

**FIELD SURVEY FOR BENT-FLOWER MILKVETCH (*ASTRAGALUS VEXILLIFLEXUS* VAR. *VEXILLIFLEXUS*) IN THE STIBNITE GOLD PROJECT AREA, VALLEY COUNTY, IDAHO**



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## **ABSTRACT**

The Midas Gold Idaho, Inc. (Midas Gold) Stibnite Gold Project is located near Stibnite, a historic mining town located in the Salmon River Mountains approximately 16 km (10 mi) east of Yellow Pine in Valley County, Idaho. The proposed disturbance footprint associated with the Stibnite Gold Project overlaps the occurrence of bent-flower milkvetch (*Astragalus vexilliflexus* var. *vexilliflexus*), a plant species of conservation concern in Idaho. I agreed to conduct a field survey in 2016 for bent-flower milkvetch targeting areas not searched in the past, but known or suspected to support potential habitat for the species. The intent of the field survey was to try and find new occurrences of bent-flower milkvetch, and if found, to document their location, extent, habitat conditions, and other relevant conservation information. The objective for the survey and gathering this information was to provide land managers a more comprehensive understanding of the conservation status of bent-flower milkvetch in the general Stibnite area. Areas selected for survey included the vicinity of the historic Cinnabar mine site; Cinnabar Peak and its upper flanks; the upper Cinnabar Creek drainage, north of both Fern Mine and Monumental Summit; and Sugar Mountain. Survey areas included lands owned either by Midas Gold, the Oberbillig family trust (optioned by Midas Gold and collectively known as Cinnabar), or the Payette National Forest. During the survey we discovered two new bent-flower milkvetch subpopulations in the vicinity of Cinnabar Peak and an extension to a previously known subpopulation south of the old Cinnabar mine site. The largest subpopulation covered approximately 25 acres centered around Cinnabar Peak and contained an estimated 7000 - 10,000 bent-flower milkvetch plants. Another smaller subpopulation covering approximately 1.5 acres was found a short distance east of Cinnabar Peak and contained an estimated 500 bent-flower milkvetch plants. The third site was located approximately 0.4 mile south of the old Cinnabar mine along the upper 1.6 km (1 mi) section of the jeep road that leads down to the old mine. A minimum of 300 bent-flower milkvetch plants were found at this site before it became confluent with a previously known bent-flower milkvetch subpopulation. We also relocated and updated information for a previously documented bent-flower milkvetch occurrence north of Monumental Summit during the survey. Bent-flower milkvetch was not found in any of the other areas we searched. The discovery of new subpopulations in 2016 improves the conservation status of bent-flower milkvetch in Idaho. However, the long-term conservation outlook for the species, especially at the large Cinnabar Peak occurrence, will probably largely depend on what level of protection subpopulations receive during any proposed mining operations for the Stibnite Gold Project.

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## INTRODUCTION

The Midas Gold Stibnite Gold Project is located near Stibnite, a historic mining town located in the Salmon River Mountains approximately 16 km (10 mi) east of Yellow Pine near the headwaters for the East Fork of the South Fork Salmon River in northeastern Valley County, Idaho (Figure 1). Mining began in the Stibnite-Yellow Pine Mining District in the late 1880s, mainly for gold, silver, tungsten, and antimony (U.S. Department of Agriculture 2012). In 2009, Midas Gold initiated mineral exploration activities in the area as part of the Golden Meadows Exploration Project to better define the area's mineral deposit potential (U.S. Department of Agriculture 2012). The project is now known as the Stibnite Gold Project. A 2014 report provides information regarding the geology, mineral resources, mining methods, economic analysis, and other facets of the project (Huss et al. 2014). The project area includes lands owned either by Midas Gold, the Oberbillig family trust (optioned by Midas Gold and collectively known as Cinnabar), or the Payette National Forest (NF).

The proposed disturbance footprint associated with the Stibnite Gold Project overlaps the occurrence of bent-flower milkvetch (*Astragalus vexilliflexus* var. *vexilliflexus*), a Payette NF plant species of conservation concern. Past botanical surveys for the species in the general Stibnite area focused mainly on Forest Service land, with only a limited amount on adjoining private property (Greystone 1994, Moseley 1994, Rust 2009). Based on my previous visits to the Stibnite area (e.g., Mancuso 2014); conversations with Alma Hanson, the botanist for the Payette NF, local geology map information (Smitherman 1988), and aerial imagery viewed on Google Earth (Google Inc. 2016) - it seemed very likely that additional potential, unsurveyed habitat for bent-flower milkvetch occurred on private and public lands associated with or near the Stibnite Gold Project. After meeting with representatives from Midas Gold (Kyle Fend) and the Idaho Conservation League (John Robison), I agreed to conduct a field survey for bent-flower milkvetch targeting areas not searched in the past, but known or suspected to support potential habitat for the species. The intent of the field survey was to try and find new occurrences of bent-flower milkvetch, and if found, to document their location, extent, habitat conditions, and other relevant conservation information. The objective for gathering this information was to provide land managers a more comprehensive understanding of the conservation status of bent-flower milkvetch in the general Stibnite area. This information can then be used by land managers to be more pro-active in developing and prioritizing possible conservation actions on behalf of the species and its habitat. Four main areas were selected for the survey, including (1) the vicinity of the historic Cinnabar mine site and slopes leading to the site from the north; (2) Cinnabar Peak and its upper flanks; (3) the upper Cinnabar Creek drainage, north of both the Fern Mine and Monumental Summit; and (4) Sugar Mountain.

## BENT-FLOWER MILKVETCH

Bent-flower milkvetch has a low, loosely matted habit at exposed, high elevation sites. The foliage tends to be grayish-green due to a relatively dense covering of hairs. Flower color ranges from pink-purple to occasionally whitish, with the declined, sessile, more or less elliptic-shaped fruit pods up to 12 mm (0.5 in) long (Barneby 1964). The species' main range is east of the Continental Divide - from southern British Columbia and Alberta to southwestern Montana and western Wyoming, eastward to Saskatchewan and South Dakota. Prior to the 2016 field survey, bent-flower milkvetch was known from three occurrences in Idaho, all located within 16 km (10 mi) of Stibnite (Idaho Natural Heritage Program 2016). Two of these occurrences were first documented in the early 1990s (Moseley 1994), including one located south of Cinnabar Peak comprised of three subpopulations and supporting an estimated 4500 bent-flower milkvetch plants (Rust 2009). At least one of these subpopulations extends onto Midas Gold property. The other occurrence, located approximately 2.4 km (1.5 mi) north of Monumental Summit in the Frank Church-River of No Return Wilderness is small, with an estimated 200

plants. More recently, a third occurrence was discovered in 2014 on Missouri Ridge southeast of Profile Gap (Mancuso 2015). Located within the Frank Church-River of No Return Wilderness, this occurrence contains an estimated 500 - 800 plants. All three of these occurrences lie disjunct at least 160 km (100 mi) westward from the nearest known populations in Montana. Bent-flower milkvetch has never been found anywhere else in Idaho. Bent-flower milkvetch is on the Forest Service Region 4 watch species list for the Payette NF, but has been proposed for upgrade to the sensitive species list (U.S. Department of Agriculture 2003). Bent-flower milkvetch has a conservation rank of G4T4/S1 in Idaho, indicating the species is secure globally, but critically imperiled and with a high risk of extinction in Idaho because of extreme rarity, steep population declines, or other factors (NatureServe 2016).

Idaho occurrences of bent-flower milkvetch occupy exposed subalpine ridges and associated upper slopes within subalpine fir-whitebark pine woodlands (Moseley 1994). Sites vary from flat or gentle to moderately steep and may be any aspect. It occurs in full sun to partial shade from associated conifers and the vegetation tends to be open with relatively low ground cover. Bare soil and/or rock cover is high. Substrates vary from sandy to gravelly, stony, or in some cases in bedrock cracks. Idaho occurrences of bent-flower milkvetch appear to be largely restricted to exposures of carbonate metasediment geology. The only exception may be at the Monumental Summit occurrence, where volcanic material dominates the general area.

## **METHODS**

Upon arrival at a target search area, the field survey was conducted by two people walking roughly parallel routes separated by an average of approximately 10 m (33 ft). An intuitive meandering method was used to choose our route within the target area, allowing us to concentrate on areas judged to contain the best potential habitat for bent-flower milkvetch. Survey routes were documented using the Track feature on a hand-held GPS unit. A GPS unit was also used to record coordinates for new bent-flower milkvetch locations found during the survey. Bent-flower milkvetch patches less than approximately 400 m<sup>2</sup> (0.1 ac) in size were documented as points. A series of points were taken to help delineate larger patches as polygons. Plant abundance was based on counts for small areas and estimates for larger areas. Information regarding habitat characteristics and any disturbances, threats, or other conservation concerns was recorded in a field notebook. In addition, photographs were taken to help document site characteristics and habitat and landscape features of conservation interest.

## **RESULTS**

The field survey for bent-flower milkvetch was conducted September 25 - 28, 2016. Three main areas were surveyed, including the Cinnabar Peak complex, ridges forming the Cinnabar Creek headwaters both north and northwest of Monumental Summit, and in the vicinity of the Fern Mine. An attempt to survey a fourth area, the upper slopes of Sugar Mountain, was aborted at approximately the 2377 m (7800 ft) contour due to difficult terrain and the lack of any observable potential habitat. Our mapped survey routes (Appendix 1) totaled approximately 31 km (19.2 mi) overall. Several distinctive vegetative characteristics made bent-flower milkvetch easy to identify even though it was too late in the season for plants to be in flower. Occasional plants did have fruit pods to help with verification.

The 2016 survey discovered two new bent-flower milkvetch subpopulations in the vicinity of Cinnabar Peak and one extension to a previously known subpopulation south of the old Cinnabar mine site (Appendix 2). The largest subpopulation covered approximately 10 ha (25 ac) centered around Cinnabar Peak and contained an estimated 7000 - 10,000 bent-flower milkvetch plants. Another smaller subpopulation covering approximately 1.5 acres was found a short distance east of Cinnabar Peak and contained an estimated 500 bent-flower milkvetch



plants. The third site was located approximately 0.7 km (0.4 mi) south of the old Cinnabar mine along the upper 1.7 km (1 mi) section of the dirt jeep road that leads to the old mine. A minimum of 300 bent-flower milkvetch plants were found in this area before it became confluent with a previously known bent-flower milkvetch subpopulation positioned along an adjoining ridgecrest. The three new bent-flower milkvetch locations are referred to as “Cinnabar Peak”, “Cinnabar Peak East”, and “Cinnabar Peak South” in this report. The new locations were all located within approximately 1 km (0.6 mi) of the previously known Cinnabar Peak occurrence of bent-flower milkvetch originally mapped in 1994 (Moseley 1994). The 2016 locations represent new extensions to this original occurrence. The three new locations all occur on a mix of both private and Payette NF lands. Occasional common dandelion (*Taraxacum officinale*) plants were observed within the “Cinnabar Peak” and “Cinnabar Peak South” subpopulations and represented the only introduced weedy species encountered during the survey. A set of photographs taken during the survey help document habitat characteristics at the bent-flower milkvetch subpopulations and other general landscape features (Appendix 3).

A small patch of bent-flower milkvetch was also found north of Monumental Summit that likely coincides with an occurrence originally discovered in 1994 (Moseley 1994). If the patch represented a new location, it was in close proximity to this previously documented occurrence. We counted 30, but estimated 50 plants at the site and refer to it as “Monumental Summit North” in this report. It occurred within the Frank Church-River of No Return Wilderness, on Payette NF land.

A standard “Idaho Rare Plant Observation Form” that summarizes information about each bent-flower milkvetch location was completed for the set of new subpopulations found in the Cinnabar Peak area, and also for the North of Monumental Summit occurrence (Appendix 4). These forms will eventually be submitted to the Idaho Natural Heritage Program in Boise for upload into their statewide, Idaho rare plant species database. Information about the new bent-flower milkvetch locations is summarized below.

### *Cinnabar Peak*

Cinnabar Peak subpopulation: This large subpopulation covered an estimated 10 ha (25 ac) along the summit ridge of Cinnabar Peak and its associated very upper slopes, with its southern edge located approximately 0.5 km (0.3 mi) north of a communication tower that sits atop USGS topographic point 8904. A dirt road leading to an old mine prospect and dilapidated cabin bisected the southern half of the subpopulation. This old mine prospect was positioned near the southwestern corner of the subpopulation. The northern half of the subpopulation appeared to be undisturbed, although flagging and metal stakes with flagging were observed in a few places.

The subpopulation was estimated to contain 7000 - 10,000 bent-flower milkvetch plants, with its abundance varying from localized dense patches to low density patches containing widely scattered individuals. Its absence within the subpopulation perimeter was limited to a few small areas. Bent-flower milkvetch was most abundant along edges and berms of the dirt jeep road that bisected the southern half of the subpopulation. Plants tended to be substantially less common on slope positions adjacent to the road. Bent-flower milkvetch was also common on the Cinnabar Peak ridgecrest and immediately adjoining upper slope positions. Plant density was lower further downslope.

Bent-flower milkvetch occupied various slope aspects within the subpopulation on flat, to gentle, or moderately steep areas. Elevation ranged from approximately 2633 m (8640 ft) at the north end, to 2548 (8360 ft) near the southern end. Soils ranged from a coarse sandy texture to

gravelly or rocky. The subpopulation appeared to be limited to an area with metasedimentary, carbonate rocks, with only a few stray bent-flower milkvetch individuals extending into adjoining quartzite-type substrates. A mix of forest and woodland vegetation characterized the subpopulation area, with subalpine fir (*Abies lasiocarpa*) and lesser amounts of whitebark pine (*Pinus albicaulis*) being the dominant trees in most places. Bent-flower milkvetch generally occurred in openings that were a natural part of the vegetation mosaic, or were associated with the old roadbed, or old mine prospect disturbances. The subpopulation segment along the western flank of Cinnabar Peak differed by the presence of open canopy limber pine (*Pinus flexilis*), a sparse shrub-herbaceous understory, and high bare ground-rock cover. Other plant species commonly associated with bent-flower milkvetch included prickly sandwort (*Arenaria aculeata*), penstemon (*Penstemon* spp.), pussytoes (*Antennaria* spp.), spearleaf arnica (*Arnica longifolia*), Jackson Hole thistle (*Cirsium subniveum*), and Wheeler's bluegrass (*Poa wheeleri*).

The occasional presence of flagging and metal stakes with flagging indicated some relatively recent activity by Midas Gold in the subpopulation area. However, evidence of recent ground disturbance was not observed within the area, including a lack of tire tracks in the old dirt road or in the old mine prospect areas. Although our survey was relatively thorough, areas of potential bent-flower milkvetch habitat were not searched extending further downslope on both the eastern and western flanks of Cinnabar Peak. The subpopulation may extend into at least portions of these unsurveyed slope areas. For this reason, the subpopulation's mapped eastern and western perimeters should be considered tentative. The eastern flank of Cinnabar Peak was too steep and loose to safely survey in places, and the western flank slope too large to fully survey in the time available.

Cinnabar Peak East subpopulation: This subpopulation encompassed approximately 0.6 ha (1.5 ac) on the eastern flank of Cinnabar Peak, roughly halfway between the peak and the old Cinnabar mine site. It was located a short distance northeast of the old jeep road that connects the old mine site with the Cinnabar Peak area.

The subpopulation contained an estimated 500 bent-flower milkvetch plants, more or less evenly distributed within the site. The subpopulation occurred on an open, stony outcrop of carbonate rock along a flat to gently sloping spur ridge on northerly to easterly aspects at approximately 2484 m (8150 ft) elevation. Herbaceous species dominated the open vegetation, with a sprinkling of intermixed, mostly short-statured conifers. Common associated species included prickly sandwort and penstemon. Forest or woodland vegetation dominated by subalpine fir surrounded the subpopulation.

Several orange property boundary wands present in and near the subpopulation indicated the area is a mix of Payette NF and private land. The site was undisturbed, although within approximately 75 m (246 ft) of an old jeep road. Additional exposures of potential bent-flower milkvetch habitat occurred north and northwest of the subpopulation, along the eastern flank of Cinnabar Peak.

Cinnabar Peak South subpopulation: This subpopulation is located approximately 0.7 km (0.4 mi) south of the old Cinnabar mine site along the jeep road that accesses the mine site from the north. The upslope edge of the subpopulation is confluent with a previously known bent-flower milkvetch subpopulation, and represents an expansion to this previously documented location. The new portion of the subpopulation consisted of small patches or individuals of bent-flower milkvetch scattered along the edge of an approximately 1.2 km (1 mi) length section of jeep road. Bent-flower milkvetch abundance within a patch ranged from <5 to >100 plants. Some plants also occurred on slopes immediately above or below the road bed. Plants were not

continuous along the road, however, and substantial gaps lacked any bent-flower milkvetch. Overall, a minimum of 300 bent-flower milkvetch individuals were observed within the subpopulation.

This subpopulation occupied a steep to moderately steep, northwest- to northeast-facing upper slope in an area underlain by metasediment rocks and associated coarse sandy to gravelly or stony soil. Elevation ranged from approximately 2621 m (8600 ft) to 2500 m (8200 ft). A mix of subalpine fir and Douglas-fir (*Pseudotsuga menziesii*) forest vegetation dominated the subpopulation area. Other common species associated with bent-flower milkvetch included alpine milkvetch (*Astragalus alpinus*), manyray goldenrod (*Solidago multiradiata*), common yarrow (*Achillea millefolium*), and penstemon. The jeep road varied from partially to fully shaded. Additional potential habitat appeared to be limited in most areas away from the road due to the full conifer canopy and sparse distribution of open light patches. Nonetheless, at least scattered individuals or small patches of additional bent-flower milkvetch plants may occur in places adjoining the subpopulation.

This was a roadside subpopulation and any improvements or other alterations to the old jeep road would impact most, if not all of the bent-flower milkvetch plants present. The jeep road receives some use, probably mostly by off-road type vehicles.

#### *Monumental Summit*

Monumental Summit North: This small patch of bent-flower milkvetch occurred on a rocky knob approximately 1.6 km (1 mi) north of Monumental Summit. It occupied an area approximately 15 m (50 ft) long by 5 m (15 ft) wide directly on a narrow, rocky, northeast-trending ridge spine at approximately 2658 m (8720 ft) elevation. An estimated 50 bent-flower milkvetch occurred at the site, although only 30 were counted. Plants occurred in bedrock cracks and small gravelly ledges on the rocky spine. The reddish and dark gray outcrop appeared to be metamorphic rock, although the surrounding area was clearly dominated by volcanic substrates. A woodland mix of subalpine fir and whitebark pine dominated the nearby vegetation. However, only scattered individuals of the latter species occurred directly on the narrow ridgecrest. Other associated species included prickly sandwort, pussytoes, cutleaf daisy (*Erigeron compositus*), sticky cinquefoil (*Potentilla glandulosa*), matted saxifrage (*Saxifraga bronchialis*), and little ricegrass (*Oryzopsis exigua*). Habitat at this occurrence was undisturbed and lacks foreseeable threats due to its location within a designated Wilderness Area.

This bent-flower milkvetch location very likely coincides with an occurrence originally discovered in 1994 (Moseley 1994). If not, it was located in close proximity, certainly within 100 m (328 ft) of the original occurrence. We did not survey further north on the ridge due to safety concerns over crossing a steep, cliffy, loose rock section of the ridge spine. The 1994 habitat description matches the location found in 2016. The main difference was an estimated 200 bent-flower milkvetch plants reported in 1994, compared to the estimate of 50 plants made in 2016. Our relocation of this occurrence represented the first revisit since 1994.

#### *Other survey areas*

Bent-flower milkvetch was not found in any of the other areas we surveyed. Large portions of the Cinnabar Peak survey route (Appendix 1) that lacked bent-flower milkvetch had too much forest canopy or other competing vegetation to be suitable for bent-flower milkvetch. Rock outcrops and other portions of this survey area with more open vegetation were unsuitable mostly due to the quartzite dominated surface geology.



The Fern Mine survey route (Appendix 1) included a series of old mine prospects, tailing piles, and spur roads to access the prospects on the southerly slopes above Fern Creek. Exposures of sparsely vegetated light-colored sands and rock outcrops in this area initially appeared to be possible habitat for bent-flower milkvetch. Although a bent-flower milkvetch subpopulation is known from the nearby saddle forming the divide between Fern and Cinnabar creeks, the species apparently does not extend southward towards the old Fern Mine area. The darker, brownish substrate color and the more mesic conditions at the known subpopulation appeared to be the two main superficial habitat differences compared to the Fern Mine site. Other portions of the Fern Mine survey route tended to be too forested or have unsuitable quartzite geology to be considered good potential habitat for bent-flower milkvetch. Minimal potential habitat for bent-flower milkvetch was encountered along the upper Cinnabar Creek survey route (Appendix 1). The main exception was an area with small outcrops of dark metamorphic rock, talus, and gravels in the vicinity of USGS topographic point 8830, located approximately 1.2 km (0.7 mi) northwest of Monumental Summit. However, even in this area habitat appeared only marginal for bent-flower milkvetch. Potential bent-flower milkvetch habitat was also found to be very limited in the North of Monumental Summit survey route (Appendix 1) due to the overwhelming dominance of volcanic and to a lesser degree quartzite substrates. Only a few small outcrops of dark metasedimentary rock were encountered on the survey route. One of these supported the “North of Monumental Summit” bent-flower milkvetch occurrence. Our attempt to survey a few areas near the summit of Sugar Mountain failed. A trail along Salt Creek provided access part way up the mountain, but the trail disappeared after a couple of miles. Cross-country travel proved very slow due to numerous obstacles (down trees) and steep terrain. We aborted our ascent after realizing we would not reach the summit area in sufficient time to also conduct a survey. We did not observe any potential habitat for bent-flower milkvetch during the day.

## **DISCUSSION**

The 2016 survey discovered two new subpopulations of bent-flower milkvetch in the vicinity of Cinnabar Peak. In addition, a third new location found in 2016 expands the extent of a previously documented subpopulation located south of the old Cinnabar mine site. Overall, the Cinnabar Peak occurrence is now known to consist of five subpopulations. It is by far the largest known occurrence for bent-flower milkvetch in Idaho. Abundance estimates for the occurrence prior to 2016 ranged from approximately 3000 (Moseley 1994) to 4500 plants (Rust 2009). Discoveries made during the 2016 field survey more than doubled the number of bent-flower milkvetch plants known for the occurrence, to at least 10,000 individuals overall. The large subpopulation centered around Cinnabar Peak accounted for most of this increase. A range in plant sizes up to at least 20 cm (8 in) diameter at the new subpopulations indicated plants of different ages, suggesting ongoing recruitment within the occurrence.

Subpopulations comprising the Cinnabar Peak bent-flower milkvetch occurrence are all located in areas mapped as either LowerCalc-silicate, Fern Marble, or Middle Marble stratigraphic formations (Stewart et al. 2015). Each of these Paleozoic metasedimentary formations contains at least some carbonate rock. Mapped locations of these formations can help guide any future bent-flower milkvetch field surveys in the Stibnite area. Habitat characteristics at new locations found in 2016 were similar to nearby previously known subpopulations. Bent-flower milkvetch was almost totally confined to carbonate metasediment substrates, with only a few stray individuals extending onto adjoining quartzite-type rock. Plants were also more or less restricted to open or only partially shaded locations, being absent from sites with full conifer canopy cover.

A large percentage of bent-flower milkvetch plants observed at the new “Cinnabar Peak” subpopulation occurred along the edge of an old jeep road or on its associated berm. Some plants also occurred within at least one old mine prospect. In more recent years, ground

disturbances associated with the jeep road and mine prospect have likely been limited to occasional motorized vehicle use. Clearly, bent-flower milkvetch has been able to colonize these disturbed habitats over time. The capacity to re-establish after a certain level of disturbance may help bent-flower milkvetch persist in the Stibnite Gold Project area. It also seems reasonable to assume that persistence will become problematic if disturbances associated with the proposed mining operations exceed some unknown threshold. Improvements or other alterations to the old road bed leading down into the historic Cinnabar Mine would impact numerous bent-flower milkvetch plants. Renewed mining operations within occupied habitat areas would also have the potential to impact many bent-flower milkvetch plants in the Cinnabar Peak area.

Although present in disturbed locations, the long-term persistence of bent-flower milkvetch near Cinnabar Peak may depend on plants located in areas of intact, minimally disturbed-undisturbed habitat that can serve as seed source reserves. Depending on the location and scale of future ground disturbances associated with the Stibnite Gold Project in the area, seeds from these reserves may be critical for post-disturbance re-establishment of bent-flower milkvetch into formerly occupied areas. Habitat across most of the northern half of the “Cinnabar Peak” and all of the “Cinnabar Peak East” subpopulations appeared to be undisturbed in 2016 and could serve as reserves for bent-flower milkvetch if not impacted by mining operations.

The discovery of new subpopulations in 2016 improves the conservation status of bent-flower milkvetch in Idaho. However, the long-term conservation outlook for the species at the large Cinnabar Peak occurrence will probably largely depend on what level of protection subpopulations receive during proposed mining operations for the Stibnite Gold Project. Although much smaller, the two other bent-flower milkvetch occurrences known for Idaho at North of Monumental Summit and Missouri Ridge have strong long-term conservation outlooks due to their locations within a designated Wilderness Area.

One unexpected botanical discovery during the 2016 field survey was finding a population of limber pine on the upper, west-facing flank of Cinnabar Peak. This appears to be one of the few, if not the only documented location for limber pine on the Payette NF. It formed an open canopy across the slope, which otherwise had a sparse shrub and herbaceous understory that included scattered individuals of bent-flower milkvetch. This slope appeared to be largely undisturbed. The full extent of the limber pine population was not delineated, but it covered several acres at a minimum, and appeared to be limited to an area with rocky, gray-colored, carbonate, metasedimentary substrate. Old cones were common under some trees and many individuals had evidence of a new cone crop. Based on cursory views of the population, most trees appeared healthy, but at least a few showed evidence of white pine blister rust (*Cronartium rubicola*). A collection made to voucher the population will be deposited at the University of Idaho herbarium.

Whitebark pine was another noteworthy conifer we observed during the field survey. It was regularly encountered in each of our survey areas. Whitebark pine is a Candidate species for possible listing under the Endangered Species Act (U.S. Fish and Wildlife Service 2011), as well as a Forest Service Region 4 sensitive plant species. It was common at the “Cinnabar Peak” and “Cinnabar Peak East” bent-flower milkvetch subpopulations. Although our observations were cursory, a range of size classes, including seedlings and saplings occurred within both subpopulations. At least several individuals had symptoms of white pine blister rust at the “Cinnabar Peak” subpopulation. Although growing nearby, whitebark pine was not observed directly within the limber pine population.

In 2013, the Payette NF initiated a monitoring program for bent-flower milkvetch and whitebark pine within the Stibnite Gold Project area (Mancuso 2013). The monitoring program's objective was to support pro-active and adaptive land management efforts aimed at ensuring the long-term conservation of both species in the project area. Monitoring included the collection of population, habitat, and disturbance information that could be used to identify and prioritize conservation measures in an adaptive management framework. Expanding the monitoring program to include the new bent-flower milkvetch subpopulations found in 2016 may be worthy of consideration - especially if mining operations for the Stibnite Gold Project will disturb these subpopulations. Expanding the monitoring program to also include the limber pine population and stands of whitebark pine located in the Cinnabar Peak area may also be a prudent conservation action.

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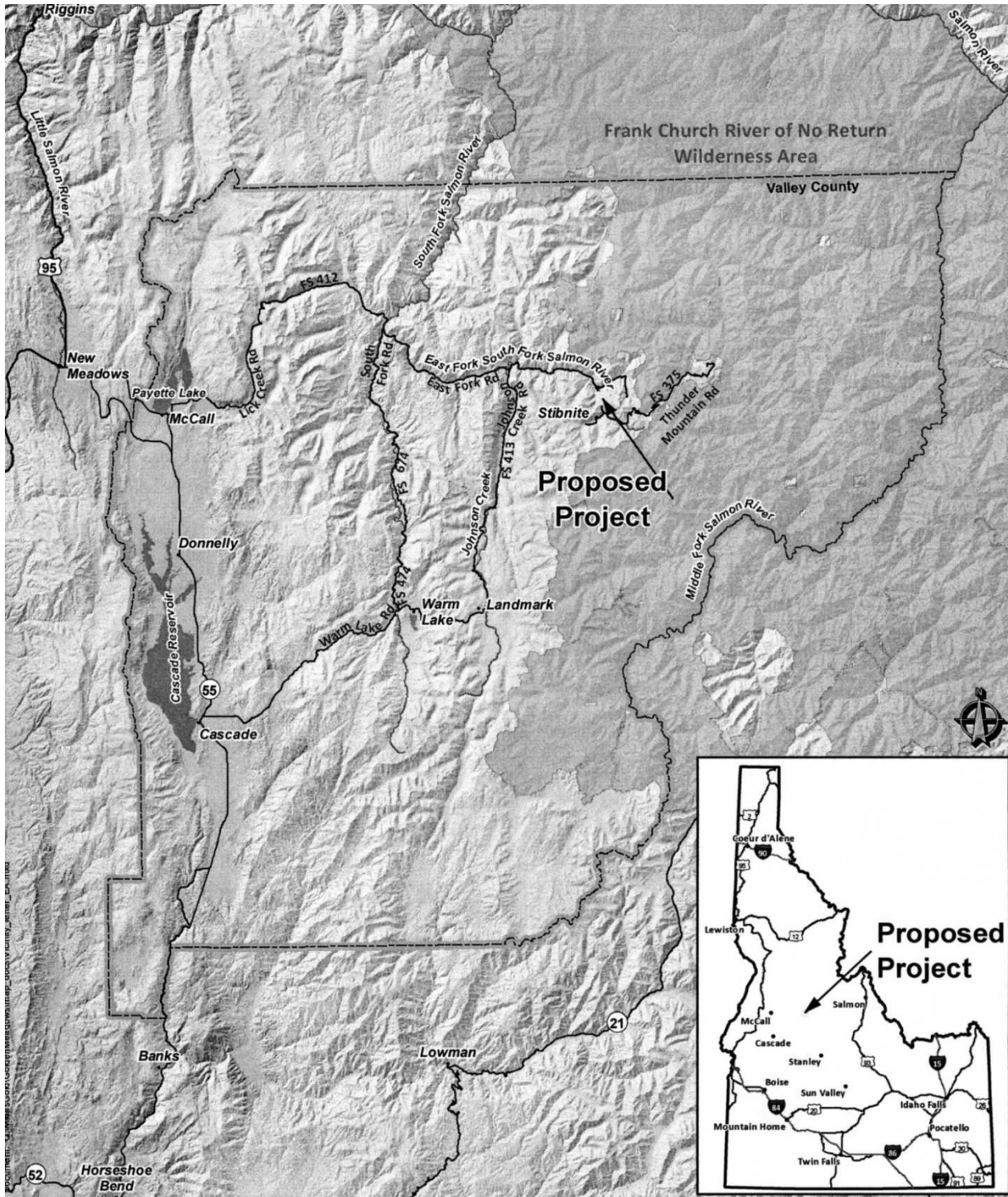
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U.S. Department of Agriculture. 2003. Southwest Idaho Ecogroup Land and Resource Management Plan Final Environmental Impact Statement. U.S. Department of Agriculture, Forest Service, Intermountain Region (Region 4), Boise/Payette/Sawtooth National Forests, Ogden, UT.

U.S. Department of Agriculture. 2012. Decision notice and finding of no significant impact. Golden Meadows Exploration Project. Krassel Ranger District, Payette National Forest, Valley County, Idaho. U.S. Department of Agriculture, Forest Service. 113 pp.

U.S. Fish and Wildlife Service. 2011. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List *Pinus albicaulis* as Endangered or Threatened With Critical Habitat. 50 CFR Part 17. Federal Register Vol. 76, No. 138, July 19, 2011, pp. 42631-42650.

Figure 1. Map location for the Stibnite Gold Project.  
Map copied from the Decision Notice for the Golden Meadows Exploration Project (U.S. Department of Agriculture 2012).

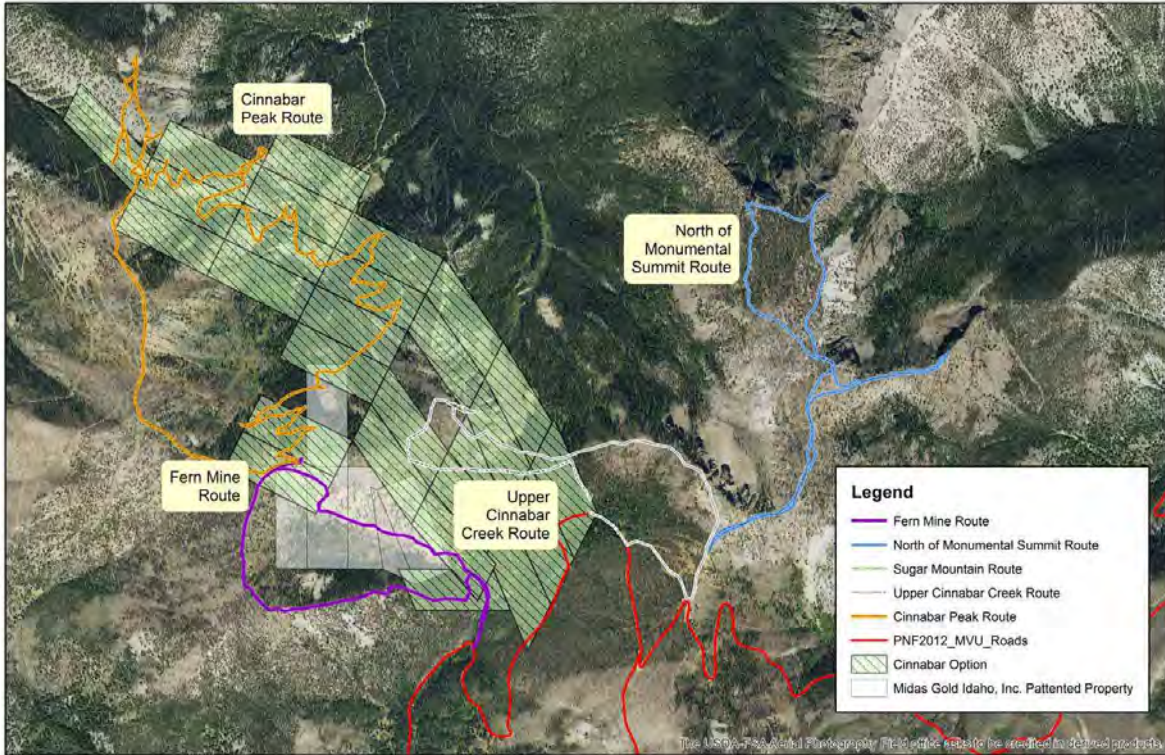


## Appendix 1

Bent-flower milkvetch survey routes.

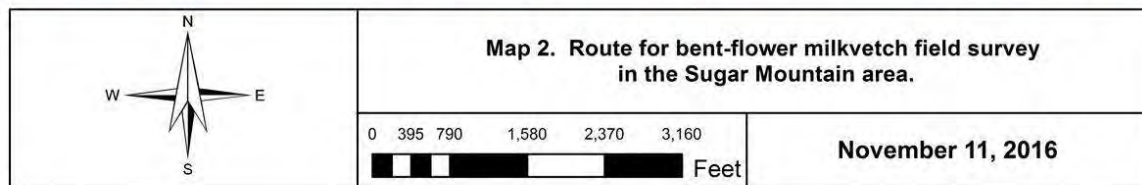
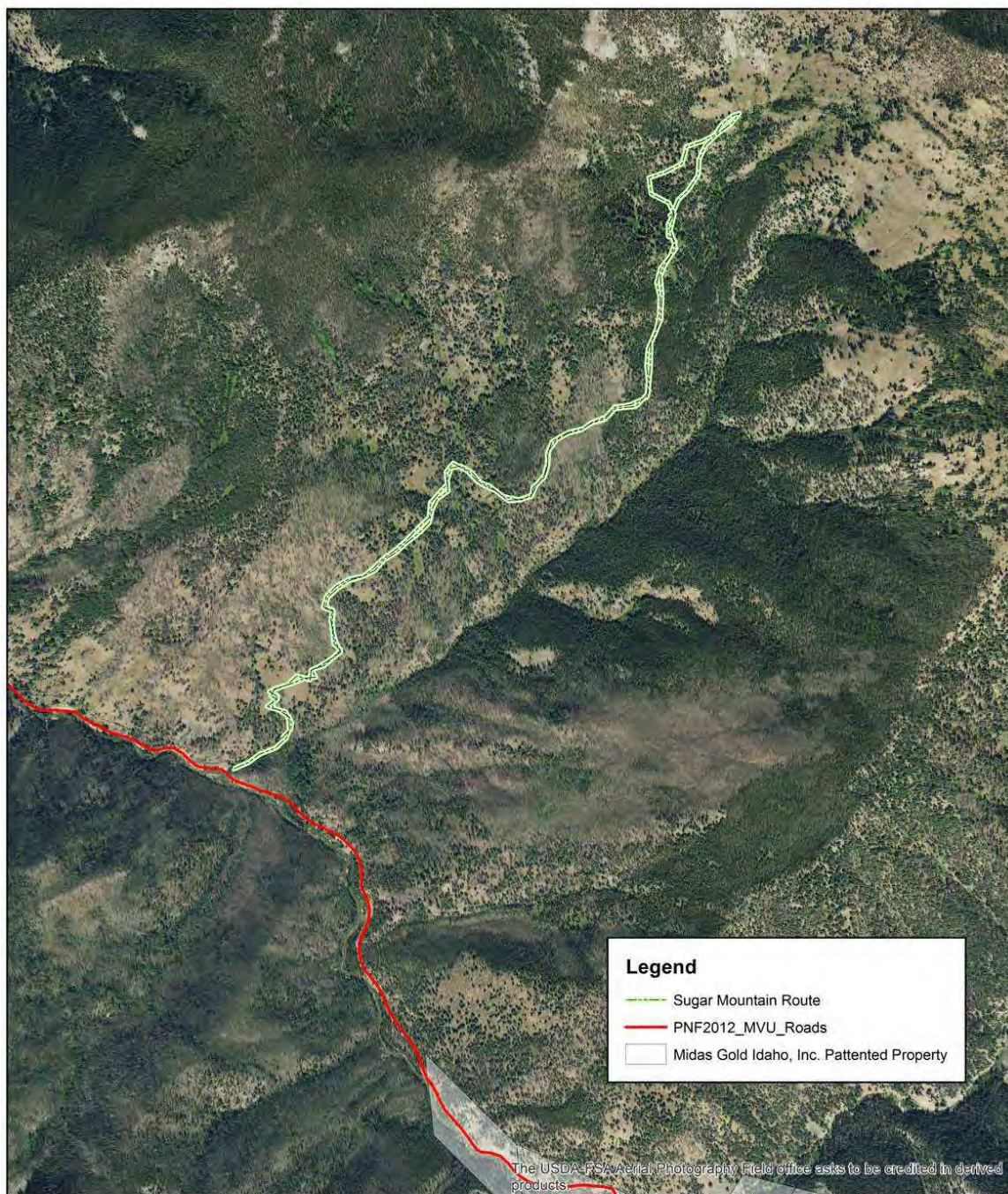


Routes for bent-flower milkvetch field surveys in the Cinnabar Peak, Upper Cinnabar Creek, Fern Mine, and North of Monumental Summit areas.



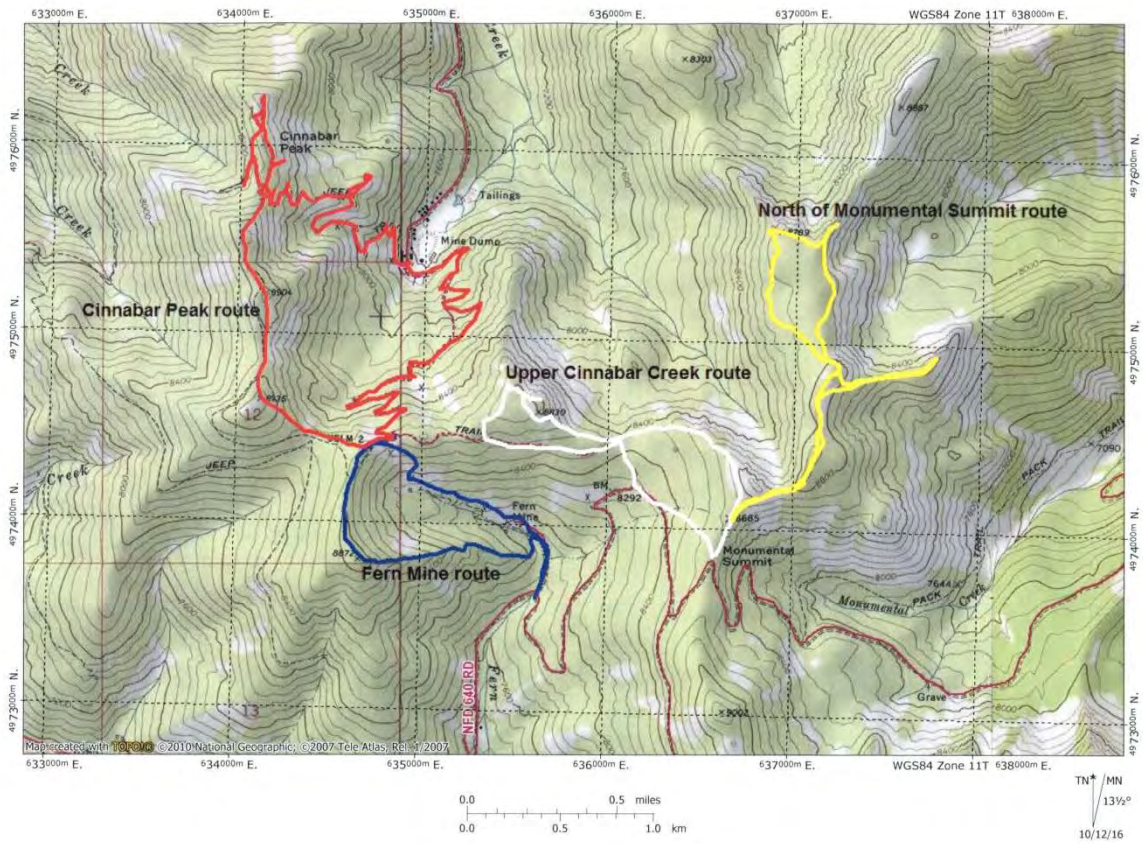


Route for bent-flower milkvetch field survey in the Sugar Mountain area.

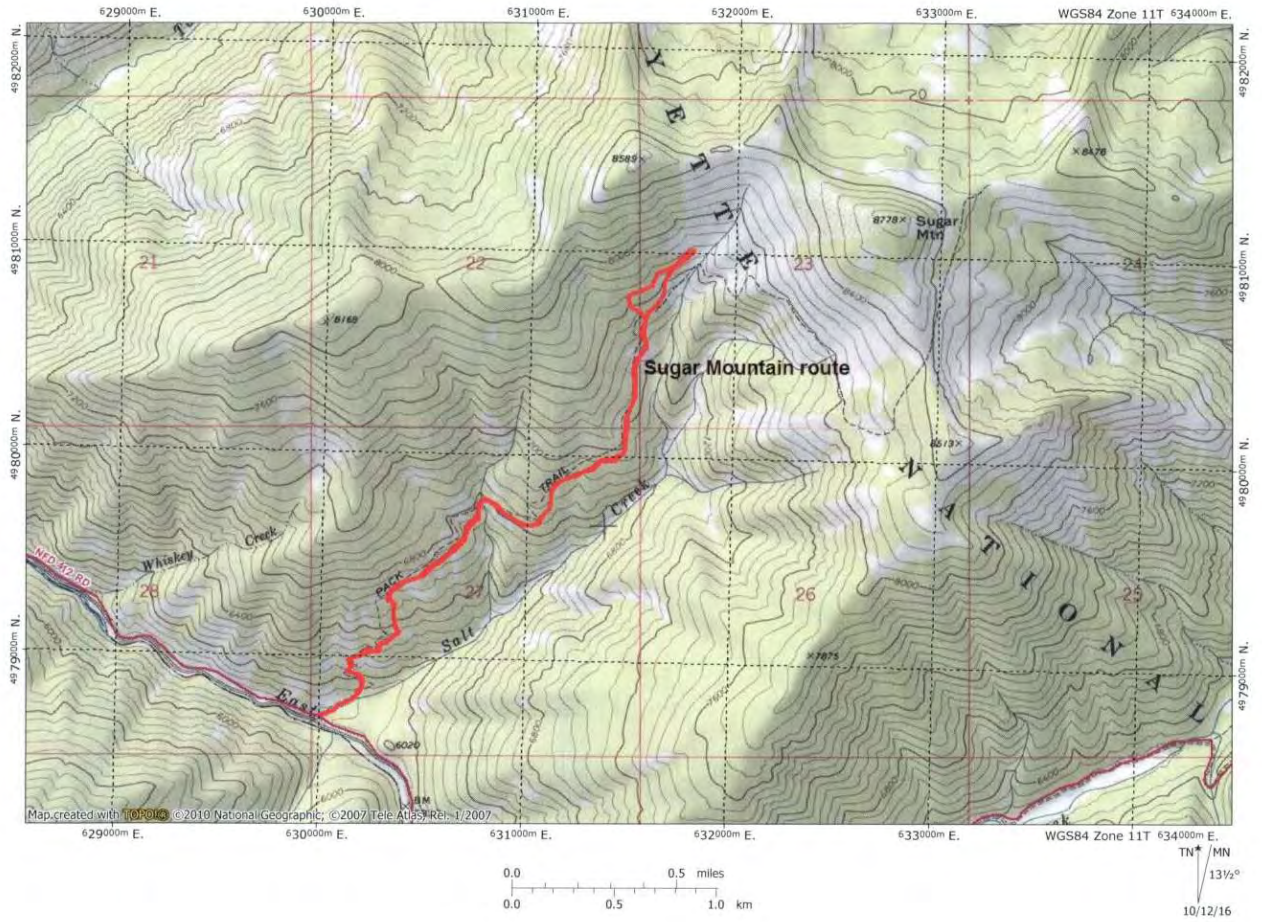




Map route for bent-flower milkvetch field survey in the Cinnabar Peak, Upper Cinnabar Creek, Fern Mine, and North of Monumental Summit areas.



Map route for bent-flower milkvetch field survey in the Sugar Mountain area.

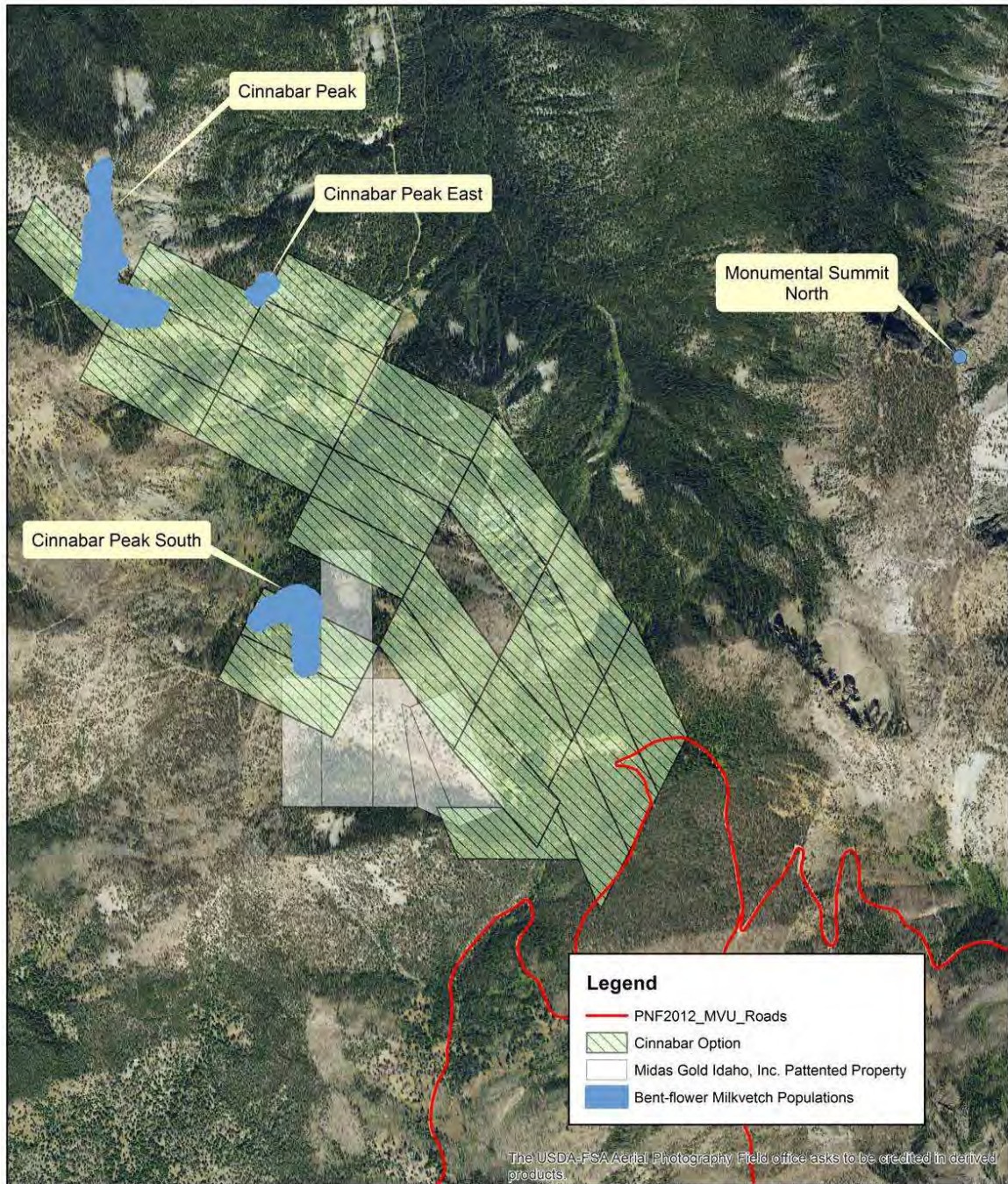


## Appendix 2

Bent-flower milkvetch locations discovered during the field survey.



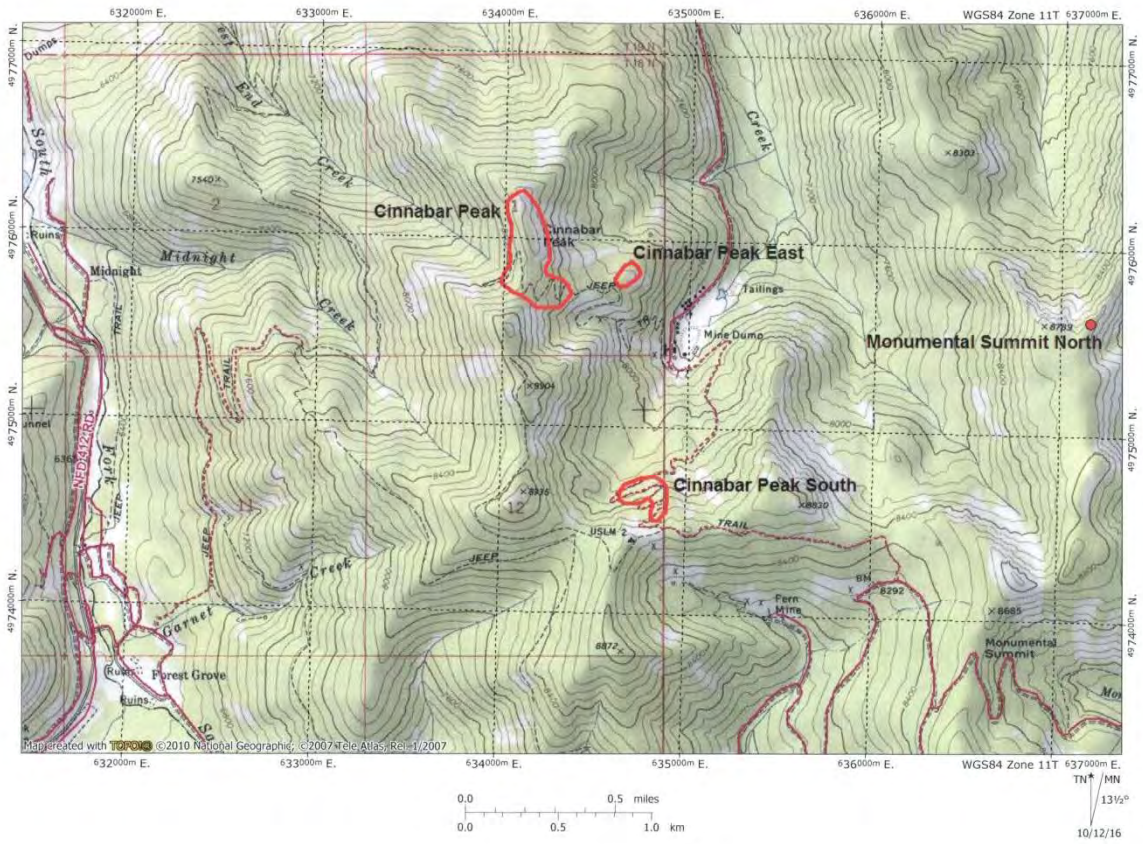
Map of bent-flower milkvetch locations at “Cinnabar Peak”, “Cinnabar Peak East”, “Cinnabar Peak South”, and “Monumental Summit North”.



	<b>Map of bent-flower milkvetch locations at “Cinnabar Peak”, “Cinnabar Peak East”, “Cinnabar Peak South”, and “Monumental Summit North”.</b>	
	0 395 790 1,580 2,370 3,160 Feet	<b>November 11, 2016</b>



Map of bent-flower milkvetch locations at “Cinnabar Peak”, “Cinnabar Peak East”, “Cinnabar Peak South”, and “Monumental Summit North”.



### Appendix 3

Photographs for the bent-flower milkvetch field survey.

GPS coordinates associated with photos = UTM 11T NAD83



Photo 1. Bent-flower milkvetch along jeep road at the "Cinnabar Peak" subpopulation.  
GPS = 634179 4975670



Photo 2. View south; bent-flower milkvetch along jeep road at the "Cinnabar Peak" subpopulation.  
GPS = 634060 4975959



Photo 3. View north; bent-flower milkvetch along jeep road near the southeastern corner of the "Cinnabar Peak" subpopulation.  
GPS = 634244 4975756





Photo 4. Bent-flower milkvetch in an old mine prospect at the "Cinnabar Peak" subpopulation.  
GPS = 634184 4975770



Photo 5. View into an old mine prospect with bent-flower milkvetch at the "Cinnabar Peak" subpopulation.  
GPS = 634184 4975770



Photo 6. View west; gash in jeep road at old mine prospect near southwestern corner of the "Cinnabar Peak" subpopulation. Bent-flower milkvetch did not occur down the road as substrate changed to quartzite rock.  
GPS = 634024 4975809





Photo 7. View north; old cabin near old mine prospect a short distance outside of the "Cinnabar Peak" subpopulation.  
GPS = near 634024 4975809



Photo 8. View north; upper west-facing slope of Cinnabar Peak with bent-flower milkvetch and limber pine trees in the "Cinnabar Peak" subpopulation.  
GPS = 634060 4975959



Photo 9. View south; upper west-facing slope of Cinnabar Peak with bent-flower milkvetch (note pinflags) at the "Cinnabar Peak" subpopulation.  
GPS = 634084 4976106





Photo 10. View south from Cinnabar Peak summit at northern end of the "Cinnabar Peak" bent-flower milkvetch subpopulation.  
GPS = 634096 4976238



Photo 11. View east; opening located southwest of Cinnabar Peak summit with abundant bent-flower milkvetch at the "Cinnabar Peak" subpopulation.  
GPS = 634056 4976168



Photo 12. View north; very upper east-facing slope and Cinnabar Peak ridge with bent-flower milkvetch at the "Cinnabar Peak" subpopulation.  
GPS = 634177 4975933





Photo 13. View west; opening and overview of the “Cinnabar Peak East” subpopulation.  
GPS = 634627 4975789



Photo 14. View northeast; property boundary wand near north edge of the “Cinnabar Peak East” subpopulation.  
GPS = 634710 4975849



Photo 15. Jeep road with bent-flower milkvetch at the “Cinnabar Peak South” subpopulation.  
GPS = near 634744 4974692





Photo 16. Rocky knob with bent-flower milkvetch at the Monumental Summit North occurrence.  
GPS = 637163 4975601



Photo 17. View southwest; ridgeline rock outcrop with bent-flower milkvetch at the Monumental Summit North occurrence.  
GPS = 637163 4975601



Photo 18. View north; along main ridge north of Monumental Summit along the "North of Monumental Summit" survey route.





Photo 19. Section of gentle, broad ridge with volcanic gravels and sparse vegetation south of USGS topographic point 8789 on the "North of Monumental Summit" survey route.



Photo 20. View west; to dark rock outcrops at USGS topographic point 8830 along the "Upper Cinnabar Creek" survey route.



Photo 21. Overview of the historic Cinnabar mine site viewed along the "Cinnabar Peak" "survey route.

## Appendix 4

Idaho Rare Plant Observation Forms for bent-flower milkvetch.

## IDAHO RARE PLANT OBSERVATION REPORT 2015

Please fill in as many fields as possible, but don't worry if you have to leave blanks. Many fields contain check boxes (double click on box, and click 'checked'). E-mail completed form to [plant@idfg.idaho.gov](mailto:plant@idfg.idaho.gov)  
If you need to mail maps or other materials that can't be sent electronically, send them to Botany Data Coordinator, Idaho Department of Fish and Game, PO Box 25, 600 S. Walnut St., Boise ID 83707-0025.  
Thanks for contributing to rare plant conservation in Idaho!

Species: *Astragalus vexilliflexus* var. *vexilliflexus*

Date(s): September 26, 2016

Observer(s): Michael Mancuso and Joseph Florko

Agency/Organization/Company: Mancuso Botanical Services

Address: 20 N. Wilson St., Boise, ID 83706

E-mail:

Phone:

Other knowledgeable individuals:

Observation was:  very thorough  fairly thorough  cursory or incidental

If this observation is part of a larger study or report, what is the study/report? Mancuso, M. 2016. Field survey for bent-flower milkvetch (*Astragalus vexilliflexus* var. *vexilliflexus*) in the Stibnite Gold Project area, Valley County, Idaho. Report prepared by Mancuso Botanical Services for Midas Gold Inc., Boise, ID.

Certainty of identification:  moderate  high  verified by: Michael Mancuso

Specimen collector/Collection #: Michael Mancuso 4383

Herbarium: ID

Photo attached?  yes  no

If photos are located elsewhere, where are they? In report noted above.

---

**Population Information** (This is for the entire population; information on subpopulations goes on next page)

Survey site name (e.g., a particular landmark or location): Cinnabar Peak

Element occurrence (EO) #, if known: 001

For an existing EO, is this:  revisit  addition  unsure

Population area (extent of all subpopulations): ca 30 acres.

Do you feel you mapped the full extent of the population?  yes  no  unsure

Is there more potential habitat in the area that hasn't been surveyed?  yes  no  unsure

Suggestions for other areas to survey: Areas on the local geology map mapped to contain Formations of carbonate rock.

Monitoring or research needs for this population: A monitoring program that includes three previously known bent-flower milkvetch subpopulations in the Cinnabar Peak area was established in 2013. It may be advantageous to expand the monitoring program to include portions of the new subpopulations discovered in 2016.

Management needs for this population: Protect from mining operation disturbances as much as possible.  
Additional population comments: Three new subpopulations discovered in 2016.

Directions (please be specific so population/subpopulations can be relocated years from now by others):  
From Stibnite, continue on USFS Road 412 towards Monumental Summit. Turn off onto an unmarked jeep trail roughly 1 mile before reaching Monumental Summit. Follow this jeep trail roughly 1 mile to a saddle. From this point it is a cross-country hike to Cinnabar Peak area; or one can follow an old dirt road that drops down to the historic Cinnabar mine site, and then leads back upslope to another saddle associated with the main ridge to Cinnabar Peak.

---

**Subpopulation information** (Copy this page and the next as needed—one for each subpop. If visits to individual subpops aren't made, fill out one for whole population. Subpops are divided by breaks in habitat, or a particular distance set by the observer, e.g., >50 m without the target species. Populations are divided by >1 km without target species.)

Subpopulation #: 1      Date of Observation: 9/26/2016      Observer(s): Michael Mancuso and Joseph Florko

Total number of individuals in subpopulation: 7000 - 10,000      This number is:  actual     minimum  
 estimated

What was counted?  genets     ramets     N/A (non-vascular etc.)     unknown

Phenology: seedling \_\_\_ %    vegetative 99%    flower \_\_\_ %    fruit 1%    dormant \_\_\_ %    unknown \_\_\_ %

Survey done too late in year to expect to see plants in flower. Many of the "vegetative" plants were probably reproductive earlier in the year. A small fraction of plants had a few residual fruit pods.

Subpopulation area: ca 25 acres

Subpopulation vigor:  excellent     good     fair     poor     unknown

Do you feel you mapped the full extent of this subpopulation?  yes     no     unsure

Uppermost slopes of eastern and western flanks of Cinnabar Peak were surveyed, but relatively extensive areas of potential habitat extending further downslope on both flanks were not searched.

Additional plants very likely occupy at least portions of these unsurveyed slope areas. The slope comprising the eastern flank was often too steep and loose to safely survey. The western flank slope was too large to fully survey in the time available.

Dominant species (existing plant community): Mostly in *Abies lasiocarpa*-*Pinus albicaulis* woodland vegetation openings. These openings often associated with old roadbed or old, small, mine pit disturbances. However, some openings a natural part of the vegetation mosaic. One portion of the subpopulation (western flank of Cinnabar Peak) with scattered *Pinus flexilis*, sparse shrub-herbaceous understory, and high rock cover.

Habitat type (potential plant community):



Associated native species: *Arenaria aculeata*, *Penstemon* spp., *Antennaria* sp., *Arnica longifolia*, *Cirsium subniveum*, *Solidago multiradiata*, *Poa wheeleri*, *Abies lasiocarpa*, *Pinus albicaulis*, *Pinus flexilis*.

Associated non-native species: Occasional *Taraxacum officinale*.

Look-alike species present: None.

General terrain/habitat (e.g., foothills, wetland, subalpine): Subalpine.

Slope: flat to steep                      Aspect: all aspects                      Toposition: ridgecrest and upper slope

Minimum Elevation: \_\_\_\_ m or \_\_\_\_ ft                      Maximum Elevation: \_\_\_\_ m or \_\_\_\_ ft

Light regime: open to partial shade                      Substrate/soil: calcareous; sandy to gravelly or rocky

Landowner(s):  BLM  USFS  state  private  other:

If all or part of subpopulation is on private land, has the landowner provided consent for the data to be exported?

Date of consent by private landowner, their contact info, and other pertinent comments:

General owner comments: Landowner is Midas Gold Inc.

Observed disturbances, such as land use, disease, predation, non-native species. For each, include severity (slight, moderate, serious, or extreme) and scope ( $\leq 10\%$ , 11-30%, 31-70%, 71-100% of subpopulation affected), if known: An old roadbed bisects the southern portion of the subpopulation. A few old mine pits also occur in this area.

Factors that may be a threat in the future. For each, include severity, scope, and imminency (near or distant future), if known: Improvements or other alterations to the old roadbed would impact many bent-flower milkvetch plants. Ground disturbances associated with mining operations would also have the potential to impact many bent-flower milkvetch plants.

Native plant community within the subpopulation is:

- A. intact with zero to low non-native plant cover and/or minimal anthropogenic disturbance
- B. intact with low to moderate non-native plant cover and/or low to moderate anthropogenic disturbance
- C. partially intact with moderate to high non-native plant cover and/or mod. to high anthropogenic disturbance
- D. almost gone with high non-native plant species cover and/or high anthropogenic disturbance

Additional comments to describe subpopulation condition and support rank: Minimal non-native plant cover, but moderate anthropogenic disturbances, including old dirt roadbed and several old, small mining pits.

Landscape surrounding the subpopulation is:

- A. unfragmented, with ecological and hydrological processes intact
- B. partially fragmented, with ecological and hydrological processes intact
- C. moderately fragmented, with ecological and hydrological processes intact
- D. highly fragmented, with many ecological and hydrological processes no longer intact

Additional comments to describe landscape setting and support rank: Disturbances associated with past mining activities much more prevalent, larger, and severe west of the subpopulation, along and above the East Fork of South Fork Salmon River.

Additional comments about the subpopulation, in general: Bent-flower milkvetch common throughout much of this subpopulation, varying from locally dense patches to low density patches with widely scattered individuals. Gaps with no plants occurred, but tended to be limited in extent. Plants were most abundant along edges and associated berms of the dirt road that bisected the southern half of the subpopulation. Plants also relatively common within the road's narrow mid-strip; but were uncommon in the road track - that portion of the road between the edge and mid-strip section where most tires pass. Overall, the road has probably received only limited traffic in recent years. The northern half of the subpopulation was largely undisturbed. Plants were common on the Cinnabar Peak ridgecrest and immediate upper slope positions, tending to occur at much lower density on other slope areas. The subpopulation probably extends further downslope on the western and eastern flanks of Cinnabar Peak than we were able to survey. We occasionally encountered flagging and metal stakes with flagging within the subpopulation - assumed this material related to Midas Gold Inc. activity.

---

If location data are from a **paper map**:

County:

Quad:

Township: \_\_\_\_\_ Range: \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of Section \_\_\_\_\_

Township: \_\_\_\_\_ Range: \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of Section \_\_\_\_\_

How accurately do you feel you mapped the subpopulation compared to its actual location on the ground?

Accurately - polygon perimeter based on a series of GPS points taken along margins of subpopulation.

However, subpopulation may be more extensive on eastern and western flanks than able to survey.

Attach a copy of part of a USGS 7.5' quad (or comparable) and delineate the subpopulation. Labeled as the "Cinnabar Peak" subpopulation on map.

---

If location data are **GPS data**:

Format of GPS data:  shapefile  digital file (.dbf, .xls, .txt, etc.)  GPS points filled in below

Method used to collect GPS data:  GPS unit  estimated on a paper map  other:

GPS unit was held:  directly over the rare plant  in the general vicinity of the rare plant

Do the GPS points mark the boundary of a plant group?  yes  no  unsure

Accuracy of GPS unit ( $\pm$  m):

Datum:  NAD27  NAD83  WGS84  unknown

Coordinate system:  UTM zone 11    UTM zone 12    UTM zone unknown    Idaho

Transverse Mercator

Decimal degrees, lat/long    state plane    township/range/section

GPS coordinates (This section has drop-down menus. No need to fill in if submitting shapefiles or digital files.)

Datum                      Zone                      ID#                      Easting (X) or Longitude                      Northing (Y) or Latitude

Accuracy

			634184	4975770	+/-
			634179	4975670	+/-
			634128	4975732	+/-
			634065	4975738	
			634140	4975783	
			634060	4975959	
			634024	4975809	
			634061	4976008	
			634097	4976080	
			634096	4976238	
			634056	4976168	
			634084	4976106	
			634177	4975933	
			634244	4975756	
			634307	4975690	

These are GPS points taken to help delineate the perimeter of the subpopulation; bent-flower milkvetch plants occurred at each point.

---

**Subpopulation information** (Copy this page and the next as needed—one for each subpop. If visits to individual subpops aren't made, fill out one for whole population. Subpops are divided by breaks in habitat, or a particular distance set by the observer, e.g., >50 m without the target species. Populations are divided by >1 km without target species.)

Subpopulation #: 2      Date of Observation: 9/26/2016      Observer(s): Michael Mancuso and Joseph Florko

Total number of individuals in subpopulation: 500

This number is:  actual    minimum    estimated

What was counted?  genets    ramets    N/A (non-vascular etc.)    unknown

Phenology: seedling \_\_\_ %   vegetative 100%   flower \_\_\_ %   fruit \_\_\_ %   dormant \_\_\_ %   unknown \_\_\_ %

Survey done too late in year to expect to see plants in flower. Many of the "vegetative" plants were probably reproductive earlier in the year.

Subpopulation area: ca 1.5 acres

Subpopulation vigor:  excellent  good  fair  poor  unknown

Do you feel you mapped the full extent of this subpopulation?  yes  no  unsure

Additional potential habitat spotty in general area. Additional plants may occur in at least some of these unsurveyed patches of potential habitat.

Dominant species (existing plant community): Scattered *Abies lasiocarpa* and *Pinus albicaulis* in area.

Habitat type (potential plant community):

Associated native species: *Arenaria aculeata*, *Penstemon* spp., *Abies lasiocarpa*, *Pinus albicaulis*.

Associated non-native species: None seen.

Look-alike species present: None.

General terrain/habitat (e.g., foothills, wetland, subalpine): Subalpine.

Slope: flat to gentle Aspect: northerly to easterly Toposition: spur ridgecrest

Minimum Elevation: \_\_\_\_ m or \_\_\_\_ ft Maximum Elevation: \_\_\_\_ m or \_\_\_\_ ft

Light regime: mostly open, but also some partial shade Substrate/soil: calcareous; gravelly and rocky

Landowner(s):  BLM  USFS  state  private  other:

If all or part of subpopulation is on private land, has the landowner provided consent for the data to be exported?

Date of consent by private landowner, their contact info, and other pertinent comments:

General owner comments: Several orange property boundary wands present suggested the area may be a mix of Payette National Forest and Midas Gold Inc. land.

Observed disturbances, such as land use, disease, predation, non-native species. For each, include severity (slight, moderate, serious, or extreme) and scope ( $\leq 10\%$ , 11-30%, 31-70%, 71-100% of subpopulation affected), if known: Subpopulation area undisturbed.

Factors that may be a threat in the future. For each, include severity, scope, and imminency (near or distant future), if known: Any mining operations at the site would have the potential to impact the subpopulation.

Native plant community within the subpopulation is:

- A. intact with zero to low non-native plant cover and/or minimal anthropogenic disturbance
- B. intact with low to moderate non-native plant cover and/or low to moderate anthropogenic disturbance
- C. partially intact with moderate to high non-native plant cover and/or mod. to high anthropogenic disturbance
- D. almost gone with high non-native plant species cover and/or high anthropogenic disturbance

Additional comments to describe subpopulation condition and support rank:

Landscape surrounding the subpopulation is:

- A. unfragmented, with ecological and hydrological processes intact
- B. partially fragmented, with ecological and hydrological processes intact
- C. moderately fragmented, with ecological and hydrological processes intact
- D. highly fragmented, with many ecological and hydrological processes no longer intact

Additional comments to describe landscape setting and support rank: Disturbances associated with past mining activities much more prevalent, larger, and severe west of the subpopulation, along and above the East Fork of South Fork Salmon River.

Additional comments about the subpopulation, in general:

If location data are from a **paper map**:

County:

Quad:

Township: \_\_\_\_\_ Range: \_\_\_\_\_ \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of Section \_\_\_\_\_

Township: \_\_\_\_\_ Range: \_\_\_\_\_ \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of Section \_\_\_\_\_

How accurately do you feel you mapped the subpopulation compared to its actual location on the ground?

Accurately - polygon perimeter based on a series of GPS points taken along margins of subpopulation.

Attach a copy of part of a USGS 7.5' quad (or comparable) and delineate the subpopulation. Labeled as the "Cinnabar Peak East" subpopulation on map.

If location data are **GPS data**:

Format of GPS data:  shapefile  digital file (.dbf, .xls, .txt, etc.)  GPS points filled in below

Method used to collect GPS data:  GPS unit  estimated on a paper map  other:

GPS unit was held:  directly over the rare plant  in the general vicinity of the rare plant

Do the GPS points mark the boundary of a plant group?  yes  no  unsure

Accuracy of GPS unit ( $\pm$  m): Datum:  NAD27  NAD83  WGS84  unknown

Coordinate system:  UTM zone 11  UTM zone 12  UTM zone unknown  Idaho

Transverse Mercator

Decimal degrees, lat/long  state plane  township/range/section

GPS coordinates (This section has drop-down menus. No need to fill in if submitting shapefiles or digital files.)

Datum	Zone	ID#	Easting (X) or Longitude	Northing (Y) or Latitude
-------	------	-----	--------------------------	--------------------------

Accuracy

			634627	4975789	+/-
			634710	4975849	+/-
			634679	4975860	+/-

These GPS points taken to help delineate the perimeter of the subpopulation.

**Subpopulation information** (Copy this page and the next as needed—one for each subpop. If visits to individual subpops aren't made, fill out one for whole population. Subpops are divided by breaks in habitat, or a particular distance set by the observer, e.g., >50 m without the target species. Populations are divided by >1 km without target species.)

Subpopulation #: 3      Date of Observation: 9/26/2016      Observer(s): Michael Mancuso and Joseph Florko

Total number of individuals in subpopulation: 300      This number is:  actual     minimum     estimated

What was counted?  genets     ramets     N/A (non-vascular etc.)     unknown

Phenology: seedling \_\_\_ %    vegetative 100%    flower \_\_\_ %    fruit \_\_\_ %    dormant \_\_\_ %    unknown \_\_\_ %

Survey done too late in year to expect to see plants in flower. Many of the "vegetative" plants were probably reproductive earlier in the year.

Subpopulation area: ca 5 acres

Subpopulation vigor:  excellent     good     fair     poor     unknown

Do you feel you mapped the full extent of this subpopulation?  yes     no     unsure

This subpopulation delineated while walking a dirt road and searching the road and immediately adjacent slope areas. Additional potential habitat appeared to be limited in most areas away from the road due to the fuller conifer canopy and relative sparse distribution of open light patches. Nonetheless, at least scattered individuals or small patches of additional plants may occur in places adjoining the subpopulation.

Dominant species (existing plant community): A mix of *Abies lasiocarpa* and *Pseudotsuga menziesii*.

Habitat type (potential plant community):

Associated native species: *Abies lasiocarpa*, *Pseudotsuga menziesii*, *Solidago multiradiata*, *Achillea millefolium*, *Penstemon* sp., *Astragalus alpinus*

Associated non-native species: Occasional *Taraxacum officinale*.

Look-alike species present: *Astragalus alpinus*.

General terrain/habitat (e.g., foothills, wetland, subalpine): Subalpine.

Slope: steep to moderately steep      Aspect: northwest to northeast      Topoposition: upper slope

Minimum Elevation: \_\_\_ m or \_\_\_ ft      Maximum Elevation: \_\_\_ m or \_\_\_ ft

Light regime: partial to nearly full shade      Substrate/soil: calcareous; gravelly

Landowner(s):  BLM     USFS     state     private     other:

If all or part of subpopulation is on private land, has the landowner provided consent for the data to be exported?

Date of consent by private landowner, their contact info, and other pertinent comments:

General owner comments: Landowner is Midas Gold Inc.

Observed disturbances, such as land use, disease, predation, non-native species. For each, include severity (slight, moderate, serious, or extreme) and scope ( $\leq 10\%$ , 11-30%, 31-70%, 71-100% of subpopulation affected), if known: Entire subpopulation associate with an old dirt road that leads to the historic Cinnabar mine site. This road suitable for ATVs.

Factors that may be a threat in the future. For each, include severity, scope, and imminency (near or distant future), if known: Improvements or other alterations to the old roadbed would impact all/nearly all bent-flower milkvetch plants. observed in the subpopulation.

Native plant community within the subpopulation is:

- A. intact with zero to low non-native plant cover and/or minimal anthropogenic disturbance
- B. intact with low to moderate non-native plant cover and/or low to moderate anthropogenic disturbance
- C. partially intact with moderate to high non-native plant cover and/or mod. to high anthropogenic disturbance
- D. almost gone with high non-native plant species cover and/or high anthropogenic disturbance

Additional comments to describe subpopulation condition and support rank: This is a roadside subpopulation. Nearly all plants located along the edge of an old dirt road. A few other plants located immediately upslope or downslope of the road.

Landscape surrounding the subpopulation is:

- A. unfragmented, with ecological and hydrological processes intact
- B. partially fragmented, with ecological and hydrological processes intact
- C. moderately fragmented, with ecological and hydrological processes intact
- D. highly fragmented, with many ecological and hydrological processes no longer intact

Additional comments to describe landscape setting and support rank: Disturbances associated with past mining activities much more prevalent, larger, and severe west of the subpopulation, along and above the East Fork of South Fork Salmon River.

Additional comments about the subpopulation, in general: This subpopulation consists of small patches or individuals of bent-flower milkvetch scattered along the roadbed edge. Plants not continuous, and absent from a larger fraction of the subpopulation area, than present. The uphill edge of the subpopulation is confluent with a previously documented subpopulation of bent-flower milkvetch.



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If location data are from a **paper map**:

County: \_\_\_\_\_

Quad: \_\_\_\_\_

Township: \_\_\_\_\_ Range: \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of Section \_\_\_\_\_

Township: \_\_\_\_\_ Range: \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of Section \_\_\_\_\_

How accurately do you feel you mapped the subpopulation compared to its actual location on the ground?

Accurately - polygon perimeter based on a series of GPS points taken along margins of subpopulation.

Attach a copy of part of a USGS 7.5' quad (or comparable) and delineate the subpopulation. Labeled as the "Cinnabar Peak South" subpopulation on map.

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If location data are **GPS data**:

Format of GPS data:  shapefile  digital file (.dbf, .xls, .txt, etc.)  GPS points filled in below

Method used to collect GPS data:  GPS unit  estimated on a paper map  other:

GPS unit was held:  directly over the rare plant  in the general vicinity of the rare plant

Do the GPS points mark the boundary of a plant group?  yes  no  unsure

Accuracy of GPS unit ( $\pm$  m): \_\_\_\_\_ Datum:  NAD27  NAD83  WGS84  unknown

Coordinate system:  UTM zone 11  UTM zone 12  UTM zone unknown  Idaho

Transverse Mercator

Decimal degrees, lat/long  state plane  township/range/section

GPS coordinates (This section has drop-down menus. No need to fill in if submitting shapefiles or digital files.)

Datum                      Zone                      ID#                      Easting (X) or Longitude                      Northing (Y) or Latitude

Accuracy

		1	634744	4974692	+/-
		2	634682	4974643	+/-
		3	634757	4974652	+/-
		4	634864	4974685	
		5	634851	4974542	

ID# 1 = ca 40 plants along a ca 50 foot length of road.

ID# 2 = marks the western edge of an ca 250 foot length of road with ca 200 plants - both along the road and slope below the road. ID# 3 marks the eastern edge.

ID# 4 = 3 plants along a ca 20 foot length of road. A few widely scattered plants continue further along road to ID# 5.

ID# 5 = plants more or less continuous from this point up the road to the saddle (plants previously known to occur in the saddle area).

## IDAHO RARE PLANT OBSERVATION REPORT 2015

Please fill in as many fields as possible, but don't worry if you have to leave blanks. Many fields contain check boxes (double click on box, and click 'checked'). E-mail completed form to [plant@idfg.idaho.gov](mailto:plant@idfg.idaho.gov)  
If you need to mail maps or other materials that can't be sent electronically, send them to Botany Data Coordinator, Idaho Department of Fish and Game, PO Box 25, 600 S. Walnut St., Boise ID 83707-0025.  
Thanks for contributing to rare plant conservation in Idaho!

Species: *Astragalus vexilliflexus* var. *vexilliflexus*

Date(s): September 27, 2016

Observer(s): Michael Mancuso and Joseph Florko

Agency/Organization/Company: Mancuso Botanical Services

Address: 20 N. Wilson St., Boise, ID 83706

E-mail:

Phone:

Other knowledgeable individuals:

Observation was:  very thorough  fairly thorough  cursory or incidental

If this observation is part of a larger study or report, what is the study/report? Mancuso, M. 2016. Field survey for bent-flower milkvetch (*Astragalus vexilliflexus* var. *vexilliflexus*) in the Stibnite Gold Project area, Valley County, Idaho. Report prepared by Mancuso Botanical Services for Midas Gold Inc., Boise, ID.

Certainty of identification:  moderate  high  verified by: Michael Mancuso

Specimen collector/Collection #: Michael Mancuso 4383

Herbarium: ID

Photo attached?  yes  no If photos are located elsewhere, where are they? In report noted above.

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**Population Information** (This is for the entire population; information on subpopulations goes on next page)

Survey site name (e.g., a particular landmark or location): Monumental Summit

Element occurrence (EO) #, if known: 002

For an existing EO, is this:  revisit  addition  unsure

Population area (extent of all subpopulations): ca 15m x 5 m

Do you feel you mapped the full extent of the population?  yes  no  unsure

Is there more potential habitat in the area that hasn't been surveyed?  yes  no  unsure

Suggestions for other areas to survey: Uncertain if this patch of bent-flower milkvetch precisely coincides with the original location for Element Occurrence 002 discovered by B. Moseley in 1994. It probably does, but if not, it is located in close proximity. We did not survey further northeast along the narrow ridge spine where another patch of plants could perhaps potentially occur. Moseley did a thorough survey for bent-flower milkvetch between Monumental Summit and Pyramid Peak in 1994, and found no other locations for this species. Other areas of potential habitat appeared to be extremely limited due to the overwhelming dominance of volcanic rock geology in the general area. However, other small outcrops of calcareous rock that might be suitable habitat may be present in the general area, but escaped detection.

Monitoring or research needs for this population: None.

Management needs for this population: None.

Additional population comments: Consists of a single small patch ca 15m x 5m in size. An estimated 50 bent-flower milkvetch at the site, although only 30 were counted. All plants were vegetative, although earlier in the year many may have been reproductive. Located on a rocky knob along a narrow ridge spine. Plants occurred in bedrock cracks and small gravelly ledges. The reddish and dark gray outcrop appeared to be metamorphic rock, although the surrounding area was clearly dominated by volcanic substrates. A woodland mix of subalpine fir and whitebark pine dominated the nearby vegetation. However, only scattered individuals of the latter species occurred directly on the narrow ridgecrest. Other associated species included *Arenaria aculeata*, *Antennaria* sp., *Erigeron compositus*, *Potentilla glandulosa*, *Saxifraga bronchialis*, and *Oryzopsis exigua*.

Associated non-native species: None.

Look-alike species present: None.

General terrain/habitat (e.g., foothills, wetland, subalpine): Subalpine.

Slope: Aspect: NE-trending ridgeline Toposition: ridgecrest

Light regime: open Substrate/soil: rocky and gravelly; calcareous?

Landowner(s):  BLM  USFS  state  private  other:

General owner comments: Payette National Forest. Occurrence located within the Frank Church-River of No Return Wilderness Area.

Observed disturbances, such as land use, disease, predation, non-native species. For each, include severity (slight, moderate, serious, or extreme) and scope ( $\leq 10\%$ , 11-30%, 31-70%, 71-100% of subpopulation affected), if known: No disturbances.

Factors that may be a threat in the future. For each, include severity, scope, and imminency (near or distant future), if known: None.

Native plant community within the subpopulation is:

- A. intact with zero to low non-native plant cover and/or minimal anthropogenic disturbance
- B. intact with low to moderate non-native plant cover and/or low to moderate anthropogenic disturbance
- C. partially intact with moderate to high non-native plant cover and/or mod. to high anthropogenic disturbance
- D. almost gone with high non-native plant species cover and/or high anthropogenic disturbance



Additional comments to describe subpopulation condition and support rank:

Landscape surrounding the subpopulation is:

- A. unfragmented, with ecological and hydrological processes intact
- B. partially fragmented, with ecological and hydrological processes intact
- C. moderately fragmented, with ecological and hydrological processes intact
- D. highly fragmented, with many ecological and hydrological processes no longer intact

Additional comments to describe landscape setting and support rank:

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If location data are from a **paper map**:

County:

Quad:

Township: \_\_\_\_\_ Range: \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of Section \_\_\_\_\_

Township: \_\_\_\_\_ Range: \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4 of Section \_\_\_\_\_

How accurately do you feel you mapped the subpopulation compared to its actual location on the ground?

Attach a copy of part of a USGS 7.5' quad (or comparable) and delineate the subpopulation.

---

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Decimal degrees, lat/long  state plane  township/range/section

GPS coordinates (This section has drop-down menus. No need to fill in if submitting shapefiles or digital files.)

Datum                  Zone                  ID#                  Easting (X) or Longitude                  Northing (Y) or Latitude

Accuracy

			637163	4975601	+/-
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Directions (please be specific so population/subpopulations can be relocated years from now by others):

From Stibnite, continue on USFS Road 412 to Monumental Summit. Walk cross-country on the main ridge that leads north towards Pyramid Peak for approximately 1 mile. The broad, gently sloping, easy-to-travel ridge abruptly narrows and changes to a section of narrow, rocky, cliffy terrain at the occurrence.