

MONTANA STATE LIBRARY

**SURVEY FOR SENSITIVE PLANT SPECIES
ON DOHERTY MOUNTAIN, JEFFERSON COUNTY**

Prepared by: Jim Vanderhorst
Montana Natural Heritage Program
State Library
1515 East Sixth Avenue
P.O. Box 201800
Helena, Montana 59620-1800

STATE DOCUMENTS COLLECTION

JUN 22 1994

Prepared for: USDI Bureau of Land Management
Butte District
P.O. Box 3388
Butte, Montana 59702-3388

MONTANA STATE LIBRARY
1515 E. 6th AVE.
HELENA, MONTANA 59620

INTRODUCTION

This report describes a survey of Bureau of Land Management (BLM) holdings on Doherty Mountain. The purpose of this study was to locate and survey populations of potential sensitive or watch species as proposed by the Bureau of Land Management in Montana (USDI Bureau of Land Management 1993). These are taxa identified by the State Office of the Bureau of Land Management as warranting sensitive or watch designation based on global rarity, state rarity, and threats.

Surveys to determine the location and size of populations of rare species are being conducted on public lands throughout the west as a result of the Federal Endangered Species Act of 1973 and subsequent Bureau of Land Management species conservation initiatives. Surveys provide baselines needed for the process of developing a list of sensitive plant species which occur on BLM lands in Montana and for addressing their conservation in the management planning process.

THE STUDY AREA

Doherty Mountain is a prominent landmark in Jefferson County, Montana which is familiar to travelers on Interstate 90. The mountain can be seen to the north where the highway crosses the steep pass between Three Forks and Whitehall. The spectacular white cliffs are formed of Cambrian limestone "wrapped around tight folds" (Alt and Hyndman 1986). Cottonwood Canyon lies between the Interstate and the mountain; its ephemeral waters drain into the Boulder River. BLM holdings in the vicinity include parts of ten sections (map in Appendix 1). The elevation of these lands ranges from about 4,700 feet (about 1,430 meters) at the bottom of Cottonwood Canyon to 6,395 feet (1,948 meters) at the top of Doherty Mountain.

PLEASE RETURN

The south face of the mountain is accessible via the gravel road which follows Cottonwood Canyon up from Cardwell. The north side of Doherty is accessible via the gravel road which crosses the Boulder River from Highway 69 about nine miles north of its beginning near Cardwell. These two-wheel drive roads are connected by a rough four-wheel drive road (see map in Appendix 1).

Native vegetation consists of several grassland, shrubland, and woodland types. Dominant grasses include *Bouteloua gracilis* (blue grama), *Elymus spicatus* (bluebunch wheatgrass), *Oryzopsis hymenoides* (Indian rice grass), and *Stipa comata* (needle and thread). Sagebrush steppe dominated by *Artemisia tridentata* and the above listed grasses occupies gentle slopes and draws with relatively well developed soils. Chaparral associations on steeper, rockier slopes are dominated by *Cercocarpus ledifolius* (mountain mahogany) and *Juniperus scopulorum* (Rocky Mountain juniper). Woodlands on dryer slopes are open canopy types dominated by *Pinus flexilis* (limber pine) and *Pseudotsuga menziesii* (Douglas fir), while closed canopy Douglas fir forests are confined to cooler northern slopes. A narrow corridor of riparian woodlands dominated by *Populus acuminata* and *P. balsamifera* is found in the bottom of Cottonwood Canyon. In addition to these vegetation types there is a considerable area which is best characterized as rock outcrop, mostly limestone. All of these native habitats are relatively undisturbed, although a number of exotic and weedy plant taxa are present, most notably in Cottonwood Canyon.

METHODS

Prior to fieldwork, the Biological Conservation Database maintained by the Montana Natural Heritage Program was queried for records of BLM potential sensitive and watch species known from the area in Jefferson County. This resulted in just one record of *Delphinium andersonii*, based on a 1964 Booth collection from along the Jefferson River between Three Forks and Cardwell. In addition, two other sensitive species, *Townsendia spathulata*, and an undescribed *Lesquerella*, were identified as search targets based on the extensive limestone in the study area. Timing of the fieldwork in the early growing season was based on the phenology of these targets and on the relatively hot dry climate of the site.

Field surveys were conducted June 2-5 and on June 14, 1993 on foot. Maps showing principle search routes are attached as Appendix 2. Both typical and unusual habitats were searched, special attention being given to limestone outcrops. Roadside populations of the putative *Delphinium andersonii* were noted en route.

Determinations were made in the field of all vascular plant species encountered in flower, fruit or in an otherwise identifiable stage. For taxonomic groups (e.g. *Poa*, *Cryptantha*) which could not be reliably identified to species, determinations were left at the level of genus. Other species were undoubtedly entirely overlooked due to their immaturity. A few specimens were collected. These have been identified and will be deposited at the herbarium at Montana State University (MONT). Duplicates of *Delphinium* specimens were sent to Michael Warnock (Sam Houston State University, Huntsville, Texas), a specialist in the genus. The primary floras used to key out plants were Dorn (1984), and Hitchcock and Cronquist (1973). In general, scientific names used in this report follow Dorn.

Field notes included lists of all vascular plant taxa encountered and characterizations of the habitat and dominant vegetation (summarized in the preceding section). A field survey form, including habitat and population data, was filled out for the *Delphinium* population that was found, and the population was mapped.

RESULTS

A total of 121 vascular plant taxa were identified within the study area including a *Delphinium* species of concern. A list of these taxa is included as Appendix 3 of this report. Several populations of the *Delphinium* were also found outside the project boundaries nearby, and along the Jefferson River. Neither *Townsendia spatulata*, nor the undescribed *Lesquerella* were seen, despite extensive searching of limestone habitats.

The *Delphinium* was found just above Cottonwood Canyon across the creek from the Interstate (see EOR printout in Appendix 4 and map in Appendix 5). This taxon has been identified in the past as *D. andersonii* or *D. geyeri*, both of which are potential BLM sensitive species. However Warnock (pers. commun.) has reviewed specimens to determine that neither species occurs in Montana, and that all specimens represent a subspecies of *D. bicolor*. Plants differ from those of *D. bicolor* by having solid blue tipped or entirely white upper petals as opposed to blue veined upper petals (see slides in Appendix 6). Both *Delphinium bicolor* ssp. *bicolor* and *D. b.* ssp. *novum* were found in the study area. The undescribed subspecies occurred in more restricted habitat and was at an earlier flowering stage. More information on this taxon is found in Vanderhorst and Lesica (1994).

At the Cottonwood Canyon site the undescribed *Delphinium* grows in relatively well developed, fine textured soils on

terraces below the hard limestone ridges. These soils are generally deeper than the soils where the plants were found in the Tendoy Mountains in Beaverhead County (Vanderhorst and Lesica 1994). Dominant vegetation at the site is sagebrush steppe (*Artemisia tridentata/Elymus spicatus*). Other common associates include *Rhus trilobata*, *Cercocarpus ledifolius*, *Stipa comata*, and *Opuntia polyacantha*. A photographic slide of the habitat is included in Appendix 6.

The population was estimated to consist of about 200 individuals, about 60% with flowering stalks and about 40% vegetative. The plants were smaller and less vigorous than other populations in the vicinity beyond BLM lands.

DISCUSSION

On grazed private land adjacent to the study area (map in Appendix 4), it straddled a fenceline and was more dense on the more-heavily grazed side. Additional roadside populations were located along the Jefferson River at Lewis and Clark State Park and further towards Three Forks along highway 287 in the general vicinity of Booth's "*D. andersonii*" collection. The State Park site is overgrown with weeds and hosts a sparse, scattered population, but at other sites along the river the plants are thriving. Although the taxon had not been documented in Jefferson County since 1964, it still seems locally common.

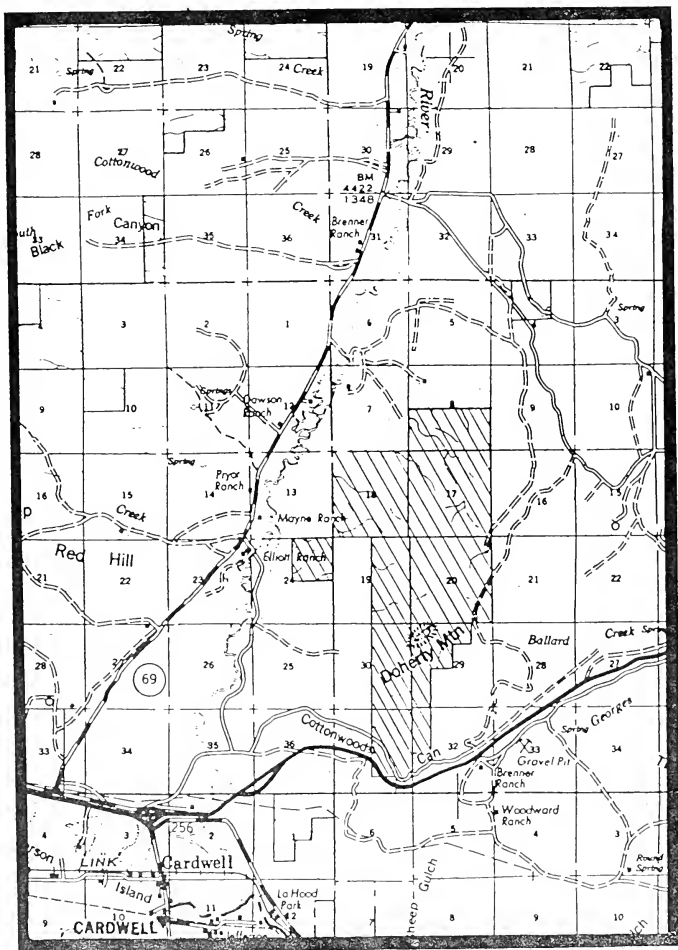
The population of the undescribed *Delphinium* subspecies does not appear to be threatened at this time, nor is the taxon threatened within the state. Grazing does not seem to adversely affect it and may even favor it. Some species of *Delphinium* are poisonous to cattle, although the larger species, which grow later in the season are best known in this regard. This taxon was seen and surveyed at numerous southwestern Montana locations during 1993 field surveys of other BLM lands (Vanderhorst 1994, Vanderhorst and Lesica 1994). Considering these facts, BLM sensitive status is not recommended for this taxon.

The list of plant species provided for Doherty Mountain should be viewed as preliminary. It is based on a short sampling period in the early part of the season when many taxa could not yet be identified. In addition, some of the BLM lands on the mountain were not surveyed, and are likely to host additional species. The unsurveyed areas are mostly on the lower slopes on the northwest side of the mountain. These areas may be more heavily grazed due to their proximity to adjacent ranches. The plant communities surveyed on Doherty Mountain were not heavily impacted by current land uses.

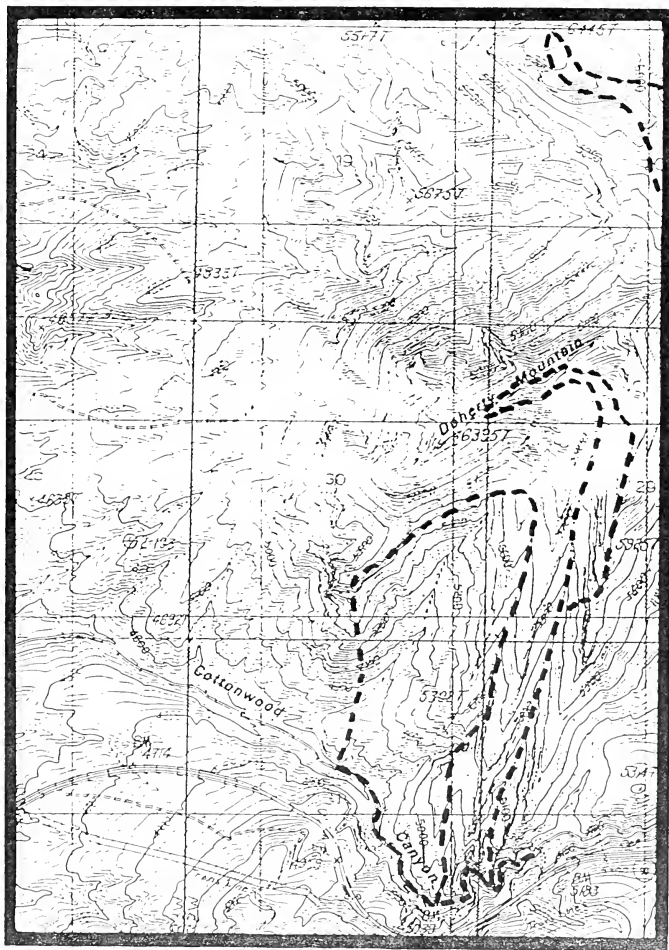
LITERATURE CITED

- Alt, D., and D. W. Hyndman. 1986. Roadside geology of Montana. Mountain Press Publishing Co., Missoula, MT. 427 pp.
- Dorn, R. D. 1984. Vascular plants of Montana. Mountain West Publishing, Cheyenne, WY. 276 pp.
- Heidel, B. L. and J. M. Poole. 1993. Montana plant species of special concern. Unpublished list. Montana Natural Heritage Program, Helena, MT.
- Hitchcock, C. L., and A. Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press, Seattle, WA. 730 pp.
- USDI Bureau of Land Management. 1993. Draft list of sensitive and watch plant species in Montana. Billings. Unpubl.
- Vanderhorst, J. 1994. Survey for sensitive plant species on Dutchman Mountain, Beaverhead County. Unpublished report to the Butte District, Bureau of Land Management. Montana Natural Heritage Program, Helena.
- Vanderhorst, J. and P. Lesica. 1994. Survey for sensitive plants in the Tendoy Mountains, Beaverhead County, Montana. Unpublished report to the Butte District, Bureau of Land Management. Montana Natural Heritage Program, Helena. In progress.

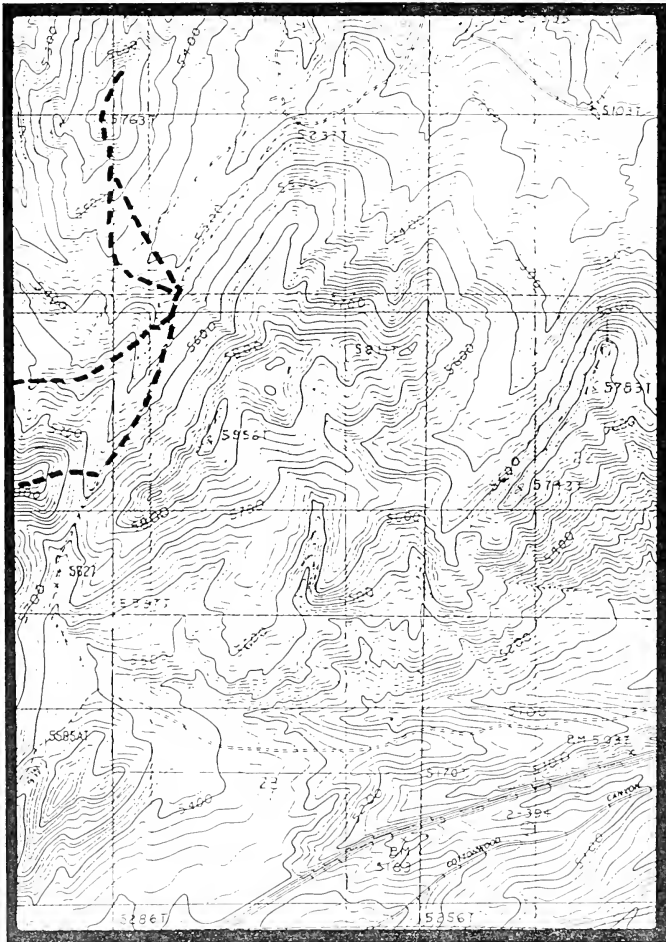
Appendix 1. Map of the study area, showing BLM lands (diagonally hatched) and access routes.



Appendix 2. Maps showing principle search routes.



USGS Doherty Mountain Quadrangle (7.5')



USGS Negro Hollow Quadrangle (7.5')

Appendix 3. Vascular plant taxa identified on BLM lands on Doherty Mountain, May 31-June 5 and June 14, 1993 (total = 121 taxa). Nomenclature follows Dorn (1984). Specimens of taxa in bold type were collected and will be deposited at MONT.

Acer glabrum	Dodecatheon conjugens
Achillea millefolium	Draba oligosperma
Agoseris glauca	Draba reptans
Allium textile	Elymus spicatus
Alyssum alyssoides	Erigeron compositus
Alyssum desertorum	Erigeron ochroleucus
Antennaria microphylla	Erigeron pumilis
Antennaria parvifolia	Eriogonum mancum
Arabis holboellii	Eritrichium howardii
Arnica cordifolia	Erysimum asperum
Arnica fulgens	Euphorbia robusta
Arenaria capillaris	Fragaria vesca
Artemisia cana	Galium aparine
Artemisia frigida	Geum triflorum
Artemisia ludoviciana	Gutierrezia sarothrae
Artemisia tridentata	Haplopappus acaulis
Astragalus agrestis	Heterotheca horrida
Astragalus cibarius	Heuchera parvifolia
Astragalus crassicaarpus	Hymenopappus polycephalis
Astragalus miser	Hymenoxys acaulis
Astragalus purshii	Ipomopsis spicata
Balsamorhiza sagittata	Iris missouriensis
Bouteloua gracilis	Juniperus communis
Bromus tectorum	Juniperus scopulorum
Camelina microcarpa	Koeleria macrantha
Carex filifolia	Lappula redowskii
Castilleja pallescens	Lesquerella alpina
Cerastium arvense	Lewisia rediviva
Cercocarpus ledifolius	Linum lewisii
Cheilanthes feei	Lithospermum incisum
Chenopodium sp.	Lithospermum ruderale
Chrysothamnus nauseosus	Lomatium foeniculaceum
Clematis ligusticifolia	Lomatium triterenatum
Collinsia parviflora	Lupinus wyethii
Collomia linearis	Mentzelia dispersa
Comandra umbellata	Mertensia oblongifolia
Coryphantha vivipara	Musineon divaricatum
Crepis modocensis	Opuntia polyacantha
Cryptantha sp.	Orobanche fasciculata
Cymopterus bipinnatus	Oryzopsis hymenoides
Cynoglossum officinale	Oxytropis lagopus
Cystopteris fragilis	Oxytropis sericea
Delphinium bicolor ssp.	Pedicularis contorta
bicolor	Penstemon aridus
Delphinium bicolor ssp.	Penstemon eriantherus
novum	Petrophyton caespitosum
Descurainia richardsonii	Phacelia linearis

Phlox hoodii
Pinus flexilis
Poa sp.
Populus acuminata
Populus balsamifera
Potentilla ovina
Prunus virginiana
Pseodotsuga menziesii
Rhus trilobata
Ribes cereum
Ribes setosum
Rosa sp.
Salix exigua
Sedum lanceolatum
Selaginella densa
Senecio canus
Sisymbrium altissimum
Sisymbrium loeselii
Sisyrinchium montanum
Stipa comata
Taraxacum laevigatum
Taraxacum officinale
Thlaspi arvense
Townsendia parryi
Tragopogon dubius
Verbascum thapsus
Vicia americana
Woodsia scopulina
Zigadenus venenosus

Appendix 4. Element Occurrence Record printout for the
undescribed *Delphinium*.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: DELPHINIUM BICOLOR SSP NOVUM
Common Name: UNDESCRIBED LARKSPUR

Global rank: G3 Forest Service status:
State rank: S2S3 Federal Status:

Element occurrence code: PDRANNOV01.010
Element occurrence type:

Survey site name: COTTONWOOD CANYON
EO rank: B
EO rank comments: SOME ADVENTIVES; GRAZING IN AREA BUT PLANTS ARE ON
STEEP SLOPES ABOVE ROCKY CLIFFS.

County: JEFFERSON

USGS quadrangle: DOHERTY MOUNTAIN

Township: Range: Section: TRS comments:
002N 002W 31 SE4; 32 SW4

Precision: S
Survey date: 1993-06-05 Elevation: 4900 - 5000
First observation: 1993-06-05 Slope/aspect: 10-45% / -
Last observation: 1993-06-05 Size (acres): 20

Location:

TAKE CARDWELL EXIT OFF I-15 AND GO NORTH AND EAST, CROSSING THE
BOULDER RIVER. CONTINUE CA. 3 MILES ON COTTONWOOD CANYON ROAD; PLANTS
ARE NORTH OF ROAD.

Element occurrence data:

200+ INDIVIDUALS, 3 SUBPOPULATIONS; 40% VEGETATIVE, 50% FLOWERING, 10%
FLOWER AND FRUIT. MANY YOUNG PLANTS. PLANTS ARE SHORT IN HEIGHT
COMPARED TO THOSE OF OTHER OCCURRENCES IN THE VICINITY.

General site description:

OPEN, DRY MIDSLOPE, LIMESTONE PARENT MATERIAL, FINE SOILS. KARST
TOPOGRAPHY TERRACES BETWEEN HARD ROCK RIDGES. ASSOCIATED SPECIES:
ARTEMISIA TRIDENTATA, ELYMUS SPICATUS, RHUS TRILOBATA, OPUNTIA
POLYACANTHA, CERCOCARPUS LEDIFOLIA, STIPA COMATA, OROBANCHE
FASCICULATA, CRYPTANTHA SP., CIRSIUM SP., EUPHORBIA ROBUSTA,
CORYPHANTA VIVIPARA.

Land owner/manager:

BLM: BUTTE DISTRICT, HEADWATERS RESOURCE AREA

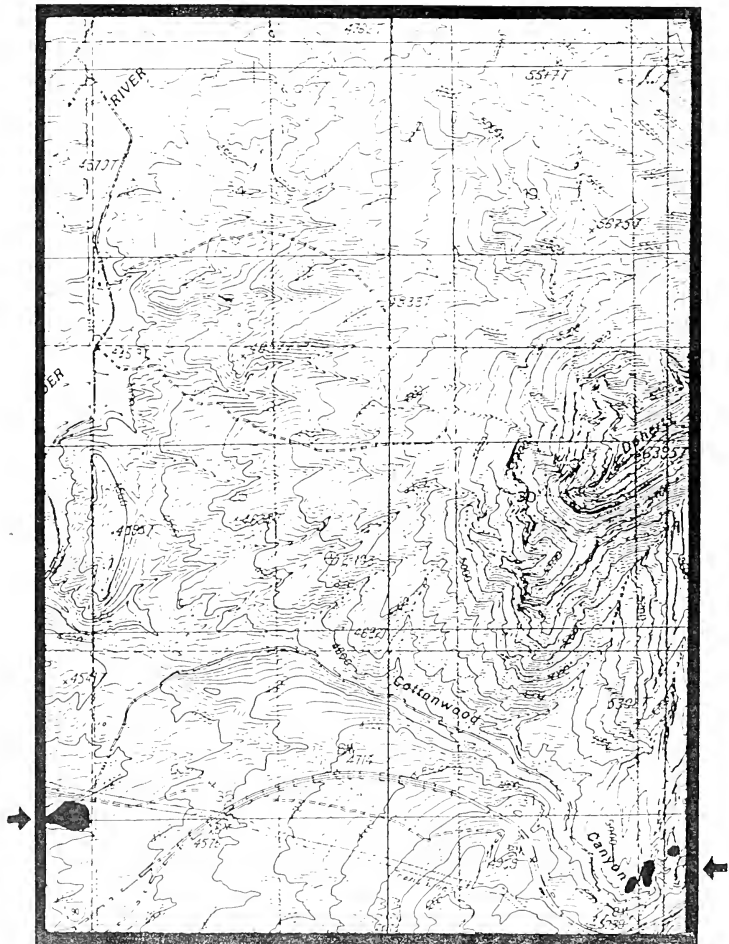
Comments:

SOME BROWSING BUT NOT EXTENSIVE.

Information source: VANDERHORST, J. 1993. [MTNHP FIELD SURVEYS
CONDUCTED AT DOHERTY MOUNTAIN FOR THE BUREAU OF
LAND MANAGEMENT.]

Specimens: VANDERHORST, J. (4919, 4923). 1993.

Appendix 5. Map showing populations of the undescribed *Delphinium* (USGS Doherty Mountain Quadrangle, 7.5'). The population at the western edge of the map is on private land.



Delphinium bicolor ssp. novum
 Doherty Mountain Quad, 7.5'

Appendix 6. Photographic slides.

Slide 2. Close-up of *Delphinium* flowers.

Slide 3. *Delphinium* plant.

Slide 12. *Delphinium* habitat above Cottonwood Canyon.

Appendix 6. Photographic slides.

Slide 2. Close-up of *Delphinium* flowers.

Slide 3. *Delphinium* plant.

Slide 12. *Delphinium* habitat above Cottonwood Canyon.

MONTANA STATE LIBRARY

This "cover" page added by the Internet Archive for formatting purposes