

## MANCOS MILKVETCH

*Astragalus humillimus* A. Gray  
Plant Symbol = ASHU

Contributed by: USDA NRCS Colorado Plant  
Materials Program



Figure 1: Mancos milkvetch (*Astragalus humillimus*). Photo ©Al Schneider, Plants Database and [www.swcoloradowildflowers.com](http://www.swcoloradowildflowers.com), used with permission.

### Alternate Names

*Tragacantha humillima* (A. Gray) O. Kuntze  
*Phaca humillima* (A. Gray) Rydberg

### Uses

Mancos milkvetch (*Astragalus humillimus*) was first described by Asa Gray and collected by Townshend Brandegee in 1876; “humillimus” means “very humble.” The attractive and sweet-smelling flowers of Mancos milkvetch are frequented by a variety of pollinators including members of the bee family, *Osmia titusi* and *O. sculleni*, as well as by honey bees. Butterflies are also often seen resting on the fragrant plant when it is in bloom. It has no known agricultural, economic, or other human uses at this time.

### Status

After first being discovered and known only from a single collection in 1875, Mancos milkvetch was rediscovered near Farmington, New Mexico in 1980 (Center for Plant Conservation, 2011). Mancos milkvetch was listed as endangered without critical habitat throughout its range by the U.S. Fish and

Wildlife Service (USFWS) in 1985. In July 2011, the USFWS completed a 5-year status review which reports that, from 1985 to 2008, the number of known individuals decreased from ~ 7,600 to less than 400. USFWS recommends changing the recovery priority status to “high degree of threat and low recovery potential with some conflict” (with development), based on genetic research showing low fecundity of the species in conjunction with its limited micro-habitat, and the isolated and restricted distribution of known populations. The NatureServe conservation status rank, an international effort which ranks species on their “global” status, ranks Mancos milkvetch as G1/S1- critically imperiled globally and statewide, because its extreme rarity makes it especially vulnerable to extinction (NatureServe, 2011).

### Description

#### General:

Pea family (Fabaceae). Mancos milkvetch is a diminutive, low-growing, tufted perennial sub-shrub growing in clumps up to 12 inches (in) (30 centimeters [cm] across, with a dense crown of persistent spiny leaf stalks (Figure 1). No other mat-forming *Astragalus* species has persistent, sub-spinescent petioles (Barneby, 1964). Stems are up to 0.4 in (1 cm) long and are crowded with matted leaves up to 1.6 in (4 cm) long, which are made up of several oval or nearly rounded leaflets no more than 0.1 in (2 millimeters [mm]) long. Flower branches support 1 to 3 lavender/purplish flowers with a conspicuous lighter-colored spot in the throat of the corolla tube (USFWS, 1989). The pods are egg-shaped and laterally compressed measuring about 0.2 in (4.5 mm) long and 0.1 in (2 mm) wide. Flowering occurs in late April and early May.

#### Distribution:

Mancos milkvetch is a narrow endemic known only from the Four Corners region of the southwestern United States. Its known global distribution includes 13 sites, including 3 sites from Colorado in Montezuma County and 10 sites from New Mexico, in San Juan County. The known populations occur on lands owned or managed by the Navajo Nation, Bureau of Land Management, State of New Mexico, and the Ute Mountain Utes. Please consult the USFWS website for a map of the species occurrence at [www.fws.gov](http://www.fws.gov).

For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

#### *Habitat:*

Mancos milkvetch grows within piñon-juniper woodland and desert scrub communities, with populations occurring in the Colorado Plateau subdivision of the Great Basin Desert of northwestern New Mexico and southwestern Colorado (Dick-Peddie, 1993). Common plant associates include: scabrous bristlebush (*Brickellia microphyla* var. *scabra*), single leaf ash (*Fraxinus anomala*), small leaf mohogany (*Cercocarpus intricatus*), and rosy ipomopsis (*Ipomopsis roseata*). Potential habitat corresponds to rimrock outcrops of the Point Lookout and Cliffhouse members of the Mesa Verde sandstone series with flat or gently sloping surfaces (Figure 2), (USFWS, 1989).

#### **Adaptation**

Mancos milkvetch is adapted to occur within a 10-mile wide section of a narrow band of Mesozoic sandstone derived from the Hogback geologic formation (USFWS, 1989). Occupied habitat is confined to large sheets of exfoliating sandstone substrate ledges and mesa tops where plants grow in cracks or shallow bowl-like depressions (tinajas) that accumulate sandy soils and rainfall at 5,650 feet, (1,854 meters) in elevation (USFWS, 1989 and New Mexico State Forestry Division, 2008). This species occurs within an average annual precipitation range of 5-10 inches (12-25 cm).



Figure 2: Mancos milkvetch (*Astragalus humillimus*) habitat, photo © Steve O’Kane, used with permission.

#### **Establishment**

Seed germination trials conducted by the Arboretum at Flagstaff have shown that this species is difficult to establish from seed and difficult to keep in cultivation as it is sensitive to over or under-watering. Reduced fitness expressed in low fecundity is commonly found in plants of the genus *Astragalus* where many species persist in small, highly restricted populations which are endemic to particular geologic formations (Karron, 1989). Allphin et al, (2005) reported low fecundity of Mancos milkvetch appears to be due to inbreeding depression.

#### **Management**

Mancos milkvetch is threatened by surface disturbance activities associated with energy exploration and development and transmission line construction and maintenance, as well as recreational off-highway vehicle (OHV) use. The plants’ habitat occurs in areas of active oil and gas development. Nearly all known and potential habitat may be affected by natural gas or oil exploration and development. Most damage occurs after vehicles and heavy equipment drive over and crush individual plants as well as break apart sandstone areas that contain tinajas, which are a requirement for Mancos milkvetch establishment.

#### **Pests and Potential Problems**

Spider mite insect infestations have been noted to cause mortality, especially when the plants are already stressed by drought (USFWS, 1989). Spider mites have been documented to entirely cover mature plant clumps, causing injured leaves to be shed and contributing to the plants mortality. Even minor spider mite infestations could potentially have a significant impact on the plants health. Larval bruchine beetles of the genus *Acanthoscelides* may also feed upon Mancos milkvetch seeds as evidenced by pin-sized emergence holes on the seed pods (Cane, 2011 personal communication).

#### **Environmental Concerns**

The decrease in population numbers of Mancos milkvetch is thought to be due to several notable drought periods of the recent past. The resulting long-term effects on the population numbers of Mancos milkvetch may not be entirely evident for several years to come. Some recovery with new seedlings has occurred but appears to be triggered by both adult mortality and increased moisture events (USFWS, 2011).

#### **Seeds and Plant Production**

Mancos milkvetch is likely to be mycorrhizal (Haskins and Murray, 2009) and is likely a symbiotic dinitrogen fixer with Rhizobium bacteria, as nearly all *Astragalus* species are (Paschke, 2011 personal communication). Mancos milkvetch plants produce viable fruit by outcrossing and self-pollination

(Tepedino, 2002). Each fruit of Mancos milkvetch produces 4 to 9 seeds in its egg-shaped pods. It takes two growing seasons for seedlings to mature, with flowering usually the third and fourth year compared to other species of *Astragalus*, which generally take one growing season to bloom.

## References

- Allphin, L, N. Brian and T. Matheson. 2005. Reproductive success and genetic divergence among varieties of the rare and endangered *Astragalus cremnophylax* (Fabaceae) from Arizona, USA. *Conservation Genetics* 6:803-821.
- Barneby, R.C. 1964. Atlas of North American *Astragalus*. Bronx, New York: New York Botanical Garden. 1188p.
- Cane, J.H. 2011 Personal Communication. Center for Plant Conservation. USDA-ARS Pollinating Insect Research Lab, Utah State University, Logan, UT.,  
Center for Plant Conservation (CPC).  
<http://www.centerforplantconservation.org/>.  
[http://www.centerforplantconservation.org/Collection/CPC\\_ViewProfile.asp?CPCNum=414](http://www.centerforplantconservation.org/Collection/CPC_ViewProfile.asp?CPCNum=414). Accessed September 2011.
- Dick-Peddie, W. 1993. *New Mexico Vegetation*. University of New Mexico Press, Albuquerque, New Mexico.
- Haskins, K. and S. Murray. 2009. Ecological study and comparison of two rare *Astragalus* species – final report. The Arboretum at Flagstaff, Arizona.
- Karron, J.D. 1989. Breeding systems and levels of inbreeding depression geographically restricted and widespread species of *Astragalus* (Fabaceae). *American Journal of Botany* 76:331-340.
- NatureServe. (2011). NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: September 25, 2011 ).
- New Mexico Rare Plants:  
[http://nmrareplants.unm.edu/rarelist\\_single.php?SpeciesID=25](http://nmrareplants.unm.edu/rarelist_single.php?SpeciesID=25). Accessed September 2011.
- New Mexico State Forestry Division (State of New Mexico). 2008. Population studies of Mancos milkvetch (*Astragalus humillimus*: Fabaceae) in San Juan County, New Mexico from 1988 to 2008. R. Sivinski, author. New Mexico Energy, Minerals, and Natural Resources Department, Santa Fe, New Mexico.
- O'Kane, S. L. 1988. Colorado's Rare Flora. *Great Basin Naturalist*. 48(4):434-484.
- O'Kane, S.L. Jr. 2011. © Photo Figure 2, used with permission.
- Paschke, Mark. 2011. Personal Communications. Warner College of Natural Resources, Colorado State University, Fort Collins, CO.
- Schneider, Al. 2011. © Photo Figure 1. Used with permission. Plants Database and [www.swcoloradowildflowers.com](http://www.swcoloradowildflowers.com). Accessed September 2011.
- Tepedino, V.J. 2002. The reproductive biology of rare rangeland plants and their vulnerability to insecticides. In: Cunningham, G.L., Sampson, M.W., tech. cords. 1996. Grasshopper integrated pest management user handbook. Tech. Bull. 1809. Washington, DC: US Department of Agriculture, Animal and Plant Health Inspection Service.
- U.S. Fish and Wildlife Service. June 27, 1985 Final rule to determine *Astragalus humillimus* to be endangered. Federal Register.
- U.S. Fish and Wildlife Service. 1989. Mancos milkvetch (*Astragalus humillimus*) recovery plan. P. Knight and D. House, authors. New Mexico Ecological Services Field Office, Albuquerque, NM.
- U.S. Fish and Wildlife Service. 2011. Mancos Milkvetch(*Astragalushumillimus*)5-Year Review Summary and Evaluation.
- Watrous, K.M. and Cane, J.H. 2011. Breeding Biology of Threadstalk Milkvetch, *Astragalus filipes* (Fabaceae), with a Review of the Genus. *The American Midland Naturalist*, 165(2):225-240.

## Acknowledgements:

Thank you for editorial and photo contributions from:

- Anderson, David and the Botany Team. Colorado Natural Heritage Program, CSU, Fort Collins, CO.
- Denver Botanic Gardens Herbarium, Denver, CO.
- Cane, Jim. USDA-ARS Pollinating Insect Research Lab Utah State University, Logan, UT.
- Lederer, N. University of Colorado Herbarium, Boulder, CO.
- Nelson, E. Rocky Mountain Herbarium. University of Wyoming, Laramie, WY.
- O'Kane, Steve L. Jr. University of Northern Iowa, Cedar Falls, IA.
- Paschke, Mark . Warner College of Natural Resources, Colorado State University, Fort Collins, CO.
- Schneider, Al. Plants Database and [www.swcoloradowildflowers.com](http://www.swcoloradowildflowers.com)
- U.S. Fish and Wildlife Service, New Mexico and Colorado.

**Prepared By:**

Christine Taliga, USDA NRCS Colorado State  
Office, Denver, CO.

**Citation**

Taliga, Christine E., 2011. Plant Guide for Mancos  
milkvetch (*Astragalus humillimus*). USDA-Natural  
Resources Conservation Service, Colorado State  
Office. Denver, CO 80225-0426.

Published *September, 2011*

Edited: 18Sep2011 cet, 18Sep2011 slo;  
19Sep2011jsj; 20Sep2011jab; 23Sep2011cga

For more information about this and other plants,  
please contact your local NRCS field office or  
Conservation District at <http://www.nrcs.usda.gov/>  
and visit the PLANTS Web site at  
<http://plants.usda.gov/> or the Plant Materials Program  
Web site <http://plant-materials.nrcs.usda.gov>  
PLANTS is not responsible for the content or  
availability of other Web sites