PETITION TO LIST

HOLMGREN'S MILKVETCH
(Astragalus holmgreniorum* Barneby*)

AND

SHIVWITS MILKVETCH
(Astragalus ampullarioides (*Welsh) Welsh*)

AS
FEDERALLY ENDANGERED SPECIES

April, 1999

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Presented to:

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PETITION

This is a formal petition to list Holmgren's and Shivwits milkvetches (*Astragalus holmgreniorum* and *A. ampullarioides*, respectively) as endangered pursuant to the Endangered Species Act, 16 U.S.C. 1531 et seq. (ESA). This petition is filed under U.S.C. 553(e) and 50 CFR 424.14 (1997) which grants interested parties the right to petition for issuance of a rule from the Secretary of Interior.

Petitioners request Critical Habitat be designated concurrent with the listing, pursuant to 50 CFR 424.12 and the Administrative Procedures Act (5 U.S.C. 553).

PETITIONERS

The Southwest Center for Biological Diversity is a non-profit public interest organization dedicated to protecting the diverse life forms of the American Southwest and northern Mexico.

SUMMARY

Holmgren's and Shivwits milkvetches are two of the rarest plants in Utah. Although they do not occur directly together, they are both endemic to specific geologic substrates found only within a localized area of southwestern Utah and adjacent northwestern Arizona. Both species are rare by virtue of their limited distribution and low population numbers. As such, both species are extremely vulnerable to natural and human-caused threats.

The small area where they are found near St. George, Utah is rapidly being developed to accommodate one of the fastest growing counties in the United States. Both plant species are threatened primarily by urban development on state and private lands. Further urbanization is being facilitated by land exchanges with the BLM.

Concomitant with the increased human population in the area, comes basic infrastructure, power transmission lines, new highways etc. all of which are threats to one or both of these rare plant species. Increased development has also resulted in heavy recreation demands, as seen by the increase in off-road vehicle impacts, and introduced weeds. Gypsum mining and livestock grazing are also threats to some populations.

Sufficient losses of both plants and habitat to date, make it clear that present mechanisms to conserve these two species and their habitats are not effective. Listing under the ESA is therefore urgently needed before additional losses are incurred, and more populations are fragmented, diminished or otherwise destroyed.

TAXONOMY

Order:	Fabales
Family:	Fabaceae
Synonomy:	Papilionaceae, Leguminosae
Subfamily:	Papilionoideae (in Leguminosae)
Genus:	*Astragalus*
Species:	*holmgreniorum*

Synonomy: none

Astragalus holmgreniorum was first collected as a scientific specimen in 1941 by Melvin Ogden. Rupert Barneby and Noel and Patricia Holmgren's rediscovered the species in 1979. Barneby (1980) recognized the species as a unique taxon and named it after its co-discoverers. He also dubbed it "paradox milkvetch" in the most recent treatment (Barneby 1989) but that common name has not been used much by modern botanists.

Species: *ampullarioides*
Synonomy: *A. eremiticus* var. *ampullarioides*

Astragalus ampullarioides (Shem or Shivwits milkvetch) was first discovered by Duane Atwood in 1976 from near Shem, Utah on the Shivwits Indian Reservation. Welsh (1986) described the taxon and named it for its similarities to *A.*. *ampullarius* but Barneby (1989) later included it within the concept of *A. eremiticus.* In a recent treatment, Welsh (1998) reexamined specimens and their relationship to *A. eremiticus* and concluded it should be recognized at the species level, thus changing its name to the current form.

Nomenclature for the genus used herein follows Barneby (1989), as well as his previous works (e.g. 1964) and subsequent additions by Welsh (1990 and 1998).

DESCRIPTION

TECHNICAL:

Astragalus holmgreniorum was described by Barneby (1989) as follows: Dwarf, tufted, strictly acaulescent, perennial herb, except for yellowish-green upper face of leaflets, stipules and pods pilose throughout with fine, spreading, basifixed hairs; stipules imbricate on root-crown petiolar-cauline, free, the lanceolate or lance-attenuate free blades membranous becoming papery, 3-8 mm long; leaves mostly appressed to ground, 4-13 (15) cm long; leaflets (5) 9-15 (17), broadly obovate - emarginate to obcordate, up to 8 - 16 mm long; peduncles scapiform, 2 -8.5 cm long, early procumbent; racemes shortly (4) 6- to 16- flowered, the flowers widely ascending, the axis in fruit 0.4 - 3.5 cm long; fruiting pedicels persistent; calyx 10.5 - 12.5 mm long, white pilose, the cylindric tube 8-9.5 mm long, broadly subulate teeth 2-3 mm long; petals purple, the gently recurved banner 21.5 - 23.5 mm long, the wings 3-4 mm shorter, the obtuse keel 16.5 - 18 mm long; ovary glabrous; ovules 30-34; pod ascending, humistrate, disjointing from receptacles, in profile shallowly lunate-elliptic, (25) 30-50 (55) x 6.5 -9 mm, abruptly obtuse at base, contracted distally into a triangular-acuminulate, unilocular beak, otherwise trigonously compressed, carinate by the gently concave, ventral structure, openly sulcate dorsally, the lateral faces low-convex or almost plain, the lateral angles obtuse, the lustrous, green or purplish brown, thinly fleshy valves becoming coriaceous stramineous inflexed as a complete septum 3 - 4 mm wide; dehiscence both apical and basal, after falling, the valves gaping to release the seeds.

NON-TECHNICAL

Holmgren's milkvetch is a small, tufted, perennial herbaceous plant that occupies warm desert areas. It has no stem and the pinnately compound leaves arise directly from the root crown. The leaves are appressed to the ground 4-13 cm. (1.5 to 5.1 inches) long with, commonly, 9 to 15 leaflets. The leaflets are 0.8 to 1.6 cm. (0.3 to 0.6 inches) long and broadly obovate in shape. *A. holmgreniorum* flowers are pink-purple, 1.8 to 2.4 cm. (0.7 to 0.9 inch) long, and have the distinctive papilionaceous legume flower shape. Usually there are six to sixteen flowers in a raceme (stalk-like) inflorescence approximately 2 to 8.5 cm (0.8 to 3.6 inches) long. The fruit is a bilocular pod commonly 3 to 5 cm (1.2 to 2 inches) long and half as wide. The infloresence is erect during anthesis and prostrate with the leaves when in fruit (Barneby 1980, 1989, Welsh et. al. 1987).

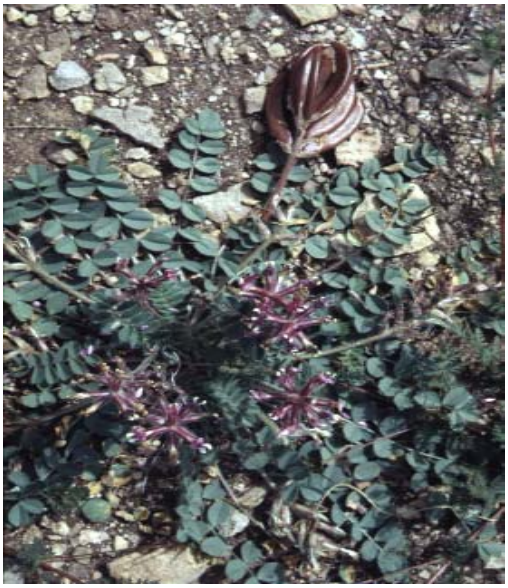

Figure 1. ***Astragalus holmgreniorum*** **in flower and showing previous years fruits. Photo courtesy R. Van Buren.**

TECHNICAL:

Astragalus ampullarioides was described by Welsh (1998) as follows: Moderate, caulescent perennial, 20-63 cm tall, from a branching subterraneal caudex. Pubescence thinly strigulose, basifixed. Stems decumbent to erect, buried for a space of 2-10 cm. Stipules 3-9 mm long, all distinct. Leaves 5-22 cm long: leaflets 13-21 4-24 mm long, 3-17 mm wide, ovate to obovate, lanceolate, or elliptic obtuse to retuse, stringose (along veins) beneath, ciliate, glabrous above.Peduncles (4) 9-23 cm long: racemes (15) 20- to 40- flowered, the flowers ascending anthesis, the axis (4) 10-16 cm long in fruit: bracts 1.5-4 mm long; pedicels 0.7-3.5 mm long; bracteoles 0-2. Calyx 5-6 mm long, the tube 4-5 mm long, short-cylindric, strigose the teeth 0.5-0.9 (1.2) mm, triangular to subulate. Flowers (11) 14-18 mm long, ochroleucous, the keel immaculate, the banner recurved through ca 25 deg. Pods erect, slenderly stipitate, the stipe 7-15 mm long, the body ovoid to ellipsoid, inflated, papery, 12-18 mm long 8-10 (12) mm thick obcompressed glabrous, essentially unilocular, the septum to ca 0.2 mm wide.

NON-TECHNICAL:

Shivwits milkvetch is a perennial herbaceous plant, with decumbent stems commonly 20 to 50 cm (8 to 20 inches) tall sometimes up to 1 meter (40 inches) tall arising from a subterranean caudex. The leaves are pinnately compound 4 to 18 cm (1.6 to 7.1 inches) long with elliptical leaflets. Flowers are ochroleucous (yellow-white), about 2 cm (0.8 inch) long, and have the distinctive papilionaceous legume flower.

The fruit is a short, broad, long-stipitate bilocular pod (0.8 to 1.5 cm (0.3 to 0.6 inches) long and 0.6 to 1.2 cm (0.2 to 0.5 inches) wide. *A. ampullarioides* commonly has up to 45 flowers in a raceme inflorescence which are borne on a peduncle up to 21 cm (8.5 inches) long.

Figure 2. ***Astragalus ampullarioides*** **in flower. Photo courtesy R. Van Buren.**

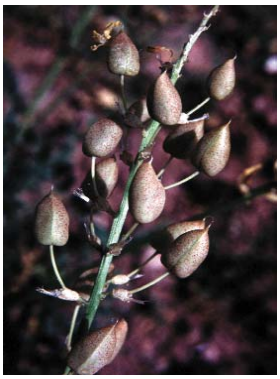

Figure 3. *Astragalus ampullarioides* fruits. Photo courtesy R. Van Buren.

HABITAT

Holmgren's milkvetch is known to occur in drainages within gravelly clay hills at the upper edge of the creosote (Larrea) zone at about 820-850 m (Barneby, 1989). Associated soils are shallow and sparsely vegetated. They are primarily derived from the Virgin Limestone member of the Moenkopi formation, although at least one occurrence is known on Chinle Shale (Stubben 1997). Harper (1997) reported two occurrences are located on the Upper Redbed of the Moenkopi Formation.

Habitat for Holmgren's milkvetch is characterized as having an average of less than 15% vegetative cover (Van Buren pers.comm.). According to Harper (1997), Holmgren's milkvetch always occurs with two shrub species: *Acamptopappus sphaerocephalus* (golden-head) and *Lycium andersonii* (wolfberry). Other plant species commonly associated include *Atriplex confertifolia (*saltbush*), Ambrosia (Fransera) dumosa* (bur-sage), *Ceratoides lanata (*winterfat), *Coleogyne ramosissima* (blackbrush), *Ephedra torreyeana* (Mormon-tea*), Grayia spinosa* (hop-sage), and *Hilaria jamesi* and *H. rigida* (galleta grasses).

According to Van Buren (pers. comm.), exotic aggressive annual plants are actually the most closely associated species to both Holmgren's and Shivwits milkvetches. These include: *Bromus rubens* (red brome), *Bromus tectorum* (cheatgrass), *Malcomia africana* (malcomia), and *Erodium circutarium* (filaree). Each of these introduced species is indicative of early seral, recently disturbed sites.

Shivwits milkvetch is found exclusively on clays derived from the Chinle Formation. These are gypsiferous substrates on the Chinle formation surrounded by creosote bush and juniper communities at about 1050-1150 m elevation.

This is an unusual and harsh environment that few plant species can tolerate. The substrate is high in clay minerals that expand greatly on wetting and shrink in equal proportions on drying. It is an