

APPENDIX N  
VEGETATION TEST PLOT MONITORING  
OF THE WILDCAT LOADOUT AREA

-1991-

**VEGETATION TEST PLOT MONITORING  
OF THE WILDCAT LOADOUT AREA**

- 1991 -

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**INTRODUCTION**

The Wildcat Loadout is the site of a storage and loadout area for coal. The coal is loaded on truck or rail and transported from the area to consumers.

Disturbed areas from the loadout facility lies within a broad valley basin surrounded by rolling hills of shadscale and scattered pinyon-juniper plant communities. The valley basin is composed of alluvial soils and those derived from Mancos Shale, supporting big sagebrush and rabbitbrush communities.

Test plots were planted in the fall of 1989 to test revegetation feasibility of some of the on-site material. The four test plot areas were seeded, fertilized and mulched with straw. A list of the plant species that were seeded is shown on Table 9. Because 1991 was the second growing season following plot implementation and seeding, qualitative and quantitative data were collected on the site.

The four test plots were labeled A - D on data sheets and tables in this report. These plots were located in four different locations around the loadout facility.

## **METHODS**

Quantitative and qualitative data were taken on the plots at the Wildcat Loadout facility on October 2, 1991. This date was prior to any significant frost in the area.

### Cover and Composition

Regular placement of sample points were predetermined to provide unbiased accuracy of the data compiled. This was accomplished by establishing transect lines at regular intervals on each end of the plots. These transect lines were placed over the entire study area to adequately represent the area as a whole. Regular points on the transect lines were then marked. From these marks, the sample points were determined by random distance numbers at right angles to the transect lines.

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information

recorded on data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows Welsh et al. (1987) for nonplanted species. To avoid confusion, the same names were used as when they were planted for the species in the seed mixtures.

### Woody Species Density

Because woody species densities were very low, all individuals were counted in each plot.

### Sample Adequacy

Sample adequacy for cover was achieved employing a the formula below.

$$\left[ \frac{1.28 (s)}{x (.1)} \right]^2 = n_{min}$$

where:

x = sample mean  
s = standard deviation  
nmin = minimum number of samples.

## RESULTS

### Plot A

This relatively narrow, rectangular plot is located near a coal pile in the loadout area. Total living cover of the plot was 40.63% (Table 1). Most of that cover, however, were weedy species e.g. Russian Thistle (*Salsola iberica*) and Summer Cypress (*Kochia scoparia*). Three desirable plant species did occur in the quadrats, although collectively they represented less than 2% total cover. For a list of the cover by species, refer to Table 2. No woody plant species were observed for density measurements in this plot.

### Plot B

Plot B is located near the electrical substation and railroad tracks. Total living cover of this plot was estimated as 52.50% (Table 3). Nearly 30% of the living cover were desirable grass species (Table 3). Dominate plant species was Summer Cypress. The most common grass species were Western Wheatgrass (*Agropyron smithii*) and Indian Ricegrass (*Oryzopsis hymenoides*). For a list of cover by species, refer to Table 4. No shrubs were observed in the plot.

### Plot C

Plot C is located near the railroad loading area. Total living cover was measured at 48.75% (Table 5). Again the same weedy forb species dominated the plot, comprising 99.43% of the total living cover (Table 5). No grasses were observed in the sample quadrats. There was, however, one desirable forb (Lewis flax or *Linum lewsi*) and one shrub (Four-winged Saltbush or *Atriplex canescens*) species observed infrequently in the quadrats (Table 6).

### Plot D

The last plot to be sampled was Plot D. This plot was measured at 40.31% cover (Table 7). The quadrats sampled in this plot comprised exclusively of weedy annual forb species. No grasses or shrubs were found to be present in the samples (Table 8).

## **DISCUSSION**

None of the four plots did particularly well to date if one considers the amount of desirable plant species that have begun

to establish themselves. However, one Plot B did noticeably better than the other plots and Plot C had a few shrubs beginning to establish.

*MT. NEBO SCIENTIFIC* was not involved at the time of implementation of the plots so we cannot rule out some of those early planting variables. One should note that the plots were implemented in the middle of an extended drought period for the area which continued through important germination and subsequent establishment periods. This could explain at least some of the reasons for the poor success.

**TABLE 1:** Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the total cover and composition for Plot A (near coal pile).

<b>TOTAL COVER</b>	<b>% MEAN COVER</b>	<b>STANDARD DEVIATION</b>	<b>SAMPLE SIZES</b>
Living Cover	40.63	5.56	16
Litter	9.69	5.01	16
Bareground	48.56	8.07	16
Rock	1.13	0.70	16
<b>COMPOSITION</b>			
Trees & Shrubs	0.00	0.00	16
Forbs	97.36	6.99	16
Grasses	2.64	6.99	16

TABLE 2: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the cover and frequency by species for Plot A (near coal pile).

<b>SPECIES</b>	<b>% MEAN COVER</b>	<b>STANDARD DEVIATION</b>	<b>SAMPLE SIZE</b>	<b>RELATIVE FREQUENCY</b>
<b>SHRUBS</b>				
<b>FORBS</b>				
<i>Kochia scoparia</i>	37.19	3.94	16	100.00
<i>Salsola iberica</i>	1.88	4.96	16	18.75
<i>Sphaeralcea grossulariaefolia</i>	0.31	1.21	16	6.25
<b>GRASSES</b>				
<i>Agropyron smithii</i>	0.63	2.42	16	6.25
<i>Stipa comata</i>	0.63	2.42	16	6.25

**TABLE 3:** Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the total cover and composition for Plot B (near substation).

<b>TOTAL COVER</b>	<b>% MEAN COVER</b>	<b>STANDARD DEVIATION</b>	<b>SAMPLE SIZES</b>
Living Cover	52.50	10.75	16
Litter	7.56	4.03	16
Bareground	39.06	10.34	16
Rock	0.88	0.70	16
<b>COMPOSITION</b>			
Trees & Shrubs	0.00	0.00	16
Forbs	70.04	23.72	16
Grasses	29.96	23.72	16

TABLE 4: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the cover and frequency by species for Plot B (near substation).

<b>SPECIES</b>	<b>% MEAN COVER</b>	<b>STANDARD DEVIATION</b>	<b>SAMPLE SIZE</b>	<b>RELATIVE FREQUENCY</b>
SHRUBS				
FORBS				
<i>Kochia scoparia</i>	36.25	12.31	16	100.00
GRASSES				
<i>Agropyron dasystachyum</i>	2.19	3.52	16	31.25
<i>Agropyron smithii</i>	6.69	8.00	16	50.00
<i>Agropyron spicatum</i>	0.31	1.21	16	6.25
<i>Bromus tectorum</i>	0.81	1.74	16	18.75
<i>Oryzopsis hymenoides</i>	6.25	7.18	16	37.50

**TABLE 5:** Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the total cover and composition for Plot C (near rail loadout).

<b>TOTAL COVER</b>	<b>% MEAN COVER</b>	<b>STANDARD DEVIATION</b>	<b>SAMPLE SIZES</b>
Living Cover	45.75	5.45	16
Litter	11.25	4.84	16
Bareground	27.50	7.29	16
Rock	12.50	6.12	16
<b>COMPOSITION</b>			
Trees & Shrubs	0.57	2.20	16
Forbs	99.43	2.20	16
Grasses	0.00	0.00	16

TABLE 6: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the cover and frequency by species for Plot C (near rail loadout).

<b>SPECIES</b>	<b>% MEAN COVER</b>	<b>STANDARD DEVIATION</b>	<b>SAMPLE SIZE</b>	<b>RELATIVE FREQUENCY</b>
<b>SHRUBS</b>				
<i>Atriplex canescens</i>	0.31	1.21	16	6.25
<b>FORBS</b>				
<i>Linum lewsi</i>	0.31	1.21	16	6.25
<i>Kochia scoparia</i>	48.13	5.27	16	100.00
<b>GRASSES</b>				

**TABLE 7:** Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the total cover and composition for Plot D.

<b>TOTAL COVER</b>	<b>% MEAN COVER</b>	<b>STANDARD DEVIATION</b>	<b>SAMPLE SIZES</b>
Living Cover	40.31	7.17	16
Litter	4.38	1.05	16
Bareground	51.13	8.34	16
Rock	4.19	2.13	16
<b>COMPOSITION</b>			
Trees & Shrubs	0.00	0.00	16
Forbs	100.00	0.00	16
Grasses	0.00	0.00	16

**TABLE 8:** Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the cover and frequency by species for Plot D.

<b>SPECIES</b>	<b>% MEAN COVER</b>	<b>STANDARD DEVIATION</b>	<b>SAMPLE SIZE</b>	<b>RELATIVE FREQUENCY</b>
<b>SHRUBS</b>				
<b>FORBS</b>				
<i>Kochia scoparia</i>	38.75	8.20	16	100.00
<i>Salsola iberica</i>	1.56	2.91	16	25.00
<b>GRASSES</b>				

TABLE 9: Species planted in the Wildcat Loadout Test Plots.

<u>Scientific Name</u>	<u>Common Name</u>	<u>Lbs/Ac</u>
<b>SHRUBS</b>		
<i>Artemisia tridentata</i> var. <i>vaseyana</i>	Big Sagebrush	0.3
<i>Chrysothamnus nauseosus</i> var. <i>albicaulis</i>	Whitestem Rabbitbrush	0.5
<i>Ceratoides lanata</i>	Winterfat	3.0
<i>Purshia tridentata</i>	Antelope Bitterbursh	3.0
<b>FORBS</b>		
<i>Linum lewisii</i>	Lewis Flax	.75
<i>Medicago sativa</i>	Alfalfa	1.0
<i>Melilotus officinalis</i>	Yellow Sweetclover	1.0
<i>Penstemon palmeri</i>	Palmer's Penstemon	0.3
<i>Sphaeralcea grossulariaefolia</i>	Gooseberryleaf Globemallow	0.3
<b>GRASSES</b>		
<i>Agropyron smithii</i>	Western Wheatgrass	3.0
<i>Agropyron gracilis</i>	Thickspike Wheatgrass	2.5
<i>Bouteloua gracilis</i>	Blue Grama	.5
<i>Oryzopsis hymenoides</i>	Indian Ricegrass	2.5
<i>Stipa comata</i>	Needle and Threadgrass	2.0
TOTAL		20.65