

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

Plant Abstract

Element Code: PDAPI19051

Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Lilaeopsis schaffneriana* (Schlecht) var. *recurva* (A.W. Hill) Affolter
COMMON NAME: Huachuca water umbel, Huachuca water-umbel, Huachuca waterumbel,
Schaffner's grasswort, Cienega False-rush
SYNONYMS: *Lilaeopsis recurva* A.W. Hill, *L. schaffneriana* ssp. *recurva*
FAMILY: Apiaceae

AUTHOR, PLACE OF PUBLICATION: A.W. Hill, J. Linn. Soc. Bot. 47: 525-551. 1927.

TYPE LOCALITY: Santa Cruz Valley near Tucson, Pima County, Arizona, U.S.A.

TYPE SPECIMEN: LT: GH. C.G. Pringle s.n. 19 May 1881. LT: US. ST: NY, GH.

TAXONOMIC UNIQUENESS: In the genus *Lilaeopsis*, the species *schaffneriana* is 1 of 5 species in North America, and contains only 1 variety *recurva*. According to Affolter (1985), "The genus *Lilaeopsis* Greene contains approximately 20 species. It is well developed in the temperate zones of North America, South America, Australia and New Zealand. 6 or 7 species recognized in North America."

According to NatureServe (2003), "The USFWS listed this taxon as *Lilaeopsis schaffneriana* ssp. *recurva* (Federal Register, Jan. 6, 1997). As of 11/31/99, *L. schaffneriana* var. *recurva* is used in its List of Endangered and Threatened Plants. The latter rank, is also used by Kartesz (1999). However, subspecies seems to be the rank used by Affolter (1985, p. 61), and is accepted in the Gray Index (online, 8/2000)." It is also used by the Missouri Botanical Garden (2003).

DESCRIPTION: Herbaceous, semi-aquatic to aquatic perennial with cylindrical, wavy, yellowish green, slender hollow leaves borne individually or in clusters, that grow from the nodes of creeping rhizomes; inconspicuous septa at irregular intervals. Leaves terete in cross section, generally 1.0-3.0 mm in diameter, however, length varies depending on micro-habitat. When growing out of water in wet soil near a stream, leaves usually only 4-8 cm (1.6-3.2 in) tall; growing in water that supports their weight, leaves can grow up to 22.5 cm (9 in) long. Umbels of 3-10 very small, white flowers (commonly with maroon-tinted petals) of less than 1 mm, borne at the base of the leaves. Inflorescence peduncles typically 1.0-7.0 cm (0.4-2.8 in.) long, always shorter than leaves. Fruits are globose, 1.5-2.0 mm in diameter, slightly longer than wide, and red colored in late fall.

AIDS TO IDENTIFICATION: Wavy, yellowish-green leaves best field characteristic (Warren 1994). Leaves curve slightly above the water surface. This characteristic distinguishes it from young or small *Eleocharis*. *Lilaeopsis* has semi-succulent leaves that are somewhat flexuous, while *Eleocharis* leaves are pithy, strictly straight and not at all succulent. Leaf color of *L. s. var. recurva* is pale yellow-green compared to the darker green of most co-occurring herbaceous species.

ILLUSTRATIONS: Line drawing of habit, flower and fruit (Affolter, 1982: Fig.9, p.52). Color photo (Lynda Pritchett-Kozak, in CPC 2003: CPC #9357, http://ridgwaydb.mobot.org/cpcweb/CPC_ProfileImage.asp?FN=9357a) Color photos (Peter L. Warren, in <http://www.co.pima.az.us/cmo/sdcp2/species/umbel.html>) Line drawing (in Falk, Jenkins et al., 2001) Color photo of plant (FWS, in Falk, Jenkins et al., 2001) Color photo of habitat (Peter Warren/TNC, in Falk, Jenkins et al., 2001) Color photo (DBG, in Kelly and McGinnis 1994) Line drawing (Michael Chamberland, in Kelly and McGinnis 1994).

TOTAL RANGE: Southwestern New Mexico, southeastern Arizona and adjacent Sonora, Mexico.

RANGE WITHIN ARIZONA: Disjunct locations in Cochise and Santa Cruz counties. Cochise County: Huachuca Mountains, San Pedro area, Saint David (extirpated), and San Bernardino Valley/Black Draw. Santa Cruz County: Canelo Hills/Turkey Creek, Sonoita Creek and San Rafael Valley. Historically in Pima County, Tucson. **See Population Trends.**

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous, semi-aquatic to aquatic perennial.

PHENOLOGY: Flowering observed March through October (DBG, accessed 2001), giving way to red fruits in late fall. According to Brooks (1999 draft), "primarily reproducing vegetatively through rhizomes; flowering in June through August; ellipsoid fruits July through September."

BIOLOGY: Rhizomes branch freely, may form dense mats (carpet) in sand or mud streambed, making it impossible to identify individual plants. Flowers may be self-fertile. Rapid colonization of newly constructed pond at San Bernardino National Wildlife Refuge suggests that species may have extended seed dormancy (K. Cobble, pers comm.). Reproduces vegetatively via rhizomatous spreading, dispersing if clumps dislodged. *Lilaeopsis* seems to require an intermediate level of flooding frequency to keep competition manageable. Plant does not compete well with larger, semi-aquatic species (sedges, bulrushes) but populations can be destroyed when floods are too frequent and intense. They

are vegetatively reduced during cooler months, resuming active growth in the spring. After spring floods scour out a riparian system, *Lilaeopsis* is one of the first plants to establish itself.

HABITAT: Cienegas or marshy wetlands at 2,000 to 6,000 feet elevation, within Sonoran desertscrub, grassland or oak woodland, and conifer forest. Plants found in unshaded or shaded sites in shallow water, saturated soil near seeps, springs and streams. *Lilaeopsis* requires perennial water, gentle stream gradients, small- to medium-sized drainage areas, and (apparently) mild winters. Usually found in water depths from 5.0-15.0 cm (2.0-16.0 in.), but occasionally to 25.0 cm (10.0 in.) deep.

ELEVATION: 2,000 - 7,100 ft. (610 - 2166 m).

EXPOSURE:

SUBSTRATE: Submerged sand, mud and/or silt.

PLANT COMMUNITY: Within Sonoran desertscrub, grassland or oak woodland, and conifer forest. Associated vegetation includes: *Alnus* sp. (alder), *Baccharis* sp. (willow) and *Populus* sp. (cottonwood), along with *Aster* (*Almutaster*) *pauciflorus*, *Berula erecta* (water (or wild) parsnip), *Carex* sp. (sedge), *Eleocharis acicularis* (needle or least) spikerush), *E. parishii* (Parish's spikerush), *Ludwigia palustris* (Marsh seedbox), *Rorippa* sp. (watercress), *Scirpus americanus* (three-square bulrush), *Typha domingensis* (southern cattail), *Veronica americana* (American speedwell), and algal mats, grasses and rushes.

POPULATION TRENDS: There are 8 known populations in the U.S. and 4 documented sites in Mexico (CPC 2003). San Pedro River Conservation Area is the chief location for this plant on BLM land, where it is recolonizing fairly rapidly. Most plants are found on the San Pedro River. Scotia and Bear canyons on the Coronado National Forest, was monitored during 1993 showing population increase. Sierra Vista's watershed condition is very important to this plant, particularly groundwater pumping.

Populations found in Mexico along Black Draw, a few miles south of San Bernardino NWR boundary and at Los Fresnos (approximately 2 miles south of the International Boundary southwest of the Huachuca Mountains).

Species has apparently been lost from at least four historic sites in Arizona (Saint David, 2 sites; Tucson; Monkey Springs), probably representative of the general loss and decline of cienega and stream habitats throughout Arizona. Twenty locations historically in Tucson. The House Pond population on the San Bernardino National Wildlife Refuge was extirpated during pond re-construction in the 1970s. Saint David area population presumed extirpated due to channel erosion.

Species appears to be naturally recolonizing the San Pedro River at several locations, including the Highway 90 crossing and Boquillas Ranch (D. Gori and P. Warren, pers. obs. 1993-1994), apparently as a result of improved aquatic habitat stability following improvement in management of the BLM San Pedro Riparian National Conservation Area. This population was believed to be lost due to destabilization of habitat and loss of water. Present in the 1930s but not present in the 1987-88 survey.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LE (USDI, FWS 1997) with Critical Habitat [PE USDI, FWS 1995] [C1 USDI, FWS 1994] [PE USDI, FWS 1993] [C1 USDI, FWS 1993] [C2 USDI, FWS 1983]

STATE STATUS: Highly Safeguarded (ARS, ANPL 1999) [Highly Safeguarded (ARS, ANPL 1993)]

OTHER STATUS: No FS Status (USDA FS Region 3 1999) [Forest Service Sensitive, USDA FS Region 3, 1990]

MANAGEMENT FACTORS: Perennial water flow and excessive erosion are key issues of management. A small number of *Lilaeopsis* populations are restricted to wetland habitats that are rare in the southwest United States and adjacent Mexico. Habitats are threatened by growing water demands and associated diversions and impoundments, uncontrolled livestock grazing (which contributes to the degradation of watersheds resulting in destructive flooding), introductions of invasive non-native plant species, sand and gravel mining, and flash flooding.

The primary management need of this species is to protect the cienega habitat that supports known populations. Management procedures include protecting water supplies by acquiring instream flow water rights and managing watersheds to reduce flood frequency and intensity. Recreation management may be needed at some local populations. (NatureServe 2003).

PROTECTIVE MEASURES: Friends of the San Pedro River docents given training to identify and monitor species on the San Pedro River (Sept. 1994).

SUGGESTED PROJECTS: Examination of possible seed dispersal mechanisms. Molecular work would reveal the degree of genetic diversity of this species along the respective drainages. Additional information as to the reproductivity in habitat would be useful.

LAND MANAGEMENT/OWNERSHIP: BLM - Tucson Field Office; DOD - Fort Huachuca Military Reservation; USFS - Coronado National Forest; USFWS - San Bernardino National

Wildlife Refuge; Cienega Creek Natural Preserve; TNC - Bingham Cienega and Cottonwood Spring Preserves; Private.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

Kevin Cobble - USFWS
Dave Gori - The Nature Conservancy, Tucson, Arizona
Peter Warren - Tucson, Arizona

ADDITIONAL INFORMATION:

Specimens from three populations have been sent to Dr. Peggy Fiedler, California State University at San Francisco for DNA analysis to compare genetic relatedness to two California species of *Lilaeopsis*.

“Currently, *Lilaeopsis* is held at the Desert Botanical Garden in the form of live plants. Although the plants are easily grown and propagated vegetatively, they seldom flower in conventional cultivation. There is a crucial need to establish a genetically representative seed bank of this plant, and to investigate seed storage and germination requirements.” (CPC 2003).

Experimental transplant study, was conducted by The Nature Conservancy back in 1990-1991 on the San Bernardino NWR. The first site failed, the second site did not grow beyond its original 5 inch diameter, but the third site grew from 5 inch to approximately 2 feet in diameter. The major conclusion is that *Lilaeopsis* can not survive where there is heavy competition from other herbaceous aquatic plants. (NatureServe 2003).

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