dirca palustris*”

MANAGEMENT RECOMMENDATIONS
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Round-leaved Sundew
Level II

Scientific Name: *Drosera rotundifolia*

**General Description:** Perennial insectivorous forb stemming 2-8in (5-20cm) from a basal rosette of leaves. Leaves are round in shape and more broad that long. Upper surface of leaves are covered with short red glandular hairs that secret a sticky substance to aid in trapping insects. Flowers are presented June-September on a scape 2-10in (5-30cm) in length with flowers being arranged in a raceme number 2-15 in the colors of pink or white.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends from Maine, south to Georgia and west to Mississippi, then north to Iowa, Minnesota, and North Dakota. Also occurs in Montana, Colorado, Idaho, Washington, Oregon, and California.

**Primary Habitat:** Most commonly found in peat bogs or swamps with exposure to ample sunlight.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

**Preferred Habitat**
- Only two occurrences have been documented in the state located in the Turtle Mountains. The plant is most commonly located in sphagnum and peat bogs associated with the region. It can also occur if conditions are right in swamps, mossy rock crevices, and around water ways. Bogs typically are acidic and low in nutrient availability with high concentrations of water that is not physically visible. Round-leaved sundew can survive with the water table being within 1in (2cm) of the surface to 16in (40cm) below. The plant needs ample sunlight in order to thrive.
Round-leaved Sundew
Level II

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because round-leaved sundew needs constant water. It can withstand flooding for several weeks but cannot withstand drought. With climate change precipitation occurrence and amount can be expected to change from what historically has occurred. If a drought occurs species that need drier conditions will encroach and take over the bog.
- Fire has proven to be vital tool in the suppression of shrub and woody species that encroach on a bog. Human activities in and around areas where the bogs are present also pose a threat. Diversion of ground water or surface water that flows into the bog can change the composition allowing other species to take over. Examples would include irrigation practices and impoundment creation.
- Other land practice such as logging, construction, and agriculture pose threats as well. Logging to close to a bog will allow sediments and nutrients into the ecosystem that are not normally present. Livestock allowed to travel through the bog could trample the habitat and deposit excrement high in nitrogen into the bog. Addition of fertilizers and other chemical could be carried by surface water into the bog; altering the composition and nutrient loads in the water.

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for Drosera rotundifolia. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Additional Research or Surveys Needed
- Remote sensing data, such as color infrared and natural color aerial photographs, in conjunction with existing land cover and vegetation data sets available on many national forest grounds, could be used to identify potential habitat.
- Comprehensive demographic surveys of known occurrences need to be conducted in order to better evaluate the current status of Drosera rotundifolia.
- More environmental data for fens that support occurrences of Drosera rotundifolia.
- Knowledge about wetland hydrology is essential part of evaluating implications for managing this particular species.
- Since this plant is vulnerable to heavy foot traffic, a long-term analysis is needed to determine the effects of trampling. This analysis includes annual census and an analysis of the soil seed bank. It is very important to understand the characteristics of D. rotundifolia’s seed production, dispersal, and storage in soils, and how trampling affects these processes.

MANAGEMENT RECOMMENDATIONS
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.
- Protect bogs and fens and other wetlands that support this plant.
- Avoid altering hydrologic regime that would change the water supplies to these wetlands.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
Round-leaved Sundew
Level II

REFERENCES


**Scientific Name:** *Equisetum palustre*

**General Description:** Perennial cryptophyte growing between 10 and 50 cm. Its fertile shoots, which carry ears, are evergreen and shaped like the sterile shoots. The stem is rough and is ribbed throughout; Most contain 8-10 ribs and in some cases 12. Branches are whorled and the tight fitting sheathes end in 4-12 teeth.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Widespread over all of Canada and Alaska. Range stretches down to Pennsylvania, Illinois, Nebraska, and California. Also present in northern Idaho, Washington, and Montana.

**Primary Habitat:** Includes marshes and swamps. In the Great Plains it is found in oxbow swamps and margins of fresh spring-fed streams. Other suitable habitat has been described as shaded boggy areas.

**Climate Index Range:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In southeastern North Dakota, Marsh Horsetail is found on moist sandy stream banks and boggy areas. It can also be found in willow thicket habitat.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations.
Marsh Horsetail
Level II

Other Natural or Manmade Factors
- Trampling by humans during recreational activities poses a major threat. Also purple loosestrife, an invasive species, can be present near Marsh Horsetail habitat but it is not known if this is a major threat to the population or not.

RESEARCH AND SURVEY EFFORTS
- Habitat preference of this species needs to be described since it occurs in small areas of larger wetland habitats. Other areas that need to be researched include the water pH and population augmentation.

MANAGEMENT RECOMMENDATIONS
- Protect populations from direct contact with humans and the invasion of an invasive aquatic species such as Purple Loosestrife or Phragmites.
- Hydrology of the area should be maintained to protect the water levels of the wetlands.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Equisetum pratense*

**General Description:** Green bottlebrush-like perennial with hollow and slender stems; 10-50 cm tall and 1-4 mm thick. Possess a dimorphic body plan; fertile and sterile stems. Fertile stems are unbranched at first, and then later develop whorls of branches. Sterile stems are mainly single branched with some whorls of branching; not as many as the fertile stem.

**Natural Heritage State Status/NatureServe Global Status:**  
S2/G5 – Imperiled/Secure  

**Federal Status:** Not listed

**Range:** Circumboreal, south in North America to New Jersey, Iowa, South Dakota, and British Columbia. Restricted to eastern North Dakota.

**Primary Habitat:** Stream banks, moist woods, thickets, and meadows in full to partial sun.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, this species occurs along riverbanks, in wet woods associated with springs, and willow thickets.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Meadow Horsetail  
Level II

Other Natural or Manmade Factors  
• Other threats include trampling, erosion or high water in riverside habitats, logging and improper maintenance of roadsides; including allowing succession to crowd out plants.

RESEARCH AND SURVEY EFFORTS  

Current Research or Surveys  
• Currently, more research is needed to determine habitat preference since it is not known why this species prefer certain areas of extensive wetland habitat.

MANAGEMENT RECOMMENDATIONS  
• Plants need to be protected from direct impact by humans using their shoreline habitat. Roadside maintenance should avoid impacting plants by using proper mowing schedules and equipment. Open wetland habitats where these plants occur should not be allowed to succeed to trees or shrubs.

MONITORING PLANS  
• Inventory abundance and distribution of invasive exotic plants to assess potential negative impacts on critical habitats and rare species and determine feasibility of control.  
• Monitor existing populations of rare plants periodically to ensure habitat management is not deterring their long term viability.

REFERENCES


Cushion Fleabane  
Level II

**Scientific Name:** *Erigeron radicatus*

**General Description:** Perennial herb that is 2-6 cm tall with a multi-branched, compact, woody rootstock. The stems are erect with sparse to dense strigose. Leaves are generally basal and persistent. Lower surface of the leaves is shiny and glabrous or become glabrous as they mature. The upper leaf surface is loosely strigose, lacking glands. Flowers are white to semi-purplish.

**Natural Heritage State Status/NatureServe Global Status:**  
S1/G3G4 – Critically Imperiled/Vulnerable-Apparently Secure

**Federal Status:** Not listed

**Range:** Known from western and central Montana, east-central Idaho, western Wyoming, and west-central North Dakota.

**Primary Habitat:** Rocky slopes, ridges, and summits, ledges and crevices, outcrops and talus, usually limestone, alpine tundra.

**Climate Index Range:** Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

### LOCATIONS AND CONDITIONS OF KEY HABITAT

**Preferred Habitat**
- In North Dakota there is only documentation of this species in Dunn County. Typically located at elevations from 1400-2600 meters.

### PROBLEMS WHICH MAY AFFECT THIS SPECIES

**Habitat**
- The greatest threat to this species is habitat alteration and loss.

**Other Natural or Manmade Factors**
- Land conversion and overgrazing.
- Agricultural activities, peat or marl mining, land drainage, and other human activities could have an effect on this species.
Cushion Fleabane
Level II

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
• Currently there are no research or survey projects being conducted for *Erigeron radicatus*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Additional Research or Surveys Needed
• Research regarding compatible development activities is a high priority.
• The role of fire as a management tool to minimize succession or the invasion of exotic species should also be investigated.
• Research on the breeding biology and genetic diversity of this species will provide a sounder basis for making management decisions.

MANAGEMENT RECOMMENDATION
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.
• Prevention of hydrological changes and maintenance of fairly open condition are necessary for maintaining viable habitat.
• Careful fire management.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Nodding Buckwheat
Level II

Scientific Name: *Eriogonum cernuum*

**General Description:** An herb with a spreading to erect posture standing .5-6 dm tall and is glabrous, grayish, greenish, or reddish. Stems are not hollow and are glabrous. Leaves are basal or sheathing up the stems and are round-ovate to orbiculate.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Found in the western United States from the Dakotas and Nebraska west to California, Oregon, and Washington.

**Primary Habitat:** Frequently found on sandy to gravelly or clayey flats and slopes, mixed grassland, saltbush, sagebrush, and mountain mahogany communities, oak, pinyon-juniper, and conifer woodlands.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota there are two records of this species in Dunn and Slope Counties.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
• Currently there are no research or survey projects being conducted for Eriogonum Cernum. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
• “Sensitive Plant Survey-Little Missouri National Grasslands”

MANAGEMENT RECOMMENDATION
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.
• Protect habitat from development and conversion to cropland.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Eriophorum gracile*

**General Description:** Perennial, colonial graminoid with creeping rhizomes and slender erect stems that stand 20-60 cm high. The leaf blades are 1-2 mm wide and deeply channelled or triangular in cross-section, except near the stem. Flowers are borne in 2-5 spikelets on short, drooping stalks that often exceed the single green, leaf-like bract that is shorter than the inflorescence. Each flower consists of numerous long, shining white bristles, approximately 2 cm long at the base of the ovary.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Circumboreal species, south in North America to Pennsylvania, Indiana, Iowa, Nebraska, Colorado, Idaho, and California.

**Primary Habitat:** Habitat in the Great Plains includes fens and boggy meadows.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABitat**

**Preferred Habitat**
- In North Dakota this species is found in fen habitat dominated by *Carex aquatillis* and *Sparganium eurycarpum*. Two occurrences in Ransom County, in the southeastern part of the state, are the only documentation of its presence in North Dakota.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
Other Natural or Manmade Factors
- Hydrologic alterations, grazing, motorized vehicle use, peat mining, and invasive species.

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Eriophorum gracile*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Additional Research or Surveys Needed
- Our current understanding of the distribution and abundance of *E. gracile* suggests that it should remain a species of concern, and that expanding our knowledge of its distribution and habitat is a high priority.

MANAGEMENT RECOMMENDATION
- Any activities that maintain the hydrologic regime of these habitats will contribute to the persistence of *E. gracile*.
- These activities may include the regulation and monitoring of hydrological modifications, domestic grazing, and motorized vehicle use.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Euonymus atropurpureus*

**General Description:** Large, clumping, deciduous shrub or occasionally a small tree with spreading, irregular crown and red or purple capsules. The twigs and leaves are lime-green, the twigs are bordered by corky lines, and the leaves turn red in the fall.

**Natural Heritage State Status/NatureServe Global Status:**
S3/G5 – Vulnerable/Secure

**Federal Status:** Not listed

**Range:** Found from Southern Ontario to North Dakota, south to Florida and Texas.

**Primary Habitat:** In the Great Plains, wahoo grows in wooded areas, along bluffs, stream banks, and thickets.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In southeastern North Dakota, habitat includes rich moist woods, oak woodlands, forest edges, and oak stands in sand hills.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Changes in land use, habitat fragmentation, forest management practices are all low-level threats to Wahoo.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Euonymus atropurpureus*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
- This plant species is reported to have medicinal properties.
- Evaluation of populations shows that deer and livestock highly prefer Wahoo, which was proved by plants being browsed back to less than two-feet tall.

Additional Research or Surveys Needed
- Information regarding current populations and land conditions.

MANAGEMENT RECOMMENDATIONS

- As with many special status species that are not federally listed, species-specific information for management is limited. The following points are ways to establish a successful management plan:
  1. Establish goals based on current conditions and land use.
  2. Gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.

MONITORING PLANS

- With the information that you collect from the above points, you can use population viability analysis to estimate the minimum population size to sustain the taxon.
- While this information is being collected, preserving habitat and restricting impacts is beneficial.

REFERENCES


Scientific Name: *Galium labradoricum*

General Description: 4-16 inch tall perennial. Three stalked flowers, that are white in color, arise from the leaf axils near the top of the plant. Petals on the flower are blunt-tipped and are longer than they are wide. Leaves are all in whorls of 4, with blunt tips and a prominent center vein. There are short hairs around the leaf edges and sometimes along the central vein on the underside. Leaves also curve or bend downward soon after emerging. Stems are weak but mostly erect and smooth except for a tuft of short hairs around the leaf nodes. A fruit that is a pair of smooth round capsules is also present.

Natural Heritage State Status/NatureServe Global Status: S3/G5 – Vulnerable/Secure

Federal Status: Not listed


Primary Habitat: In the Great Plains, includes moist thickets and woods, usually swampy. Other habitat is reported as bogs, fens, and swamps.

Climate Index Rank: Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

Reason for Designation: This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

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LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- In North Dakota it occupies wet bogggy ground or wetland thicket habitat dominated by alder and bog birch. Other habitat includes peat lands, fens, seeps, marshy lake borders, and oxbow wetlands. Prefers open areas within these habitat types.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threat to this species is habitat loss and modification.
Other Natural or Manmade Factors
• Competition and shading from native and exotic plants, flooding due to beaver activity, and anthropogenic changes to water quality or hydrologic regime.

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Galium labradoricum*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• If necessary, a plan for vegetation control should be constructed.
• Beaver activity should be noted and reported if habitat is in danger of being inundated.

MONITORING PLANS
• Habitats should be monitored periodically for invasive plants and for competition or shading by competing plants.

REFERENCES


5. *Labrador Bedstraw (Galium Labradoricum).* Westborough, MA: Massachusetts Division of Fisheries & Wildlife, 1985-2010. PDF.
**Scientific Name:** *Gymnocarpium dryopteris*

**General Description:** A delicate, deciduous fern that grows to 12 inches tall. Leaves are lime-green and broadly triangular. Stalk is very slender, shiny, straw-colored and sparsely scaled at the base.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Circumboreal species; South in North America to Virginia, West Virginia, Iowa, South Dakota, Arizona, and Oregon.

**Primary Habitat:** Habitat in the Great Plains includes damp, shaded granite rock ledges and crevices, and rocky wooded slopes. It also occurs on mesic to wet sites in mixed conifer and northern hardwood stands. Soils are moist to well-drained.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In the Sheyenne Sandhills, a single population of this fern has been discovered. It occurs within an enclosure in the Olson Allotment. It grows in mesic oak woodlands adjacent to a wetland margin. Other habitat in North Dakota includes moist birch or elm-ash forests on north-facing slopes with full shade in the Pembina Gorge.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.

**Other Natural or Manmade Factors**
- Potential threats also include grazing, hydrologic alteration, and recreational land use.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Gymnocarpium dryopteris*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species and their life cycle requirements necessary for survival.

Additional Research or Surveys Needed
- A monitoring system should be set up and further investigation done into its habitat specificity.

MANAGEMENT RECOMMENDATIONS
- Fire can top kill oak fern and repeated burning can significantly reduce its frequency.
- Oak fern response to logging varies. If logging leads to decreases in site moisture, oak fern will decrease.
- In wet, high-elevation areas, logging can increase oak fern abundance.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Hudsonia tomentosa*

**General Description:** Low growing shrub usually about 3-8 inches tall and finely branched. Leaves are elongated and scale like, usually less than .125 inches long and coated with soft, white, wooly hair. Yellow flowers that are 5-petaled and about .25 inches across are present from May through July.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Occurs along the Atlantic Coast from Maine to North Carolina, along the Great Lakes from New York to Minnesota and North Dakota.

**Primary Habitat:** Sand dunes, sandy pine woods, pine-barrens, and sand hill clearings.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, habitat includes dunes and sand blowouts in the Sheyenne Sandhills.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Very sensitive to trampling, mechanical disturbances by off-road vehicles, and over shading by woody species.
Wooly Beach-heather
Level II

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for *Hudsonia tomentosa*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
- Wooly Beach-heather is easily overtopped and eliminated if dunes stabilize.
- Protect sand dune habitats from Off-road vehicles.
- Avoid planting into the open sand dunes and blowouts.
- Since this plant is highly sensitive to trampling, management guidelines need to be developed to accommodate this.
- At this time there are not many management recommendations that are published for the Beach Heather.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Lappula cenchrusoides*

**General Description:** Intricately bushy-branched species that is 2-4 cm tall. The stems and branches are slender with moderately harsh pubescence that is rather minute on shorter stems. Leaves are somewhat similar with scanty hairs on the upper face that are denser below with inordinately large pustulate bases. Leaves are also numerous, small, and oblong to ovate. The flowers are leafy-bracted spikes and are very minute.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G4 – Critically Imperiled/Apparently Secure

**Federal Status:** Not listed

**Range:** Range includes Connecticut, Massachusetts, Nebraska, South Dakota, North Dakota, Utah, Wyoming, and Montana.

**Primary Habitat:** Found in dry soils in the open.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this plant species has been documented in Billings, Dunn, McKenzie, Sioux Slope, and Williams Counties.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Lappula cenchrusoides*. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
• Management goals need to be based on the current conditions.
• Gaining knowledge of population locations, extent, demographic characteristics, and changes in populations characteristics over time.
• With this information you can use population viability analysis to estimate the minimum population size to sustain the taxon which can help establish management practices.
• Preserving habitat and restricting/limiting harvest would be beneficial while gathering population information.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** Lechea stricta

**General Description:** Erect perennial standing about 4-16 inches tall. Pale grayish in color with very fine hairs on the spreading stems. Leaves are lance-like with the lower side more or less finely hairy. A three-parted, red flower is present. Stalks are very hairy and inflorescence is a 6 inch tall, branched, spike–like cluster.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G4? – Imperiled/Apparently Secure Inexact Numeric Rank

**Federal Status:** Not listed

**Range:** Range extends from New York and Ontario, west to North Dakota, south to Indiana, Illinois, and Nebraska.

**Primary Habitat:** Dry sandy woods and prairies.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this plant is found in sandhills. The recent record of the Sheyenne National Grassland occurs on an open midslope with fine sands on very gentle slopes. The plant has been documented in both Richland and Bowman counties in North Dakota.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Upright Pinweed
Level II

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Lechea stricta*. However, further research is always needed as it helps us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
• Avoid placing new facilities, roads, trails, fences, salting and minerals and other developments in habitat.
• Identify habitats as priority areas for noxious weed control.
• Avoid the use of noxious weed and invasive plant control methods that may negatively impact populations.
• Design timing, intensity, and frequency of mowing, burning, and livestock grazing to maintain or increase populations.
• Ensure that management actions do not contribute to loss of population viability.
• Protect known populations from land use activities that cause trampling or increased soil compaction.
• Enhance and improve habitat for known populations through restoration programs.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES
**Scientific Name:** *Leucocrinum montanum*

**General Description:** Stemless perennial about 5-10 cm tall, with a short, deeply buried rhizome and fibrous roots. Leaves are basal, tufted, linear, and grass like and can be up to 20 cm long and 2-8 mm broad. Flowers are few to several starting from the base of the plant. They are fragrant and white in color. The fruit is a capsule that is at or below ground level.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range includes Oregon, California, Nevada, Arizona, New Mexico, Utah, Colorado, Idaho, Montana, Wyoming, Nebraska, South Dakota, and North Dakota.

**Primary Habitat:** Sagebrush desert to open montane forest, in sandy to rocky areas or in fairly heavy soil.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, populations of the Sand Lily have only been found in Slope and Golden Valley Counties. This species likes sandy or gravelly shortgrass prairies and foothills that are moderately or heavily grazed.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations.
RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Leucocrinum montanum*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Liparis loeselii*

**General Description:** Plant with two large basal leaves with parallel venation; reaches 3-8 inches in height. White to yellowish-green flowers present.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends west from Nova Scotia and Quebec to Manitoba, south to New Jersey, Ohio, Alabama, and Nebraska. Abundance includes some of the states in the western United States like Washington and Montana.

**Primary Habitat:** Occurs in full or partial sunlight in moist, sterile habitats such as bogs, wetlands, springs, and frequently where conifer forests are present. (Douglas fir stands)

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species occurs in fens, wetland swales in sand hills, and wetland thickets.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Other threats that could potentially affect this species are changes in the hydrologic regime, livestock grazing, and recreational activities.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Research is currently underway on propagation of this species at the Royal Botanic Gardens.

Previous Research or Surveys
- Research on the ecology and conservation of this species has been done and will continue further.

Additional Research or Surveys Needed
- Additional inventory of wetlands, particularly bog and fen habitats, is needed.
- Practical ways to restore this species within wetland habitats should be considered.

MANAGEMENT RECOMMENDATIONS
- This species reportedly prefers sparsely vegetated habitat.
- Studies of the dynamics of seed production, dispersal, and seed bank longevity, population viability studies, and studies of gene flow will help provide information that is necessary in the management of this species.
- It was noted in previous years that following a prescribed burn, Liparis loeselii was recorded in peak numbers. This indicates that a winter burning or light trampling is an appropriate conservation measure.

MONITORING PLANS
- Population and habitat monitoring are used when trying to better understand a population. This helps determine what management strategies can be put into action to keep the population of a plant at an equilibrium and possibly boost its population numbers. Habitat monitoring can also be effective because it helps biologists fully understand what type of habitat any particular species prefers.

REFERENCES


Scientific Name: *Lipocarpha micrantha*

**General Description:** Annual sedge that has stems 4in (10cm) long and leaves the same length. The flower is presented in oval spikes 2-6mm in length. Each stem contains 1-3 spikes.

**Natural Heritage State Status/NatureServe Global Status:** S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Occurs throughout the United States except for Nevada, Utah, Colorado, Wyoming, Montana, South Dakota, West Virginia, and Vermont.

**Primary Habitat:** Primarily located on sandy beaches where the plant is protected from the heavy wave action. Soils must be sandy with minimal to no organic sediment.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Typically found on moist sandy shores immediately surrounding glacial lakes or areas that have seasonal flooding. Does not tolerate disturbances or competition from other species and is typically located in protected areas away from strong currents and heavy waves.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because of the possibility of changing precipitation and temperatures. Increased or decreased precipitation could cause the available habitat to become uninhabitable for the species. Invasive species encroachment taking up available resources will also pose a threat as they are aggressive and spread rapidly. The areas that small flowered lipocarpha is present is also highly sought after for shoreline development.
Small–flowered Lipocarpha
Level II

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for Lipocarpha micrantha. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
- Protect shorelines through the use of conservation easements.
- Create possible wave breaks.
- Control invasive species.
- Practice rotational burning: intervals of 3-4 years in tallgrass prairie, 6 years in mixed-grass prairie, and 5-10 years in shortgrass prairie.
- Delay mowing until July 15.
- Prevent overgrazing.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Menyanthes trifoliata*

**General Description:** Smooth hardy lakeshore perennial that typically lives near shallow water. All leaves are basal hanging from a creeping stem that grows along the ground; Produces a fruit and a flower.

**Natural Heritage State Status/NatureServe Global Status:** S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Circumboreal, south in North America to Delaware, Virginia, Ohio, Missouri, South Dakota, Colorado, and California.

**Primary Habitat:** Fens and old bogs, edges of ponds and moist soils, shallow waters; Common in sunny shallows near portage landings.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, buckbean is found in sphagnum bogs, rich fens, bog birch fens, calcareous fens. Habitat in the Sheyenne Sand hills is the wettest peat wetland interiors. This species has been documented in three counties in southeast and north central North Dakota.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Menyanthes trifoliata*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Minuartia dawsonensis*

**General Description:** Moss-like perennial forb that is 4-16 in (10-40 cm) tall typically on the shorter side. Leaves are short and narrow bristle-like in appearance. Flowers are white with five petals and 1/2 in (1 cm) wide.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Only occurs in North Dakota, Minnesota, and Wisconsin.

**Primary Habitat:** Typically located on bedrock outcrops or upland prairies with sandy soils derived from similar bedrock.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant which means that it is not listed as federal or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**

- Primarily found on sandstone and limestone outcrops that are exposed. There is only one recorded occurrence in the state in Cavalier county located in the Pembina Escarpment. The plant grows in crevices and shallow soils over exposed bedrock. It will not grow on vertically exposed bed rock. It is also typically found in upland prairies with soils primarily sand or gravel derived from sandstone and limestone. Rock stitchwort is primarily found in areas that become very dry and warm mid and late summer. Plant thrives in areas with little competition and disturbance.
PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat

With only one recorded occurrence for the species the greatest threat is population size and available habitat. The habitat that supports rock stitchwort does not tolerate disturbance and is very delicate. Human activities even those that are non-aggressive such as hiking can disturb a site enough to make it uninhabitable for rock stitchwort. Grazing practices in areas where viable habitat is present presents a large threat if the outcroppings are accessible to cattle. Climate change poses a significant threat because with the change in temperature and precipitation, certain requirements for the plant may become non-existent. Increased temperature and precipitation would lead to faster erosion of the outcroppings and a change in the soils chemistry. Invasive species and encroachment by woody species utilizing the same resources as rock stitchwort poses a threat.

RESEARCH AND SURVEY EFFORTS

Currently there is no research or survey projects being conducted for *Minuartia dawsonensis* However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- Protect or create large tracts of grassland, particularly native prairie.
- Prevent encroachment of woody vegetation in grasslands.
- Encourage vegetative diversity.
- Practice rotational burning: intervals of 3-4 years in tallgrass prairie, 6 years in mixed-grass prairie, and 5-10 years in shortgrass prairie.
- Delay mowing until July 15.
- Prevent overgrazing.
- Use native grasses when replanting grassland.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Sensitive Fern
Level II

Scientific Name: *Onoclea sensibilis*

**General Description:** Coarse-textured, medium to large-sized perennial fern with broad leaves and leaflets; Grows to 18”-24” tall.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range includes all of the eastern United States and Canada, stretching west to Colorado and Wyoming. In Canada the range extends to Manitoba.

**Primary Habitat:** Dwells in a variety of wet swamp and wood habitats such as wet meadows, thickets, streams and riverbanks, and usually in slightly acidic soil.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant species, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In southeastern North Dakota this fern occupies wet woods and thickets. Other habitat in the state is described as alder thickets, wet hardwood forest, wetland thickets-forest ecotones, and seep and spring areas.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Disruptions to bedrock or glacial deposits such as mining or drilling
- Groundwater extraction
- Groundwater pollution
- Foot traffic and recreational activities
RESEARCH AND SURVEY EFFORTS

Previous Research or Surveys
- Research has been done on spore germination, the effect of light on growth, and breeding systems.

Additional Research or Surveys Needed
- More site inventory and classification work is needed.
- Understanding the natural successional pathways and the historical frequency of disturbances such as fire and grazing would be important when managing these wetlands.

MANAGEMENT RECOMMENDATIONS
- Mining, drilling or other disruptions to the bedrock or glacial deposits should not be undertaken within half a mile of seepage wetlands.
- Understanding of bedrock layers and groundwater flows is very beneficial.
- Since wetlands are sensitive to trampling and other disturbances due to foot traffic and other recreational activities, trails should be located away from the wetland or elevated structures should be employed to prevent direct traffic within the wetland.
- A natural buffer around the wetland should be maintained in order to minimize nutrient runoff, pollution, and sedimentation.

MONITORING PLANS
- Soil texture, condition of the adjacent vegetation, and the topography of the surrounding area should be considered and monitored when establishing buffers around wetland habitat.
- Monitor wetland conditions these plants occur in.

REFERENCES


Adder’s-tongue Fern
Level II

Scientific Name: *Ophioglossum pusillum*

**General Description:** Upright stem, 1/8 inch in diameter with one leaf. Trophophore stalk expands gradually into blade. Blade is erect or spreading, usually plane when alive. Pale green, dull, mostly oval shaped and narrow at the base. Sporangia clusters are present with each containing 10-40 pairs of sporangia.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends from New Brunswick to British Columbia and Alaska south to Virginia, Ohio, Illinois, North Dakota, Montana, and Washington.

**Primary Habitat:** Terrestrial pastures, old fields, roadside ditches, and flood plain woods in seasonally wet, rather acidic soil.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota it is apparently limited to the Sheyenne Sandhills. It is found in wetland swales and has been documented in full sun and in shade of willows. It is often found in saturated soils.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
**Adder's-tongue Fern**

**Level II**

**Other Natural or Manmade Factors**
- Potential threats also include grazing, trampling, logging, and any activities which would alter the hydrology of the sites.

**RESEARCH AND SURVEY EFFORTS**

**Additional Research or Surveys Needed**
- No systematic inventories have been undertaken for this species. Inventory efforts could be aided by training individuals to recognize the species and its habitat.

**MANAGEMENT RECOMMENDATIONS**
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

**MONITORING PLANS**
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

**REFERENCES**


Scientific Name: *Phlox alyssifolia*

**General Description:** Tufted, much-branched, tap rooted perennial only about 2-4 inches tall. Leaves are mostly opposite and only about three quarters in length and an eighth inch wide. Lower branches are woody, with shreddy white bark. Flowers arise in clusters of two or three at the tips of about 5-10 of the largest branches.

**Natural Heritage State Status/NatureServe Global Status:** S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Small range that includes North and South Dakota, Montana, Wyoming, Nebraska, and parts of Saskatchewan and Alberta.

**Primary Habitat:** Dry sands, clays, or gravels on open prairie hilltops and benches.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Dry sands, clays, gravels of prairie hilltops, limestone cliffs, rock outcrops, as well as pasture land. This species is known from Billings, Golden Valley, and Williams counties in North Dakota.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations.
Alyssum-leaved Phlox
Level II

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for Phlox alyssifolia. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• Management goals need to be based on the current conditions.
• Knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With this knowledge, population viability analysis can be used to estimate minimum population size to sustain the taxon.
• Protecting habitat and avoid converting to cropland.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Pinus flexilis*

**General Description:** Trees 12-15 m tall and 60-90 cm in diameter; Straight to contorted; Bark light grey, nearly smooth and becoming dark brown and cross-checked in age into scaly plates and ridges. Branches spreading to ascending, often persistent to trunk base; Twigs are pale red-brown and are covered with dense small hairs; Needles five per fascicle, spreading to up curved and ascending. Staminate cones broadly ellipsoid-cylindrical and pale red or yellow in color.

**Natural Heritage State Status/NatureServe Global Status:** S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range scatters widely; Extends from British Columbia south to California, Arizona, and New Mexico. It is scattered widely across the Great Basin into Utah, Nevada, Colorado, Wyoming, and Montana. Isolated populations occur in the Dakotas and Nebraska.

**Primary Habitat:** Occurs on dry to moderately moist sites in subalpine environments; often on rocky terrain penetrating the spaces between rocks.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species has only been documented in Slope County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- White pine blister rust
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Pinus flexilis*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
- Many studies have been done on *Pinus flexilis*’s response to drought at high elevations.
  - "Response of high-elevation timber pine to multi-year droughts and 20th century warming".

MANAGEMENT RECOMMENDATION
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.
- Watershed protection and enhancement.
- Periodic fires to reduce undergrowth.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Rose Pogonia
Level II

Scientific Name: *Pogonia ophioglossoides*

**General Description:** Glabrous plant, 15-35 cm tall arising from a cluster of fibrous roots. One leaf located halfway up the stem, ovate to elliptical shape, 3-10 cm long and 1-2.5 cm wide. Leaf is somewhat fleshy in texture. Typically one pink flower terminating the stem, rarely two or three; Sepals and petals are pink. Labellum is spatulate and the margin is fringed with fleshy hairs. Center of labellum bears several rows of similar hairs that are typically pink with marginal hairs darker pink-purple or magenta and central hairs yellow, occasionally all pink or deep magenta.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends from Maine south to Florida, west to Texas and Oklahoma and north to Minnesota and North Dakota.

**Primary Habitat:** Almost always found in acidic, boggy conditions in marshy meadows or grassy seepage slopes.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota there is one record of this species being present in Grand Forks County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Rose Pogonia
Level II

Other Natural or Manmade Factors
• Habitat destruction due to construction and herbicide treatment of ditches and waterways.
• Non-native invasive plants are also a threat to this species.

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
• Currently there are no research or survey projects being conducted for *Pogonia ophioglossoides*. However, further research is always needed as it helps us better understand a multitude of sensitive plant species, their populations, and their life cycle requirements necessary for survival.

Previous Research or Surveys
• “Origin and Development of Shoots from the Tips of Pogonia ophioglossoides”

MANAGEMENT RECOMMENDATION
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Swamp Smartweed
Level II

Scientific Name: *Polygonum hydropiperoides*

**General Description:** Erect perennial forb that stands up to 6-40 in (15-101 cm) stemming from a rhizome. Leaves are alternate and linear in shape. Flowers are white or pink on a thin inflorescence appearing from June-September. The fruit produced is a smooth, black, shiny seed.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Ranges all across the United States with the exception of Utah, Wyoming, and Colorado.

**Primary Habitat:** Lowland moist areas in woods, swamps and along shallow streams; requires an organic soil.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant which means that it is not listed as federal or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

**Preferred Habitat**
- One occurrence is documented in East central Pembina County. Swamp smartweed is predominantly located in low lying wooded areas, swamps, and areas with moist organic soils. Commonly found bordering ponds. Requires ample moisture and does not handle extended period of drought.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because swamp smartweed requires moisture and with the possible increase of decrease in temperature and precipitation biological requirements may not be maintained for a viable population. Human interaction and manipulation of water flow presents a threat to the species as well.
RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for *Polygonum hydropiperoides*. However, further research is always needed as this will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
- Protect wetland habitats.
- Avoid draining wetlands and altering natural hydrologic regimes.
- Use caution when applying pesticides.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Lanceleaf Cottonwood
Level II

Scientific Name: *Populus x acuminata*

**General Description:** Single-stemmed tree with branches horizontal to shallowly ascending, a narrowly-spreading flat-topped crown, resinous leaf buds, orange-tan twigs of the first year and furrowed bark. Angular lanceolate leaves are longer than they are wide.

**Natural Heritage State Status/NatureServe Global Status:**
S2/GNA – Imperiled/Not Ranked

**Federal Status:** Not listed

**Range:** As a hybrid it has not been assigned global distribution. *P.angustifolia*, one of the species that makes a hybrid with *Populus deltoids*, has a range from Montana, Wyoming, South Dakota, Nebraska, and New Mexico.

**Primary Habitat:** Grows best in loamy, sandy, pebbly, and clay soil that is moderately moist to wet.

**Climate Index Rank:** Moderately Vulnerable (MV):
Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

### LOCATIONS AND CONDITIONS OF KEY HABITAT

**Preferred Habitat**
- Lance leaf cottonwood has been recorded in its primary habitat in Billings and Slope counties in North Dakota.

### PROBLEMS WHICH MAY AFFECT THIS SPECIES

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

### RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for *Populus x acuminata*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

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Key to the Habitat Distribution Map

- **High Probability**
- **Low Probability**
MANAGEMENT RECOMMENDATIONS

• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


American Primrose
Level II

Scientific Name: *Primula incana*

**General Description:** Herbaceous plant with thin, short rhizomes. Plants are 2-46 cm tall with rosettes. Plants are usually whitish or yellowish farinose, sometimes farinose, especially in age. Leaves are thin and margins remotely denticulate. The leaf apex is acute to obtuse, and the surfaces glabrous. Inflorescences are 4-19 flowered. Pedicels are erect and thin about 3-9 mm long with involucral bracts. Flowers are homostylous with a green calyx that is broadly cylindrical. The corolla is lavender with a tube 4-10 mm, and about equal to the calyx. Capsules are cylindrical to ellipsoid, length 1.5-2 times the calyx.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G4G5 – Imperiled/Apparently Secure-Secure

**Federal Status:** Not listed

**Range:** Found throughout Canada and the western states of North Dakota, Montana, Idaho, Wyoming, Colorado, and Utah.

**Primary Habitat:** Most frequently found on alkaline clay soils in river floodplains and moist open meadows at elevations from 0 to 3500 meters.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota there have been two records of this species in Mountrail and Burke Counties.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Water diversions that lower the water table.
- Livestock grazing
American Primrose
Level II

RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for *Primula incana*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.
- Maintaining site quality in terms of hydrology and the effects of impacts to wet soils, along with woody species management

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Ribes cynosbati*

**General Description:** 24-48 inch tall, erect, perennial shrub that rises on multiple stems from a branching, woody root system. The stems are ascending, arching, or prostrate on the ground and creeping. First year stems are green and hairy and become gray or brown and hairless by the third year. The leaves are alternate and occur singly or in small clusters of two or three. The inflorescence is a loose, unbranched cluster of one to three. The fruit is a globular berry with conspicuous prickles. Immature berries are shiny green with narrow, pale green, vertical stripes. When ripe they are dull red or dull purple. They are held well away from the stem.

**Natural Heritage State Status/NatureServe Global Status:**
S3/G5 – Vulnerable/Secure

**Federal Status:** Not listed

**Range:** Range extends from New Brunswick to Manitoba, then south to Missouri and Georgia.

**Primary Habitat:** Habitat in the plains includes wooded hillsides and flat areas, usually with moist soil. Other habitat in the Great Plains includes rocky to loamy rich wooded hillsides.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species is found in rich forests. In the Sheyenne sandhills, a single population has been documented recently from a steep, wooded, north-facing slope.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Potential threats also include grazing, hydrologic alteration, and recreational land use.
Prickly Gooseberry
Level II

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for Ribes cynosbati. However, further research is always helpful as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• Limiting access of livestock to the steep wooded slope at the single population site on the Sheyenne National Grassland will help maintain the species.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Rorippa calycina*

**General Description:** Rhizomatous perennial with spreading or lax stems that are 1-4 dm long. The alternate leaves are 3-7 cm long and have coarsely toothed to shallowly lobed margins. Foliage is roughened or sparsely covered with stiff hairs. Several stalked flowers are borne on the ends of terminal branches that arise from the axils of upper leaves. Each flower has four separate sepals, four separate light yellow petals, and four long and two short stamens.

**Natural Heritage State Status/NatureServe Global Status:** SH/G3 – Possibly Extirpated/Vulnerable

**Federal Status:** Not listed

**Range:** Very small range; Extant in North Dakota, Montana, Wyoming, and Idaho.

**Primary Habitat:** Sparsely vegetated, moist sandy to muddy banks of streams, stock ponds and man-made reservoirs near the high water line. Also present in high plain swales that evaporate, and along creeks.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant which means that it is not listed as federal or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, this species was only documented one time in McKenzie County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Changes in water management that reduce the periodicity of flooding.
- Competition of exotic plants, herbicide spraying, trampling by livestock, recreational activities, and mining are other potential threats.
Hayden’s Yellowcress
Level II

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for Rorippa calycina. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.
• Setting aside protective areas for this species could be beneficial. Particularly man-made bodies of water since they are where this species occurs most often.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Swamp Willow
Level II

Scientific Name: *Salix maccalliana*

**General Description:** Shrub species that grows 6-13ft (2-4m) tall. Stems and branches are dark purple or red in color. Leaves are shiny and dark green in color with finely serrated edges 1.5-3in (4-8cm) long and less than 1in (2.5cm) wide. Flowers are in the form of catkins and yellowish brown in color and depending on sex vary from .5-2.5in (1.5-6cm) and are hairy at the base and develop along with leaves in May.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5? – Critically Imperiled/Secure Inexact Numeric Rank

**Federal Status:** Not listed

**Range:** Very small range including Washington, North Dakota, and Minnesota.

**Primary Habitat:** Low lying areas with ample moisture such as fens, swamps, and marshes.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant which means that it is not listed as federal or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

**Preferred Habitat**
- There is only one documented case occurring in northeast Bottineau County in the Turtle Mountains. Due to its need for moisture it is mostly located in or around fens, swamps, and marshes. The soil is usually peaty with a loamy or clayey-loam texture. It needs ample sunlight to grow so it is not found in heavily forested bogs and swamps. Swamp willow also is not tolerant of highly acidic soils so it is not commonly found in bogs where water tends to be more stagnant.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because of the possibility for increased precipitation could cause areas to become too wet to support the species or the inverse with too little precipitation. While increased temperature could cause the soil composition to change allowing other species to compete for the available resources. Altering water movement and disturbances also pose a threat. Allowing cattle or other activities that can destroy and change the habitat can also cause the decline of the species.
Swamp Willow
Level II

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Salix maccalliana*. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• Large habitats of this species may require little active management. Prescribed burning every 4-8 years is the only thing that is required to maintain the habitat requirements. This is assuming that natural drainage patterns have not been altered and invasive species are not established.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Salix pedicellaris*

**General Description:** Slender shrub with sparse, ascending branches. Branches are yellowish to light brown or reddish brown in color. Leaves are alternate with long stalks. Stalks are green above and whitish with a waxy coating beneath. Flowers are yellowish brown to reddish and a brownish capsule like fruit is present; grows to be 1.5 meters tall and flowers in May and June.

**Natural Heritage State Status/NatureServe Global Status:** S3/G5 – Vulnerable/Secure

**Federal Status:** Not listed

**Range:** Range extends from Newfoundland to the Northwest Territories and British Columbia, South to New Jersey, Iowa, Idaho, and Oregon.

**Primary Habitat:** Habitat includes sphagnum swamps and bogs. Habitat in the Great Plains also includes fens.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species is found in sphagnum bogs, bog birch fens, sedge fens, and wetland thickets. There is a single known population located in the Sheyenne National Grassland.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Peat mining could be a threat to this plant since it appears to be restricted to peat substrates.
RESEARCH AND SURVEY EFFORTS

• Currently there are no research or survey projects being conducted for *Salix pedicellaris*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Pod Grass
Level II

Scientific Name: *Scheuchzeria palustris*

General Description: Erect rush that stands 9-18in (20-40cm) with a zig-zag stem and alternate leaves that are linear and 2-12in (5-30cm) in length. Flowers occur on racemes number 3-5 per plant and are yellow-green in color. Fruiting bodies are presented in pods and are present from early July to early September with each one containing one or two small black seeds.

Natural Heritage State Status/NatureServe Global Status:
S1/G5 – Critically Imperiled/Secure

Federal Status: Not listed

Range: Range includes all the New England and Great Lakes states; also includes Iowa, North Dakota, New Mexico, Wyoming, Montana, Idaho, Washington, Oregon, and California.

Primary Habitat: Predominantly found in open bogs.

Climate Index Rank: Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- The only documented occurrence of pod grass in the state was in Northeastern Bottineau County in the Turtle Mountains. Pod grass is primarily found in open peat bogs with high acidity and high water tables.
Pod Grass
Level II

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because of the possible change in temperature and precipitation. Alterations in precipitation may change the amount of water in an area making either too wet to support the species or too dry. Changes in water quality due to nutrient loads changing from livestock, fertilizers, or salt on roads could alter the water and soil chemistry. Changes in temperature could also pose a threat raising soil and water temperatures so that pod grass could not properly grow and allow other species to compete. Destruction of a bog through trampling and compaction is another threat that is posed to pod grass. This can be caused by cattle coming to get water or recreational use such as off road vehicles.

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for Scheuchzeria palustris. However, further research is always needed as it helps us better understand sensitive plant populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
- Protecting habitat of this species requires maintaining high water quality and natural, stable water levels. This may involve restricting use of road salt and fertilizers in adjacent areas, and regulating water drawdown if the wetland has a dam or is used for irrigation.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Ledge Spike-moss  
Level II

Scientific Name: *Selaginella rupestris*

**General Description:** Creeping perennial moss that creates loose spreading mats. Stems are .5-1.5in (1-4cm) long. Leaves are lance in shape and are 2mm in length. Reproductive cones appear from April to October that stand upright 5-20mm tall and produce spores.

**Natural Heritage State Status/NatureServe Global Status:**  
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends from Maine, south to Georgia, and west to Oklahoma; north to Wyoming, South Dakota, and North Dakota.

**Primary Habitat:** Rocky outcrop and sandy gravelly soils in open areas.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Only two documented occurrences in the sand deltas and beach ridges of Pembina County. The species grows in dry sandy soils or rock outcrops with little competition. Does well in open areas with a lot of sun light.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because the species thrives in a dry habitat and the possibility of increased precipitation could change the soil composition and make conditions unfavorable for ledge spike moss. Disturbances and alterations to habitat by livestock or recreational use also pose a threat.
Ledge Spike-moss  
Level II

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for *Selaginella rupestris*. However, further research is always needed as it allows us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
- Protect habitat from disturbances.
- Use care when applying pesticides near habitat.
- Avoid disturbances such as trampling or Off-highway vehicular use.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Solidago flexicaulis*

**General Description:** 2-3 foot tall perennial wildflower that is usually unbranched. The central stem is light green and glabrous to hairy. Leaves are alternate and are 2-5 inches long and 1-4 inches across, becoming shorter and narrower where flowers occur. Flowers are in a cluster form and consist of 3-4 yellow ray florets, 4-8 yellow disk florets, and several series of floral bracts at its base. Blooming period occurs from late summer to early fall and lasts about one month.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Very abundant throughout the United States. This species is present in 33 states including all of the East coast. Range stretches west to Nebraska, the Dakotas, Nebraska, and Kansas.

**Primary Habitat:** Rich deciduous woodlands, protected wooded slopes facing north or east, calcareous seeps in wooded areas, low areas along woodland streams, shaded limestone cliffs, and edges of limestone glades.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species is found in woodland areas in four counties. It has been documented in Cass, Ransom, Sargent, and Richland counties.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations.

**Other Natural or Manmade Factors**
- Potential threats also include grazing, hydrologic alteration, and recreational land use.
RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for *Solidago flexicaulis*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Sphagnum teres*

**General Description:** Fairly slender to moderate sized plant. Pale green to yellowish in color, or reddish brown in sun-grown forms; Forms loose to dense carpets; Stems are pale green to red-brown. Branches are long-cylindrical and branch leaves are ovate to ovate-lanceolate and are gradually narrowed to an involute tip.

**Natural Heritage State Status/NatureServe Global Status:** S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed


**Primary Habitat:** Minerotrophic habitats such as floating mats around lakes, carpets and lawns of rich fens, and marginal fen lags; sometimes intermixed with *S. angustifolium* in transitional fens.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Only one population of this species has been found in North Dakota. It was located in a bog in the Turtle Mountains of Bottineau County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
Round-leaved Sphagnum
Level II

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for *Sphagnum teres*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Sporobolus airoides*

General Description: Tough perennial that grows 2-3 feet in height. Grows in large bunches and contains culms, or large hollow stems. Blades are elongate, flat, and begin to grow “curly”; most distinctive in August.

Natural Heritage State Status/NatureServe Global Status: S3/G5 – Vulnerable/Secure

Federal Status: Not listed

Range: Ranges from South Dakota to Washington, south to Missouri, Kansas, Texas, and Mexico.

Primary Habitat: Grows on dry to moist sites with sand or gravelly soil. Often found growing on alkaline flats, prairies, and sandy plateaus; also common along drainage in desert and semi-desert areas.

Climate Index Rank: Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- Common records in North Dakota show that this species is present in the Badlands region and in Grand Forks County. Distribution of this species is confined to the southern unit of Theodore Roosevelt National Park and can be found in clay outcroppings and washouts. Highest densities occur along road cuts along a segment of I-94.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threat to this species is habitat alterations.
RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for *Sporobolus airoides*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- This plant is tolerant to moderate grazing and can produce abundant herbage utilized by livestock and wildlife.
- Alkali sacaton is one of the most commonly used species for seeding and stabilizing disturbed lands.
- Notable for its tolerance to flood, drought, alkaline soil, moderate grazing, and mining. This plant is very durable and can be used in many conservation/management projects.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Talinum parviflorum*

**General Description:** Perennial plant that grows from fleshy roots. Stems are short or absent. The leaves are all basal, about 2 inches long, and are nearly round in cross-section. A striking feature of this plant is the six-inch flower stalk that overtops the leaves. Pink to purple flowers about ½ inch long and a capsule like fruit of smooth seeds is present.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5-Imperiled/Secure

**Federal Status:** Not listed

**Range:** Fairly abundant in Alabama, Arizona, Arkansas, Colorado, Illinois, Iowa, Kansas, Louisiana, Minnesota, Missouri, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming.

**Primary Habitat:** Shallow, often exposed soils. It shows tolerance to a broad array of substrates but is most often found on sandy, acidic soils and least often found on calcareous soils.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In the Dakota’s this species tends to grow on sandstone outcrops of Sioux quartzite or on sparsely vegetated slick spots amidst fragile prickly pear cactus. It is drought and heat tolerant, flowering in late afternoon for many weeks during the height of the summer.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Prairie Fameflower
Level II

Other Natural or Manmade Factors
- Light grazing can be an issue but there are no adverse impacts from cattle grazing because the habitat that this species inhabits is very poorly vegetated. The only time cattle will appear in this habitat is when they are traversing to better forage.

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for Talinum parviflorum. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
- Prairie Fameflower Survey- Cedar River National Grassland

MANAGEMENT RECOMMENDATIONS
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Hooker's Townsendia
Level II

Scientific Name: Townsendia hookeri

General Description: Perennial herb from a taproot and few to many branched woody stem-base; stems sometimes inconspicuous or lacking; covered with old persistent leaf bases, 2-5 cm tall when developed. Flowers are white to pinkish; disk flowers are yellow and sometimes pinkish topped.

Natural Heritage State Status/NatureServe Global Status: S1/G5 – Critically Imperiled/Secure

Federal Status: Not listed

Range: Small range that includes Idaho, Montana, North Dakota, South Dakota, Wyoming, Nebraska, Colorado, and Utah.

Primary Habitat: Dry grassy slopes and meadows in the grassland and lower mountain areas.

Climate Index Rank: Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- There is an insufficient amount of data relating to this species whereabouts in North Dakota. One population has been documented in the Little Missouri Grasslands near Medora.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations. Conversion of grasslands to cropland pose a threat to this species. Oil and gas development also would negatively impact Townsendia hookeri.
Hooker's Townsendia
Level II

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Townsendia hookeri*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
- Research has been done on the genetic structure and mating patterns of *Townsendia hookeri*.
  - "Genetic Structure and Mating Patterns of Diploid and Polyploid Townsendia hookeri"

MANAGEMENT RECOMMENDATIONS
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Triplasis purpurea*

**General Description:** Delicate, tufted, summer annual in northern states to perennial in its southern range. Stems are simple, sometimes decumbent below. Stems ascend to widely spreading above rising to 30-100 cm tall. Internodes are glabrous and light green in color with longitudinal veins. Flowers are loosely bunched and partially included in the upper leaf sheath. Branches are few and with few flowers and are initially erect, but become ascending to spreading as plant matures. This plant can easily be identified by the purplish color of the stems and leaf sheaths that are conspicuous in late summer.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G4G5 – Critically Imperiled/Apparently Secure-Secure

**Federal Status:** Not listed

**Range:** Widespread in the eastern two-thirds of the United States and is found along the Atlantic and Gulf Coasts, shorelines of the Great Lakes, and locally inland. North and South Dakota and Colorado, south to where it proliferates in disturbed areas, and Washington. It is somewhat common in the southeast and becomes rarer in the Midwest and Northeast.

**Primary Habitat:** Found in hot, arid, sandy areas with little competition. Generally confined to beaches, but has spread to disturbed areas inland where present sandy prairies and blowouts.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**

- In North Dakota, purple sandgrass is found in dry sandy prairie and sandhills. This grass species is only known from the Sheyenne Sandhills. The most recent record of this species was found on a moderate slope, on the open, dry midslope.
PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
• The greatest threats to this species are habitat alterations. The loss of native prairie poses the greatest threat to this species.

Other Natural or Manmade Factors
• Off-road vehicles and grazing on beaches
• Conversion of prairie grasslands to cultivated agriculture

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
• In North Dakota there is a limited amount of information on the habitat and other characteristics that are important to maintain this plant species. Further research is needed.

Additional Research or Surveys Needed
• Information that is ecology specific to this plant is needed. While some general characteristics from other localities may apply, there is a need to describe the habitat(s) the taxon occupies, along with limitations and those characteristics that can enhance plant growth.
• The factors that limit, if not prevent, the establishment and preservation of populations also needs to be addressed.
• Other areas of study may include seed bank, genetics, the role of asexual reproduction, and more.

MANAGEMENT RECOMMENDATIONS
• Establish goals based on current conditions and land use.
• Gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.

MONITORING PLANS
• Population viability analysis can be used to estimate the minimum population size to sustain the taxon.
• While this information is being collected, preserving habitat and restricting impacts is very beneficial.

REFERENCES


Drummond’s Milkvetch
Level III

Scientific Name: *Astragalus drummondii*

**General Description:** Several stemmed perennial forb that stands 15.5-27.5in (40-70cm) tall. Leaves are alternate 2.5-5.5in (6-14cm) long with 13-31 leaflets that are hairy on the bottom surface. Flowers are pale white on the terminate end of stems. Fruits are displayed as drooping pods <1-1.5in (2-4cm)

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range includes Oregon, Idaho, Utah, Montana, Wyoming, Colorado, New Mexico, Nebraska, South Dakota, and North Dakota.

**Primary Habitat:** Dry hillsides and prairies, near or along rivers and riparian areas.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Drummond’s Milk-vetch is primarily found in the dry uplands and hillsides referred to as the river breaks surrounding the Missouri River. Typically occurs on the south and west facing slopes of hills.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations. Habitat alterations through common land use practices and development poses a significant risk to the plant. Cattle could trample the plants and their surrounding habitat, compacting the soils rendering them unfit to support the plant. Oil and gas exploration in the western part of the plants range pose threats as well as invasive species.
Drummond's Milkvetch
Level III

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for Astragalus drummondii. However, further research is always needed as it allows us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES
Scientific Name: *Astragalus vexilliflexus*

**General Description:** Low, bushy, sprawling perennial with stems that are partially erect and stand 12in (30.5cm). Its leaves are 2in (5cm) long with 5-17 leaflets .5in (1.27cm) long and elliptical in shape. Flowers are pinkish purple and appear on a raceme. Fruits are displayed in a pod that is 3/8in (1cm) with smooth black seeds.

**Natural Heritage State Status/NatureServe Global Status:**
S3/G4 – Vulnerable/Apparently Secure

**Federal Status:** Not listed

**Range:** Small range that includes North Dakota, South Dakota, Wyoming, Montana, and Idaho.

**Primary Habitat:** Rocky prairie knolls and ridges southwest of the Missouri River.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant species, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- The habitat that bent-flowered milk-vetch is associated with only occurs southwest of the Missouri River in the Missouri Plateau eco-region. It is primarily found on ridges, knolls and hills. Primarily found in well drained sandy or gravely soils.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threat to this species is habitat loss through invasive species encroachment, land use practices, and climate change. Disturbances caused by oil and gas developments pose a significant risk to this species. Bent-flowered milk-vetch is highly vulnerable to climate change also. Changes in precipitation and temperature could negatively affect the growing seasons and conditions for the plant.
Bent-flowered Milkvetch
Level III

RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for *Astragalus vexiliflexus*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- Protect or create large tracts of grassland, particularly native prairie.
- Prevent encroachment of woody vegetation in grasslands.
- Encourage vegetative diversity.
- Practice rotational burning: intervals of 3-4 years in tallgrass prairie, 6 years in mixed-grass prairie, and 5-10 years in shortgrass prairie.
- Delay mowing until July 15.
- Prevent overgrazing.
- Use native grasses when replanting grassland.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Chamomile Grapefern
Level III

Scientific Name: *Botrychium matricariifolium*

General Description: Grow 4-6” (10-15cm) tall and has two fronds. One is sterile with a single leaf 1” (2.5cm) long and the fertile frond is taller than sterile frond with branched clusters on it. Stem is approximately 4” (10cm) long and pale green in color.

Natural Heritage State Status/NatureServe Global Status:
S1/G5 – Critically Imperiled/Secure

Federal Status: Not listed

Range: Range includes all of the New England and Great Lake states, as well as South Dakota, North Dakota, Minnesota, and Iowa

Primary Habitat: Typically found in wide variety of habitats and variety of soils.

Climate Index Rank: Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- Matricary grape fern is found in a wide array of habitats ranging from forests and woodlot edges to roadsides and borrow pits. It is also commonly found in both acidic and neutral soils. There are only four documented occurrences in the state with the most recent being in the Sheyenne Sandhills where it grows near the bottom of a wooded valley near seepage.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because despite having a wide array of habitat the plant could exist in it only is found in a small area in the state. Degradation and loss of this crucial habitat that exists within the state poses a large threat to the species because of the limited habitat it has been found in within the state.
Chamomile Grapefern
Level III

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys

- Currently there are no research or survey projects for *Botrychium matricariifolium*. However, further research is always needed as it helps us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Additional Research or Surveys Needed

- Monitoring study that compares reproductive and mortality rates of this species in burned vs. unburned, grazed vs. ungrazed, weedy vs. natural, and shaded vs. unshaded would answer many questions about this species and would be beneficial in determining management practices.
- Descriptive data for the habitat and community ecology of occurrences should be gathered whenever a new colony of this species is encountered.
- Research of the life history and demography is needed.
- Research is needed to determine the role of non-reproductive plants in the population biology of this species.

MANAGEMENT RECOMMENDATIONS

- Protect or create large tracts of grassland, particularly native prairie.
- Prevent encroachment of woody vegetation in grasslands.
- Encourage vegetative diversity.
- Practice rotational burning: intervals of 3-4 years in tallgrass prairie, 6 years in mixed-grass prairie, and 5-10 years in shortgrass prairie.
- Delay mowing until July 15.
- Prevent overgrazing.
- Use native grasses when replanting grassland.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** Carex backii

**General Description:** Densely clumped grass like plant that is often sprawled out or flattened along the ground. Leaves can be up to 14.5in (37cm) long and are yellow green in color. Back’s sedge is most easily identified during the fruiting season from May-July. Flowers are presented as spikes and are .75-3in (1.9-7.2cm) long.

**Natural Heritage State Status/NatureServe Global Status:**
S3/G4 – Vulnerable/Apparently Secure

**Federal Status:** Not listed

**Range:** Range includes all of the New England states; also includes Michigan, Wisconsin, Minnesota, Iowa, South Dakota, North Dakota, Montana, Wyoming, Colorado, Utah, Idaho, Washington, and Oregon.

**Primary Habitat:** Dry mixed or evergreen forests and mixed-grass prairies.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- Primarily located in the northern part of the state associated with the Turtle Mountains, Northern Black Prairie, and Northern Dark Brown Prairie eco-regions. Limestone soils on hills and on dry calcareous bluffs and ledges; also in open calcareous forests of mixed hardwoods or conifers are the typical areas that plant is found.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations. Human interaction with the landscape through recreation or land uses poses the largest threat. Activities such as logging and ATV use could diminish the quality of the habitat available for the species. Noxious weeds species also pose a threat, due to the fact that many can outcompete native species for resources.
RESEARCH AND SURVEY EFFORTS

• Currently there are no research or survey projects being conducted for Carex backii. However, further research is always needed as it allows us to better understand a multitude of sensitive plant species populations and their life cycle requirements that are necessary for survival.

MANAGEMENT RECOMMENDATIONS

• Protect or create large tracts of grassland, particularly native prairie.
• Prevent encroachment of woody vegetation in grasslands.
• Encourage vegetative diversity.
• Practice rotational burning: intervals of 3-4 years in tallgrass prairie, 6 years in mixed-grass prairie, and 5-10 years in shortgrass prairie.
• Delay mowing until July 15.
• Prevent overgrazing.
• Use native grasses when replanting grassland.

MONITORING PLANS

• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Bismarck, ND.
**Scientific Name:** *Carex capillaris*

**General Description:** A densely tufted grass-like plant that produces seeded tops that are white or bronze in color and grows anywhere from 4-24 inches when mature. Leaves are .75-4 mm wide and slender stems are up to 60 cm long. The apex of the stem is terminated by a cluster of male flowers 4-10 mm long. Towards the apex of the stem 2-3 female flowers are present. These female flowers eventually turn into a fruit.

**Natural Heritage State Status/NatureServe Global Status:** S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Quite abundant; Circumboreal species. Range extends throughout all of Canada. In the United States the range extends from Oregon and Washington to the south through Nevada, Utah, Colorado, and New Mexico. Also includes Idaho, Montana, Wyoming, North and South Dakota, extending further east to New York and north to Maine.

**Primary Habitat:** Stream banks, wet meadows, wet ledges, and marshy lake shores; can also be found in non-wetland areas.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, this species has been documented in Bottineau and McHenry counties. It is known to grow in boggy areas along lake shores and in rocky crevices. The specific community of hair like sedge that was found in North Dakota was located in the Turtle Mountains and areas surrounding the Turtle Mountains in boggy meadows.
Hair-like Sedge
Level III

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
• The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

Other Natural or Manmade Factors
• Other threats to the taxon include significant hydrologic change, timber harvesting, and recreation use.

RESEARCH AND SURVEY EFFORTS
• Little is known about the threats that could potentially harm this species.

MANAGEMENT RECOMMENDATIONS
• Reduce the amount of trampling and density of trails.
• Keep hikers and OHV users on designated trails.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES
**Scientific Name:** *Cypripedium parviflorum var. pubescens*

**General Description:** Erect plant standing 70-700 cm tall; sparsely pubescent; Leafy throughout with sheathing, broadly elliptic to lanceolate-elliptic shaped leaves. Flowers have sepals that are greenish or yellowish.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5T5 – Imperiled/Secure-Secure Infraspecific Taxon

**Federal Status:** Not listed

**Range:** Range extends from British Columbia to Washington and Oregon, east of the Cascade crests to Idaho, Wyoming, Utah, Colorado, New York, and to much of eastern Canada and the United States.

**Primary Habitat:** A variety of wet situations in neutral or slightly alkaline substrates; wet openings and borders in fens and swamp forest; wet prairies; arbor vitae thickets.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species has been observed in Benson, Bottineau, Cavalier, Grand Forks, and Ransom Counties.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Other Natural or Manmade Factors
- Alteration of hydrological setting.
- Timber harvest, development, grazing, plant collecting, fire suppression, and prescribed burns during the growing season are possible threats.
- Trampling and compression of soil; casual picking of flowers, digging by nurserymen and wildflower gardeners, and over-collecting.

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for *Cypripedium parviflorum var. pubescens*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Nine-anthered Dalea
Level III

**Scientific Name:** *Dalea enneandra*

**General Description:** A perennial herb with a yellow taproot and a knobby to shortly branching caudex (stem). Each caudex has 1-3 erect, branched stems that are 5-10 dm tall. Leaves are sub sessile and pinnately divided into 2-6 pairs of 4-12 mm leaflets. Flowers appear white and pea-like and are well separated on the spike.

**Natural Heritage State Status/NatureServe Global Status:**
S3/G5 – Vulnerable/Secure

**Federal Status:** Not listed

**Range:** Distributed over most of the Midwestern United States. Range stretches from Montana to North Dakota and flows down to Texas and New Mexico, inhabiting many of the states in between these boundaries. Wyoming, South Dakota, Nebraska, Iowa, Colorado, Kansas, Missouri, Indiana, and Oklahoma have all documented *Dalea enneandra*.

**Primary Habitat:** Primarily found on dry prairies and hillsides, remaining below 1220 meters (4,000 feet), along roads, and in stream valleys on rocky calcareous or silty soils.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, this species can be found on sandy or open gravely slopes, on a dry mixed grass prairie and on shale. The largest populations of this plant in North Dakota occur in Theodore Roosevelt National Park and some of the surrounding areas along the Missouri and Heart Rivers.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Heavy grazing has been known to be a main factor in the loss of this species. Most of the time it can tolerate moderate grazing, however when grazing is increased it cannot endure.
RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for *Dalea enneandra*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
- As with many other special status species that are not federally listed, it is often hard to find specific information regarding management because not a lot of research has been done to establish these plans.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


### Scientific Name: *Desmanthus illinoensis*

**General Description:** Warm season, herbaceous, perennial leguminous forb. Multiple stems grow from a woody thick caudex. The erect stems are smooth, angular, and grooved and stand 1.5 to 4.25 feet tall when mature. It’s doubly compound leaves are attached to the stems in alternate arrangement. The white flowers contain five sepals, petals and stamens and produce clustered flat scythe-shaped pods each about 1 to 1.5 inches long. These pods contain two to six seeds and usually split open when mature.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Ranges southward from South Dakota and Minnesota, through Colorado, New Mexico, and Texas, and eastward to Ohio, Kentucky, Tennessee, North Carolina, South Carolina, and into Florida.

**Primary Habitat:** Common along roadside ditches, at the margins of cultivated fields, in upland swales and on low, open ground, moist meadows, and woodland openings.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS):
Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

### LOCATIONS AND CONDITIONS OF KEY HABITAT

**Preferred Habitat**
- In North Dakota this species has been recorded in Ramsey, Emmons, and Sargent counties.

### PROBLEMS WHICH MAY AFFECT THIS SPECIES

**Habitat**
- The greatest threats to this species are habitat alterations. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Rabbits, rodents, grasshoppers, and leafhoppers selectively attack legumes, especially at the seedling stage.
- Fungal leaf spot diseases and seed eating insects are a problem with this species.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Desmanthus illinoensis*. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
- “The Biology of *Desmanthus Illinoensis*”

MANAGEMENT RECOMMENDATION
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


3. *The Biology of Desmanthus Illinoensis*  

Scientific Name: *Dicentra cucullaria*

**General Description:** Perennial plant standing 4-8” tall that consists of a rosette of basal leaves spanning about 6” across. Basal leaves are greyish green and hairless, and are divided into three primary leaflets. From the center of the rosette, drooping racemes of 2-6 pairs of white flowers develop. Blooming occurs from early to mid-spring and lasts about 2-3 weeks. The flowers will have no noticeable floral scent.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range includes all of the eastern United States and Canada, Oregon, Idaho, and Washington.

**Primary Habitat:** Includes deciduous mesic woodlands, especially along gentle slopes, ravines, or ledges along streams. Partial shade, moist conditions, and fertile soil are conditions in which this plant thrives.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- This plant has been documented in the southeastern part of North Dakota. More specifically it is known to be living in Ransom and Sargent Counties, just south of the Sheyenne National Grassland. In this area there are mesic woodland environments, slopes, and ravines along many lakes and small rivers all of which are suitable for this species.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations.
Dutchman’s Breeches
Level III

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Dicentra cucullaria*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• Promote health of deciduous woods and the formation of rich forest soils.
• Prevent logging as much as possible. Partial removal of the canopy is less likely to affect this species than complete removal of the canopy.

MONITORING PLAN
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Eleocharis parvula*

**General Description:** grass-like perennials with oval shaped spikes at the tips of smooth and round stems that measure 1-10 cm tall. Most active growth is during the summer and fall.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends throughout all of the contiguous 48 states; excluding Montana, Nevada, Nebraska, Indiana, Kentucky, West Virginia, and Vermont.

**Primary Habitat:** Adapted primarily to fluctuating water levels such as wet saline flats, marshes, and alkaline lakes.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- These spike-rush species grow in clumps or individual arrangements along shallow water shorelines or in shallow shore water itself. Dwarf spike rush in North Dakota is seen most commonly in Grand Forks and Burleigh counties.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
Dwarf Spikerush  
Level III

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Elocharis parvula*. However, further research is always needed as it helps us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• Protect habitat and avoid altering natural hydrology.
• Prevent noxious weeds in or around habitat.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Wolf’s Spikerush
Level III

Scientific Name: *Eleocharis wolfii*

**General Description:** Perennial plant that may grow in circular clumps or often comes together to form large mats. Culms are erect (sometimes decumbent when dry), sides variably smooth or with 1 to few acute ridges. Leaf sheaths are persistent, dark red, brown, stramineous, or colorless and are ovate-lanceolate. Flowers are a fruit are present.

**Natural Heritage State Status/NatureServe Global Status:**
SH/G3? – Possibly Extirpated/Vulnerable Inexact Numeric Rank

**Federal Status:** Not listed

**Range:** Since 2000, this species has been recorded in 15 states. These states include Arkansas, Georgia, Iowa, Illinois, Kansas, Louisiana, Minnesota, Missouri, Mississippi, Nebraska, Ohio, Oklahoma, Tennessee, Texas, and Wisconsin. Historically, Wolf’s Spikerush was known from approximately 59 sites scattered across 43 counties of 20 states. These historical sites include most of the states listed above plus Alabama, Colorado, Indiana, New York, and North Dakota.

**Primary Habitat:** Wet depressions of bottomland and mesic upland prairies, wet open sites, wet river and lake margins, marshes and seeps, ephemeral pools in open grasslands, limestone barrens, oak flatwoods or woodlands on river terraces, wet depressions, pond and river margins, wet sand prairies, wet meadows and other moist areas.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species has been recorded from two different sites in Cass County. One site was from a roadside ditch and another site has since been destroyed by development.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Wolf's Spikerush
Level III

Other Natural or Manmade Factors
- The conversion of habitat to agricultural lands or pastures.
- Over-utilization for commercial, recreational, scientific, or educational purposes.
- Disease or predation.
- The inadequacy of existing regulatory mechanisms.

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Based on recent discoveries, surveys should be conducted between March and May in the southern U.S and between May and June in the northern limits of the species range.

Previous Research or Surveys
- Recent discoveries of *E. Wolfii* in previously unrecorded habitats suggest that the species occupies a broader range of habitats.

Additional Research or Surveys Needed
- Research on life history and ecological requirements would be helpful in identifying areas where additional populations could be discovered.
- Further studies on the population dynamics and genetic diversity of this species would be useful in assessing the long-term persistence and conservation status of this species in the future.
- Research on seed viability, predation, population genetics, and germination requirements for the species is lacking.
- Studies should be conducted to further examine competition and responses by *E. Wolfii* to various levels of management and disturbance, especially grazing pressure from native and non-native herbivores.
- Analyses of land use changes would help to assess threats to species, especially related to the conversion of native habitat for agriculture and development.
- Further evaluations are needed to assess differences in habit, light requirements, and reproductive success of individuals in shaded sites vs. localities in full sunlight.

POPULATION ESTIMATES
- Other than very rough estimates, there are limited detailed demographic data available on Wolf's Spikerush at most sites in North America.

MANAGEMENT RECOMMENDATION
- Little information is known on management recommendations that benefit Wolf's Spikerush.
- It is suggested that the maintenance of openings in woodland habitats, the monitoring of potential impacts of exotic species, and the use of prescribed fire to prevent encroachment of woody vegetation were treatments that could be useful in maintaining populations.
- Advise against actions that would alter soils where *E. wolfii* occurs.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
REFERENCES


Wood Horsetail
Level III

Scientific Name: *Equisetum sylvaticum*

General Description: Perennial, deciduous, homosporous pteridophyte. Sterile stems are green with lacy branches and grow up to 28 inches tall. Fertile stems are at first unbranched and lack chlorophyll but become branched and green after spores are released. A cone that is ¾-1 inch is borne on short stalk at the tip of fertile stem.

Natural Heritage State Status/NatureServe Global Status:
S2/G5 – Imperiled/Secure

Federal Status: Not listed

Range: Circumboreal species. In North America it is distributed throughout Alaska and Canada, south to the Pacific Northwest, the Great Lakes states, New England, and North Carolina.

Primary Habitat: Lowland wet conifer forests, also common in mixed upland, dry conifer, and deciduous forest habitats.

Climate Index Rank: Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- In North Dakota there are two records of this species being present in Pembina and Cavalier Counties.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
Wood Horsetail
Level III

Other Natural or Manmade Factors
- Habitat loss can be the result of wetland draining, logging, or high recreation use.

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for *Equisetum* sylvaticum. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Chamisson’s Cottongrass
Level III

Scientific Name: *Eriophorum chamissonis*

General Description: Perennial, colonial graminoid with creeping rhizomes and non-tufted culms, 20-70 cm tall. Spikes are solitary and erect, without blade-bearing involucral bracts. The lower and basal leaves have a well-developed sheath and short, narrow triangular to channeled blades up to 2 mm wide. Uppermost leaves are bladeless and borne near the middle of the culm. Flowers have anthers more than 1 mm long, triangular achenes, and numerous cinnamon or reddish perianth bristles that elongate in fruit to form a “cotton-ball” head.

Natural heritage State Status/NatureServe Global Status:
S2/G5 – Imperiled/Secure

Federal Status: Not listed

Range: Circumpolar species that occurs in most of the northern tier of U.S. states west of the Great Lakes. (Alaska, Colorado, Idaho, Minnesota, Montana, North Dakota, Oregon, Washington, Wisconsin, and Wyoming, as well as in all of the Canadian provinces)

Primary Habitat: Cool temperate, alpine, and arctic regions, in wetlands with peat soils that are supported by groundwater discharge or snow melt. Other habitat includes fens and marshes.

Climate Index Rank: Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- In North Dakota, this species has been documented in only two places. These include the Turtle Mountains in Bottineau County and near glacial lake deltas in McHenry County.
PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.

Other Natural or Manmade Factors
- Hydrologic alterations, grazing, motorized vehicle use, peat mining, fire, and global climate change.
- Trenching, ditching, logging, mining, and fire.
- Wetland draining.

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Our current research indicates that this is a species of concern, and that the species would benefit from an expansion of our knowledge of its biology and habitat.

Previous Research or Surveys
- There have been no studies on the effects of management activities, but based on our knowledge of this species preferred habitat, we can draw conclusions about what will have an effect on the habitat this species needs to survive.

Additional Research or Surveys Needed
- Research is needed on the effects of management activities and natural disturbances on *Eriophorum chamissonis*.
- Information about distribution, life cycle, habitat, population trends, response to change, metapopulation dynamics, and demography are needed.
- Restoration methods.

MANAGEMENT RECOMMENDATIONS
- Protection of wetland habitats.
- Any activity that maintains hydrologic regime in these habitats will contribute to the persistence of this species.

MONITORING PLANS
- Regulation and monitoring of hydrological modifications, domestic grazing, and motorized vehicle use.
- Species and habitat inventory
- Population monitoring
- Habitat monitoring
REFERENCES


**Scientific Name:** *Eriophorum viridicarinatum*

**General Description:** Extensively colonial from creeping rhizomes. Stems are not completely cylindrical and are 8-24 inches tall. Leaves are basal and elongate and the blade is well developed. Leaves are also flat but become narrow and triangular or channeled towards the tip. Involucral bracts are present, the longest one matching or exceeding the length of the inflorescence. 2-8 spikelets are present on the stem. Scales are blackish-green and bristles are numerous. Small dry fruit that is blackish is also present.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Occurs from Newfoundland to Alaska, south to New York, Michigan, Colorado, Washington and northern Idaho.

**Primary Habitat:** Cold, sometimes calcareous, swamps and bogs at moderate to high elevations. This species is also an obligate wetland species which means it is particularly restricted to wetland habitats.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, Green Keeled Cotton grass has been documented in the Turtle Mountains, and in sand hills and beach ridges in Pembina and Richland counties.
PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations.

Other Natural or Manmade Factors
- Hydrologic alteration and grazing are the greatest threats.

RESEARCH AND SURVEY EFFORTS
- Currently there are no research or survey projects being conducted for *Eriophorum viridicarinatum*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
- Particular habitats with this species should be protected from trampling to preserve the established population.

MONITORING PLANS
- Maintenance of the hydrologic regime is important for the survival of this species.

REFERENCES


Scientific Name: Geranium maculatum

General Description: Perennial herb 8-24 inches tall, that produces upright usually unbranched stems and flowers. Leaves are palmately lobed with five or seven deeply cut lobes. They are deeply parted into three or five divisions, each of which is again cleft and toothed. The flowers are 2.5-4 cm in diameter with five rose-purple, pale or violet-purple petals. They appear from April to June in loose clusters of two to five at the top of the stems. The fruit capsule, which springs open when ripe, consists of five cells each containing a seed joined to a long bean-like column 2-3 cm long.

Natural Heritage State Status/NatureServe Global Status: SH/G5 – Possibly Extirpated/Secure

Federal Status: Not listed

Range: Range extends throughout much of eastern North America. From southern Ontario it reaches south to Georgia, and west to eastern Oklahoma and eastern North and South Dakota.

Primary Habitat: Dry to moist woods; is a dominant understory species.

Climate Index Rank: Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- Only one documented occurrence in Cass County in North Dakota. Most likely found in the dry to moist woods near the Red River.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
Wild Geranium
Level III

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
• Currently there are no research or survey projects being conducted for *Germanium maculatum*. However, further research is always needed as it will help us better understand a multitude of sensitive plant populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
• Research has been done on the life cycle and reproduction of this species.

MANAGEMENT RECOMMENDATIONS

• Keep habitat undisturbed as this species appears to be dependent on a constant, stable environment. It has not been found in disturbed areas of habitat.
• Maintaining acidity levels in soils is important because this species is particularly sensitive to changes in soil acidity.

MONITORING PLANS

• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Mahonia repens*

**General Description:** Perennial evergreen ground cover plant with spreading rhizomes. Clustered flowers are yellow and produce edible purple fruits.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range stretches from British Columbia and Alberta in Canada, south through California, west to Texas and North Dakota.

**Primary Habitat:** Most frequently seen in rocky or gravely areas with low vegetative cover or under open conifer or hardwood stands with sparse understory vegetation.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- There is an insufficient amount of data relating to this species whereabouts in North Dakota.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and habitat loss.
RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for *Mahonia repens*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Yellow Monkeyflower
Level III

**Scientific Name:** *Mimulus guttatus*

**General Description:** Variable plant that can be either an annual with fibrous roots or a perennial with stout stolons; can grow to as high as three feet. The leaves are opposite on the stem and the lower leaves are attached with a stalk to the stem while the upper leaves are stalk less. The leaves are usually coarse toothed on the margins. The yellow flowers have red or maroon spots on the wide, hairy throat of the lower lip petal; the flowers are arranged in a terminal raceme or arise singly from the upper leaf axils.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends from Alaska to California, east to New Mexico and then north to Colorado, Nebraska, South Dakota, and North Dakota. Also includes Michigan, Pennsylvania, New York, and Connecticut.

**Primary Habitat:** Wet places such as along creeks, seeps, beaver dams. Also in wet places from sea level to mid-elevations in the mountains.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species has only been documented in Grand Forks County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys

- Currently there are no research or survey projects being conducted for *Mimulus guttatus*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys

- “Seed dispersal in *Mimulus guttatus* by Wind and Deer”

MANAGEMENT RECOMMENDATION

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Mitella nuda*

**General Description:** Small rhizomatous and often stoloniferous perennial with pubescent stalks 0.7-2.5 dm tall. Leaves are basal with one sessile or short-petiole leaf below the middle of the stem. Blades are round to heart shaped and may be kidney shaped. Hair-like structures are present on the upper surface. Flowers are small, greenish, and in clusters of 3-12. Fruit capsules are 2-3 mm long and open widely into shallow cups; usually shiny and black in color.

**Natural Heritage State Status/NatureServe Global Status:** S3/G5 – Vulnerable/Secure

**Federal Status:** Not listed


**Primary Habitat:** Bogs and swamps, often growing around mosses.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species has been recorded in Pembina, Bottineau, and Rolette Counties.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Mitella nuda*. However, further research is always needed as it helps us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Oenothera rhombipetala*

**General Description:** Annual or biennial wildflower initially forms a low rosette of basal leaves spanning 3-6” across. It later develops little branched flowering stalks about 1-2’ tall. Stems are light green and are densely covered with appressed white hairs. The leaves are alternate up to 2 ½ long and ½ across. Most leaves are sessile, although some of the lower ones have short petioles. Leaf blades are linear-lanceolate, lanceolate, or oblong in shape; Upper surface of leaves are medium green and sparsely covered with small white hairs; lower surfaces are pale green and more densely covered with white hairs. Stem terminates in a leafy spike of yellow flowers.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G4G5 – Imperiled/Apparently Secure-Secure

**Federal Status:** Not listed

**Range:** Ranges from southern South Dakota, Nebraska, Kansas, western Missouri, Oklahoma, Texas, scattered areas in central Arkansas, and Lea County New Mexico; Other populations include eastern Minnesota, south-western Wisconsin, Illinois, and Michigan.

**Primary Habitat:** Upland sand prairies, sandy hill prairies, sand dunes, upland sandy savannas, abandoned sandy fields, areas along sandy paths, and areas along railroads.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

- **Preferred Habitat**
  - In North Dakota there has been two records from Richland and Grand Forks Counties.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

- **Habitat**
  - The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Rhombic Evening-primrose
Level III

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for Oenothera rhombipetala. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.
• Occasional wildfires are beneficial in reducing the encroachment of woody vegetation.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES
One-flowered Broomrape
Level III

Scientific Name: *Orobanche uniflora*

**General Description:** Perennial wildflower producing 1-5 erect flowering stalks about 3-8” tall. Short scales present along the stem are highly modified leaves and are oval to ovate in shape and somewhat thick and succulent. The flowering stalks are usually pale gray or grayish tan, terete, and hairy. At the apex each stalk produces a single nodding flower about ¾-1” long. Flowers are white to lilac or a blending of these colors.

**Natural Heritage State Status/NatureServe Global Status:** SH/G5 – Possibly Extirpated/Secure

**Federal Status:** Not listed

**Range:** Range includes all of the contiguous 48 states and Alaska. Also includes much of Canada.

**Primary Habitat:** Upland woods, rocky cliffs where some seepage occurs, the base of bluffs, rocky glades, and thickets.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species has only been recorded in Cass County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
One-flowered Broomrape
Level III

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Orobanche uniflora*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Small-flowered Grass-of-Parnassus
Level III

Scientific Name: *Parnassia palustris* var. *parviflora*

**General Description:** Stems stand 1-4 dm in height. Except for a single stem leaf, the leaves are produced in a basal rosette. The basal leaves are long-petioled, with rounded, heart-shaped blades that are about 15-30 mm long and 11-25 mm broad, smooth-margined, and thin-textured. Upward, a single leaf is produced in the middle of the flowering stem; this stem leaf is stalk less and clasping. The flowering stem is terminated by a single, creamy white flower with 5 conspicuously veined petals 8-13 mm long.

**Natural Heritage State Status/NatureServe Global Status:**
S3/G4 – Vulnerable/Apparently Secure

**Federal Status:** Not listed

**Range:** Distributed from Alaska to Labrador, Newfoundland and Quebec, ranging south to Oregon, Wyoming, North and South Dakota, the Upper Great Lakes region, and New York.

**Primary Habitat:** Frequently occurs in more alkaline habitats, such as meadows and in damp calcareous sands on lakeshores.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota there is only one record of this species being present in Bottineau County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Parnassia palustris*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Additional Research or Surveys Needed
- Inventory, particularly to determine the status of the mainland sites, as well as survey to discover new locations would be desirable, as would monitoring of any extant colonies for population trends and dynamics.

MANAGEMENT RECOMMENDATION
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Penstemon procerus*

**General Description:** Perennial herb with mat-forming stems at the base. Stems ascend, becoming erect; 10-40 cm tall, smooth, and slender.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends from Alaska south to California and Colorado and east as far as Manitoba.

**Primary Habitat:** Dry meadows and on open forested slopes in the foothills up to alpine habitats.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota, this species prefers the dry meadows of Burke county in the northwest corner of the state.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Small-flowered Penstemon
Level III

RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for Penstemon procerus. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Sweet Coltsfoot
Level III

Scientific Name: *Petasites frigidus*

**General Description:** Perennial herb; 15-35 cm high with course flowers in several deep pink to pale pink heads; Large, triangular and coarsely toothed vegetative leaves.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Present in most of Canada. In the United States the range includes: California, Oregon, Washington, Idaho, North Dakota, Minnesota, Wisconsin, Michigan, and most of the New England States.

**Primary Habitat:** Substrates, along streams, river terraces, imperfectly drained moist areas, seepage slopes, gravel, sand, silt, moss, and other moist organic areas.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- This species has been documented in Bottineau, McHenry, Rolette, Benson, and Pembina Counties in North Dakota.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
SWEET COLTSFOOT
Level III

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Petasites frigidus*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES
**Scientific Name:** *Phlox pilosa*

**General Description:** Perennial plant that stands up to 2 feet tall and is unbranched. The stem is covered in fine white hairs. Opposite leaves are up to 3.5 inches long and ½ inch wide and are sparsely distributed along the stem. The lower leaves tend to turn yellow and drop off the stem when the plant becomes stressed out. There is a cluster of flowers at the apex of the plant on short hairy stalks. Each flower is about ½ inch across and has five lobes that flare abruptly outward from a long narrow tubular corolla. Thee lobes are rather angular and become considerably more narrow the closer to the base of the corolla they are. The flowers may be white, pink, or lavender and have a mild pleasant fragrance.

**Natural Heritage State Status/NatureServe Global Status:** S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends from North Dakota, east to New York and south to Florida and Texas.

**Primary Habitat:** Moist to mesic black soil prairies, rocky open forests, bur oak savannas, sandy black oak savannas, limestone glades, thickets, abandoned fields, and prairie remnants along railroads.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- This species has been documented as present in Cass and Richland counties of North Dakota, in the Red River Valley.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Downy Phlox
Level III

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted for *Phlox pilosa*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
- Research has been done on the relationship between population size and reproductive characteristics.

MANAGEMENT RECOMMENDATION
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


**Scientific Name:** *Platanthera clavellata*

**General Description:** Small, herbaceous, perennial plant with 3-15 yellow-green (or whitish-green in shade) flowers at the top of and angled from an erect stem.

**Natural Heritage State Status/NatureServe Global Status:** SH/G5 – Possibly Extirpated/Secure

**Federal Status:** Not listed

**Range:** Range extends from Maine to Florida, west to Texas and Oklahoma, and north to Minnesota and North Dakota.

**Primary Habitat:** Seepages, springs (usually wooded); shrub borders of acid bogs; swamp woods; creek floodplains; occasionally open fens; and in the northern or mountainous part of its range, seepage slopes or sunlit stream beds. This species may also thrive in disturbed sites, such as abandoned quarries, road banks, and ditches.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota this species has only been recorded once in Grand Forks County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
Green Woodland Orchid
Level III

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
•  There hasn't been a lot of studies on this particular species, however continued basic examination of the widely scattered herbarium specimens of this orchid determine its current and historic range throughout the Midwest region.

Previous Research or Surveys
•  Some research on fungal symbionts and their relationship with young plants of this kind has been done but much of the relationship is still unknown.

Additional Research or Surveys Needed
•  Fertility, the actual population sizes, dormancy periods, early establishment requirements, precise moisture needs, growth rates, and genetic health (including variability) are all areas where more data is needed. Field observations over a period of several years is needed to fully understand this species.
•  Fire management needs to be experimented before put to use. Although it has showed to be beneficial, carefully controlled experiments are needed to solve the mystery of why it is actually beneficial to this species.
•  Botanical surveys need to be conducted for this species.

MANAGEMENT RECOMMENDATION
•  To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
•  With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
•  Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
•  Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
•  Periodic monitoring of the life history and potential threats should be evaluated.
•  Population stability, reproduction, and vigor should all be monitored also.

REFERENCES


Mountain Meadow Cinquefoil
Level III

**Scientific Name:** *Potentilla diversifolia*

**General Description:** Perennial that arises from woody persistent base, and short thick rootstocks. There are usually several spreading to erect stems that are 4 to 18 inches tall. Pinnate leaves appear greenish and are mainly basal and can be up to ½ inch broad. The leaflets are slightly to moderately covered in soft hairs, at least on the lower surface, and often become hairless. The many-flowered inflorescence has a flat top.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Fairly broad range includes Southeastern British Columbia, and Southeastern Alberta, Idaho, Montana, the Dakotas, Wyoming, Utah, and Washington.

**Primary Habitat:** Gullies, glacial valleys, on ridge tops, in a moist meadow at the margin of a wetland and a coniferous forest from 5850 to 7380 feet elevation. It also favors moist, shady and open areas, gravelly soils of glacially carved areas, alpine to subalpine or montane areas, ledges and rocky slopes, as well as stream banks.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

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**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- This species has been documented in shady and open areas in Billings and Slope Counties in North Dakota.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
Other Natural or Manmade Factors

- Potential threats also include grazing, hydrologic alteration, and recreational land use.

RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for Potentilla diversifolia. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Scientific Name: *Ranunculus cardiophyllus*

**General Description:** Fibrous-rooted perennial with erect, branched stems that are 15-40 cm high. The basal leaves have spade-shaped blades that are 2-6 cm long and toothed margins and petioles that are 2-12 cm long. The few, alternate stem leaves are deeply divided like fingers on a hand. The foliage is covered with straight, spreading hairs. Stalked flowers arise from the axils of the uppermost leaves, or bracts, forming an open, few-flowered inflorescence. Each saucer-shaped flower has five yellowish sepals that fall off shortly after opening, five yellow petals that are 8-15 mm long, each with a small basal pocket with long hairs at the top. The cylindrical fruiting heads bear 20-100 flattened, egg-shaped, hairy fruits that are 1-2 mm long; each has a short, straight beak on top.

**Natural Heritage State Status/NatureServe Global Status:**
S1/G4G5 – Critically Imperiled/Apparently Secure-Secure

**Federal Status:** Not listed

**Range:** Currently identified as present in Arizona, Colorado, Montana, North Dakota, New Mexico, South Dakota, Utah, Washington, and Wyoming.

**Primary Habitat:** Moist meadows and grasslands often associated with wetlands in the foothill zone.

**Climate Index Rank:** Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In North Dakota there is only one record of this species in McKenzie County.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
Heart-leaved Buttercup
Level III

Other Natural or Manmade Factors
• Grazing/trampling
• Introduction of invasive species.
• Changes to hydrology.

RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for *Ranunculus cardiophyllus*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATION
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Hair Beakrush
Level III

Scientific Name: *Rhynchospora capillacea*

**General Description:** Perennial herb which may grow up to .9-4 dm in height. It has a capillary, flexuous-erect stem and thread-like leaves. Inflorescence is an axillary spikelet with imbricate scales. Each stem bears a single, long-peduncled, ovoid cluster of 1-10 fusiform spikelets. Each floret is subtended by papery, light or dark brown scale, and bears a perianth of 6 bent barbed or smooth bristles. The fruit is fusiform, lenticular, oblong-elliptic, and quite narrowed towards the base.

**Natural Heritage State Status/NatureServe Global Status:**
S2/G4 – Imperiled/Apparently Secure

**Federal Status:** Not listed

**Range:** Range extends from Newfoundland to Saskatchewan, south to Virginia, Tennessee, and Missouri.

**Primary Habitat:** Calcareous swamps, bogs, fens and shores; Open non-forested wetland.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- In the Midwest habitat includes calcareous fens, marl fens, fen-like seepage communities, sedge meadows, calcareous lakeshores (cobble beaches, wet sandy or stony shores, boggy beach pools); shoreline meadows, interdunal meadow depressions; limy seeps, seepages of limestone and dolomite cliffs; seepy, shelving rock ledges, moist areas of calcareous quarries and gravel pits.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
Hair Beakrush
Level III

Other Natural or Manmade Factors
- Alteration to hydrology, loss of natural disturbance regime, habitat destruction or conversion, grazing, and subsequent competition from invasive exotic species.

RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Seeds have been collected from four of the New England populations through the NEPCoP Seed Bank Program. The purpose of the program is to collect and store seeds of New England populations of regionally and globally rare species in order to increase the knowledge of species habitat and cultural requirements, scientific research, augmentation, reintroduction, or introduction into the wild.

Previous Research or Surveys
- Although there hasn’t been any species-specific research done, research into the general community types that support this species have been conducted. Study topics have included the effects of dam impoundment on flooding regimes along river shore communities, effects of road salt and invasive species on a fen community, and the influence of beaver flooding on species composition and diversity of a fen community.

MANAGEMENT RECOMMENDATIONS
- Protect or create large tracts of grassland, particularly native prairie.
- Prevent encroachment of woody vegetation in grasslands.
- Encourage vegetative diversity.
- Practice rotational burning: intervals of 3-4 years in tallgrass prairie, 6 years in mixed-grass prairie, and 5-10 years in shortgrass prairie.
- Delay mowing until July 15.
- Prevent overgrazing.
- Use native grasses when replanting grassland.

MONITORING PLANS
- Semi-regular monitoring of several sites has occurred for most of the current New England populations.

REFERENCES


Nodding Ladies'-tresses
Level III

Scientific Name: *Spiranthes cernua*

**General Description:** Plant pubescent above the leaves, 10-40 cm tall (including inflorescence). Leaves are mostly basal, oblanceolate to linear-lanceolate, 10-20 cm long and .5-1 cm wide. Inflorescence is a downy, spicate raceme of 20-40 white flowers, 10-40 cm tall; dense and multi-ranked, each flower subtended by an elongate, ovate-lanceolate bract.

**Natural Heritage State Status/NatureServe Global Status:** S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends along most of the eastern United States from Georgia to Maine and covers all the states to the west until you reach Texas, Oklahoma, Kansas, and Nebraska.

**Primary Habitat:** Commonly found in moist, sandy, acidic or basic soils. Other possible habitat includes moist meadows, lakeshores, and roadside ditches.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

**LOCATIONS AND CONDITIONS OF KEY HABITAT**

**Preferred Habitat**
- This species is present in the southern portion of North Dakota.

**PROBLEMS WHICH MAY AFFECT THIS SPECIES**

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
- Currently there are no research or survey projects being conducted on *Spiranthes cernua*. However, further research is always needed because it helps us better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

Previous Research or Surveys
- Research has been performed on reproductive and photosynthetic aspects.

MANAGEMENT RECOMMENDATION
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Hooded Ladies’-tresses
Level III

Scientific Name: *Spiranthes romanzoffiana*

**General Description:** Erect perennial that is hairless and stands about 10-40 cm tall. Leaves are alternate and there are several of them towards the base of the plant. They are linear to narrowly oblong.

**Natural Heritage State Status/NatursServe Global Status:** S1/G5 – Critically Imperiled/Secure

**Federal Status:** Not listed

**Range:** Range extends from Newfoundland to Alaska, south to California, Arizona, New Mexico, Montana, Nebraska, Iowa and New York.

**Primary Habitat:** Damp meadows, on lakeshores, in seasonally flooded pastures, and in valley bogs.

**Climate Index Rank:** Moderately Vulnerable (MV): Abundance and/or range extent within geographical area assessed likely to decrease by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

**Preferred Habitat**
- In North Dakota this species has been documented in Burke and Benson Counties. In these counties there is potential habitat near the lakes that are in the area.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs. The largest threat is habitat loss and alterations through previously undisturbed prairie being broken to produce crops.

**Other Natural or Manmade Factors**
- Grazing; too much or too little can be a negative impact depending on where the population is located.
- Disturbance on lakeshores through trampling, and development of recreational facilities.
- Fertilizer and herbicide use.
- Altered hydrological regimes.
Hooded Ladies’-tresses
Level III

RESEARCH AND SURVEY EFFORTS

**Current Research or Surveys**
- Currently there are two research projects being conducted by the NPWS. The first project is investigating the ecology, distribution, and reproductive biology of populations of *Spiranthes romanzoffiana* in Ireland. This study will assess the extent of genetic variation between and among Irish, British, and North American populations. These data will assist in the production of scientifically based management plans for the species and the site in which it occurs. The second project will look more closely at the pollination biology. This research will examine the idea that due to the rarity of this species, insufficient pollinators are attracted to it, which results in seed production and increased rarity.

**Previous Research or Surveys**
- Site monitoring occurs every 3 years in Ireland. This site monitoring surveys designated sites for any changes to the habitats and the species itself. It also reports all activities that may have an impact on the habitats and species and in doing so monitors any effects to the protected species present.

**Additional Research or Surveys Needed**
- Details regarding this species ecological requirement are lacking.

**MANAGEMENT RECOMMENDATION**
- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

**MONITORING PLANS**
- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.
REFERENCES


**Scientific Name:** *Utricularia intermedia*

**General Description:** Submersed plant with slender stems, commonly creeping along the bottom. Numerous, alternate leaves parted at the base and 1-3 times dichotomous. Segments are often unequal, slender, and flat. Contains 2-4 flowers that are corolla yellow and with a very short proper tube.

**Natural Heritage State Status/NatureServe Global Status:** S2/G5 – Imperiled/Secure

**Federal Status:** Not listed

**Range:** Circumboreal in North America, extending south to California, northern Nevada, southeast Idaho, northern Utah, Montana, Indiana, and Delaware.

**Primary Habitat:** Shallow ponds, slow-moving streams, and wet sedge or rush meadows.

**Climate Index Rank:** Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

**Reason for Designation:** This species is considered a sensitive plant, which means it is not listed as threatened or endangered but is still designated for special management consideration.

### LOCATIONS AND CONDITIONS OF KEY HABITAT

**Preferred Habitat**
- Species has been documented in Bottineau, Cavalier, McHenry, and Pembina counties.

### PROBLEMS WHICH MAY AFFECT THIS SPECIES

**Habitat**
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.

**Other Natural or Manmade Factors**
- Invasion of aquatic weeds
- Draining wetlands
- Herbicide applications
RESEARCH AND SURVEY EFFORTS

Current Research or Surveys
• Currently there are no research or survey projects being conducted for *Utricularia intermedia*. However, further research is always needed as it allows us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS
• Preserving the natural wetland habitat.
• Prevent the invasion of aquatic weeds.

MONITORING PLANS
• Suitable habitat throughout the range of the species should be systematically inventoried.

REFERENCES


Scientific Name: Veronicastrum virginicum

General Description: Perennial plant that is up to 5 feet tall and unbranched. Central stem is round and smooth. Scattered along the stem are 3-7 whorled leaves that can be up to 6 inches long and 1.5 inches across. At the apex of the plant are several slender spikes of white flowers up to 8 inches long. The narrow tubular flowers are about ¼ inches long from which two yellow or brown stamens are exerted. The flowers have no scent and they bloom early to mid-summer.

Natural Heritage State Status/NatureServe Global Status: SH/G4 – Possibly Extirpated/Apparently Secure

Federal Status: Not listed

Range: Range includes all of the eastern and mid-western United States. The range ends at North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas.

Primary Habitat: Occurs in moist to mesic black soil prairies, sand prairies, openings and edges of woodlands, thickets, savannas, and swampy meadows along rivers and ditches.

Climate Index Rank: Not Vulnerable/Presumed Stable (PS): Available evidence does not suggest that abundance and/or range extent within the geographical area assessed will change (increase/decrease) substantially by 2050. Actual range boundaries may change.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
• In North Dakota this species has only been documented in Pembina County.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
• The greatest threats to this species is habitat alteration and loss.

Other Natural or Manmade Factors
• Potential threats also include grazing, hydrologic alteration, and recreational land use.
RESEARCH AND SURVEY EFFORTS

- Currently there are no research or survey projects being conducted for *Veronicastrum virginicum*. However, further research is always needed as it helps us to better understand a multitude of sensitive plant species populations and their life cycle requirements necessary for survival.

MANAGEMENT RECOMMENDATIONS

- To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
- With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS

- Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
- Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


Bog Violet
Level III

Scientific Name: Viola conspersa

General Description: Perennial wildflower standing 4-8” tall; Consists of leafy stems that are light green and glabrous. The blades of the alternate leaves are 1-2.5” long and ¾-1.5” across; they are oval-cordate in shape and serrate-crenate along their margins. The base of each leaf blade is indented, while its tip is well-rounded to somewhat pointed; upper blade surface is medium to dark green and glabrous, while the lower surface is light to medium green and glabrous. Individual flowers develop from the axils of the leaves on pedicels about 1.5-3” long. They are ½-3/4” across, consisting of five pale blue-violet petals. Dark blue-violet veins radiate away from the throat of each flower across the petals. Fertilized flowers produce an ovoid-oblongoid seed capsule about 1/3” long; this capsule splits into three parts to fling the seeds from the mother plant.

Natural Heritage State Status/NatureServe Global Status: S2/G5 – Imperiled/Secure

Federal Status: Not listed

Range: Range extends from Maine, south to Florida and west to Alabama, Tennessee, Kentucky, Illinois, Wisconsin, Minnesota, and North Dakota. Also includes Colorado, and much of Canada.

Primary Habitat: Moist rich woodlands, swampy woodlands, and moist meadows in wooded areas.

Climate Index Rank: Highly Vulnerable (HV): Abundance and/or range extent within geographical area assessed likely to decrease significantly by 2050.

Reason for Designation: This species is considered a sensitive plant, which means that it is not listed as threatened or endangered but is still designated for special management consideration.

LOCATIONS AND CONDITIONS OF KEY HABITAT

Preferred Habitat
- In North Dakota this species has been recorded once in Richland County, in the southeastern part of the state.

PROBLEMS WHICH MAY AFFECT THIS SPECIES

Habitat
- The greatest threats to this species are habitat alterations and climate change. Climate change poses a threat because it could change the amount of precipitation and temperature in the region altering soil chemistry that the plant needs.
RESEARCH AND SURVEY EFFORTS
• Currently there are no research or survey projects being conducted for Viola conspersa. However, further research is always needed as it will help us better understand a multitude of sensitive plant species populations and their life cycle requirements that are necessary for survival.

MANAGEMENT RECOMMENDATION
• To establish management plans, the first step is to gain knowledge of population locations, extent, demographic characteristics, and changes in population characteristics over time.
• With the above knowledge gained, population viability analysis can be used to estimate the minimum population size to sustain the taxon. While this information is being collected, preserving habitat and restricting/limiting harvest would be beneficial.

MONITORING PLANS
• Monitor all populations in sufficient detail to determine whether viable populations are being maintained, assess the factors causing population fluctuations, and determine the conservation status of the populations.
• Monitor habitat condition and management on a periodic basis to ensure that optimal site management is being achieved.

REFERENCES


APPENDIX B

Plant Species of Conservation Priority Matrix
<table>
<thead>
<tr>
<th>State Scientific Name</th>
<th>State Common Name</th>
<th>Global Rank</th>
<th>SPSRS Rank</th>
<th>Elevation Rank</th>
<th>Confidence</th>
<th>NDCWCS Focus Area</th>
<th>NDCWCS Landscape Components</th>
<th>Ecogion - EPA Level IV</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ppatarama americana</td>
<td>Western Prairie-fringed Orchid</td>
<td>S2 G3</td>
<td>LT EV VH</td>
<td>Sand Deltas and Beach Ridges, Sheyenne River</td>
<td>Tallgrass Prairie, Rivers, Streams, and Riparian</td>
<td>Sand Deltas and Beach Ridges, Glacial Lake Agassiz Basin, Drift Plains, Tekawon Dead Ice Moraine, Glacial Outwash</td>
<td>Sand Deltas and Beach Ridges, Glacial Lake Agassiz Basin, Drift Plains, Tekawon Dead Ice Moraine, Glacial Outwash</td>
<td>Habitat: Sandy or rocky calcareous prairie, dry upland woods, gravelly hillside prairies.</td>
<td></td>
</tr>
<tr>
<td>Amaranthus tuberculatus</td>
<td>Sticky False-aspredine</td>
<td>S1 G5</td>
<td>EV VH I</td>
<td>Devils Lake Mountains</td>
<td>Eastern-Mixed-grass Prairie, Rivers, Streams, and Riparian</td>
<td>Devils Lake Mountains</td>
<td>Devils Lake Mountains</td>
<td>Habitat: Sandy, gravelly shores, mesic gravelly prairies, occurs primarily on sites with a periodic disturbance regime.</td>
<td></td>
</tr>
<tr>
<td>Allium canadense</td>
<td>Meadow Onion</td>
<td>S1 G5</td>
<td>HV VH I</td>
<td>Sand Deltas and Beach Ridges</td>
<td>Eastern-Mixed-grass Prairie, Tallgrass Prairie, Rivers, Streams, and Riparian, Upland Deciduous Forest</td>
<td>Sand Deltas and Beach Ridges, Glacial Lake Agassiz Basin, End Moraine Complex, Missouri Plateau</td>
<td>Sand Deltas and Beach Ridges, Glacial Lake Agassiz Basin, End Moraine Complex, Missouri Plateau, River Breaks, Little Missouri Badlands, Pembina Escarpment</td>
<td>Habitat: Sandy or rocky calcareous prairie, dry upland woods, gravelly hillside prairies.</td>
<td></td>
</tr>
<tr>
<td>Asclepias curassavica</td>
<td>Hairless Asclepias</td>
<td>S2 G5</td>
<td>HV Low I</td>
<td>Sand Deltas and Beach Ridges</td>
<td>Tallgrass Prairie</td>
<td>Sand Deltas and Beach Ridges, Pembina Escarpment, Glacial Lake Agassiz Basin</td>
<td>Sand Deltas and Beach Ridges, Pembina Escarpment, Glacial Lake Agassiz Basin</td>
<td>Habitat: Sandy, gravelly shores, mesic gravelly prairies, occurs primarily on sites with a periodic disturbance regime.</td>
<td></td>
</tr>
<tr>
<td>Panicum capillare</td>
<td>Hairless Sedge</td>
<td>S2 G5</td>
<td>HV Low I</td>
<td>Sand Deltas and Beach Ridges, Sheyenne River</td>
<td>Eastern-Mixed-grass Prairie</td>
<td>Sand Deltas and Beach Ridges, Pembina Escarpment, Glacial Lake Agassiz Basin</td>
<td>Sand Deltas and Beach Ridges, Pembina Escarpment, Glacial Lake Agassiz Basin</td>
<td>Habitat: Sandy, gravelly shores, mesic gravelly prairies, occurs primarily on sites with a periodic disturbance regime.</td>
<td></td>
</tr>
<tr>
<td>Carex viridula</td>
<td>Spring Sedge</td>
<td>S1 G37S</td>
<td>HV Mod II</td>
<td>Turtle Mountains</td>
<td>Deciduous Forest</td>
<td>Turtle Mountains</td>
<td>Turtle Mountains</td>
<td>Habitat: Sandy, gravelly shores, mesic gravelly prairies, occurs primarily on sites with a periodic disturbance regime.</td>
<td></td>
</tr>
<tr>
<td>Chasmanthea filis</td>
<td>Sandbar Grass</td>
<td>S1 G5</td>
<td>HV VH II</td>
<td>Kildeer Mountains</td>
<td>Upland Deciduous Forest</td>
<td>Little Missouri River, Ponderosa-Pine Area, Big Sable River, Beach Prarie, Western Mixed-grass/Shortgrass Prairie, Badlands</td>
<td>Little Missouri Badlands</td>
<td>Habitat: Sand Dunes, beach, dune, and coastal sands.</td>
<td></td>
</tr>
<tr>
<td>Chenopodium album</td>
<td>Smooth Goosefoot</td>
<td>S1 G24A</td>
<td>HV Mod I</td>
<td>Little Missouri River, Ponderosa-Pine Area, Big Sable River, Beach Prarie, Western Mixed-grass/Shortgrass Prairie, Badlands</td>
<td>Eastern-Mixed-grass Prairie, Rivers, Streams, Upland Deciduous Forest, Glacial Lake Agassiz Basin</td>
<td>Little Missouri River, Ponderosa-Pine Area, Big Sable River, Beach Prarie, Western Mixed-grass/Shortgrass Prairie, Badlands</td>
<td>Habitat: Snow, ice, and seasonally frozen habitats.</td>
<td></td>
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</tr>
<tr>
<td>Chenopodium album var. lamellosa</td>
<td>Sandbar-blackmarsh Goosefoot</td>
<td>S1 G76</td>
<td>EV VH II</td>
<td>Kildeer Mountains</td>
<td>Upland Deciduous Forest</td>
<td>Little Missouri River, Ponderosa-Pine Area, Big Sable River, Beach Prarie, Western Mixed-grass/Shortgrass Prairie, Badlands</td>
<td>Little Missouri Badlands</td>
<td>Habitat: Sand Dunes, beach, dune, and coastal sands.</td>
<td></td>
</tr>
<tr>
<td>Cyanus intermedium</td>
<td>Brook Flatsedge</td>
<td>S2 G5</td>
<td>HV Low II</td>
<td>Missouri Coteau Breaks, Sand Deltas and Beach Ridges, Sheyenne River</td>
<td>Tallgrass Prairie, Mixed-grass Prairie, Rivers, Streams, and Riparian</td>
<td>Missouri Coteau Breaks, Sand Deltas and Beach Ridges</td>
<td>Missouri Coteau Breaks, Sand Deltas and Beach Ridges</td>
<td>Habitat: Wet, fen, and lowland wetlands, including wet meadows and marshes.</td>
<td></td>
</tr>
<tr>
<td>Cyperus crispus</td>
<td>White Cyperus</td>
<td>S2 G4</td>
<td>HV Low I</td>
<td>Glacial Lake Deltas, Saline Areas, Sand Deltas and Beach Ridges, Sheyenne River, Devils Lake Basin</td>
<td>Eastern-Mixed-grass Prairie, Rivers, Streams, and Riparian, Tallgrass Prairie</td>
<td>Glacial Lake Deltas, Glacial Outwash, End Moraine Complex, Glacial Lake Basins, Glacial Lake Agassiz Basin, Saline Area, Drift Plains, Sand Deltas and Beach Ridges, Tekawon Dead Ice Moraine</td>
<td>Glacial Lake Deltas, Glacial Outwash, End Moraine Complex, Glacial Lake Basins, Glacial Lake Agassiz Basin, Saline Area, Drift Plains, Sand Deltas and Beach Ridges, Tekawon Dead Ice Moraine</td>
<td>Habitat: Biggy areas, wet prairies, decumbent and discontinuous forest, upland, thickets, prairies, meadows, fens, usually associated with old growth pine and fir forests.</td>
<td></td>
</tr>
</tbody>
</table>
Cypripedium reginae  Shining Ladys-slipper  S2  G4  HV  Low  II  Dovb Lake Mountains, Sand Deltas and Beach Ridges, Shaney River, Dovb Lake Basin

Eastern-Mixed-grass Prairie, Rivers, Streams, and Riparian, Tallgrass Prairie

Glacial Outwash, End Morbrane Complex, Sand Deltas and Beach Ridges, Glacial Lake Agassiz Basin

Cypripedium reginae has an extensive range throughout much of eastern North America. The species is found from Newfoundland, Nova Scotia, Quebec, Ontario, Minnesota, and western Saskatchewan south to Virginia, Tennessee, Arkansas, and North Dakota; cold northern wetlands (e.g., mossy conifer swamps of Thuya occidentalis, Picea mariana, or Larix laricina), swampland thickets, bogs, woodland glades, ravines, streams and lake edges, seepages on limestone or sandstone bluffs, damp calcareous slopes or shores, limestone quarries, wet calcareous meadows, circumneutral seep springs, forested fens, shrub borders of fens, sandy shores, and oligotrophic lakes; in soils ranging from slightly acidic to slightly alkaline. It has been observed growing in sphagnum as long as its roots are able to penetrate into deeper substrate layers that have a higher pH. It also prefers constant moisture and full sun to semi-shaded conditions associated. Plant species very considerably between habitat type and across the range of the species; Swampland woodlands and thickets, fens, Shady swamps and bogs, and near old oxbows and beaver ponds. Soils at these sites may be acid to slightly alkaline. Often associated with species such as, Asclepias, and red-veined dewsedge (N.1., found on the Shayne National Grassland portion of the Custer National Forest.

Drosophyllum rotundifolia  Round-leaved Sundew  S1  G5  HV  Low  II  Turtle Mountains

Upland Deciduous Forest

Turtle Mountains

Drosophyllum rotundifolia is found in areas of very sparse vegetation, and apparently does not tolerate competition from other plant species. It is usually found in the Study National Grassland and is subject to seasonal flooding, but are protected from high waves or strong currents. It is usually found in areas of very sparse vegetation, and apparently does not tolerate competition from other plant species. It is usually found in areas of very sparse vegetation, and apparently does not tolerate competition from other plant species. It is usually found in areas of very sparse vegetation, and apparently does not tolerate competition from other plant species. It is usually found in areas of very sparse vegetation, and apparently does not tolerate competition from other plant species. It is usually found in areas of very sparse vegetation, and apparently does not tolerate competition from other plant species. 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<table>
<thead>
<tr>
<th>Species</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Stiff Sandwort</em></td>
<td>Open rocky or gravelly areas, on rocky bluffs, calcareous ledges, and gravelly areas (dry, open, and sometimes disturbed slopes), calcareous gravel raised beach ridges, thin soil over limestone (meets forest openings and meadows in montane and subalpine areas and carved plains); dry, open xerothermic meadows or salt (wet), alkali, alkali flats, saline dunes and beaches (wet).</td>
</tr>
<tr>
<td><em>Tallgrass Prairie</em></td>
<td>Turtle Mountains, calcareous gravel raised beach ridges, sandy prairie, stream banks and lake shores (wet meadows); abundant in western Canada, dispersed throughout the rest of its range. This species is widely scattered from the Pacific Northwest Coast and Cascade Ranges westward across Canada to Quebec and in the Yukon Territory.</td>
</tr>
<tr>
<td><em>Sensitive Fern</em></td>
<td>Prairie Coteau Escarpment, Sand Deltas and Beach Ridges.</td>
</tr>
<tr>
<td><em>Swamp Willow</em></td>
<td>Wet meadows and swampy areas; abundance varies according to drainage and soil type. This species is widely scattered from the Pacific Northwest Coast and Cascade Ranges westward across Canada to Quebec and in the Yukon Territory.</td>
</tr>
<tr>
<td><em>One-flowered Broomrape</em></td>
<td>Swampy woods, bogs, sphagnum bogs, sphagnum seeps and wetlands, wet sandy and peaty meadows, marshes, low woods, wet prairies, and roadside; seepages; springs (usually wooded); shallow borders of acid bogs; swamp woods; creek floodplains; occasionally open heaths, and in the northern or mountainous part of its range, seepage sloughs or sustain stream beds. This species may also thrive in disturbed sites, such as abandoned quarries, roadcuts, ditches, and sandy and tilled soils; occurrences from Newfoundland west to Ontario and Minnesota and south to Florida and Texas.</td>
</tr>
<tr>
<td><em>Swamp Smartweed</em></td>
<td>Rooted in or near water; wet banks and clearings, shallow water, marshes, woodlots, ditches; along the margin of lakes, ponds, and streams; found from Nova Scotia to Minnesota and from Florida to Texas; most of North America, widely distributed.</td>
</tr>
<tr>
<td><em>Thin-fruited Knotweed</em></td>
<td>Damp or dry soils, on clay; open forest openings; marshes, woodlots, bogs, and wetlands; often brackish soils and shores; Great Plains; (B.C. to Florida to Texas; most of North America.</td>
</tr>
<tr>
<td><em>Salix maccalliana</em></td>
<td>Low moist, calcareous flatwoods, marshes, wet meadows, wet pine flatwoods, pine savannas, cypress swamps, sandy-peat stream banks; seepage slopes, ditches, woodlots, rarely calcareous fens, E. ND-Grand Forks to New Brunswick, S to FL. and East. Barrens, NO.</td>
</tr>
<tr>
<td><em>Drapetos frigido</em></td>
<td>Inhabits sparsely vegetated, moist sandy to muddy banks of streams, stock ponds and man-made reservoirs near the high water line. Topographic features and water level appear to be more important than geologic substrates in determining where this species grows (Firth and Welb 1998). Its habitat is usually sparsely vegetated with bunchgrasses, early successional or weedy forbs, and scattered shrubs. In Wyoming, it occurs mostly on semi-disturbed or recently flooded openings in small tracts or bogs with scattered clumps of Hordum jubatum, Fox succisa, Elmis smithii and a variety of native and exotic early successional forbs. Occasional populations can also be found in oxbows in gravel streams, in briers patches among thickets of Salix exigua or Tamarix chinensis ssp. collaris, and on the banks of small playa lakes (Firth and Welb 1998). Known originally from only a few sites in Montana and Wyoming, and adjacent western Nebraska and North Dakota; only known to be extant and persisting in Wyoming where it is currently found in the southeastern part of the state in the early 2000s (Firth and Welb 1998).</td>
</tr>
<tr>
<td><em>Gentiana spicata</em></td>
<td>Inhabitants sparsely vegetated, moist sandy to muddy banks of streams, stock ponds and man-made reservoirs near the high water line. Topographic features and water level appear to be more important than geologic substrates in determining where this species grows (Firth and Welb 1998). Its habitat is usually sparsely vegetated with bunchgrasses, early successional or weedy forbs, and scattered shrubs. In Wyoming, it occurs mostly on semi-disturbed or recently flooded openings in small tracts or bogs with scattered clumps of Hordum jubatum, Fox succisa, Elmis smithii and a variety of native and exotic early successional forbs. Occasional populations can also be found in oxbows in gravel streams, in briers patches among thickets of Salix exigua or Tamarix chinensis ssp. collaris, and on the banks of small playa lakes (Firth and Welb 1998). Known originally from only a few sites in Montana and Wyoming, and adjacent western Nebraska and North Dakota; only known to be extant and persisting in Wyoming where it is currently found in the southeastern part of the state in the early 2000s (Firth and Welb 1998).</td>
</tr>
<tr>
<td><em>Sedum banksii</em></td>
<td>Moist hills and rocky slopes, ditches, and sandy and tilled soils; occurrences from Newfoundland west to Ontario and Minnesota and south to Florida and Texas.</td>
</tr>
<tr>
<td><em>Mitella nuda</em></td>
<td>Moist woods and along streambanks; Swampy (wetland woods and thickets; wet; forests, bogs, often in moor; Global Range Comments: Widespread in northeastern North America and Alaska, Common distribution in northwestern North America. MN, ND, (across Canada, s to U.S.).</td>
</tr>
<tr>
<td><em>Auniffolia uniflora</em></td>
<td>Swampy woods, bogs, sphagnum bogs, sphagnum seeps and wetlands, wet sandy and peaty meadows, marshes, low woods, wet prairies, and roadides; seepages; springs (usually wooded); shallow borders of acid bogs; swamp woods; creek floodplains; occasionally open heaths, and in the northern or mountainous part of its range, seepage sloughs or sustain stream beds. This species may also thrive in disturbed sites, such as abandoned quarries, roadcuts, ditches, and sandy and tilled soils; occurrences from Newfoundland west to Ontario and Minnesota and south to Florida and Texas.</td>
</tr>
<tr>
<td><em>Minuartia dawsonensis</em></td>
<td>Occurs on both sides of the Cascades in Washington; ranging throughout much of North America.</td>
</tr>
<tr>
<td><em>Hayden’s Yellowcress</em></td>
<td>Hair-covered, moist, calcareous flatwoods, marshes, wet meadows, wet pine flatwoods, pine savannas, cypress swamps, sandy-peat stream banks; seepage slopes, ditches, woodlots, rarely calcareous fens, E. ND-Grand Forks to New Brunswick, S to FL. and East. Barrens, NO.</td>
</tr>
<tr>
<td><em>Pogonia ophioglossoides</em></td>
<td>Occurs on both sides of the Cascades in Washington; ranging throughout much of North America.</td>
</tr>
<tr>
<td><em>Orobanche uniflora</em></td>
<td>Closely related to California (C. S. Eaton) 0.064 miles to the north on the Arctic coast of Canada’s Northwest Territories; MN, ND, (across Canada, s to U.S.).</td>
</tr>
<tr>
<td><em>Onoclea sensibilis</em></td>
<td>Occurs on both sides of the Cascades in Washington; ranging throughout much of North America.</td>
</tr>
<tr>
<td><em>Salix maccalliana</em></td>
<td>Damp or dry soils, on clay; open forest openings; marshes, woodlots, bogs, and wetlands; often brackish soils and shores; Great Plains; (B.C. to Florida to Texas; most of North America.</td>
</tr>
<tr>
<td><em>S.1</em></td>
<td>Low moist, calcareous flatwoods, marshes, wet meadows, wet pine flatwoods, pine savannas, cypress swamps, sandy-peat stream banks; seepage slopes, ditches, woodlots, rarely calcareous fens, E. ND-Grand Forks to New Brunswick, S to FL. and East. Barrens, NO.</td>
</tr>
<tr>
<td><em>Sh.1</em></td>
<td>Low moist, calcareous flatwoods, marshes, wet meadows, wet pine flatwoods, pine savannas, cypress swamps, sandy-peat stream banks; seepage slopes, ditches, woodlots, rarely calcareous fens, E. ND-Grand Forks to New Brunswick, S to FL. and East. Barrens, NO.</td>
</tr>
<tr>
<td><em>S2</em></td>
<td>Low moist, calcareous flatwoods, marshes, wet meadows, wet pine flatwoods, pine savannas, cypress swamps, sandy-peat stream banks; seepage slopes, ditches, woodlots, rarely calcareous fens, E. ND-Grand Forks to New Brunswick, S to FL. and East. Barrens, NO.</td>
</tr>
<tr>
<td><em>SH</em></td>
<td>Low moist, calcareous flatwoods, marshes, wet meadows, wet pine flatwoods, pine savannas, cypress swamps, sandy-peat stream banks; seepage slopes, ditches, woodlots, rarely calcareous fens, E. ND-Grand Forks to New Brunswick, S to FL. and East. Barrens, NO.</td>
</tr>
<tr>
<td>Species</td>
<td>Habitat</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Pod Grass</td>
<td>Dry, rocky outcrops, often with gravel or sand, but also on nutrient-rich soils.</td>
</tr>
<tr>
<td>Chamomile Gracilis</td>
<td>Dry, rocky outcrops, often with gravel or sand, but also on nutrient-rich soils.</td>
</tr>
<tr>
<td>Round-leaved Sphagnum</td>
<td>Sphagnum bogs, often in wetlands or waterlogged areas, or on wet, poorly drained soils.</td>
</tr>
<tr>
<td>Seagrass, Langley</td>
<td>Wet, poorly drained soils, often in wetlands or waterlogged areas.</td>
</tr>
<tr>
<td>Carex sterilis</td>
<td>Marshy areas, often in wetlands or waterlogged areas.</td>
</tr>
<tr>
<td>Carex formosa</td>
<td>Marshy areas, often in wetlands or waterlogged areas.</td>
</tr>
<tr>
<td>Carex alopecoidea</td>
<td>Marshy areas, often in wetlands or waterlogged areas.</td>
</tr>
<tr>
<td>Botrychium mingnanense</td>
<td>Moist, rich, wooded areas, often in wetlands or waterlogged areas.</td>
</tr>
<tr>
<td>Botrychium multifidum</td>
<td>Moist, rich, wooded areas, often in wetlands or waterlogged areas.</td>
</tr>
<tr>
<td>Campylocentrum solandri</td>
<td>Damp, rich, wooded areas</td>
</tr>
<tr>
<td>Cane brook</td>
<td>Damp, rich, wooded areas</td>
</tr>
<tr>
<td>Cane broom</td>
<td>Damp, rich, wooded areas</td>
</tr>
<tr>
<td>Cane reed/rope</td>
<td>Damp, rich, wooded areas</td>
</tr>
<tr>
<td>Cane sternum</td>
<td>Damp, rich, wooded areas</td>
</tr>
</tbody>
</table>

Global Range: Newfoundland to the NW territories and B.C. s to NJ, Vt., and OR; Sphagnum bogs, and fens in the Great Plains; ND it occurs in bog birch fens, sph. bogs, sedge fens, and wetland forests. Specifically in E and N central part of the state, Benson, Bottineau, McHenry, Ransom, and Rolette. Other habitats include areas of permanent standing water or high water tables in meadows. Typically occur as a constituent of wet sphagnum-carpet communities forming open water, of waterlogged mud-bottom communities, and of fens in raised bogs, and other poor fen communities. It is a circumpolar species that ranges south to northern New Jersey, northern Pennsylvania, Wisconsin, Minnesota, northern Idaho, and along the coast to northern California.
<table>
<thead>
<tr>
<th>Taxon</th>
<th>Habitat Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Caulophyllum thalictroides</strong></td>
<td>Blue Cohosh, Prairie Coteau Escarpment, Glacial Lake Agassiz Basin, Rivers, Streams, and Riparian</td>
</tr>
<tr>
<td><strong>Cryptantha tomentosa</strong></td>
<td>Torre's Cryptantha, Big Sagedbrush-Drift-Stepping, Little Missouri River, Breaking, Missouri River System, Little Missouri Badlands, Missouri Plateau</td>
</tr>
<tr>
<td><strong>Dalea semea</strong></td>
<td>Nine-angled Dalea, Heart River, Little Missouri River, Breaks, Missouri River System, Western-Mixed Grass/Prairie Prairie, Little Missouri Badlands, Missouri Plateau</td>
</tr>
<tr>
<td><strong>Distetus coccifera</strong></td>
<td>Dutchman's Breeches, Eastern-Mixed Grass Prairie, Rivers, Streams, and Riparian, Prairie Coteau Escarpment, Glacial Lake Agassiz Basin</td>
</tr>
<tr>
<td><strong>Dioctis pauciflora</strong></td>
<td>Leatherwood, Wet meadows, streambanks; native from the Province of Quebec; south to the Appalachian River in Florida and west as far as Missouri and Oklahoma.</td>
</tr>
<tr>
<td><strong>Elymus susleei</strong></td>
<td>Wolf's Spikerush, Sand Deltas and Beach-Ridges, Red River, Tulipgrass Prairie, Rivers, Streams, and Riparian, Glacial Lake Agassiz Basin</td>
</tr>
<tr>
<td><strong>Equisetum arvense</strong></td>
<td>Eastern-Mixed Prairie, Rivers, Streams, and Riparian, Prairie Coteau Escarpment, Glacial Lake Agassiz Basin</td>
</tr>
<tr>
<td><strong>Equisetum arvense</strong></td>
<td>Dutchman's Breeches, Eastern-Mixed Grass Prairie, Rivers, Streams, and Riparian, Prairie Coteau Escarpment, Glacial Lake Agassiz Basin</td>
</tr>
<tr>
<td><strong>Eriophorum gracile</strong></td>
<td>Dune Shrubsteppe, Pokeberry, School Creek, Big Sagedbrush, and Drifts, Missouri River, Western-Mixed Grass/Shorgrass Prairie, Tulipgrass Prairie, Missouri Plateau</td>
</tr>
<tr>
<td><strong>Eriogonum cernuum</strong></td>
<td>Butte slopes, on scoria; dry plains, prairie steps, North Dakota, Driftingae; widely distributed east of the Cascades in Washington; British Columbia to Oregon, east to Montana. Habitat: Open areas, low to mid-elevations in the mountains.</td>
</tr>
<tr>
<td><strong>Eriogonum cernuum</strong></td>
<td>Butte slopes, on scoria; dry plains, prairie steps, North Dakota, Driftingae; widely distributed east of the Cascades in Washington; British Columbia to Oregon, east to Montana. Habitat: Open areas, low to mid-elevations in the mountains.</td>
</tr>
<tr>
<td><strong>Equisetum palustre</strong></td>
<td>Sandy or gravelly slopes, dry mixed grass prairie; in ND it is ranked as imperiled. It occurs in the TRNP. It's state center of distribution appears to be along the Missouri and heart river; it is securely globally, ranging across the Great Plains from ND to Minnesota, Texas, and New Mexico. In TRNP it occurs on south-facing rims of plateau tops capped by unconsolidated alluvial gravel deposits.</td>
</tr>
<tr>
<td><strong>Eleocharis wolfii</strong></td>
<td>Butte slopes, on scoria; dry plains, prairie steps, North Dakota, Driftingae; widely distributed east of the Cascades in Washington; British Columbia to Oregon, east to Montana. Habitat: Open areas, low to mid-elevations in the mountains.</td>
</tr>
<tr>
<td><strong>Euryops aetosme</strong></td>
<td>Open sandy grasslands and foothills, a WV, s WY, s CO, s OR to s WA to s MT to s NM, and CA; Buttes on scoria or limestone; Sandy to gravelly or clayey flats and slopes; mixed grassland, saltbush, sagebrush, and mountain mahogany communities, oak, prairie-juniper, and conifer woodlands</td>
</tr>
<tr>
<td><strong>Erythronium cernuum</strong></td>
<td>Butte slopes, on scoria; dry plains, prairie steps, North Dakota, Driftingae; widely distributed east of the Cascades in Washington; British Columbia to Oregon, east to Montana. Habitat: Open areas, low to mid-elevations in the mountains.</td>
</tr>
<tr>
<td><strong>Erythronium wynnii</strong></td>
<td>Grassland, School Creek, Big Sagedbrush, and Drifts, Missouri River, Western-Mixed Grass/Shorgrass Prairie, Tulipgrass Prairie, Missouri Plateau</td>
</tr>
<tr>
<td><strong>Euphorbus aetosme</strong></td>
<td>Open sandy grasslands and foothills, a WV, s WY, s CO, s OR to s WA to s MT to s NM, and CA; Buttes on scoria or limestone; Sandy to gravelly or clayey flats and slopes; mixed grassland, saltbush, sagebrush, and mountain mahogany communities, oak, prairie-juniper, and conifer woodlands</td>
</tr>
<tr>
<td><strong>Euphorbus praetnica</strong></td>
<td>Open sandy grasslands and foothills, a WV, s WY, s CO, s OR to s WA to s MT to s NM, and CA; Buttes on scoria or limestone; Sandy to gravelly or clayey flats and slopes; mixed grassland, saltbush, sagebrush, and mountain mahogany communities, oak, prairie-juniper, and conifer woodlands</td>
</tr>
<tr>
<td><strong>Gymnosporangium dryopteris</strong></td>
<td>Oakhern, Quartzite Hills, Sand Deltas and Beach-Ridges, Sheyenne River, Tulipgrass Prairie, Missouri Plateau, Little Missouri Badlands, Rivers, Streams, and Riparian, Upland Deciduous Forest</td>
</tr>
</tbody>
</table>

225
<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>S</th>
<th>G</th>
<th>PS</th>
<th>VH</th>
<th>Habitat/Community</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Townsendia hookeri</td>
<td>Hooker's Townsendia</td>
<td>S1</td>
<td>G5</td>
<td>PS</td>
<td>VH</td>
<td>Missouri River System, Missouri River Breaks, Little Missouri River, Knife River, Heart River, Badlands</td>
<td>Western Mixed-grass/Shortgrass Prairie, Rivers, Streams, Riparian, Little Missouri Badlands</td>
</tr>
<tr>
<td>Triplasis purpurea</td>
<td>Purple Sandgrass</td>
<td>S1</td>
<td>G4G5</td>
<td>PS</td>
<td>Mod</td>
<td>Sand Deltas and Beach Ridges</td>
<td>Sandy prairies, dry sandy beaches; Gravelly benches, sandy slopes, NE SD, NW MT, NE WY, and along the edge of the Rocky Mountains in CO.; native to western North America, ranging from the Yukon south to central Mexico, and west of the Mississippi River.</td>
</tr>
<tr>
<td>Veronicastrum virginicum</td>
<td>Culver's-root</td>
<td>SH</td>
<td>G4</td>
<td>PS</td>
<td>VH</td>
<td>Sand Deltas and Beach Ridges</td>
<td>Glacial Lake Agassiz Basin, Sand Deltas and Beach Ridges.</td>
</tr>
</tbody>
</table>

In North Dakota, it is found on dry sandy prairie and sandhills, open dry knolls. Ecology Comments: Inhabits hot, dry, sandy areas where competition is light. Naturally confined to beaches but spreading to disturbed areas inland. Habitat Comments: Dry, sandy beaches and dunes; Widespread in the eastern two-thirds of the United States along the Atlantic and Gulf coasts and the shores of the Great Lakes, and locally inland where it spreads to disturbed areas. It is common to occasional in most of the southeast (Wunderlin 1998, Weakley 2000) and rare in most of the midwest and northeast.
APPENDIX C

Maxent
Introduction

Maximum Entropy Modeling of Species Geographic Distributions (Maxent version 3.3.3e Schapire 2011) is software used for species habitat modeling. To better understand the spatial distributions of plant species in North Dakota, Maxent and Arcview (a geographic information systems software) were used to create habitat modeling maps for the 100 Plant Species of Conservation Priority. Maxent compares a set of known occurrences to a set of environmental variables of the same defined space to estimate a target probability distribution of maximum entropy. Maxent can produce valid output with a small set of observations but is typically more accurate when using a larger set of observations.

Maxent Challenges

There were several challenges we encountered using Maxent. First of all, it was new to us. Learning to use any new software always presents a challenge. A good deal of time was spent researching how others had used Maxent and finding tutorials to help us understand how to use the software properly.

The next challenge was deciding which and how many inputs (environmental layers and the sample file) to use. We wanted to make sure to use enough environmental layers to narrow the areas the plants may occur but not so many that the software would eliminate too much potential habitat. Another issue with using too many layers was the amount of computer memory it takes to run the software process. Our project area was large so we had to make sure that the layers we used wouldn’t be so big as to crash our computers during the process.

This leads to another challenge related to computer memory. Maxent requires that all the layers be in a particular format before they can be run through the software. It took some considerable time to convert all the layers to the necessary format, projection, cell size, and extent. It also took time to then convert the data created by Maxent into a format that could be utilized by Arcview software.
APPENDIX D

Biotics
Introduction

Biotics is a biodiversity data management software developed by NatureServe. It is built on a sophisticated data model implemented in an Oracle database. The system incorporates custom applications for spatial data management, tabular data management, data import/export and reconciliation, and reporting. The spatial component of the system is a custom geographic information system (GIS) application that supports basic digital mapping, spatial analyses, and data visualization.

This database contains taxonomic information, global and state ranks (based on degree of endangerment), and special protection designations for over 5,000 plant and animal species and significant ecological communities found in North Dakota.

Biotics is used to manage location information on plant and animal species, significant ecological communities, and other biological features of special concern. It includes site-specific data on population size, associated species, observation dates, geographic locators (such as township-range, latitude-longitude, county, watershed), land management status, and the best source for additional information. Records are based on published and unpublished reports, field surveys and collection records.

North Dakota Natural Heritage Inventory Methodology

The North Dakota Natural Heritage Inventory provides a comprehensive system (Heritage System) for identifying and prioritizing ecologically significant natural features in the state. Based on methodology developed by The Nature Conservancy and NatureServe, the Heritage System emphasizes features that are exemplary, unique, or endangered on a statewide or national level. In North Dakota this includes natural communities such as tall grass prairie and species such as the least tern and prairie fringed orchid.

The Heritage System approach marks an advance in the effort to ensure an objective, thorough assessment of a state's ecological diversity. Unlike previous inventories, which focused on sites rather than individual elements, the Heritage System identifies important but little known areas and clarifies the significance of better known sites. Whereas site-by-site inventories are conducted over a set time period and are quickly outdated, the Heritage System is ongoing with an information base that can be readily updated.

The Heritage System has three main facets for identifying the portions of the landscape that best represent the full range of North Dakota's natural diversity: classification, inventory, and data analysis.
Inventory and Data Analysis

The inventory and data analysis phase of the Heritage System are cyclical and therefore, integral.

The inventory phase of the Heritage System is a continuing process in which data is collected and compiled into a usable form. The basic unit of collection is the occurrence of a natural community of species of concern, that is, a natural feature. The Heritage System collects information on a site where a natural feature has been observed, collected, and/or reported.

Data Management

The data bank is the center of all Natural Heritage Inventory operations. Efficient storage of the data compiled is necessary for retrieval and analysis, and is a critical aspect of the Natural Heritage Inventory. The Natural Heritage Inventory data bank consists of a mapper and element tracker components. Both components are integrated to allow information retrieval in numerous ways.

The data bank centers around occurrences of natural communities and rare species. This information is stored in the data bank under numerous geographic fields such as township-range-section, watershed, latitude-longitude, physiographic province, county, and others. Thus, the data can be sorted, retrieved, and analyzed in numerous ways. The utility of this type of system is far reaching.

Summary

The Heritage System for identification of significant natural areas centers around the occurrences of special natural heritage elements. These natural elements are classified into natural communities, and species of concern. The Natural Heritage Inventory is responsible for classifying, ranking, and inventorying these features. The information obtained is analyzed to determine field work needs, gaps in our knowledge, and ultimately to determine protection priorities. This process is ongoing as new information becomes available, as the landscape changes, and as we begin to fill in gaps in our knowledge of North Dakota's natural heritage.

Natural Heritage Ranks (Global and State Status)

Each element is ranked on the basis of its global (range-wide) and state rarity. These ranks are assigned according to a standardized procedure used by the Natural Heritage Program.

These ranks are necessary to set priorities for both inventory and protection efforts. High ranking elements receive attention before low ranking elements. To rank elements in the relative order of importance, NaturesServe developed a ranking system that assigns each community or species a statewide and a global rank. These ranks are defined as follows:
Natural Heritage Global Ranks

**G1** Critically Imperiled – Critically imperiled globally because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (<1,000) or acres (<2,000) or stream miles (<10). [Critically endangered throughout its range.]

**G2** Imperiled - Imperiled globally because of rarity or because of other factors demonstrably making it very vulnerable to extinction or elimination throughout its range. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or stream miles (10 to 50). [Endangered throughout its range.]

**G3** Vulnerable – Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations) or because of other factors making it vulnerable to extinction or elimination throughout its range. Typically of 21 to 100 occurrences or between 3,000 and 10,000 individuals. [Threatened throughout its range.]

**G4** Apparently Secure – Uncommon but not rare (although it may be quite rare in parts of its range, especially at the periphery), and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.

**G5** Secure – Common, widespread, and abundant (although it may be quite rare in parts of its range, especially on the periphery). Not vulnerable in most of its range. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

**GX** Presumed Extinct (species elements) - Believed to be extinct throughout its range (e.g., passenger pigeon), virtually no likelihood that it will be rediscovered.

Eliminated (community elements) – Eliminated throughout its range, with no restoration potential due to extinction of dominant or characteristic species.

**GH** Possibly Extinct (species elements) – Known from only historical occurrences, but may nevertheless still be extant, further searching is needed.

Presumed Eliminated (Historical) (community elements) – Presumed eliminated throughout its range, with no or virtually no likelihood that it will be rediscovered, but with the potential for restoration.

**G#G#** Range Rank – A numeric range rank (e.g., G2G3) is used to indicate uncertainty about the exact status of a taxon. Ranges cannot skip more than one rank (e.g., GU should be used rather than G1G4).
GU  Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

GNR  Unranked – Global rank not yet assessed.

GNA  A conservation status rank is not applicable because the Element is not a suitable target for conservation activities for one of the following reasons:

Hybrid – Element not ranked because it represents an interspecific hybrid judged to be without conservation value.

Domestic Origin – The Element is a product of domestication or cultivation.

Ruderal, Invasive, Managed/Modified, or Cultural – Communities in one of these categories are not judged to have conservation value.


Q  Questionable Taxonomy – Distinctiveness of this entity as a taxon or community at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, inclusion of this taxon in another taxon, or inclusion of this community within another community with the resulting Element having a lower-priority (numerically higher) conservation status rank.

C  Captive or Cultivated Only – Taxon at present is extant only in captivity or cultivation, or as a reintroduced population not yet established.

T#  Infraspecific Taxon (trinomial) – The status of infraspecific taxa (subspecies or varieties) are indicated by a “T-rank” following the species’ basic global rank. A T subrank cannot imply the subspecies or variety is more abundant than the species’ basic global rank (i.e., a G1T2 subrank should not occur).

Natural Heritage State Ranks

S1  Critically Imperiled – Critically imperiled in the state because of extreme rarity or because of some factor of its biology making it especially vulnerable to extirpation from the state. Typically 5 or fewer occurrences or very few remaining individuals (<1,000). [Critically endangered in state.]

S2  Imperiled – Imperiled in the state because of rarity or because of other factors making it very vulnerable to extirpation from the state. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000). [Endangered in the state.]

S3  Vulnerable – Vulnerable in the state either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it
vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 to 10,000 individuals. [Threatened in the state.]

S4 Apparently Secure – Uncommon but not rare, and usually widespread in the state. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.

S5 Secure – Common, widespread, and abundant in the state. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

SX Presumed Extirpated – Element is believed to be extirpated from the state. Virtually no likelihood that it will be rediscovered.

SH Possibly Extirpated (Historical) – Elements occurred historically in the state, and there is some expectation that it may be rediscovered. Its presence may not have been verified in the past 20 years. An Element would become SH without such a 20-year delay if the only known occurrences in a state were destroyed or if it had been extensively and unsuccessfully looked for.

SNR Unranked – State rank not yet assessed.

SU Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

S#S# Range Rank – A numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the element. Ranges cannot skip more than one rank (e.g., SU should be used rather than S1S4).

SNA A conservation status rank is not applicable because the Element is not a suitable target for conservation activities for one of the following reasons:

Hybrid – Element not ranked because it represents an interspecific hybrid judged to be without conservation value.

Exotic Origin – The Element is not native to the state.

Accidental/Nonregular – Element is not regularly found in the state, in other words, infrequent and outside usual range.

Not Confidently Present – Element’s presence in the state has been reported, but the report is unconfirmed or doubtful; Element has been falsely reported, and may or may not potentially occur; Element may potentially occur (e.g. habitat is suitable); Element was never present in the state despite presence in surrounding areas.
No Definable Occurrences – Element is native and appears regularly but lacks practical conservation concern in the state because it is transient or occurs in a dispersed, unpredictable manner.

Synonym – Element reported as occurring in the state, but the state data center does not recognize the taxon; therefore the Element is not assigned a state rank.


B Breeding – Basic rank refers to the breeding population of the Element in the state.

N Non-breeding – Basic rank refers to the non-breeding population of the Element in the state.

M Migrant – Basic rank refers to the transient/migrant population of the Element in the state.

References


## North Dakota Plant Species of Concern 2013

North Dakota Natural Heritage Inventory

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>State Rank</th>
<th>Global Rank</th>
<th>USFWS Federal Status</th>
<th>NDHNI Occurrence Distribution</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acorus americanus</td>
<td>Sweetflag</td>
<td>S4</td>
<td>G5</td>
<td>-</td>
<td>Bott, McHe, Rans</td>
<td>Peatlands, fens, and seeps.</td>
</tr>
<tr>
<td>Allium canadense L.</td>
<td>Meadow onion</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Sarg</td>
<td>Prairies, open woods.</td>
</tr>
<tr>
<td>Allium tricoccum Ait.</td>
<td>Wild garlic</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Rich</td>
<td>Rich undisturbed woods.</td>
</tr>
<tr>
<td>Arabis canadensis L.</td>
<td>Sicklepod</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Sarg</td>
<td>Mesic woodlands.</td>
</tr>
<tr>
<td>Arnica cordifolia Hook.</td>
<td>Heart-leaved arnica</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Loga</td>
<td>Open woodlands.</td>
</tr>
<tr>
<td>Asclepias lanuginosa</td>
<td>Wooly milkweed</td>
<td>S1</td>
<td>G4?</td>
<td>-</td>
<td>Dunn, Grnt, McHe, Star, Stut</td>
<td>Sandy or rocky calcareous prairie.</td>
</tr>
<tr>
<td>Asclepias sullivantii Engelm. ex Gray</td>
<td>Sullivant’s milkweed</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Cass, Rich</td>
<td>Mesic tallgrass prairies.</td>
</tr>
<tr>
<td>Astragalus drummondii Dougl. ex Hook.</td>
<td>Drummond’s milkvetch</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Gfor, Will</td>
<td>Open or wooded hillsides, ravines.</td>
</tr>
<tr>
<td>Astragalus neglectus (Torr. and Gray) Sheldon</td>
<td>Cooper’s milkvetch</td>
<td>S1</td>
<td>G4</td>
<td>-</td>
<td>Pemb</td>
<td>Sandy, gravelly shores, mesic gravelly prairies.</td>
</tr>
<tr>
<td>Astragalus vexilliflexus Sheldon</td>
<td>Bent-flowered milkvetch</td>
<td>S3</td>
<td>G4</td>
<td>-</td>
<td>Dunn, Slop, Star</td>
<td>Barren badland slopes and buttes.</td>
</tr>
<tr>
<td>Athyrium filix-femina Roth</td>
<td>Northern lady-fern</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Cava, Gfor, Pemb, Rans, Rich</td>
<td>Moist woods, thickets, bogs, along streams.</td>
</tr>
<tr>
<td>Species</td>
<td>Common Name</td>
<td>Ref</td>
<td>Habitat Notes</td>
<td></td>
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</tr>
<tr>
<td>Botrychium campestre</td>
<td>Prairie grapefern</td>
<td>S1</td>
<td>G3G4 McHe</td>
<td>Dry, gravelly or sandy prairie.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botrychium matricarifolium</td>
<td>Chamomile grapefern</td>
<td>S1</td>
<td>G5 McHe, Ward</td>
<td>Moist woodlands.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botrychium minganense</td>
<td>Moonwort</td>
<td>S1</td>
<td>G4 Bott, Burk, Cava, Rans</td>
<td>Wooded, often north-facing slopes, meadows.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botrychium multifidum</td>
<td>Leathery grapefern</td>
<td>S1</td>
<td>G5 Cava</td>
<td>Wet meadows, rich woodlands.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botrychium simplex</td>
<td>Least grapefern</td>
<td>S2</td>
<td>G5 Rans</td>
<td>Meadows, barrens, and woods; subacid soils.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bromus kalmii</td>
<td>Kalm’s brome</td>
<td>S3</td>
<td>G5 Cava, Pemb</td>
<td>Open oak woods, sandy soils.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calla palustris</td>
<td>Water arum</td>
<td>S2</td>
<td>G5 Pemb, Rich</td>
<td>Northern marshes and swamps.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campanula aparinoides</td>
<td>Marsh bellflower</td>
<td>S2S3</td>
<td>G5 Pemb, Rans, Rich</td>
<td>Wetland thickets, seepage peatlands.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardamine bulbosa</td>
<td>Spring cress</td>
<td>S1</td>
<td>G5 Rans</td>
<td>Wet meadows and woods, springs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carex alopecoida</td>
<td>Foxtail sedge</td>
<td>S2</td>
<td>G5 Barn, Bott, Pemb, Rans, Rich</td>
<td>Damp, rich, wooded areas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carex athrostachya</td>
<td>Jointed-spike sedge</td>
<td>S3</td>
<td>G5 Bens, Divi, Moun, Will</td>
<td>Low prairie, marsh margins.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carex backii</td>
<td>Back’s sedge</td>
<td>S3</td>
<td>G4 Bott, Burk, Cava</td>
<td>Damp, wooded areas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carex brunnescens</td>
<td>Brown sedge</td>
<td>S1</td>
<td>G5 McHe</td>
<td>Fens, wet wooded areas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carex buxbaumii</td>
<td>Buxbaum’s sedge</td>
<td>S2</td>
<td>G5 Barn, Stut</td>
<td>Wet meadows, fens.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carex capillaris</td>
<td>Hair-like sedge</td>
<td>S2</td>
<td>G5 Bott, McHe</td>
<td>Wet meadows, fens.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carex chordorrhiza</td>
<td>Creeping sedge</td>
<td>S1</td>
<td>G5 Bott</td>
<td>Sphagnum bogs, poor fens.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carex convoluta</td>
<td>Spiral sedge</td>
<td>S2</td>
<td>G5 Sarg</td>
<td>Rich, deciduous woodlands.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Carex diandra</strong> Schrank</td>
<td>Lesser-panicled sedge</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Bott, Burk, Gfor, Role</td>
<td>Swamps, meadows, shores.</td>
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<tr>
<td><strong>Carex echinata ssp echinata</strong> Spiny sedge</td>
<td>S1</td>
<td>G5T5</td>
<td>-</td>
<td>Bott</td>
<td>Sphagnum bogs.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex festucacea</strong> Schkuhr ex Wild. Fescue sedge</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Cass</td>
<td>Wooded area.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex foenea</strong> Wild. Dry-spiked sedge</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Bott, Dunn</td>
<td>Aspen woods, ravines.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex formosa</strong> Dewey Handsome sedge</td>
<td>S1</td>
<td>G4</td>
<td>-</td>
<td>Rich</td>
<td>Low, moist, eastern woodlands.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex garberi</strong> Fern. Elk sedge</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Bens, Burk, McHe</td>
<td>Fens, swamps, pond margins.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex gracillima</strong> Schwein. Graceful sedge</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Pemb</td>
<td>Moist swampy woods.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex gynocrates</strong> Wormskj. ex Drej. Pistillate sedge</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>McHe</td>
<td>Peaty fens.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex haydenii</strong> Dewey Hayden’s sedge</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Dunn</td>
<td>Wet meadows, sloughs.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex lasiocarpa</strong> Ehrh. Wiregrass sedge</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Bott, Gfor, McHe, Rans, Rich</td>
<td>Sphagnum bogs, seepage-fed peatlands, lake borders.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex leptalea</strong> Wahlenb. Delicate sedge</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Cava, McHe, Pemb, Rans, Rich</td>
<td>Shubby peatland fens, swampy woods and thickets.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex limosa</strong> L. Mud sedge</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Bott, Mche</td>
<td>Sphagnum bogs, fens.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex nebrascensis</strong> Dewey Nebraska sedge</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Emmo, Lamo, Slop</td>
<td>Wet meadows, stream margins.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex pedunculata</strong> Muhl. ex Willd. Peduncled sedge</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Cava</td>
<td>Moist oak or birch woodlands.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex richardsonii</strong> R. Br. Richardson’s sedge</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Cass, McHe, Rich</td>
<td>Low, usually sandy, prairie.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex scirpoidea</strong> Michx. Spikerush sedge</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Dunn, McHe, Role</td>
<td>Rocky slopes, wet meadows.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex scoparia</strong> Schkuhr ex Wild. Pointed broom sedge</td>
<td>SH</td>
<td>G5</td>
<td>-</td>
<td>Bens, Gfor, Stut, Wals</td>
<td>Damp woods, low prairie, lakeshores.</td>
<td></td>
</tr>
<tr>
<td><strong>Carex simulata</strong> Mackenzie Copycat sedge</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Burk, Divi, McHe</td>
<td>Calcareous fens, wet meadow.</td>
<td></td>
</tr>
<tr>
<td>Scientific Name</td>
<td>Common Name</td>
<td>Map Keys</td>
<td>Page Numbers</td>
<td>Key(s)</td>
<td>Distribution Notes</td>
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<tr>
<td>Carex sterilis Willd.</td>
<td>Sterile sedge</td>
<td>S1</td>
<td>G4</td>
<td>-</td>
<td>McHe</td>
<td></td>
</tr>
<tr>
<td>Cauphyllium thalictroides (L.) Michx.</td>
<td>Blue cohosh</td>
<td>S1</td>
<td>G4G5</td>
<td>-</td>
<td>Cass, Rans Rich, Role</td>
<td></td>
</tr>
<tr>
<td>Chaenactis douglasii (Hook.) Hook. &amp; Arn.</td>
<td>Douglas’ dusty-maiden</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Bill, Gold</td>
<td></td>
</tr>
<tr>
<td>Cheilanthes feei T. Moore</td>
<td>Slender lip fern</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Dunn</td>
<td></td>
</tr>
<tr>
<td>Chenopodium subglabrum (S. Wats.) A. Nels.</td>
<td>Smooth goosefoot</td>
<td>S1</td>
<td>G3G4</td>
<td>-</td>
<td>Bill, Slop</td>
<td></td>
</tr>
<tr>
<td>Clematis columbiana var tenuiloba (Gray) J. Pringle</td>
<td>Slender-lobed clematis</td>
<td>S1</td>
<td>G5?T4?</td>
<td>-</td>
<td>Dunn</td>
<td></td>
</tr>
<tr>
<td>Collinsia parviflora Lindl.</td>
<td>Blue lips</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Bill, Dunn, Slop</td>
<td></td>
</tr>
<tr>
<td>Crataegus mollis Scheele</td>
<td>Downy hawthorn</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Cass, Gfor, Rans</td>
<td></td>
</tr>
<tr>
<td>Cryptpantha torreyana (Gray) Greene</td>
<td>Torrey’s cryptantha</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Bill, Bowm</td>
<td></td>
</tr>
<tr>
<td>Cyperus bipartitus Torr.</td>
<td>Brook flatsedge</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Cass, Rans, Rich, Stut</td>
<td></td>
</tr>
<tr>
<td>Cyperus diandrus Torr.</td>
<td>Low flatsedge</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Rans, Rich</td>
<td></td>
</tr>
<tr>
<td>Cypripedium parviflorum Salisb.</td>
<td>Small yellow lady’s- slipper orchid</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Bens, Bott, Cava, Dunn, Gfor, McHe, Pemb, Rans, Role, Sarg, Wals</td>
<td></td>
</tr>
<tr>
<td>Cypripedium parviflorum var. pubescens (Willd.) Knight</td>
<td>Large yellow lady’s- slipper</td>
<td>S2</td>
<td>G5T5</td>
<td>-</td>
<td>Bens, Eddy, Rans, Role</td>
<td></td>
</tr>
<tr>
<td>Cypripedium reginae Walt.</td>
<td>Showy lady’s-slipper</td>
<td>S2</td>
<td>G4</td>
<td>-</td>
<td>Bens, Cava, Eddy, Pemb, Rans, Rich</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Swampy woodlands and thickets, fens</td>
<td></td>
</tr>
<tr>
<td><strong>Dalea enneandra</strong> Nutt.</td>
<td>Nine-anthered dalea</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Bill, Grnt, Merc, Mort, Siou</td>
<td>Sandy or gravelly slopes, dry mixed grass prairie.</td>
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<tr>
<td><strong>Desmanthus illinoensis</strong> (Michx.) Macm. ex B. L. Robins. &amp; Fern</td>
<td>Prairie mimosa</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Emmo, Sarg</td>
<td>Prairies with rocky or sandy soil.</td>
</tr>
<tr>
<td><strong>Dicentra cucullaria</strong> (L.) Bernh.</td>
<td>Dutchman's breeches</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Gfor, Rans, Sarg</td>
<td>Rich eastern woodlands.</td>
</tr>
<tr>
<td><strong>Diervilla lonicera</strong> P. Mill.</td>
<td>Dwarf honeysuckle</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Cava</td>
<td>Shady woods, usually aspen.</td>
</tr>
<tr>
<td><strong>Dirca palustris</strong> L.</td>
<td>Leatherwood</td>
<td>S1</td>
<td>G4</td>
<td>-</td>
<td>Cava</td>
<td>Shady, damp woodland slopes.</td>
</tr>
<tr>
<td><strong>Drosera rotundifolia</strong> L.</td>
<td>Round-leaved sundew</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Bott</td>
<td>Acid bogs, swamps.</td>
</tr>
<tr>
<td><strong>Dryopteris carthusiana</strong> (Vill.) H.P. Fuchs</td>
<td>Spinulose woodfern</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Cava, Pemb, Rans, Rich</td>
<td>Rich, moist woods, ravines, boggy areas, alder thickets.</td>
</tr>
<tr>
<td><strong>Dryopteris cristata</strong> (L.) Gray</td>
<td>Crested woodfern</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Bott, Cass, Cava, Pemb, Rans, Rich</td>
<td>Swampy woods and thickets, seeps.</td>
</tr>
<tr>
<td><strong>Eleocharis parvula</strong> (Roemer &amp; J.A. Schultes) Link ex Bluff., Nees &amp; Schauer</td>
<td>Dwarf spikerush</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Burl, Gfor, Nels, Sarg</td>
<td>Brackish or alkaline shores.</td>
</tr>
<tr>
<td><strong>Eleocharis pauciflora</strong> (Lightf.) Link</td>
<td>Few-flowered spikerush</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Bens, Burk, Kidd, McHe, Role, Stut, Well</td>
<td>Calcareous fens and seeps.</td>
</tr>
<tr>
<td><strong>Elymus glaucus</strong> Buckl.</td>
<td>Blue wildrye</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Bott, McHe</td>
<td>Open woods, prairie slopes.</td>
</tr>
<tr>
<td><strong>Epilobium coloratum</strong> Biehler</td>
<td>Purple-leaved willowherb</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Rans, Rich, Stut</td>
<td>Marshes, seeps, shores.</td>
</tr>
<tr>
<td><strong>Epilobium pygmaeum</strong> (Speg.) P. Hoch &amp; Raven</td>
<td>Smooth-spike primrose</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Bill, Hett</td>
<td>Along streams and early-drying vernal pools.</td>
</tr>
<tr>
<td><strong>Equisetum palustre</strong> L.</td>
<td>Marsh horsetail</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Rans, Rich</td>
<td>Willow or alder thickets, swampy woods, stream banks.</td>
</tr>
<tr>
<td><strong>Equisetum pratense</strong> Ehrh.</td>
<td>Meadow horsetail</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Barn, Cass, Pemb, Rans, Rich</td>
<td>Moist boggy woods, shady river banks and shores.</td>
</tr>
<tr>
<td><strong>Equisetum sylvaticum</strong> L.</td>
<td>Wood horsetail</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Bens, Cava, Pemb</td>
<td>Moist aspen or lowland woods, seeps.</td>
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<tr>
<td><em>Equisetum variegatum</em> Schleich. ex F. Weber &amp; D.M.H. Mohr</td>
<td>Variegated horsetail</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>McHe</td>
<td>Marl pools of calcareous fens.</td>
</tr>
<tr>
<td><strong>Erigeron divergens</strong> Torr. &amp; Gray</td>
<td>Spreading fleabane</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Gold, Nels</td>
<td>Dry, open rocky or sandy sites, buttes.</td>
</tr>
<tr>
<td><strong>Erigeron radicatus</strong> Hook.</td>
<td>Cushion fleabane</td>
<td>S1</td>
<td>G3G4</td>
<td>-</td>
<td>Dunn</td>
<td>Dry, exposed hillsides, buttes at higher elevations.</td>
</tr>
<tr>
<td><strong>Eriogonum cernuum</strong> Nutt.</td>
<td>Nodding buckwheat</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Dunn, Slop</td>
<td>Buttes on scoria or limestone.</td>
</tr>
<tr>
<td><strong>Eriogonum visherii</strong> A. Nels.</td>
<td>Dakota buckwheat</td>
<td>S2</td>
<td>G3</td>
<td>-</td>
<td>Bill, Gold, Grnt, McKe, Moun, Siou, Slop</td>
<td>Clayey badland buttes and slopes, sandy-clay outwash areas.</td>
</tr>
<tr>
<td><strong>Eriophorum chamissonis</strong> C.A. Mey.</td>
<td>Chamisson’s cottongrass</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Barn, Bott, Lamo, McHe, Role</td>
<td>Bogs, marshes, peaty fens.</td>
</tr>
<tr>
<td><strong>Eriophorum gracile</strong> W.D.J. Koth</td>
<td>Slender cottongrass</td>
<td>S1</td>
<td>G5</td>
<td>-</td>
<td>Rans</td>
<td>Seepage fens.</td>
</tr>
<tr>
<td><strong>Eriophorum viridicarinatum</strong> (Engelm.) Fern.</td>
<td>Green keeled cottongrass</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Bott, Pemb, Rans</td>
<td>Sphagnum bogs, peaty fens.</td>
</tr>
<tr>
<td><strong>Euphorbia robusta</strong> (Engelm.)</td>
<td>Rocky mountain spurge</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Bill</td>
<td>Dry, sandy or gravelly prairie slopes.</td>
</tr>
<tr>
<td><strong>Fraxinus nigra</strong> Marsh.</td>
<td>Black ash</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Cava, Pemb</td>
<td>Swampy or wet lowland woods.</td>
</tr>
<tr>
<td><strong>Fritillaria pudica</strong> (Pursh) Spreng.</td>
<td>Yellow fritillary</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Bill, Mort</td>
<td>Ephemeral moist areas of buttes.</td>
</tr>
<tr>
<td><strong>Galium labradoricum</strong> (Wieg.) Wieg.</td>
<td>Bog bedstraw</td>
<td>S3</td>
<td>G5</td>
<td>-</td>
<td>Bott, McHe, Rans, Rich</td>
<td>Wetland thickets, fens, swampy woods.</td>
</tr>
<tr>
<td><strong>Gentianopsis crinita</strong> (Froel.) Ma</td>
<td>Fringed gentian</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Burk, Eddy, Kidd, Pemb, Town</td>
<td>Low wet prairies, stream banks.</td>
</tr>
<tr>
<td><strong>Geranium maculatum</strong> L.</td>
<td>Wild geranium</td>
<td>SH</td>
<td>G5</td>
<td>-</td>
<td>Cass</td>
<td>Rich, eastern, deciduous woods.</td>
</tr>
<tr>
<td><strong>Geum rivale</strong> L.</td>
<td>Water avens</td>
<td>S2</td>
<td>G5</td>
<td>-</td>
<td>Pemb</td>
<td>Marshes, wet meadows, river banks.</td>
</tr>
<tr>
<td>Species</td>
<td>Habitat Description</td>
<td>Page Numbers</td>
<td>County Abbreviations</td>
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<tr>
<td>Gymnocarpium dryopteris (L.) Newman</td>
<td>North-facing or shady wooded slopes.</td>
<td>S2 G5</td>
<td>Cava, Rans</td>
<td></td>
<td></td>
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<tr>
<td>Halenia deflexa (Sm.) Griseb.</td>
<td>Wetland thickets, damp shady woods.</td>
<td>S3 G5</td>
<td>Cava, Pemb</td>
<td></td>
<td></td>
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<tr>
<td>Helianthemum bicknellii Fern.</td>
<td>Open woods, prairies, usually dry sandy soil.</td>
<td>S1 G5</td>
<td>Pemb, Rans</td>
<td></td>
<td></td>
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<tr>
<td>Hudsonia tomentosa Nutt.</td>
<td>Sand prairies and dunes.</td>
<td>S1 G5</td>
<td>Rans</td>
<td></td>
<td></td>
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<tr>
<td>Iris missouriensis Nutt.</td>
<td>Mesi areas within mixed grass prairie.</td>
<td>S2 G5</td>
<td>Burl, Emmo, Kidd, Loga</td>
<td></td>
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<tr>
<td>Juncus brevicaudatus (Engelm.) Fern.</td>
<td>Wet meadows, fens, marshes.</td>
<td>S2 G5</td>
<td>Bott, McHe</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Juncus vaseyi Engelm.</td>
<td>Wet meadows, shores.</td>
<td>S2 G5?</td>
<td>Bott</td>
<td></td>
<td></td>
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<tr>
<td>Lappula cenchrusoides</td>
<td>Dry soils in the open.</td>
<td>S1 G4</td>
<td>Bill, Dunn, McKe, Siou, Slop, Will</td>
<td></td>
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<tr>
<td>Lechea stricta Legget ex Gray</td>
<td>Dry, sandy woods and prairie.</td>
<td>S2 G4?</td>
<td>Bowm, Rans, Rich</td>
<td></td>
<td></td>
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<tr>
<td>Leersia virginica Eilid.</td>
<td>Moist woods, stream banks.</td>
<td>S3 G5</td>
<td>Rich</td>
<td></td>
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<tr>
<td>Leucocrimum montanum Nutt. ex Gray</td>
<td>Dry prairie, sandy or clay soils.</td>
<td>S2 G5</td>
<td>Bill, Bowm, Gold, Slop</td>
<td></td>
<td></td>
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<tr>
<td>Linnaea borealis L.</td>
<td>Moist, wooded, (north-facing) slopes.</td>
<td>S4 G5</td>
<td>Bott, Cava, Dunn</td>
<td></td>
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<tr>
<td>Liparis loeselii (L.) L. C. Rich.</td>
<td>Damp woods, prairie swales, fens.</td>
<td>S2 G5</td>
<td>Bens, Kidd, Pemb, Rans, Stut</td>
<td></td>
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<tr>
<td>Lipocarpha micrantha (Vahl) G. Tucker</td>
<td>Wet sandy areas, sandbars.</td>
<td>S1 G5</td>
<td>Cass</td>
<td></td>
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<tr>
<td>Meholia repens (Lindl.) G. D</td>
<td>Coulees, slopes of high plains.</td>
<td>S2 G5</td>
<td>Bill, Bowm</td>
<td></td>
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<tr>
<td>Mentzelia pumila Nutt. ex Torr. &amp; Gray</td>
<td>Dry sandy or clayey soils.</td>
<td>S1 G4</td>
<td>Slop</td>
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<td>Menyanthes trifoliata L.</td>
<td>Sphagnum bogs, fen peatlands.</td>
<td>S2 G5</td>
<td>Bott, McHe, Rans</td>
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<tr>
<td>Mimulus guttatus DC.</td>
<td>Marshes, along streams and lake shores.</td>
<td>S1 G5</td>
<td>Gfor</td>
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<td>Scientific Name</td>
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<tr>
<td>Minuartia dawsonensis (Britt.) House</td>
<td>Stiff sandwort</td>
<td>Cava, Open rocky or gravelly areas, on shale.</td>
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<td>Mitella nuda L.</td>
<td>Naked mitrewort</td>
<td>Cava, Pemb, Role, Swampy lowland woods and thickets.</td>
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<tr>
<td>Monotropa uniflora L.</td>
<td>Indianpipe</td>
<td>Bott, Cava, Dunn, Rans, Role, Rich shady woods.</td>
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<tr>
<td>Muhlenbergia filiformis (Thurb. ex S.Wats.) Rydb.</td>
<td>Pull-up muhly</td>
<td>Burk, Marl pools of calcareous fens.</td>
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<tr>
<td>Myosurus aristatus Benth</td>
<td>Sedge mouse-tail</td>
<td>Slop, Ward, Will, Moist areas, vernal wetlands of mixed grass prairies.</td>
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<tr>
<td>Myriophyllum pinnatum (Walt.) B.S.P.</td>
<td>Cutleaf watermilfoil</td>
<td>Barn, Lamo, Loga, Stut, Shallows of marshes and shores.</td>
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<tr>
<td>Najas guadalupensis (Spreng.) Magnus</td>
<td>Southern naiad</td>
<td>Emmo, Lakes or streams.</td>
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<tr>
<td>Orobanche uniflora L.</td>
<td>One-flowered broom-rape</td>
<td>Cass, Damp woods and thickets.</td>
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<tr>
<td>Oxytropis deflexa (Pallas) DC</td>
<td>Drooping locoweed</td>
<td>Bott, Cava, Pemb, Role, Sandy lake shores, low meadows, aspen woodland clearings.</td>
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<tr>
<td>Oxytropis sericea Nutt.</td>
<td>White locoweed</td>
<td>Bens, Bill, Slop, Mixed grass prairie on slopes or buttes.</td>
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<tr>
<td>Parnassia palustris var. parviflora (DC) Bovin</td>
<td>Small-flowered grass-of-Parnassus</td>
<td>Bott, Calcareous fens or bogs.</td>
<td></td>
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<tr>
<td>Pellaea glabella Mett. ex Kuhn</td>
<td>Smooth cliffbrake</td>
<td>Adam, Bowm, Dunn, Gold, Grnt, Hett, McKe, Mort, Oliv, Sandstone caprock of buttes and ledges.</td>
<td></td>
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<tr>
<td>Species</td>
<td>Common Name</td>
<td>Flower Color</td>
<td>Location</td>
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<tr>
<td><em>Penstemon procerus</em></td>
<td>Small-flowered penstemon</td>
<td>S1, G5</td>
<td>Burk</td>
<td>Northern prairie slopes.</td>
<td></td>
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</tr>
<tr>
<td><em>Petasites frigidus</em></td>
<td>Sweet coltsfoot</td>
<td>S2, G5</td>
<td>Bott, Cava</td>
<td>Damp meadows and woods.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Phlox alyssifolia</em></td>
<td>Alyssum-leaved phlox</td>
<td>S2, G5</td>
<td>Bill, Gold, Will</td>
<td>Sandy, gravelly, or clayey slopes and ridges, buttes.</td>
<td></td>
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<tr>
<td><em>Phlox pilosa</em></td>
<td>Downy phlox</td>
<td>S1, G5</td>
<td>Cass, Rich</td>
<td>Mesic prairies of open woods.</td>
<td></td>
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<tr>
<td><em>Pinus flexilis</em></td>
<td>Limber pine</td>
<td>S1, G5</td>
<td>Bill, Slop</td>
<td>Exposed scoria ridge.</td>
<td></td>
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<tr>
<td><em>Piptatherum pungens</em></td>
<td>Slender mountain-ricegrass</td>
<td>S2, G5</td>
<td>Cava</td>
<td>Xeric slopes, usually shale.</td>
<td></td>
<td></td>
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<tr>
<td><em>Platanthera clavellata</em></td>
<td>Green woodland orchid</td>
<td>SH, G5</td>
<td>Gfor</td>
<td>Swampy woods, bogs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Platanthera praecla</em></td>
<td>Western prairie fringed orchid</td>
<td>S2, G3</td>
<td>LT, Rans, Rich</td>
<td>Moist prairie swales of sandhills.</td>
<td></td>
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<tr>
<td><em>Pogonia ophioglossoides</em></td>
<td>Rose pogonia</td>
<td>S1, G5</td>
<td>Gfor</td>
<td>Bogs, swampy woods.</td>
<td></td>
<td></td>
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<tr>
<td><em>Polygonum hydropiperoides</em></td>
<td>Swamp smartweed</td>
<td>S1, G5</td>
<td>Pemb</td>
<td>Rooted in or near water.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Polygonum leptocarpum</em></td>
<td>Thin-fruited knotweed</td>
<td>S1, G2G4Q</td>
<td>Grnt</td>
<td>Damp or dry soils, on clay.</td>
<td></td>
<td></td>
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<tr>
<td><em>Polygonum punctatum</em></td>
<td>Dotted smartweed</td>
<td>S3, G5</td>
<td>Cava, Emmo, Gfor, Rich</td>
<td>Swampy thickets, river banks, wet meadows.</td>
<td></td>
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<tr>
<td><em>Polygonum sagittatum</em></td>
<td>Arrow-leaved tearthumb</td>
<td>S2, G5</td>
<td>Bott</td>
<td>Marshes, wet meadows.</td>
<td></td>
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<tr>
<td><em>Populus x acuminata</em></td>
<td>Lanceleaf cottonwood</td>
<td>S2, GNA</td>
<td>Bill, Slop</td>
<td>Riparian areas, slopes.</td>
<td></td>
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<tr>
<td><em>Potamogeton diversifolius</em></td>
<td>Water-thread pondweed</td>
<td>S3, G5</td>
<td>Bill, Emmo, Slop, Stut</td>
<td>Shallow ponds, marshes.</td>
<td></td>
<td></td>
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<tr>
<td><em>Potamogeton filiformis</em></td>
<td>Slender pondweed</td>
<td>S3, G5</td>
<td>Barn, Divi, Rams</td>
<td>Shallow lakes, ponds, and streams.</td>
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<tr>
<td><em>Potamogeton natans</em></td>
<td>Floating pondweed</td>
<td>S2, G5</td>
<td>Bott, Bruk, Role</td>
<td>Cold, shallow to deep lakes and streams.</td>
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<tr>
<td><em>Potamogeton praeflorgus</em></td>
<td>White-stemmed pondweed</td>
<td>S1, G5</td>
<td>Bott, Ward</td>
<td>Usually cool, deep water of lakes.</td>
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<tr>
<td><strong>Potamogeton strictifolius</strong>&lt;br&gt;Benn.</td>
<td>Narrow-leaved pondweed</td>
<td>S1</td>
<td>G5</td>
<td>Bott, McHe</td>
<td>Shallow lakes, streams.</td>
<td></td>
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<tr>
<td><strong>Potamogeton vaginatus</strong>&lt;br&gt;Turcz.</td>
<td>Sheathed pondweed</td>
<td>S3</td>
<td>G5</td>
<td>Bott, Gfor, Kidd, Oliv, Role, Stut</td>
<td>Usually deep cold lakes, ponds.</td>
<td></td>
</tr>
<tr>
<td><strong>Potentilla diversifolia</strong>&lt;br&gt;Lehm.</td>
<td>Mountain meadow cinquefoil</td>
<td>S1</td>
<td>G5</td>
<td>Bill, Slop, Star</td>
<td>Along drainages, meadows.</td>
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<tr>
<td><strong>Potentilla palustris</strong>&lt;br&gt;(L.) Scop.</td>
<td>Purple cinquefoil</td>
<td>S2</td>
<td>G5</td>
<td>Bott, Gfor, McHe</td>
<td>Fens, wet meadows, bogs.</td>
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<tr>
<td><strong>Potentilla tridentata</strong>&lt;br&gt;Ait.</td>
<td>Three-toothed cinquefoil</td>
<td>S1</td>
<td>G5</td>
<td>Bill, Cava</td>
<td>Open dry, outcrops, on shale or scoria.</td>
<td></td>
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<tr>
<td><strong>Primula incana</strong>&lt;br&gt;M. E. Jones</td>
<td>American primrose</td>
<td>S2</td>
<td>G4G5</td>
<td>Burk, Divi, Moun</td>
<td>Alkali wet meadows, fens.</td>
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<tr>
<td><strong>Psoralea tenuiflora</strong>&lt;br&gt;Pursh</td>
<td>Slim-flowered scurfpea</td>
<td>SH</td>
<td>G5</td>
<td>Bowm</td>
<td>Dry prairie, high plains.</td>
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<tr>
<td><strong>Ranunculus cardiophyllus</strong>&lt;br&gt;Hook.</td>
<td>Heart-leaved buttercup</td>
<td>S1</td>
<td>G4G5</td>
<td>McKe, Will</td>
<td>Wet meadows, seeps.</td>
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<tr>
<td><strong>Ranunculus flammula</strong>&lt;br&gt;L.</td>
<td>Acrid spearwort</td>
<td>S1</td>
<td>G5</td>
<td>Burk</td>
<td>Marshes, damp shores.</td>
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<tr>
<td><strong>Ranunculus recurvatus</strong>&lt;br&gt;Poir.</td>
<td>Hooked crowfoot</td>
<td>S1</td>
<td>G5</td>
<td>Gfor, Rich</td>
<td>Wooded ravines, swampy woods.</td>
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<tr>
<td><strong>Rhynchospora capillacea</strong>&lt;br&gt;Torr.</td>
<td>Hair beakrush</td>
<td>S2</td>
<td>G4</td>
<td>Bens, Bott, McHe, Stut, Well</td>
<td>Calcareous fens, seeps.</td>
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<tr>
<td><strong>Ribes cynosbati</strong>&lt;br&gt;L.</td>
<td>Prickly gooseberry</td>
<td>S3</td>
<td>G5</td>
<td>Barn, Cass, Gfor, Rans, Rich</td>
<td>Moist rich woods.</td>
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<tr>
<td><strong>Rorippa calycina</strong>&lt;br&gt;(Engelm.) Rydb.</td>
<td>Hayden’s yellowcress</td>
<td>SH</td>
<td>G3</td>
<td>McKe</td>
<td>Riverbanks, shores.</td>
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<tr>
<td><strong>Salix maccalliana</strong>&lt;br&gt;Rowlee</td>
<td>Swamp willow</td>
<td>S1</td>
<td>G5?</td>
<td>Bott</td>
<td>Bogs, swamps.</td>
<td></td>
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<tr>
<td><strong>Salix pedicellaris</strong>&lt;br&gt;Pursh</td>
<td>Bog willow</td>
<td>S3</td>
<td>G5</td>
<td>Bens, Bott, McHe, Rans, Role</td>
<td>Sphagnum bogs, fens.</td>
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<tr>
<td><strong>Scheuchzeria palustris</strong>&lt;br&gt;L.</td>
<td>Scheuchzeria</td>
<td>S1</td>
<td>G5</td>
<td>Bott</td>
<td>Sphagnum bogs.</td>
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<tr>
<td><strong>Scirpus cyperinus</strong>&lt;br&gt;(L.) Kunth</td>
<td>Cottongrass bulrush</td>
<td>SNR</td>
<td>GNR</td>
<td>Pemb</td>
<td>Wet meadows, fresh marshes, boggy areas, fen wetlands.</td>
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<tr>
<td>Taxon</td>
<td>Common Name</td>
<td>Location</td>
<td>Usage Codes</td>
<td>Notes</td>
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<tr>
<td><em>Selaginella rupestris</em> (L.) Spring</td>
<td>Ledge spike-moss</td>
<td>S1</td>
<td>G5</td>
<td>Pemb</td>
<td>Sandy soils, near oak woods.</td>
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</tr>
<tr>
<td><em>Senecio eremophilus</em> Richards.</td>
<td>Northern ragwort</td>
<td>S2</td>
<td>G5</td>
<td>Bott, Role</td>
<td>Open sites in aspen woodlands.</td>
<td></td>
</tr>
<tr>
<td><em>Solidago riddellii</em> Frank ex Riddell</td>
<td>Riddell's goldenrod</td>
<td>SH</td>
<td>G5</td>
<td>Rich</td>
<td>Low prairies, wet meadows.</td>
<td></td>
</tr>
<tr>
<td><em>Sphagnum recurvum</em> P. Beauv.</td>
<td>Recurved sphagnum</td>
<td>S1</td>
<td>G5</td>
<td>Bott</td>
<td>Bogs, fens, forests, near wetlands</td>
<td></td>
</tr>
<tr>
<td><em>Sphagnum teres</em> (Schimp.) Angstr. In Hartm.</td>
<td>Round-leaved sphagnum</td>
<td>S1</td>
<td>G5</td>
<td>Bott</td>
<td>Bogs, fens, forests, near wetlands</td>
<td></td>
</tr>
<tr>
<td><em>Spiranthes cernua</em> (L.) L.C. Rich.</td>
<td>Nodding ladies'-tresses</td>
<td>S1</td>
<td>G5</td>
<td>Bens, McHe, Rich, Stut</td>
<td>Fens, low prairies.</td>
<td></td>
</tr>
<tr>
<td><em>Spiranthes romanzoffiana</em> Cham.</td>
<td>Hooded ladies'-tresses</td>
<td>S1</td>
<td>G5</td>
<td>Bens, Burk, McHe</td>
<td>Fens, wet meadows.</td>
<td></td>
</tr>
<tr>
<td><em>Sporobolus airoides</em> (Torr.) Torr.</td>
<td>Alkali sacaton</td>
<td>S3</td>
<td>G5</td>
<td>Bill, Bowm, Gfor, Slop</td>
<td>Moist or drying soil, alkali seeps.</td>
<td></td>
</tr>
<tr>
<td><em>Stephanomeria minor</em> (Hook.) Nutt.</td>
<td>Narrow-leaved wirelettuce</td>
<td>S3</td>
<td>G5</td>
<td>Bill, Slop</td>
<td>Dry, clay outcrops.</td>
<td></td>
</tr>
<tr>
<td><em>Talinum parviflorum</em> Nutt.</td>
<td>Prairie fameflower</td>
<td>S2</td>
<td>G5</td>
<td>Grnt, Mort, Siou, Slop</td>
<td>Sandy outcrops, butte slopes.</td>
<td></td>
</tr>
<tr>
<td><em>Thelesperma subnudum var. marginatum</em> (Rydb.) T.E. Melchert ex Cronq.</td>
<td>Greenthread</td>
<td>S2</td>
<td>G5T5</td>
<td>Divi, Will</td>
<td>Sandy prairie, open plains.</td>
<td></td>
</tr>
<tr>
<td><em>Thelypteris palustris</em> Schott</td>
<td>Marsh fern</td>
<td>S3</td>
<td>G5</td>
<td>Kidd, McHe, Pemb, Rans, Rich</td>
<td>Wetland thickets, shrubby fens.</td>
<td></td>
</tr>
<tr>
<td><em>Townsendia hookeri</em> Beaman</td>
<td>Hooker’s townsendia</td>
<td>S1</td>
<td>G5</td>
<td>Bill</td>
<td>Butte summits.</td>
<td></td>
</tr>
<tr>
<td><em>Trianthra glutinosa</em> (Michx.) Pers.</td>
<td>Sticky false-asphodel</td>
<td>S1</td>
<td>G5</td>
<td>Bens</td>
<td>Fens, wet meadows.</td>
<td></td>
</tr>
<tr>
<td><em>Triplasis purpurpea</em> (Walt.) Chapman</td>
<td>Purple sandgrass</td>
<td>S1</td>
<td>G4G5</td>
<td>Rans, Rich</td>
<td>Sandy prairies, blowouts.</td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Common Name</td>
<td>Locality Codes</td>
<td>Elevation Codes</td>
<td>Author(s)</td>
<td>Habitat</td>
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<td>----------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>----------------------------------</td>
<td></td>
</tr>
<tr>
<td><em>Utricularia intermedia</em></td>
<td>Flat-leaved bladderwort</td>
<td>S2 G5</td>
<td></td>
<td>Bott, McHe, Pemb</td>
<td>Calcareous fens, seepage peatlands.</td>
<td></td>
</tr>
<tr>
<td><em>U. minor</em></td>
<td>Lesser bladderwort</td>
<td>S2 G5</td>
<td></td>
<td>Bens, Burk, Eddy, Kidd, McHe, Pemb, Stut</td>
<td>Calcareous fens, seeps.</td>
<td></td>
</tr>
<tr>
<td><em>Uvularia sessilifolia</em></td>
<td>Sessile-leaved bellwort</td>
<td>S2 G5</td>
<td></td>
<td>Cass, Cava</td>
<td>Rich deciduous woods.</td>
<td></td>
</tr>
<tr>
<td><em>Veronicastrum virginicum</em></td>
<td>Culver's-root</td>
<td>SH G4</td>
<td></td>
<td>Pemb</td>
<td>Low prairie, rich woods.</td>
<td></td>
</tr>
<tr>
<td><em>Viola conspersa</em></td>
<td>Bog violet</td>
<td>S2 G5</td>
<td></td>
<td>Bill, Cass, Dunn, Gfor, Rans, Rich</td>
<td>Moist woods, stream banks.</td>
<td></td>
</tr>
<tr>
<td><em>V. incognita</em></td>
<td>Large-leaved white violet</td>
<td>SH G4G5T4T5</td>
<td></td>
<td>Pemb</td>
<td>Moist woods.</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX E

Rank Calculator
**Introduction**

North Dakota’s plant species of conservation priority status ranks were assessed using NatureServe’s rank calculator, version 2.0. This calculator facilitates the process of assigning status ranks through automation.

The protocol for assigning a status rank is based on ten conservation status factors. These factors are grouped based on: rarity, trends, and threats. Scores for the individual factors within these categories result into a calculated state rank. This calculated rank is reviewed, adjusted, and recorded as the final assigned conservation status rank using a S1-S5 scale for North Dakota, where S1 is the rarest and S5 most common.

The set of factors used to assess conservation status are:

- **Rarity:** Population Size, Range Extent, Area of Occupancy, Number of Occurrences, Number of Occurrences or Percent Area with Good Viability/Ecological Integrity, and Environmental Specificity;
- **Trends:** Long-term and Short-term trend in population size or area;
- **Threats:** Threat impact and Intrinsic Vulnerability.

**Rank Calculator Version 2.0**

NatureServe has developed a rank calculator to facilitate through automation the process of assigning conservation status ranks. The calculator works in combination with NatureServe’s data management system (Biotics 4) which contains the element database, including the rank factor information and assigned conservation status ranks for all elements.

The approach begins with the initial completion of an Element Ranking file within Biotics, which stores the summary data for the ten primary status factors which have been determined to be relevant for assessing extinction or extirpation risk of species and ecosystems. The ratings values for these factors can then be exported to this rank calculator. The rank calculator contains a series of procedures (points and rules) for using the factor ratings to generate a calculated status rank, which is reviewed, adjusted if deemed appropriate (with reasons documented), and finalized. For programs without Biotics, the calculator may be used as a stand-alone application.

With the new rank calculator tool, NatureServe’s ability to upgrade its status ranks will be improved based on an accurate, consistent, repeatable, and transparent method. There will be continued emphasis on data accuracy by using the strength and expertise of the NatureServe network through ongoing peer review of new information collected by biologists throughout the network (NatureServe, 2013).

**Ranking Guidelines**

NatureServes Conservation Status Assessments Methodology for assigning ranks was utilized when assigning state ranks. However, in some cases there was limited information available to populate the rank calculator. In these cases, the calculator was utilized as much as possible then professional judgments along with other survey data were used to assign the final rank.
If the rank calculator receives limited data inputs, it automatically ranks each species as S1 or S2, which is not always accurate. Some rare species have more documented occurrences than those more common in our state. These rare species are targeted and are more likely to get entered into the database. Those species with limited data available in the database were ranked based on habitat requirements/availability, other database searches, journal findings, web searches, and professional sources such as Flora of the Great Plains and the Handbook of North Dakota Plants.

Habitat requirements and availability in North Dakota was a common factor used to help guide the state ranks. Since North Dakota’s landscape has been highly altered due to agriculture, the available habitat has been greatly reduced and fragmented across many landscapes. This type of knowledge was utilized when assigning each rank.

The threat levels to each species vary depending on where the plant occurs in North Dakota and the habitat requirements needed to survive and reproduce. The threat levels varied for each habitat type in North Dakota.

Some species only occurred in one or two counties while other ranged statewide. To make a final rank, the distribution data was based on the size and number of counties and the likelihood the species may occur in adjacent counties. Also, different sources had different distribution data and this data from multiple sources was always combined to make the final rank.

Generally, the S1 species occurred in just one or two counties, had the greatest threats, required habitat which is rare in ND, occurred at the edge of the range, had a high environmental specificity, and had the fewest number of occurrences in our database. The S4 and S5 species were just the opposite while the S2/S3 species fell somewhere in between.

**Analysis**

A total of 290 plant species were ranked. The graph below represents the total number of plants and their updated S-ranks. The ranks listed along the x-axis represent the old state ranks. The updated S-ranks are represented by the bars within the graph.
Table 1. Ranking Matrix.

<table>
<thead>
<tr>
<th>New Ranks</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>SNR</th>
<th>SH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Ranks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SU (30)</td>
<td>3</td>
<td>10</td>
<td>16</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SNA (12)</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>SNR (40)</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>19</td>
<td>7</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>SH (17)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>S1? (2)</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S1 (78)</td>
<td>64</td>
<td>11</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>S1S2 (17)</td>
<td>3</td>
<td>13</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S2 (32)</td>
<td>0</td>
<td>27</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>S2S3 (24)</td>
<td>0</td>
<td>12</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S3 (27)</td>
<td>0</td>
<td>2</td>
<td>24</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S3S4 (4)</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S4 (7)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>0</td>
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<td>0</td>
</tr>
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<td>Totals</td>
<td>72</td>
<td>83</td>
<td>74</td>
<td>27</td>
<td>7</td>
<td>9</td>
<td>18</td>
</tr>
</tbody>
</table>

The following table is a summary of all the updated S-ranks. The updated ranks are represented in the yellow blocks. The old ranks with plant numbers are those in the orange blocks.
<table>
<thead>
<tr>
<th>Name</th>
<th>Old S-Rank</th>
<th>New S-Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allium tricoccum</td>
<td>SU</td>
<td>S3</td>
</tr>
<tr>
<td>Arnica cordifolia</td>
<td>SU</td>
<td>S3</td>
</tr>
<tr>
<td>Asclepias sullivantii</td>
<td>SU</td>
<td>S2</td>
</tr>
<tr>
<td>Botrychium simplex</td>
<td>SU</td>
<td>S2</td>
</tr>
<tr>
<td>Bromus kalmii</td>
<td>SU</td>
<td>S3</td>
</tr>
<tr>
<td>Carex festucacea</td>
<td>SU</td>
<td>S2</td>
</tr>
<tr>
<td>Epilobium coloratum</td>
<td>SU</td>
<td>S3</td>
</tr>
<tr>
<td>Fritillaria pudica</td>
<td>SU</td>
<td>S3</td>
</tr>
<tr>
<td>Geum rivale</td>
<td>SU</td>
<td>S2</td>
</tr>
<tr>
<td>Juncus vaseyi</td>
<td>SU</td>
<td>S2</td>
</tr>
<tr>
<td>Leersia virginica</td>
<td>SU</td>
<td>S3</td>
</tr>
<tr>
<td>Parnassia palustris var. parviflora</td>
<td>SU</td>
<td>S3</td>
</tr>
<tr>
<td>Phlox pilosa</td>
<td>SU</td>
<td>S1</td>
</tr>
<tr>
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<td>SU</td>
<td>S1</td>
</tr>
<tr>
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<td>SU</td>
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</tr>
<tr>
<td>Carex deflexa</td>
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<td>S3</td>
</tr>
<tr>
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<td>S2</td>
</tr>
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<td>SU</td>
<td>S1</td>
</tr>
<tr>
<td>Cuscuta glomerata</td>
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</tr>
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</tr>
<tr>
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<td>S3</td>
</tr>
<tr>
<td>Festuca rubra</td>
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<td>Juncus brachycephalus</td>
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<td>Myriophyllum heterophyllum</td>
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<td>S5</td>
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<td>SNR</td>
<td>S4</td>
</tr>
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<td>S4</td>
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<td>Clematis columbiana</td>
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<td>S4</td>
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<td>SNR</td>
<td>SNR</td>
</tr>
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<td>SNR</td>
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<td>Gaura coccinea</td>
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<td>S4</td>
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<tr>
<td>Krascheninnikovia lanata</td>
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<td>S4</td>
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<td>S5</td>
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<td>Nassella viridula</td>
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<td>S4</td>
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<td>Pascopyrum smithii</td>
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<td>S4</td>
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<td>Physaria brassicoides</td>
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<td>Populus balsamifera</td>
<td>SNR</td>
<td>S4</td>
</tr>
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<td>Ribes cereum</td>
<td>SNR</td>
<td>S3</td>
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<td>SNR</td>
<td>S4</td>
</tr>
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<td>SNR</td>
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<td>Sarcobatus vermiculatus</td>
<td>SNR</td>
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</tr>
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<td>Viola blanda</td>
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</tr>
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<td>Coryphantha missouriensis</td>
<td>SNR</td>
<td>S4</td>
</tr>
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<td>Helianthus grosseserratus</td>
<td>SNR</td>
<td>S4</td>
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<td>Species</td>
<td>Range</td>
<td>Status</td>
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<td>-------</td>
<td>--------</td>
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<td>Juglans cinerea</td>
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<td>SH</td>
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APPENDIX F

Distribution Maps
Habitat Distribution Map

Meadow onion
*Allium canadense*
Level I
Habitat Distribution Map

Chamomile grapefern
*Botrychium matricariiifolium*
Level III

NDONH 2012
Habitat Distribution Map

Foxtail sedge
*Carex alopecoidea*
Level II

NDONH 2012
Habitat Distribution Map

Slender lip fern
*Cheilanthes feei*
Level II

NDNHP 2012
Habitat Distribution Map

Torrey’s cryptantha
Cryptantha torreyana
Level II

NDNHP 2012
Habitat Distribution Map

Small yellow lady’s-slipper orchid
_Cypripedium parviflorum_
Level II

NDNHI 2012
Habitat Distribution Map

Large yellow lady’s-slipper
*Cypripedium parviflorum var. pubescens*
Level III

NDNII 2012
Habitat Distribution Map

Bicknell’s sunrose
*Helianthemum bicknellii*

Level I

NDNHP 2012

High Probability
Low Probability
Habitat Distribution Map

Alyssum-leaved phlox
Phlox alyssifolia
Level II

NDMHH 2012
Western prairie fringed orchid

*Platanthera praecella*

Level I

Habitat Distribution Map

NDNHP 2012
Habitat Distribution Map

Lanceleaf cottonwood
*Populus x acuminata*
Level II

NDMHP 2012
Habitat Distribution Map

Heart-leaved buttercup
*Ranunculus cardiophyllus*
Level III
Habitat Distribution Map

Hair beakrush
*Rhynchospora capillacea*
Level III
Habitat Distribution Map

Flat-leaved bladderwort
*Utricularia intermedia*
Level III

High Probability

Low Probability

NDNHP 2012