

RESULTS OF FIELD SURVEYS  
FOR ALLOTROPA VIRGATA  
IN THE BEAVERHEAD AND DEERLODGE  
NATIONAL FORESTS

Prepared by:

Jackie M. Poole  
Montana Natural Heritage Program  
State Library Building  
1515 E. 6th Avenue  
Helena, Montana 59620

Order Numbers: 43-0378-2-0131

© 1992 Montana Natural Heritage Program

This document should be cited as follows:

Poole, J. M. 1992. Results of Field Surveys for Allotropia virgata on the Beaverhead and Deerlodge National Forests. Montana Natural Heritage Program. Helena, Montana. 11 pp. plus appendix

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....1

ACKNOWLEDGEMENTS.....2

INTRODUCTION.....3

SPECIES REVIEW.....3

METHODS.....6

RESULTS.....7

DISCUSSION.....8

CONCLUSION.....8

LITERATURE CITED.....10

FIGURE 1. Distribution of Allotropa virgata in Montana

APPENDIX 1: New or verified occurrences of Allotropa virgata  
including maps and photographs

APPENDIX 2: Areas surveyed with negative results

## EXECUTIVE SUMMARY

The purpose of this study was to search for and study new populations of Allotropia virgata on the Beaverhead and Deerlodge National Forests. During 11 days of surveying almost 3400 acres, four new populations (184 plants with 632 stems) were found on the Beaverhead National Forest, and two populations (176 plants with 560 stems) not seen since 1976 were relocated on the Deerlodge National Forest.

Allotropia virgata is listed as Sensitive by U.S. Forest Service Regions 1 and 4. It is the only species within the genus, and has a disjunct distribution with the main range being in the Cascades and Sierra Nevadas of the western U.S. while an isolated, much smaller group of populations occurs in Montana and Idaho. Such disjuncts often contain substantial genetic differences as compared to the main part of the range. In Montana and Idaho the species occupies harsh sites, within subalpine fir/beargrass or subalpine fir/grouse whortleberry habitat types dominated by lodgepole pine, occasionally with Douglas fir as a co-dominant. Stand age ranges from 80->300 years, and averages about 200. The species prefers well-drained, acidic, granitic-derived soils on southerly gentle slopes at moderate (5000-7800 feet) elevations.

Allotropia virgata is quite distinctive with its red and white striped stems, resembling a candy cane. The species lacks chlorophyll, and is a mycotroph, a plant which obtains its nutrition from a photosynthetic host via a fungus associated with the roots. Any action which destroys the host (in the case of A. virgata, probably lodgepole pine and/or Douglas fir) will also kill A. virgata.

Allotropia virgata may not surface above ground every year. An underground network of rhizomes with adventitious buds may use energy one year working on below ground strength to allow for the more energy-intensive production of sexual reproductive features the next. The species surfaces as early as June and as late as September, with peak flowering in July and August. Bumblebees are the primary pollinators. Deer, elk, and moose occasionally graze on A. virgata, but without serious damage.

Allotropia virgata is threatened by timber harvest. Single-year clearance surveys are not always accurate as the plant may be in a subsurface phase. A Conservation Strategy needs to be written on a regional level to address species conservation and management concerns. Several large, healthy meta-populations should be permanently protected, and monitoring should continue to further elucidate the species reaction to various land use practices as well as critical factors in the long-term viability of the species.

#### ACKNOWLEDGEMENTS

I would like to thank John Joy for pointing me in the right direction for locating Allotropia habitat. I would also like to thank Dan Svoboda for taking time out of his busy schedule to accompany me into the field for a day to observe and discuss Allotropia, and for agreeing to let me do field surveys when he really wanted management guidelines. Jeff Jones was kind enough to provide me a place to work and sleep at the Wisdom District. My greatest source of inspiration during this study was Quinn Carver. His in-depth studies and general knowledge of the habitat and the area were invaluable to me, and his boundless enthusiasm encouraged me to continue despite the monotony of the habitat. Finally I would like to thank my fellow botanist, Bonnie Heidel, for putting up with my endless rantings about Allotropia.

## INTRODUCTION

Allotropia virgata was added to the U.S. Forest Service Region 1 list of Sensitive species in early 1991. At that time the relatively few known localities consisted primarily of small populations. Surveys were conducted in Montana and Idaho in the late 1980s and early 1990s (Roe 1992; Carver 1991; Kratz 1989; Lichthardt and Mancuso 1991) revealing the existence of many more populations (Figure 1. Distribution of Allotropia virgata in Montana). Monitoring plots were established in 1990 in Idaho on the site of a proposed timber sale to investigate the effects of harvest on the species, and although the sale had not taken place, preliminary monitoring results were reported in 1991 (Lichthardt and Mancuso 1991). On the Beaverhead National Forest in Montana in 1991, numbers of stems per site were compared to 1990 data, and monitoring plots were set up to more accurately track population demography (Carver 1991). Data from the 1992 season was not available at the time of this report. Monitoring plots have also been established on the Bitterroot National Forest in Montana. A Conservation Strategy for the species for all of Region 1 was proposed as a 1992 Challenge Cost-Share project to be funded by several of the national forests involved; however funding was not available from all forests and the project was postponed.

The purpose of this study was to search for additional localities of the Forest Service Sensitive species, Allotropia virgata, on the Beaverhead and Deerlodge National Forests. Areas were selected which appeared to be suitable habitat either according to Forest Service staff, or from topographic maps and/or aerial photographs.

## SPECIES REVIEW

Allotropia virgata is the only species within the genus. The species is primarily found in the Cascades and Sierra Nevadas, from southeastern British Columbia to California (Lichthardt and Mancuso 1991). The species was discovered in Montana in 1965, and in 1972 in Idaho (Steele and Stickney 1974). These populations are disjunct from the main portion of the range by some 300 miles (Lichthardt and Mancuso 1992). Little interest was paid to the species until the late 1980s. Shortly after this the species was listed by the U.S. Forest Service as Sensitive. There are now 35 populations documented in southwestern Montana through 1992 (Figure 1) and about 40 in adjacent Idaho (Lichthardt and Mancuso 1991). The species is found in Beaverhead, Granite and Ravalli Counties in Montana on the Beaverhead, Bitterroot, Deerlodge, and Lolo National Forest, and in Idaho in Idaho County on the Nez Perce and Payette National Forests.

In the disjunct portion of its range, Allotropia virgata occurs in harsh, low productivity sites. It grows on dry, acidic, sandy to gravelly, granitic soils which are shallow and well-drained. The plant also seems to require decaying logs or at least a two inch layer of humus (Carver 1991). Charred wood, fire scars, and a relatively low amount of downed wood indicate fire history, but the frequency and intensity, with the exception of stand-destroying and thus A. virgata destroying blazes, necessary for the health of A. virgata, are not known. Understory vegetation is sparse (canopy cover 0-50%, Carver 1991), repetitive, and of low diversity. The overstory is fairly closed (40-80% canopy cover, Carver 1991) and dominated by lodgepole pine, with Douglas fir as an occasional co-dominant. Stand age varies from around 80 years to over 300 years, with an average age of about 200 (Lichthardt and Mancuso 1991; Roe 1992). However A. virgata has been observed growing in a "doghair" stand of lodgepole pine in Idaho (Lichthardt and Mancuso 1991). Allotropia virgata is a component of the subalpine fir/grouse whortleberry or subalpine fir/beargrass habitat types, and subalpine firs when present are usually in the seedling or sapling stage. During the course of this study, two previously unreported species for A. virgata habitat were discovered. Alnus sinuata (Sitka alder) was found at the Gory Creek site on the Beaverhead National Forest, and Juniperus communis (common juniper) was located at the Meyers Creek site on the Deerlodge National Forest.

The disjunct Northern Rocky Mountain populations of Allotropia virgata are found primarily between elevations of 5000-7800 feet. However one population in Idaho was found near 2300 feet, and at least one plant was seen in Montana around 8000 feet (Carver, pers. comm., 1992). In the species' main range, the plants are commonly found at lower elevations. Although the species can be found on all aspects, it is generally prefers southerly exposures on lower slopes up to ridgetops. It occurs on almost level ground to moderately steep slopes, although it is perhaps most common on gentle slopes.

In the past Allotropia virgata has been referred to as a saprophyte. However it is actually a mycotroph, a plant which obtains its sustenance from a fungus associated with its roots. The fungus is attached to a photosynthetic plant which indirectly provides nutrition to the mycotroph via the fungal intermediary. In Oregon the mycorrhizal fungus associated with A. virgata is Rhizopogon vinicolor (Castellano and Trappe 1985). Whether the same fungus occurs with A. virgata in Montana and Idaho is not known. The photosynthetic species in the chain are most likely lodgepole pine and/or Douglas fir. Because of this co-dependency A. virgata is quite sensitive to loss of these trees whether through timber harvest or stand-replacing fire. However as long as a certain amount of live trees remain, populations of A. virgata can survive. A vigorous A. virgata has been observed within three meters of a clearcut (Carver 1991), and at least one

population occurs in a stand which was thinned. Allotropa virgata due to its underground perennating buds withstands ground fires which do not affect the overstory (Lichthardt and Mancuso 1991).

A large, live specimen of Allotropa virgata is an eye-catching plant. Undoubtedly one of the showiest members of the Ericaceae (Heath Family), the common name for this plant, candystick or sugarstick, gives an instant picture. When alive the stem is red (sometimes pink to reddish-brown) and white (to off-white) striped like a candy cane. The species is achlorophyllous (lacking in chlorophyll) so there is not a hint of green in any part of the plant. Even though A. virgata is quite distinctive, there are at least two other species and one genus which can be confused with A. virgata, at least from a distance. Allotropa virgata is 2-18 inches tall, with small upward-pointed leaves held close to the stem, running from the base to under each flower. The flowers lack petals, are composed of five sepals, and stick straight out from the stem. Two other achlorophyllous members of the Ericaceae, pinesap (Hypopitys monotropa) and pinedrops (Pterospora andromedea) are frequently found in the same habitat as A. virgata. Hypopitys monotropa is usually yellowish overall, but can sometimes have a pinkish or brownish cast particularly late in the season. The flowers of H. monotropa are four-parted and have petals. The entire inflorescence is bent over during flowering but becomes erect during fruit development. Pterospora andromedea is often much taller (up to 40 inches) and has a deep reddish-brown, glossy, fuzzy appearance due to a covering of sticky, glandular hairs. The five-lobed corolla is pendulous from a short, slender stem. One other group of plants which from a distance resemble A. virgata is the genus Corallorhiza. These orchids are immediately identifiable on closer inspection, but the purplish to reddish-brown color of the entire plant often lures an investigator closer.

Allotropa virgata begins surfacing as early as June, and continues into September. Plants may bear both new and old stems, or be composed entirely of either new or old stems. July and August are the peak flowering months, although plants may not flower (i.e. surface) every year (Lichthardt and Mancuso 1991). Theoretically this would allow the plant to partition resources to flowering and seed production one year and underground perennating buds the next (Lichthardt and Mancuso 1991). The main pollinators are bumblebees (Psithyrus insularis and Bombus mixtus) (Roe 1992). After fruit set, the plant eventually fades to an overall dark reddish-brown. Old stems may last over one or two (or perhaps more) winters, and appear dark reddish-brown to black and crumbly in comparison to the latest season's crop. The seeds are minute (perhaps less than 20 cells), numerous, and wind-dispersed. Due to their small size, they lack nutrient reserves, and probably must establish their mycorrhizal



association immediately upon germination (Lichthardt and Mancuso 1991).

Although grazing does not present a serious threat, a few stems in most large populations are eaten. Moose were observed close to a plant which had four live stems grazed. Carver (1991) reported that elk and deer tracks were seen in stem groups which were heavily grazed.

Population size in Allotropa virgata is quite variable. Of the 31 known sites in Montana, 29 have some population data. If an arbitrary population size category (small =  $\leq 25$  plants and/or 50 stems; medium =  $\leq 100$  plants and/or 300 stems; large =  $\geq 100$  plants and 300 stems) is used with some flexibility, about one-half (14) of the populations are small, one-third (10) are of medium size, and one-fifth (5) are large.

A major problem in estimating populations of A. virgata is what to count: plants or stems. Much of A. virgata's growth goes on beneath the ground. The species is clonal, and spreads by rhizomes, bearing adventitious buds on its far-reaching root system (Lichthardt and Mancuso 1991). When a bud develops into a new root crown, the connection with the old root crown is severed and a new "plant" although genetically identical to the "old" plant is formed (Lichthardt and Mancuso 1991). Such ramets (independent individuals formed vegetatively from the same genetic individual) may be up to one meter apart (Lichthardt and Mancuso 1991). Thus the problem of counting unique genetic individuals becomes realistically impractical. Usually stems or groups of stems are more or less separated in space, and can be considered "plants" for the purpose of tallying individuals. Probably for demographic studies, live stem counts are the most reliable with number of plants estimated as additional information, thus lessening investigator bias concerning the concept of what constitutes a "plant".

## METHODS

The purpose of this study was to conduct field searches for additional populations of Allotropa virgata on the Beaverhead and Deerlodge National Forests. Areas of potential habitat were selected either by knowledgeable individuals (John Joy on the Deerlodge NF) or using a combination of aerial photographs, 7.5' USGS topographic maps, and staff expertise (Quinn Carver and Jeff Jones on the Beaverhead NF). Lodgepole pine-grouse whortleberry plant associations appear light and coarse-grained in aerial photographs, and are easy to discern from the other forest habitats (Carver 1991). Also A. virgata occurs on more gently sloping, rounded topographic features rather than on features with steep and sharp edges, at least in the Bitterroot Mountains of the Beaverhead National Forest.

Selected sites were surveyed during 13, 15-18 July 1992 on the Deerlodge National Forest, and 11-13, 31 August - 2 September 1992 on the Beaverhead National Forest. Random meander through such sites was used to reach areas of high quality habitat more rapidly. When Allotropia virgata was located, the area was searched until no more individuals were located, or the time constraints prevented further survey.

For all Allotropia virgata populations, an exact tally of number of stems, both live and dead, as well as estimated number of plants, was obtained. For the purposes of the survey, a "plant" was considered to be any cluster of one or more live and/or dead stems within at least one foot of each other. For each plant, numbers of live and/or dead stems were recorded with the exception of the first population encountered on the Deerlodge National Forest before the methodology had solidified.

### RESULTS

Four new sites for Allotropia virgata were discovered on the Beaverhead National Forest, and two populations not seen since 1976 were relocated on the Deerlodge National Forest (see Appendix for detailed population information, maps, and photographs). This brings total number of sites on the Beaverhead National Forest to eight (this does not include Carver's 1992 data), while the total on the Deerlodge National Forest remains at three. A total of 184 plants with 632 stems (299 live and 333 dead) were observed on the Beaverhead National Forest during this study. The following table provides a more detailed explanation. For site specific data, refer to Appendix 1.

# of plants	# of live stems	# of dead stems
79	163	
61		162
44	136	171
	299 total live stems	333 total dead stems
184 total plants	632 total stems	

The two relocated populations on the Deerlodge National Forest had a total of 176 plants with 560 stems (200 live and 360 dead). Of these 176 plants, 65 had only live stems, 93 had only dead stems, and 18 had both live and dead stems on the same plant. For the first population surveyed on the Deerlodge National Forest, a count was not made of number and type of stems per

plant. For more detailed information concerning each site, refer to Appendix 1.

A total of 3355 acres were surveyed. Allotropia virgata was found on 205 acres, or slightly over 6% of the area surveyed. However of the acreage where A. virgata was not found, the species may occur there. As has been previously mentioned, A. virgata does not surface every year. Thus areas surveyed with negative results may require an additional survey before actions are undertaken which could harm the species. See Appendix 2 for areas which were surveyed with negative results.

#### DISCUSSION

Although Allotropia virgata often occurs in harsh, low productivity sites, these sites still provide stands of harvestable timber. Removal of canopy trees upon which A. virgata depends through its mycorrhizal fungal associate for survival, extirpates A. virgata from that site. The same is true of a stand-destroying fire. Although a few trees may be selectively removed from a stand (such as the aforementioned thinning on the Beaverhead National Forest) without apparent impact on the population, the exact number of trees which may be extracted is not known.

Due to Allotropia virgata's more or less biennial flowering schedule and its rhizomatous root system with perennating buds, the above ground stems may be few or none in number. Although this may permit the plant to partition energy resources to vegetative reproduction one year and sexual the next as well as allow the plant to escape ground fires, it does not help field staff in determining whether or not the plant is present at a particular site.

#### CONCLUSION

Allotropia virgata should continue to be categorized as Sensitive by the U.S. Forest Service in Regions 1 and 4. Although the plant is now known from many localities in Montana and Idaho, the total area covered by this disjunct group of populations is still small. It is possible also that this disjunct group represents a different genotype as compared to those plants in the main part of the range. The Montana Natural Heritage Program will rerank this species as G4S2S3. This intermediate rank represents the high population numbers (S3 - found locally in a restricted range), but is moderated by the threat of timber harvest to these populations (S2 - vulnerable to extinction within the state due to threat).

Because Allotropia virgata does not always appear above ground in any given year, a single-year clearance survey will not always be an accurate representation of the extent or even presence of the species at a site. Sites judged as good potential habitat should be surveyed during two consecutive years to determine population extent and species presence.

A Northern Rockies Conservation Strategy should be written for Allotropia virgata to address all populations in both Montana and Idaho. Data should be gathered from all sources, including each forests' surveys, monitoring plans, biological evaluations, etc. This plan should present information concerning critical requirements of the species, and give guidelines to managers to help them make decisions about impacts to the species and its habitat.

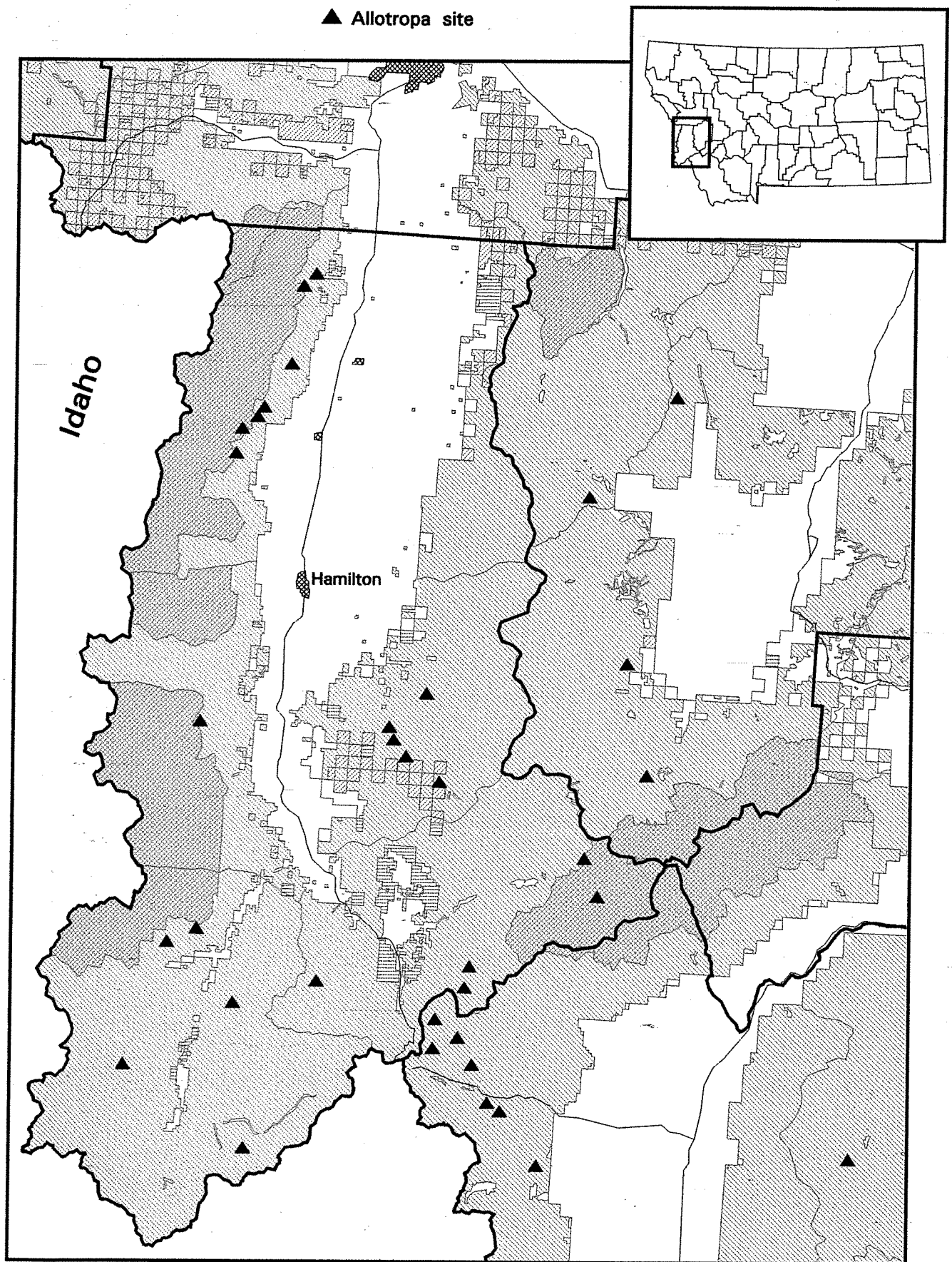
Several representative sites with large, healthy meta-populations should be set aside and protected from any current or future threats. These sites should comprise large enough tracts to encompass many small sub-populations, avoid edge effects, provide additional suitable habitat for future colonization, and ameliorate the effects of large-scale habitat disturbance such as stand-destroying fire. Monitoring should continue and be expanded to investigate the long-term viability of the species which should be the basis of any conservation effort. Population age structure, growth, recruitment, size, and distribution both spatially and temporally, are extremely important in determining abundance and distribution of the species, and will be the ultimate means of theorizing how these populations will react to changes in their habitat.

#### LITERATURE CITED

- Carver, Q. 1991. Sensitive Plants Final Report 1991. Beaverhead National Forest, Wisdom Ranger District, Wisdom, Montana. 5+ pp.
- Castellano, M. A. and J. M. Trappe. 1985. Mycorrhizal associations of five species of Monotropoideae in Oregon. *Mycologia* 77:499-502.
- Kratz, A. 1989. Allotropia virgata: Summary of 1989 Fieldwork. Lolo National Forest, Missoula, Montana. 2 pp.
- Lichthardt, J. and M. Mancuso. 1991. Report of the Conservation Status of Allotropia virgata (candystick) on the Nez Perce National Forest. I. Field Survey and First- and Second-year Monitoring Results. Idaho Department of Fish and Game, Boise. 16 pp. plus 10 appendices.
- Roe, L. S. 1992. Status Review of Allotropia virgata on the Bitterroot and Deerlodge National Forests, Montana. Montana Natural Heritage Program, Helena. 46 pp.
- Steele, R. and P. F. Stickney. 1974. Allotropia virgata (Ericaceae), First Records for Montana and Idaho. *Madroño* 22:27.

Figure 1.

# Occurrences of *Allotropa virgata* in Montana



**APPENDIX 1**

**ELEMENT OCCURRENCE RECORDS  
LOCATIONS ON 7.5' USGS TOPOGRAPHIC MAPS  
PHOTOGRAPHS OF SPECIES AND HABITAT**

MONTANA NATURAL HERITAGE PROGRAM  
Element Occurrence Record  
Allotropa virgata

Occurrence # 001

Survey site name: HELM CREEK  
EO rank: B  
EO rank comments: MODERATELY LARGE POPULATION WITH MORE  
THAN A THIRD OF THE STEMS LIVE; ADJACENT  
TO CLEARCUT WHICH MAY AFFECT THE PLANTS  
IN THE FUTURE, BUT PROTECTS IT FROM  
FURTHER CUTTING.

County: GRANITE

USGS quadrangle: MAUKEY GULCH

Township: Range: Section: TRS comments:  
005N 016W 21 NE4

Survey date: 1992-07-18 Elevation: 6640 -6800  
First observation: 1976 Slope/aspect: 30% / EAST  
Last observation: 1992-07-18 Size (acres): 20

Location:

EAST FLANK OF SAPPHIRE MOUNTAINS, ON THE EAST SLOPE OF AND 1.8 AIR  
MILES SOUTHEAST OF MOUNT EMERINE PEAK. FROM THE JUNCTION OF FS RDS  
#5060 AND 5070, GO NORTH CA. 3 MILES. SITE IS ON WEST SIDE OF ROAD,  
ABOVE CLEARCUT.

Element occurrence data:

1992: 83 PLANTS TOTAL: 11 WITH LIVE AND DEAD STEMS; 33 WITH LIVE STEMS  
ONLY; AND 39 WITH DEAD STEMS ONLY (274 TOTAL STEMS, 99 LIVE AND 175  
DEAD). 90% IN FLOWER, 5% IN FRUIT, 5% IN BUD. 4 DEAD STEMS HAD BEEN  
GRAZED. 1976: SINGLE PLANT.

General site description:

OPEN PINUS PONDEROSA-VACCINIUM SCOPARIUM COMMUNITY, CA. 25% BARE  
GROUND; SILTY, GRAVELLY, GRANITE-DERIVED SOIL, WITH XEROPHYLLUM TENAX,  
CHIMAPHILA UMBELLATA, HYPOPITHYS MONOTROPA.

Land owner/manager:

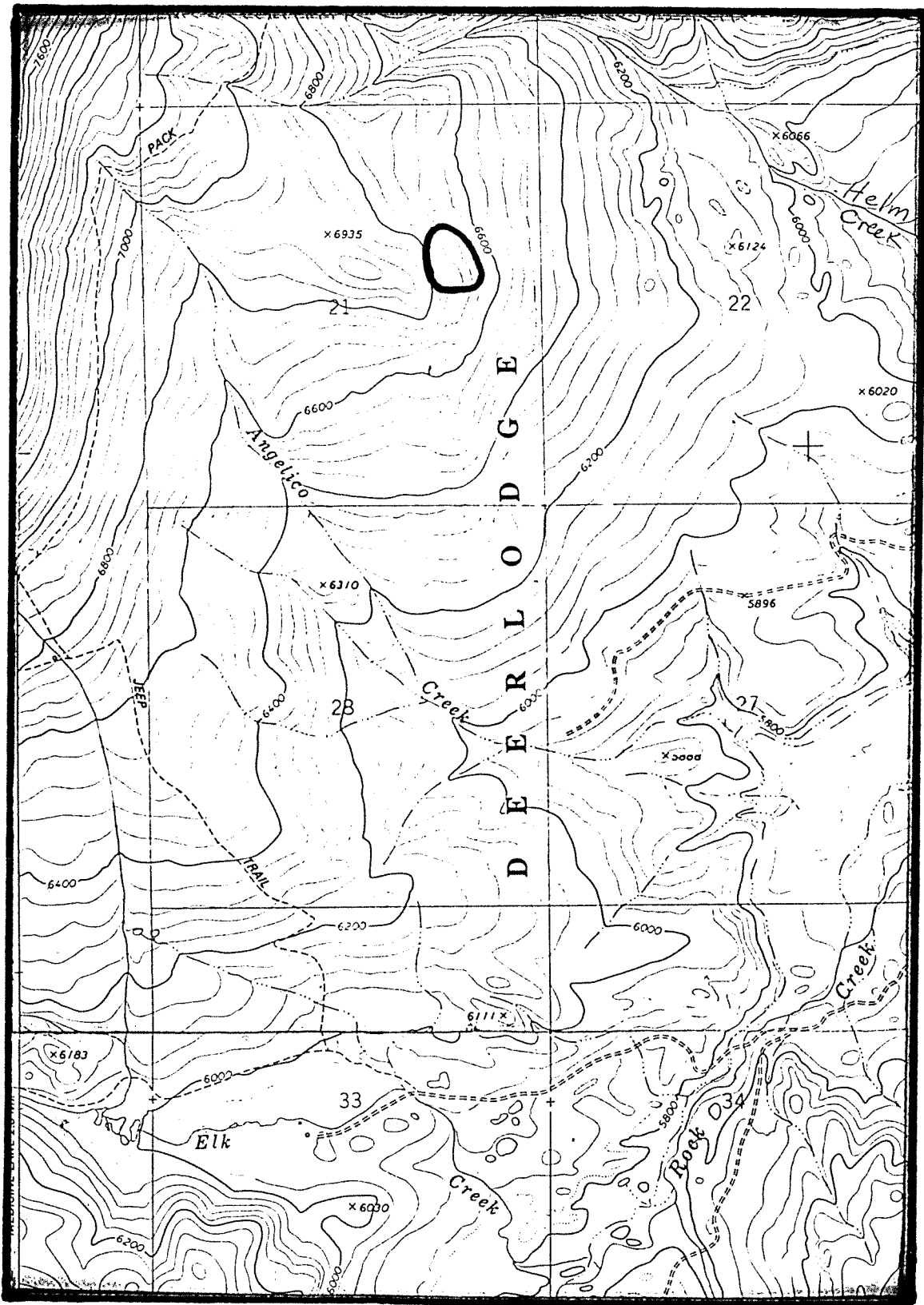
DEERLODGE NATIONAL FOREST, PHILIPSBURG RANGER DISTRICT

Comments:

Information source:

POOLE, J. M. 1992. [FIELD SURVEYS TO SAPPHIRE AND ANACONDA RANGES,  
DEERLODGE NATIONAL FOREST, OF JULY 13, 15-18.]





Allotropa virgata 001  
Site name: Helm Creek

Maukey Gulch 7.5' Quad

MONTANA NATURAL HERITAGE PROGRAM  
Element Occurrence Record  
Allotropa virgata

Occurrence # 002

Survey site name: MEYERS CREEK  
EO rank: AB  
EO rank comments: MODERATELY LARGE POPULATION IN FAIRLY  
NATURAL HABITAT, BUT WITH MORE DEAD  
PLANTS AND STEMS THAN LIVE.

County: GRANITE

USGS quadrangle: MOOSE LAKE

Township: Range: Section: TRS comments:  
003N 016W 02 NW4  
35 S2SW4

Survey date: 1992-07-16 Elevation: 6280 -6680  
First observation: 1976 Slope/aspect: 0-30% / N-S, WEST  
Last observation: 1992-07-16 Size (acres): 50

Location:

NORTHWEST FLANK OF ANACONDA RANGE, NORTHWEST OF MEYERS CREEK, CA. 1.4  
MILES WSW OF MOOSE LAKE, CA. 2.5-3.0 AIR MILES FROM COPPER CREEK  
CAMPGROUND ON FS RD #5057.

Element occurrence data:

1992: 93 PLANTS: 32 WITH 89 LIVE STEMS; 54 WITH 165 DEAD STEMS; 7 WITH  
12 LIVE AND 20 DEAD STEMS (286 STEMS, 101 LIVE AND 185 DEAD). 93% IN  
FLOWER, 7% IN FRUIT. 7 STEMS IN SUBPOPULATION, 3 GRAZED. 1976: SINGLE  
PLANT.

General site description:

OPEN PINUS PONDEROSA-VACCINIUM SCOPARIUM ASSOCIATION, MUCH BARE GROUND  
AND DOWNED WOOD, FIRE SCARS PRESENT. ASSOCIATED SPECIES: XEROPHYLLUM  
TENAX, ARCTOSTAPHYLOS UVA-URSI, HIERACIUM ALBIFLORUM, JUNIPERUS  
COMMUNIS, APOCYNUM ANDROSAEMIFOLIUM.

Land owner/manager:

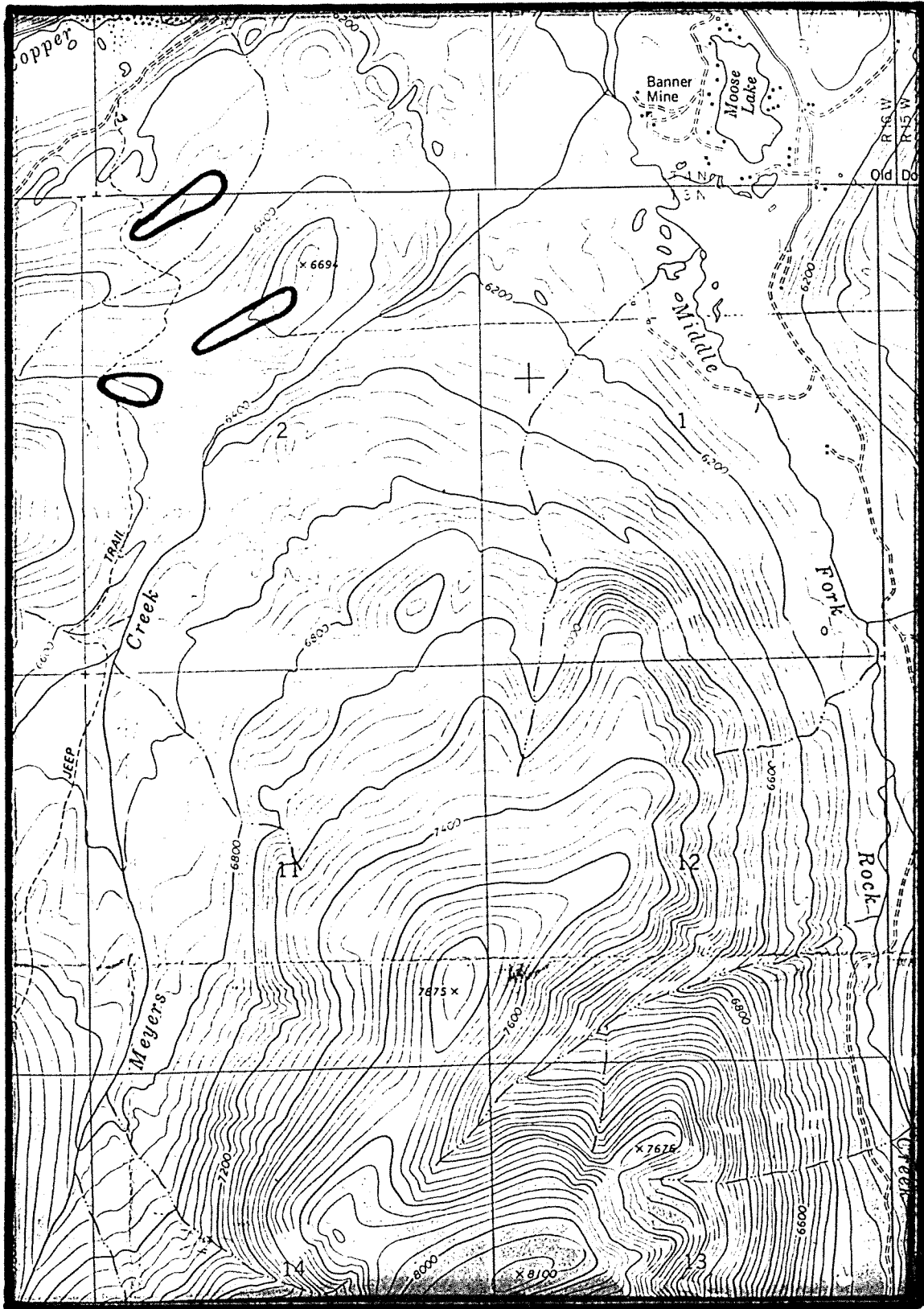
DEERLODGE NATIONAL FOREST, PHILIPSBURG RANGER DISTRICT

Comments:

POPULATION NOT RELOCATED IN 1991 SURVEY (JONES AND TOUBMAN).

Information source:

POOLE, J. M. 1992. [FIELD SURVEYS TO SAPPHIRE AND ANACONDA RANGES,  
DEERLODGE NATIONAL FOREST, OF JULY 13, 15-18.]



Allotropia virgata 002  
Site name: Meyers Creek

Moose Lake 7.5' Quad

MONTANA NATURAL HERITAGE PROGRAM  
Element Occurrence Record  
Allotropa virgata

Occurrence # 028

Survey site name: MAY CREEK RIDGE

EO rank: BC

EO rank comments: SMALL POPULATION WITH WIDELY SCATTERED  
INDIVIDUALS, SOME HUMAN DISTURBANCE.

County: BEAVERHEAD

USGS quadrangle: ELK CREEK

Township: Range: Section: TRS comments:  
002S 018W 23 NW4NE4, NE4NW4

Survey date: 1992-08-11 Elevation: 6480 -6720  
First observation: 1992-08-11 Slope/aspect: 0-20% /E AND  
PREDOMINANTLY S  
Last observation: 1992-08-11 Size (acres): 35

Location:

BITTERROOT MOUNTAINS, RIDGE NORTH OF MAY CREEK AND WEST OF MAY CREEK  
CAMPGROUND (CA. 18 MILES WEST OF WISDOM ON HIGHWAY 43.) FROM  
CAMPGROUND, TAKE TRAIL ACROSS CREEK AND HEAD UP RIDGE.

Element occurrence data:

IN 1992, THERE WERE 28 PLANTS (12 WITH 22 LIVE STEMS, 7 WITH 15 DEAD  
STEMS, AND 9 WITH 33 LIVE AND 38 DEAD STEMS), 108 TOTAL STEMS (55 LIVE  
AND 53 DEAD STEMS); 99% IN FRUIT, 1% IN FLOWER, 4 OF THE DEAD STEMS  
HAD BEEN GRAZED.

General site description:

PONDEROSA PINE - GROUSE WHORTLEBERRY PLANT ASSOCIATION; DRY, GRAVELLY,  
SANDY SOIL ON MIDSLOPE OF ROLLING UPLANDS; PARTIAL SHADE EXPOSURE.  
MANY DOWNED TREES, SOME BARE GROUND, CANOPY SOMEWHAT OPEN;  
FIRE-SCARRED AND BLACKENED TRUNKS. WITH CAREX GEYERI, ARCTOSTAPHYLOS  
UVA-URSI, CHIMAPHILA UMBELLATA, LUPINUS SERICEUS, BERBERIS REPENS,  
HYPOPITYS MONOTROPA, CORALLORHIZA MACULATA, ARNICA CORDIFOLIA,  
EPILOBIUM ANGUSTIFOLIUM, PINUS ALBA, PSEUDOTSUGA MENZIESII, VACCINIUM  
SCOPARIUM, PINUS CONTORTA.

Land owner/manager:

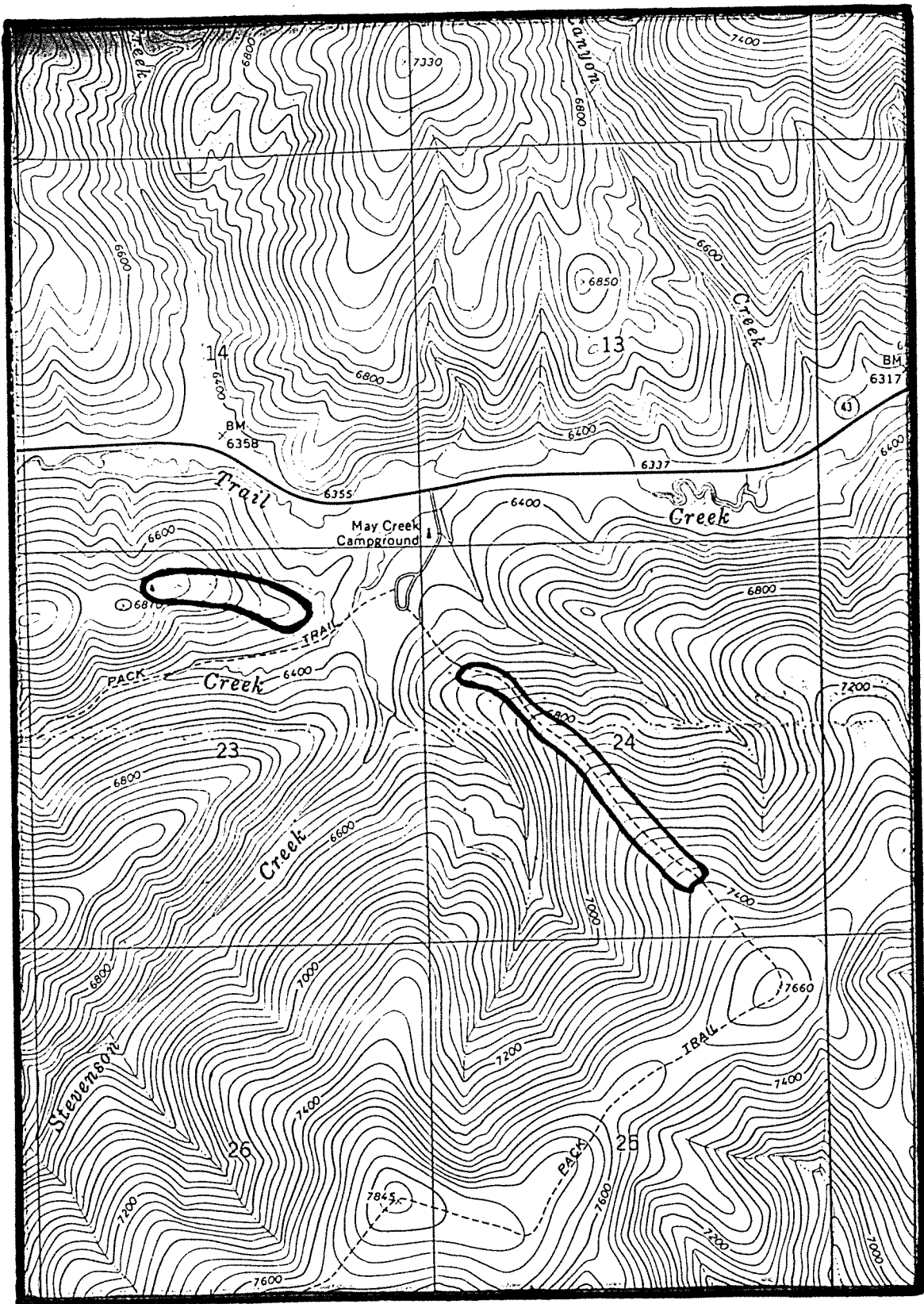
BEAVERHEAD NATIONAL FOREST, WISDOM RANGER DISTRICT

Comments:

MYCORRHIZAL SYMBIOSIS, EVIDENCE OF GRAZING BY MAMMALIAN HERBIVORES.

Information source:

POOLE, J. M. 1992. [MTNHP FIELD SURVEY TO BITTERROOT AND PIONEER  
MOUNTAINS OF AUG. 11-13, 31 AND SEPT. 2.]



Allotropia virgata 028 Elk Creek 7.5' Quad  
Site name: May Creek (1)

MONTANA NATURAL HERITAGE PROGRAM  
Element Occurrence Record  
Allotropia virgata

Occurrence # 029

Survey site name: GORY CREEK  
EO rank: C  
EO rank comments: SMALL POPULATION ABOVE THINNED PINUS  
PONDEROSA STAND, SURROUNDED BY  
CLEARCUTS.

County: BEAVERHEAD

USGS quadrangle: ISAAC MEADOWS

Township: Range: Section: TRS comments:  
003S 017W 09 SE4SE4, 16NW4SE4SE4

Survey date: 1992-08-12 Elevation: 6800 -6900  
First observation: 1992-08-12 Slope/aspect: 30% / SOUTHEAST  
Last observation: 1992-08-12 Size (acres): 10

Location:

BITTERROOT MOUNTAINS, NORTH OF ISAAC MEADOWS, WEST OF RUBY CREEK AND  
SOUTH OF GORY CREEK, CA. 2.1 AIR MILES NORTHWEST OF 1120 RANCH. FROM  
FS RD #9451 BELOW GORY CREEK, HEAD THROUGH THINNED PINUS PONDEROSA  
STAND NORTHWEST UP SLOPE.

Element occurrence data:

34 PLANTS (15 LIVE PLANTS WITH 34 STEMS, 13 DEAD PLANTS WITH 23 STEMS  
AND 6 PLANTS WITH 21 LIVE AND 13 DEAD STEMS); 91 TOTAL STEMS (55 LIVE  
AND 36 DEAD), ALL IN FRUIT. 1 LIVE STEM GRAZED.

General site description:

PINUS PONDEROSA-VACCINIUM SCOPARIUM ASSOCIATION; DRY, GRAVELLY, SILTY  
SANDY SLOPES, OPEN TO FAIRLY DENSE CANOPY, LITTLE BARE GROUND. SOME  
DOWNED TREES AND EVIDENCE OF PAST FIRE, WITH CALAMAGROSTIS RUBESCENS,  
LUPINUS SERICEUS, SPIRAEA BETULIFOLIA, PTEROSPORA ANDROMEDA, ALNUS  
VIRIDIS, HYPOPITYS MONOTROPA, CHIMAPHILA UMBELLATA, HIERACIUM  
ALBIFLORUM, PSEUDOTSUGA MENZIESII, EPILOBIUM ANGUSTIFOLIUM, PYROLA  
ASARIFOLIA, ARCTOSTAPHYLOS UVA-URSI.

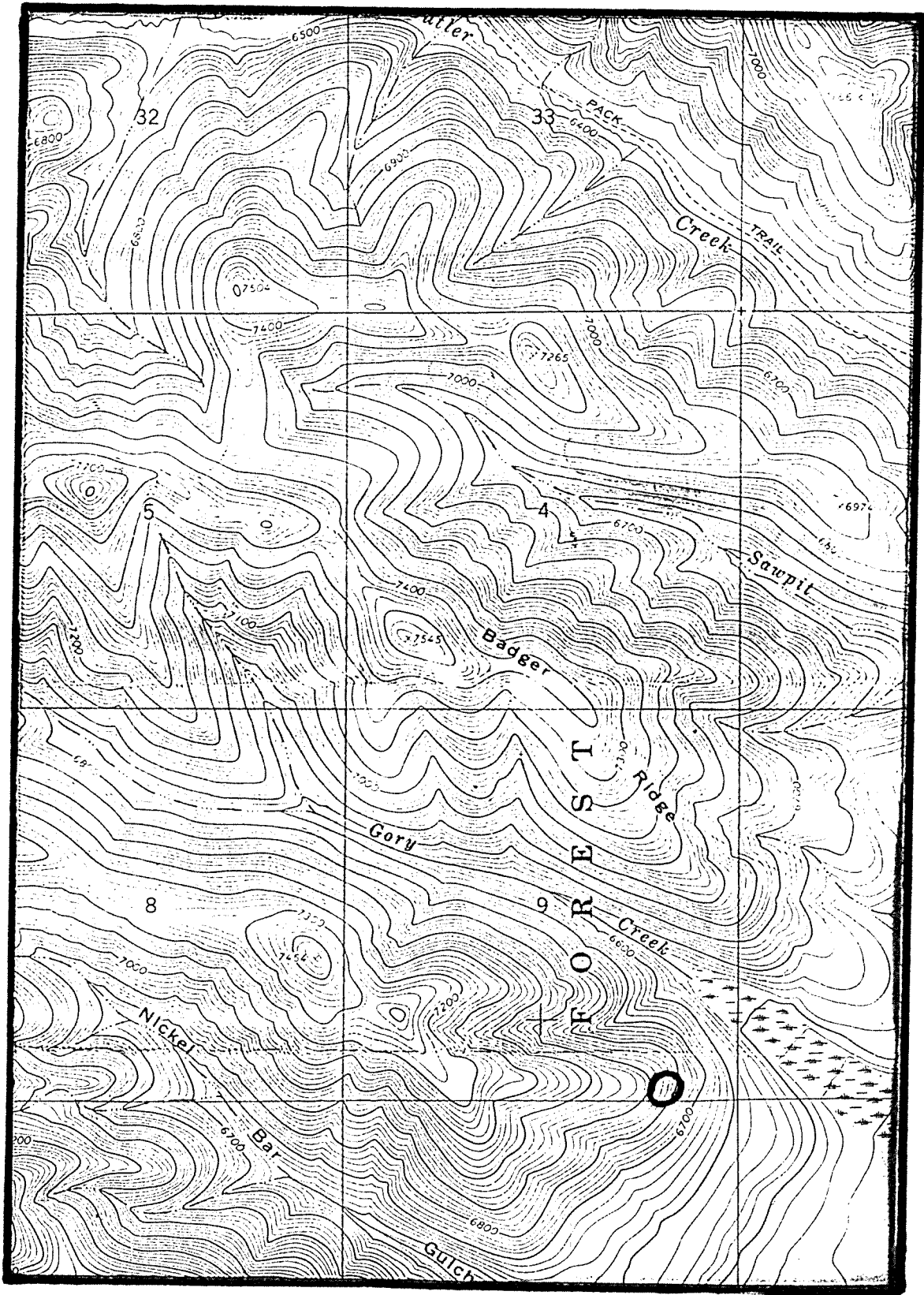
Land owner/manager:

BEAVERHEAD NATIONAL FOREST, WISDOM RANGER DISTRICT

Comments:

Information source:

POOLE, J. M. 1992. [FIELD SURVEYS TO SAPPHIRE AND ANACONDA RANGES,  
DEERLODGE NATIONAL FOREST, OF JULY 13, 15-18.]



Allotropia virgata 029  
Site name: Gory Creek

Isaac Meadows 7.5' Quad

MONTANA NATURAL HERITAGE PROGRAM  
Element Occurrence Record  
Allotropia virgata

Occurrence # 030

Survey site name: BOBCAT LAKES TRAIL  
EO rank: C  
EO rank comments: SMALL POPULATION WITH WIDELY-SCATTERED  
INDIVIDUALS; SOME PLANTS BESIDE TRAIL.

County: BEAVERHEAD

USGS quadrangle: ODELL LAKE

Township: Range: Section: TRS comments:  
003S 013W 02 S2NE4, 3S2NE4

Survey date: 1992-08-31 Elevation: 7020 -7760  
First observation: 1992-08-31 Slope/aspect: 5-45% / S-N, MOSTLY  
EAST  
Last observation: 1992-08-31 Size (acres): 30

Location:

PIONEER MOUNTAINS, CA. 14 AIR MILES EAST OF WISDOM AND CA. 2.3 AIR  
MILES NORTH OF LOWER SKULL CREEK MEADOW. GO UP THE BOBCAT LAKES TRAIL  
FROM ITS JUNCTION WITH THE LACY CREEK TRAIL; SITE IS IN TRAIL VICINITY  
CA. 0.2-1.0 MILES FROM JUNCTION.

Element occurrence data:

20 PLANTS (3 WITH 11 LIVE AND 7 DEAD STEMS, 8 WITH 12 LIVE STEMS AND 9  
WITH 27 DEAD STEMS); 57 STEMS (23 LIVE AND 34 DEAD), 95% IN FRUIT, 5%  
IN FLOWER, 4 LIVE STEMS GRAZED WITH MOOSE OBSERVED NEARBY.

General site description:

PARTIALLY TO VERY OPEN PINUS PONDEROSA-VACCINIUM SCOPULARUM  
ASSOCIATION, MUCH DEAD WOOD AND LITTER IN SOME AREAS; DRY, SILTY OR  
GRAVELLY-SILTY SOIL, WITH SHEPERDIA CANADENSIS, SPIRAEA BETULIFOLIA,  
CALAMAGROSTIS RUBESCENS, CAREX GEYERI, HIERACIUM ALBIFLORUM,  
ARCTOSTAPHYLOS UVA-URSI, HYPOPITYS MONOTROPA, LUPINUS SERICEUS, AND  
ABIES LASIOCARPA.

Land owner/manager:

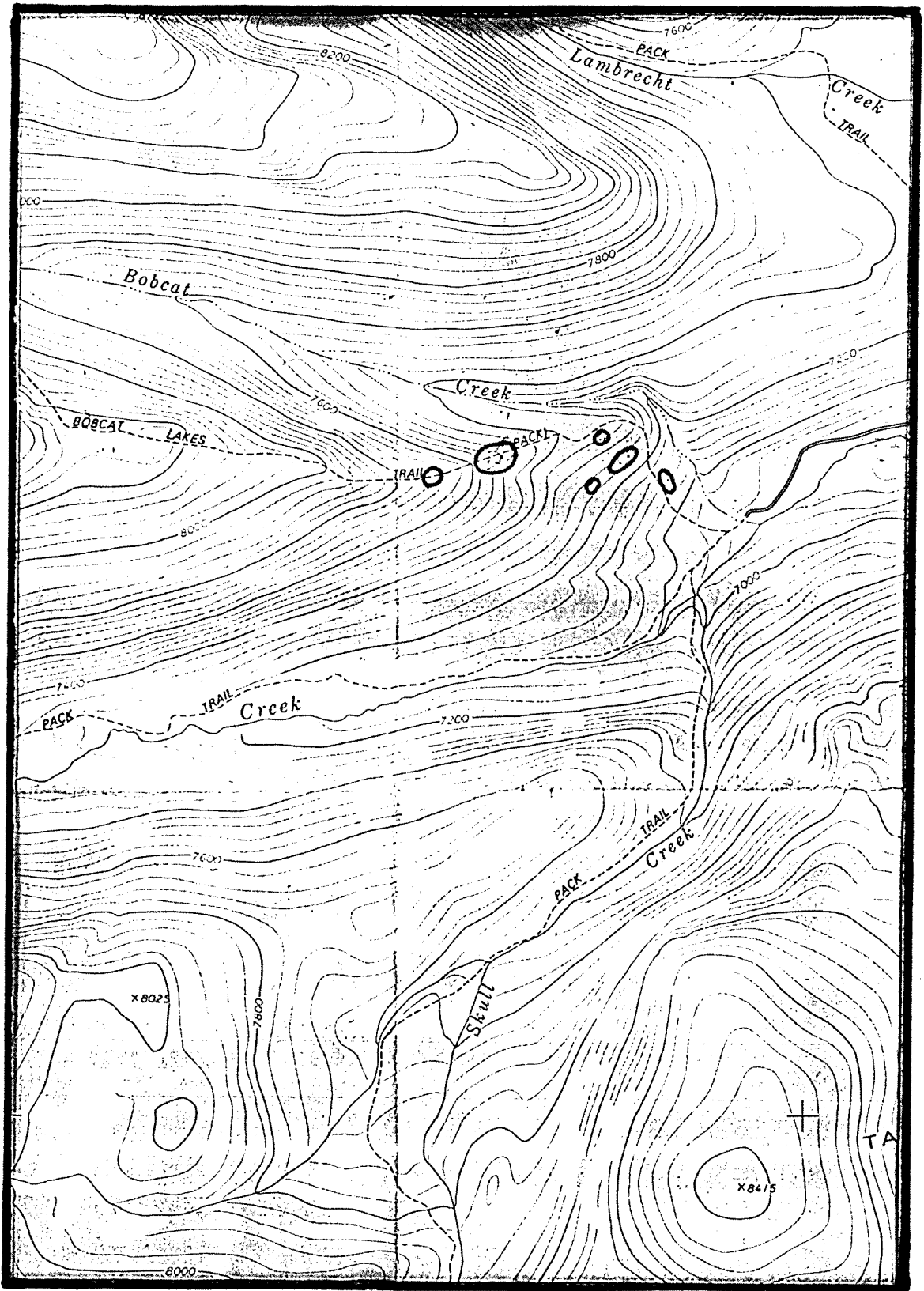
BEAVERHEAD NATIONAL FOREST, WISE RIVER RANGER DISTRICT

Comments:

Information source:

POOLE, J. M. 1992. [FIELD SURVEYS TO SAPPHIRE AND ANACONDA RANGES,  
DEERLODGE NATIONAL FOREST, OF JULY 13, 15-18.]





Allotropia virgata 030 Odell Lake 7.5' Quad  
 Site name: Bobcat Lakes Trail

MONTANA NATURAL HERITAGE PROGRAM  
Element Occurrence Record  
Allotropa virgata

Occurrence # 031

Survey site name: STEVENSON CREEK TRAIL  
EO rank: AB  
EO rank comments: MODERATELY LARGE POPULATION ALONG  
HEAVILY-USED ERODING TRAIL; CLEARCUTS  
NEARBY.

County: BEAVERHEAD

USGS quadrangle: ELK CREEK

Township: Range: Section: TRS comments:  
002S 018W 24 S2NW4,NE4SW4,E2SE4

Survey date: 1992-09-02 Elevation: 6600 -7400  
First observation: 1992-09-02 Slope/aspect: 5-25% / W-N, MOSTLY NW  
Last observation: 1992-09-02 Size (acres): 60

Location:

BITTERROOT MOUNTAINS, SOUTH OF MAY CREEK CAMPGROUND. FROM WISDOM GO  
WEST CA. 18 MILES ON HIGHWAY 43 TO STEVENSON CREEK TRAIL; SITE IS FROM  
CA. 0.2 TO 1.0 MILES SOUTHEAST OF CAMPGROUND.

Element occurrence data:

102 PLANTS (26 WITH 71 LIVE AND 113 DEAD STEMS, 44 WITH 95 LIVE STEMS,  
AND 32 WITH 107 DEAD STEMS), 376 STEMS TOTAL (166 LIVE AND 210 DEAD).  
6 LIVE STEMS AND 1 DEAD STEM GRAZED. 10% IN FLOWER, 90% IN FRUIT.

General site description:

OPEN TO VERY OPEN PINUS PONDEROSA-VACCINIUM SCOPARIUM ASSOCIATION WITH  
A SIGNIFICANT AMOUNT OF PSEUDOTSUGA MENZIESII. MUCH OPEN GROUND,  
LITTER AND DEAD WOOD; DRY SILTY SLOPING RIDGE, EVIDENCE OF PAST FIRE,  
WITH LICHENS, SPIRAEA BETULIFOLIA, CALAMAGROSTIS RUBESCENS, VACCINIUM  
GLOBULARE, CAREX GEYERI, HYPOPITYS MONOTROPA, CHIMAPHILA UMBELLATA,  
ANTENNARIA SP., XEROPHYLLUM TENAX AND EPILOBIUM ANGUSTIFOLIUM.

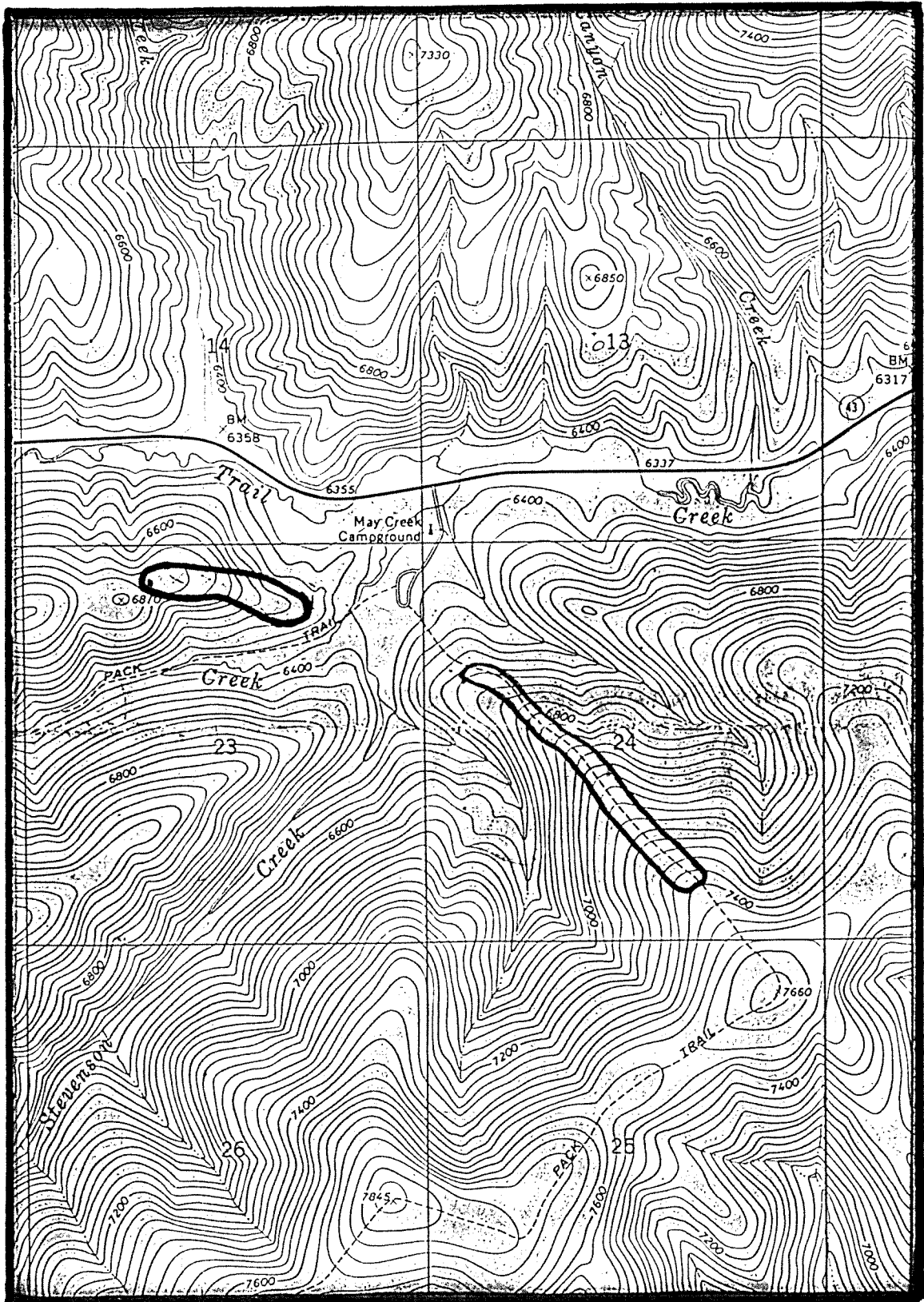
Land owner/manager:

BEAVERHEAD NATIONAL FOREST, WISDOM RANGER DISTRICT

Comments:

Information source:

POOLE, J. M. 1992. [FIELD SURVEYS TO SAPPHIRE AND ANACONDA RANGES,  
DEERLODGE NATIONAL FOREST, OF JULY 13, 15-18.]



Allotropa virgata 031  
Site name: Stevenson Creek Trail (r)

APPENDIX 2

AREAS SURVEYED WITH NEGATIVE RESULTS

Deerlodge National Forest

George Lake area - 13 July 1992

T4N R14W SECTION 18 NE $\frac{1}{4}$ NW $\frac{1}{4}$ , E $\frac{1}{2}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$   
T4N R14W SECTION 7 NW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$   
T4N R15W SECTION 13 N $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ , SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ , NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , W $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$   
T4N R15W SECTION 12 S $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$

Big Spring and Dexter Creek area - 15 July 1992

T4N R15W SECTION 23 SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , NW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ , E $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ ,  
SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ , NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , E $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$   
T4N R15W SECTION 24 W $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$   
T4N R15W SECTION 26 S $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$   
T4N R15W SECTION 25 W $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$   
T4N R15W SECTION 35 NW $\frac{1}{4}$ NE $\frac{1}{4}$ , N $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ , NE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ , E $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$

Meyers Creek area - 16 July 1992

T3N R16W SECTION 3 E $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$   
T4N R16W SECTION 35 W $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ , NW $\frac{1}{4}$ SW $\frac{1}{4}$ , NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ , E $\frac{1}{2}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ ,  
NW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ , NW $\frac{1}{4}$ NE $\frac{1}{4}$ , NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$   
T4N R16W SECTION 26 SW $\frac{1}{4}$ NE $\frac{1}{4}$

Whetstone Ridge area - 17 July 1992

T3N R16W SECTION 6 S $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , SW $\frac{1}{4}$ SE $\frac{1}{4}$ , SE $\frac{1}{4}$ SW $\frac{1}{4}$ , N $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ ,  
S $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ , NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ , W $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ ,  
SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ , NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$   
T3N R16W SECTION 7 NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$   
T3N R17W SECTION 1 E $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ , E $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$

Helm Creek area - 18 July 1992

T5N R16W SECTION 33 NW $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$   
T5N R16W SECTION 28 W $\frac{1}{2}$ SE $\frac{1}{4}$ , SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ , NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , E $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$   
T5N R16W SECTION 21 W $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , W $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ , SE $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ ,  
SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ , S $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$

AREAS SURVEYED WITH NEGATIVE RESULTS (cont.)

BEAVERHEAD NATIONAL FOREST

Ridge north of Sawpit Ridge, Badger Ridge, and ridge between -  
12 August 1992

T3S R17W SECTION 15  $W\frac{1}{2}NW\frac{1}{4}$   
T3S R17W SECTION 16  $SE\frac{1}{4}NE\frac{1}{4}, S\frac{1}{2}NE\frac{1}{4}NE\frac{1}{4}, NE\frac{1}{4}NE\frac{1}{4}NE\frac{1}{4}$   
T3S R17W SECTION 9  $SE\frac{1}{4}SE\frac{1}{4}SE\frac{1}{4}, N\frac{1}{2}SE\frac{1}{4}NE\frac{1}{4}, SW\frac{1}{4}NE\frac{1}{4}NE\frac{1}{4},$   
 $E\frac{1}{2}NW\frac{1}{4}NE\frac{1}{4}, NW\frac{1}{4}NW\frac{1}{4}NE\frac{1}{4}$   
T3S R17W SECTION 10  $NW\frac{1}{4}NW\frac{1}{4}$   
T3S R17W SECTION 4  $SW\frac{1}{4}SW\frac{1}{4}SE\frac{1}{4}, SE\frac{1}{4}SW\frac{1}{4}, NE\frac{1}{4}SW\frac{1}{4}SW\frac{1}{4},$   
 $NE\frac{1}{4}NW\frac{1}{4}SW\frac{1}{4}SW\frac{1}{4}, SW\frac{1}{4}NW\frac{1}{4}SW\frac{1}{4}, SE\frac{1}{4}NE\frac{1}{4},$   
 $N\frac{1}{2}SW\frac{1}{4}NE\frac{1}{4}, S\frac{1}{2}NW\frac{1}{4}NE\frac{1}{4}, NE\frac{1}{4}NW\frac{1}{4}, N\frac{1}{2}NW\frac{1}{4}NW\frac{1}{4}$   
T3S R17W SECTION 5  $W\frac{1}{2}NE\frac{1}{4}NE\frac{1}{4}, E\frac{1}{2}NW\frac{1}{4}NE\frac{1}{4}, NW\frac{1}{4}SE\frac{1}{4}NE\frac{1}{4}, E\frac{1}{2}SW\frac{1}{4}NE\frac{1}{4},$   
 $S\frac{1}{2}SW\frac{1}{4}NE\frac{1}{4}, N\frac{1}{2}NE\frac{1}{4}SE\frac{1}{4}$   
T2S R17W SECTION 33  $SW\frac{1}{4}SW\frac{1}{4}SW\frac{1}{4}$   
T2S R17W SECTION 32  $S\frac{1}{2}SE\frac{1}{4}SE\frac{1}{4}, SE\frac{1}{4}SW\frac{1}{4}SE\frac{1}{4}$

Ridge north of Butler Creek - 13 August 1992

T2S R17W SECTION 27  $E\frac{1}{2}NE\frac{1}{4}NE\frac{1}{4}, SE\frac{1}{4}NE\frac{1}{4}, SE\frac{1}{4}SE\frac{1}{4}SW\frac{1}{4}, W\frac{1}{2}SW\frac{1}{4}SE\frac{1}{4},$   
 $S\frac{1}{2}NW\frac{1}{4}SE\frac{1}{4}, W\frac{1}{2}NE\frac{1}{4}SE\frac{1}{4}$   
T2S R17W SECTION 28  $SE\frac{1}{4}SE\frac{1}{4}, N\frac{1}{2}SW\frac{1}{4}SE\frac{1}{4}, S\frac{1}{2}NW\frac{1}{4}SE\frac{1}{4}, NE\frac{1}{4}SW\frac{1}{4},$   
 $E\frac{1}{2}NW\frac{1}{4}SW\frac{1}{4}$   
T2S R17W SECTION 33  $NE\frac{1}{4}NE\frac{1}{4}NE\frac{1}{4}NE\frac{1}{4}$   
T2S R17W SECTION 34  $NW\frac{1}{4}NW\frac{1}{4}, NW\frac{1}{4}NE\frac{1}{4}NW\frac{1}{4}$

Bobcat Lakes trail - 31 August 1992

T3S R13W SECTION 2  $NW\frac{1}{4}NW\frac{1}{4}SE\frac{1}{4}, NE\frac{1}{4}NE\frac{1}{4}SW\frac{1}{4}$   
T3S R13W SECTION 3  $S\frac{1}{2}SW\frac{1}{4}NE\frac{1}{4}, S\frac{1}{2}NW\frac{1}{4}$

Swamp Creek road, Twin Lakes Campground and road, Big Lake Creek  
pack trail  
1 September 1992

T5S R17W SECTION 26  $W\frac{1}{2}SE\frac{1}{4}, S\frac{1}{2}NE\frac{1}{4}SW\frac{1}{4}, N\frac{1}{2}SE\frac{1}{4}SW\frac{1}{4}$   
T5S R17W SECTION 10  $NW\frac{1}{4}$   
T5S R17W SECTION 9  $N\frac{1}{2}NE\frac{1}{4}, N\frac{1}{2}NW\frac{1}{4}$   
T5S R17W SECTION 8  $NE\frac{1}{4}NE\frac{1}{4}$

Stevenson Creek trail - 2 September 1992

T2S R18W SECTION 24  $SE\frac{1}{4}SW\frac{1}{4}SE\frac{1}{4}, SW\frac{1}{4}SW\frac{1}{4}SE\frac{1}{4}SE\frac{1}{4}, NW\frac{1}{4}SW\frac{1}{4}NW\frac{1}{4},$   
 $SW\frac{1}{4}NW\frac{1}{4}NW\frac{1}{4}$   
T2S R18W SECTION 25  $NE\frac{1}{4}NE\frac{1}{4}$

REPORT SLIDES

DEERLODGE NF

*Allotropa virgata* 002

Deerlodge NF

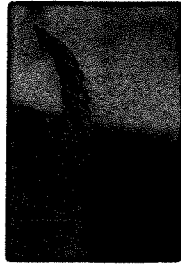


7/10/92

Jackie M. Poole

*Allotropa virgata* 002

Jackie M. Poole

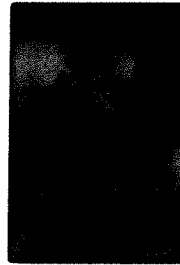


Meyers Creek  
Deerlodge NF

7/16/92

*Allotropa virgata* 001

Helm Cr.  
Deerlodge NF

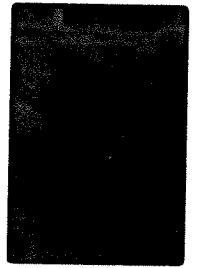


7/18/92

Jackie M. Poole

*Allotropa virgata* 002

Meyers Creek  
Deerlodge NF



7/16/92

Jackie M. Poole

*Allotropa virgata* 001

Deerlodge NF

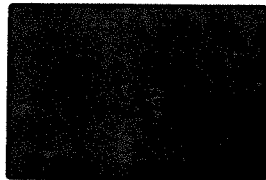


7/18/92

Jackie M. Poole

*Allotropa virgata* 002  
stem grazed

Meyers Creek



Deerlodge NF

7/16/92

Jackie M. Poole

*Allotropa virgata* 001  
Meyers Cr., Deerlodge NF



Site above creek

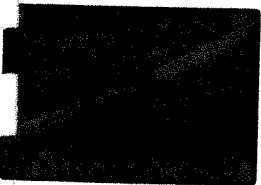
Jackie M. Poole

7/18/92

BEAVERHEAD NF

*Allotropa virgata* 031

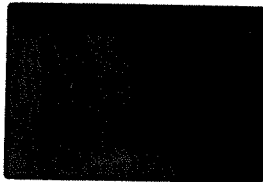
Beaverhead NF



9/2/92

Jackie M. Poole

*Allotropa virgata* 029  
Gory Cr., Bitterroot mts.  
Beaverhead NF



8/12/92

Jackie M. Poole

*Allotropa virgata* 030  
habitat

Bobcat-Lakes trail  
Beaverhead NF



8/31/92

Jackie M. Poole

*Allotropa virgata* 029  
with *Alnus viridis*

8/12/92



Jackie M. Poole

Gory Cr. Bitterroot Mts.  
Beaverhead NF

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100  
101  
102  
103  
104  
105  
106  
107  
108  
109  
110  
111  
112  
113  
114  
115  
116  
117  
118  
119  
120  
121  
122  
123  
124  
125  
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150  
151  
152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172  
173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192  
193  
194  
195  
196  
197  
198  
199  
200  
201  
202  
203  
204  
205  
206  
207  
208  
209  
210  
211  
212  
213  
214  
215  
216  
217  
218  
219  
220  
221  
222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248  
249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
260  
261  
262  
263  
264  
265  
266  
267  
268  
269  
270  
271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302  
303  
304  
305  
306  
307  
308  
309  
310  
311  
312  
313  
314  
315  
316  
317  
318  
319  
320  
321  
322  
323  
324  
325  
326  
327  
328  
329  
330  
331  
332  
333  
334  
335  
336  
337  
338  
339  
340  
341  
342  
343  
344  
345  
346  
347  
348  
349  
350  
351  
352  
353  
354  
355  
356  
357  
358  
359  
360  
361  
362  
363  
364  
365  
366  
367  
368  
369  
370  
371  
372  
373  
374  
375  
376  
377  
378  
379  
380  
381  
382  
383  
384  
385  
386  
387  
388  
389  
390  
391  
392  
393  
394  
395  
396  
397  
398  
399  
400  
401  
402  
403  
404  
405  
406  
407  
408  
409  
410  
411  
412  
413  
414  
415  
416  
417  
418  
419  
420  
421  
422  
423  
424  
425  
426  
427  
428  
429  
430  
431  
432  
433  
434  
435  
436  
437  
438  
439  
440  
441  
442  
443  
444  
445  
446  
447  
448  
449  
450  
451  
452  
453  
454  
455  
456  
457  
458  
459  
460  
461  
462  
463  
464  
465  
466  
467  
468  
469  
470  
471  
472  
473  
474  
475  
476  
477  
478  
479  
480  
481  
482  
483  
484  
485  
486  
487  
488  
489  
490  
491  
492  
493  
494  
495  
496  
497  
498  
499  
500  
501  
502  
503  
504  
505  
506  
507  
508  
509  
510  
511  
512  
513  
514  
515  
516  
517  
518  
519  
520  
521  
522  
523  
524  
525  
526  
527  
528  
529  
530  
531  
532  
533  
534  
535  
536  
537  
538  
539  
540  
541  
542  
543  
544  
545  
546  
547  
548  
549  
550  
551  
552  
553  
554  
555  
556  
557  
558  
559  
560  
561  
562  
563  
564  
565  
566  
567  
568  
569  
570  
571  
572  
573  
574  
575  
576  
577  
578  
579  
580  
581  
582  
583  
584  
585  
586  
587  
588  
589  
590  
591  
592  
593  
594  
595  
596  
597  
598  
599  
600  
601  
602  
603  
604  
605  
606  
607  
608  
609  
610  
611  
612  
613  
614  
615  
616  
617  
618  
619  
620  
621  
622  
623  
624  
625  
626  
627  
628  
629  
630  
631  
632  
633  
634  
635  
636  
637  
638  
639  
640  
641  
642  
643  
644  
645  
646  
647  
648  
649  
650  
651  
652  
653  
654  
655  
656  
657  
658  
659  
660  
661  
662  
663  
664  
665  
666  
667  
668  
669  
670  
671  
672  
673  
674  
675  
676  
677  
678  
679  
680  
681  
682  
683  
684  
685  
686  
687  
688  
689  
690  
691  
692  
693  
694  
695  
696  
697  
698  
699  
700  
701  
702  
703  
704  
705  
706  
707  
708  
709  
710  
711  
712  
713  
714  
715  
716  
717  
718  
719  
720  
721  
722  
723  
724  
725  
726  
727  
728  
729  
730  
731  
732  
733  
734  
735  
736  
737  
738  
739  
740  
741  
742  
743  
744  
745  
746  
747  
748  
749  
750  
751  
752  
753  
754  
755  
756  
757  
758  
759  
760  
761  
762  
763  
764  
765  
766  
767  
768  
769  
770  
771  
772  
773  
774  
775  
776  
777  
778  
779  
780  
781  
782  
783  
784  
785  
786  
787  
788  
789  
790  
791  
792  
793  
794  
795  
796  
797  
798  
799  
800  
801  
802  
803  
804  
805  
806  
807  
808  
809  
810  
811  
812  
813  
814  
815  
816  
817  
818  
819  
820  
821  
822  
823  
824  
825  
826  
827  
828  
829  
830  
831  
832  
833  
834  
835  
836  
837  
838  
839  
840  
841  
842  
843  
844  
845  
846  
847  
848  
849  
850  
851  
852  
853  
854  
855  
856  
857  
858  
859  
860  
861  
862  
863  
864  
865  
866  
867  
868  
869  
870  
871  
872  
873  
874  
875  
876  
877  
878  
879  
880  
881  
882  
883  
884  
885  
886  
887  
888  
889  
890  
891  
892  
893  
894  
895  
896  
897  
898  
899  
900  
901  
902  
903  
904  
905  
906  
907  
908  
909  
910  
911  
912  
913  
914  
915  
916  
917  
918  
919  
920  
921  
922  
923  
924  
925  
926  
927  
928  
929  
930  
931  
932  
933  
934  
935  
936  
937  
938  
939  
940  
941  
942  
943  
944  
945  
946  
947  
948  
949  
950  
951  
952  
953  
954  
955  
956  
957  
958  
959  
960  
961  
962  
963  
964  
965  
966  
967  
968  
969  
970  
971  
972  
973  
974  
975  
976  
977  
978  
979  
980  
981  
982  
983  
984  
985  
986  
987  
988  
989  
990  
991  
992  
993  
994  
995  
996  
997  
998  
999  
1000

Hypopitys monotropa  
Vaccinium scoparium  
Deerlodge NF, MT  
7/18/92  
Jackie M. Poole  
7/15/92

Hypopitys monotropa  
Vaccinium scoparium  
Deerlodge NF, MT  
7/18/92  
Jackie M. Poole  
7/15/92

Allotropa virgata 028  
habitat, May Creek  
Ridge  
8/11/92  
Wisdom Dist.  
Beaverhead NF, MT  
Jackie M. Poole

Allotropa virgata 028  
May Creek Ridge, Wisdom  
District Beaverhead NF, MT  
8/11/92  
Jackie M. Poole

Allotropa virgata 001  
habitat  
14 Helm Creek  
Deerlodge NF, MT  
7/18/92  
Jackie M. Poole

Allotropa virgata 001  
Helm Creek  
Deerlodge NF, MT  
7/18/92  
Jackie M. Poole

Allotropa virgata 030  
Bobcat Lakes Trail,  
9/2/92  
Pioneer Mts  
Beaverhead NF, MT  
Jackie M. Poole

Allotropa virgata 031  
Stevenson Creek Trail  
15/9/2/92  
Bitterroot Mts  
Beaverhead NF, MT  
Jackie M. Poole

Allotropa virgata 031  
Stevenson Creek Trail  
25/9/2/92  
Bitterroot Mts  
Beaverhead NF, MT  
Jackie M. Poole

Allotropa virgata 031  
Stevenson Creek Trail  
25/9/2/92  
Bitterroot Mts  
Beaverhead NF, MT  
Jackie M. Poole

Allotropa virgata 002  
habitat  
7/16/92  
Deerlodge NF, MT  
Jackie M. Poole

Allotropa virgata 002  
Meyers Creek  
Deerlodge NF, MT  
7/16/92  
Jackie M. Poole

Allotropa virgata 002  
Meyers Creek  
Deerlodge NF, MT  
7/16/92  
Jackie M. Poole