ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDAPO03060
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Amsonia grandiflora* Alexander
COMMON NAME: Large-flowered Blue Star, Arizona bluestar
SYNONYMS:
FAMILY: Apocynaceae

AUTHOR, PLACE OF PUBLICATION: E.J. Alexander, Torreya 34(5): 116-117. 1934.

TYPE LOCALITY: USA: Arizona: Near Patagonia (Santa Cruz County).

TYPE SPECIMEN: HT: US 1468292. R.H. Peebles 6986, Harrison and Loomis, 6 May 1930. IT: ARIZ.

TAXONOMIC UNIQUENESS: *Amsonia grandiflora* is a member of subgenus Longiflora, one of three subgenera of Apocynaceae. *A. longiflora* and *A. fugatei*, are the other two members of this subgenera. Nonsympatric. There are 16 species of *Amsonia* (USDA 2002), 8 of which occur in Arizona (Kearney and Peebles 1951).

DESCRIPTION: **Showy herbaceous perennial** with milky sap (characteristic of Apocynaceae) and numerous erect stems that arise in a dense clump from a long-lived root. **Foliage and flowers entirely glabrous** (hairless). Alternate leaves, 4.0-12.0 cm (1.6-4.8 in.) long, 2.0-7.0 mm wide, and somewhat dimorphic, ranging from narrowly lanceolate on lower parts of the plant, to linear or filiform on upper part of plant; 1.0-3.0 mm wide on upper stems. White (blue-tinged), fragrant flowers borne in terminal clusters of 5-10 (5-25, *in* DBG 1999), commonly with between 15-30 inflorescences per plant. Flowers are trumpet shaped with narrow corolla tube 1.6-1.9 cm (0.64-0.76 in.) long and 5 spreading corolla lobes 1.0-1.5 cm (0.4-0.6 in.) long. Tube constricts at mouth. **Stamens inserted high in the tube**. Fruit have two distinct ovaries that mature into narrow seed pods 7.0-9.0 cm (0.28-0.36 in.) long with no constrictions and an acuminate tip. **Seeds corky** in texture, usually cylindrical with truncated ends, 8.0-11.0 mm (0.32-0.44 in.) long, and 2.0-3.0 mm wide.

AIDS TO IDENTIFICATION: This species differs from other members of the genus in Arizona by the longer flowers. The other two species in the region (not known to be sympatric) typically have much shorter (less than 1.25-2.54 cm (0.5-1.0 in.) flowers and broader leaves. Only green shrub flowering in its habitat in April and May. Note: without flowers or fruit, plant difficult to spot.

ILLUSTRATIONS: Line drawing (USFWS)
Drawing of flower (McLaughlin 1982)

Color photo of plant (Barb Phillips, in Falk, Jenkins et al. 2001)
Color photo of plant in habitat (Peter Warren, in Falk, Jenkins et al. 2001)
Color photos of flower and plant (Kathy Rice, CPC #118 accessed 6/18/2003 from http://ridgwaydb.mobot.org/cpcweb/CPC_ProfileImage.asp?FN=118a)

TOTAL RANGE: Northern Sonora (one site*), Durango**, Mexico; and southern Arizona.

RANGE WITHIN ARIZONA: Pena Blanca Lake vicinity, Sonoita Creek and Santa Cruz River vicinities, Mt. Benedict, and Patagonia and Atascosa/Pajarito mountains, Santa Cruz County. Also found in the San Luis and Tumacacori mountains in Pima counties.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Suffrutescent perennial forb/herb.

PHENOLOGY: Peak flowering in April through May, sporadic through mid-summer. "Fruits begin ripening in early summer, and generally dehisce during July and August, with all fruits open by September" (Warren et al. 1992). Plant bears ripened and dehisced pale yellow fruits for about six months.

BIOLOGY: Individuals appear to be capable of spreading by underground rhizomes, making it difficult to distinguish between individuals in some cases. Plants become completely dormant during the winter, dying back to the woody crown. They are drought tolerant when established. They are possibly pollinated by hawk moths. "Thick woody stem with carbohydrate reserves may be adaptation for resprouting after disturbance" (Warren et al. 1992). McLaughlin (1982) reported that number of fertile seed in a population reduced to zero when large numbers of the stinkbug *Chlorochroa ligata* infested plants.

HABITAT: Canyon bottoms and sides in oak woodlands, typically dominated by Emory oak (*Quercus emoryi*) and Mexican blue oak, however, site specific qualities are inconsistent. Adapted to rock fall disturbance.

ELEVATION: 3,685 - 4,500 feet (1124-1350 m).

EXPOSURE: Mainly northern exposure in full sun or partial shade.

SUBSTRATE: Level alluvial soils that are sandy or gravelly or rocky hillsides composed of rhyolite, granite, quaternary sediments and possible metamorphosed limestone.

PLANT COMMUNITY: Southern Arizona oak woodlands dominated by *Quercus emoryi*. Associated species may include willow (*Salix* sp.), mesquite (*Prosopis* sp.), catclaw (*Acacia* sp.), hackberry (*Celtis* sp.), and milkweed (*Asclepias* sp.).

POPULATION TRENDS: Seems to have high reproductive potential (Warren 1989), but populations appear relatively stable with low mortality and recruitment. Populations and individual plants are few in number, with only five known localities (USFWS 1996). No explanation as to why they are rare. They are not palatable to livestock, so there is no grazing pressure. Known populations are very dense, and discrete. The trend seems to be stable. Some known sites are highly susceptible to disturbance. All sites are within one hour of Nogales. This area is expanding rapidly, thus a lot of impact is related to development.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[Category 2, USDI, FWS 1993]
[Category 2, USDI, FWS 1990]
[Category 2, USDI, FWS 1985]
[Category 2, USDI, FWS 1983]

STATE STATUS:

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)
[Forest Service Sensitive USDA, FS Region 3 1990]

MANAGEMENT FACTORS: Populations are few and relatively small. Although the species may be trampled, they are apparently unpalatable to livestock, due to their milky sap. Main management action would be avoiding impact on populations. Species might make a good landscape plant. Monitoring sites near Patagonia (outlier of more extensive population). Unusual site (valley bottom) but this is still rocky, alluvial soil. Plants came back vigorously after being burned.

CONSERVATION MEASURES TAKEN:

SUGGESTED PROJECTS: Survey for and monitor populations. Reproductive biology studies (pollination biology), and hybridization experimentation with other *Amsonia* species would be beneficial.

LAND MANAGEMENT/OWNERSHIP: USFS - Coronado National Forest; AGFD Arivaca Lake Wildlife Area; TNC - Patagonia-Sonoita Creek Preserve; Private.

SOURCES OF FURTHER INFORMATION

REFERENCES:

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

Mima Falk - Botanist, Fish and Wildlife Service, Tucson, Arizona.
Dave Gori - The Nature Conservancy, Tucson, Arizona.
Jack Kaiser - Retired, Nogales, Arizona.
Steve McLaughlin - University of Arizona, Tucson, Arizona.
Barb Phillips - USFS Zone Botanist for the Coconino, Kaibab and Prescott National Forests, Flagstaff, Arizona.
Peter Warren - Tucson, Arizona.

ADDITIONAL INFORMATION:

*Only one population known for Sonora, southwest of Nogales. At present (November, 1994) unable to relocate other Sonoran populations. An *Amsonia* collection (lacking flowers) from the Sierra el Tigre of eastern Sonora, at one time catalogued as *A. grandiflora*, is probably an example of *A. palmeri* (Warren 1989).

**The specimen from Durango is *Amsonia grandiflora*, but Steve McLaughlin wonders about this. He thinks the locality information on the sheet may be mistaken. He believes this is a local endemic.

According to the Center for Plant Conservation (2003), "*A. grandiflora* is easily grown from seed, and has a high reproductive potential. Cuttings are difficult, but not impossible. The time of year that cuttings are taken probably plays a major part in the successful rooting of cuttings. Plants in cultivation produce seeds readily, but must be separated from other *Amsonia* species to ensure that cross-pollination between species does not occur. Desert Botanical Garden has approximately 10,400 seeds in storage from three populations, and has produced 3,000 seeds in cultivation by controlled cross-pollination."

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1991-11-22 (SR)
1991-12-04 (SR)
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1994-12-14 (DBI)
1998-01-06 (SSS)
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