

PLANT COMMUNITIES OF THE KEVIN
RIM, TOOLE COUNTY, MONTANA:
Preliminary Survey Results

Robert L. DeVelice
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Abstract. -- Plant communities of the Kevin Rim in northcentral Montana are described according to their floristic composition and associated environmental variables. These results are based on 21 reconnaissance "fast-plot" samples located along environmental gradients. Floristic data were grouped into community types based on existing classifications. Results indicate the presence of eleven series (three grassland, six shrubland, and two forest) containing thirteen plant communities. Elevation was ordinated against a subjectively defined moisture index (basically a composite of aspect, slope, and topographic position). Results suggest that the plant communities occur along a complex topographic/soil/moisture gradient. Since total relief is only 800 feet, it is likely elevation relationships are more strongly associated with topographic position than with altitude-related temperature limitations. These results are based on a total of two-days of field work and must be regarded as tentative pending more intensive fieldwork.

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INTRODUCTION

The Kevin Rim in northcentral Montana contains the second highest raptor nest density recorded in the western United States (information on file at MTNHP). At present these raptor populations are being intensively inventoried and monitored as part of a study to determine potential impacts of oil/gas and agricultural development in the area. Additionally, the Bureau of Land Management has proposed a portion of the Kevin Rim be designated an Area of Critical Environmental Concern (ACEC) and the raptor study will provide information relevant to the ACEC designation process.

Although significant knowledge is building regarding raptor populations, plant community composition and environmental relationships at the Kevin Rim have been poorly studied. **Since plant communities constitute a major component of raptor habitat, this survey was conducted.** The objective was to provide a preliminary description of plant community/environmental relationships of the area. The results are based on only two-days of fieldwork (June 20 and 21, 1990) and would require significant additional field survey to validate and refine the community listing and to develop an acceptable vegetation map.

METHODS

The study area was defined as extending from the south-end of the Kevin Rim (T35N, R3W, Sec. 19) north approximately six miles (T36N, R3W, Sec. 20). The study area forms a 3/4 mile-wide band extending approximately 1/4 mile across the mesa-top from the sandstone escarpment and 1/2 mile below the escarpment.

Samples were subjectively selected using a variation of the "gradsect" method described by Gillison and Brewer (1985). The method involved preferential sampling along local transects following the maximum perceived environmental gradients. Representation of the range of elevational, topographic, and soil conditions was strived for. Only two days were available for fieldwork. An additional, five days of sampling would likely be necessary to be confident that a representative sample was achieved.

Reconnaissance "fast-plots" were established on different topographic positions along elevational transects where subjective judgement indicated a marked change in vegetation composition. Information recorded included community occurrence acreage (continuous area), topographic position, slope shape, aspect, slope percent, elevation, canopy cover estimates of the five to ten dominant plant species, and general comments regarding the community occurrence.

Analysis focused on using existing plant community classifications to identify plant community types. Direct gradient analysis was used to describe general patterns of communities in relation to environmental factors. Elevation formed one axis of this ordination while the other axis was a subjectively defined moisture index (basically a composite of aspect, slope, and topographic position).

Species nomenclature follows GPFA (1986).

RESULTS AND DISCUSSION

A total of 21 reconnaissance plots were established (Fig. 1). These data were grouped into three grassland, six shrubland, and two forest series containing thirteen plant communities (Table 1). A diagnostic key utilizing indicator plant species is provided for field identification of the plant communities (Table 2).

Community types occur along topographic and soil moisture gradients (Fig. 2). Since total relief is only 800 feet, it is likely elevation relationships are more strongly associated with topographic position than with altitude-related temperature limitations. Descriptions of the 13 community types and their general environmental relationships follow (refer to Fig. 2 also):

Grasslands. The AGSM-BOGR community is common on alluvial fans and other flat to slightly sloping surfaces at low elevations. Heavy grazing by cattle is common and the dominance of *Bouteloua gracilis* likely reflects the species ability to increase in response to grazing. Other characteristic species include *Agropyron smithii*, *Carex filifolia*, and *Artemisia frigida*.

The AGSM-STVI community likely represents a less heavily grazed and/or slightly mesic variant of the AGSM-BOGR community. *Bouteloua gracilis* is often well represented where cattle grazing is moderate to heavy. The community occurs on clayey alluvial fans, flats, and depressions at low elevations. In addition to *Bouteloua gracilis*, *Agropyron smithii*, *Stipa viridula*, *Poa sandbergii*, *Stipa comata*, *Carex filifolia*, and *Artemisia frigida* are generally common to well represented. The most heavily disturbed sites typically feature *Bromus tectorum*.

The AGSP-BOGR community is common on flat to steep slopes at low to mid elevations. Cattle grazing is moderate to heavy and "increaser" plants such as *Artemisia frigida*, *Sphaeralcea coccinea*, *Hymenoxys* spp., and *Phlox hoodii* are often common. Generally, *Bouteloua gracilis* appears to be more abundant on the heavily grazed sites. Other characteristic species include *Agropyron spicatum*, *Stipa comata*, *Carex filifolia*, and *Koeleria pyramidata*.

The AGSP-POSA community is common above the sandstone rim at the highest elevations of the study area. These relatively flat to gently sloping sites have likely received heavy grazing historically both by cattle and sheep. However, no stock were visible at survey time. "Increaser" species such as *Artemisia frigida*, *Phlox hoodii*, and *Selaginella densa* are often abundant. Characteristic species are *Agropyron spicatum*, *Poa sandbergii*, *Carex filifolia*, *Stipa comata*, and *Koeleria pyramidata*. *Bouteloua gracilis* is generally absent.

The FEID-AGSP community is relatively uncommon in the study area and occurs above the sandstone rim on sites similar to the AGSP-POSA community. It is possible that more mesic occurrences of the AGSP-POSA community might represent FEID-AGSP sites where *Festuca idahoensis* has been eliminated by heavy grazing. In addition to *Festuca idahoensis* and *Agropyron spicatum*, characteristic species include *Poa sandbergii* and *Koeleria pyramidata*.

Shrublands. The ARCA/AGSM community is of relatively small extent and occurs in steep mid slope concavities (e.g., draws and other moisture run-on sites). The community represents the driest extreme of "riparian" sites in the study area. The common occurrence of "weedy"

species such as *Bromus tectorum* and *Descurainia pinnata* is suggestive of grazing disturbance, perhaps by sheep. Cattle traffic on these steep slopes is likely infrequent. Characteristic species include *Artemisia cana*, *Agropyron smithii*, and *Elymus cinereus*.

Xeric "badland" sites at low to mid elevations feature vegetation varying widely in composition and cover. Bare soil dissected by gullies characterizes most sites. Perhaps the most characteristic species are *Atriplex nuttallii* and *Oryzopsis hymenoides* and the community is provisionally referred to as ATNU/ORHY (complete community descriptive information would be needed to verify classification). Additional species encountered include *Agropyron spicatum*, *Artemisia cana*, and *Chrysothamnus nauseosus*. Since the cover of forage species seldom exceeds 10 percent and the slopes are often steep, grazing impacts by domestic stock is low. However, even infrequent movement of stock across these unstable sites would likely result in enhanced erosion.

A community provisionally referred to as POFR/AGSP was observed at one location in the study area (complete community descriptive information would be needed to verify classification). The site is a steep, mesic north slope at mid elevation. High species diversity is present (>40 species/tenth acre). Although the grasslands/shrublands below on gentle topography have been heavily impacted by cattle, the steep topography on this site likely prevents cattle from frequently venturing onto the site. Species that are common or well-represented include *Potentilla fruticosa*, *Agropyron spicatum*, *Amelanchier alnifolia*, *Juniperus communis*, *Eleagnus commutata*, and *Koeleria pyramidata*.

Two "riparian" shrubland communities were found in the study area: PRVI and SYOC. The PRVI community is found in upper slope draws and moist concavities and the more common SYOC community occurs in similar habitats at lower elevations. Owing to the greater water availability on these sites, forage production is generally higher than on surrounding uplands. This has generally resulted in higher relative utilization (and impact) by livestock and wildlife on such sites. Increases in species such as *Bromus tectorum* and *Poa pratensis* are often well represented.

Characteristic species in the PRVI community include *Prunus virginiana* and *Symphoricarpos occidentalis*. However, species composition is highly varied among occurrences of this community and *Agropyron smithii*, *Elymus cinereus*, *Artemisia ludoviciana*, *Ribes aureum*, and *Thermopsis rhombifolia* are well represented on some sites.

Symphoricarpos occidentalis characterizes the SYOC community and sometimes dominates stands to the extent that other species are either excluded or are depauperate. Associated species that may be well represented include *Agropyron smithii* and *A. dasystachyum*, and *Artemisia ludoviciana*.

A RHAR/AGSP community occurs on, xeric mid elevation sites. Slopes are steep and soils are sandy and erosive^{er. 2000?} with up to 70% bare soil exposed. The physiognomic characteristics are similar to the ATNU/ORHY badlands community which occurs on clayey substrates. Characteristic species include *Rhus aromatica*, *Agropyron spicatum*, *Artemisia cana*, *Oryzopsis hymenoides*, and *Calamovilfa longifolia*.

Forests. Two riparian broadleaved forest communities were found in the study area: PODE/COST and POTR/COST. These communities occupy perhaps the smallest total area of any community in the study area but contain such high species and structural diversity that their biodiversity importance greatly exceeds their area. ?

The most mesic of the two communities is PODE/COST which was found in a very steep, mid elevation draw. Dominant species present are *Populus deltoides*, *Prunus virginiana*, *Amelanchier alnifolia*, and *Heracleum sphondylium*.

The POTR/COST community was found on a steep north-facing upper slope. Dominant species are *Populus tremuloides*, *Cornus stolonifera*, *Prunus virginiana*, *Amelanchier alnifolia*, and *Ribes lacustre*. The *Populus tremuloides* present features about 30 percent crown mortality (perhaps in response to drought stress?) but appears to be regenerating sufficiently for self-replacement. Species diversity is high (>40 species/tenth acre). The dense vegetation and isolation high up a steep slope has minimized livestock impacts and vegetation condition was among

the most pristine observed. Complete community descriptive information would be desirable to fully document this interesting community occurrence.

CONSERVATION-SPECIFIC COMMENTS

Most of the vegetation present appears to have been impacted by grazing disturbance. At present, livestock do not appear to be intensively utilizing the steeper slopes and vegetation condition may be improving from past impacts (by sheep?) on such sites. However, many of the steep slopes present feature unstable substrates that will likely continue to provide suitable sites for disturbance opportunists such as *Bromus tectorum*, regardless of grazing status. Reduction of cattle numbers on the more heavily-impacted flat areas below the escarpment may result in improvement in vegetation condition since abundant native seed sources remain.

Conversion of native vegetation to agriculture (i.e., "sod-busting") has occurred on flat topography both above and below the sandstone escarpment. Continued farm expansion may degrade native habitat quality in the area both by reducing the extent of native plant community occurrences and by expanding the seed pool of exotic species.

The network of access roads associated with oil field development and ranching in the area poses a threat to biodiversity. Potential impacts associated with these roads include: disturbances to soils and vegetation resulting from off-road vehicle use, increased poaching, and increased dispersal of weeds.

LITERATURE CITED

- Anderson, N.L. 1973. The vegetation of rangeland sites associated with some grasshopper studies in Montana. Montana Agriculture Experiment Station Bulletin No. 668. Montana State University, Bozeman.
- Gillison, A.N. and K.R.W. Brewer. 1985. The use of gradient directed transects or gradsects in natural resource surveys. Journal of Environmental Management 20:103-127.
- GPFA (Great Plains Flora Association). 1986. Flora of the great plains. University Press of Kansas, Lawrence.
- Hansen, P., K. Boggs, R. Pfister, and J. Joy. 1990. Classification and management of riparian and wetland sites in central and eastern Montana. Draft Version 2. Montana Riparian Association, School of Forestry, University of Montana, Missoula.
- Mueggler, W.F. and W.L. Stewart. 1980. Grassland and shrubland habitat types of western Montana. USDA Forest Service General Technical Report INT-66.
- Ross, R.L., E.P. Murray, and J.G. Haigh. 1973. Soil and vegetation inventory of near-pristine sites, Montana. USDA Soil Conservation Service, Bozeman, Montana.

Table 1. Moisture index (1=most mesic; 5=most xeric), elevation (feet), percent slope, aspect, topographic position, element occurrence rank by community type (see code definitions and authority at bottom of table), and plot number.

<u>PLOT</u>	<u>CT</u>	<u>INDEX</u>	<u>ELEV</u>	<u>SLOPE</u>	<u>ASP.</u>	<u>POS.</u>	<u>RANK</u>
GRASSLANDS							
18	AGSM-BOGR	5	3530	5	NE	fan	F
2	AGSM-STVI	4	3660	5	S	flat	C
3	AGSM-STVI	4	3700	8	S	flat	D
1	AGSP-BOGR	5	3600	2	SE	flat	C
4	AGSP-BOGR	5	3840	45	SE	mid	B
9	AGSP-BOGR	5	3540	2	S	flat	C
11	AGSP-POSA	4	4190	3	E	ridge	C
17	AGSP-POSA	4	4250	1	W	ridge	C
21	FEID-AGSP	3	4020	5	E	ridge	C
SHRUBLANDS							
5	ARCA/AGSM	3	3940	20	SE	mid	C
6	ARCA/AGSM	3	4000	40	SE	mid	D
14	ATNU/ORHY	5	3700	5	SE	ridge	B
15	ATNU/ORHY	5	3700	45	S	mid	B
19	POFR/AGSP	2	3780	70	N	mid	B
7	PRVI	2	4060	85	SE	draw	C
12	PRVI	2	4060	50	E	draw	C
8	RHAR/AGSP	4	3960	75	SE	upper	C
16	RHAR/AGSP	4	3900	65	E	mid	B
10	SYOC	2	3580	10	S	draw	C
FORESTS							
13	PODE/COST	1	3960	100	NE	draw	B
20	POTR/COST	1	3920	65	N	upper	B

Table 1. (continued)

AGSM-BOGR:	<i>Agropyron smithii-Bouteloua gracilis</i> (Anderson 1973)
AGSM-STVI:	<i>A. smithii-Stipa viridula</i> (Ross et al. 1973)
AGSP-BOGR:	<i>A. spicatum-Bouteloua gracilis</i> (Mueggler and Stewart 1980)
AGSP-POSA:	<i>A. spicatum-Poa sandbergii</i> (Mueggler and Stewart 1980)
FEID-AGSP:	<i>Festuca idahoensis-A. spicatum</i> (Mueggler and Stewart 1980)
ARCA/AGSM:	<i>Artemisia cana/Agropyron smithii</i> (Hansen et al. 1990)
ATNU/ORHY:	<i>Atriplex nuttallii/Oryzopsis hymenoides</i> (not previously described)
POFR/AGSP:	<i>Potentilla fruticosa/Agropyron spicatum</i> (not previously described)
PRVI:	<i>Prunus virginiana</i> (Hansen et al. 1990)
RHAR/AGSP:	<i>Rhus aromatica/Agropyron spicatum</i> (Mueggler and Stewart 1980)
SYOC:	<i>Symphoricarpos occidentalis</i> (Hansen et al. 1990)
PODE/COST:	<i>Populus deltoides/Cornus stolonifera</i> (Hansen et al. 1990)
POTR/COST:	<i>Populus tremuloides/Cornus stolonifera</i> (Hansen et al. 1990)

Table 2. Key to community types of the Kevin Rim.

1. *Populus* spp. with at least 5 percent canopy cover -- 2
1. *Populus* spp. with less than 5 percent canopy cover -- 3

2. *Populus tremuloides* with at least 5 percent canopy cover --
***Populus tremuloides/Cornus stolonifera* CT**
2. *Populus tremuloides* with less than 5 percent canopy cover --
***Populus deltoides/Cornus stolonifera* CT**

3. Shrubs present with a combined canopy cover of at least 10 percent -- 4
3. Shrubs with a combined canopy cover of less than 10 percent -- 9

4. *Potentilla fruticosa* with at least 10 percent canopy cover --
***Potentilla fruticosa/Agropyron spicatum* CT**
4. *P. fruticosa* with less than 10 percent canopy cover -- 5

5. *Artemisia cana* with at least 10 percent canopy cover --
***Artemisia cana/Agropyron smithii* CT**
5. *Artemisia cana* with less than 10 percent canopy cover -- 6

6. *Prunus virginiana* with at least 15 percent canopy cover --
***Prunus virginiana* CT**
6. *P. virginiana* with less than 15 percent canopy cover -- 7

7. *Symphoricarpos occidentalis* with at least 15 percent canopy cover --
***Symphoricarpos occidentalis* CT**
7. *S. occidentalis* with less than 15 percent canopy cover -- 8

8. *Rhus aromatica* with at least 10 percent canopy cover --
***Rhus aromatica/Agropyron spicatum* CT**
8. *Rhus aromatica* with less than 10 percent canopy cover --
***Atriplex nuttallii/Oryzopsis hymenoides* CT**

Table 2. (continued)

9. *Festuca idahoensis* with at least 5 percent canopy cover --
***Festuca idahoensis-Agropyron spicatum* CT**
9. *F. idahoensis* with less than 5 percent canopy cover -- 10
10. *Agropyron spicatum* with at least 5 percent canopy cover
-- 11
10. *A. spicatum* with less than 5 percent canopy cover -- 12
11. *Bouteloua gracilis* with at least 5 percent canopy cover --
***Agropyron spicatum-Bouteloua gracilis* CT**
11. *B. gracilis* with less than 5 percent canopy cover --
***Agropyron spicatum-Poa sandbergii* CT**
12. *Stipa viridula* present --
***Agropyron smithii-Stipa viridula* CT**
12. *S. viridula* absent --
***Agropyron smithii-Bouteloua gracilis* CT**

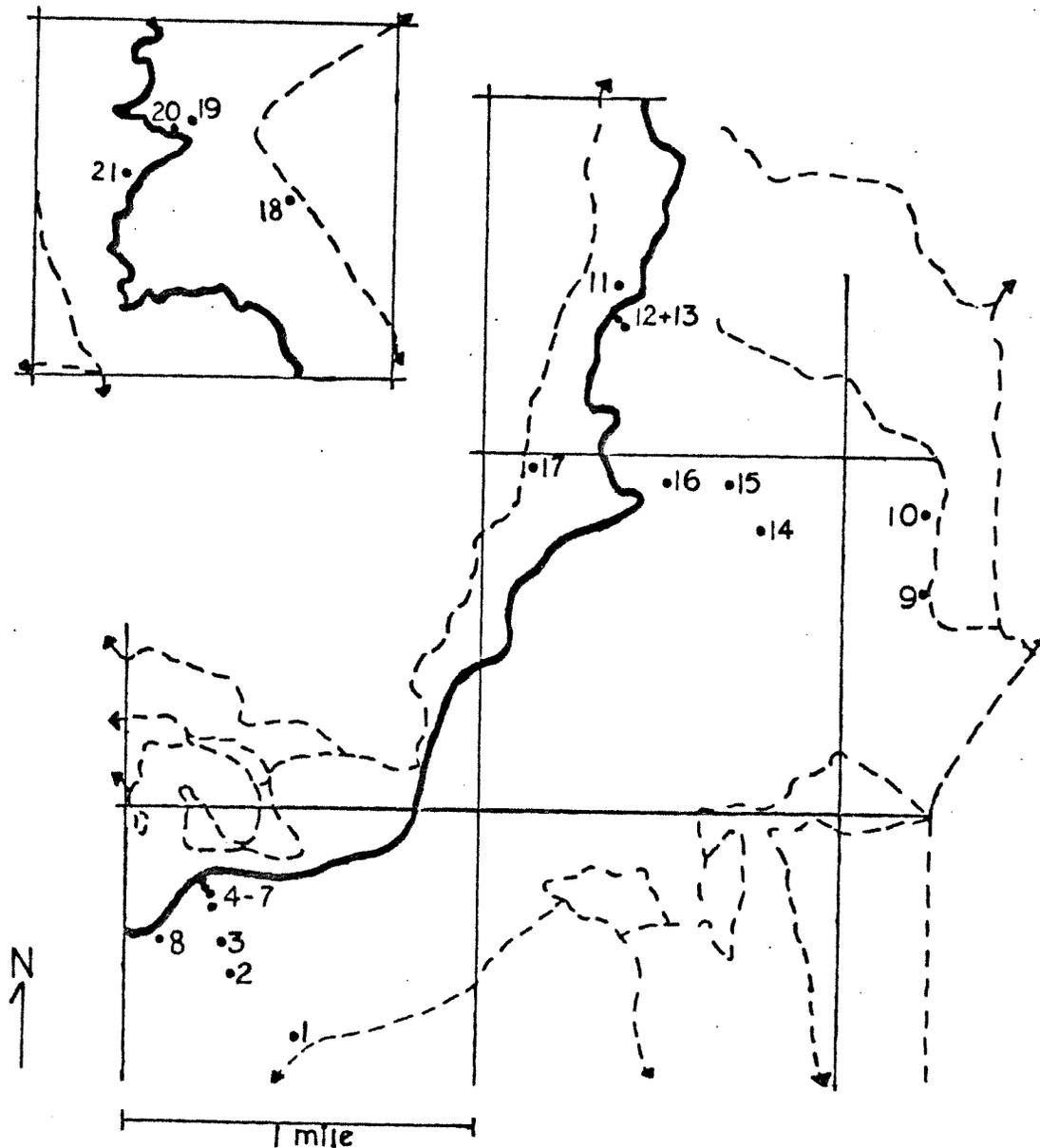


Figure 1. Map of the Kevin Rim study area showing locations of study plots. The square at upper left represents T36N, R3W, Section 20 and the thick black line is the 4000 foot contour. The bottom left (including plots 1 through 8) is the northern portion of T35N, R3W, Section 19 and the thick black line is the 4100 foot contour. The contour lines follow the sandstone rim and the dashed lines represent roads.

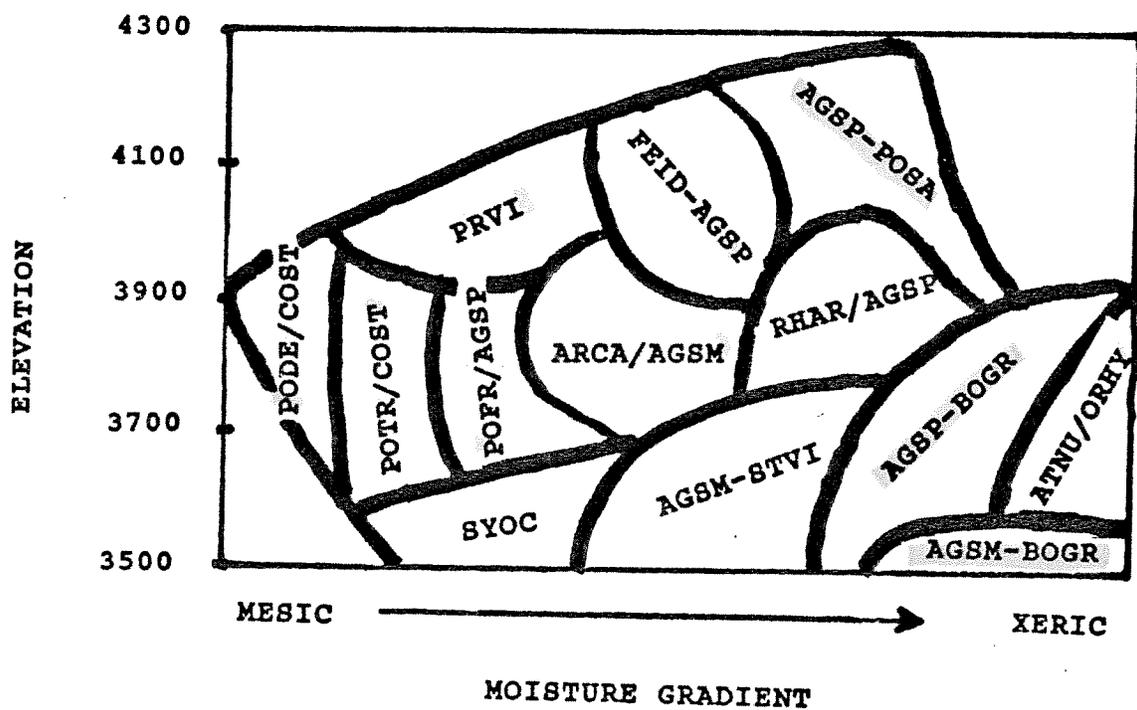


Figure 2. Approximate distribution of Kevin Rim plant communities along soil moisture and elevation gradients. The empty area represents combination that do not exist or are unsampled. Pink, yellow, and no highlighting indicate communities of high, low, and intermediate relative acreage.

MONTANA NATURAL HERITAGE PROGRAM

1515 East Sixth Avenue
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(406) 444-3009



October 1, 1990

Marco Restani
Department of Biology
Montana State University
Bozeman, Montana 59717

Dear Marco:

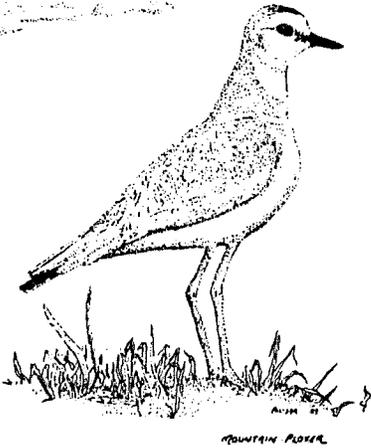
Please find enclosed the long awaited Kevin Rim plant community report for your reading enjoyment. If you have any questions or comments please write or call me. I talked with Dave Genter about this report and he thought it could be appended to your report. I'll let you *two* decide that fate.

Sincerely,

Robert L. DeVelice

MONTANA NATURAL HERITAGE PROGRAM

1515 East Sixth Avenue
Helena, Montana 59620
(406) 444-3009



October 3, 1990

Tad Day
BLM Great Falls RA Office
812-14th Street North
P.O. Box 2865
Great Falls, MT 59403-2865

cc: Joan Bird (TNC), Patrick Bourgeron (TNC), Dean Culwell
(WESTECH), Angela Evenden (USFS), Dan Leschevsky (BLM),
Peter Lesica (UM)

Dear Mr. Day:

I have enclosed a copy of my report entitled "Plant Communities of the Kevin Rim, Toole County, Montana: Preliminary Survey Results" for your information. This report is based on two days of field reconnaissance conducted at the request of Dave Genter (Coordinator, Montana Natural Heritage Program). I have also submitted the report to Marco Restani for potential incorporation into his Kevin Rim raptor survey report. If you have any questions or comments please write or give me a call.

Sincerely,

Robert L. DeVelice
Community Ecologist

R. L. Delklice

①

Kevin Rim Community Survey

June 20, 1990 begin: 9:30 am finish: 8:30 pm

photo 1: looking NW from Sec. 19 parking spot towards the Rim

Recon plot basic site info. to record:

- 1) recon. plot # (same as on quad map)
- 2) community type name
- 3) continuous community acreage
- 4) plot position - ridge

upper slope

mid slope

Lower slope

Bench (or flat)

draw

- 5) slope shape - straight

convex

concave

undulating

- 6) Aspect

- 7) Slope %

- 8) Elevation

- 9) Canopy cover estimates of 5-10 dominant (or characteristic species)

T = 0-19%

1 = 1-5%

2 = 5-25%

3 = 25-50%

4 = 50-75%

5 = 75-95%

6 = 95-100%

- 10) Photo

- 11) Comments

- 12) EORANK + Comments

Dictionary

plots 1-8 Mountain View School Quad T35N, R3E, S. 19

plot 9,10 Mountain View School Quad T35N, R3E, S. 16

plot 11-13 MVS Quad T35N, R3E, S. 15

plot 14-17 MVS Quad T35N, R3E, S. 17

plot 18,19 MVS Quad T36N, R3E, S. 20

general note: various Astrag. spp. occur throughout the study area

Handwritten scribbles at the top of the page.

Handwritten scribbles in the upper middle section.



June 21, 1990

Start: 8:30AM

Finish: 6pm

①

- 1. Plot 14
- 2. ATRGAR
- 3. lac
- 4. ridge
- 5. convex
- 6. SE
- 7. 5%
- 8. 3700

(ORYHYM)?

"badlands"

- 9. ORYHYM T
- AGRSPI T
- ARTGAR 1
- ARTCAN 1
- ERIFLA^{gonium} T
- lesf. alp. T

- ARTFRI T
- Chrys. nans. T (coll)

on plot 15

- 1. plot 15
- 2. ATGAR
- 3. 3 acres
- 4. Mid
- 5. undulating (from gully erosion)
- 6. S
- 7. 45%
- 8. 3770

(ORYHYM) "badlands"

- 9. ARTCAN 1
- ATRGAR 1
- Chrs. nans (coll) T
- AGRSPI 1
- ORYHYM 1

10. None

11. This veg. is likely ± characteristic of the "badlands" portions of the Kevin Rim area. However, there is likely wide variation in composition + cover among these sites

12. B- because of the generally minor amt. of forage these sites were probably less visited + impacted by domestic stock (although walking across such sites would likely increase erosion)

11. (cont) both ARTGAR + ORYHYM appear diagnostic

10. None

11. some livestock tracks criss + cross this slope. This site has higher granivoid cover than plot 14 and prob. receives more livestock use (although the slopes are steeper than most cows are comfortable with.

12. B-

①

(Mueggler & Stewart type)

- 1. plot 1
- 2. AGRSPI - CARFIL (AGSP-BOGR)
- 3. > 160 acres
- 4. Flat
- 5. Straight
- 6. SE
- 7. 2%
- 8. 3600

- 9. STICOM 3
- AGRSPI 3
- POASEC T
- CARFIL 2
- ARTFRI 2
- EROLAN 1
- SPHCOC 1
- HYMACA 1
- KOEMAC T
- BOUGRA 2 OPUPOL T

- 10. no photo (except that foreground of photo C9 includes this plot)
- 11. currently being mod → heavily grazed
- 12. C- (increaser plants abundant in total) ^{11. (cont.)} STIVIR is sporadically present but has likely decreased due to grazing pressure

- 1. plot 2
- 2. AGRSMI - STIVIR
- 3. circa 5 acres
- 4. Flat
- 5. Concave
- 6. S
- 7. 5%
- 8. 3660

- 9. AGRSMI 3 ARTCAN T
- STIVIR 1
- KOEMAC T
- POASEC 2
- STICOM 2
- BOUGRA 1
- CARFIL 1
- BROTEC T
- CERLAN T
- ARTFRI 1

- 10. None
- 11. currently being grazed mod → heavily
- 12. C (note BROTEC + POASEC)
- 11. (cont.) type in depressions (± draws probably where soil clay content is higher)

(Muegler & Stewart type)

2

1. plot 1
2. AGRSPI - CARFIL (AGSP-BOGR)
3. > 160 acres
4. Flat
5. Straight
6. SE
7. 2%
8. 3600
9. STICOM 3
AGRSPI 3
POASEC T
CARFIL 2
ARTFRI 2
EROLAN 1
SPHCOC 1
HYMACA 1
KOEMAC T
BOUGRA 2 OPUPOL T
10. No photo (except that foreground of photo C9 includes this plot)
11. currently being mowed → heavily grazed
12. C- (increasing plants abundant in total) ^{11. (cont.)} STIVIER is sporadically present but has likely decreased due to grazing pressure

1. plot 2
2. AGRSMI - STIVIER
3. circa 5 acres
4. Flat
5. Concave
6. S
7. 5%
8. 3660
9. AGRSMI 3 ARTCAN T
STIVIER 1
KOEMAC T
POASEC 2
STICOM 2
BOUGRA 1
CARFIL 1
BROTEC T
CERLAN T
ARTFRI 1
10. None
11. currently being grazed mowed → heavily
12. C (note BROTEC + POASEC)
11. (cont.) type in depressions (≠ draw probably where soil clay content is higher)

- 1 Plot 16
- 2 ? ("badlands")
- 3 1 acre
- 4 Mid
- 5 Concave
- 6 E
- 7 65%
- 8 3900
- 9 RHUARO 1 ROSWOOD 1
 AGRSPI 1
 ARTCAN 1
 Chrys. nans. (coll) T
 ELECOM T
- 10. None

Eleagnus



- 11. perhaps a more mesic variant of the plot 14 + 15 situation. Lacks ATRGAR. The RHUARO is present as ~~small~~ < 10" tall clones on scattered mounds (ave. 1 meter across)
- 12. B

11 (cont.) this type might be more abundant on the sandier substrates while the ATRGAR variant is more common on the clayey substrates

- 1 plot 17 - degraded
- 2 ** AGRSPI - CARFIL
- 3 > 160 ac
- 4 mesa top (above the rim)
- 5 straight
- 6 W
- 7 1%
- 8 4250
- 9 KOEMAC 3 PHLHOO 3
 POASEC 2 AGRSPI 1
 ARTFRE 4 SELDEN T
 CARFIL 2
 STECOM 1
- 10. None

11 This area has obviously been heavily grazed in the past (not heavy occurrence of "increasos" but no fresh cattle pies were present at time of sampling
on sheep droppings)

12. C-

** 11 (cont.) note absence of BOUGRA

1. plot 3
- *2. AGRSMI-BOUGRA-BROTEC
3. >20 acres
4. Flat (directly below the steeper slopes of rim)
5. Undulating
6. S
7. 8%
8. 3700

9.	AGRSMI	2	PLAPAT	T
	BOUGRA	3	LAPRED	1
	STICOM	1	ARTFRI	1
	POASEC	3		
	BROTEC	2		
	EROLAN	1		
	ARTCAN	T		
	STIVER	T		
	CARFIL	1		

10. None (except community is visible in photo C9 taken from truck; i.e., note BROTEC at base of steep slopes)
11. currently being mod. → heavily grazed
12. D (note abundance of "noxious" weeds)

11.(cont.) * probably a degraded AGRSMI - STIVER comm.

1. plot 4
2. AGRSPI - CARFIL (AGSP-BOGR)
3. >10 acres
4. Mid
5. CONVEX
6. SE
7. 45%
8. 3840

9.	AGRSPI	2	AGRSMI	T
	CARFIL	1	ASTDRU	T
	STICOM	2	GUTSAR	T
	BOUGRA	1		
	HYMRIC	T		
	ARTFRI	1		
	ARTCAN	T		
	ORYHYM	T		

10. 1 - looking across plot to adjoining slopes (looking NE)
11. probably too steep for most cattle to wander (prob. grazed by sheep in the past), Erosive sandy soil (surface anyway), Sheet erosion + 50% of ground surface exposed.
12. B current grazing low

③

1. plot 3
- *2. AGRSMI - BOUGRA - BROTEC
3. > 20 acres
4. Flat (directly below the steep slopes of the rim)
5. Undulating
6. S
7. 8%
8. 3700
9.

AGRSMI	2	PLAPAT	T
BOUGRA	3	LAPRED	1
STICOM	1	ARTFRI	1
POASEC	3		
BROTEC	2		
EROLAN	1		
ARTCAN	T		
STIVER	T		
CARFIL	1		
10. None (except community is visible in photo C9 taken from truck; i.e., note BROTEC at base of steep slopes)
11. Currently being mod. → heavily grazed
12. D (note abundance of "noxious" weeds)
- 11.(cont.) * probably a degraded AGRSMI - STIVER comm.

1. plot 4
2. AGRSPI - CARFIL (AGSP-BOGA)
3. > 10 acres
4. mid
5. CONVEX
6. SE
7. 45%
8. 3840
9.

AGRSPI	2	AGRSMI	T
CARFIL	1	ASTDRU	T
STICOM	2	GUTSAR	T
BOUGRA	1		
HVMRIC	T		
ARTFRI	1		
ARTCAN	T		
ORYHYM	T		
10. 1 - looking across plot to adjoining slopes (looking NE)
11. probably too steep for most cattle to wander (prob. grazed by sheep in the past), Erosive sandy soil (surface anyway), Sheet erosion + 50% of ground surface exposed.
12. **B** current grazing low

- 1. plot 18
- *2. AGRSMI-BOUGRA trashed by grazing
- 3. 80 ac.
- 4. alluvial fan
- 5. convex
- 6. NE
- 7. 5%
- 8. 3530
- 9. BOUGRA 5
 AGRSMI 2
 ARTFRI 3
 CARFIL 1
 STIVIR T
 AGRSPI T
 POASEC T
 EROLAN 1

- 10. none
- 11. -totally beat-out rangeland
 -100 or so head of cattle
 tramping around in here
 today
- 12. F

*11.(cont.) perhaps beat-out
 AGRSPI-BOUGRA?

- 1. plot 19
- 2. ?
- 3. 2 ac
- 4. mid
- 5. concave
- 6. N
- 7. 70%
- 8. 3780
- 9. POTFRU 2
 JUNCOM 1
 AMEALN 2
 ELEAGNUS COM 1
 AGRSPI 2
 KOEMAC 1
 JUNHOR T

- 10. None
- 11. v± mesic N slope Shrub/grassland
 v the country below to being
 heavily grazed but cattle
 would infrequently venture up
 these steep slopes

12. B-

11.(cont.) prob. > 40 sp/375m²
 -erosive site (some gully
 erosion present)

- 1. plot 5
- 2. ARTCAN/AGRSMI
- 3. .5 acres
- 4. mid slope bench
- 5. concave
- 6. SE
- 7. 20%
- 8. 3940

9.	ARTCAN	4
	AGRSMI	1
	DESPIN	1
	BROTEC	1
	ARTFRI	T
	Ely. cia (coll)	T
	POASEC	T

- 10. 1- taken looking across community
- 11. weedy site (note BROTEC and DESPIN) -
This community is relatively minor in total acreage on these slopes but occurs on small benches and concavities + draws.
- 12. C - (quite weedy)

- 1. plot 6
- 2. ARTCAN/AGRSMI
- 3. 3 acres
- 4. mid slope depression (~300' across)
- 5. concave
- 6. SE
- 7. 40%
- 8. 4000
- 9. ELYCIN (coll 5) 2

	AGRSMI	3
	BROTEC	4
	DESPIN	1
	ARTCAN	1

- 10. None
- 11. weedy site just below sandstone rimrock
- 12. D

- 1 plot 5
- 2 ARTCAN/AGRSMI
- 3 .5 acres
- 4 mid slope bench
- 5 concave
- 6 SE
- 7 20%
- 8 3940
- 9 ARTCAN 4
 AGRSMI 1
 DESPIN 1
 BROTEC 1
 ARTFRE T
 Ely. cia (coll) T
 POASEC T
- 10. 1- taken looking across community
- 11. Weedy site (note BROTEC and DESPIN) -
 This community is relatively minor in total acreage on these slopes but occurs on small benches and concavities + draws.
- 12. C - (quite weedy)

- 1. plot 6
- 2. ARTCAN/AGRSMI
- 3. 3 acres
- 4. mid slope depression (~300' across)
- 5. concave
- 6. SE
- 7. 40% 8. 4000
- 9. ELYCIN (coll 5) 2
 AGRSMI 3
 BROTEC 4
 DESPIN 1
 ARTCAN 1
- 10. None
- 11. weedy site just below sandstone rimrock
- 12. D

* Should be revisited
→ 1/3 quantitative
plot installed

- 1. plot 20
- 2.
- 3. 2ac (max)
- 4. Upper (upper edge of community, abouts rimrock)
- 5. undulating
- 6. N
- 7. 65%
- 8. 3920
- 9. POPTRE 4
- CORSTO 3
- PRUVIR 2
- HERLAN 1
- AMEALN 2
- RIBLAC 2
- ROSWOO 2
- MOSS 2
- SMERAC 1

(prob. > 40 sp/375m²)

- 10. Y - looking E from rimrock
- 11. Well above the direct impacts of cattle. There is a suggestion of self-replacement of the aspen with old aspens as snags (ave. 20cm dia) on the ground and...

12. B (although the viability may be in question given the mortality to both young + old POPTRE's)

11. (cont.) regen present. However, the regen. + mature trees almost all have >30% crown mortality. Cause of stress? - unknown.
mean POPTRE height = 20 ft; max = 30 ft

* * AGRSPI - FESIDA may occur on the mesa top see T36N, R3E, S20

- 1. plot 21
- 2.
- 3. .3 acre
- 4. mesa top
- 5. concave (relatively mesic site surrounded by AGRSPI - CARFEL (POASEC syn.))
- 6. E
- 7. 5%
- 8. 4020
- 9. FESIDA 3 BOUGRA T
- POASEC 3
- THERHO 2
- ARTLUO 1
- AGRDAS 2
- KOEMAC 1
- CHYVIC T
- AGRSPI T
- VICAME 1

10. None

11. sodbusted land directly above plot. The plot is probably not within a grazing unit (at least since sod-busting) and the veg. is in ± good condition

12. C+ (might be better but the viability is prob. low because of the adjacency of the sod-busted area)

11. (cont.) this community was likely more widespread on this tp at one time

- 1 plot 7
- 2 PRUVIR?
- 3 .1 acre
- 4 upper slope draw
- 5 concave
- 6 SE
- 7 85%
- 8 4060

- 9 Ribos ^{aureum} ~~vise.~~ (coll) 2
- PRUVIR 1
- ROSWOO T
- BROTEC 2
- AGRSMI 3
- ARTCAN T AGRSPI T
- 10. None
- 11. Weedy site just below rimrock (top of plot abuts rimrock)
- 12. C-

- 1. plot 8
- 2. ? (Rhar/Agsp?)
- 3. > 2 acres
- 4. M → Upper (just below rimrock)
- 5. Convex
- 6. SE
- 7. 75%
- 8. 3960

- 9. RHUARO 1
- CALLON T
- ORYHYM 1
- AGRSMI T
- ARTCAN T
- AGRSPI T
- STICOM T
- 10. 1 - looking E (with Dave + Marco Ristany)
- 11. Very dynamic soil surface 70% bare ground + rocks exposed. Sheet + gully erosion
- 12. C+ dynamic soils + site naturally

- 11. (cont.) most of this particular slope is eroded (see quad map)

- 1 plot 7
- 2 PRUVIR?
- 3 1/2 acre
- 4 upper slope draw
- 5 concave
- 6 SE
- 7 85%
- 8 4060
- 9 Ribos ^{avenum} ~~vise~~ (coll) 2
 PRUVIR 1
 ROSWOO T
 BROTEC 2
 AGRSML 3
 ARTCAN T AGRSPI T
- 10. None
- 11. Weedy site just below rimrock (top of plot abuts rimrock)
- 12. C-

- 1. plot 8
- 2. ? (Rhar/Agsp?)
- 3. > 2 acres
- 4. M → Upper (just below rimrock)
- 5. convex
- 6. SE
- 7. 75%
- 8. 3960
- 9. RHUARO 1
 CALLON T
 ORYHYM 1
 AGRSML T
 ARTCAN T
 AGRSPI T
 STICOM T
- 10. 1 - looking E (with Dase + Marco Ristany)
- 11. Very dynamic soil surfaces 70% bare ground + rocks exposed. Sheet + gully erosion
- 12. C + dynamic soils + site naturally
- 11. (cont.) most of this particular slope is eroded (see quad map)

- 1. Plot 9
- 2 degraded AGRSPI - CARFIL (Agsp-Bay)
- 3. 780 ac
- 4. flat
- 5. straight
- 6. S
- 7. 290
- 8. 3540
- 9. STICOM 2 PHLHOO 1
- CARFIL 2 BOUGRA 2
- KOEMAC 2
- ARTFRI 2
- HYM RIC T
- AGRSPI 1
- SPHCOC 1
- AGRSME T
- 10. None
- 11. heavily grazed upland site
- 12. C - (v. weedy)

- 1 Plot 10
- 2 degraded SYMOCC?
- 3 > 5 ac (linear along draw bottom)
- 4 draw
- 5 Concave
- 6 S
- 7 1090
- 8 3580
- 9 SYMOCC 1
- POAPRA 2
- ARTLUO 2
- AGROAS 2
- ACHMEL 1
- ZYGVEN T
- Poa (coll) 1
- STIVER T
- 10 None
- 11 heavily disturbed draw
- 12 C - (v. weedy)

dry
panicle

750
4
500

- 1. Plot 11
- * 2. AGRSPI - CARFIL
- 3. > 80 acres
- 4. "ridge" (top of Rim)
- 5. Convex
- 6. E
- 7. 3%
- 8. 4190
- 9. AGRSAE 1
CARFIL 3
STICOM 2
HYMCOA T
KALHOO 3
SELDEN 2
POASEC 1
KOEMAC 2
ARTIRE 2
- 10. None
- 11. heavily grazed historically
- 12. C-

~~BOUGRA?~~
↑
none

* 11 cont Note absence of BOUGRA

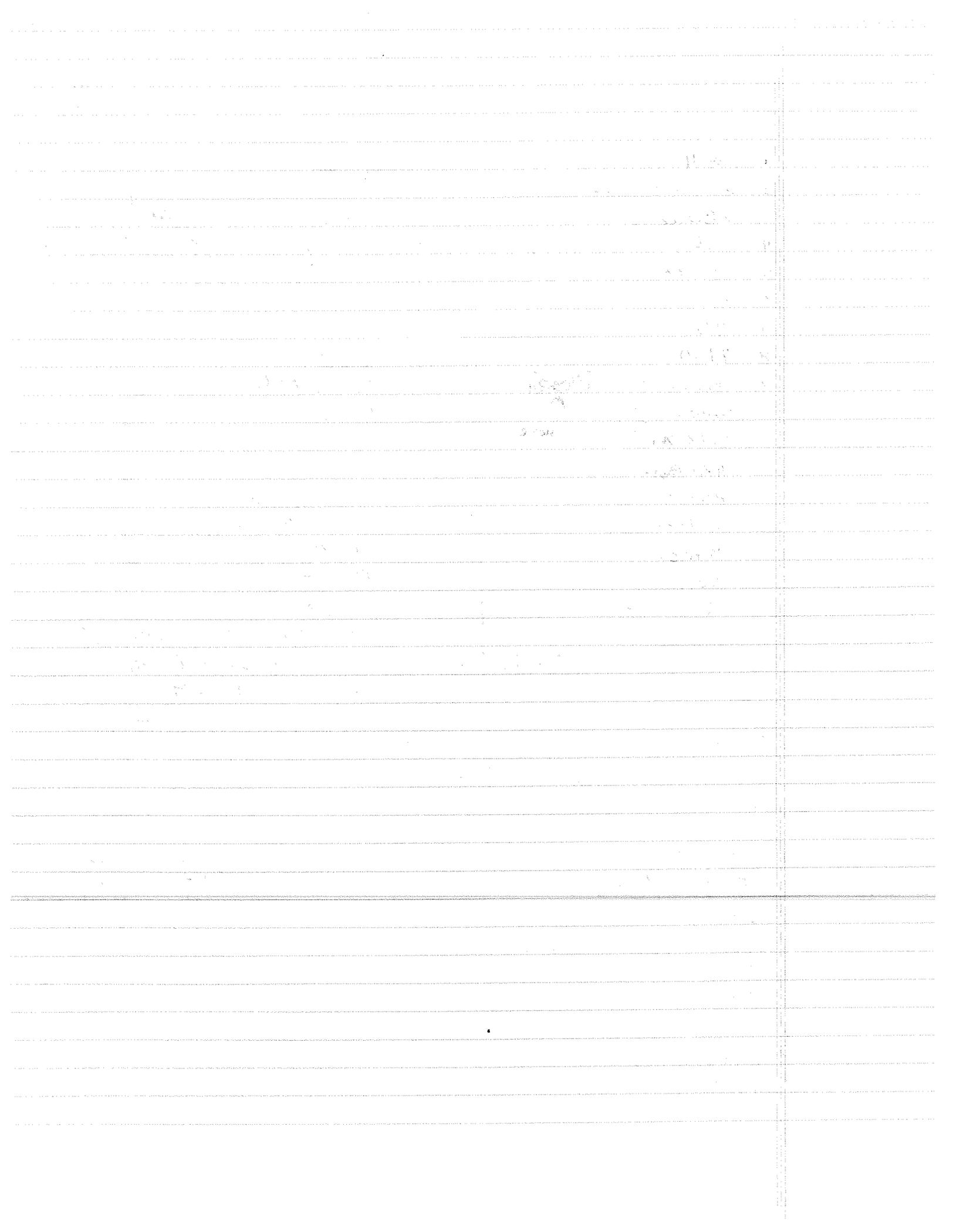
- 1 plot 12
- 2 ?
- 3 1 acre
- 4 mesic upper slope ^{draw head} (top of abouts rimrock)
- 5 concave
- 6 E
- 7 50%
- 8 4060
- 9 ELMCIN (coll 5) 2
PRUVIR 2
SYMOC 2
ARTLW 2
Ceraot. arvens. 2
Smilio (coll) sphaer. ? 1
THERHO 2
BROTEC 1
AGRDAS 1
STEVIR T AMEALM 1
- 10. 1 From distance (Plot 13 is below)
- 11. species-rich site.
probably 40 sp. / 375 m²
- 12 C because of weediness

4000
20

- 1 Plot 13
- 2 POPDEL / CORSTO
- 3 .2 acre
- 4 draws below rimrock
- 5 concave
- 6 NE
- 7 100%
- 8 3980
- 9. POPDEL 5
PRUVIR 3
AMEALM 2
HERLAN 2

10 from distance
(Plot 12 is prob. visib. above the trees + below the cliff)

11. Species rich site
12. B?



EDCODE: ABNKC19128 .001 IDENT: Y FONUM: .
SNAME: BUTEO REGALIS
SCOMNAME: FERRUGINOUS HAWK
ELEMENT RANKS: GRANK: G4 NRANK: SRANK: S3
FS STATUS: SENSITIVE LIST
NATION: US SITECODE: COUNTYCODE:
SURVEYSITE: KEVIN RIM MTTOOL

PRECISION: M

QUADNAME: QUADCODE: MARGNUM: TENTEN: LAT: 484930
MOUNTAIN VIEW SCHOOL 4811271 1 10.4 LONG: 1120022
KEVIN NORTH 4811178 1
HILLSIDE COLONY 4811281 1

S: 484620
N: 485256
E: 1115613
W: 1120725

TOWNRANGE: 035N003W SECTION: 04 MERIDIAN: PR

TRSCOM: MANY ADDITIONAL SECTIONS

DIRECTIONS: THE KEVIN RIM IS A PROMINENT LANDMARK WEST OF I-15 AND 8 TO
14 MILES SOUTH OF THE CANADIAN BORDER.

PHYSPROV: MB WATERSHED: 10030203

SURVEYDATE: LASTOBS: 1988-07-10 FIRSTOBS:
EORANK: A EORANKDATE:

EORANKCOM: SECOND HIGHEST RAPTOR NEST DENSITY RECORDED IN WESTERN U.S.
EODATA: WITHIN THE MAPPED AREA (CA. 9 SQ. MI.) IN 1988 WERE OBSERVED
24 ACTIVE NESTS AND 42 ALTERNATE (INACTIVE) NESTS. IN 1988
AT LEAST 50 YOUNG WERE FLEDGED FROM 18 NESTS WITHIN THE
AREA.

CONTACT: CONTACTNUM:

GENDESC: THE KEVIN RIM IS A SANDSTONE ESCARPMENT THAT RUNS CA. 8
MILES, GENERALLY N-S, AND THAT FACES EAST. THE CLIFFS AND
ADJACENT BADLANDS, GRASSLANDS AND DRAWS HOST A VERY HIGH
DENSITY OF RAPTOR NESTS, PRIMARILY BUTEO REGALIS AND FALCO
MEXICANUS.

ELEV: 4100 SIZE: 0

MACODE: PRIVATEOWNMTUS CONTAINED: N
FBLDLEWISMTUS N
SSLGNXXXXIMTUS N

MORELAND: MOREPROT: MOREMGMT: TNCINVOLVE:
MGMTCOM: BLM PORTION IS PROPOSED ACEC.
PROTCOM:

OWNER: OWNERINFO:

COMMENTS: ADDITIONAL RAPTORS NESTING: FALCO SPARVERIUS, FALCO
MEXICANUS, BUTEO JAMAICENSIS, BUTEO SWAINSONI, AQUILA
CHRYSAETOS, CIRCUS CYANEUS, BUBO VIRGINIANUS.

SLOPE/ASP:

DATASENS: BOUNDARIES: Y PHOTOS: Y
BESTSOURCE: DUBOIS, KRISTI, 3517 6TH AVE. N. GREAT FALLS, MT 59401
SOURCECODE: PNDDUB01MTUS TRANSCRIBER: 89-05-26 CDJ CDREV: Y

US9DUB01MTUS

MAPPER: 89-05-26 CDJ

QC: Y

DATARESP: MTHP

UPDATE: 89-06-14 MEZ

