

Verbascum Thapsus
Wooly Mullein, Common Mullein

Kimberly Bauer, edited by Alison Foster
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History

Verbascum thapsus, more commonly referred to as wooly mullein or common mullein, has been recognized and treated as an invasive species in Rocky Mountain National Park (ROMO) since 1969. While treatment of wooly mullein began recently in the park, the species has a long history in the United States. Some reports note that wooly mullein was spotted in Boulder County, Colorado as early as 1905. Others report early settlers in the eastern US bringing mullein seeds over before the Revolutionary War as an agent to poison fish for easier fishing practices. It was also sought after for its medicinal properties. Reports note that, when consumed, the plant can help deter digestive issues such as nausea and diarrhea. With such a seemingly practical application for the plant, wooly mullein's popularity as a commodity only exacerbated its early spread across the US, reaching Hawaii in the early 1930s and Alaska in the 1960s. Exactly how wooly mullein traveled across the US landscape is not well known, but many have surmised that settlers and Native Americans aided in its dissemination through trade and other exchanges. Though the plant is widespread, it is currently only considered a noxious invasive exotic in two states, Colorado and Hawaii. ROMO's past management focuses on manual control; a tactic still considered the best approach today.¹



Figure 1. Wooly mullein.
Source: US Department of Agriculture PLANTS database, Available from US Department of Agriculture PLANTS, http://plants.usda.gov/java/largeImage?imageID=veth_010_avp.tif, accessed July 2014.

Biological Concerns

Wooly mullein reproduces only through seed, although the great quantity of seed it produces allows it to develop a substantial seed bank. Seeds can also lay dormant in the soil for 100 years and still retain the ability to germinate. Additionally, “[m]ullein seeds are able to germinate over a wide range of environmental conditions, requiring only moisture and exposure to light to germinate.” This biological versatility allows wooly mullein to colonize a variety of disturbed landscapes, making preventative management of the species challenging. Adding to this concern is the number of seeds that a single plant can expel, with many estimates placing the seed count at over 100,000 seeds per plant. While that number is high, the seeds themselves generally are not expelled very far from the parent plant, most falling within a five meter radius. biological aspects provide an advantage in management, however, as it is easily spotted, relatively easy to remove from the ground, and seeds in its second year, allowing land managers more time before it is a serious concern.²

Management Strategies

Unlike some other invasive species which cannot be pulled by hand due to their allelopathic and rhizomatous properties, wooly mullein only spreads through seeds produced in its second year.

The primary method of mechanical control involves removal of the entire plant including its root by either hand pulling or digging. The roots of woolly mullein are shallow and typically easy to pull by hand. Manual control has been the only treatment method used for woolly mullein in ROMO, and park managers have reported success in manual removal. They state that initial manual treatment needs to be intensive, but in following years spot treatment is all that is required throughout the season. Other mechanical treatments, including prescribed burning and mowing, have been seen to be effective but require continued dedication to prohibit seedlings from flowering. Woolly mullein can be treated using herbicide. Telar (Glyphosate) is recommended for use on woolly mullein and has been seen to be effective on other species in ROMO. Grazing has been suggested as a treatment method, however, it is generally not considered a preferable method as cattle and sheep find the felt-like exterior unappealing. Biological controls for woolly mullein include the curculionid weevil (*Gymnaetron tetrum*) and mullein moth (*Cucullia verbasci*), both of which have been tested in the U.S. The curculionid weevil has been determined to be specific to mullein by the US Department of Agriculture. The larvae develop in mullein seed capsules and can destroy up to 50% of seeds through consumption. There does not appear to be much research on the mullein moth, but it is considered a relatively safe control agent due to its consistent feeding and development in mullein it consistently feeds.³

Recommendations

After reviewing the different methods of potential management, it is the author's recommendation that manual control remain the preferred control tactic in ROMO. Based on ROMO vegetation Year-End Reports, use of weevils presents the potential for unintended consequences. A weevil introduced to help fight against Canada thistle, *Larinus planus*, is now starting to be a problem within the park, thus making biological controls a less viable option. Manual removal of woolly mullein has the potential to be effective if practiced with persistence. Chemical controls are expensive and should be reserved for primary use on high priority species that require chemical treatment for eradication, such as Canada thistle. However, if it is possible to jointly treat mullein with other high priority species, this course of action is recommended. Therefore, a combination of trying to keep already disturbed areas free from further disturbance and manually pulling mullein currently reigns as the best option for woolly mullein management in ROMO.

Endnotes

¹Corey L. Gucker, "Verbascum thapsus," US Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, 2008, <http://www.fs.fed.us/database/feis/plants/forb/vertha/all.html>; Marc C. Hoshovsky, "Element Stewardship Abstract for *Verbascum thapsus*," The Nature Conservancy, 1986, <http://www.invasive.org/weedcd/pdfs/tneweeds/verbtha.pdf>; Julie Knudson, Matt Ounsworth, Michael Prowatzke, Jamie Dahlkemper, Jim Bromberg, and Brian Kolokowsky, "Rocky Mountain National Park Exotics Year-End Reports," Rocky Mountain National Park: Division of Resource Stewardship, 2000-2013; Rocky Mountain National Park, "27 Years of Exotic Plant Control in Rocky Mountain National Park: Summary and Recommendations," 1987. ²Katherine L. Gross, "Colonization by *Verbascum Thapsus* (Mullein) of an Old-Field in Michigan: Experiments on the Effects of Vegetation," *Journal of Ecology* 68, no. 3 (1980): 919; "Common Mullein: Options for Control," Lincoln County Noxious Weed Control Board, <http://www.co.lincoln.wa.us/WeedBoard/biocontrol/COMMON%20MULLEIN%20BROCHURE.pdf>; Gucker, "Verbascum thapsus;" Hoshovsky, "Element Stewardship Abstract for *Verbascum thapsus*;" Tom Remaley, "Common Mullein Fact Sheet," National Park Service Plant Conservation Alliance's Alien Plant Working Group,

2005, <http://www.nps.gov/plants/alien/fact/veth1.htm>; L. Moser and D. Crisp, "San Francisco Peaks Weed Management Area fact sheet on *Verbascum thapsus*," US Forest Service Coconino National Forest, http://sbsc.wr.usgs.gov/research/projects/swepic/factsheets/vethsf_info.pdf; William Halvorson and Patricia Guertin, "USGS Weeds in the West project: Status of Introduced Plants in Southern Arizona Parks," US Geological Survey: Southwest Biological Science Center, 2003, <http://sdrsnet.snr.arizona.edu/data/sdrs/ww/docs/verbthap.pdf>; James A. Reinartz, "Life History Variation of Common Mullein (*Verbascum Thapsus*): I. Latitudinal Differences in Population Dynamics and Timing of Reproduction," *Journal of Ecology* 72, no. 3 (1984): 897-912.
³Reinartz, 898; Gucker, "*Verbascum Thapsus*;" Hoshovsky, "Element Stewardship Abstract for *Verbascum thapsus*;" Rocky Mountain National Park, "Year-End Reports;" "*Verbascum Thapsus* L.: Common Mullein," USDA, <http://plants.usda.gov/core/profile?symbol=VETH>; Tom Remaley and Jil M. Swearingen, "Least Wanted: Common Mullein," National Park Service Plant Conservation Alliance's Alien Plant Working Group, last modified July 7, 2009, <http://www.nps.gov/plants/alien/fact/veth1.htm>; Rocky Mountain National Park, "27 Years of Exotic Plant Control in Rocky Mountain National Park: Summary and Recommendations," 1987.
