

REPORT ON THE CONSERVATION STATUS OF
Phacelia inconspicua IN IDAHO

by

Robert K. Moseley
Natural Heritage Section
Nongame/Endangered Wildlife Program
Bureau of Wildlife

June 1989

Idaho Department of Fish and Game
600 South Walnut, P.O. Box 25
Boise, Idaho 83707
Jerry M. Conley, Director

Status Survey Report prepared for
Idaho Department of Parks and Recreation
through Section 6 funding from
U.S. Fish and Wildlife Service, Region 1

REPORT ON THE CONSERVATION STATUS OF
Phacelia inconspicua IN IDAHO

Taxon Name:	<u>Phacelia inconspicua</u> Greene
Common Name:	Obscure phacelia
Family:	Hydrophyllaceae
States Where Taxon Occurs:	U.S.A.; Idaho, Nevada
Current Federal Status:	Category 2 Candidate
Recommended Federal Status:	Category 2 Candidate
Author of Report:	Robert K. Moseley
Original Date of Report:	June 30, 1989
Date of Most recent Revision:	N/A
Individual to Whom Further Information and Comments Should be Sent:	Robert K. Moseley Idaho Natural Heritage Program Idaho Department of Fish and Game P.O. Box 25 Boise, ID 83707

ABSTRACT

Obscure phacelia (*Phacelia inconspicua*) is a small, desert annual known only from five sites in Pershing County, Nevada, and southern Butte County, Idaho. A status inventory for obscure phacelia in Idaho, was conducted by the Idaho Natural Heritage Program during June 1989, in the portion of the eastern Snake River Plain known as the Big Desert.

Ten populations of obscure phacelia were found in Idaho, comprising less than 33 acres. Over 10,000 individuals were observed in June 1989. Nine populations occur at Big Southern Butte, ranging in size from one to six acres with several hundred to approximately 2000 individuals each. One population occurs at Pratt Butte, less than 0.5 acre in size and containing approximately 500 individuals. Most suitable-appearing habitat within the Big Desert was searched during June 1989, with only the two sites mentioned above found. All populations occur on lands administered by the Big Butte Resource Area, Idaho Falls District, Bureau of Land Management.

Although known populations are few and occur in locally rare habitats, all appear stable. No significant threats to population viability were observed, although a heavily used cattle watering area occurs within 30 m of the Pratt Butte population.

It is recommended that obscure phacelia remain a category 2 candidate until its conservation status in Nevada is determined. The U.S. Fish and Wildlife Service should enter into a Conservation Agreement with the BLM for management and protection of the known populations in Idaho.

TABLE OF CONTENTS

Title Page i

Abstract ii

Table of Contents iii

I. Species Information

1. Classification and nomenclature 1

2. Present legal or other formal status 1

3. Description 2

4. Significance 4

5. Geographical distribution 4

6. General environment and habitat description 5

7. Population biology 8

8. Population ecology 10

9. Current land ownership and management responsibility 11

10. Management practices and experience 12

11. Evidence of threats to survival 13

II. Assessment and Recommendations

12. General assessment of vigor, trends, and status 14

13. Recommendations for listing or status change 14

14. Recommended critical habitat 15

15. Conservation/recovery recommendations 15

16. Interested parties 15

III. Information Sources

17. Sources of information 16

18. Summary of materials on file 17

IV. Authorship

19. Initial authorship 18

20. Maintenance of status report 18

V. New Information

21. Record of revisions 18

Appendices

Appendix 1. Literature Cited.

Appendix 2. Line drawing of Phacelia inconspicua.

Appendix 3. Slides of Phacelia inconspicua and habitat in Idaho.

Appendix 4. Maps of Phacelia inconspicua distribution.

Appendix 5. Occurrence records for Phacelia inconspicua populations in Idaho.

I. Species Information.

1. Classification and nomenclature.

A. Species.

1. Scientific name.

- a. Binomial:** Phacelia inconspicua Greene
- b. Full bibliographic citation:** Greene, E.L. 1924. Erythea 3:24
- c. Type specimen:** Greene, s.n., West Humboldt Mountains, Pershing County, Nevada, July 18, 1894; isotype at NY.

2. Pertinent synonym(s): None.

3. Common name(s): Obscure phacelia, Inconspicuous phacelia

4. Taxon codes: PDHYDOC280 (Idaho and Nevada Natural Heritage Programs)

5. Size of genus: A large and polymorphic genus, of at least 150 species, native to the New World, best developed in the western United States and northern Mexico (Cronquist 1984).

B. Family classification.

1. Family name: Hydrophyllaceae

2. Pertinent family synonym: None

3. Common name(s) for family: Waterleaf

C. Major plant group: Dicotyledonea

D. History of knowledge of taxon: Until recently, obscure phacelia was known only from the type locality in Nevada and from near Webb Spring, on the north side of Big Southern Butte, in Butte County, Idaho.

In Nevada, it is now known from three populations, all occurring within a one square mile area and totaling approximately 1,000 individuals.

The Idaho population was discovered by Duane Atwood on June 13, 1967, and relocated by Jim Grimes and Pat Packard in June 1980.

E. Comments on current alternative taxonomic treatment(s): None.

2. Present legal or other formal status.

A. International: None.

B. National.

1. Present designated or proposed legal protection or regulation:

Obscure phacelia is a category 2 candidate (U.S. Fish and Wildlife Service 1985).

2. Other current formal status recommendation: Obscure phacelia is currently ranked as "critically imperiled throughout range" (global rank = G1) by the Nature Conservancy.

3. Review of past status: N/A

C. State.

1. Idaho.

a. Present designated or proposed legal protection or regulation: None.

b. Other current formal status recommendation: Obscure phacelia is currently listed as "critically imperiled in Idaho" (state rank = S1) by the Idaho Natural Heritage Program.

c. Review of past status: Packard (1981) recommended that obscure phacelia be listed as endangered, mostly because of its rarity.

2. Nevada.

a. Present designated or proposed legal protection or regulation:

Listed as threatened with extinction by the Nevada Division of Forestry (February 14, 1979); protected by NRS 527.270; permit required for collection (Mozingo and Williams 1980).

b. Other current formal status recommendation: Obscure phacelia is currently listed as "critically imperiled in Nevada" (state rank = S1) by the Nevada Natural Heritage Program.

c. Review of past status: Considered as possibly extinct by the Reno T/E Workshop, February 25, 1978, and endangered by the Reno T/E Workshop, November 2, 1979 (Mozingo and Williams 1980).

3. Description.

A. General nontechnical description: An erect-stemmed annual up to 1.5 dm (6 inches) tall, freely branching from the base. The many elliptical leaves are 3.5 cm long or less, green above and somewhat paler below. They are entire and softly pubescent and possess a short, winged petiole. The inflorescence is generally shorter than the leaves. Individual flower stalks are 1 to 3 cm long and bear 3 mm tubular, whitish flowers with linear, pubescent, 3 mm long calyx segments. The lobes of the corolla are erect, and not spreading. The stamens are equal to or barely exceed the corolla in length, and have smooth stalks. The hairy style is 2.5 mm long. The ovoid capsule is tapered to a short beak and is about 3 mm long, somewhat pubescent, and produces 2 seeds (Mozingo and Williams 1980).

B. Technical description: Erect annual, 0.5-2 dm tall, freely branched, usually from near the base; herbage evidently spreading-hairy throughout, but not at all glandular, the pubescence of the stems and inflorescence consisting of numerous fine, short, loosely curled-spreading hairs and a smaller number of longer, stiffer, spreading hairs (those of the calyces more numerous, longer, and stouter); pubescence of the leaves less obviously dimorphic than that of the stems; leaf-blades mostly 1-3.5 cm long and up to about 1 cm wide, rather narrowly elliptic, or lance-ovate, trinerved from near the base, or penninerved with few, elongate, ascending primary lateral veins, all entire,

the lower evidently petiolate, the upper less so or sessile; flowers short-pedicellate or subsessile in bractless, helicoid cymes; calyx 2-3 mm long at anthesis, elongating to 5-6 mm in fruit, the segments linear or nearly so, only slightly or not at all expanded distally; corolla small and inconspicuous, pale bluish, open-campanulate, 3-4 mm long and up to about as long as wide, the lobes up to about as long as the undivided portion; filaments glabrous, about equaling or very shortly surpassing the corolla; anthers minute, ca 0.2 mm long; style about 2-2.5 mm long or a little less, cleft more than half-way to the base; ovary and fruit shorthairy; ovules 4; capsule ca 2-2.5 mm long, evidently beaked; seeds 2 (or probably sometimes 4), ca 1.6-1.8 mm long, pitted-reticulate (Cronquist 1984).

C. Local field characters: Obscure phacelia is very much like Phacelia humilis in aspect, except for its small, inconspicuous flowers. Both species occur in the West Humboldt Mountains, but the Butte County, Idaho, population is far beyond the known range of P. humilis. Obscure phacelia is even more similar to the more southern P. austromontana, from which it differs in its nonglandular pubescence and consistently entire leaves (Cronquist 1984).

Phacelia glandulifera is the only other annual Phacelia sympatric with obscure phacelia in Idaho. The two are easily distinguished; P. glandulifera has pinnatifid leaves, is glandular throughout, and has a smaller, open panicle.

D. Identifying characteristics of material which is in interstate or international commerce or trade: No interstate or international trade is known. See above section for differences with closely related species.

E. Photographs and/or line drawings: The only known line drawings of obscure phacelia appear in Mozingo and Williams (1980) and Cronquist (1984). See Appendix 2 for a reproduction of the line drawing from Cronquist (1984). Photographs of (35 mm slides) of obscure phacelia and its habitat in Idaho are in the slide collection of the Idaho Natural Heritage Program. Several have been reproduced in Appendix 3.

4. Significance.

A. Natural: None known.

B. Human: None known.

5. Geographical distribution.

A. Geographical range: In Idaho, obscure phacelia is known from two sites, consisting of ten populations; nine populations occur on the lower, northeast slope of Big Southern Butte (001) and one occurs on Pratt Butte (002), all in Butte County. See Appendix 4 for maps of the range of obscure phacelia in Idaho.

B. Precise occurrences in Idaho.

1. Populations currently or recently known extant: Two sites, consisting of nine populations are known extant in Idaho: Big Southern Butte (001) and Pratt Butte (002). See Appendix 4 for maps of the populations and Appendix 5 for the occurrence records.

2. Populations known or assumed extirpated: None

3. **Historically known populations where current status not known:** None.
4. **Locations not yet investigated believed likely to support additional natural populations:** Suitable habitat on the Big Desert only occurs on volcanic cones, which are topographic features with enough relief to create differential snow deposition patterns in this otherwise flat landscape. The following buttes were searched unsuccessfully for obscure phacelia in June 1989:

Table Legs Butte (S13 T1N R31E)
Cedar Butte (S26 T1N R30E)
Sixmile Butte (S9 T2N R27E)
Tea Kettle Butte (S13 T2N R27E)
Wildhorse Butte (S30 T2N R27E)
Tin Cup Butte (S26 T2N R27E)
Fingers Butte (S13 T1N R27E)
Quaking Aspen Butte (S29 T1N R28E)
Serviceberry Butte (S27 T1S R28E)
China Cup (S4 T2S R29E)
Antelope Butte (S7 T2S R29E)
Rattlesnake Butte (S13 T2S R27E)
Split Top (S18 T3S R29E)
Mule Butte (S18 T4S R27E)

Mountain shrub communities, similar to those in which obscure phacelia occurs, are relatively rare habitats on the Snake River Plain, being more common in the foothills of mountains north and south of the plain. For the most part, however, the geologic substrate in mountains adjacent to the Snake River Plain is nonvolcanic. Other volcanic-derived features that remain to be inventoried for obscure phacelia populations on the eastern Snake River Plain occur in Craters of the Moon National Monument, the Idaho National Engineering Laboratory, and in the Big Desert/Wapi Lava Flow area south of Bear Trap Cave. The Mount Bennett Hills and numerous buttes are the volcanic-derived features most likely to harbor obscure phacelia populations on the central Snake River Plain, east of Craters of the Moon.

5. **Reports having ambiguous or incomplete locality information:** Roger Rosentreter reported a possible location of obscure phacelia on sandy soil in upper Ditto Creek, in the foothills of the Danskin Mountains, Elmore County. The specimen was collected late in the season and Duane Atwood, an expert in the group, was unable to positively identify it.
6. **Locations known or suspected to be erroneous reports:** None.

C. **Biogeographical and phylogenetic history:** At least three other rare species, *Machaeranthera laetevirens*, *Lesquerella kingii* var. *cobrensis*, and *Antennaria arcuata*, exhibit a similar distribution pattern, with widely disjunct populations in central Nevada and south-central Idaho. *Antennaria arcuata*, however, also has an additional disjunct population in central Wyoming.

6. **General environment and habitat description.**

A. **Concise statement of general environment and habitat:** The Idaho populations of obscure phacelia grow on north-, east-, and northeast-facing slopes

with loose, well-drained soil in mountain shrub communities dominated by Prunus virginiana and/or Symphoricarpos oreophilus. These habitats occur in the lee of ridges and are areas of snow deposition in winter and early spring, an attribute that makes them relatively mesic compared to surrounding habitats. Elevations range between 5400 and 6000 feet. The substrate of both sites is volcanic, either rhyolite or basalt.

B. Physical characteristics.

1. Climate.

- a. Koppen climate classification:** Habitat for obscure phacelia in Idaho is classified as Koppen's unit BSk: semiarid climate or steppe, with average annual temperature under 64.4° F (Trewartha 1954).
 - b. Regional macroclimate:** The regional macroclimate is extrapolated from the Arco weather station, 25 air miles northeast of Big Southern Butte. Mean annual temperature for Arco is 56.3° F and the mean annual precipitation is 10.96 inches. The annual temperature range for Arco is very wide, with extreme high temperatures reached during July, and the coldest occurring during January. Mean annual precipitation shows two peaks, with almost 25 percent received during May and June, and only slightly less during December and January. Annual precipitation fluctuates widely from year to year. July marks the beginning of a pronounced dry season, during which rainfall does not exceed 1.0 inch for the five-month period. The period between the last freeze of the spring and the first freeze of the fall is estimated to be only 92 days (Caicco and Wellner 1983).
 - c. Local microclimate:** All Idaho obscure phacelia populations occur on the lee sides of ridges, an area where snow accumulates in winter and early spring. Slope aspects are consistently to the north, northeast, or east. These attributes make obscure phacelia habitats relatively mesic compared to surrounding areas. During the course of the June 1989 inventory, it became apparent that mountain shrub habitats are relatively rare on the Big Desert.
- 2. Air and water quality requirements:** Unknown.
 - 3. Physiographic provinces:** The Idaho population of obscure phacelia lies on the Snake River Plain section of the Columbia Intermontane Geomorphic Province (Ross and Savage 1967).
 - 4. Physiographic and topographic characteristics:** Obscure phacelia populations occur on the lee sides of ridges, where snow is deposited during winter and early spring. On the eastern Snake River Plain, this topographic position only occurs on volcanic buttes.
 - 5. Edaphic factors:** The Big Southern Butte (001) population of obscure phacelia lies on rocks mapped as Quaternary Sugary Rhyolite (Spear and King 1982). The Pratt Butte (002) population occurs on rocks mapped as Quaternary basalt lava flows and pyroclastic deposits (Rember and Bennett 1979).

The Nevada populations also occur on volcanic substrates.

6. **Dependence of this taxon on natural disturbance:** In Idaho, obscure phacelia occurs on relatively unstable microsites within the shrub communities. These microsites lack soil cover and are inhabited by several species of annuals in addition to obscure phacelia. The microsites are small, however, and may occur beneath the canopy of the shrubs. Fire probably has burned through the mountain shrub communities in the past, but probably did not hinder the performance of obscure phacelia.
7. **Other unusual physical features:** None known.

C. Biological characteristics.

1. **Vegetation physiognomy and community structure:** The Idaho obscure phacelia populations occur within undescribed mountain shrub communities. These habitats are dominated by Prunus virginiana and/or Symphoricarpos oreophilus, which have high canopy cover. Artemisia tridentata ssp. vaseyana was consistently present in all stands. Perennial bunchgrass cover is conspicuously low in most stands, although Elymus cinereus, Stipa lettermanii, Poa secunda, and/or Agropyron spicatum may be present. Perennial forbs also have low cover. Numerous annual and biennial species inhabit the bare-soil microsites within the shrub stands.
2. **Regional vegetation type:** Kuchler (1964) places the Idaho regional vegetation type as Sagebrush Steppe (Artemisia-Agropyron).
3. **Frequently associated species:** Following is a list of frequently associated species in Idaho:

Agropyron spicatum
Allium acuminatum
Artemisia tridentata ssp. vaseyana
Astragalus cibarius
Bromus tectorum
Calochortus nuttallii
Chaenactis douglasii
Chrysothamnus viscidiflorus
Collomia linearis
Crepis acuminata
Cryptantha fendleri
Elymus cinereus
Galium bifolium
Gayophytum ramosissimum
Lappula redowskia
Lithospermum ruderale
Lomatium triternatum
Lupinus wyethii
Machaeranthera sp.
Mentzelia albicaulis
Microsteris gracilis
Orthocarpus sp.
Poa secunda
Polygonum annual sp.
Prunus virginiana

Purshia tridentata
Stipa lettermanii
Symphoricarpos oreophilus

4. **Dominance and frequency:** Obscure phacelia can be locally dominant in the bare-soil microsites within mountain shrub habitats. Since it is an annual, the dominance and frequency may vary annually depending on the amount of spring moisture.
5. **Successional phenomena:** The communities in which obscure phacelia occurs appear successional stable. The volcanic substrates in these habitats, in combination with steep slopes, are naturally unstable. Suitable bare-soil microsites, therefore, are constantly being created in these communities. The lack of perennial grass in the stands may indicate heavy grazing pressure from cattle in the past.
6. **Dependence on dynamic biotic features:** None known.
7. **Other endangered species:** None.

7. Population biology.

A. General summary: Two sites, consisting of ten populations of obscure phacelia, are known from the eastern Snake River Plain in Butte County, Idaho (Map 2, Appendix 4). One population occurs at Pratt Butte (002) consisting of approximately 500 individuals in June 1989. Nine populations occur on the northeast slope of Big Southern Butte (001), each consisting of several hundred to over 2000 individuals. Little is known of its reproductive biology.

B. Demography.

1. **Known populations:** Ten populations, occurring at two sites on the eastern Snake River Plain in Butte County, Idaho: one population on Pratt Butte (002) and nine on the northeast slope of Big Southern Butte (001). Population sizes range from less than 0.5 acre at Pratt Butte (002) to almost six acres at one population at Big Southern Butte (001).

2. Demographic details (Idaho).

a. Big Southern Butte (001)

1. **Area:** Nine populations totaling approximately 32 acres.
2. **Number and size of plants:** Greater than 10,000 individuals in June 1989.
3. **Density:** Ranges from widely scattered under canopy of shrubs to very dense in small openings.
4. **Presence of dispersed seeds:** Unknown.
5. **Evidence of reproduction:** No evidence.
6. **Evidence of expansion/contraction:** No evidence.

b. Pratt Butte (002)

1. **Area:** Less than 0.5 acre.
2. **Number and size of plants:** Approximately 500 individuals in June 1989.

3. **Density:** Ranges from widely scattered under canopy of shrubs to very dense in small openings.
4. **Presence of dispersed seeds:** Unknown.
5. **Evidence of reproduction:** No evidence.
6. **Evidence of expansion/contraction:** No evidence.

C. Phenology.

1. **Patterns:** Specific details are unknown, but in 1989, flowering took place in early June. This probably varies annually with the timing of spring temperatures and rainfall.
2. **Relation to climate and microclimate:** Specific details are unknown, but since obscure phacelia is an annual, phenology and germination are probably affected by the amount and timing of precipitation and temperature patterns in the spring.

D. Reproductive ecology.

1. **Type of reproduction:** Obscure phacelia does not disperse vegetatively; new individuals arise from seed.
2. **Pollination.**
 - a. **Mechanisms:** Unknown, but probably flying insect.
 - b. **Specific known pollinators:** Unknown.
 - c. **Other suspected pollinators:** None known.
 - d. **Vulnerability of pollinators:** Unknown.
3. **Seed dispersal.**
 - a. **General mechanisms:** Specific details unknown, but wind or gravity dispersal is suspected.
 - b. **Specific agents:** Unknown, but probably wind or gravity.
 - c. **Vulnerability of dispersal agents and mechanisms:** Unknown.
 - d. **Dispersal patterns:** Unknown.
4. **Seed biology.**
 - a. **Amount and variation of seed production:** Specific details unknown, but Cronquist (1984) states that obscure phacelia produces four ovules, with generally only two becoming mature seeds. He does, however, parenthetically state that occasionally four seeds may be produced.
 - b. **Seed viability and longevity:** Unknown, but expected to be relatively long, given the seed longevity characteristics of other desert annuals growing in sandy or unstable substrates and in regions where the annual precipitation varies widely from year to year.
 - c. **Dormancy requirements:** Unknown.

- d. **Germination requirements:** Unknown.
 - e. **Percent germination:** Unknown.
 - 5. **Seedling ecology:** Specific details unknown, but obscure phacelia always had cotyledons attached to the lower stem. In many cases the cotyledons were still slightly green, indicating that it germinates in the spring, and if the seedling survives, it probably matures rapidly to a flowering plant.
 - 6. **Survival and mortality:** Unknown.
 - 7. **Overall assessment of reproductive success:** Obscure phacelia disperses only by seeds, which are produced at a relatively low rate for an annual: normally two seeds per flower. Pollination and dispersal traits are unknown. Seed longevity is unknown, but may be relatively long, given the characteristics of many desert annuals.
8. **Population ecology of the taxon.**
- A. **General summary:** Ten populations of obscure phacelia, occurring at two sites, are known from Idaho. They all occur in very localized, relatively rare habitats on the portion of the eastern Snake River Plain known as the Big Desert. Populations are relatively dense. No herbivore, parasite, or disease damage was observed. Heavy grazing by cattle occurs at one site, but does not appear to be detrimental to the obscure phacelia population. Obscure phacelia populations are isolated from all closely related Phacelias and the genetic integrity of the taxon does not appear to be in jeopardy.
 - B. **Positive and neutral interactions:** None known.
 - C. **Negative interactions.**
 - 1. **Herbivores, predators, pests, parasites and diseases:** None known.
 - 2. **Competition.**
 - a. **Intraspecific:** Possibly significant, especially in years of low rainfall, when intraspecific competition may limit number of mature individuals.
 - b. **Interspecific:** Possibly significant, given the plethora of annual species that inhabit the bare-soil microsites and could compete for limited moisture during low precipitation years.
 - 3. **Toxic and allelopathic interactions with other organisms:** Unknown.
 - D. **Hybridization.**
 - 1. **Naturally occurring:** Unknown, but Cronquist (1984) states that the two closest relatives of obscure phacelia are allopatric with the Idaho populations.
 - 2. **Artificially induced:** Unknown.
 - 3. **Potential in cultivation:** Unknown.

E. Other factors of population ecology: None known.

9. Current land ownership and management responsibility.

A. General nature of ownership: The known Idaho populations occur on land administered by the Bureau of Land Management, Idaho Falls District Office.

B. Specific landowners (Idaho): All Idaho populations occur on land administered by the Big Butte Resource, Idaho Falls District, Bureau of Land Management.

C. Management responsibility: Same as above.

D. Easements, conservation restrictions, etc.: The Big Southern Butte (001) populations occur within the Big Southern Butte National Natural Landmark. This National Park Service-administered program gives no binding protection to the area; the BLM voluntarily protects the nationally significant geological and ecological features.

10. Management practices and experience.

A. Habitat management.

1. Review of past management and land-use experiences.

a. This taxon: Cattle and/or sheep grazing has been the dominant land-use in the past at both sites. The effect of this practice on obscure phacelia populations is unknown.

b. Related taxa: Unknown.

c. Other ecologically similar taxa: Unknown.

2. Performance under changed conditions: No baseline population data exists from which long-term performance can be evaluated.

3. Current management policies and actions: Grazing has been removed from Big Southern Butte (001) by the BLM to protect the fragile and unique ecological features that occur there (U.S. Department of the Interior, National Park Service 1989). Pratt Butte is within a cattle allotment and is currently grazed. A livestock watering area is located within 30 m of the Pratt Butte (002) population.

4. Future land use: Future plans unknown.

B. Cultivation.

1. Controlled propagation techniques: None known.

2. Ease of transplanting: Unknown.

3. Pertinent horticultural knowledge: None known for annual phacelias.

4. Status and location of presently cultivated material: None known to be in cultivation.

11. Evidence of threats to survival.

A. Present or threatened destruction, modification, or curtailment of habitat or range.

1. **Past threats:** No apparent past destruction of obscure phacelia habitat was observed. Past livestock grazing has probably modified its habitat; there is a conspicuous lack of perennial bunchgrasses in communities containing obscure phacelia.
2. **Existing threats:** No habitat destruction is anticipated. Cattle grazing takes place in the Pratt Butte (002) population, and is expected to continue.
3. **Potential threats:** See above.

B. Overutilization for commercial, sporting, scientific, or educational use.

1. **Past threats:** Minimal to no past threats in Idaho.
2. **Existing threats:** Minimal to no existing threats in Idaho.
3. **Potential threats:** Minimal to no potential threats in Idaho.

C. Disease, predation, or grazing.

1. **Past threats:** No direct past threats to the population viability of obscure phacelia due to disease or predation are known. It is unknown if livestock herbivory takes place on obscure phacelia.
2. **Existing threats:** No direct existing threats to the population viability of obscure phacelia due to disease, predation or grazing are known. Some incidental grazing of individuals may take place at Pratt Butte (002).
3. **Potential threats:** No direct potential threats to the population viability of obscure phacelia due to disease, predation or grazing are known.

D. Inadequacy of existing regulatory mechanisms.

1. **Past threats:** None.
2. **Existing threats:** None.
3. **Potential threats:** None.

E. Other natural or manmade factors.

1. **Past threats:** None known.
2. **Existing threats:** None known.
3. **Potential threats:** None known.

II. Assessment and Recommendations.

12. General assessment of vigor, trends and status: Ten populations of obscure phacelia are known in Idaho, comprising less than 33 acres. Over 10,000 individuals were observed in June 1989. Nine populations occur at Big Southern Butte (001), ranging in size from one to six acres with several hundred to approximately 2000 individuals each. One population occurs at Pratt Butte (002), less than 0.5 acre in size and containing approximately 500 individuals. Most suitable-appearing habitat within a portion of the eastern Snake River Plain known as the Big Desert was searched during June 1989, with only the two sites mentioned above found. All populations occur in southern Butte County, on lands administered by the Big Butte Resource Area, Idaho Falls District, Bureau of Land Management.

Although known populations are few and occur in locally rare habitats, all appear stable. No significant threats to population viability were observed, although a heavily used cattle watering area occurs within 30 m of the Pratt Butte (002) population.

13. Recommendations for listing or status change.

A. Recommendation to U.S. Fish and Wildlife Service: Obscure phacelia should remain a category 2 candidate until its conservation status in Nevada is determined. Based on the Idaho data (few, localized populations), a listing priority of 5 (high magnitude threat with nonimminent immediacy) is warranted.

The U.S. Fish and Wildlife Service should enter into a Conservation Agreement with the BLM for management and protection of the known populations in Idaho.

B. Recommendations to other U.S. Federal Agencies.

1. Bureau of Land Management: Obscure phacelia is currently on the Idaho BLM Sensitive Plant List as an Endangered Species. No change in status is recommended. The BLM should enter into a Conservation Agreement with the U.S. Fish and Wildlife Service for the management and protection of known populations.

C. Other status recommendations.

1. Counties and local areas: No recommendations.

2. State: Obscure phacelia is currently ranked S1 by the Idaho Natural Heritage Program. No status change is recommended.

3. Other Nations: No recommendations.

4. International: No recommendations.

14. Recommended critical habitat: The complete status of obscure phacelia is not yet known in the Nevada portion of its range. Thus, critical habitat is not being recommended at this time.

15. Conservation/recovery recommendations.

A. General conservation recommendations.

1. Recommendations regarding present or anticipated activities: The Big

Southern Buute (001) populations appear suitably protected under current management strategies. The Pratt Butte (002) population should be monitored to determine the effects of adjacent, intense cattle use on long-term population viability.

2. **Areas recommended for protection:** All known populations in Idaho.
The Big Southern Butte (001) populations appear to be suitably protected. The Pratt Butte (002) population should be monitored to determine the effects of adjacent, relatively intense cattle grazing.
3. **Habitat management recommendations:** The Pratt Butte (002) population may need protection from the adjacent, relatively intense cattle grazing.
4. **Publicity sensitivity:** Probably none.
5. **Other recommendations:** None.

B. Monitoring activities and further studies recommended: A monitoring study is recommended for the Pratt Butte (002) population to determine the effects of the adjacent, relatively intense cattle grazing on long-term population viability. A Conservation Agreement between the U.S. Fish and Wildlife Service and BLM should include monitoring of both land-use changes and population levels.

16. Interested parties:

Pat Packard
Harold Tucker Herbarium
College of Idaho
Caldwell, ID 83605

Douglass Henderson
University of Idaho Herbarium
University of Idaho
Moscow, ID 83843

Duane Atwood
USFS Intermountain Region
324 25th Street
Ogden, UT 84401

Idaho Natural Heritage Program
Idaho Fish and Game
P.O. Box 25
Boise, ID 83707

Bob Parenti
Boise Field Office
U.S. Fish and Wildlife Service
4696 Overland Road
Boise, ID 83705

Roger Rosentreter
Idaho State Office
Bureau of Land Management
3380 American Terrace
Boise, ID 83706

Idaho Falls District Office
Bureau of Land Management
940 Lincoln Road
Idaho Falls, ID 83401

Nevada Natural Heritage Data Base
Capitol Complex, Nye Building
201 South Fall Street
Carson City, NV 89710

Larry Morse
The Natura Conservancy
1815 Lynn Street
Arlington, VA 22209

III. Information Sources.

17. Sources of information.

A. Publications.

1. **References cited in report:** See Appendix 1.

2. **Other pertinent publications.**

a. **Technical:** None.

b. **Popular:** None.

B. Herbaria consulted: Specimens of obscure phacelia from Idaho are known to be deposited in the New York Botanical Garden (NY), College of Idaho (CIC), University of Idaho (ID), and Brigham Young University (BYU). Following is a list of known herbarium specimens, indexed by population:

001 - Atwood 969 (BYU, NY)
Grimes 1627 (NY, CIC)
Moseley 1392 (ID)
Bernatas 89-33 (ID)

002 - none

C. Fieldwork: I conducted an inventory of suitable habitat in the northern part of the Big Desert, between Arco (north) and Bear Trap Cave (south), and Craters of the Moon lava flow (west) and U.S. Highway 26 (east) during June 1989. I was accompanied on this inventory by Duane Atwood, U.S. Forest Service, on June 12, and Susan Bernatas, The Nature Conservancy, on June 14-17.

D. Knowledgeable individuals:

Pat Packard
Harold Tucker Herbarium
College of Idaho
Caldwell, ID 83605

Duane Atwood
USFS Intermountain Region

324 25th Street
Ogden, UT 84401

Bob Moseley
Idaho Natural Heritage Program
Idaho Fish and Game
P.O. Box 25
Boise, ID 83707

E. Other information sources: None known.

18. Summary of materials on file: Color slides, field forms, maps and all published and unpublished references pertaining to obscure phacelia in Idaho are on file at the Idaho Natural Heritage Program office.

IV. Authorship.

19. Initial authorship:

Bob Moseley, Plant Ecologist
Idaho Natural Heritage Program
Idaho Fish and Game
P.O. Box 25
Boise, ID 83707
208/334-3402

20. Maintenance of status report: The Idaho Natural Heritage Program will maintain current information and update the status report as needed. Should obscure phacelia be listed as an endangered or threatened species by the U.S. Fish and Wildlife Service, the Service, through its Boise Field Office, should maintain the primary file on information, encourage others to provide new information, and distribute new findings, as received, to the interested parties (section II.16.).

V. New Information.

21. Record of revisions: Not applicable.

APPENDIX 1.

Literature Cited.

Caicco, S.L., and C.A. Wellner. 1983. Research Natural Area Recommendation for Big Southern Butte, Bureau of Land Management, Idaho Falls District, Idaho. Unpublished report on file at: Idaho Fish and Game, Idaho Natural Heritage Program, Boise, ID. 11 p.

Cronquist, A. 1984. Phacelia. Pages 157-192 In: A. Cronquist, A.H. Holmgren, N.H. Holmgren, J.L. Reveal, and P.K. Holmgren, Intermountain Flora: Vascular Plants of the Intermountain West, U.S.A., Volume 4, The New York Botanical Garden, Bronx, NY.

Kuchler, A.W. 1964. Potential natural vegetation of the conterminous United States. Spec. Bull. No. 36. American Geographical Society, N.Y.

Mozingo, H.N., and M. Williams. 1980. Threatened and endangered plants of Nevada: An illustrated manual. USDI, Fish and Wildlife Service, Portland, OR. 268 p.

U.S. Department of the Interior, National Park Service. 1989. Reconnaissance survey, expansion of Craters of the Moon National Monument. USDI, National Park Service, Pacific Northwest Region, Seattle, WA. 49 p.

Packard, P.L. 1981. Phacelia inconspicua. Page 33 In: Rare and Endangered Plants Technical Committee of the Idaho Natural Areas Council, compilers, Vascular plant species of concern in Idaho. Bull. No. 34. Forest, Wildlife and Range Experiment Station, University of Idaho, Moscow.

Rember, W.C., and E.H. Bennett. 1979. Geologic map of the Idaho Falls Quadrangle, Idaho. Geologic Map Series (2° Quadrangle), Idaho Bureau of Mines and Geology, Moscow, ID.

Ross, S.H., and C.N. Savage. 1967. Idaho earth science. Earth Science Series No. 1. Idaho Bureau of Mines and Geology, Moscow. 271 p.

Spear, D.B., and J.S. King. 1982. The geology of Big Southern Butte. Pages 395-403 In: B. Bonnicksen and R.M. Breckenridge, eds., Cenozoic Geology of Idaho, Bureau of Mines and Geology Bull. 26, Moscow, ID.

Trewartha, G.T. 1954. An introduction to climate. McGraw-Hill Book Co., Inc., NY. 402 p.

U.S. Fish and Wildlife Service. 1985. Endangered and threatened wildlife and plants; review of plant taxa for listing as endangered or threatened species; notice of review. Federal Register 50(188):39526-39585 (27 September 1985).

APPENDIX 2.

Line drawing of Phacelia inconspicua.
(Reproduced from Cronquist 1984)

APPENDIX 3.

Slides of Phacelia inconspicua and habitat in Idaho.

APPENDIX 4.

Maps of Phacelia inconspicua distribution.

- Map 1. Overview of the distribution of known populations in Idaho and Nevada.
- Map 2. Overview of the distribution of known populations in Idaho.
- Map 3. Map of the Big Southern Butte (001) populations. Portion of 1972 Big Southern Butte 7.5' topographic quadrangle.
- Map 4. Map of the Pratt Butte (002) population. Portion of the 1972 Pratt Butte 7.5' topographic quadrangle.

APPENDIX 5.

Occurrence records for Phacelia inconspicua populations in Idaho.

- Page 1. Record for Big Southern Butte (001) populations.
- Page 2. Record for Pratt Butte (002) population.