

Rare Plants of Devils Tower National Monument

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Introduction

Devils Tower National Monument (NM) was established in 1906 to protect and provide public access to Devils Tower, an isolated columnar monolith of igneous rock near the banks of the Belle Fourche River in Crook County, Wyoming. In addition to its unusual geologic features, the monument also contains 16 primary vegetation types and nearly 450 vascular plant species (Marriott 1982; The Nature Conservancy 1996). The diversity of the monument's flora can be attributed to its location along the boundary of the Black Hills and northern Great Plains floristic regions. Devils Tower NM also has the distinction of being the only National Park unit in northeastern Wyoming and provides the highest level of protection for native biological diversity of any area of public land in the Wyoming portion of the Black Hills ecoregion (Merrill et al. 1996).

Seven plant species from Devils Tower are considered rare within the state of Wyoming (Table 1) (Fertig and Beauvais 1999). These are primarily Great Plains forbs, and wetland and Eastern Deciduous Forest graminoids found at the far western edge of their range. For several of these plants, Devils Tower represents the only location in the state where they are known to occur or are protected.

This report summarizes the current knowledge of these rare plants in Wyoming. Element Occurrence records for each of these plants are included in Appendix B along with a map of their distribution in the monument. A revised checklist of the flora of Devils Tower NM (derived from Marriott [1982] and more recent work) is also included in Appendix A.

Table 1.
Rare Plants of Devils Tower National Monument

Species	Common Name	Heritage Rank	Range Notes	Federal Status	County	Managed Area
<i>Asclepias verticillata</i>	Whorled milkweed	G5/S1	Periph.	None	Crook	Devils Tower NM
<i>Carex emoryi</i>	Emory's sedge	G5/S1	Periph.	None	Crook, Platte?	Devils Tower NM
<i>Elymus villosus</i>	Hairy wild-rye	G5/S1	Periph.	None	Crook	Black Hills NF? Devils Tower NM Newcastle BLM
<i>Glandularia bipinnatifida</i>	Dakota vervain	G5/S1	Periph.	None	Crook Fremont	Devils Tower NM
<i>Helianthemum bicknellii</i>	Plains frostweed	G5/S1	Periph.	None	Crook	Black Hills NF Devils Tower NM
<i>Oenothera laciniata</i>	Cut-leaved evening-primrose	G5/S1	Periph.	None	Campbell Crook	Black Hills NF Devils Tower NM
<i>Viola pedatifida</i>	Prairie violet	G5/S1	Periph.	None	Crook	Black Hills NF Devils Tower NM Newcastle BLM?

Note: Heritage Ranks are assigned by Natural Heritage Programs based on the rangewide abundance of each species (G) and subspecies or variety (T) of plant and animal and their state (S) abundance on a 1-5 scale (1 = extremely rare, 5 = extremely common). Range Notes are based on the geographic distribution pattern of species in Wyoming. Periph. = peripheral (species at the edge of their contiguous range in WY).

Statewide Status of Rare Plants of Devils Tower NM

ASCLEPIAS VERTICILLATA

Heritage Rank: G5/S1

Occurrences in Wyoming: Known from a single location in Wyoming, last observed in 1981.

Abundance: Not known, but presumed to be low given its limited range in Wyoming.

Range: Peripheral; in Wyoming, known only from the Black Hills in Crook County.

Trends: Not known.

Protection Status: Wyoming's only occurrence is in Devils Tower National Monument.

Threats: Populations could be threatened by herbicides or competition with introduced plants.

Managed Areas: Occurs in Devils Tower National Monument.

References: Dorn 1992; Great Plains Flora Association 1986; Marriott 1989.

CAREX EMORYI

Heritage Rank: G5/S1

Occurrences in Wyoming: Known from two records in Wyoming, both discovered since 1981. The most recent reports are from 1996 (Hazlett et al. 1997; The Nature Conservancy 1996).

Abundance: Reported as "somewhat common" in 1981 within one small stretch of river corridor in Devils Tower National Monument.

Range: Peripheral; in Wyoming known only from the Black Hills (Crook County) and Southeastern Plains (Platte County).

Trends: Not known.

Protection Status: One occurrence is protected within Devil's Tower National Monument.

Threats: May be threatened by competition from leafy spurge (*Euphorbia esula*) in its lowland habitat. Response of this species to management is not understood.

Managed Areas: Found in Devils Tower National Monument and Camp Guernsey.

References: Dorn 1992; Great Plains Flora Association 1986; Hazlett et al. 1997; Standley 1989; The Nature Conservancy 1996.

ELYMUS VILLOSUS

Heritage Rank: G5/S1

Occurrences in Wyoming: Known from 2 extant locations in Wyoming (both relocated or discovered since 1983) and 3 historical records.

Abundance: Not known.

Range: Peripheral; in Wyoming, known only from the Black Hills in Crook County.

Trends: Not known.

Protection Status: One historical record is known from Devils Tower National Monument. All other reports are from state or public lands managed for multiple use.

Threats: May be impacted by grazing, competition from weeds, or loss of habitat to road and home construction.

Managed Areas: May occur on lands managed by Black Hills National Forest and the BLM Newcastle Field Office. An historical record is known from Devils Tower National Monument.

References: Church 1967; Dorn 1992; Great Plains Flora Association 1986.

GLANDULARIA BIPINNATIFIDA

Heritage Rank: G5/S1

Occurrences in Wyoming: Known from 1 extant occurrence and 1 historical record in Wyoming (most recently observed in 1989).

Abundance: 125 plants were observed in an area of 50 square meters on Devils Tower National Monument by Marriott in 1988.

Range: Peripheral; in Wyoming, known only from the Black Hills and "Wind Rivers" in Crook and Fremont counties.

Trends: Not known, but could potentially be an increaser in disturbed areas.

Protection Status: One occurrence is protected in Devils Tower National Monument.

Threats: Threats poorly understood, although populations could be impacted by herbicides or the elimination of prairie dog colonies.

Managed Areas: Occurs in Devils Tower National Monument.

References: Dorn 1992; Great Plains Flora Association 1986; Marriott 1989.

HELIANTHEMUM BICKNELLII

Heritage Rank: G5/S1

Occurrences in Wyoming: Known from 4 occurrences in Wyoming, the last observed in 1984.

Abundance: Not known.

Range: Peripheral; in Wyoming known only from the Black Hills (Crook County).

Trends: Not known.

Protection Status: One occurrence is found in Devils Tower National Monument and another is within the Geis Spring Late Successional Landscape area on Black Hills National Forest. Other populations are on public lands managed for multiple use.

Threats: Populations could be impacted by competition with exotic plants, herbicides, grazing, or road construction.

Managed Areas: Occurs on lands managed by Black Hills National Forest and Devils Tower National Monument.

References: Dorn 1992; Great Plains Flora Association 1986; Marriott 1989.

OENOTHERA LACINIATA

Heritage Rank: G5/S1

Occurrences in Wyoming: Known from 5 extant, native records in Wyoming, all observed since 1976. The Rocky Mountain Herbarium also has a specimen from downtown Laramie that has probably escaped from cultivation.

Abundance: Not known.

Range: Peripheral; in Wyoming, known from the northern Great Plains and Black Hills in Campbell and Crook counties.

Trends: Not known.

Protection Status: One population occurs in Devils Tower National Monument. All other known occurrences are on public lands managed for multiple use.

Threats: Populations could be affected by competition with exotic plants, herbicides, grazing, or soil disturbance.

Managed Areas: Occurs in Black Hills National Forest and Devils Tower National Monument.

References: Dorn 1992; Great Plains Flora Association 1986.

VIOLA PEDATIFIDA

Heritage Rank: G5/S1

Occurrences in Wyoming: Known from 3 extant occurrences (all observed since 1982) and 1 historical record in Wyoming.

Abundance: Population size is not known statewide, although one colony observed at Devils Tower in 1999 contained fewer than 10 individuals.

Range: Peripheral; in Wyoming, known only from the Black Hills in Crook County.

Trends: Not known.

Protection Status: One occurrence is found in Devils Tower National Monument. Other known populations are on public lands managed for multiple use or private lands.

Threats: May be threatened by recreational activity, competition with exotics, grazing, or herbicides.

Managed Areas: Occurs on Devils Tower National Monument and lands managed by Black Hills National Forest and the BLM Newcastle Field Office.

References: Dorn 1992; Great Plains Flora Association 1986; Marriott 1989; Spackman et al. 1997.

Excluded Species: Marriott (1989) reported two additional rare species for Devils Tower: *Panicum [Dichanthelium] wilcoxianum* and *Verbesina encelioides*. Both of these species have recently been found to be more common or widely distributed in eastern Wyoming and have been dropped as species of special concern by WYNDD. *Muhlenbergia mexicana*, another species from Devils

Tower NM, is classed as “status uncertain” by WYNDD (Fertig and Beauvais 1999) because additional information is needed on its native range and abundance in Wyoming to determine if species of special concern status is justified.

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Appendix A.

Vascular Plants of Devils Tower National Monument

The following species list is based primarily on a general floristic survey by Marriott (1982) and subsequent species checklists prepared by Marriott (1995) and San Miguel and Marriott (1996). Additions to these lists come largely from historical records at the Rocky Mountain Herbarium from C.L. Porter.

Species are arranged alphabetically by genus. Additional information for each species includes its family (a 3-letter acronym that is usually based on the first letters of the family name), relevant synonymy, global and state heritage rank (as determined by WYNDD on a scale of 1-5 as in Table 1), distribution in Wyoming, growth form, and major biome type. Non-native status is based on Fertig (1999). Nomenclature follows Dorn (1992).

Biogeographic Patterns

The vascular flora of Devils Tower consists of 387 native (86.2%) and 62 non-native taxa (13.8%), for a total of 449 species. The native flora is derived primarily of species with Great Plains and Rocky Mountain Forest affinities (Table 2). 352 of the 387 native species in the monument (91%) are widespread in Wyoming and of low conservation concern, while 29 are peripherals (7.5%), 2 are “sparse” (widely scattered and uncommon over a large range in the state), and 4 (1%) are regional endemics (with their range centered in the northern Great Plains). In contrast to many areas of the Black Hills, disjunct species are notably absent from the Devils Tower flora. Perennial forbs make up the largest component of the total flora, with 220 taxa (49%) (Table 3).

Table 2.
Distribution of the Flora of Devils Tower NM by Biome Type

Biome	Number of Species	Percentage of Native Flora N = 387
Great Plains	177	45.7
Rocky Mountain Forest	131	33.9
Wetlands	48	12.4
Intermountain Desert Steppe	21	5.4
Eastern Deciduous Forest	10	2.6

Table 3.
Distribution of the Flora of Devils Tower NM by Growth Form

Growth Form	Number of Species	Percentage of Total Flora N = 449
Perennial Forbs	220	49.0
Perennial Graminoids	89	19.8
Annual Forbs	79	17.6
Shrubs	32	7.2
Annual Graminoids	11	2.4
Trees	10	2.2
Ferns and Fern-Allies	8	1.8

Appendix B.

Element Occurrence Records for
Rare Plants of Devils Tower National Monument

ASCLEPIAS VERTICILLATA
WHORLED MILKWEED
OCCURRENCE # 001

IDENT: Y
ELEMENT RANK: G5/S1

COUNTY: Crook
LOCATION: Black Hills, Devils Tower, ca 600-900 feet northeast of the tower.
QUADNAME: Devils Tower PRECISION: S
LAT: 443530N LONG: 1044215W
TOWN/RANGE/SECTION: T53N R65W S7
WATERSHED: 10120201

LASTOBS: 1981-07-28 FIRSTOBS: 1981-07-28
POPULATION DATA: 1981-07-28: In flower (corollas white, tinged with purple).

HABITAT: Ponderosa pine forest with grass understory on rocky-sandy soil.
ELEVATION: 4300 ft

MANAGED AREA: Devils Tower National Monument

GENERAL COMMENTS: Only known Wyoming occurrence.

SPECIMENS: Marriott, H.J. (889). 1981. RM.

EDITION: 96-03-26 EDAUTHOR: Walter Fertig

CAREX EMORYI
EMORY'S SEDGE
OCCURRENCE # 001

IDENT: Y
ELEMENT RANK: G5/S1

COUNTY: Crook
LOCATION: Black Hills, Devils Tower National Monument south of entry station on south bank
of old river channel [banks of the Belle Fourche River].

QUADNAME: Devils Tower PRECISION: M
LAT: 443512N LONG: 1044205W
TOWN/RANGE/SECTION: T53N R65W S7 (SE4) or Sec 18 (NE4)
WATERSHED: 10120201

LASTOBS: 1996-summer FIRTOBS: 1981-06-05
POPULATION DATA: 1996-summer: Observed with *Ambrosia psilostachya*, *Equisetum arvense*,
Glycyrrhiza lepidota, *Helianthus petiolaris*, *Elymus smithii*, *Spartina pectinata*, and
Sporobolus cryptandrus in TNC vegetation plot.
1981-06-05: Reported as "somewhat common" by H. Marriott. Occurs with *Poa pratensis*
and *Bromus tectorum*.

HABITAT: Sandy alluvial soil in *Populus deltoides*/*Salix amygdaloides* woodland on the
floodplain of the Belle Fourche River.

ELEVATION: 3850 ft.

MANAGED AREA: Devils Tower National Monument

SOURCES: The Nature Conservancy 1996.
SPECIMENS: Marriott, H. 682. 1981. RM.

EDITION: 00-04-22 EDAUTHOR: Walter Fertig

ELYMUS VILLOSUS
SLENDER WILD-RYE
OCCURRENCE # 002

IDENT: Y
ELEMENT RANK: G5/S1

COUNTY: Crook
LOCATION: Black Hills, "Devils Tower".

QUADNAME: Devils Tower PRECISION: M
LAT: 443547N LONG: 1044231W
TOWN/RANGE/SECTION: T53N R65W S7?
WATERSHED: 10120201

LASTOBS: 1897-08 FIRTOBS: 1897-08
POPULATION DATA:

HABITAT: Lowland opening.

ELEVATION: 3900 ft.

MANAGED AREA: Devils Tower National Monument

SPECIMENS: Griffiths, D. (567). 1897. US?

EDITION: 98-01-19 EDAUTHOR: Walter Fertig

GLANDULARIA BIPINNATIFIDA

DAKOTA VERVAIN

OCCURRENCE # 002

IDENT: Y

ELEMENT RANK: G5/S1

COUNTY: Crook

LOCATION: NW Black Hills, Devils Tower National Monument, prairie dog town on south side
of main park road [located near the NE end of the second pullout coming into the park].

QUADNAME: Devils Tower PRECISION: S

LAT: 443500N LONG: 1044303W

TOWN/RANGE/SECTION: T53N R65W S18 (NW4)

WATERSHED: 10120201

LASTOBS: 1989-08-09 FIRSTOBS: 1977-09-16

POPULATION DATA: 1988-08-09: 113 flowering plants and 12 vegetative plants
counted by Marriott and Gyra in a 10 x 5 m area. Individuals typically clustered.
1977-09-16: Reported as "common" by H. Marriott. Observed in flower.

HABITAT: Disturbed alluvial soil very close to road.

ELEVATION: 3850 ft SIZE: less than 1 acre

MANAGED AREA: Devils Tower National Monument

COMMENTS: Monitoring plot established by Marriott (see 1989 report).

SOURCES: Marriott 1989

SPECIMENS: Marriott, H.J. (233). 1977. Devils Tower NM Herbarium.

EDITION: 00-04-22 EDAUTHOR: Walter Fertig

HELIANTHEMUM BICKNELLII
PLAINS FROSTWEED
OCCURRENCE # 003

IDENT: Y
ELEMENT RANK: G5/S1

COUNTY: Crook
LOCATION: Northwest Black Hills, Devils Tower National Monument near visitors center
parking lot and west base of tower.
QUADNAME: Devils Tower PRECISION: S
LAT: 443527N LONG: 1044304W
TOWN/RANGE/SECTION: T53N R65W S7 (SW4)
WATERSHED: 10120201

LASTOBS: 1982 FIRSTOBS: 1982
POPULATION DATA:

HABITAT: Ponderosa pine forest.
ELEVATION: 4200 ft

MANAGED AREA: Devils Tower National Monument

SPECIMENS:

EDITION: 98-01-19 EDAUTHOR: Walter Fertig

OENOTHERA LACINIATA
CUT-LEAVED EVENING-PRIMROSE
OCCURRENCE # 004

IDENY: Y
ELEMENT RANK: G5/S1

COUNTY: Crook
LOCATION: Black Hills, prairie dog town near the amphitheater at Devils Tower
National Monument.
QUADNAME: Devils Tower PRECISION: M
LAT: 443500N LONG: 1044303W
TOWN/RANGE/SECTION: T53N R65W S7 (NW4)
WATERSHED: 10120201

LASTOBS: 1982-07-01 FIRSTOBS: 1982-07-01
POPULATION DATA: 1982-07-01: Reported as "occasional" by H. Marriott.

HABITAT: Disturbed alluvial soil.
ELEVATION: 3850 ft

MANAGED AREA: Devils Tower National Monument

SPECIMENS: Marriott, H.J. (1260). 1982. RM.

EDITION: 98-06-03 EDAUTHOR: Walter Fertig

VIOLA PEDATIFIDA
PRAIRIE VIOLET
OCCURRENCE # 002

IDENT: Y
ELEMENT RANK: G5/S1

COUNTY: Crook

LOCATION: Northwest Black Hills, Devils Tower, 2 locations: (1) along Redbed Trail just east of the Visitor Center parking loop below the west face of the tower, (2) in the vicinity of the Redbed Trail ca 0.5 miles northeast of the tower.

QUADNAME: Devils Tower PRECISION: S

LAT: 443547N LONG: 1044231W

TOWN/RANGE/SECTION: T53N R65W S7 (SW4 of NW4 of SW4 & NE4)

WATERSHED: 10120201

LASTOBS: 1999-06-03 FIRSTOBS: 1982

POPULATION DATA: 1999-06-03: 2 flowering plants observed by W. Fertig along the Redbed Trail, just east of the visitor center parking loop. Occurs with *Thermopsis rhombifolia*, *Artemisia ludoviciana*, *Antennaria howellii*, *Cerastium arvense*, and *Vicia americana*. Much additional potential habitat in vicinity.

HABITAT: Ponderosa pine forest with understory of *Poa pratensis* and high cover of *Euphorbia esula*.

ELEVATION: 4200-4260 ft

MANAGED AREA: Devils Tower National Monument

COMMENTS: Populations could be impacted by recreation use and competition from exotic plants (especially *Euphorbia esula*).

SPECIMENS:

EDITION: 99-06-07 EDAUTHOR: Walter Fertig
