ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDASC02290
Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Asclepias welshii* N. & P. Holmgren
COMMON NAME: Welsh's Milkweed
SYNONYMS:
FAMILY: Apocynaceae

AUTHOR, PLACE OF PUBLICATION: N.H. Holmgren and P.K. Holmgren, Brittonia 31(1): 110-114, f. 1-2. 1979.

TYPE LOCALITY: North end of Coral Pink Sand Dunes, Kane County, Utah, U.S.A.

TYPE SPECIMEN: HT: NY. N. Holmgren and P. Holmgren 9009, 20 June 1978. IT: BRY, UT, UTC.

TAXONOMIC UNIQUENESS: Asclepiadaceae has approximately 250 genera and 2000 species (18 genera and 75 species in North America), chiefly of tropical and subtropical regions of both hemispheres. However, Asclepiadaceae has been moved into the dogbane family (Apocynaceae), and consists of a subfamily, Asclepiadoideae. *A. welshii* is a very distinctive species with no obvious close relatives (Sundell 1993).

Recent publications by Fishbein and others (Fishbein et al. 2011, 2018) have elucidated the phylogenetic relationship of *Asclepias* and the origin and evolution of several characteristics found within this genus of plants, including leaf trichomes and waxiness. *Asclepias welshii* is part of the Temperate North American Clade of milkweeds, and some of its closest relatives include *A. labriformis*, *A. involucrata*, and *A. macrosperma* (Fishbein 2011, Fishbein 2018). However, those three species do not have thick, epicuticular wax whereas *A. welshii* does.

DESCRIPTION: Herbaceous perennial with a root system of vertical taproots and horizontal runners connecting clusters of stems 25-100 cm (10-40 in) tall, erect or ascending; few to several in a cluster. Leaves opposite, densely white-woolly pubescent at first, becoming glabrous, especially beneath. Upper leaves broadly elliptic to ovate or obovate with short petioles, 7.0-9.0 cm (2.8-3.6 in) long, 3.5-6.0 cm (1.4-2.4 in) broad. Lower leaves are smaller, sessile, with acuminate tips. Foliage and stems with dense white-wooly tomentum. Inflorescence spherical, 7 cm (2.8 in) in diameter on a short pedicel, compactly many-flowered with the flowers so crowded as to prevent the corolla lobes from becoming truly reflexed. Pedicels 8-13 mm long, cottony-pubescent. Peduncles 2-4 cm (0.8-1.6 in) long. Corolla 6-7 mm long, ovate, cream colored with rose-tinged center, reflexed at base with lobes usually

forced upward in the thick-lacked umbel, tomentulose beneath. Large broadly oval seeds 20+ mm long, with rudimentary tuft of hairs. Few fruits develop; propagates mostly from rhizomes.

AIDS TO IDENTIFICATION: "*A. welshii* is distinguished by its anther wings, which are broadest near the middle rather than at the base, by its warty rather than smooth follicles, and by its sepals, which are subequal to the corolla lobes rather than obviously shorter" (Holmgren and Holmgren 1979). According to Falk and Jenkins et al. (2001), "*A. welshii* is distinguished from other milkweeds by its large seeds, spreading to pendulous follicles and cottony-pubescent pedicles. Juvenile resembles *A. cutleri* Woodson."

Two other growth forms are known to exist. What is designated as the "primary" growth form has narrow linear leaves and looks very similar to *A. subverticillata*. A second form exhibits intermediate leaf traits of the "primary" form and the first description (the "mature" form described above) and is called the "secondary" form (CPC accessed 2003).

ILLUSTRATIONS: Line drawing (Holmgren and Holmgren 1979:111)
Color photos of plant and habitat (J.P. Riser, in NRCS Technical Note, 2013)
Line drawing (KHT *in* Falk and Jenkins et al. 2001)
Color photo of plant in habitat (Joyce Maschinski, *in* Falk and Jenkins et al. 2001)
Color photo of plants in habitat (Ben Franklin, *in* Falk and Jenkins et al. 2001)

TOTAL RANGE: Near the Utah-Arizona state line, from the Coral Pink Sand Dunes and Sand Hills, in Kane County Utah, and from Coconino, Navajo and Apache counties, in Arizona. Since the time of listing, several new populations in Arizona have been discovered; these scattered populations include Thousand Pockets, Coyote Buttes, and Sand Cove (all in Coconino County), and two from the Navajo Indian Reservation: Comb Ridge and Tuba City (Navajo, Coconino and Apache counties) (USDI, FWS 2015).

RANGE WITHIN ARIZONA: From the Paria Plateau and Kaibito Plateau north of Hwy 160 and Wildrose Spring, Coconino County, and in Little Capitan Valley in Navajo County east into Apache County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial forb/herb.

PHENOLOGY: Flowers May to June, with seed dispersal from July to early September. Utah Div. of Wildlife Res. (UDWR) reports flowering from June to August.

BIOLOGY: Plants produce milky juice. They reproduce mainly by rhizomes, but by seed when conditions are right. Pollinated by insects. The dense tomentum on the young parts of *A. welshii* may serve to protect the tender growing tissues from the abrasive wind-blown sand and may be important in reducing transpirational water loss (Cronquist et al. 1984).

In 2008, a genetic study was conducted to determine genetic variability between populations. This study found genetic variability both within and between populations to be nonexistent. Although this species does reproduce asexually, it seems doubtful that asexual reproduction is the only means by which it reproduces, as individuals do produce seed. A more likely scenario is that better genetic markers are needed for testing genetic relatedness (USDI, FWS 2015).

Low genetic diversity in a separate milkweed species, *A. lanuginosa*, was found to be driving demographic declines, leading plants in certain populations to reproduce by completely asexual means. This compounded the already low genotypes found amongst individual plants within scattered populations. If low genetic variability within *A. welshii* is found after more genetic testing, then transplanting individual plants or moving seeds from site to site may aid in reinforcing genetic variability (Kim et al. 2015).

HABITAT: Found on open, sparsely vegetated semi-stabilized coral pink sand dunes, in sagebrush, juniper, pine and oak communities of the Great Basin desertscrub, at 1700-1900 meters. Occupies both the crest and lee slopes of dunes (derived from Navajo Sandstone), adjusting readily to changes in depth of the sand (Welsh et al. 1993, *in* NatureServe 2003).

ELEVATION: 4,700 - 6,250 ft. (1434 - 1906 m). UDWR reports an elevation range of 1542 to 1993 meters (5,056 – 6,534 ft).

EXPOSURE: Found on crests and lee sides of dunes

SUBSTRATE: Sand dunes

PLANT COMMUNITY: Plant communities adjacent to the dunes are commonly those dominated by pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus utahensis*), sagebrush (*Artemisia* spp.), and ponderosa pine (*Pinus ponderosa*) (Esplin 2006; Welsh et al. 2008). Species found in direct association with Welsh's milkweed include sand mulesears (*Wyethia scabra* ssp. *attenuata*), silvery sophora (*Sophora stenophylla*), giant sandreed (*Calamovilfa gigantea*), blowout grass (*Redfieldia flexuosa*), Indian ricegrass (*Achnatherum hymenoides*) and Gambel oak (*Quercus gambelii*) (USFWS 2015).

POPULATION TRENDS: Unknown. Lack of demographic and population trend studies, combined with a lack of detailed genetic studies and the clonal nature of the species make assessment of population viability and trends difficult (USFWS 2015). Welsh's milkweed is a rare plant due to its small geographic range, narrow habitat specificity, and small number of small populations. Its rareness appears to be naturally caused but makes the species more vulnerable to both natural and human-induced extinction. (Meyer, accessed 2003). Known

from 8 locations with a total of approximately 72,000 above-ground stems; the number of genetic individuals is unknown and maybe lower than 72,000, as an individual plant sometimes has multiple stems (NatureServe 2003, USFWS 2015). Based on collections in SEINet (accessed 2005), often described as locally abundant, regionally rare.

As of 2002, the Coral Pink Sand Dunes population made up 98% of the known stems (roughly 71,500 stems), while consisting of just 42% of the known occupied habitat. The additional seven known populations make up the remaining 2% of stems, scattered across the remaining 58% of the total occupied habitat. However, not all of the suitable habitat in the Navajo Indian Reservation has been surveyed (USDI, FWS 2015).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LT with Critical Habitat (USDI, FWS 1987)

STATE STATUS: Highly Safeguarded (ARS, ANPL 2016)
[Highly Safeguarded (ARS, ANPL 1993, 1999)]

OTHER STATUS: Group 3 (NNDFW, NESL 2008)
[Group 4 (NNFWD, NESL 2000)]
Bureau of Land Management Sensitive (USDI, BLM AZ 2017)

MANAGEMENT FACTORS: The species' sand dune habitat is very fragile and is threatened by off-highway vehicle (OHV) activity, drought, and to a lesser extent herbivory and trampling by livestock.

The 5-Year review of the species concluded that the threat of OHVs to Welsh's milkweed is moderate. OHV use has decreased in recent years at the Coral Pink Sand Dunes area, and studies are inconclusive as to whether or not OHV use is detrimental to the existing population. Additionally, OHV use is not a concern at the seven other known sites (USFWS 2015). The threat to this species from livestock, both from grazing and trampling, is considered low.

PROTECTIVE MEASURES TAKEN: OHV closure areas have been established on 572 acres of BLM administered portions of the Coral Pink Sand Dunes, and 312 acres encompassing the entirety of the known Sand Hills population. The BLM has monitored Coral Pink Sand Dune populations since 1989, with a new monitoring protocol implemented in 2011 to account for movement of dunes and milkweed stands on the dunes (RMER 2011). The additional five populations discovered since 1992 are inconsistently surveyed (USFWS 2015).

SUGGESTED PROJECTS: Seed germination protocol has been determined, but cultivation for more than 2 years has been problematic. Further cultivation trials are needed. In addition, the possibility of creating new dune habitat adjacent to occupied habitat could be explored.

In 2015, the results of a 5-year review identified projects for both surveys/monitoring and research. Specifically, a complete survey of the Comb Ridge and Tuba City populations is suggested, as large populations found at these sites could warrant future delisting of the species. The 5-year review also recommended that the Fish and Wildlife Service revise the Recovery Plan, as additional populations, threats, and species knowledge have emerged since the time of listing. Additionally, the current Recovery Plan does not provide measurable recovery criteria, which is essential in order to determine if a species has met delisting criteria. Revising the Recovery Plan with measurable criteria is therefore necessary.

Several facets of this species' life history are still unknown (USDI, FWS 2015). The breeding biology, pollinators, and pollinating mechanisms need further study. When and why Welsh's milkweed reproduces sexual versus asexually is in need of study. Seedling recruitment, seed dispersal mechanisms, and further genetic studies are all good candidates for investigation.

A standardized survey protocol needs to be created, in order to make comparisons between populations, and time, meaningful.

LAND MANAGEMENT/OWNERSHIP: BIA – Navajo Nation; BLM – Arizona Strip Field Office.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

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ADDITIONAL INFORMATION:

The Utah Endangered Threatened and Sensitive Plant Field Guide states ... "Recognized by the large seeds 20 mm long)..." This is in contradiction to Holmgren and Holmgren who give the size of the seed as 1.2 mm.

Revised: 1994 07-11 (DBI)
1994-07-12 (BGP)
2003-08-21 (SMS)
2005-09-09 (SMS)
2021-01-05 (TME)