

STATUS REPORT ON
Thelesperma caespitosum
IN SOUTHWESTERN WYOMING

Prepared for the Bureau of Land Management,
Rock Springs District, by

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I. INTRODUCTION

In 1988, botanist Robert Dorn discovered a small population of an unusual Thelesperma while conducting field work in the Green River area in southwestern Wyoming. Dorn recognized the plants as belonging to an undescribed species, which he named Thelesperma caespitosum (Dorn 1990).

Until recently, T. caespitosum was known only from the type locality near Green River and an historical occurrence southwest of Duchesne, Utah. Due to its limited distribution, the species was designated as a Category 2 candidate for listing under the Endangered Species Act by the US Fish and Wildlife Service (USFWS) in 1993. Under Bureau of Land Management (BLM) Manual 6840, the BLM is directed to manage USFWS candidate species in such a manner that these species and their habitats are conserved and to ensure that agency actions do not contribute to the need to list these species as Threatened or Endangered (Willoughby et al. 1992). T. caespitosum is currently managed as a Special Status plant species by the BLM Rock Springs District (Amidon 1994).

In 1994, the Rock Springs District and Wyoming State Office of the BLM contracted on a cost-share basis with The Nature Conservancy's Wyoming Natural Diversity Database (WYNDD) to conduct field surveys for Thelesperma caespitosum on public lands in southwest Wyoming. The objectives of this project were to collect information on the biology, distribution, habitat use, population size, and potential threats to this species to be used in guiding management decisions. In addition, a permanent monitoring plot was established and baseline demographic and population trend data were collected.

II. METHODS

Information on habitat and distribution of Thelesperma caespitosum was obtained from secondary sources, including WYNDD files and computer databases, collections of the Rocky Mountain Herbarium (RM), the literature, and knowledgeable individuals. USGS topographic maps, geologic maps (Love and Christiansen 1985), and BLM land status maps were used to identify areas of potential habitat for ground survey.

Field surveys were conducted by the author in mid to late June, 1994 (survey routes and collection sites are indicated in Appendix B). Data on biology, habitat, population size, and management needs were collected using WYNDD plant survey forms (Appendix C). Locations of occurrences were mapped on 7.5' USGS topographic maps. If populations were sufficiently large,

voucher specimens were collected for deposit at the RM. Information gathered in the field was entered into the computerized Element Occurrence database of WYNDD. A single permanent transect was established at Occurrence # 001, following the protocol of Lesica (1987). The transect consisted of a single belt 1 m x 30 m long, subdivided into 30 1 m x 1 m cells. Within each cell, the locations of individual plants were mapped and each plant was assigned to one of three age classes: reproductive (in flower), fruiting (including plants with fruiting involucre of a previous season), and vegetative (completely lacking flowering or fruiting heads). The number of flowering, fruiting, and vegetative rosettes per plant was also tallied. This technique generates quantitative data on population size, density, age distribution, and reproductive potential. Baseline data from this transect are included in Appendix D.

III. SPECIES INFORMATION

A. CLASSIFICATION

1. SCIENTIFIC NAME: Thelesperma caespitosum Dorn (Dorn 1990).

2. SYNONYMS: Welsh et al. (1993) reduced T. caespitosum to varietal status under Thelesperma subnudum, creating the new combination T. subnudum Gray var. caespitosum (Dorn) Welsh. Cronquist (1994) considered T. caespitosum and T. subnudum var. alpinum to be synonyms of Thelesperma pubescens Dorn.

3. COMMON NAME: Green River greenthread (Fertig et al. 1994, in ed.); Duchesne greenthread (Welsh et al. 1993).

4. FAMILY: Asteraceae (Sunflower family).

5. SIZE OF GENUS: Cronquist (1994) recognizes about a dozen species and Welsh et al. (1993) recognize two species and three varieties in Utah.

6. PHYLOGENETIC RELATIONSHIPS: Thelesperma caespitosum is one of five taxa in the "Thelesperma subnudum complex" (Dorn 1990). Dorn hypothesizes that T. subnudum is the ancestral species in the complex due to its wide distribution and less specialized habitat requirements. T. pubescens and T. caespitosum are considered to be more recent derivatives adapted

to more specialized and restricted environments. T. subnudum var. alpinum, although morphologically similar to T. caespitosum, is believed to have evolved as a separate lineage from T. subnudum (Dorn 1990).

7. COMMENTS ON ALTERNATIVE TAXONOMIC TREATMENTS: Field and herbarium studies support the recognition of Thelesperma caespitosum as a distinct taxon, separate from T. pubescens. The two taxa differ greatly in leaf pubescence and habitat specificity and are readily distinguished in the field. Welsh's (1993) treatment may have merit if T. caespitosum is considered to be rhizomatous rather than tap-rooted, as field observations would suggest. Whether T. caespitosum is ultimately considered a distinct species or a variety of another species (most likely T. subnudum), it is still worthy of conservation attention.

B. PRESENT LEGAL OR OTHER FORMAL STATUS

1. NATIONAL

- a. LEGAL STATUS: Listed as a Category 2 (C2) species by the USFWS (US Fish and Wildlife Service 1993). Category 2 includes taxa for which there is current evidence of vulnerability, but for which USFWS lacks sufficient biological data or field survey information to support a listing proposal. Thelesperma caespitosum is also designated as a Special Status plant species by the Rock Springs District, BLM (Amidon 1994) and is listed as Sensitive by US Forest Service Region 4 (Intermountain Region) (Joslin 1994).
- b. HERITAGE RANK: Ranked G1 in The Nature Conservancy's Natural Heritage Network system. As a species, Thelesperma caespitosum is considered critically imperiled because of extreme rarity throughout its range.

2. STATE

- a. LEGAL STATUS: None.
- b. HERITAGE RANK: WYNDD ranks this species as S1, indicating that it is critically imperiled because of

extreme rarity in the state of Wyoming
(Fertig 1994).

C. DESCRIPTION

1. GENERAL NON-TECHNICAL DESCRIPTION: Thelesperma caespitosum is a tap-rooted perennial herb with glabrous flowering stems 1.5-7.5 inches high (4-19 cm) (figures 1-2). The mostly basal leaves are pinnately compound with 3-5 short, narrow leaflets. Leaves are glabrous except for the ciliate margins of the petiole. Flower heads occur singly or in pairs on each stem and contain only reddish-yellow disk flowers. The involucre consists of two distinct rows of bracts, with the inner bracts conspicuously larger than the reflexed outer ones. Individual flowers lack a pappus but are subtended by a membranous receptacle bract (Dorn 1990, 1992; Fertig et al. 1994, in ed.).

2. TECHNICAL DESCRIPTION: Perennial from a woody taproot and branched caudex that bears a dense layer of persistent old leaf bases. Stems 4-19 cm high, glabrous, naked or with a few reduced leaves or bracts which are generally opposite below and alternate above. Leaves mostly basal, 1-6 cm long, pinnately or ternately divided into mostly 3-5 linear-elliptic segments which are sometimes divided again, segments mostly 1-2 (4) mm wide and 3-12 (18) mm long (or some leaves occasionally simple), glabrous except for ciliate petiole margins and occasionally blade margins. Heads 1 or rarely 2. Involucre 6-11 mm high, inner bracts with broad scarious margins, nearly free to connate 1/3 of their length, outer bracts linear to lanceolate, ca 1/2 as long as inner. Ray flowers lacking. Disk corolla yellow, (4) 5.5-9 mm long, with reddish-brown veins, corolla lobes triangular and much shorter than the throat. Pappus lacking. Achenes glabrous, olive-brown, lance-linear and slightly curved, ridged on front and back faces and longitudinally striate, (4) 4.8-7 (7.5) mm long, each subtended by a longer membranous bract (adapted from Dorn 1990).

3. LOCAL FIELD CHARACTERS: Thelesperma caespitosum can be recognized by its single, rayless flower head per stem, two rows of unequal involucre bracts,

glabrous stems and leaf blades (except for ciliate hairs along the petiole), and the basal cluster of pinnately compound leaves divided into narrow segments.

Figure 1. Thelesperma caespitosum. Insets, clockwise from top:
flower head; disk flower with subtending bract; leaf.
Illustration by Isobel Nichols from Fertig et al. (1994, in
ed.).

Figure 2. Thelesperma caespitosum from the type locality on the east side of the Green River, about 2 miles southeast of the city of Green River in Sweetwater County, Wyoming. Plants occur in clusters on bleached whitish outcrops of shale of the Green River Formation. Adjacent clusters of stems are usually discrete plants, but may be joined below ground by rhizome-like branching caudices. Photo by W. Fertig.

4. SIMILAR SPECIES: Thelesperma pubescens differs in having leaf heads per stem, and a more northerly distribution. Hymenopappus species are also rayless with compound leaves, but can be distinguished by having multiple heads per stem and woolly-pubescent leaves. Rayless specimens of Erigeron compositus differ in having thin pappus bristles and involucre bracts in a single, uniform series (Dorn 1992).

In Utah, T. caespitosum may be confused with varieties of T. subnudum. Variety subnudum differs in having long, broad leaf segments, glabrous leaves, somewhat creeping rootstalks, and ray flowers (although rayless specimens are occasionally found). T. subnudum var. alpinum, an endemic of Wayne County, Utah, has shorter stems, smaller heads, and pubescent leaves and stems (Welsh et al. 1993).

D. GEOGRAPHICAL DISTRIBUTION

1. RANGE: Thelesperma caespitosum is a regional endemic, known only from southwestern Sweetwater County, Wyoming and southern Duchesne County, Utah. In Wyoming, the species is restricted to two small sites on escarpments above the Green River about 2 air miles southeast of the city of Green River (Figure 3). These two populations are only 1.7 air miles apart, but are separated by the Green River. The entire known range of the species in Wyoming falls within an area of approximately 2.5 square miles. The size of the Utah occurrence is not presently known.

2. EXTANT SITES: Prior to 1994, the only known extant population of Thelesperma caespitosum was from the type locality, on the east side of the Green River (Dorn 1990). Surveys in 1994 resulted in the discovery of additional satellite populations in the vicinity of the type location and the discovery of a new occurrence (consisting of six subpopulations) on the west side of the Green River. Exact locations of these populations are listed in Table 2. More detailed information is provided in the Element Occurrence Records and maps in Appendix A.

Table 1. Comparison table of selected characteristics
distinguishing Thelesperma caespitosum from related
species in Wyoming and Utah (from Dorn 1990).

Figure 3. Wyoming distribution of Thelesperma caespitosum.

3. HISTORICAL SITES: An historical collection by Ripley and Barneby (#8700, NY) is known from "white shale benches southwest of Duchesne" in Duchesne County, Utah (Dorn 1990). This occurrence has not been relocated and its current status is unknown (Ben Franklin, botanist, Utah Natural Heritage Program, personal communication). No historical populations are known in Wyoming.

4. UNVERIFIED/UNDOCUMENTED REPORTS: None known.

5. AREAS SURVEYED BUT SPECIES NOT LOCATED: Surveys in 1994 focused on outcrops of the Green River Formation and other whitish shales in southwestern Wyoming. Suitable, but unoccupied habitat was surveyed on foot along the length of White Mountain north and west of Rock Springs, the Wilkins Peak area east of Green River, and the Firehole Canyon and Sage Creek areas on the east side of Flaming Gorge. Survey routes are provided in Appendix B.

E. HABITAT

1. ASSOCIATED VEGETATION: Thelesperma caespitosum occurs in sparsely vegetated cushion plant communities with little or no cover of graminoids or shrubs (Figure 4). Vegetative cover averages 10-15%. T. caespitosum may be locally dominant or co-dominant within its specialized habitat.

2. FREQUENTLY ASSOCIATED SPECIES:

Arenaria hookeri (Hooker's sandwort)
Atriplex confertifolia (Shadscale)
Cryptantha caespitosa (Tufted cat's-eye)
Eriogonum brevicaulis (Shortstem wild-buckwheat)
Haplopappus armerioides (Thrift goldenweed)
Haplopappus nuttallii (Nuttall's goldenweed)
Hymenoxys acaulis (Stemless hymenoxys)
Leptodactylon caespitosum (Caespitose prickly gilia)
Lesquerella alpina var. condensata (Condensed bladderpod)
Linum lewisii (Wild blue flax)
Phacelia glandulosa (Shale phacelia)
Phlox muscoides (Moss phlox)
Stanleya viridiflora (Desert plume)

Table 2. Location information for known populations of Thelesperma caespitosum in southwestern Wyoming.

Occurrence # 001 (composed of 3 subpopulations)
County: Sweetwater
Legal Description: T17N R106W S6 (NE4 of NE4); T18N R106W S31 (SE4 of NE4)
Latitude: 41° 29' 24" N (centrum)
Longitude: 109° 24' 29" W (centrum)
Elevation: 6300-6330 ft (1920-1929 m)
USGS 7.5' Quad: Whalen Butte
Location: Ridge approximately 0.75 miles north of Cordwood Bottom on east side of the Green River, about 2 air miles southeast of the city of Green River.

Occurrence # 002 (composed of 6 subpopulations)
County: Sweetwater
Legal Description: T17N R106W S7 (center of SW4); T17N R107W S12 (S2 of NE4)
Latitude: 41° 27' 57" N (centrum)
Longitude: 109° 25' 27" W (centrum)
Elevation: 6440-6520 ft (1963-1987 m)
USGS 7.5' Quad: Whalen Butte
Location: Ridge on south side of Logan Draw and on east side of Tributary Draw, about 0.25 miles north of BLM road, about 1 mile southeast of Whalen Butte, on west side of the Green River, approximately 2 air miles southeast of the city of Green River. Also on ridge about 0.75 miles south of Logan Draw, approximately 2.5 miles southeast of city of Green River.

3. TOPOGRAPHY: Thelesperma caespitosum typically occurs on flat benches or ridgetops on the mid-slope of river bluffs. Occasionally, plants may also be found on upper, west-facing slopes (Figure 5). Known occurrences range in elevation from 6300-6520 ft (1920-1990 m).

4. SOIL RELATIONSHIPS: Wyoming occurrences of Thelesperma caespitosum are found on fine-textured, white shale and gravelly sandstone-ash outcrops of the Green River Formation. These bench-like outcrops may be part of the Wilkins Peak Member (Charmaine Refsdal, personal communication). Soils are generally thin, dry, and covered by a surface layer of bleached shale gravel. The Duchesne, Utah, occurrence is found on white shale benches of the Uinta Formation (Dorn 1990; Ben Franklin, personal communication).

5. REGIONAL CLIMATE: The habitat of Thelesperma caespitosum falls within Koppen's cold steppe with winter drought region (Ackerman 1941). Average annual precipitation in the Green River area is

7.71 in (196 mm), with peak levels in May. Mean annual temperature is 42.7° F (5.9° C), with mean maximum and minimum temperatures in January of 32.1° and 4.9° F (0° and - 15° C) and mean maximum and minimum temperatures in July of 86.9° and 49.4° F (30.5° and 9.7° C) (Martner 1986).

6. LOCAL MICROCLIMATE: The light color of soils and the sparse plant cover combine to make the local microclimate of Thelesperma caespitosum hotter and drier than regional climate data would indicate.

F. POPULATION BIOLOGY AND DEMOGRAPHY

1. PHENOLOGY: Flowering occurs from May to late June, probably depending on moisture conditions. In 1994, a drought year, flowering was nearly complete by June 20-28. Plants immediately adjacent to roadbeds tended to remain in flower later, perhaps due to additional moisture from runoff. Fruits mature in late June and July.

2. POPULATION SIZE AND CONDITION: There are currently two known within a very small area of specialized habitat. The entire state population occupies less than

17.5 acres of habitat within a 2.5

Figure 4. Habitat of Thelesperma caespitosum on the south side of Logan Draw (Occurrence # 002), about 2 miles southeast of the city of Green River. Plants occur on the whitish shale outcrops of the Green River Formation on the flats in the foreground and on the bare, northwest-facing slopes below the caprock in the background. T. caespitosum is absent from grass-dominated sites below the slope. WYNDD photograph by W. Fertig.

Figure 5. Topographic position of Thelesperma caespitosum on the landscape, based on the Logan Draw population (Occurrence #002, shown in Figure 4). Illustration by W. Fertig.

- A. Bleached shale gravel and flakes completely cover the surface. T. caespitosum present, but scattered. Occurs with Cryptantha caespitosa and Haplopappus nuttallii.
- B. North-west facing slope with low vegetative cover (15-20%). T. caespitosum present, but widely scattered. Soil dry, fine-textured, and covered by shale slabs and small rocks.
- C. Slopes of fine-textured gravel and dark brown rock flakes dominated by Artemisia tridentata var. wyomingensis, Chrysothamnus sp., and Atriplex confertifolia. No T. caespitosum present.
- D. Gentle slopes dominated by Artemisia tridentata var. wyomingensis and scattered Sarcobatus. Little gravel on surface. No T. caespitosum

present.

- E. Barren, flat bench with high cover of bleached shale rocks and slabs. T. caespitosum locally common, occurring with Eriogonum brevicaule, Phlox muscoides, and Lesquerella alpina var. condensata.
- F. Slopes of fine-textured soils with little surface gravel dominated by grasses and low shrubs. No T. caespitosum present.
- G. Scree slopes of whitish-grey flaky shale. No T. caespitosum present.

square miles area. Total population size is estimated at 22,000-28,000 individuals, based on surveys in 1994. The subpopulations just south of Logan Draw (Occurrence # 002) appear to be the most numerous and densely clustered in the state.

Demographic data collected in 1994 is summarized in Table 3 and in Appendix D.

3. REPRODUCTIVE BIOLOGY

a. TYPE OF REPRODUCTION: Thelesperma caespitosum is a perennial that reproduces sexually by seed. Individual plants may also spread by the formation of branches off of the main caudex. Exhumation of some plants by vehicles revealed extensive root systems with numerous caudex branches that resemble rhizomes. The linear distribution pattern observed at several sites also suggests that T. caespitosum may spread by rhizomes or rhizome-like roots. Related species in the T. subnudum complex are characterized by creeping rhizomes and may propagate asexually in this way (Dorn 1990).

b. POLLINATION BIOLOGY: The pollinator of Thelesperma caespitosum is unknown. Although the flowering heads lack showy ray flowers normally associated with insect pollination, their large size and upward orientation suggest adaptation to an animal pollinator rather than wind pollination.

c. SEED DISPERSAL AND BIOLOGY: The achenes of Thelesperma caespitosum lack a pappus or other specialized structures for dispersal by animals or the wind. It is likely that the fruits drop close to the parent plant, accounting for the clumped distribution pattern observed at known sites. Wind gusts may carry fruits short distances downwind of the parent plant.

G. POPULATION ECOLOGY

1. GENERAL SUMMARY: Thelesperma caespitosum occurs on barren, bl Although populations may be locally abundant, they are restricted to small patches of

Table 3. Demographic information for known populations of Thelesperma caespitosum in southwestern Wyoming.

Occurrence # 001 (east side of Green River, north of Cordwood Bottom)

Area: 5 acres.

Number and age of plants: 800-1000 plants were observed in flower and fruit during ground surveys in 1994. The total population of the occurrence is estimated at 2000-3000 plants based on demographic plot data and ocular estimates of suitable habitat.

Density: 3.83 plants per square meter were found in one demographic plot. Plants appeared to form linear bands, suggesting that individuals may be rhizomatous. The linear pattern may also reflect subsurface geological structures, such as faults or cracks, that may influence where seedlings can become established.

Presence of dispersed seed: No fruits were observed on the ground. 4.2 plants per square meter were observed in fruit at one demographic plot in 1994.

Evidence of reproduction: 1.5 plants per square meter were observed in flower at one demographic plot in 1994. In all, 50.4% of all plants observed in the plot were in flower or fruit (the remainder were vegetative).

Evidence of expansion/contraction: No baseline population trend data are available to determine if this population is stable, expanding, or contracting. This population has been known since 1988.

Occurrence # 002 (west side of Green River, south of Logan Draw)

Area: 12.5 acres.

Number and age of plants: 327 rosettes were observed in one sample plot of 90 square meters in 1994. Based on a sample density of 3.63 plants per square meter, the total population of the occurrence was estimated at 20,000-25,000 individuals divided among six subpopulations. Field observations resulted in a similar estimate.

Density: Plants exhibit a non-random clustered distribution pattern or appear in linear bands.

Presence of dispersed seed: Dispersed fruits were not observed on the ground.

Evidence of reproduction: Approximately 5% of all plants had flowering or fruiting heads. The percentage of flowering individuals approached 50% at one site bisected by a road. The low number of flowering individuals may be a result of drought conditions in 1994.

Evidence of expansion/contraction: No baseline data are

available to determine if the population is stable, expanding, or contracting.

suitable habitat. All known Wyoming occurrences are restricted to a thin band of the Green River Formation.

2. COMPETITION: Thelesperma caespitosum appears to be intolerant
3. HERBIVORY: Nine plants in the demographic plots (7.8%) were observed to show signs of herbivory. In most cases, herbivory was restricted to flowering and fruiting heads. Mature leaves were rarely grazed, probably due to their leathery texture. Grazing appeared to be restricted to insects, rodents, and possibly pronghorn antelope. No evidence of grazing by sheep or cattle was detected.
4. HYBRIDIZATION: The closest relative of Thelesperma caespitosum Range (Dorn 1989). Both species are reproductively isolated by geographic and ecological barriers. There are no field nor experimental data to suggest that these species hybridize in nature.

H. LAND OWNERSHIP

1. BLM: Thelesperma caespitosum is known or suspected to occur on the southwest quarter of Section 32 of Township 18 North, Range 106 West (Occurrence # 001). Resurvey of this area in 1994 failed to document plants or suitable habitat in this section, although occupied habitat was found immediately west of the section line on private and Forest Service lands. Five of the six known subpopulations in Occurrence # 002 are found on BLM lands on the south side of Logan Draw. The BLM sections in the area are part of the "checkerboard" of public and private lands paralleling the Union Pacific Railroad.
2. US FOREST SERVICE: A very small portion of Occurrence # 001 crosses onto Flaming Gorge National Monument, managed by Ashley National Forest.
3. PRIVATE: Almost all of Occurrence # 001 and one subpopulation of Occurrence # 002 are on private lands within the BLM checkerboard. Private lands in Occurrence # 001 are part of the FMC Picnic Grounds, a local recreation area for the city of Green River. Lands in Occurrence # 002 are owned by UP Resources, a subsidiary of the Union Pacific Railroad.

IV. ASSESSMENT AND MANAGEMENT RECOMMENDATIONS

- A. POTENTIAL THREATS TO CURRENTLY KNOWN POPULATIONS: The restricted activities are considered to be the main threats to the survival of this species:
1. RECREATION: Trampling by motorized vehicles, both on established and on established, is the largest threat to the largest colony in Occurrence # 001. Traffic on this latter road has increased since road repairs were completed in 1993 (Charmaine Refsdal, personal communication). No plants were observed in wheel ruts within the roadbed where the soil was compacted. Plants along the edge of the road were also observed to be dislodged by vehicle trampling. Road widening, resulting from vehicles driving on the edge of the road to avoid ruts, leads to further mortality of plants, and soil erosion and compaction. Smaller subpopulations protected from vehicle access by draws and steep slopes showed little or no evidence of trampling or habitat degradation. Other, non-motorized, forms of recreation are not likely to have an impact on this species.
 2. MINERAL DEVELOPMENT: Oil and gas exploration has occurred in the immediate area occupied by Thelesperma caespitosum in the past. A capped drill hole is present less than 0.25 miles from five subpopulations on BLM lands in Occurrence # 002. The flat benches inhabited by the plant are also well suited for placement of well pads and associated structures. The fragile soils and erodible slopes associated with populations of T. caespitosum are also vulnerable to damage from vehicles testing seismic lines.
- B. MANAGEMENT PRACTICES AND RESPONSE: No experimental data exist on the response of this species to management actions, such as prescribed burning or herbicide treatment. Observations in 1994 suggest that Thelesperma caespitosum is not impacted by cattle or sheep grazing, although it could potentially be affected by trampling. Observations of trampled and dislodged plants in and adjacent to roads suggest that motorized vehicles are a source of mortality, even on roads with low vehicle traffic. Nothing is known of the germination requirements of the species or its

response to transplanting.

C. CONSERVATION RECOMMENDATIONS

1. RECOMMENDATIONS REGARDING PRESENT OR ANTICIPATED

ACTIVITIES: New roads should not be constructed in areas of occupied or potential habitat of Thelesperma caespitosum. Existing roads should be maintained in good condition to prevent the formation of ruts and the inevitable "widening" of the roadbed by drivers trying to avoid the ruts. Off-road vehicle trails leading from established roads in T. caespitosum habitat should be closed by physical barriers and the establishment of new routes discouraged.

Well pads, roads, and other structures associated with oil and gas development should be located off-site of occupied T. caespitosum habitat. Additional exploration should be allowed only with No-Surface Occupancy stipulations.

2. NOTIFICATION OF BLM PERSONNEL OF LOCATIONS ON BLM

LANDS: To prevent inadvertent impacts to known populations, all appropriate BLM personnel involved in planning and on-the-ground land management activities should be provided with location data for Thelesperma caespitosum. It is especially important that agency minerals, engineering, and range staff know precise locations so that disturbances can be avoided.

3. AREAS RECOMMENDED FOR PROTECTION: Several

subpopulations of Thelesperma caespitosum on the south side of Logan Draw (Occurrence # 002) are the only populations reliably known to occur on BLM surface-managed lands in Wyoming. This area should be managed as an ACEC, following the management prescription for candidate plant species outlined in the draft Resource Management Plan for the Green River Resource Area (USDI Bureau of Land Management 1992, p. 185). The BLM should also consider consolidating public ownership of occupied and potential habitat of T. caespitosum within the BLM checkerboard through land exchange with adjacent private landowners.

D. STATUS RECOMMENDATIONS: Thelesperma caespitosum should continue to be listed as a C2 candidate by USFWS

and as a Special Status plant species by the Rock Springs BLM. Although 1994 surveys resulted in the discovery of large numbers of plants, the species is still known from a very small area that could be easily degraded. In addition, the lack of population trend data makes it impossible to determine if the species is increasing, decreasing, or stable at this time. A follow-up survey of known sites and investigation of additional potential habitat in the vicinity should be conducted in the next 1-3 years to determine population trends. Ideally, such surveys should be done in non-drought years. Surveys of suitable habitat in northeastern Utah should also be conducted. Once follow-up studies are done, the status of the species should be reevaluated. If the population is stable or increasing and lacks serious threats, it can be considered for downlisting to Category 3C. If populations are in decline or threats increase, T. caespitosum should be proposed for listing as Threatened.

The BLM Wyoming State Office should list Thelesperma caespitosum as a state Sensitive species and develop appropriate management strategies to ensure that actions by agency personnel do not contribute to the further endangerment of the species and the subsequent need for listing under the Endangered Species Act.

E. SUMMARY: Thelesperma caespitosum is a recently described species restricted to Sweetwater County, Wyoming and Duchesne County, Utah. Although some disagreement exists over the classification of the species, field and herbarium studies support its taxonomic distinctiveness. T. caespitosum is currently listed as a C2 candidate by USFWS and is managed as a Special Status plant species by the BLM Rock Springs District and as a Sensitive species by Ashley National Forest (Flaming Gorge National Recreation Area). Prior to 1994, it was known only from the type locality, south of Green River, Wyoming, and an historical record southwest of Duchesne, Utah. Surveys in 1994 resulted in the discovery of one new population on BLM and private lands south of Green River. T. caespitosum was found to be locally common, but restricted to small pockets of suitable habitat. In Wyoming, the species is known only from benches and upper slopes of barren, bleached shale soils derived from the Green River Formation, while in Utah it occurs on outcrops of the Uinta Formation. T. caespitosum was found to be highly

threatened by trampling, soil compaction, and soil erosion resulting from road construction and use of off-road vehicles in its narrow habitat. None of the Wyoming occurrences are currently within existing or proposed special management areas. Follow-up surveys and censuses are recommended to determine population trends of the species. Until such studies are completed, it is recommended that the species remain a C2 candidate and be officially designated as a Sensitive species by the BLM Wyoming State Office.

V. LITERATURE CITED

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Appendix A.
Element Occurrence Records
and
Population Maps
for Thelesperma caespitosum

Appendix B.
1994 Survey Routes

Appendix C.
Special Plant Survey Form
WYNDD

Appendix D.
Monitoring Data, 1994

Thelesperma caespitosum (Green River greenthread)

Demographic Monitoring Data

Date: 20 June 1994 Surveyor: Walter Fertig

Transect Location:

County: Sweetwater

Occurrence: 001 (east side of Green River)

Legal Description: T18N R106W S31 SE4 of SE4

Orientation: 250° magnetic North

Latitude: 41° 29.3536 N

Longitude: 109° 24.5135 W

USGS Quad: Whalen Butte

Directions: From the city of Green River, proceed to the FMC Picnic Grounds. Cross the bridge over the Green River and continue on the main dirt road for about 2.5 miles to the boundary marker of Flaming Gorge National Monument (Ashley National Forest). The demographic plot is located on the west side of the road near the rim of a wide, flat bench.

Sampling Method: A 30 x 1 meter belt transect was established with starting points indicated by orange re-bar and a low rock pile. The meter tape formed the baseline and meter sticks framed each 1 x 1 meter subdivision. 30 contiguous plots were read following the left side of the tape, beginning from the origin (at the northeast end of the belt) and continuing southwest. Locations of individual rosettes were mapped and given X, Y coordinates. The number of rosettes per plant was recorded on the map. One of three age classes was assigned to each plant: R (reproductive, in flower or bud), F (fruiting), and V (vegetative). The number of flowering and fruiting heads present and the estimated percent vegetative cover per plot was also recorded.

Habitat: Barren cushion plant community on flat bench of fine-textured soil covered by bleached whitish flakes and gravel of shale. Associated species include: Cryptantha caespitosa, Eriogonum brevicaulis, Atriplex confertifolia, Arenaria hookeri, Haplopappus nuttallii, Chaenactis douglasii, Lesquerella alpina var. condensata, and Linum lewisii.

Summary of Results: Since monitoring was only initiated in 1994, no information on population trends is available at this time. The accompanying data sheets summarize baseline data collected this year. Because of drought conditions in 1994,

production may have been adversely affected.

Discussion and Recommendations: Follow-up monitoring should be conducted at this site every 1-3 years. Monitoring yearly would provide valuable data on reproductive success, seedling establishment, and longevity of individual plants.

Periodic monitoring (every 2-3 years) would provide population trend data for this site only, but could provide inferences to overall trends of the species. Additional monitoring sites should be located in the future to create a larger data set and more accurately indicate population size and trends.

Figure 6. Location of monitoring plot.

Thelesperma caespitosum
Transect # 001

Date: 20 June 1994
Surveyor: Walter Fertig

Subdiv #	Total #	#R	#F	#V	# Fl heads	#Fr heads	% cover	Notes
1	8	2	3	3	3	4	50	
Unusually high cover								
2	5	3	1	1	5	1	10	
3	7	0	1	6	0	1	10	
4	5	1	1	3	1	1	10	
5	5	0	1	4	0	1	5	<u>I.</u>
<u>caespitosum</u> only plant present								
6	8	2	1	5	2	3	15	
7	4	0	1	3	0	5	15	
8	4	0	1	3	0	3	10	
9	6	0	1	5	0	3	25	2
plants heavily grazed								
10	3	1	1	1	5	2	15	
11	1	0	0	1	0	0	20	
12	3	0	3	0	0	6	10	
13	4	0	3	1	0	11	25	
14	8	1	5	2	1	14	30	Floral
herbivory observed								
15	2	2	0	0	6	12	15	Floral
herbivory observed								
16	2	1	1	0	1	2	5	Floral
herbivory observed								
17	2	0	0	2	0	0	10	
18	4	2	0	2	8	8	5	
19	0	0	0	0	0	0	2	
20	5	1	2	2	2	7	30	
21	7	1	1	5	3	5	25	
22	4	0	3	1	0	7	15	
23	4	0	3	1	0	14	45	All
fruit aborted.								
24	1	0	0	1	0	0	10	
25	1	1	0	0	1	10	5	
26	1	1	0	0	2	2	3	
27	0	0	0	0	0	0	0	Plot
completely barren								
28	1	1	0	0	2	0	18	Flowers

all aborted									
29	3	1	1	1	1	1	20		
30	7	2	1	4	2	3	25	One	
flower aborted									
Total	115	23	35	57	45	126			

Number of plants per square meter: 3.83

Number of flowering stems per square meter: 1.5

Number of fruiting stems per square meter: 4.2

% of plants in flower and fruit: 50.4%

Codes: R = Reproductive (plants with mature flowers or buds), F = Fruiting (plants with heads bearing mature or ripening fruit), V = Vegetative (plants or stems lacking flowers, buds, or fruits), Fl = Flowering, Fr = Fruiting.

Thelesperma caespitosum
Transect # 001

X, Y coordinates, growth form class, and number of flowering and fruiting heads or rosettes for each plant per plot.

Date: 20 June 1994

Surveyor: Walter Fertig

Plot 1: (1.0, 1.5) V-7; (1.5, 0.7) R-2/V-1; (1.5, 2.3) R-1/V-3; (3, 3.8) F-1/V-25; (4.2, 6.1) F-2/V-38;
(6.0, 1.5) F-1/V-7; (9.7, 1.9) V-1; (9.9, 4.3) V-2.

Plot 2: (1.0, 1.7) R-2/V-16; (1.8, 3.7) V-1; (2.5, 2.3) F-1/V-4; (2.5, 7.8) R-2;
(6.6, 5.0) R-1/V-41.

Plot 3: (2.0, 8.4) F-1/V-28; (2.7, 0.9) V-10; (2.8, 9.6) V-18; (4.2, 6.6) V-15;
(5.8, 9.1) V-6;
(7.5, 9.0) V-8; (8.8, 4.5) V-14.

Plot 4: (3.2, 8.1) V-14; (4.2, 2.5) V-4; (5.1, 5.8) F-1/V-17; (6.3, 8.6) R-1/V-26;
(8.1, 2.3) V-19.

Plot 5: (4.6, 7.1) V-43; (6.1, 0.1) V-6; (8.1, 0.9) F-1/V-17; (8.3, 9.1) V-5;
(8.8, 3.3) V-1.

Plot 6: (1.5, 7.6) R-1/F-2/V-12; (4.9, 6.6) V-26; (6.7, 4.8) V-13; (7.5, 2) V-14;
(8, 8.1) V-37;
(8.7, 3.3) V-8; (9.6, 0.5) R-1/V-10; (9.6, 1.8) F-1/V-10.

Plot 7: (3.2, 3.0) F-5/V-45; (3.3, 4.5) V-22; (3.8, 9.1) V-21; (7.5, 6.8) V-10.

Plot 8: (3.0, 4.3) V-14; (3.3, 7.6) V-26; (6.0, 2.8) V-21; (7.0, 0.7) F-3/V-17.

Plot 9: (1.9, 7.8) V-20; (4.2, 4.3) V-30; (4.6, 0.2) V-2; (7.3, 1.0) F-3/V-3;
(7.3, 3.5) V-33;
(9.9, 3.5) V-22.

Plot 10: (2.0, 5.8) R-5/F-1/V-31; (3.3, 7.6) V-3; (9.3, 9.9) F-1/V-7.

Plot 11: (4.5, 6.3) V-58.

Plot 12: (1.5, 1.8) F-1/V-28; (3.3, 1.8) F-1/V-21; (5.5, 7.3) F-4/V-21.

Plot 13: (4.5, 2.8) F-3/V-36; (6.5, 4.3) F-2; (8.1, 6.1) V-14; (8.3, 5.1) F-6/V-19.

Plot 14: (0.1, 3.3) F-1/V-29; (0.1, 9.7) F-2/V-21; (1.5, 0.7) F-8/V-7; (2.3, 1.8) F-1/V-25;

(3.0, 1.0) V-12; (3.4, 2.4) V-7; (5.0, 3.5) R-1/V-20; (7.5, 6.3) F-2/V-21.

Plot 15: (8.2, 2.0) R-3/V-42; (8.5, 5.0) R-3/F-11/V-12.

Plot 16: (3.7, 1.0) F-2/V-40; (7.0, 9.9) R-1, V-11.

Plot 17: (4.2, 5.3) V-24; (7.1, 2.8) V-23.

Plot 18: (1.0, 0.5) V-17; (3.4, 8.1) R-1/V-20; (7.5, 9.1) V-1; (9.9, 1.2) R-7/F-8/V-17.

Plot 19: None.

Plot 20: (2.0, 4.5) F-1/V-17; (2.7, 3.5) F-3/V-6; (4.5, 4.5) V-5; (7.4, 3.3) R-2/F-3/V-14; (9.5, 2.5) V-5.

Plot 21: (1.0, 6.3) V-21; (1.5, 9.1) F-4/V-24; (1.9, 3.0) V-5; (4.4, 0.6) V-3;
(5.2, 1.0) V-4;
(6.5, 2.0) R-3/F-1/V-35; (8.4, 2.6) V-7.

Plot 22: (5.0, 2.0) F-1/V-6; (8.3, 5.3) V-50; (9.0, 8.9) F-1/V-13; (9.5, 5.8) F-5/V-27.

Plot 23: (1.2, 6.6) F-2/V-3; (2.4, 7.6) V-24; (5.5, 9.1) F-7/V-20; (5.8, 6.3) F-5/V-40.

Plot 24: (9.5, 7.3) V-7.

Plot 25: (9.9, 0.7) R-1/F-10/V-20.

Plot 26: (8.4, 1.5) R-2/F-2/V-22.

Plot 27: None.

Plot 28: (9.3, 5.3) R-2/V-18.

Plot 29: (4.3, 0.2) F-1/V-6; (5.0, 8.1) R-1/V-26; (8.5, 6.1) V-16.

Plot 30: (0.5, 5.1) F-1/V-13; (0.7, 7.7) R-1/V-4; (1.5, 3.9) V-12; (3.0, 4.0) V-23;
(4.0, 2.0) V-13;
(6.5, 3.8) V-13; (7.3, 2.0) R-1/F-2/V-25.

Appendix E.

Slides