STATE OF MONTANA
NATURAL RESOURCE DAMAGE PROGRAM

EXPERT REBUTTAL OPINIONS REGARDING INJURIES TO TERRESTRIAL RESOURCES CLARK FORK RIVER BASIN, MT

OCTOBER 1995

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EXPERT REBUTTAL OPINIONS REGARDING INJURIES TO TERRESTRIAL RESOURCES, CLARK FORK RIVER BASIN, MT

Prepared for:

Montana Natural Resource Damage Litigation Program

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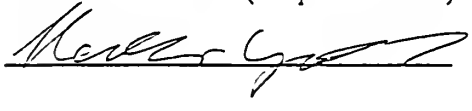

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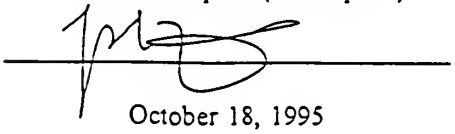

October 18, 1995

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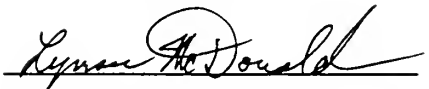

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ACRONYMS

ARCO	Atlantic Richfield Company
GPS	global positioning system

CHAPTER 1
REPORT OVERVIEW

This report contains rebuttal opinions regarding injuries to terrestrial resources of the Clark Fork River Basin, MT (including soils, vegetation, and wildlife). These opinions are based on review of reports submitted by experts representing the Atlantic Richfield Company (ARCO), review of, and familiarity with issues and literature addressed in ARCO reports, and rebuttal work performed independently by Hagler Bailly Consulting, Inc. (Hagler Bailly). The opinions of the following experts for the State of Montana are relied upon in this report:

- Dr. Hector Galbraith, Hagler Bailly
- Dr. Larry Kapustka, EP&T
- Ms. Kate LeJeune, Hagler Bailly
- Dr. Josh Lipton, Hagler Bailly
- Dr. Lyman McDonald, WEST, Inc.

This report is organized as follows: Chapter 2 contains opinions regarding vegetation mapping and quantification of injury to terrestrial vegetation. Chapter 3 addresses phytotoxicity testing conducted by ARCO. Chapter 4 addresses wildlife. Chapter 5 presents literature cited in this report.

CHAPTER 2
INJURIES TO TERRESTRIAL VEGETATION: QUANTIFICATION ISSUES

2.1 ***The vegetation study designed by ARCO investigators was based on subjectively determined vegetation types. No criteria for discrimination of vegetation types was described in the study report or included with the materials provided to the State for review.***

The vegetation data collected by ARCO investigators in 1994 on Stucky Ridge, Mount Haggin, and in German Gulch (Keammerer, 1995) that form the basis of ARCO's opinions are based on a highly subjective sampling design. ARCO's methodology involved classification of "habitat types" from aerial photographs (Keammerer, 1995). In other words, terrestrial habitats were classified qualitatively and subjectively into supposedly uniform habitat types (e.g., forb/grassland, coniferous forest). No quantitative distinctions were made between these classifications, despite very real ecological differences. Keammerer (1995) then selected sites, apparently subjectively, within randomly selected "cells" within his mapped habitat types. Nowhere in his report or in the papers provided to the State does he describe the mapping criteria used to discriminate among these "types." No coherent description of the sampling strategy was presented in the report or accompanying materials. For example, on page 24 of Keammerer's report, he states "Sampling points were located in the dominant vegetation type in the randomly chosen cells." First, the mapping criteria are highly questionable. Then, instead of relying on a randomly chosen point, he apparently biased his sampling by subjectively positioning his plot within the "expected vegetation type" of the area.

The classification process utilized by Keammerer — essentially a stratification process — requires that the "strata," in this case habitat types, be similar. Otherwise the classification process is meaningless. However, ARCO's own data on vegetative cover reveals that cover characteristics within a habitat "type" differ substantially between areas, and that vegetation-type classification criteria varied by area. For example, inspection of the vegetation type called "grasslands," or "forb/grasslands," in each of the three areas sampled in 1994 reveals that mean percent vegetative cover ranged from 57% in German Gulch control grasslands to 21% cover in Stucky Ridge injured grasslands (Keammerer, 1995). Similarly, the mean percent cover of bare soil ranged from 0-3% in German Gulch control grasslands, but as high as 75% bare soil on Stucky Ridge (Keammerer, 1995). Clearly these "grassland" community types differ substantially. Therefore, ARCO's claim that forb/grassland and grassland are the most abundant and widespread habitat types on Stucky Ridge and Mount Haggin is based on a highly subjective, qualitative classification approach that fails to account for substantial

differences between injured and control sites. ARCO opinions based on such a flawed classification method are invalid. Additional data collected by Hagler Bailly Consulting, Inc. (see Section 2.2) provide further evidence of this design flaw.

As with the "grassland" habitat type, the "bare area" vegetation type differed in quality in each of the three areas, despite the classification procedure. For example, total vegetation in the German Gulch control site bare areas averaged 21%. In injured site bare areas, vegetative cover was substantially lower: percent vegetative cover in Stucky Ridge bare areas was 4%, and in Mount Haggin bare areas, 12%. Bare soil in the German Gulch bare areas averaged 16%, with a maximum value of 22% (i.e., a maximum of 22% of the German Gulch bare areas were covered by bare soil). In the Stucky Ridge and Mount Haggin areas, bare soil averaged 37% and 40%, respectively, and ranged as high as 93% and 75%, respectively (i.e., in Stucky Ridge bare areas, up to 93% of the area consisted of bare soil). As stated in Keammerer (1995), bare areas in German Gulch were characterized by the highest species diversity of vegetation types sampled in German Gulch, whereas the Stucky Ridge and Mount Haggin bare areas were species-depauperate in comparison. The common typing of these ecologically different areas appears to be an attempt to portray barren impact areas as a naturally occurring vegetation community type. This is a misrepresentation, and the data collected by ARCO's investigators confirm the misrepresentation.

Thus, the procedures used to obtain the results presented by Keammerer (1995) were subjective, and relied on the classification of highly divergent habitats into arbitrary vegetation types. The results presented in Keammerer (1995) are not an accurate accounting of the acreage of vegetation types in the impact areas, and the subjective evaluation of acreage of each type and cover estimates within a type could not be duplicated by an independent investigator (see Section 2.2, below). Opinions based on this flawed design are invalid.

2.2 *Evaluation of vegetation types described by Keammerer (1995) as "grasslands" reveals that injured and control "grasslands" are not similar and that the arbitrary classification procedures used by ARCO understates substantial differences in vegetation injuries.*

As a means of evaluating conditions within vegetation types classified by Keammerer (1995) as "grasslands" and "forb/grasslands," Hagler Bailly conducted an independent evaluation of these sites.

In September, 1995, field reconnaissance, photo-documentation, and vegetation measurements were performed at "grassland" and "grassland/forb" sites designated by Keammerer (1995). As further described in the Standard Operation Procedure contained as Appendix A, an objective, randomized procedure was used to identify sampling sites:

- A numbered grid was superimposed over the delineated study areas of Keammerer (1995) for Stucky Ridge and Mount Haggin.
- A random number generator was used to randomly identify grid coordinates.
- The first three coordinates at Stucky Ridge and Mount Haggin that fell within areas delineated as "grassland" by Keammerer and were at least 500 feet from another community type were sampled.
- When the approximate study site location was arrived at in the field (using global positioning system (GPS) and/or topographical maps and compass), the actual sample site was placed 10 paces from this point on a randomly chosen compass bearing.
- In addition to impact area sites, three control sites containing grassland as a dominant cover type at one or more sub-sample points (Lipton et al., 1995) were selected randomly. Three of eight sites designated as "controls" by Keammerer (1995) were also selected randomly.
- At each site, color photographs (slides) were taken at views north, south, east and west (near foreground) from the sample site, and a close-up of the vegetation within a 10-meter radius of the sample site.
- At each site, two intersecting 20-meter transects (subdivided into four 10-meter transects) were placed on the ground using a tape measure (north-south; east-west). Measurements were taken along the four transects of: percent cover of living vegetation, percent cover of plant litter, and percent cover of nonliving material (rock, bare ground). The dominant species at each site was also recorded.

The results of this sampling (data presented in Appendix B) confirm that "grasslands" designated by Keammerer (1995) differ substantially between injured sites on Stucky Ridge and Mt. Haggin, and control sites in the German gulch area. Specifically, injured sites are dominated by bare ground and low vegetative cover, whereas control grassland sites in German Gulch are dominated by abundant vegetation and virtually no bare ground.

For example, Figures 2-1 through 2-3 present photographs and data collected at injured sites designated as "grasslands" by Keammerer (1995). The mean percent bare ground (i.e., mean of four 10-meter directional transects) was approximately 65% at site SR953, 70% at site SR952, and 75% at site SR951. In contrast, control grasslands contained essentially no bare ground (Figures 2-4 through 2-6).

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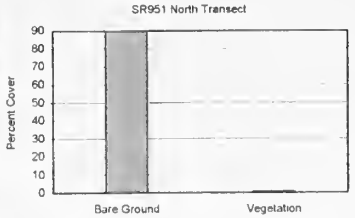

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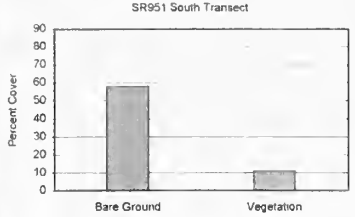

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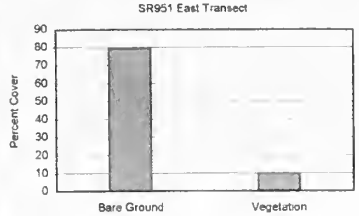

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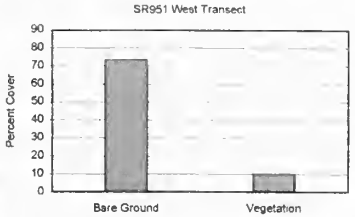

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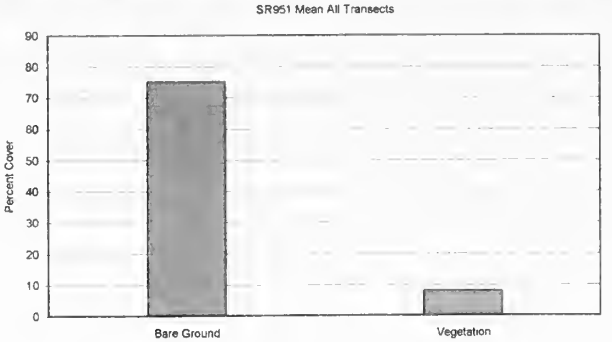
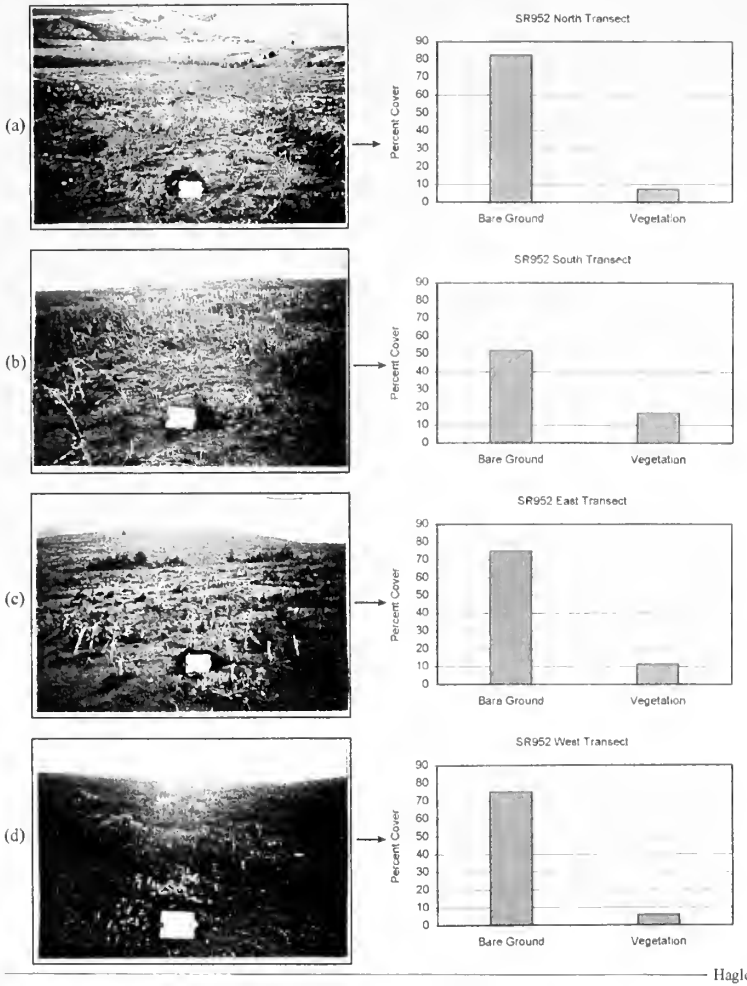


Figure 2-1. Stueky Ridge vegetation type designated as forb-grassland by Keammerer (1995). Four 10-m line transects at site SR951 were sampled by the State in September, 1995. Photographs **a-d** present views of the north, south, east, and west transects, respectively. Photograph **e** is looking straight down at the site center. Corresponding graphs illustrate the predominance of bare ground and sparse vegetation along each transect. Mean vegetation cover at the site is <10%.



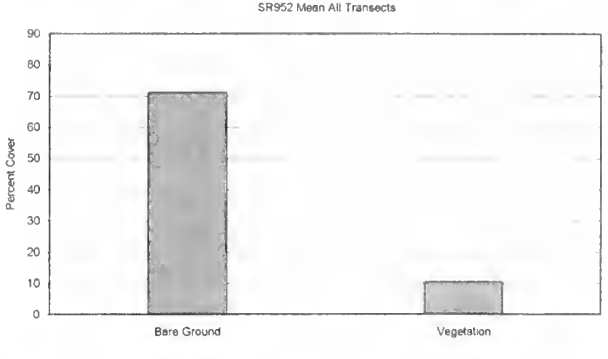


Figure 2-2. Stucky Ridge vegetation type designated as forb-grassland by Keammerer (1995). Four 10-m line transects at site SR952 were sampled by the State in September, 1995. Photographs **a-d** present views of the north, south, east, and west transects, respectively. Photograph **e** is looking straight down at the site center. Corresponding graphs illustrate the predominance of bare ground and sparse vegetation along each transect. Mean vegetation cover at the site is approximately 10%.

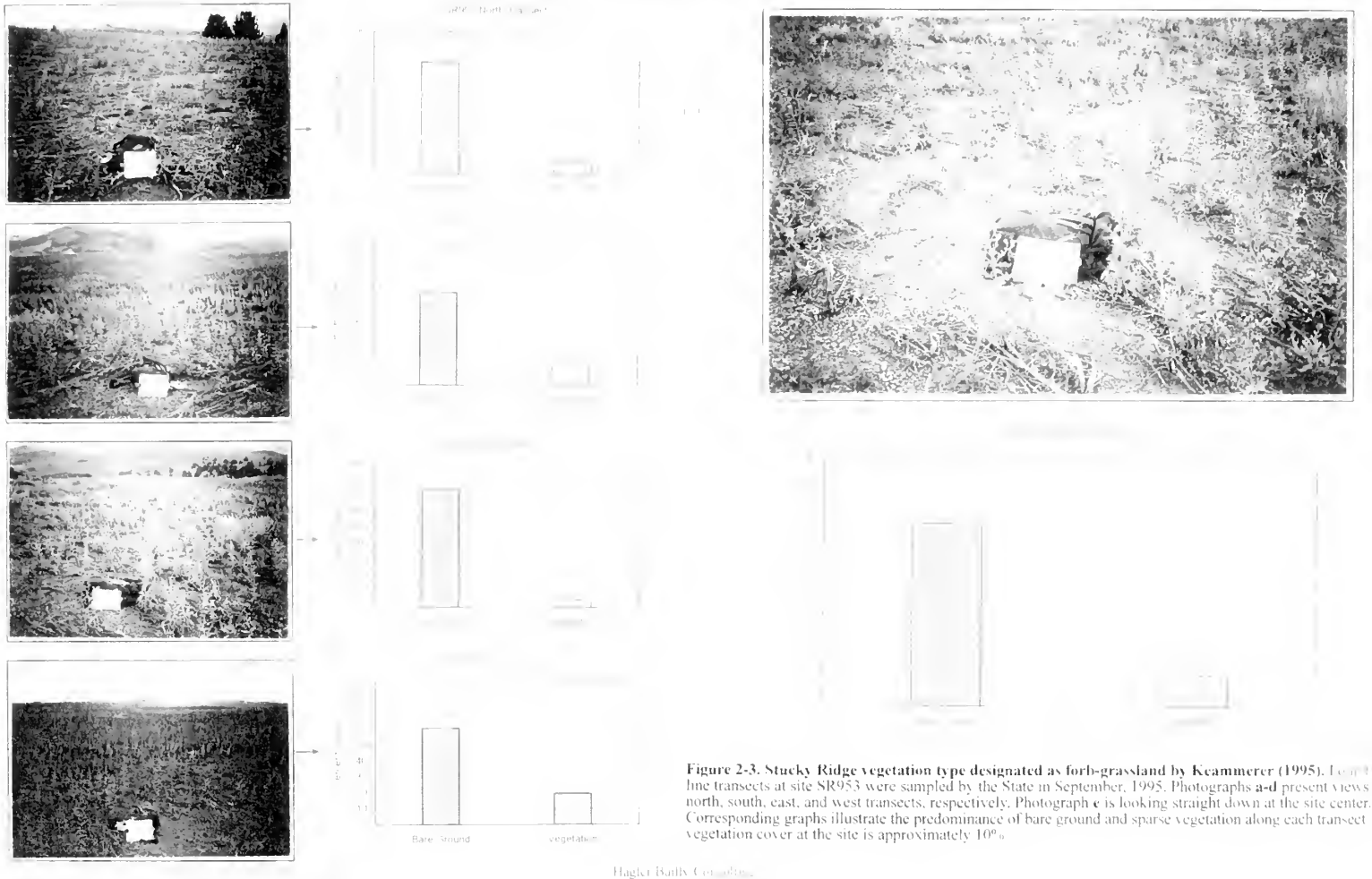
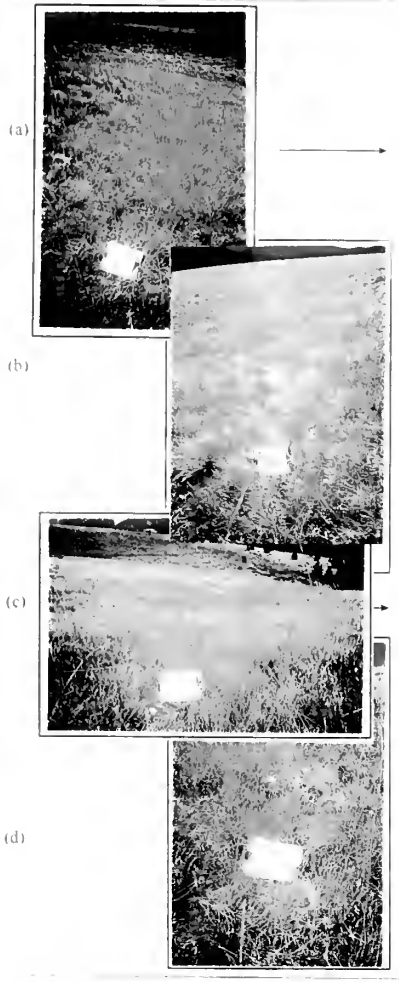
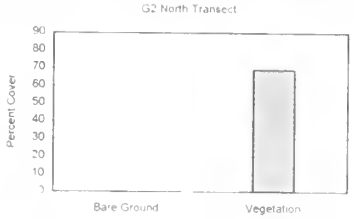
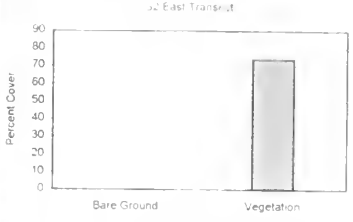
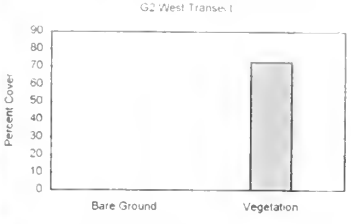


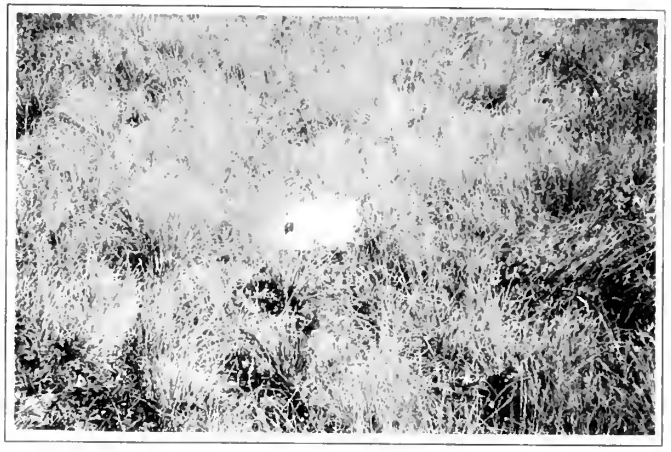
Figure 2-3. Stucky Ridge vegetation type designated as forb-grassland by Keammerer (1995). Four 3-foot line transects at site SR953 were sampled by the State in September, 1995. Photographs **a-d** present views of the north, south, east, and west transects, respectively. Photograph **e** is looking straight down at the site center. Corresponding graphs illustrate the predominance of bare ground and sparse vegetation along each transect. Mean vegetation cover at the site is approximately 10%.











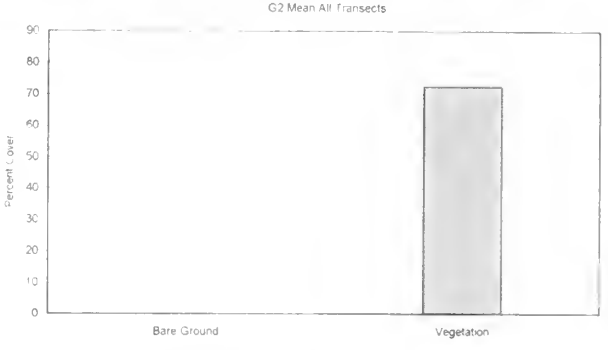
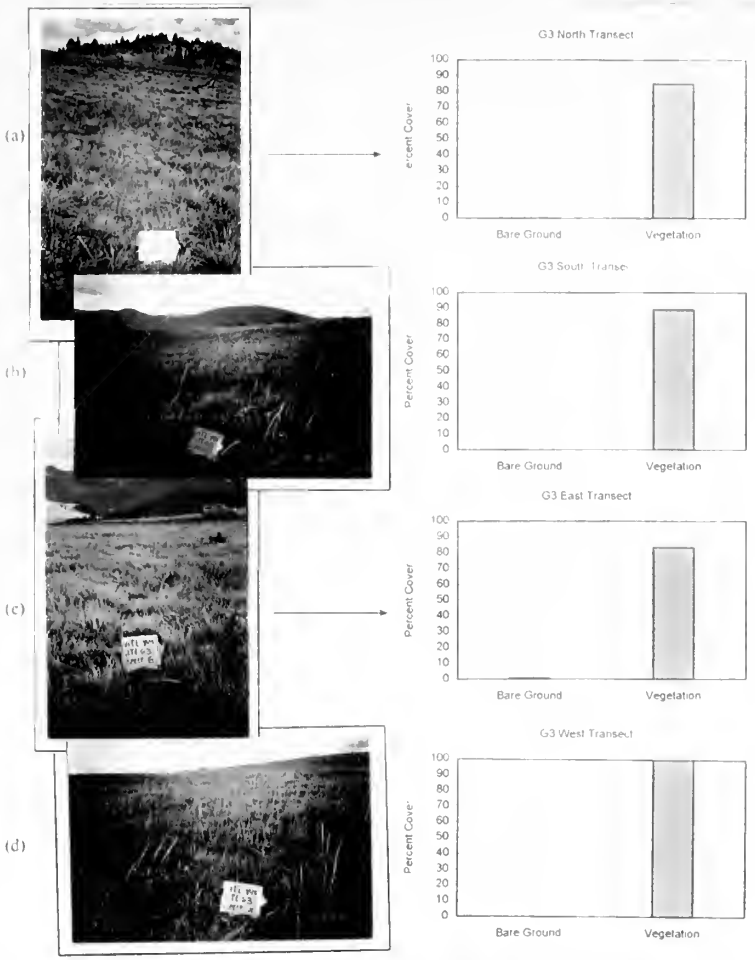


Figure 2-4. German Gulch control site G2 designated as grassland by Keammerer (1995). Four 10-m line transects at site G2 were sampled by the State in September, 1995. Photographs **a-d** present views of the north, south, east, and west transects, respectively. Photograph **e** is looking straight down at the site center. Corresponding graphs illustrate the predominance vegetation along each transect. Mean vegetation cover at the site exceeds 70%. Bare ground is not exposed at the site.



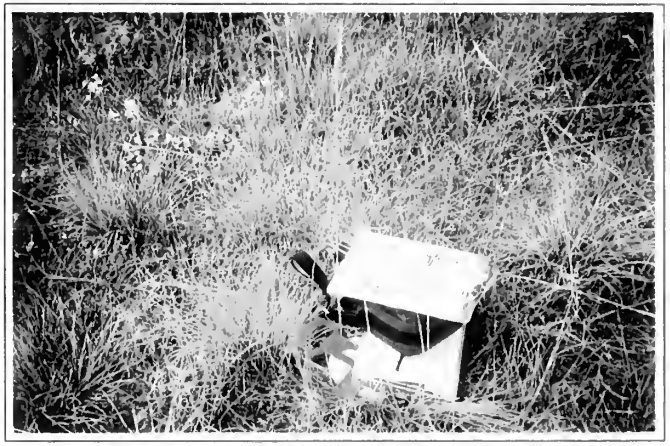
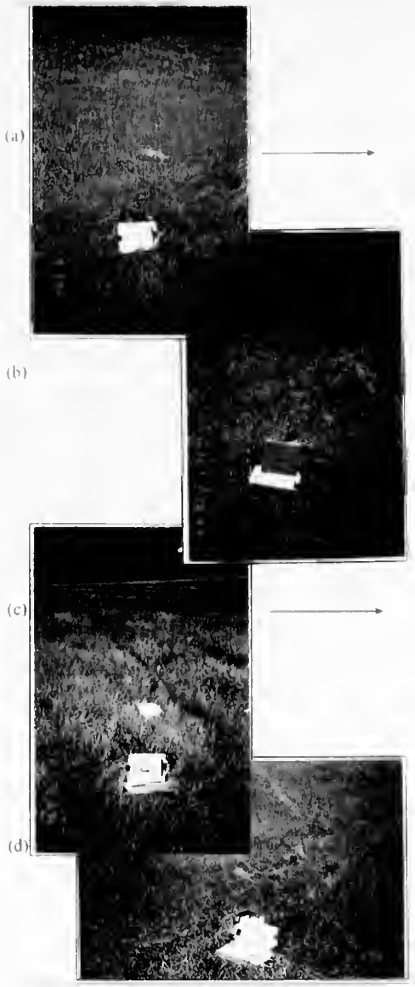
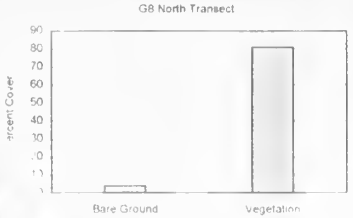
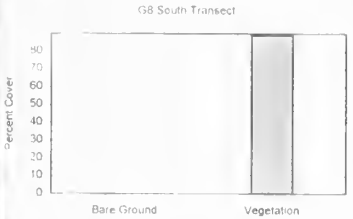
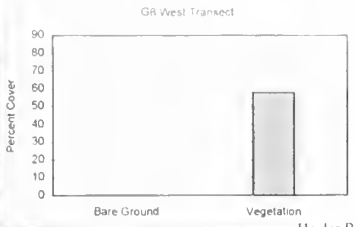


Figure 2-5. German Gulch control site G3 designated as grassland by Keammerer (1995). Four 10-m line transects at site G3 were sampled by the State in September, 1995. Photographs **a-d** present views of the north, south, east, and west transects, respectively. Photograph **e** is looking straight down at the site center. Corresponding graphs illustrate the predominance vegetation along each transect. Mean vegetation cover at the site is approximately 90%. Bare ground is virtually absent.









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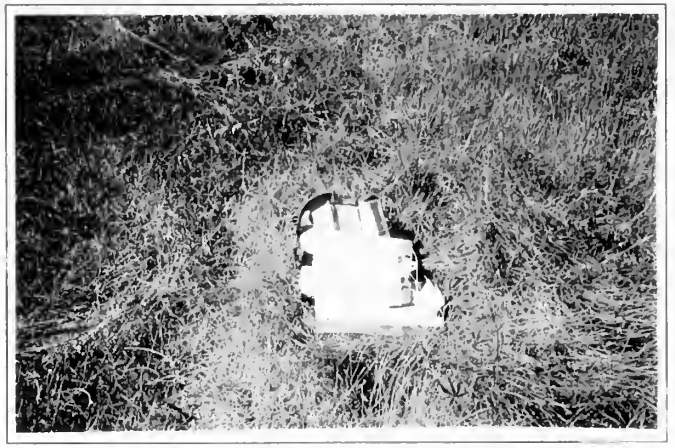

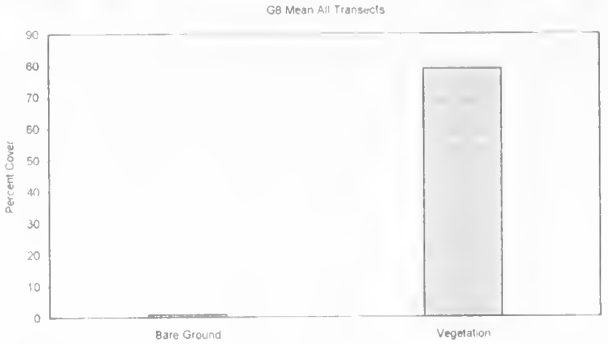

Figure 2-6. German Gulch control site G8 designated as grassland by Keammerer (1995). Four 10-m line transects at site G8 were sampled by the State in September, 1995. Photographs **a-d** present views of the north, south, east, and west transects, respectively. Photograph **e** is looking straight down at the site center. Corresponding graphs illustrate the predominance vegetation along each transect. Mean vegetation cover at the site is approximately 80%. Bare ground is virtually absent.

The same pattern is evident in the amount of vegetative cover. Stucky Ridge sites SR953, SR952 and SR951 all contained, on average, about 10% vegetative cover. German gulch control grasslands contained 70%, 90%, and 80% vegetative cover (sites G2, G3, and G8, respectively).

As shown by the above data, and as summarized in Figure 2-7, impact and control sites designated as "grasslands" by Keammerer (1995) clearly are not similar. ARCO's attempt to use such a flawed, subjective methodology to equate habitat types in injured and control sites does not reflect actual conditions, and substantially understates the very real reduction in vegetative cover and composition in injured sites relative to baseline conditions.

2.3 *ARCO investigators used a method for selecting sample sites in the impact areas that is subjective and potentially biased.*

ARCO's investigators have generally described the site selection methodology for Stucky Ridge and Mount Haggin as a random process. However, the procedures used to select sites do not generate random samples. According to the methodology described, all sites within a vegetation type do not have equal probability of being selected. The points selected for sampling were subjectively located in the subjectively determined "dominant vegetation type in the randomly chosen cells." This process does not generate a random, or systematic random sample from the vegetation type. Rather, the process has the potential for a strong "investigator bias" by enabling scientists to choose sites subjectively, if not arbitrarily. Inferences made based on subjective sampling cannot be deemed representative and cannot be applied across the vegetation type as a whole.

In contrast, the State's sampling grid in the impact area guaranteed that every point in the impact areas had an equal and unbiased chance of being selected for the study. Each point randomly selected in the impact area was then matched with three points in German Gulch with similar values of covariates that affect potential vegetation (slope, elevation, aspect, etc.), and one of the three points was randomly selected for sampling. Statistical inferences apply to the entire collection of impact areas (and separately to the individual impact areas). Scientists following the State's procedures with careful attention to the written protocol for matching points would obtain the same conclusions concerning vegetation differences.

2.4 *ARCO's investigators provide no criteria for selection of the control area in German Gulch, and no criteria for selecting sampling points within the control area.*

As stated in Keammerer (1995), the German Gulch reference area was sampled with the intent to "obtain insight into the structure and composition of vegetation types that have not been influenced by emissions from the smelter." However, the procedure for site selection

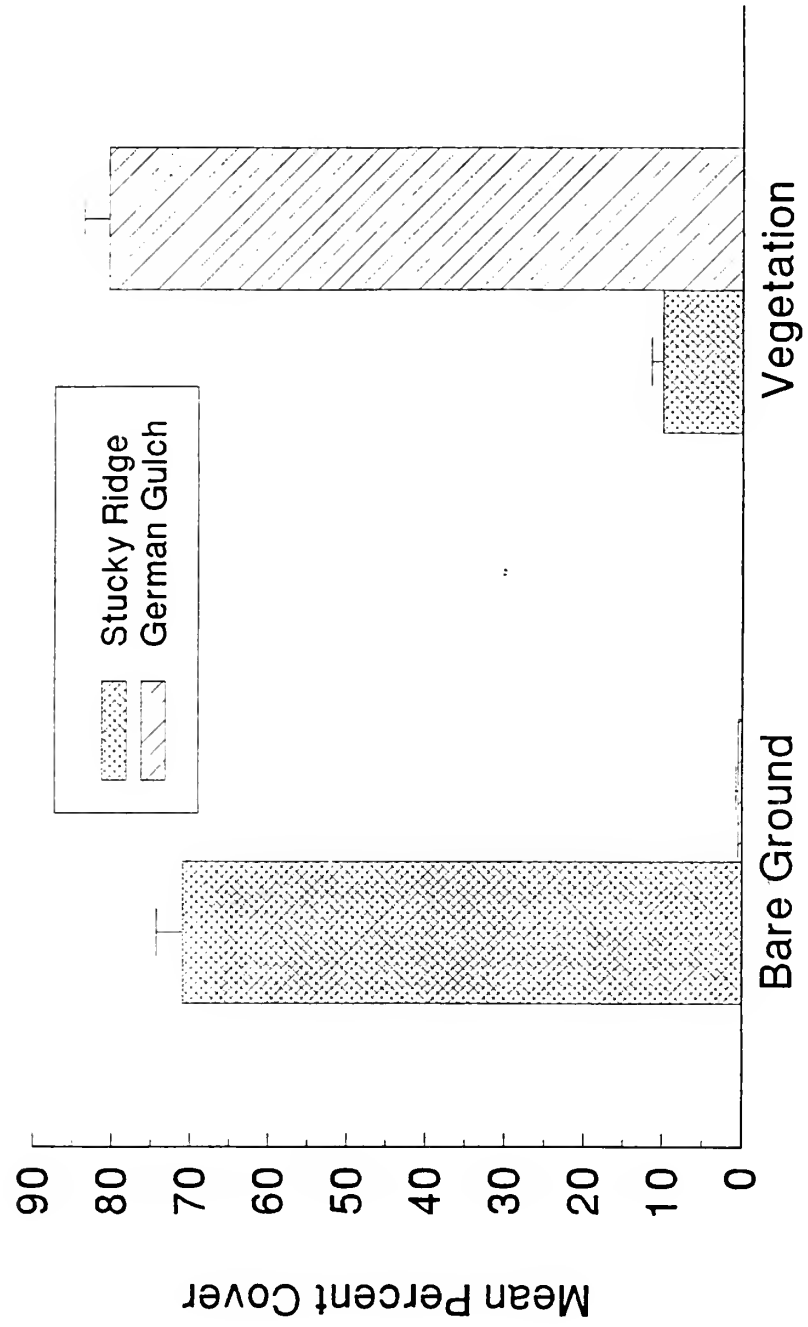

Figure 2-7. Mean Percent Vegetative Cover and Bare Ground: Stucky Ridge Injured Sites, German Gulch Control Sites. Bars represent standard error of the mean.

was apparently even more subjective than sample site selection in the impact areas, as evidenced by Keammerer's statement: "Field reconnaissance in the German Gulch area was used as a means for identifying general areas where these vegetation types were present." Sampling points were then apparently subjectively determined ". . .with the intent of sampling a variety of sites within these types." An independent investigator following the methods described for control site selection in Keammerer (1995) would likely obtain different results and conclusions regarding vegetation differences between control and impact vegetation types. Moreover, it is standard scientific practice to select control areas based on independent criteria, and not on the endpoints that are being measured. ARCO's investigators, instead, chose to compare a subjectively defined vegetation type in the impact area with a subjectively defined vegetation type in the reference area. Their results confirm that the two subjectively determined vegetation types occur in both impact and control areas. Their results do not provide a basis for comparison of vegetation communities. For example, ARCO's investigators have attempted to compare conifer forests across a wide range of elevations in German Gulch, Mount Haggin, and Stucky Ridge. The pooling of data for comparison across a wide range of elevations has the effect of swamping the comparison with statistical noise related to environmental variability alone.

In contrast, for each of the randomly selected points in the impact area, the State identified three points in German Gulch that matched the sampling points in the impact area based on important environmental covariates that affect vegetation community composition and structure. One of the three points was randomly selected for sampling. The procedures used to select points were described in the State's report, and scientists following the State's procedures with careful attention to the written protocol for matching points would reach the same conclusions concerning vegetation differences. Each of the points selected as a paired control site is realistically representative of baseline conditions at the matched impact site.

2.5 ***Standard Operating Procedures (SOPs) used to identify soil sample collection sites, to collect soil samples, and laboratory methods for soil and plant tissue analyses were not provided in the report nor in supporting materials provided to the State. The State has not been provided the opportunity to review field sampling or laboratory protocols; thus it cannot confirm the validity of the methods used by ARCO.***

Keammerer (1995) reports that pooled soil samples were collected at each sample plot, which presumably refers to the 10-m square sampling area that was subjectively selected for vegetation sampling. Within the sampling plot ten sub-samples sites were "randomly chosen and sampled." No SOPs for identification of random coordinates within a plot or for soil sample collection were included with the materials provided to the State. It is unclear from the method description in the ARCO report text whether consistent randomization techniques were used from site to site, or whether each of the sub-samples at a site is represented in

equal portion in the pooled sample from the site. Subjective subsampling at a site could result in a field bias towards soils which appear to satisfy a desired outcome.

Methods used to analyze soil and plant tissues are not identified in the study report. The methods section states that the soil samples were analyzed for the chemical characteristics listed in the tables and attachments to the report, but the tables and attachments identify the soil metal concentrations merely as "plant available." If the methods used to analyze the soil samples collected in 1994 on Stucky Ridge, Mount Haggin, and in German Gulch are the same as those used to analyze the Smelter Hill soils (PTI, 1991), two different methods were used to estimate the "plant available" fraction of total metals in soils: for Smelter Hill soils with pH > 6.0, an NH_4HCO_3-DTPA extraction was used, and for soils with pH < 6.0, a Mehlich No. 1 extraction was used. No documentation supporting the contention that these methods extract comparable fractions of metals, nor that they simulate appropriately and continuously the plant available fraction of metals over the pH range tested, is provided.

2.6 ***ARCO presents no data supporting their contention that the so-called "plant available" metals extractions actually represent the concentration of metal that may cause injuries.***

As noted in the above comment, ARCO provides no information on the laboratory methods used to measure what are casually referred to as "plant available" metals. Assuming the methods used parallel those used in the 1994 Smelter Hill soils analysis performed by ARCO (PTI, 1991), two different analytical methods were used. ARCO has provided no data to support the contention that this combination of methods — or either method individually — actually provides an accurate measurement of the metals that are hazardous to plants. The site specific, effective toxicity of metals to plants can depend on a range of factors, potentially including: absolute metals concentrations, interactions between hazardous substances, soil pH and buffering capacity, redox conditions, interactions between plants and metals at the plant root-hair, soil/pore water interface, etc. Arbitrarily selecting laboratory methods that only measure *a portion* of the metals present in soil, rather than measuring the total concentration in soil, presupposes an understanding of precisely what conditions will be toxic to plants. ARCO has presented no data whatever to show that their methods actually measure this toxic fraction. Moreover, ARCO presents no data justifying the use of multiple extraction methods. This dual methodology assumes that the two analytical methods perfectly mimic the differential responses of plants to metal toxicity at different pH. The State adopted a more circumspect approach to analyzing soil metals; by analyzing total metal concentrations (with a nitric acid digestion method), the State measured the total amount of hazardous substances present that could cause toxicity to plants over a range of conditions. Moreover, this method recovers consistent fractions of different hazardous substances across a range of pH. Therefore, the analytical methods utilized by ARCO are not justified, and the resultant recovery of only *a portion* of the metals present in the soil *underestimates* potentially injurious conditions to plants.

2.7 ***ARCO's investigators included in their sampling areas lands beyond the areas delineated as grossly injured by the State. Inclusion of noninjured areas biases the results so that the impact areas seem more ecologically similar to the control area.***

ARCO's investigators claim that their Mount Haggin study area coincides with the Mount Haggin impact area identified by the State. However, the area described on the vegetation maps included with the report shows that ARCO's study area includes a portion of the Mount Haggin Wildlife Management Area east of Cabbage Gulch that the State did not consider to be grossly injured, and that the State did not include in its impact area (see Chapter 3 for additional comments). By adding this additional area, ARCO's investigators have added noninjured areas, including a substantial acreage of coniferous forest and aspen to their cover estimates. ARCO data show widespread elimination of baseline coniferous forest from the injured area. If the coniferous forest east of Cabbage Gulch that was incorrectly factored in by ARCO is removed from the areal estimates, ARCO's vegetation maps even further support the State's conclusion regarding widespread elimination of indigenous coniferous forests.

2.8 ***Biased data reporting by ARCO attempts to minimize the evidence of injury.***

In Keammerer (1995), ARCO concludes that the vegetation in the impact area is not dominated by noxious weeds, nor composed of metals tolerant species. However, as shown in Figure 2-8, of the mean 21% vegetation cover in Stucky Ridge grasslands (which itself represents a substantial loss of vegetative cover relative to baseline grasslands), an average of 63% is comprised of noxious weed species, including *Centaurea maculosa*, *Cirsium arvense*, and *Cardaria draba*, a substantially greater proportion than in German Gulch control sites. ARCO's data, therefore, clearly show that noxious weeds dominate the vegetation of Stucky Ridge. Likewise on Smelter Hill, the Great Basin Wildrye Grasslands are dominated by *Elymus cinereus*, a metals tolerant grass after which the vegetation type is named. Thus the ARCO data support the State's conclusions that the sparse grasslands on Stucky Ridge and Smelter Hill are dominated by weedy species and metals tolerant species.

A second example of the overstating of vegetation quality and misrepresentation of the data presented in ARCO's consultants reports involves the character of the understory vegetation in coniferous forests sampled. Keammerer (1995) states that understory cover in coniferous forests was not significantly different in Stucky Ridge and German Gulch coniferous forests. What he does not point out when presenting this comparison is that the inherent baseline differs significantly. Stucky Ridge coniferous forests are open (mean canopy cover 38.6%). Sparse overstory cover should not limit understory growth, yet bare soil in the coniferous forest understory on Stucky Ridge averaged 26%. In contrast, the German Gulch coniferous forests supported a dense, closed canopy (mean canopy cover 77.2 %) that precludes light from reaching the forest floor, and thus the presence of a dense understory. However, bare soil comprised less than one percent of cover under German Gulch coniferous forest.

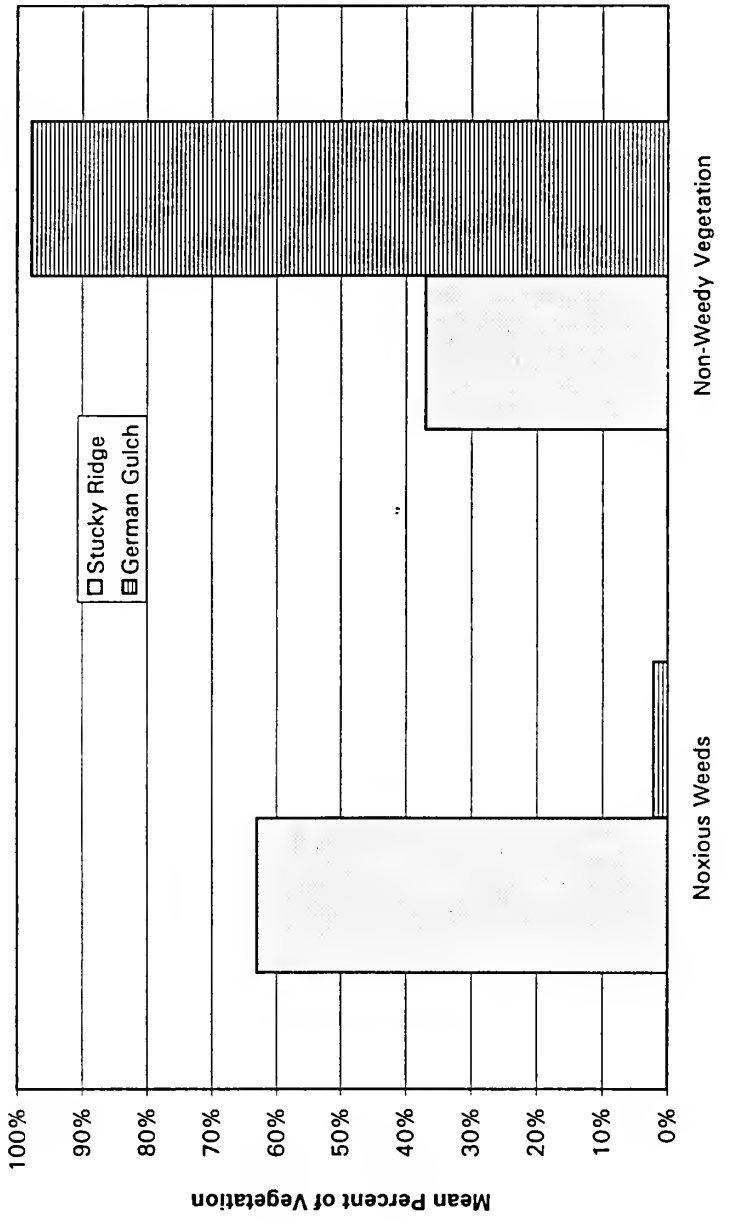

Figure 2-8. Proportion of Noxious Weeds in Grassland Vegetation: Stucky Ridge Injured Area and German Gulch Control Area.

Although misrepresented in the ARCO report, the data clearly show that (1) coniferous forests have been eliminated in injured areas, (2) understory has not developed in injured areas, and (3) total vegetative cover has decreased while bare ground has increased in injured areas.

Keammerer (1995) states that no evidence of metals effects on vegetation were apparent in the data, but as presented in the results section of his report and as his data show, on Stucky Ridge, higher arsenic concentrations were associated with lower cover values, and that higher arsenic concentration sites were associated with bare areas. Keammerer's data also confirmed that the highest copper concentrations on Stucky Ridge coincided with the bare areas and grassland sites with low cover values. It is not surprising that ARCO found no patterns of decreasing vegetation cover with increasing metals concentrations given the subjectivity of their vegetation classification, sampling design, and sampling and analysis methods. Since the study could not be repeated by an independent investigator following the methods presented, and no justification was provided of the analytical methods presumed to have been used, the results presented regarding causal mechanisms of the vegetation injury cannot be regarded as scientifically defensible.

CHAPTER 3
INJURY TO VEGETATION: PHYTOTOXICITY STUDIES

3.1 ***Phytotoxicity studies performed by ARCO utilized a flawed design and biased statistical analysis. Nevertheless, ARCO data demonstrate phytotoxicity of injured soils.***

ARCO critiques phytotoxicity tests performed by the State, and asserts that ARCO phytotoxicity tests demonstrate an absence of phytotoxicity of injured site soils (Redente, 1995). However, as shown by Kapustka (1995), ARCO tests utilized a flawed design, including:

- ARCO tests involved blending all soils collected from both "grassed" and "barren" areas. This methodology has the effect of (1) eliminating all statistical comparisons between individual sites, because all sites are pooled together, and (2) diluting the phytotoxicity of more highly phytotoxic soils by mixing in less phytotoxic soils. Therefore, the ARCO tests were not representative of actual conditions.

- Notwithstanding the above comment, soil mixing, as implemented by ARCO, assumes that the proportion at which soils were mixed is representative of the distribution at which different types of soils occur in the sampled areas. ARCO made no attempt to ensure that these distributions were equivalent. Therefore, the ARCO soils were not a representative sample.

- ARCO tests included a subjective thinning procedure in which investigators selected germinated plants for thinning. This has the potential to introduce significant investigator bias, in which investigators remove plants that demonstrate growth that is "undesirable" in terms of study objectives. Moreover, the thinning process results in tracking growth of the most resistant plants. Subsequent to thinning, ARCO comparisons were based on a total of eight selected plants (i.e., two plants per pot, four replicate pots), a sample size that is extremely small.

- Statistical testing performed by ARCO inappropriately includes "control" growth from Ft. Collins soils in the comparison of injured area soils with German Gulch control soils. This inappropriate inclusion of a control has the effect of statistically masking actual differences between injured soils and German Gulch control soils. This statistical bias is further confounded by the failure, by ARCO, to test Smelter Hill soils, despite the clear toxicity of these soils in the State's phytotoxicity testing.

- ARCO claims that amendment of injured site soils with lime and fertilizer demonstrates that hazardous substance toxicity is not the cause of growth phytotoxicity. However, this claim is entirely unsubstantiated by the ARCO data because testing was not performed with the German Gulch control soils with lime/fertilizer amendment. In other words, this aspect of the test was entirely uncontrolled. The conclusion that amendment of the injured soils with lime and/or fertilizer enhances plant growth is not surprising. However, concluding that this demonstrates that hazardous substances in injured soils do not cause phytotoxicity injuries is not substantiated in the ARCO study.

- Despite the methodological flaws in the ARCO design, examination of growth of the three plant species in injured soils (Stucky Ridge, Mt. Haggin) against growth in the German Gulch soils from the ARCO testing demonstrates clear growth reduction phytotoxicity. For all three species, root mass, shoot mass, and total mass is greater in German Gulch soils than in Stucky Ridge and Mt. Haggin soils, with growth being German Gulch > Mt. Haggin > Stucky Ridge -- the same ordering of concentrations of hazardous substances in the soils (Figure 3-1; data adapted from Kapustka, 1995, Tables 3 and 4). Moreover, plant growth was negatively correlated with soils concentrations of the hazardous substances arsenic (bluebunch wheatgrass:shoot mass; slender wheatgrass: shoot, root, and total mass; Redtop: root mass and total mass) and copper (all species, all endpoints) (Kapustka, 1995, Table 5).

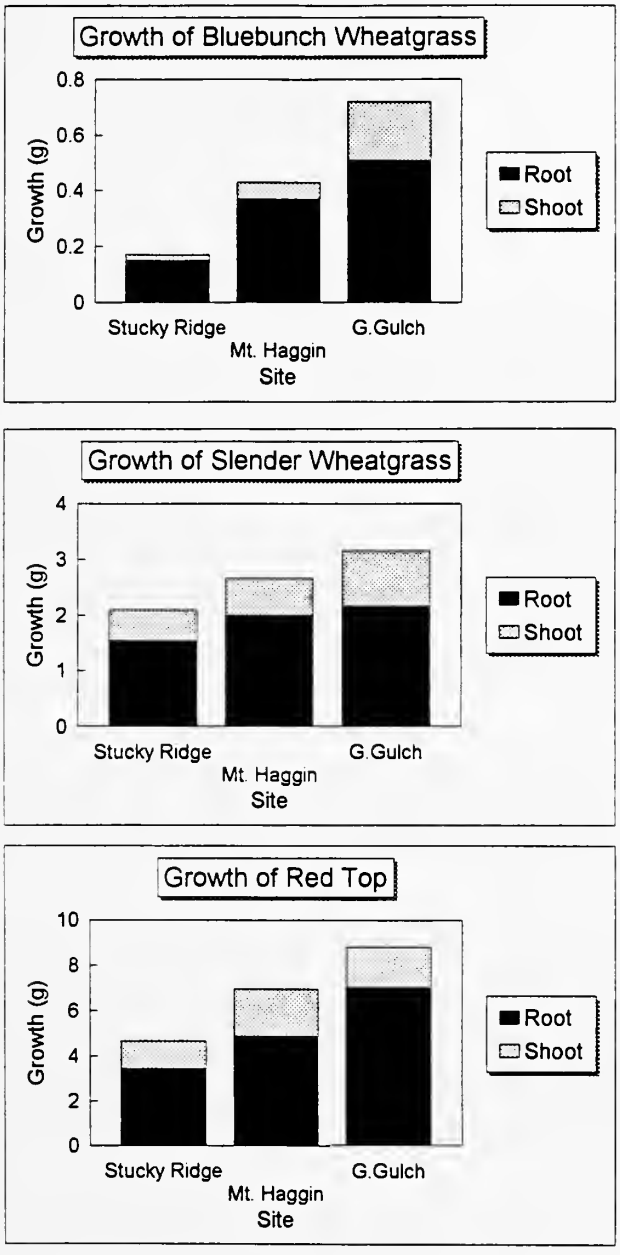

Figure 3-1. Plant Growth (Root Mass, Shoot Mass) Measured by ARCO in German Gulch Control Soil (G.Gulch), and Stucky Ridge and Mt. Haggin Injured Soils. Data adapted from Kapustka (1995, Tables 3 and 4).

CHAPTER 4
INJURY TO WILDLIFE

4.1 *Injury to wildlife.*

ARCO reports on terrestrial wildlife (Hayden-Wing, 1995) contend that wildlife is not injured, as evidenced by population surveys which purport to demonstrate that population composition and size in impact sites is equivalent to that in control areas. At the outset, it should be clarified that the State did not base its claim for injury to wildlife based on population estimates. Rather, the basis for the claim of injury is that injuries to vegetation have resulted in substantial degradation or elimination of wildlife habitat in riparian slickens areas and in upland areas in the vicinity of Anaconda. Notwithstanding, the ARCO reports are fraught with substantial methodological errors, misstatements, and flawed conclusions, as described in the following sections. These flaws are sufficient to conclude that the results of the study, and the ARCO opinions, have no scientific basis and should be disregarded. As presented below, however, close inspection of the ARCO data — despite the severe methodological flaws — suggests that wildlife have been injured.

4.2 *By not developing and/or providing the State with SOPs, ARCO investigators have cast doubt on the validity of their data and have failed to provide the State with the opportunity of adequately evaluating the methodologies they used in the upland or riparian areas.*

It is standard scientific practice to develop SOPs before conducting any scientific field work. The purpose of this is to pre-determine the best methods that are possible and to eliminate to the extent possible methodological inconsistencies and possible biases in the field. Without SOPs, the scientific defensibility of any study is suspect and cannot be critically evaluated by outside parties. By not providing the State with SOPs, and, perhaps, by not developing adequate SOPs before starting field work, the ARCO consultants have jeopardized the validity of their studies and have failed to provide the trustees with the necessary opportunity to evaluate their data.

Important unanswered methodological questions that the State cannot address in the absence of SOPs include:

- How were upland transects chosen? The transects identified in the report do not agree with the cursory description of the methodology given in the text of the ARCO report.

- How were observers trained in the strip transect methodology and how did the investigators ensure comparability between observers?
- What were the investigators' justifications for excluding certain riparian impacted areas from survey?
- How was the German Gulch "control area" chosen and delineated?
- How did the observers make the decision that the birds that they recorded on their breeding bird surveys were, in fact, breeding birds and not transients?
- How did the investigators ensure that the observers on the bird transects accurately estimated distances?

4.3 ***ARCO investigators include in their identification of the State's injured upland and riparian areas extensive areas that the State does not consider to be injured and have, as a result, biased their results toward making the control and impact areas appear more ecologically similar than they actually are.***

In their upland bird, mammal and pellet group analysis the ARCO consultants gathered data in what they claimed to be the area delineated by the State as grossly injured, and compared it with what they claimed to be the State's reference or control area. However, it is clear from the information provided by the ARCO consultants that they have included in their "impact sample areas" large tracts of land that the State *did not* determine to be injured. For example, on Mount Haggin, the ARCO consultants included a large area of land to the east of Cabbage Gulch in their "impact area." The State did not include this area in their delineation of injury for the reason that it does not appear to be injured; it supports apparently healthy mature conifer forest, rather than the impoverished bare ground and grasslands found within the State's delineated injured area (Figure 4-1).

Figure 4-2 compares the delineation of the State's injured area on Stucky Ridge (from Lipton et al., 1995) with the area sampled by ARCO. It is clear from this figure that the delineated line does not approach the stream to the west of sample point A7 as closely as the ARCO line does in Map 2 of Keammerer (1995). By pushing the State's line to the west, the ARCO consultants have arbitrarily included conifer forest in the injured area, even though the State did not include it in its delineated injured area.

Once these invalid areas were drawn into the ARCO version of the State's injured area, the ARCO consultants located transects in them for the purpose of making bird and mammal observations (see below). The effect of this initial misrepresentation of the State's study areas and subsequent invalid sampling has been to misrepresent the State's case by including

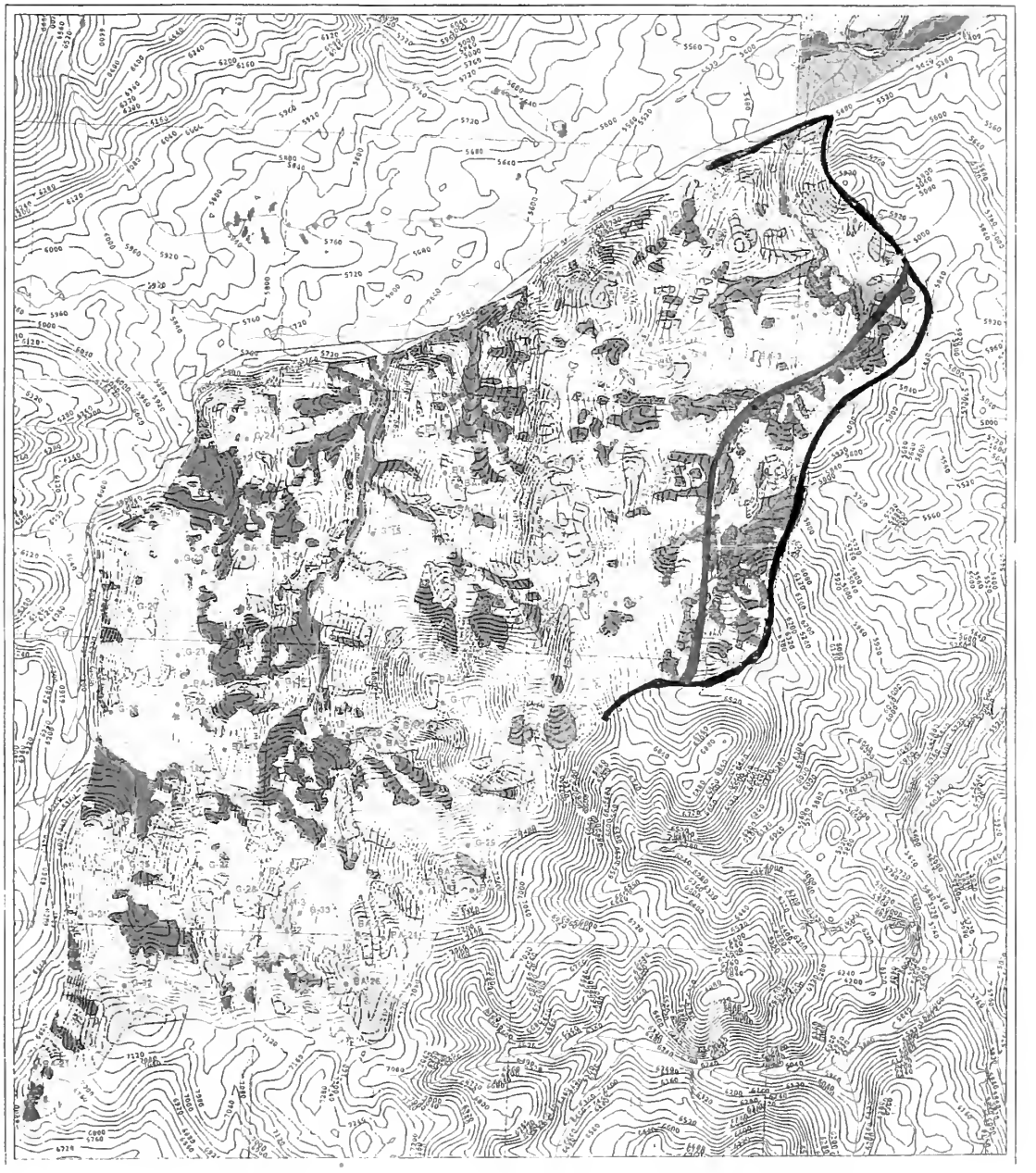

Figure 4-1. Comparison of ARCO and State Delineations on Mount Haggin.
Blue line = State Delineation. Black = ARCO Delineation.

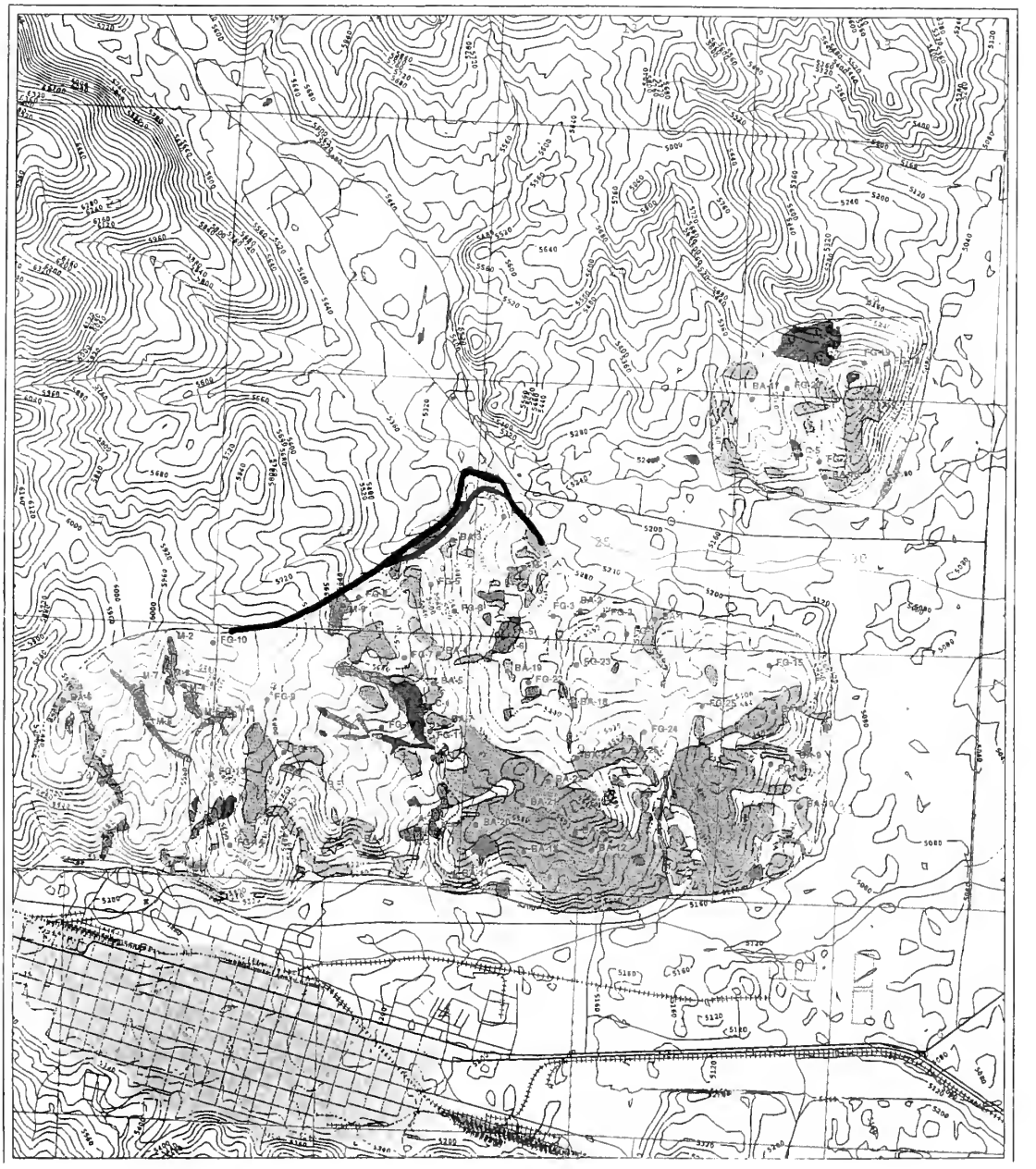

Figure 4-2. **Comparison of ARCO and State Delineations on Stucky Ridge.** Blue line = State Delineation. Black = ARCO Delineation.

uninjured areas which serves to mask the very real differences in vegetation and wildlife between the injured areas of uplands and adjacent unimpacted uplands.

In their riparian studies, the ARCO consultants also carried out an expansion of study areas by making observations of wildlife in nonslickens areas although the State clearly stated that their riparian wildlife claim applies only to slickens. Furthermore, it is apparent from the information supplied by ARCO to the State, that the ARCO consultants further biased their studies in the riparian habitat by choosing not to make observations in the largest single area of slickens along Silver Bow Creek, Ramsay Flats (Figure 4-3). Once again, the effect of this misrepresentation of the State's study areas has been to mask very real differences between the injured riparian areas and adjacent unimpacted habitat.

4.4 ***In selecting their upland transects, the ARCO consultants used a method that was highly subjective, nonscientific, and severely biased the results of their subsequent bird and mammal surveys. Furthermore, the ARCO consultants did not adhere to their own stated method of transect sighting.***

In Hayden-Wing (1995), a methodology is reported for randomly locating nonriparian transects in the upland areas. This involved setting up a numbered axis at the edge of the impact area and choosing a transect starting point by selecting a number from the axis randomly. If all transects were selected using this procedure, the resulting transects within any study area would run parallel to each other. This generally is the case for the Stucky Ridge area, but is not so on Mount Haggin, Smelter Hill, German Gulch, and the northern extension of Stucky Ridge. In these areas, transects run at various angles to each other and even intersect at right angles (Figure 4-4). Thus, the ARCO consultants obviously did not adhere to their stated methodology, but give no reason or justification for not doing so. Thus one can only conclude that the transects were not located in a random fashion.

Additional methodological errors and inconsistencies in the selection of transect area locations include:

- The ARCO consultants adopted a wholly subjective and nonscientific method of selecting transects along upland areas. Indeed, at least on Stucky Ridge and Mount Haggin it appears that the transect locations were apparently chosen to run through vegetationally rich, but highly unrepresentative, areas, thus biasing the data. This is obvious from a comparison of the vegetation maps, Maps 2 and 4, in Keammerer (1995) and the transect locations given in Figures M-3 and M-6 of Hayden-Wing 1995. Transects 4, 1, and 1N on Stucky Ridge (Hayden-Wing, 1995, Figure M-6) were obviously chosen to run through the only patches of conifer cover delineated by Keammerer (1995) on the study area. Furthermore transects 3 and 6 on Stucky Ridge were again apparently placed so that they would run through large aspen stands.

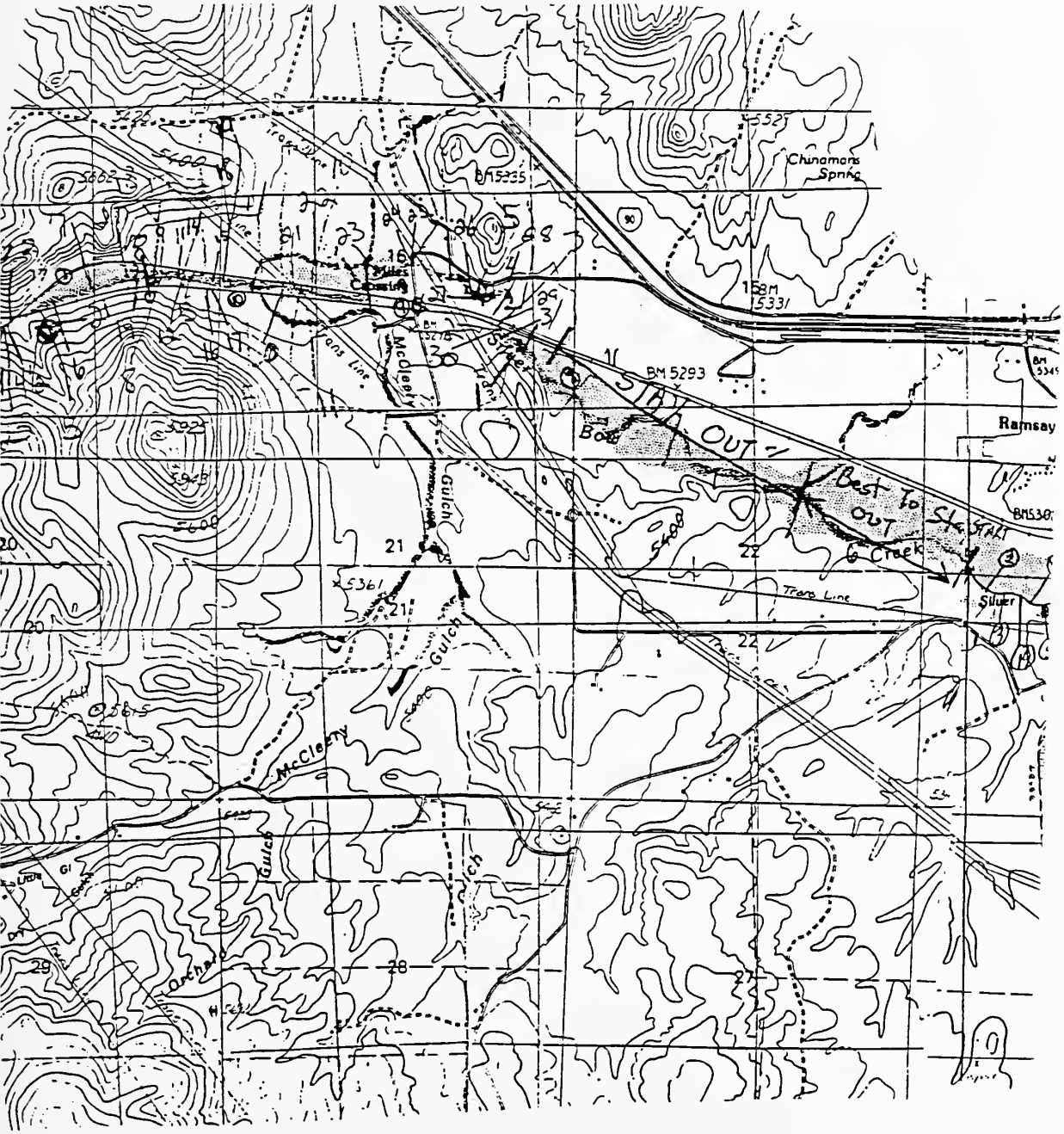

Figure 4-3. ARCO Consultants Wildlife Transect Map for Silver Bow Creek Showing that Observations were Not Made in Ramsay Flats. Source: Hayden-Wing, 1995.

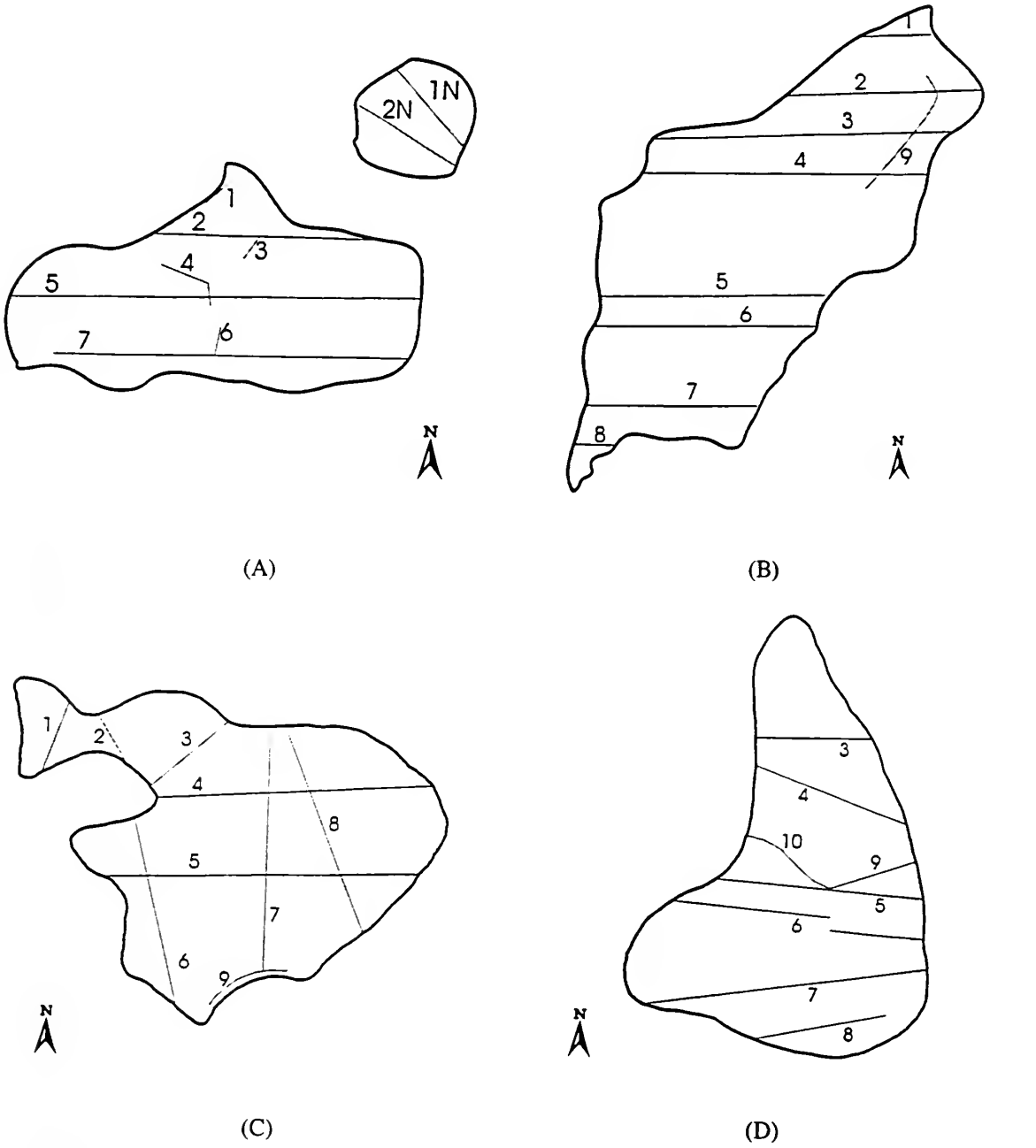

Figure 4-4. ARCO Transect Locations for Stucky Ridge (A), Mount Haggin (B), Smelter Hill (C), and German Gulch (D).

Thus, 5 of the 9 "randomly placed" transects on Stucky Ridge were sited so as to sample unrepresentative vegetation communities in contrast with the State's transect selection methods which sampled the various vegetation communities in proportion to their true representation on the study sites. Similarly, transect 9 on Mount Haggin (Figure M-3) appears to have been chosen to run through patches of conifer cover, rather than the more typical riparian vegetation communities represented on the impacted sites. Furthermore, much of the land sampled by transect 9 was not identified as injured by the State.

By selecting their transect locations in this subjective and biased way, the ARCO consultants have succeeded in collecting bird and mammal data that fail to capture the true condition of injury at the impact areas.

4.5 *The ARCO investigators do not provide any validation of their choice of an upland control area and seem to be uncertain about its position and delineation.*

The information provided by the ARCO consultants indicates that the basis for their delineation of a control area in German Gulch was that they chose the State's control area. However, it is clear from the State's reports that the State did not to have a generalized "control area" because of the ecological differences that would have pertained between the three impacted areas prior to injury. Instead, the State adopted a scientifically valid comparative method by selecting specific sample points in the injured area and pairing them with control sites in the German Gulch uplands using important environmental variables. Thus, the comparisons made by the State were between specific and ecologically comparable sample points, not between the injured area and some generalized and unrepresentative "control area."

The ARCO consultants therefore have made invalid comparisons between impact and "control" conditions. For example, their Stucky Ridge data are compared with data collected from all over their generalized German Gulch "control area," much of which, because of differences in elevation, aspect, slope, etc., is not comparable with how Stucky Ridge would have looked under baseline conditions. By comparing paired sites, the State did not make this fundamental error.

Even if the ARCO consultants had not made the error described above, and even if we assume that their method was valid, the delineation of their "control area" is extremely problematic because it does not accurately overlap with the general area containing the State's control sample sites on the German Gulch uplands. For example, a line drawn round the outlying sample points used by the State does not match the configuration of the ARCO consultants' control area delineation. Large areas that are included in the former actually fall outside of the "control area" delineated by the ARCO consultants. In fact, 8 of the State's 20 control sites are outside of the ARCO delineation (Figure 4-5). Once again, the ARCO

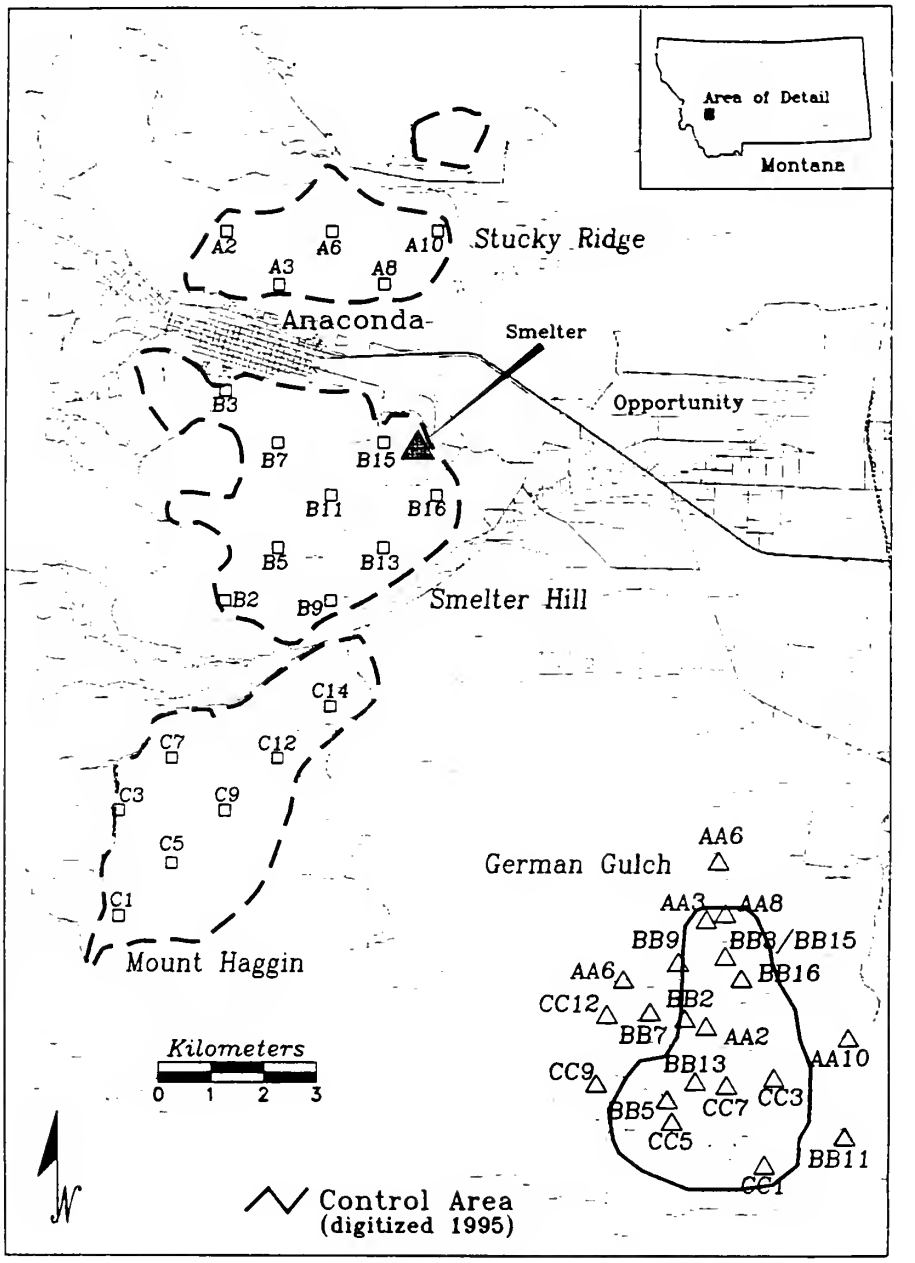

Figure 4-5. ARCO "Control" Area Delineated (solid line) over State Control Sampling Points in German Gulch.

consultants are purporting to make similar comparisons to those made by the State but are actually comparing unlike units.

Furthermore, the "control area" delineated by the ARCO consultants is not even consistent within the Hayden-Wing report, as can be seen by comparing the figures in Hayden-Wing (1995). The "control area" delineated in Hayden-Wing report does not accurately conform to the delineated "control area" in Figure 4-5. Thus, the ARCO consultants seem to be under some uncertainty as to exactly where their control area is located. It is likely that sections of the transects identified in Figure M-4 are not, in fact, in the "control area" presented in the maps in Appendix A of Hayden-Wing (1995).

4.6 ***The ARCO investigators failed to identify, much less address, the serious potential biases in their use of the strip transect method of bird survey when comparing areas composed of different habitat types.***

The results of the strip transect method used by the ARCO consultants in their bird census work in the uplands are seriously biased when comparisons are being made between different habitat types (Verner, 1985; Bibby et al., 1992). Therefore, the data reported by ARCO fail to identify true differences between the impacted and control upland areas.

Line transects as a method of censusing and surveying bird populations and communities are most accurate in habitats where bird detectability is comparatively high. However, because of the limited visibility and greater hiding cover, birds (particularly unobtrusive species) are likely to be less detectible in wooded areas (Verner, 1985). Furthermore, walking transects through dense wooded habitat is likely to result in birds being disturbed and silenced (hence, not recorded) before being detected by the observers (Bibby et al., 1992; Verner, 1985; Burnham et al., 1980). Thus, when used in the open, comparatively treeless, impact areas of Stucky Ridge, Smelter Hill and Mount Haggin, line transects will result in a greater detection probability for individual birds settled on the ground or in vegetation than when they are utilized in dense woodland, such as that which covers much of the German Gulch uplands. In such wooded areas, transects will comparatively underestimate the numbers of birds present. Furthermore, in open country such as the impacted areas, any birds flying over at height can still be seen and recorded. This is not the case in much of German Gulch where a thick tree canopy prevents such sightings. The net effect of all of the above considerations is that the method selected by the ARCO consultants has likely seriously underestimated the numbers of birds present along the German Gulch transects and hidden real differences between impact and control areas.

In addition, ARCO consultants did not normalize for time when carrying out their counts. The numbers of birds, mammals and pellet groups encountered and recorded will be affected by the length of time that the observer spends carrying out a transect. In spite of this no attempt was made to either ensure that similar lengths of time were spent at each transect, or

that the data were time-normalized. Therefore, any quantitative opinions based on the ARCO data are not justifiable.

Finally, to avoid double-counting of birds, each transect should have been completed in the shortest possible time span, at most in one day. It is apparent from the data supplied by the ARCO consultants that this was not done. Any one of their transects may have been surveyed over the course of two or more days. By delaying the completion of the transect survey the observers become vulnerable to double-counting of birds. Thus, a bird or group of birds seen on one section of the transect one day one could be seen and counted again on a neighboring section the following day. An example of this is their survey of transects 3 and 9 on Mount Haggin: 44 red crossbills were counted on this transect over three days in the field. 10 were counted on June 23, while 25 were observed approximately 0.6 miles further along the transect the following day. In spite of the fact that this could easily have been an example of double counting, the ARCO consultants recorded the total as 35 birds. Again, the result of this error is that any quantitative opinions based on the ARCO data are not scientifically defensible.

4.7 *In their "breeding bird surveys," the ARCO investigators failed to discriminate between birds that were actually breeding on the survey sites and transients.*

Birds are highly mobile animals. Therefore it is imperative, when carrying out surveys of breeding birds, to attempt to distinguish between actual breeding animals and transients (i.e., birds that are simply moving through an area of unsuitable habitat en route to more suitable areas). It has long been standard practice in bird survey work (e.g., Bibby et al., 1992; Verner, 1985; Williamson, 1964; Enemar, 1959; Kendeigh, 1944) to distinguish between breeding birds and transients, using some category of evidence of breeding or territoriality such as nests and eggs, feeding young, breeding display, or song. Although this has been standard practice for breeding bird surveys in North America and Europe for the last three decades, the ARCO consultants made no attempt to differentiate between actual breeding birds on any of their transects and transients. Although they call their surveys "breeding bird surveys," it seems that their definition of a breeding bird is any bird that is seen, regardless of whether it actually is using the site in some way or is only flying over en route to somewhere else.

This failure to differentiate between breeders and transients has introduced a serious bias into the ARCO consultants' data. Because the counts were carried out at the height of the migration season (late May and early June) when numerous transients would be overflying the study sites on their way north. and because transients would be much more easily detected over the open country of the impacted areas, rather than over the closed canopy of German Gulch, the observers have again seriously biased the methods toward underestimating the numbers of birds associated with their control area.

4.8 ***In their comparisons of bird communities, ARCO consultants fail to evaluate a reasonable baseline upland bird community, confound their data with observations of transient animals, and thus obfuscate actual conditions. Nevertheless, normalized ARCO data demonstrate reduced numbers of birds in injured areas.***

ARCO's main argument that the bird communities in the impacted area are comparable to baseline communities is flawed. It is obvious even from their own data (Table R-13 of Appendix C to Hayden-Wing, 1995) that a reasonable baseline bird community, while represented at the German Gulch control area, is not well represented at the impacted areas. The baseline bird community in the southwest Montana uplands is one that is adapted to the existence in mature pine and Douglas fir forests. Representative species include blue grouse, mountain chickadee, pine grosbeak, Clark's nutcracker, hairy woodpecker, pine siskin, gray jay, red crossbill, red-breasted nuthatch, ruby-crowned kinglet, spruce grouse, western tanager, and yellow-rumped warbler.

Eleven of the 13 species identified above were seen during the course of the ARCO surveys. Of these, 9 were recorded in much greater numbers on the control transects than the impact, one (gray jay) in equal numbers, and only one (red crossbill) in greater numbers on the impact transects (Table 4-1). Scrutiny of the ARCO data shows that 10 of the red crossbills were actually recorded in the section of Cabbage Gulch (Mount Haggin) that was not in the State's impact area, while 25 were in a flock "flying over" Mount Haggin. This is an example of the way in which the ARCO consultants have included transients in their "Breeding Bird Surveys" to inflate the impact area totals, since red crossbills do not breed in colonies and 25 individuals seen flying over in one flock are obviously not breeding.

Table 4-1
Comparisons of Baseline Avian Community Bird Detection Rates (estimated from maps in Hayden-Wing, 1995) on Impact and Control Areas (data from Hayden-Wing, 1995)

Location	Transect Length (km)	Number of Birds Recorded	Bird Detection Rate (birds/transect km)
German Gulch Control Area	18.5	212	11.4
Mount Haggin	21.9	120	5.5
Smelter Hill	23.9	48	2.0
Stucky Ridge	16.7	52	3.1
All Impact	62.5	220	3.5

In total, 212 individuals of the species identified above as baseline bird community species were recorded on approximately 18.5 km of control area transects compared with only 120 on 21.9 km of Mount Haggin transects, 48 on 23.9 km of Smelter Hill transects, and 52 on 16.7 km of Stucky Ridge transects. Thus, the rate of detection of these bird species in the German Gulch control area was twice that on Mount Haggin, almost six times that on Smelter Hill and almost four times that on Stucky Ridge (Table 4-1). Thus, ARCO's own data indicate that a baseline bird community is not present on the impacted areas.

CHAPTER 5
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APPENDIX A
STANDARD OPERATING PROCEDURE FOR 1995 MONTANA GRASSLAND STUDIES

APPENDIX A
STANDARD OPERATING PROCEDURE FOR 1995 MONTANA GRASSLAND STUDIES

A.1 INTRODUCTION

This standard operating procedure (SOP) describes the methods to be used to make measurements and take photographs at sites designated in Keammerer (1995) as grassland or grassland/forb on Stucky Ridge, Mount Haggin, and German Gulch, Montana. There are four components to this SOP: selection of impact area sampling sites; selection of control area sampling sites; sample site photography; and vegetation measurements. These are dealt with separately in the remainder of this SOP.

A.2 SELECTION OF IMPACT AREA SAMPLING SITES

1. A numbered grid with cell boundaries 500 feet long was superimposed over the delineated study areas on Maps 2 (Stucky Ridge) and 4 (Mount Haggin) of Keammerer (1995).

2. A random number generator was used to generate random sets of grid coordinates.

3. The first three random sets of coordinates at Stucky Ridge and at Mount Haggin that fell within areas delineated as grassland in Maps 2 and 4 of Keammerer (1995) and that were at least 500 feet from another community type were selected as study sites.

4. The study site locations were marked on 1:24,000 topographical maps and the latitudes and longitudes of each site estimated.

5. The sites were located in the field using a Geographical Positioning System and/or 1:24,000 topographical map and compass.

6. When the approximate site location was arrived at in the field, the actual sample site was located 10 paces from this point on a randomly chosen compass bearing.

A.3 SELECTION OF CONTROL AREA SAMPLE SITES

1. Control areas were selected from Lipton et al. (1995).

2. Three control sites containing grassland as a dominant cover type at one or more subsample points (Lipton et al. 1995) were selected randomly.

3. For each control site (i.e., n = 3), one sub-sample site containing grassland as the dominant cover type was selected randomly.

4. In addition, three of eight sites designated as "controls" by Keammerer (1995) were selected for sampling using a random number generator.

5. The study site locations for the Keammerer (1995) sites were marked on 1:24,000 topographical maps and the latitudes and longitudes of each site estimated.

6. Sites were located in the field using Geographical Positioning System and/or 1:24,000 topographical map and compass.

7. When the approximate site location was arrived at in the field, the actual sample site was located 10 paces from this point on a randomly chosen compass bearing.

A.4 PHOTOGRAPHY AT SAMPLE SITES

On arriving at the impact and control sample sites 5 color photographic slides/prints were taken:

1. Views north, south, east, and west from the sample site (near foreground).
2. A close-up view of the vegetation within a 10 meter radius of the sample site.

Descriptions of the photographs taken were recorded on field recording forms (Attachment A).

A.5 VEGETATION MEASUREMENTS

At each sample site two intersecting 20-meter transects were placed on the ground using a tape measure. Each transect ran north-south or east west and intersected at the sample point. These 20-meter transects were divided into four 10-meter line intercepts and the following variables measured and recorded on field recording forms (Attachment B):

- percent cover of living vegetation
- percent cover of plant litter
- percent cover of nonliving material (rock, bare ground).

The dominant species at each sample site were also recorded on the field recording form.

A.6 REFERENCES

Keammerer, W.R. 1995. Expert Report. U.S. District Court, District of Montana, Helena Division. State of Montana v. Atlantic Richfield Company, No. CV-83-317-HLN-PGH.

Lipton, J., H. Galbraith, K. LeJeune, H. Bergman, L. Kapustka, and L. McDonald. 1995. Terrestrial Resources Injury Assessment Report. Upper Clark Fork River Basin. Report prepared for the State of Montana, Natural Resource Damage Litigation Program. Helena, MT.

APPENDIX B
1995 HAGLER BAILLY SAMPLING DATA

KEY TO COVER TYPES AND HABITAT LAYERS DATA KEYS

Cover Types

EF = evergreen forest
DF = deciduous forest
G = grassland
BG = bare ground
ES = evergreen shrubland
DS = deciduous shrubland

Habitat Layers

TC = tree canopy
TB = tree bole
SM = shrub midstory
US = understory
TS = terrestrial subsurface
SW = surface of water column
WC = water column
BWC = bottom of water column

Presence/absence

0 = absent at sample site
1 = present at sample site

1995 Vegetation Data
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			Cover Type						Habitat Layers							
Location	Transect	Date	EF	DF	G	BG	ES	DS	TC	TB	SM	US	TS	SW	WC	BWC
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G2	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0

			Line Intercept Measurements				Dominant Species													
Transect	Line_Int	Meter	Bare_Grnd	Litter	Vegetation	Rock	GBWR	RT	CA	AS	BW	PO	GR	RRB	JN	RW	FW	MH	AL	FS	YW
G2	East	1	0	20	80	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	East	2	0	20	80	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	East	3	0	20	80	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	East	4	0	20	80	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	East	5	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	East	6	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	East	7	0	30	70	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	East	8	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	East	9	0	30	70	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	East	10	0	0	100	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	North	1	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	North	2	0	30	70	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	North	3	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	North	4	0	30	70	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	North	5	0	20	80	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	North	6	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	North	7	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	North	8	0	30	70	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	North	9	0	20	80	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	North	10	0	20	80	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	South	1	0	30	70	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	South	2	0	20	80	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	South	3	0	20	80	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	South	4	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	South	5	0	30	70	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	South	6	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	South	7	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	South	8	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	South	9	0	0	100	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	South	10	0	0	100	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	West	1	0	50	50	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	West	2	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	West	3	0	50	50	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	West	4	0	20	80	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	West	5	0	0	100	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	West	6	0	0	100	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	West	7	0	10	90	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	West	8	0	40	60	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	West	9	0	30	70	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G2	West	10	0	30	70	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
G3	East	1	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	East	2	0	20	80	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	East	3	0	20	80	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	East	4	0	20	80	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	East	5	0	25	75	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	East	8	0	30	70	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	East	7	10	40	50	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	East	8	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	East	9	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	East	10	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	North	1	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	North	2	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	North	3	0	20	80	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	North	4	0	20	80	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	North	5	0	30	70	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	North	6	0	40	60	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0

1995 Vegetation Data																
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			Cover Type						Habitat Layers							
Location	Transect	Date	EF	DF	G	BG	ES	DS	TC	TB	SM	US	TS	SW	WC	BWC
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G3	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0

			Line Intercept Measurements				Dominant Species														
Transect	Line_Int	Meter	Bare_Grnd	Litter	Vegetation	Rock	GBWR	RT	CA	AS	BW	PO	GR	RRB	JN	RW	FW	MH	AL	FS	YW
G3	North	7	0	40	60	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	North	8	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	North	9	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	North	10	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	South	1	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	South	2	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	South	3	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	South	4	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	South	5	0	20	80	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	South	6	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	South	7	0	30	70	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	South	8	0	30	70	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	South	9	0	30	70	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	South	10	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	West	1	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	West	2	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	West	3	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	West	4	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	West	5	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	West	6	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	West	7	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	West	8	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	West	9	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G3	West	10	0	0	100	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
G8	East	1	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	East	2	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	East	3	0	20	80	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	East	4	0	20	80	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	East	5	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	East	6	0	40	60	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	East	7	0	20	80	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	East	8	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	East	9	0	20	80	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	East	10	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	North	1	0	20	80	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	North	2	0	20	80	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	North	3	0	10	90	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	North	4	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	North	5	0	30	70	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	North	6	0	30	70	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	North	7	20	20	60	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	North	8	0	0	100	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	North	9	20	20	60	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	North	10	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	South	1	0	50	50	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	South	2	0	20	80	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	South	3	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	South	4	0	20	80	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	South	5	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	South	6	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	South	7	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	South	8	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	South	9	0	20	80	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	South	10	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	West	1	0	70	30	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	West	2	0	40	60	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1

1995 Vegetation Data																
p \monty\95field veg95 wk4																
			Cover Type						Habitat Layers							
Location	Transect	Date	EF	DF	G	BG	ES	DS	TC	TB	SM	US	TS	SW	WC	BWC
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
German Gulch	G8	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH951	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0

			Line Intercept Measurements				Dominant Species														
Transect	Line_Int	Meter	Bare_Grnd	Litter	Vegetation	Rock	GBWR	RT	CA	AS	BW	PO	GR	RRB	JN	RW	FW	MH	AL	FS	YW
G8	West	3	0	50	50	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	West	4	0	60	40	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	West	5	0	40	60	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	West	6	0	40	60	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	West	7	0	40	60	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	West	8	0	60	40	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	West	9	0	20	80	2	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
G8	West	10	0	0	100	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1
MH951	East	1	20	30	50	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	East	2	25	75	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	East	3	0	60	40	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	East	4	0	30	70	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	East	5	0	90	10	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	East	6	0	70	30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	East	7	35	35	30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	East	8	0	60	40	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	East	9	0	55	45	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	East	10	70	20	10	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	North	1	40	30	30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	North	2	0	40	60	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	North	3	0	70	30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	North	4	0	100	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	North	5	20	45	35	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	North	6	15	70	15	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	North	7	0	65	35	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	North	8	0	50	50	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	North	9	0	50	50	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	North	10	0	60	40	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	South	1	30	40	30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	South	2	20	60	20	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	South	3	0	50	50	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	South	4	10	60	30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	South	5	0	70	30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	South	6	0	60	40	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	South	7	0	60	40	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	South	8	0	40	60	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	South	9	0	100	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	South	10	0	70	30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	West	1	0	60	40	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	West	2	0	60	40	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	West	3	0	100	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	West	4	15	30	55	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	West	5	0	30	70	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	West	6	15	55	30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	West	7	20	50	30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	West	8	0	40	60	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	West	9	35	55	10	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH951	West	10	70	30	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MH952	East	1	90	30	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	East	2	70	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	East	3	0	0	100	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	East	4	80	0	20	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	East	5	40	0	60	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	East	6	90	0	10	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	East	7	90	0	10	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	East	8	60	40	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0

1995 Vegetation Data																
p \monty\95field veg95 wk4																
			Cover Type						Habitat Layers							
Location	Transect	Date	EF	DF	G	BG	ES	DS	TC	TB	SM	US	TS	SW	WC	BWC
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH952	09/06/95	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0

			Line Intercept Measurements				Dominant Species														
Transect	Line_Int	Meter	Bare_Grnd	Litter	Vegetation	Rock	GBWR	RT	CA	AS	BW	PO	GR	RRB	JN	RW	FW	MH	AL	FS	YW
MH952	East	9	60	20	20	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	East	10	70	20	10	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	North	1	60	20	20	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	North	2	50	30	20	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	North	3	35	30	35	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	North	4	60	20	20	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	North	5	30	30	40	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	North	6	45	30	25	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	North	7	60	20	20	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	North	8	75	5	20	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	North	9	50	30	20	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	North	10	60	20	20	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	South	1	50	40	10	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	South	2	60	30	10	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	South	3	0	40	60	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	South	4	30	10	60	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	South	5	30	0	70	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	South	6	20	30	50	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	South	7	20	30	50	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	South	8	30	40	30	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	South	9	40	30	30	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	South	10	40	30	30	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	West	1	25	40	35	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	West	2	0	40	60	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	West	3	0	40	60	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	West	4	25	40	35	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	West	5	25	40	35	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	West	6	30	40	30	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	West	7	25	25	50	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	West	8	25	25	50	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	West	9	0	50	50	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH952	West	10	20	60	20	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
MH953	East	1	80	10	10	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	East	2	20	30	50	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	East	3	20	30	50	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	East	4	80	20	20	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	East	5	100	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	East	6	100	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	East	7	80	10	10	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	East	8	70	10	20	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	East	9	60	5	35	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	East	10	60	5	35	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	North	1	80	10	10	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
MH953	North	2	90	5	5	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
MH953	North	3	55	10	35	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
MH953	North	4	25	10	65	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
MH953	North	5	60	10	30	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
MH953	North	6	40	25	35	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
MH953	North	7	80	10	10	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
MH953	North	8	75	20	5	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
MH953	North	9	100	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
MH953	North	10	100	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0
MH953	South	1	0	0	100	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	South	2	10	30	60	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	South	3	0	20	80	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	South	4	0	30	70	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0

1995 Vegetation Data																
p \monty\95field veg95 wk4																
			Cover Type							Habitat Layers						
Location	Transect	Date	EF	DF	G	BG	ES	DS	TC	TB	SM	US	TS	SW	WC	BWC
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Mount Haggin	MH953	09/07/95	0	0	1	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR951	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0

			Line Intercept Measurements				Dominant Species														
Transect	Line_Int	Meter	Bare_Grnd	Litter	Vegetation	Rock	GBWR	RT	CA	AS	BW	PO	GR	RRB	JN	RW	FW	MH	AL	FS	YW
MH953	South	5	20	50	30	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	South	6	20	50	30	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	South	7	0	70	30	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	South	8	30	40	30	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	South	9	30	40	30	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	South	10	100	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	West	1	10	20	70	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	West	2	30	20	50	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	West	3	30	20	50	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	West	4	20	50	30	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	West	5	60	20	20	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	West	6	100	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	West	7	25	50	25	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	West	8	30	30	40	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	West	9	100	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
MH953	West	10	40	30	30	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
SR951	East	1	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	East	2	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	East	3	70	25	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	East	4	70	30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	East	5	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	East	6	75	10	15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	East	7	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	East	8	40	20	40	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	East	9	40	20	40	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	East	10	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	North	1	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	North	2	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	North	3	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	North	4	20	80	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	North	5	60	20	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	North	6	90	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	North	7	10	90	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	North	8	20	60	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	North	9	20	40	40	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	North	10	60	10	30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	South	1	90	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	South	2	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	South	3	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	South	4	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	South	5	70	20	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	South	6	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	South	7	80	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	South	8	80	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	South	9	80	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	South	10	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	West	1	70	30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	West	2	75	25	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	West	3	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	West	4	70	0	30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	West	5	20	10	70	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	West	6	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	West	7	0	100	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	West	8	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	West	9	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR951	West	10	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

KEY TO LINE INTERCEPT MEASUREMENTS

Meter	= specific 1-meter section of each 10-meter line intercept
Bare Ground	= percent cover of bare ground in each 1-meter section
Litter	= percent cover of vegetative litter in each 1-meter section
Vegetation	= percent cover of living vegetation in each 1-meter section
Rock	= percent cover of rock in each 1-meter section

Dominant species:

GBWR	= Great Basin wild rye (*Elymus cinereus*)
RT	= Red top (*Agrostis stolonifera*)
CA	= Canada thistle (*Cirsium arvense*)
AS	= Bluebunch wheatgrass (*Agropyron spicatum*)
BW	= Buckwheat spp (Erigonum sp.)
PO	= Poa sp.
GR	= Geranium sp.
RRB	= Rubber rabbit-brush (*Chrysothamnus nauseosus*)
JN	= Juncus sp.
RW	= *Rosa woodsii*
FW	= Fireweed (*Epilobium angustifolium)*
MH	= Oregon grape (*Mahonia repens*)
AL	= Alopecurus sp.
FS	= Festuca sp.
YW	= Yarrow (*Achillea millefolium*)

Dominant/Nondominant

1	= dominant at sample site
0	= not dominant at sample site

1995 Vegetation Data																
p \monty\95field veg95 wk4																
			Cover	Type					Habitat	Layers						
Location	Transect	Date	EF	DF	G	BG	ES	DS	TC	TB	SM	US	TS	SW	WC	SWC
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR952	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0

Line Intercept Measurements

Dominant Species

Transect	Line_Int	Meter	Bare_Grnd	Litter	Vegetation	Rock	GBWR	RT	CA	AS	BW	PO	GR	RRB	JN	RW	FW	MH	AL	FS	YW
SR952	East	1	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	East	2	90	0	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	East	3	40	30	30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	East	4	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	East	5	80	5	15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	East	6	20	20	60	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	East	7	60	40	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	East	8	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	East	9	60	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	East	10	80	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	North	1	90	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	North	2	70	20	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	North	3	80	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	North	4	65	5	30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	North	5	90	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	North	6	70	5	25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	North	7	90	0	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	North	8	90	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	North	9	60	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	North	10	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	South	1	80	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	South	2	55	20	25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	South	3	90	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	South	4	85	10	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	South	5	70	20	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	South	6	60	20	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	South	7	30	50	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	South	8	20	60	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	South	9	10	40	50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	South	10	20	60	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	West	1	70	30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	West	2	80	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	West	3	70	20	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	West	4	70	20	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	West	5	50	20	30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	West	6	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	West	7	80	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	West	8	70	30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	West	9	60	30	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR952	West	10	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	East	1	55	30	15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	East	2	40	60	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	East	3	70	30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	East	4	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	East	5	80	20	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	East	6	70	15	15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	East	7	70	30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	East	8	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	East	9	60	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	East	10	100	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	North	1	80	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	North	2	70	20	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	North	3	85	10	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	North	4	50	40	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	North	5	45	35	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	North	6	70	30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

1995 Vegetation Data																
p \monty\95field veg95 wk4																
			Cover Type						Habitat Layers							
Location	Transect	Date	EF	DF	G	BG	ES	DS	TC	TB	SM	US	TS	SW	WC	BWC
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Stucky Ridge	SR953	09/05/95	0	0	0	1	0	0	0	0	0	1	1	0	0	0

			Line Intercept Measurements				Dominant Species														
Transect	Line_Int	Meter	Bare_Grnd	Litter	Vegetation	Rock	GBWR	RT	CA	AS	BW	PO	GR	RRB	JN	RW	FW	MH	AL	FS	YW
SR953	North	7	90	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	North	8	90	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	North	9	70	10	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	North	10	60	20	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	South	1	60	20	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	South	2	45	30	25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	South	3	95	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	South	4	35	40	25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	South	5	50	30	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	South	6	60	40	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	South	7	50	25	25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	South	8	80	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	South	9	60	35	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	South	10	50	40	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	West	1	55	30	15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	West	2	60	20	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	West	3	70	10	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	West	4	80	10	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	West	5	85	10	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	West	6	20	40	40	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	West	7	20	20	60	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	West	8	75	15	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	West	9	55	30	15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
SR953	West	10	90	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0