

ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract

Element Code: PDRUB0N090

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Galium bifolium*
COMMON NAME: Twoleaf Bedstraw
SYNONYMS:
FAMILY: Rubiaceae

AUTHOR, PLACE OF PUBLICATION: Watson, Sereno. United States Geological
Exploration [sic] of the Fortieth Parallel, Vol 5, Botany 134, pl. 14 f.8. 1871.

TYPE LOCALITY: Wahsatch Mountains, 7000 feet. [Wasatch Mountains, Utah].

TYPE SPECIMEN: The Gray Herbarium, GH00092732. S. Watson (#480). 1869/6.

TAXONOMIC UNIQUENESS: *Galium* is a large genus of about 400 species worldwide, with 81 species and an additional 74 subspecies found in the US and Canada. Arizona has 16 species with another six subspecies.

DESCRIPTION: **Plant:** annual herb; 5-20 cm high, glabrous **Leaves:** lanceolate or narrowly elliptic, obtuse or acute, not apiculate, mostly 4 per node, in 2 unequal pairs, the larger pair 10-21 mm long, the upper nodes often 2-leaved **Flowers:** perfect, solitary in axils, the long pedicels bent away from the leaves, sharply reflexed below fruit; corolla generally 3-lobed, glabrous, cleft about 2/3 of their length, white, the lobes ascending, ovate, obtuse, shorter than ovaries **Fruit:** FRUITS with short uncinat hairs; mericarps joined 2/3 of their length, nearly separated at maturity. (Dempster 1995.)

AIDS TO IDENTIFICATION: *Galium bifolium* is an annual herb standing erect to a maximum height of about 15 centimeters. Leaves grow in whorls of four divided into two pairs. The foliage is hairless and sometimes slightly fleshy. The solitary flowers have three white tepals and the fruit is a round nutlet covered in shiny white hairs.

ILLUSTRATIONS:

Photos: <http://swbiodiversity.org/seinet/taxa/index.php?taxon=Galium+bifolium>.

Photos and Herbarium Mounts: <http://eol.org/pages/1103770/media>.

TOTAL RANGE: *G. bifolium* is native to western North America from British Columbia south to California and east to New Mexico, Colorado and Alberta.

RANGE WITHIN ARIZONA: Mostly higher elevation sites across northern Arizona. East of the Virgin Mountains and in the Uinkaret Mountains of Mohave County, the Kaibab Plateau of Coconino County, and the Carrizo and Chuska Mountains of Navajo County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Annual herb.

PHENOLOGY: California records indicate that *G. bifolium* flowers from June to September. In Arizona, fruits were observed for collections made in May, June and July, which suggests that flowering starts even earlier.

BIOLOGY:

HABITAT: Mountain forests and high-elevation plateaus, open meadows, shady slopes and even cliff walls. One AZ collection site was actually aquatic/semi-aquatic.

ELEVATION: Collections made in Arizona ranged from 5500 – 9200 feet (1675-2805m). Collections in California extend the elevation range from 4920 – 12135 feet (1500-3700m).

EXPOSURE: Two collections specified a “steep N facing slope” and a “NE facing bench.” Depending on elevation, there may be a preference for the cooler or more mesic exposures. The species is also reported from shady slopes and open meadows.

SUBSTRATE: Not well defined in the literature, but one Arizona collection indicated a silty to silty-sand soil covered by pine needles. Another collection made in an aquatic/semi-aquatic setting noted saturated, silty-clay soils.

PLANT COMMUNITY: High elevation forest communities from Ponderosa Pine to Mixed Conifer, open meadows at higher elevations, and in one instance, an aquatic/semi-aquatic community. Plants associated with Arizona collections include: *Acer grandidentatum*, *Quercus gambelii*, *Abies concolor*, *Pseudotsuga menziesii*, *Populus tremuloides*, *Robinia neomexicana*, *Picea*, *Maianthemum racemosum*, *Senecio neomexicanus*, *Erigeron flagellris*, *Symphoricarpos*, *Pinus ponderosa*, *Pteridium*, *Fendlera rupicola*, *Amelanchier utahensis*, and, at the aquatic/semi-aquatic site, *Carex athrostachya*, *Eleocharis*, *Poa*, *Hippuris*, *Utricularia*, *Alisma plantago-aquatica*, *Mentha arvensis*, *Potentilla norvegica* var. *hirsute* and *Polygonum amphibium*.

POPULATION HISTORY AND TRENDS: Unknown for Arizona. A total of 12 collections sites are known for the State, and two of these were visited over multiple years. Until recently, there were only four sites recorded, which is why NatureServe lists the species in Arizona as critically imperiled. Collections made during the past decade have expanded the

range of the species in Arizona, but do not better define either population dynamics or population trends.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None.
STATE STATUS: None.
OTHER STATUS: None.

MANAGEMENT FACTORS: None specified.

PROTECTIVE MEASURES TAKEN: None, although all of the known sites in NW Arizona are on Federal lands (USNPS, USFS, or USDI BLM). NE Arizona sites are on Navajo Nation lands.

SUGGESTED PROJECTS: Inventory other high elevation areas such as the San Francisco Peaks, the Mogollon Rim, the White Mountains and peaks east from Springerville to Alpine to determine if the known range of *Galium bifolium* in Arizona can be expanded.

LAND MANAGEMENT/OWNERSHIP: About one-half of the collection records in Arizona are from Navajo Nation lands in the very NE part of the State. The remaining collections from NW Arizona, north of the Colorado River are on BLM lands (3), the Kaibab National Forest (2), or the Grand Canyon National Park (2).

SOURCES OF FURTHER INFORMATION

REFERENCES:

- Dempster, Lauramay T. 1995. Rubiaceae, Madder Family. JANAS 29(1): 29-38.
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MAJOR KNOWLEDGEABLE INDIVIDUALS:

ADDITIONAL INFORMATION: The common name “bedstraw” derives from the former use of this plant as a mattress stuffing.

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