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INVENTORY OF THREATENED AND ENDANGERED PLANTS

LOCATED IN THE BIG DESERT

for

BUREAU OF LAND MANAGEMENT
IDAHO FALLS DISTRICT, IDAHO

July 1980

RALSTON & ASSOCIATES

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Bureau of Land Management
Idaho Falls District, Idaho

Contract No.: ID-910-CT9-0014

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By

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- have pictures available
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on req. being met

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Redfoot ... in '81

have pictures available
there pictures for Steele

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SUMMARY

During the 1979-1980 field season, Ralston & Associates surveyed a portion of the Big Desert Planning Unit for rare vascular plant taxa. No plant species were found that are currently Federally listed for protection. However, the following species of interest were found growing within the area:

Cryptantha sobolifera Payson - once Federally listed, but not recommended for relisting.

Oxytheca dendroidea Nutt. - presently on the Idaho Watch List.

Gymnosteris nudicaulis (H. & A.) Greene - sensitive species, not currently listed.

Ranunculus andersonii Gray - sensitive species, not currently listed.

INTRODUCTION

Congress has declared a basic public policy to protect environmental values by creating the Federal Land Management Policy Act (FLMPA) 1976. Title 1, § 102, sets forth the following policy statement for the management of public lands:

- 2) The national interest will be best realized if public lands and their resources are periodically and systematically inventoried.
- 8) The public land be managed in such a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archeological values.

The amended Endangered Species Act of 1973 requires the recognition and establishment of protection practices for Threatened and Endangered plants. Data on the presence and extent of Threatened and Endangered plants enables the Bureau of Land Management to prepare environmental impact statements in compliance with the National Environmental Policy Act (NEPA). This specialized inventory contains a review of sensitive plant species in the Big Desert Planning Unit which will provide guidance for Bureau of Land Management staff in formulating land use policies and management decisions needed in future environmental statements.

In accordance with FLMPA policy, the Bureau of Land Management is required to manage public land in a manner that will protect the quality of ecological and environmental values. Further direction for management practices is provided in Title II, § 202(c) (3), which gives priority to the designation and protection of areas of critical environmental concern. According to the authors of the Boise District Bureau of Land Management Environmental Statement on Agricultural Development, 1979, it is "Bureau of Land Management policy to ensure that critical habitats of sensitive species will be managed or conserved to minimize the need for listing rare species with Federal and State governments in the future."

Our inventory of Big Desert flora focused on those species which were proposed for Threatened or Endangered status in the Vascular Plant Species of Concern in Idaho (hereafter referred to as the State List), those known as sensitive to the authors, and those plants subject to review for possible listing by the Fish and Wildlife Service. As of the

publication of this report, the U.S. Fish and Wildlife Service has withdrawn the 3,187 vascular plant taxa considered by the Smithsonian Institution as endangered, threatened, or extinct. The Service continues to collect data on 3,131 plants that remain subject to review for future listing. The Fish and Wildlife Service directs that these plant taxa should be considered in environmental planning. A review of this situation is given in the Endangered Species Technical Bulletin, 5 (1), Department of the Interior, U.S. Fish and Wildlife Service, Endangered Species Program, Washington, D.C. 20240.

The Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Coordinating Committee (hereafter referred to as the Technical Committee) has completed its annual review, but has not published the Species of Concern in Idaho report for 1980. The authors have consulted with both the U.S. Fish and Wildlife Service Regional Botanist and with the Chairman of the Technical Committee regarding the legal status of the sensitive species in Idaho which are discussed in this report.

Our systematic inventory of Big Desert assists the Idaho Falls District of the Bureau of Land Management in carrying out its mission to protect environmental values while managing public land.

METHODS

Literature searches for records of plant collections were conducted prior to and during the field inventory. Several major state and intermountain herbaria were visited to determine historical collection data for this area. In addition, the New York Botanical Garden provided collection data on several species of special concern. The combination of literature search, herbarium search, and field surveys provided a comprehensive approach to the study of sensitive species in the Big Desert.

It became apparent early in the field survey that much of the Big Desert had been extensively altered by range management practices. There was little constancy of the vegetation in the region and few habitats where vegetation remained unaltered. This decreased the likelihood of finding any sensitive plant species in the Big Desert.

The field crews familiarized themselves with the study area, using the maps provided by the Bureau of Land Management, and the aerial photographs located at the Bureau of Land Management field station in Atomic City. Initial reconnaissance was conducted to become better acquainted with the flora of the region, and to identify potential habitats for threatened and endangered plants. During reconnaissance, it was possible to identify areas, which because of topography or edaphic (soil) conditions, were most likely to support rare plant species. These areas were monitored closely throughout the 1979 and 1980 field seasons.

During the months of June, July, and August of 1979, and April, May, and June of 1980, field crews inventoried the flora of the Big Desert. The 1979 field season was relatively dry, while the early spring of 1980 was dry, followed by a late, wet spring. The field crews, composed of experienced plant taxonomists and photographers, visited the study area at least once in each of these months. On several occasions, there were three field crews working simultaneously in the Big Desert.

DISCUSSION

General Overview

The Big Desert flora has been substantially impacted by overgrazing and past range improvement programs. Most sensitive species of plants cannot tolerate disturbances. Therefore, threatened and endangered plants were not expected to occur in these areas. The areas generally between Big Southern Butte and American Falls and west of Big Southern Butte show the greatest impact of overgrazing. Where perennial grasses remain, they are pedestalled and native perennial and annual forbs are scarce. Plant species diversity is poor and introduced weeds are common. Most of the groundcover between the shrubs has been trampled and by mid-summer, the soil becomes powdery and is easily wind-borne.

Portions of the northern part of the study area have been treated to remove shrubs and then planted to crested wheat grass. Species intolerant to disturbance, such as Oxytheca dendroidea, Gymnosteris nudicaulis, and Ranunculus andersonii, were absent. The occurrence of these species in untreated areas nearby indicates that they may have occurred previously in the treated areas. The treated areas have a much lower species diversity than the less disturbed areas. Lowered species diversity, with its consequent lowered gene pool diversity, makes it difficult for ecosystems to maintain plasticity and the ability to rebound from disasters and other adverse effects. Elimination of native species and lowering of species diversity facilitates invasion of difficult-to-control introduced weeds.

Native plants are more likely to have a resistance to pests as a result of having evolved with the pests. Insect pests, such as grasshoppers, appear to be more abundant in weedy areas having low species diversity. The large biomass of weedy plants provide the grasshopper with an excellent food supply, free from competition with invertebrates dependent on native plants. This may result from the disappearance of native insects and predatory birds which were a part of the ecosystem prior to range improvement.

Artificial land treatments have generally had an adverse impact on the Big Desert ecosystem. Such treatments in the future would jeopardize

the continued existence of the more sensitive plant species in the area. Natural fires, and perhaps carefully controlled burning, are probably better options than spraying, brush plowing, brush chaining, and planting of introduced perennial grasses, when considering long term range management.

There are a few areas in the Big Desert where relatively natural vegetation exists. Pristine natural vegetation has an abundance of native annual and perennial forbs, a diversity of grasses, and few, if any, introduced species. Three areas within the Big Desert have had minimal disturbance and their relatively natural flora has been maintained. Sensitive plants are most likely to occur in these areas, and they were studied closely. These areas are:

Blizzard Basin

(T 2 N, R 23 E, S 13 and R 24 E, S $\frac{1}{2}$ S 7, S 8, S 17, S 18)

This area has a montane to subalpine flora with a diversity of habitats, from alpine ridgetops to protected slopes, exposed slopes, and valley bottoms. There was evidence of grazing damage in this area and cattle were present during our visits in the summer of 1979. The stream banks of Lava Creek have been trampled by cattle and the very narrow riparian habitat, typical of small, montane streams, has been impacted. However, the meadow in Blizzard Basin shows little or none of the effects which commonly occur in heavily grazed meadows. Native grasses and sedges are common, as are native annual and perennial forbs. The soil is not heavily compacted and pedestalling of bunch grasses is not common. The ridges and valleys in the drainages from Blizzard Mountain to Black Cap also have a relatively undisturbed montane to subalpine flora. The diversity of native forbs in this area indicates a flora in good to excellent condition. This species diversity should be monitored, since several of these plants may be sensitive to grazing pressure. If grazing pressure increases, species diversity may decrease.

Big Southern Butte to Cedar Butte

(T 1 N, R 30 E, S 14 through S 33)

This area consists of sagebrush grasslands and junipers on the slopes

of Cedar Butte. There are some volcanic habitats, and some soils under the juniper stands on Cedar Butte support little other vegetation. This area shows little damage from grazing. There are areas which have been planted to crested wheat grass on the east side of Cedar Butte. It is also bordered on the north by a large planting of crested wheat grass. The soil in this area is sandy and appears to be fragile. There is little or no pedestalling of bunch grasses south of the crested wheat grass planting, and annual and perennial forbs are common.

One particular species of interest, Gymnosteris nudicaulis, occurs in this area. Although it is not currently on any State or Federal list, it is being reconsidered for inclusion on the State list. This species is perhaps southern Idaho's most sensitive indicator species. It will not tolerate grazing disturbance, nor will it tolerate disturbance from man. Its presence in this area indicates a healthy ecosystem.

Twin Buttes Area

(T 2 N, R 32 E, W $\frac{1}{2}$ R 33 E, and T 1 N, NE $\frac{1}{4}$ R 32)

This area is a sagebrush grassland with some juniper woodlands. The juniper habitat in this area, however, is on the flats, as opposed to those in the vicinity of Cedar Butte, which occur on the hillsides. These juniper habitats are quite different from those of Cedar Butte. The soil types are also different in this area. The area between the Twin Buttes is a healthy sagebrush steppe, with some brushlands and juniper occurring on the sides of the buttes. There is little indication of overgrazing or range abuse. Species diversity in this area appears to be naturally low as far as forbs are concerned, but there is a relatively large number of native grasses. This low species diversity indicates a habitat which is naturally more sensitive to disturbance. The areas between sagebrush plants are barren; the forbs and grasses generally grow under the sage. These barren areas would probably be seriously eroded if heavily used by cattle. The juniper woodlands south-southeast of East Butte are in excellent condition. The woodlands are interrupted by areas of rock outcrops or rocky drainages. The woodlands and these rocky areas support different floras with differing plant compositions. Both have high species diversity and native perennial and annual forbs

are common. This repeating pattern of juniper woodland - rocky drainages creates a diverse ecosystem. Ranunculus andersonii occurs in this area. This plant is one of the first to bloom in early spring.

Other Areas Adjacent to the Big Desert Study Area

Although not included in the study area, there are two locations surrounded by, or adjacent to the study area which were reviewed. A search for collection records of rare plants at the New York Botanical Garden Herbarium revealed a collection of Phacelia inconspicua from Big Southern Butte. Although Big Southern Butte was specifically excluded from this contract, we surveyed the recorded location in order to see if this very rare plant was still present, and to determine its habitat as a reference regarding the study area.

Another location adjacent to the study area was reviewed when it was noted to be an area of unstable sand. This is a preferred habitat of several species. It was seen from the rest stop located on State Highway 20-26, where the Big Lost River crosses nearby. Two species of interest, Oxytheca dendroidea and Gymnosteris nudicaulis, were found there. the Oxytheca was collected at this location rather than where it was found within the study area, since this was a much healthier population.

Plant Species of Special Interest

We found no species that are currently Federally listed. One was found that had been listed but is not recommended for relisting by the Technical Committee. Several sensitive species now on the State List (or may be listed in the future) were found. The reports on these species have been organized into the following categories:

1. Species found or reported in adjacent areas, or likely to be found in the area. These will be proposed for Federal status by the Technical Committee and they include:

Antennaria arcuata Cronquist

Astragalus ceramicus Shel. var. apus Barneby

Astragalus oniciformis Barneby
Halimolobos perplexa (Hend.) Pollins
Phacelia inconspicua Greene
Primula cusickiana Gray

2. Species previously proposed for Federal status, but now recommended for deletion by the Technical Committee. This includes:
Cryptantha sobolifera Payson
3. Species on the State Watch List. This includes:
Oxytheca dendroidea Nutt.
4. Miscellaneous species of interest:
Gymnosteris nudicaulis (H. & A.) Greene
Ranunculus andersonii Gray

A discussion of each of these species, their status, and locations of occurrence is contained in the following section.

PLANT SPECIES REPORTS

SPECIES FOUND OR REPORTED IN ADJACENT AREAS OR LIKELY TO BE FOUND IN THE AREA PROPOSED FOR FEDERAL STATUS

The following report on Phacelia inconspicua Greene is included, although it was not found in the part of the Big Desert included in the contract with Ralston & Associates. The site is surrounded by the study area and a collection was made. The report is organized in the format used for the Fish and Wildlife Service Status Reports on rare plants.

Phacelia inconspicua

I. NOMENCLATURE

A. Family

1. Scientific name: Hydrophyllaceae
2. Synonym: None
3. Common name: Waterleaf family

B. Species

1. Scientific binomial: Phacelia inconspicua Greene
2. Synonym: None
3. Common name: None

II. TAXONOMIC PROBLEMS

None. This has just been revised for the intermountain area by Cronquist (Vol. 4, Intermountain Flora, manuscript).

III. STATUS

- A. Federal: None
- B. State: None
- C. Other: Recommended that it be proposed for Endangered Federal Status by the Rare and Endangered Plants Technical Committee, Idaho Natural Areas Coordinating Committee (in press).

IV. DESCRIPTION

Field characters: A small annual, entire-leaved Phacelia. Flowers small and inconspicuous, pale lavender-blue. Not at all glandular.

V. GEOGRAPHICAL DISTRIBUTION

- A. Past: Not known. It may have been continuous between the two known sites, or, less probably, one population may represent long distance dispersal, which is not unknown in this genus.
- B. Present: Known from only two sites, Star Peak in the West Humboldt Mountains, Pershing County, Nevada, and Big Southern Butte, Butte County, Idaho.
- C. Potential: The habitat for this species on Big Southern Butte did not appear to be exceptional, although in the Big Desert region, there are few comparable sites. The plant might appear on any similar moist site in the study area if similar sites could be found. Habitat is probably suitable in the Blizzard Mountain

area. East Butte is also a likely site, but although it was searched for several different times, this plant was not seen. The plant is highly inconspicuous and grows among rocks and other vegetation. It is most difficult to see and could be missed all too easily.

VI. HABITAT DESCRIPTION

- A. Community structure or type: The area is an open slope with loose tumbled rocks, dominated by Artemisia tridentata and Chrysothamnus viscidiflorus. The spaces between shrubs were filled with annual weedy grasses.
- B. Associated species: Artemisia tridentata, Chrysothamnus viscidiflorus, and Phacelia hastata.
- C. Elevational range: 5500 to 6800 feet.
- D. Exposure and slope: Both sites are on the north or northwest side of a butte or small range.
- E. Edaphic features: Tumbled rocks of volcanic origin, interstices filled in with soil and decompositional debris. The site may have been impacted by "road" building some years ago.
- F. Other unusual habitat features: Isolation from similar sites.

VII. POPULATION BIOLOGY

- A. Number of known populations: Two populations are known.
- B. Estimated number of individuals per population: Several hundred individuals were present on Big Southern Butte. The area occupied by the population was not large. Nevada population size is unknown.
- C. Type of reproduction: seeds are the only apparent means of reproduction.
- D. Age classes: Short-lived annuals.
- E. Flowering and fruiting period: Mid-June to mid-July. The active season in any one year is probably very short and terminated by drought. Flowering and fruiting occur more or less at the same time.
- F. Dispersal mechanism: No obvious mechanism.
- G. Pollinators: No information. Self-pollination is a possibility.
- H. Other biological factors: None apparent.
- I. Current population dynamics, trends, and status: The Big

Southern Butte population was collected in 1967 and again in 1980. It appears to be stable. The species was found in the West Humboldt Mountains in 1894 and again in 1978. This may or may not be the same population.

VIII. RECOMMENDED CRITICAL HABITAT

The canyon surrounding Webb Spring on Big Southern Butte should be designated critical habitat. No recommendation on critical habitat in Nevada.

IX. THREATS TO SURVIVAL

A. Existing threats to survival:

1. Present or threatened destruction, modification, or curtailment of habitat or range: The Big Southern Butte population is by a bulldozed strip that may be a spur road; its utility is not obvious. Free use of earth moving equipment in this area should be discouraged.
2. Overutilization for commercial, sporting, or education purposes: None.
3. Disease, predation, or grazing: Grazing was occurring in the area, but most of the impact was confined to the area around a nearby watering trough. Cattle seem to avoid the steeper rocky slope in spite of the abundant grass. In drought years when feed is scarce, this might not be true.
4. Inadequacy of existing regulatory mechanisms: No regulatory mechanisms known.
5. Other natural or man-made factors affecting its continued existence: None observed.

B. Potential threats in the foreseeable future: The population is located between a watering trough and Webb Spring. It should be considered before any further development is done.

X. LAND MANAGEMENT OR OWNERSHIP

Bureau of Land Management in Idaho, unknown in Nevada.

XI. MANAGEMENT IMPLICATIONS

No information. The response of this species to disturbance is not known. In dry years the impact of grazing should probably be minimized.

XII. POTENTIAL VALUE

This species is small and inconspicuous and has no known uses. It may play a part in community interrelationships but, if so, its importance is not likely to be great. If the reasons for, and the means behind its disjunct distribution were known and understood, its value in understanding the relationships of the desert flora could be analyzed.

XIII. REFERENCES

Cronquist, A. Vol. 4, Intermountain Flora, Hydrophyllaceae manuscript.

XIV. COLLECTIONS

Idaho:

Atwood, N.D. 969. 13 VI 1967, and 1071. 1 VII 1967. BUTTE COUNTY, IDAHO: at Webb Springs on the north side of Big Butte; sandy soil; elev. 5600-6000 ft; associated with Artemisia, choke cherry, Arabis, Lupinus, Penstemon, Lithospermum and Astragalus. NY

Grimes, Packard, Smithman and Smithman 1627. 10 VI 1980. BUTTE COUNTY, IDAHO: in rocky areas around Webb Spring, Big Southern Butte; sandy soil around an old road, in debris which was graded off. Growing among sagebrush and rabbitbrush. T 1 N, R 29 E, S 4, NWSE. Elev. c. 5700 ft. CIC

Nevada:

E.L. Greene s.n. 18 VII 1894 (TYPE). PERSHING COUNTY, NEVADA: West Humboldt Range. NY

Tiehm & Williams 4345. 11 VI 1978. PERSHING COUNTY, NEVADA: north end of the Humboldt Range, 5.8 air miles SSW of Imlay, NW of Star Peak, plants very local on a tall sagebrush slope, growing with Hydrophyllum occidentale and Holodiscus. Elev. c. 6800 ft. T 31 N, R 34 E, S 7. NY

The following species are currently proposed for Federal Threatened or Endangered status by the Technical Committee (in press). They have been collected or reported in areas adjacent to the study area but were not found in the study area during the 1979 - 1980 field seasons. Most of these species probably do not occur in the study area. Favorable habitat may be lacking or some other environmental factor may exclude them. However, the apparent absence during one or two seasons of field work is not entirely significant. Many desert perennials remain dormant during some seasons and only reappear during exceptionally favorable years. The study area should be monitored for the presence of these species for several seasons.

The decision to give these plants Federal protection must be based on as accurate an estimation as possible of range and abundance, so it is important that all possible populations of these plants be detected and reported.

Antennaria arcuata Cronquist

Antennaria arcuata is found only in three localities, one in Wyoming, one in northern Nevada, and one adjacent to Craters of the Moon National Monument, close to the study area. The habitat is wet meadows with hummocks, a habitat that would be expected in the western part of the study area, but was not encountered. The known Idaho site is small. Since it occurs in localized areas, there is a remote possibility that a very small population might have escaped notice. This species should be watched for during several seasons. Endangered status and Federal protection is currently being proposed by the Technical Committee.

Astragalus ceramicus Sheld. var. apus Barneby

Suitable habitat in the study area was searched repeatedly for this plant but it was not found during the 1979-1980 field seasons. It occurs from the base of the Lemhi Range (Henderson, oral communication) in Butte County, east to Madison and northwestern Bonneville Counties, but is apparently highly discontinuous within this range. The habitat is apparently the brown sands "near the sinks of the Lost River" (Barneby 1964). This habitat is encountered within the study area and

the range surrounds the study area on several sides. This plant may be found in the study area in a favorable year. Threatened status and Federal protection is currently being proposed by the Technical Committee.

Astragalus oniciformis Barneby

The habitat for this species, "sandy flats and hollows among boulders, sometimes with sagebrush, on basalt, 4750 - 4900 feet" (Barneby 1964) extends into the study area and one of the few existing collections was made three miles west of Carey (Davis, # 3088, IDS). Botanists operating in the area should be alerted to the possibility of finding Astragalus oniciformis in the area. No collections later than 1947 are known, and it has not been relocated in the Picabo-Carey area. It is possibly extinct. The probability of this being found in the study area is remote, but this wispy, difficult-to-see Astragalus should be watched for in sandy areas at the base of the hills in the western-most part of the study area for several years before its presence is ruled out. Endangered status and Federal protection is currently being proposed by the Technical Committee if this plant is still extant.

Halimolobos perplexa (Hend.) Rollins

A sheet identified as this species has been reviewed at the Idaho State University herbarium. The label information is as follows:

Atwood, AEC 31. 20 VI 1950. BUTTE COUNTY, IDAHO: half way up the slope of Big Butte. Dry. IDS

It was not identified as to variety, but the site is closest to the range of variety lemhiensis. This specimen was immature and the identification could not be confirmed. Big Southern Butte is out of the assumed range of this taxon. Halimolobos perplexa was not found in the study area, nor was what is assumed to be suitable habitat found. This species is proposed for threatened status and Federal protection by the Technical Committee.

Primula cusickiana Gray

A collection of Primula cusickiana has been reported from the Craters

of the Moon area. This collection has not been seen to confirm the report, but if accurate, then there is a possibility of it occurring in the study area. It often grows with or adjacent to Ranunculus andersonii, which does grow in the study area. At the periphery of its range, the Primula grows in scattered, very small populations. The dark purple flowers are almost invisible from a distance, so one must be almost directly on the plants to see them. These two factors make the small populations most difficult to locate. They also bloom in April when the roads are muddy, making access to the area difficult or impossible. Ralston & Associates field crews are all quite familiar with this species, but it was not found in the study area. Primula cusickiana possibly consists of three taxa, one of which is endangered, but does not occur in our area. If a small population of Primula cusickiana is eventually found on the study area, it will probably be the relatively widespread scabland form. The plants currently in this taxon are being studied. This study will require several years to complete and might result in the recommendation that the form of Primula cusickiana occurring adjacent to the study area not be given Federal protection. This species is currently proposed for endangered status and Federal protection by the Technical Committee.

SPECIES PREVIOUSLY PROPOSED FOR FEDERAL STATUS
BUT NOW RECOMMENDED FOR DELETION

The following taxon was once proposed for threatened status:

Cryptantha sobolifera Payson

Synonyms: C. subretusa Johnston
C. hypsophila Johnston
C. nubigena (Greene) Payson

Collection:

Packard, Grimes, Ralston and Ralston 79-257. 17 VI 1979. BUTTE COUNTY, IDAHO: loose, probably ashy soil on a ridge above South Lava Creek. Base of Blizzard Mountain. T 2 N, R 24 E, S 8. Elev. c. 6800 ft.

At the time this plant was collected, it was listed as threatened, but since then the 1976 has been discontinued. The Technical Committee is recommending that it not be relisted.

SPECIES ON THE STATE WATCH LIST

Oxytheca dendroidea

I. NOMENCLATURE

A. Family

1. Scientific name: Polygonaceae
2. Synonym: None
3. Common name: Buckwheat family

B. Species

1. Scientific trinomial: Oxytheca dendroidea Nutt. ssp. dendroidea
2. Synonym: Eriogonum dendroideum Stokes
3. Common name: None

II. TAXONOMIC PROBLEMS

None. The genus has been revised by Ertter (1980).

III. STATUS

A. Federal: None

B. State: None

C. Other: Recommended for inclusion on the Watch List, Rare and Endangered Plants Technical Committee, Idaho Natural Areas Coordinating Committee (in press).

D. Recommended by compiler: This should be moved to some status indicating that it is endangered in Idaho.

IV. DESCRIPTION

Field characters: A small, many-branched annual with mostly basal leaves; slender, unequal awns on the involucre; tiny, inconspicuous flowers.

V. GEOGRAPHICAL DISTRIBUTION

A. Past: This species has been known in southern Idaho from four sites, one each in Bingham, Butte, Elmore, and Fremont Counties. Possibly more sandy sites were occupied in the recent past, but there is no way of confirming this.

B. Present: The only site in Idaho known to be extant at this time is in Butte County. It was collected in 1959 at the Fremont County sand dunes and can be presumed to still be extant at

that site. The general distribution of the species is Washington, Oregon, California, Nevada, and Wyoming.

- C. Potential: The extent of the habitat is limited in southern Idaho. There may be a very few unknown sites for this plant, but the possibility of this is not great.

VI. HABITAT DESCRIPTION

- A. Community structure or type: For the most part, southern Idaho populations are found on island habitats within sagebrush communities occurring in sandy soil.
- B. Associated species: Species found in island habitats are usually drawn from the surrounding communities and vary from site to site. This is generally true of sandy sites in southern Idaho.
- C. Elevational range: Elevation is not critical. It grows from approximately 1200 feet in the northern portion of its range to 9000 feet in the southern portion (Ertter 1980).
- D. Exposure and slope: Not critical.
- E. Edaphic features: In this part of its range, it is restricted to active sand dune areas and very sandy soil.
- F. Other unusual habitat features: In most of its range, this plant occupies disturbed sites, including road shoulders. The Idaho populations possibly represent a different ecotype. They are confined to active or nearly active sand, show no weedy or aggressive tendencies, and apparently have a low tolerance for disturbance.

VII. POPULATION BIOLOGY

- A. Number of known populations: There have been four populations known in Idaho. Only two populations may now be extant.
- B. Estimated numbers of individuals per population: The population was diffuse; 50-100 individuals were seen in one area covered. The total population is estimated to be larger. Habitat extends from the Sinks of the Big Lost River to west of Big Southern Butte.
- C. Type of reproduction: This is an annual and depends on the production of seeds.
- D. Age classes: Annual, short life cycle.
- E. Flowering and fruiting period: In our area, June into July. In part, it depends on the timing of the rains.
- F. Dispersal mechanisms: There is no obvious dispersal mechanism, although the species has a bipolar distribution. Dispersal might

be an important factor. ORV's are creating new habitat, but this plant may not have the ability to utilize this.

G. Pollinators: No information. Possibly self-pollinated.

H. Other biological factors: None known at this time.

I. Current population dynamics, trends, and status: The ecotype occurring in southern Idaho does not seem to be holding its own. ORV people love to drive in sand; the Oxytheca probably cannot tolerate this disturbance or the effect of cattle on sandy habitats.

VIII. RECOMMENDED CRITICAL HABITAT

This requires, as far as is known, active or nearly active sand and probably the lack of human disturbance. Because the populations are diffuse, the critical habitat would have to be of some size to insure pollination if it is not self-pollinated and to preserve variability. No more specific recommendation can be made at this time. The best habitat for this species was not included in the study area. The sandy area south of the Lost River Sinks and west of Big Southern Butte probably should be designated critical habitat, but this needs further observation.

IX. THREATS TO SURVIVAL

A. Existing threats to survival.

1. Present or threatened destruction, modification, or curtailment of its habitat or range: Inadequate information.
2. Overutilization for commercial, sporting, or education purposes: None in the Butte County site. ORV's may be a factor in other areas where this taxon has disappeared.
3. Disease, predation, or grazing: The Butte County population had not been grazed recently. This may possibly have been a factor in its ability to persist here, although it has disappeared in two other sites.
4. Inadequacy of existing regulatory mechanisms: No regulatory mechanisms exist.
5. Other natural or man-made factors affecting its continued existence: Any impact on the area will probably have an adverse effect on the continued existence of this plant.

B. Potential threat in the foreseeable future: Intensification of existing threats.

X. LAND MANAGEMENT OR OWNERSHIP

The only known Idaho populations are on BLM and INEL land.

XI. MANAGEMENT IMPLICATIONS

This species should be considered in land use planning. The Butte County population is apparently one of two remaining in Idaho, and possibly the last of this ecotype.

XII. POTENTIAL VALUE

This is a small, inconspicuous plant with small inconspicuous flowers. It is probably seral to some degree and plays a part in stabilizing active sand. It occupies a habitat with a depauperate flora that may or may not have interspecific interactions. If interspecific interactions are present, it would be important in the stability of the community because of the low number of community members. This is a peripheral population in the species distribution, and differs from the species in its lack of weedy tendencies. It is these peripheral populations that are crucial in maintaining evolutionary potential.

Since it has a bipolar distribution, it is one member of a group of such plants. Understanding the distribution of this group may help understand the evolution of the flora of the western hemisphere.

XIII. REFERENCES

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XVI. COLLECTIONS

Grimes, Ralston and Ralston. 1454. 6 VII 79, BUTTE COUNTY, IDAHO: sandy soil along the Big Lost River at the crossing of Highway 20-26. T 3 N, R 29 E, S 32. CIC (The population in the study area was too sparse to collect. This collection was from stronger population outside the study area.)

Atwood, N.D. AEC 185. 20 VII 1950, BUTTE COUNTY, IDAHO: Plot #4, southwest of Big Butte, Snake River Plains. Dry open sandy sagebrush. IDS

(The location in the study area, where it was seen, but not collected, is as follows: Diffuse, scattered plants in T 3 N, S $\frac{1}{2}$ R 28 E.)

MISCELLANEOUS SPECIES OF INTEREST

The two species in this section are not listed among the 1980 Vascular Plant Species of Concern for Idaho, but both are listed for Oregon. There is evidence that both species are suffering range retraction because they are intolerant to agricultural, grazing, and human impact. For this reason, they are sensitive indicators of the quality of range management, being able to persist only on range that is under very little stress. These species are not yet known to be rare, but because of the retracting ranges, they are being studied for possible inclusion on a future Idaho list.

Gymnosteris nudicaulis (H. & A.) Greene

Once this tiny annual phlox was common from Baker and Malheur Counties, Oregon, through the Snake River Plains of Idaho and south to central Nevada. It is still common in more remote areas where grazing has been light and range improvement has not impacted the native range. Old collections from the lower Boise River section of the Snake River Plains mention its abundance, but the last collection known from that area was in 1938. It is a fugitive species and no longer exists in the Boise Valley or in other areas where agriculture, cattle, and man are prevalent. This makes it a good indicator species of stress. Its presence indicates well managed range land. In many places, this species is still common in a year with good spring moisture. However, fugitive species with an intolerance to man are probably eventually doomed. This species is listed in Oregon as I b - Regional endemic; rare and threatened in Oregon (Siddall, Chambers & Wagner 1979). For critical habitat, see DISCUSSION: Big Southern Butte to Cedar Butte, and Big Lost River area.

Ranunculus andersonii Gray

Few collections of this species have been made, yet it may not be rare. It is a high scabland species on thin, stony soil; in extremely favorable areas it will occur in deep desert soil with sagebrush. It

blooms in April during mud season when roads are generally impassable, although with adequate spring rains, may bloom into late May. Since its prevalent habitat (scabland) tends to be remote, few botanists see it. The total range of this peculiar buttercup that looks like an anemone is from the Panamint Mountains of California, north through Nevada and eastern Oregon, to central Idaho. It is highly discontinuous within this range, so although it is possibly not rare, it is probably restricted in the number of populations.

Because of the difficulty in observing this species, little is known about it. It is part of the peculiar and little known high scabland flora, consisting of narrowly distributed, endemic species that probably had a Pleistocene origin during a later glacial period. Many of these species have narrow ecological tolerances and do not withstand disturbance well. Because of the number of apparently suitable habitats close to civilization that do not support Ranunculus andersonii, and because a number of the old collections cannot be relocated, this species probably cannot tolerate much disturbance. The taxon has probably retracted during historical time and appears to be highly sensitive to disturbance. Oregon considers this species to be III - Rare and Threatened in Oregon; assumed to be more abundant southward (Siddall, Chambers & Wagner 1979). It is more abundant in Idaho at this time, but may become rare in the future. For critical habitat, see DISCUSSION: Twin Buttes Area.

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IDS: Ray J. Davis Herbarium, Idaho State University, Pocatello, Idaho.

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