ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDHYD0C4B0
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Phacelia serrata* J.W. Voss
COMMON NAME: Cinder phacelia, Serrate phacelia, Cinder caterpillar weed, saw phacelia, saw scorpion-weed
SYNONYMS: *Phacelia macdougalii*
FAMILY: Hydrophyllaceae

AUTHOR, PLACE OF PUBLICATION: J.W. Voss, Bull. Torr. Club 64(2): 88-89. 1937.

TYPE LOCALITY: Arizona: Coconino County: San Francisco Mountains

TYPE SPECIMEN: HT: POM-200561. C.A. Purpus 8064, May-October 1900. IT: UC, US.

TAXONOMIC UNIQUENESS: Distinct species in a polymorphic American genus of about 200 species, mostly of the western United States and adjacent Mexico. USDA, PLANTS Database (2002) reports 158 species in the genus *Phacelia*.

DESCRIPTION: An annual with strongly glandular and sticky herbage. Plants are 10.0-34.0 cm (4.0-13.4 in.) tall, with stems that are characteristically stout, erect, sparsely hirsute and canescent-puberulent. Stems are simple or branched at base, with leaves up to the flower branches. Leaves are lanceolate, serrate, dentate to shallow lobed, 1.0-5.0 cm (0.4-2.0 in.) long, and 0.5-2.0 cm (0.2-0.8 in.) wide. The upper leaves are sessile or nearly so, while the lower with petiole up to 1.5 cm long, setose, hirsute and glandular. Inflorescence consists of compound scorpioid cymes, setose, puberulent with multicellular stipitate glands. The corolla is rotate, blue to light violet, 3.0 - 4.0 mm long and broad, pubescent; stamens and style exserted. Mature seeds 4, elliptical to oblong, dark brown, 2.5-3.0 mm long, 1.0-1.25 mm wide, dorsal and ventral sides divided by a prominent ridge.

AIDS TO IDENTIFICATION: Glandular hairs like other *Phacelias*. *Phacelia serrata* exhibits the unusual combination of restriction to volcanic cinders, late summer flowering, and corrugated seed margins. In New Mexico, *Phacelia integrifolia* sometimes grows in cinders in the Zuni-Bandera Volcanic Field, but it has smooth seed margins, and it does not bloom in the late summer (Bleakly 1999).

ILLUSTRATIONS: Color photo (*in* Bleakly 1999, Accessed 12/12/2003 from http://nmrareplants.unm.edu/reports/phaser.htm)

TOTAL RANGE: Endemic to volcanic cinders in only two disjunct regions, approximately 260 miles apart, in Arizona and New Mexico (El Malpais NM). In New Mexico, this taxon can be found in the Zuni-Bandera Volcanic Field south of the Zuni Mountains in Cibola County, while in Arizona, it grows in the San Francisco Volcanic Field, Coconino County.

RANGE WITHIN ARIZONA: In and around Sunset Crater National Monument and the San Francisco Mountains north of Flagstaff, as well as west of Flagstaff, Coconino County, Arizona.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous annual.

PHENOLOGY: Late-June to mid-September.

BIOLOGY: Population numbers fluctuate according to rainfall amounts. Limited research on reproduction indicates the species takes advantage of the monsoon rains to flower and set seed late in the year (Huisinga et al. 2000, *in* NatureServe 2003). Seeds can lay dormant in the ground until favorable environmental conditions occur. This species appears to be tolerant of man-made and natural disturbance. Its annual life cycle contributes to its tolerance of disturbance. Specific pollinators have not been identified.

HABITAT: Primarily in volcanic cinder areas associated with volcanic cones, but also roadcuts and abandoned quarries in open, exposed sunny locations. In Arizona, this species also colonizes large "cinder lakes." These flat areas have no underlying clay and are approximately 50 acres in size (B. Phillips, pers. comm. 2000, *in* NatureServe 2003).

ELEVATION: 5,000 - 7,200 ft. (1,525 - 2,200 m).

EXPOSURE: Generally open on slopes of 0-15 degrees.

SUBSTRATE: Volcanic cinders.

PLANT COMMUNITY: Ponderosa pine forests, pinyon-juniper woodlands to juniper flats and hills. Associated plant species include: *Amaranthus retroflexus* (red-root amaranth), *Andropogon gerardi* var. *paucipilis* (sand bluestem), *Atriplex canescens* (four-wing saltbush), *Bahia dissecta* (dissecta bahia), Bouteloua hirsute (hairy grama), *Castilleja chromosa* (desert paintbrush), *Chaenactis fremontii* (Fremont's pincushion), *Chenopodium graveolens* (fetid goosefoot), *Chrysothamnus nauseosus* (rubber rabbit-bush), *Corydalis aurea* (golden corydalis), *Coryphantha* (*Escobaria*) *missouriensis* (Missouri pincushion cactus), *Coryphantha* (*Escobaria*) *vivipara* (purple pincushion), *Echinocactus polycephalus* var. *xeranthemoides* (many-headed barrel), *Echinocereus triglochidiatus* var. *melanacanthus*

(claret-cup hedge-hog cactus), *Ephedra viridis* (green Mormon-tea), *Eriogonum corymbosum* (crispleaf wild-buckwheat), *E. fasciculatum* (California wild buckwheat), *E. inflatum* (trumpet buckwheat), *Fallugia paradoxa* (Apache plume), *Forestiera neomexicana* (desert olive), *Gaura coccinea* (scarlet gaura), *Gayophytum* sp. (groundsmoke), *Gutierrezia sarothrae* (broom snakeweed), *Hilaria jamesii* (James galleta), *Ipomopsis aggregata* (scarlet gilia), *Krascheninnikovia* (*Eurotia*) *lanata* (winter-fat), *Lupinus kingii* (King's lupine), *Machaeranthera canescens* (hoary tansy-aster), *Mentzelia pumila* (golden stickleaf), *Nicotiana attenuata* (coyote tobacco), *Oenothera coronopifolia* (comb-like evening-primrose), *Opuntia* sp., *Oryzopsis hymenoides* (Indian mountain-ricegrass), *Penstemon clutei* (a beardtongue), *Phaseolus* sp., *Physaria newberryi* (Newberry's twinpod), *Polanisia trachysperma* (clammyweed), *Rhus trilobata* (sumac), *Ribes cereum* (white squaw currant), *Salsola kali* (Russian thistle), *Schoenocrambe linearifolia* (*Sisymbrium linearifolium*) – windmills, *Stipa neomexicana* (New Mexico needlegrass), *Tradescantia occidentalis* (prairie spider-wort), and *Verbascum thapsus* (great mullein).

POPULATION TRENDS: Restricted in range but common locally. Although locally abundant, its presence is dependent upon specific substrate, namely volcanic cinders. Trends show populations of *Phacelia serrata* to be stable. (NatureServe 2003).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1993]
[3C USDI, FWS 1985]
[3C USDI, FWS 1980]
[PTN-T USDI, FWS 1975]

STATE STATUS: None

OTHER STATUS: None

MANAGEMENT FACTORS: Threats include land trades, an increased use (off road vehicles, recreation, road realignments, land trades, etc.) of its range by an expanding Flagstaff population, competition with non-native plants, and hybridization. A potential threat to its critical habitat includes the quarrying of volcanic cinders for road construction materials.

Maintaining adequate acreage of the black volcanic cinders, is the most important management requirement. Periodically (very five years) inventorying this taxon is recommended in order to confirm that populations of this rare endemic are secure. (NatureServe 2003).

CONSERVATION MEASURES TAKEN: Coconino National Forest is actively managing this plant, and obtains some amount of protection on National Monument lands.

SUGGESTED PROJECTS: The effect of disturbance on genetic diversity and seed set is unknown. Understanding how disturbance affects this species would help in making informed management decisions. (NatureServe 2003).

LAND MANAGEMENT/OWNERSHIP: NPS: USFS - Coconino National Forest; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

It should be noted that most *Phacelias* have glands, which may cause an allergic reaction similar to poison ivy (Phillips 1993).

Revised: 1993-05-23 (MHH)
1995-04-25 (DBI)
1997-08-20 (SMS)
2004-01-27 (SMS)