

**MONITORING MULFORD'S MILKVETCH AT CAMEL'S BACK RESERVE,  
BOISE, IDAHO**

By

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## INTRODUCTION

Mulford's milkvetch (*Astragalus mulfordiae*) is a rare plant endemic to shrub-steppe and desert shrub habitats in southwestern Idaho and adjacent eastern Oregon. Populations tend to be local in extent and contain relatively low numbers of plants. Several Mulford's milkvetch populations have been extirpated in recent years, and others reduced in size and/or quality. The main long-term conservation threats are habitat destruction due to urban and agricultural development, and large-scale habitat degradation from wildfires and the subsequent invasion of weedy species. Off-road motorized vehicles, non-motorized recreation, livestock grazing, and mining are other activities that contribute to local habitat degradation problems. Mulford's milkvetch is a high priority conservation concern in both Idaho and Oregon largely because of these ongoing habitat threats.

The Boise Foothills represent one of the three main distribution centers for Mulford's milkvetch in Idaho, with most populations in this part of its range occurring partly or fully on private land. However, one of the largest Foothills populations occurs in Camel's Back/Hulls Gulch Reserve, on land managed by the Boise Parks and Recreation Department. Due to resource damage concerns, the Parks and Recreation Department completed a series of erosion control projects at Camel's Back Reserve in 1999. Portions of the trail improvements, reroutings, and closings are located in places supporting Mulford's milkvetch. The erosion control measures are meant to benefit all of the Reserve's resources, including Mulford's milkvetch and its associated hillside and ridgetop habitat. The conservation concern and need to monitor Mulford's milkvetch at the Reserve has grown in recent years in response to the great increase in the area's popularity.

A monitoring program for Mulford's milkvetch was established at Camel's Back Reserve in the spring of 1999. It was initiated as a cooperative project between the Parks and Recreation Department and the Idaho Conservation Data Center. One of the management objectives for the Reserve is the maintenance of rare plant populations and their habitat. The purpose of this monitoring program is to help the Parks and Recreation Department assess whether or not they are meeting this objective. This initial monitoring program provides a coarse level of information regarding Mulford's milkvetch and its habitat at selected resource management project areas. It is insufficient to assess the species long-term viability in the Camel's Back/Hulls Gulch complex. A more intensive approach will be needed to answer these larger questions. This report outlines the monitoring methodology and summarizes the baseline data collected in 1999.

## METHODS

Establishing the monitoring program in 1999 was timely because it coincided with initiation of erosion control projects at Camel's Back Reserve. Data collected this year serves as the baseline for future monitoring results.

Three permanently marked monitoring sites were subjectively located along open or closed recreation trails/treads within Camel's Back Reserve (Appendix 1). The monitoring stations were labeled CB1, CB2, and CB3. Mulford's milkvetch census information was collected along each transect. Soil disturbance, weed abundance, and trail width information were also collected along the transects. Photographs were taken of the transect area to monitor habitat changes.

### Monitoring protocol

Monitoring plots were permanently marked and comprised of a single 25 m belt transect. The transect tape was placed along the margin (the distinct interface between the tread, which has little if any vegetation, and the immediately adjacent vegetated slope) of the trail/tread segment

selected for monitoring. One meter square microplots were sampled at each meter mark along the transect tape. Sampling starts at the 0 m and ends at the 24 m marks, for a total of 25 microplots/ transect. The quadrat microplot was aligned flush against the tape when sampling. Data were recorded on special monitoring forms developed for this project.

#### Census data

Density information was collected by counting every Mulford's milkvetch plant rooted within the quadrat microplot. In addition, stage class information was collected for individual Mulford's milkvetch plants sampled in the microplots. Plants were divided into three stage classes categories: (1) Reproductive stage class - all individuals with flowers and/or fruits; (2) Non-reproductive stage class - non-flowering/fruitlet individuals that were obviously not seedlings; (3) Seedlings – tiny germinants, usually less than 2 cm tall. Cotyledons were sometimes present, along with one or occasionally two pair of leaves.

#### Weeds

Exotic, invasive forbs were the primary target of this monitoring attribute. More or less naturalized species such as storksbill (*Erodium cicutarium*) and cheatgrass (*Bromus tectorum*) were not considered. The cover of weedy forbs within each microplot was estimated and assigned to one of the following cover classes:

- 0 = no weedy forbs
- 1 = <1% cover
- 2 = 1% - 10% cover
- 3 = 11% - 25% cover
- 4 = 26% - 50% cover
- 5 = >50% cover.

#### Ground disturbance

The amount of ground disturbance within each microplot was another attribute estimated along the transects. In this case, the disturbance classes reflect the percentage of ground surface within the microplot that was clearly broken, crushed, or sloughing. Ground disturbance cover class categories were as follows:

- 0 = none
- 10 = 1% - 15%
- 20 = 15% - 25%
- 30 = 25% - 35%
- 40 = 35% - 45%
- 50 = 45% - 55%
- 60 = 55% - 65%
- 70 = 65% - 75%
- 80 = 75% - 85%
- 90 = 85% - 95%
- 98 = 95% - 100%.

#### Width of trail

The width of the trail/tread was measured at three intervals along the transect – at the beginning (0 m), in the middle (13 m), and the end (24 m). The margins of the vegetation on either side of the bare ground pathway were the reference points used to delineate the trail width. This attribute will help monitor re-vegetation of closed trails and erosion control of open trails.

### Photopoints

Photopoints were established at each transect. Photographs of the general habitat along the transects will help monitor changes in plant cover, weed invasion, disturbances, and erosion patterns. Photographs were taken using a SLR camera, 50 mm lens, and color print film. Photographs are on file at the Parks and Recreation Department in Boise.

## **TRANSECT INFORMATION**

### Transect CB1

This transect was located along the upper segment of a popular open trail on the west flank of Camel's Back ridge. A new split-rail fence, a sign, and other erosion control measures were constructed in spring 1999. The transect begins (0 m mark) 152 cm at a bearing of  $150^{\circ}$  (a declination of  $18^{\circ}$  used for all compass bearings) from the ninth fencepost (the most downhill post in 1999) downhill from the top of the ridge where the fence project begins. This wooden fencepost serves as the permanent marker for the transect. The transect bearing was  $197^{\circ}$ , with the tape laid along the uphill margin of the trail. Microplots were read on the uphill side of the transect tape. We sampled 27 m for this transect to capture a relatively dense cluster of Mulford's milkvetch plants just beyond the 25 m mark.

The fencepost marker also serves as the photopoint reference marker. Three photographs were taken: 1) facing downtrail along the transect; 2) facing uptrail in the opposite direction of the transect; 3) from the transect's 25 m mark, looking back uptrail along the transect.

### Transect CB2

This transect was located along the upper segment of a trail that Parks and Recreation closed in spring 1999. A split-rail fence was constructed at the top of the very steep spur ridge to discourage people from using the tread. The transect starts at the base of the third fencepost, counting from the east. This fencepost serves as the transect's permanent marker. The transect runs downhill at a bearing of  $186^{\circ}$ , parallel to the slope along the tread margin. It intersects an erosion berm that bisects the trail part way down the tread. Microplots were sampled on alternating sides of the transect tape. Even meter numbers were read on the left-hand side, and odd numbers on the right-hand side facing downhill. Stations 19, 21, and 23 passed through the middle of the tread (bare ground).

The fencepost marker also serves as the photopoint reference point. Three photographs were taken: 1) facing downtrail along the transect; 2) facing uptrail in the opposite direction of the transect; 3) from the transect's 25 m mark, looking back uptrail along the transect to the fencepost marker.

### Transect CB3

This transect was placed along an old tread that was closed several years ago, although it continues to receive limited use. The tread has a concave shape, with the middle of the tread averaging about 25 cm below the level of the adjacent vegetated slope. Scattered clumps of needle-and-thread grass and a few native forb species (including Mulford's milkvetch) are reestablishing in the tread. The transect is located uphill of a main open trail that traverses the eastern slope of Camel's Back ridge. The beginning of the transect is permanently marked by a piece of painted rebar hammered flush with the ground. The stake is positioned 1.5 m at a  $188^{\circ}$  bearing from the wooden signpost indicating the tread is closed. It is also 8.2 m at a  $90^{\circ}$  bearing from the stake to the end post of a nearby split-rail fence originally constructed to protect Mulford's milkvetch plants in the area. The transect runs uphill, parallel to the slope at  $298^{\circ}$ ,

along the north (right-hand side when facing uphill) margin of the tread. Microplots were sampled on the left-hand side of the tape facing uphill.

Two photographs were taken for this transect: 1) from the rebar stake facing uphill along the transect; 2) from the transect's 25 m mark facing back downhill to the start of the transect.

## RESULTS

Monitoring took place on May 20, 1999, and copies of the data sheets are in Appendix 2. These sheets also contain some general description information about the transect area. Transect CB1 was located along a popular open trail; transect CB2 along a trail closed in spring 1999; and CB3 along an unofficial tread that was closed several years ago. The density of Mulford's milkvetch ranged from 10 to 39 plants/transect. All three transects had both reproductive and non-reproductive plants, but only two (CB1 and CB2) had seedlings.

The weed cover class attribute was added to help track weed invasion, if any, at the monitoring transects. Presently, the most invasive weedy forbs at Camel's Back Reserve are rush skeleton weed (*Chondrilla juncea*) and blue bachelor buttons (*Centaurea cyaneus*), both of which are well established. Both were encountered in trace amounts on transect CB3. Trace cover of tumble mustard (*Sisymbrium altissimum*) was the only weedy forb encountered on transect CB1, and was also at transect CB3. Weedy forbs were absent from the majority of microplots for all transects, including no weeds at transect CB2. Ground disturbance is an attribute that over time may be expected to decrease along closed treads. Baseline scores were highest at transect CB2 with an average disturbance cover class value of 80. Transect CB1 had an average value of 50. No ground disturbance was recorded at transect CB3.

The Mulford's milkvetch population at Camel's Back/Hulls Gulch Reserve is one of the largest in the Boise Foothills, and important for the species' long-term regional conservation. Data collected in 1999 should be seen as an initial step towards a more comprehensive monitoring program for Mulford's milkvetch in the Reserve.

## Appendix 1

Map locations of Mulford's milkvetch monitoring plots at Camel's Back Reserve

Appendix 2

1999 monitoring forms for Mulford's milkvetch