

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Plant Abstract

Element Code: PDPOR080M0

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Phemeranthus validulus*

COMMON NAME: Tusayan Flame Flower; Western Flame Flower

SYNONYMS: *Talinum validulum*

FAMILY: Portulacaceae

AUTHOR, PLACE OF PUBLICATION: Greene, Edward L. 1912. Leaflets of botanical observation and criticism. Vol.II. Washington, D.C.

TYPE LOCALITY: Kaibab National Forest (Tusayan Forest Reserve), Coconino County, Arizona.

TYPE SPECIMEN: US 691244. R.R. Hill. 11 August, 1912.

TAXONOMIC UNIQUENESS: Price (2012) recognizes ca. 25 species of *Phemeranthus*. Kiger (2001) confirmed new combinations to transfer 13 species from *Talinum* to *Phemeranthus* due to differences in leaf, pollen, fruit, and seed structure.

DESCRIPTION: Low (1.0 - 6.0 cm [0.4 - 2.4 in.] high) perennial herb from spindle shaped, fleshy, long (10.0 cm [4.0 in.] or more) root, bearing 1 to 3 thick, branched, woody stems, tending to spread horizontally, that bear annual leafy branches. Leaves rounded in cross-section, very narrow, 0.9 - 3.5 cm (0.36 - 1.4 in.) long and 1.0 - 4.0 mm (0.04 - 0.16 in.) broad. Flowers 1-4 clustered on stalks 1-4 cm long, petals 5, white to rose-pink, 3.0 - 5.4 mm (0.12 - 0.22 in.) long. These petals borne in loose cluster at stalk tip. Stamens 6-17 with yellow anthers. Fruit is oval shaped capsule 5.0 mm (0.20 in.) long, 3.5 mm (0.14 in.) in diameter with brown seeds 1.0 mm (0.04 in.) long and 1.0 mm (0.04 in.) wide.

AIDS TO IDENTIFICATION: *Phemeranthus validulum* is a small plant, growing abundantly in open areas, with succulent leaves. Succulent stems tend to spread horizontally, are thicker and softer than those of *Phemeranthus parviflorum* which has a wiry, thin flowering stalk. Flowers of *P. validulum* are white to rose-pink in season. *P. parviflorum* is quite similar to *P. validulum*, but is much taller (up to 20.0 cm, 7.87 in.) with 1.5 - 5.0 cm (0.59-1.97 in.) long leaves. *P. parviflorum* has strawlike leaf bases while the bases of *P. validulum* are knoblike with shorter, fatter leaves. *Phemeranthus validulum* has around ten stamens while other *Phemeranthus* species have five. According to Phillips (1993b), there are a number of clues which must be used together to distinguish these species and sometimes

they cannot be determined on an individual basis. Best time to tell these species apart is in the fall when *P. parviflorum*'s leaves have turned yellow with red tips. Leaves of *P. validulum* turn brilliant red giving the plant its common name of "flame flower." *P. parviflorum* has a lot of above ground stem and "looks like a worm when it overwinters" whereas *P. validulum* dies back to the ground every year (Phillips 1993b).

ILLUSTRATIONS: Line drawing of plant in flower (USFWS)

TOTAL RANGE: Coconino and Yavapai Counties, Arizona.

RANGE WITHIN ARIZONA: Several separate localities include: Pine Flats and vicinity, Tusayan, Coconino Plateau, Kaibab Plateau, southeast of Williams, south boundary of Grand Canyon NP, near Grand Canyon Caverns, and a old collection from Rattlesnake Tanks near the San Francisco Mountains, Coconino County; and Juniper Mountains, Big Black Mesa, and Black Hills, Yavapai County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Succulent perennial

PHENOLOGY: Flowers and fruits following precipitation in August - September; may also flower in May.

BIOLOGY: According to Phillips (1993b), *P. validulum* has a dual growing season, is not competitive, and is opportunistic regarding rainfall. Plant will go dormant during early summer drought while succulent root allows it to withstand drought conditions.

HABITAT: Open mountain meadows with very shallow rocky clay soils derived from basalt in ponderosa pine forest, and shallow basins at rims of canyons and flat ridgetops with cherty gravels from Kaibab limestone in pinyon-juniper woodland (Phillips 1999). Because this plant is not a good competitor, it grows in openings in micro sites (Phillips 1993b) and in open meadows and hilltops in ponderosa pine and pinyon-juniper vegetation. Phillips (1993b), considers habitat more important than substrate.

ELEVATION: About 5,590 - 7,700 ft. (1705 - 2349 m).

EXPOSURE: Various

SUBSTRATE: Rocky clay soils derived from basalts; cherty gravels derived from Kaibab limestone; red-brown silt among fossiliferous chert and limestone gravel and rocks. According to Phillips (1993b), the plant is found in limestone bedrock close to the surface with a layer of thin, rocky soil.

PLANT COMMUNITY: Great Basin Conifer Woodland, Rocky Mountain Montane Grassland, and Petran Montane Conifer Forest. Associated species are *Pinus ponderosa*, *Juniperus osteosperma*, *Pinus edulis*, *Quercus gambelii*, *Purshia stansburiana*, and *Chamaebatiaria millefolium*.

POPULATION TRENDS:

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1980]
STATE STATUS: Salvage Restricted (ARS, ANPL 1993)
OTHER STATUS: Not Forest Service Sensitive (USDA, FS
Region 3 1999)
[Forest Service Sensitive USDA, FS Region
3 1990]

MANAGEMENT FACTORS: Several projects have potential to impact Tusayan populations.

CONSERVATION MEASURES TAKEN: Kaibab and Prescott national forests have conducted surveys. Kaibab National Forest is monitoring selected populations. Disturbance does not seem to be a problem with this plant as it has been found along jeep and hiking trails according to Baker (1993).

SUGGESTED PROJECTS: Relocation of Rattlesnake Tank population and surveys to extend range, along with continued monitoring.

LAND MANAGEMENT/OWNERSHIP: NPS - Grand Canyon National Park; USFS - Kaibab and Prescott National Forests, and Coconino National Forest (historical); Private.

SOURCES OF FURTHER INFORMATION

REFERENCES:

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ADDITIONAL INFORMATION:

Noel Fletcher believes that area disturbance hinders plant growth whereas Art Phillips stated that it helps. He also believes that *T. validulum* does not "like" pine duff but Noel has one site located under pines. Noel has also found it under rabbitbrush with litter but this appears to be the exception rather than the rule.

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