

MISSOURI BLADDERPOD

Species and Habitat Description

Missouri bladderpod (*Physaria filiformis*) is a winter annual, with rosettes forming in late fall and early winter and blooming the following spring, usually beginning in April and lasting until May depending on local available soil moisture. Plants typically senesce in Arkansas by mid-June, and there is little or no visible evidence of their presence by mid-summer. The species can be identified by its bright yellow flowers with four petals, spherical fruit, and densely hairy stems (Yatskievych, 2006). Plants have erect, hairy stems 20 cm in height that branch from the plant's base. Basal leaves are hairy on both surfaces, 1.0-2.25 cm long, 0.3-1.0 cm wide, broadly rounded, and tapered to a narrow petiole. Stem leaves are densely hairy on both surfaces, 1.0 to 3.2 cm long, 1.6-16 mm wide, and have a silvery-gray appearance. Fruits are two-seeded capsules, 3-4 mm long, and without a stalk above the attachment point of the perianth. (U.S. Fish & Wildlife Service 2003; Yatskievych 2006).

Missouri bladderpod is primarily found on open glades formed over dolomite and limestone bedrock in the Ozark Plateau and in shale barrens in the Ouachita Mountains. All the known sites in Arkansas contain treeless zones with very thin soil and exposed bedrock surrounded by open woodlands with varying degrees of cedar and other woody plant encroachment. All known sites in the Ozarks have been partially invaded by Eastern Red Cedar (*Juniperus virginiana*) and can include common associate species such as Nuttall's Death Camas (*Toxicoscordion nuttallii*), Ozark Cornsalad (*Valerianella ozarkana*), Bluestar (*Amsonia ciliata*), Ozark Bluestar (*Amsonia illustris*), Crawe's Sedge (*Carex crawei*), Limestone Adder's-tongue Fern (*Ophioglossum engelmannii*), Pitcher's Stitchwort (*Minuartia patula*), Buck Brush (*Andrachne phyllanthoides*), Purple Cliffbrake (*Pellaea atropurpurea*), Shaggy Dwarf Morning Glory (*Evolvulus nuttallianus*), Prairie Turnip (*Pedimelum esculentum*), Englemann's Milkvetch (*Astragalus distortus* var. *engelmannii*), Slender Rock Cress (*Arabis hirsuta* var. *adpressipilis*), and Trelease's Larkspur (*Delphinium treleasei*).

All known Ouachita Mountain sites occur on Mississippian and Ordovician shales with interbedded limestones (Womble, Mazarn, and Stanley Formations) (McFarland 2004). These sites are flat to gently sloping and are characterized by areas of exposed shale bedrock and/or areas of bare shale residuum surrounded by areas of very thin, shale-derived soils. These areas are typically moist in winter and spring and very dry in summer. As with the Ozark glades, these sites are susceptible to encroachment by eastern red cedar. In the Ouachita sites, common associates include Nuttall's Cornsalad (*Valerianella nuttallii*), Longtube Cornsalad (*Valerianella longiflora*), Claspig Jewelflower (*Streptanthus maculatus* ssp. *obtusifolius*), Buck Brush (*Andrachne phyllanthoides*), Wedgeleaf Spurge (*Euphorbia longicruris*), Meadow Garlic (*Allium canadense* var. *mobile*), Ozark Calamint (*Calamintha arkansana*), Hairy Lip Fern (*Cheilanthes lanosa*), Golden Selenia (*Selenia aurea*), Englemann's Milkvetch (*Astragalus distortus* var. *engelmannii*), Pitcher's Stitchwort (*Minuartia patula*), Opengound Draba (*Draba aprica*), Fameflower (*Phemeranthus (Talinum) calycinus*), Wild Hyacinth (*Camassia scilloides*), and Slimpod Venus' Looking-glass (*Triodanis leptocarpus*).

SPECIES PROTECTIVE MEASURES

Construction of Transmission Lines

Above Ground Activities

If a glade that provides suitable habitat for Missouri bladderpod is discovered during the blooming season (April 1st to June 15th), the project proponent will first attempt to avoid the glade by altering the route of the project. If the route cannot be altered, the project will be designed in a fashion that will span the glade.

Below Ground Activities

If a glade that provides suitable habitat for Missouri bladderpod is discovered during the blooming season (April 1st to June 15th), the project proponent will avoid the glade by altering the route of the project.

Habitat Management Activities

Many glades have a pronounced hydro-xeric hydrologic cycle, with soils that are saturated in winter and spring and extremely dry in summer and early fall. To minimize soil disturbance, use of heavy equipment, including ATVs, should be limited and restricted to dry times of the year (i.e. summer and early fall) (Witsell 2008). Use of heavy equipment, and even excessive foot traffic, when thin glade soils are soft and wet, may cause unwanted disturbance or damage to a site and increase the risk of invasion by non-native invasive plant species.

Mechanical Removal of Woody Vegetation

Mechanical control of woody vegetation should occur outside the blooming season (April 1st to June 15th) and should target larger (>40cm dbh) woody species. Felled cedars should be either piled and burned or removed from glade openings to prevent establishment of non-native invasive plant species from growing beneath them (Witsell 2008).

Mowing, Grazing, Prescribed Burning

These habitat management activities can benefit Missouri bladderpod as long as mowing and prescribed burning occur outside the blooming season (April 1st to June 15th) and soil disturbance associated with grazing is moderate (Witsell 2008).

Herbicide Application

Application of target-specific herbicide, e.g., legume-specific herbicide to target species, e.g., *Sericea lespedeza*, should occur outside the blooming season (April 1st to June 15th). Application of non-specific herbicides should be avoided from October to July in known/occupied Missouri bladderpod habitat (U.S. Fish & Wildlife Service 2003). Small infestations of brome, cheatgrass, or spotted knapweed may be controlled by pulling the young plants up by the roots.

Literature Cited

- U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; reclassification of *Lesquerella filiformis* (Missouri Bladderpod) from endangered to threatened. Federal Register 68(111): 34569-34576.
- Witsell, T. 2008. Management Plan for Missouri Bladderpod (*physaria filoformis*) in Arkansas and Recently Discovered New Populations in Arkansas. Unpublished report submitted to U. S. Fish and Wildlife Service. Arkansas Natural Heritage Commission, Little Rock, Arkansas.

Dichotomous Key to Aid in Making a Determination

1. Is the project in or near an open glade? If yes, then proceed to 2. If no, then this project will have no effect to Missouri bladderpod.
2. Is suitable habitat present? If yes, then proceed to 3. If no, then this project will have no effect to Missouri bladderpod.
3. Will the project proponent implement species protective measures as provided on previous page? If yes, then a “may affect, not likely to adversely affect” determination may be appropriate. If no, then proceed to 4.
4. Has the project site been surveyed for Missouri bladderpod? If yes, then proceed to 5. If no, then your project “may affect” this species, therefore we recommend consulting with the Arkansas Ecological Service Field Office.
5. Is Missouri Bladderpod present on the site? If yes, then your project “may affect” this species, therefore we recommend consulting with the Arkansas Ecological Service Field Office. If no, then a “may affect, not likely to adversely affect” determination may be appropriate.