MOUNTAIN COAL COMPANY

APPLICATION
FOR
PHASE III BOND RELEASE

HUNTINGTON CANYON NO. 4 MINE
INA/015/004

SUPPLEMENT A

Prepared by

BLACKHAWK ENGINEERING CO.
Helper, Utah

Mountain Coal Company
West Elk Mine
Post Office Box 591
Somerset, Colorado 81434
Telephone 303 929-5015

RECEIVED
MAR 20 1997
DIV. OF OIL, GAS & MINING

March 17, 1997

Pamela Grubaugh - Littig
Permit Supervisor
Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Attn: Susan White
Sharon Falvey

Re: Phase III Bond Release
Huntington Canyon No. 4 Mine
INA / 015 / 004-96A; Folder #2
Emery County, Utah

Dear Ms. Littig:

In reference to your letter of October 16, 1996, Mountain Coal Company is herein providing 3 copies of additional information on the hydrology and revegetation for the Huntington Canyon No. 4 Mine. The following is a brief description of the information being submitted along with the regulatory reference:

R 645-301-750 - Water monitoring results have been summarized for all stations monitored since reclamation in the fall of 1985. Also included is information on the Little Bear Spring from 1982 through 1996, provided by the Castle Valley Special Services District. Certain monitoring stations (4-1-W, 4-2-W, 4-4-W, 4-5-W) were eliminated prior to - or shortly after - reclamation. All available data for these stations has been provided; however, only 4-1-W (Little Bear Spring), 4-3-W, 4-6-W, 4-7-W, and 4-8-W have been continually monitored over the past 11 years.

Based on available data, there is no evidence of subsurface impacts to the area, nor is there any indication of a probability of future impacts. Mining ceased on this site nearly 13 years ago, and the area has been reclaimed over 11 years. Any impacts to the hydrologic regime would certainly be expected to have become evident by this time.

R645-301-356 - Information has been provided to verify the minimum sample size has been met according to the Division's Vegetation Information Guidelines.

PERMIT CHANGE TRACKING FORM

Bond Release

☐ Significant Permit Revision
☐ Permit Amendment
☐ Incidental Boundary Change

DATE RECEIVED 7/22/96	By: pgl (Initial)	PERMIT NUMBER	ACT/015/004
Title of Proposal:		PERMIT CHANGE #	96A
Description: Phase III Bond Release Application		PERMITTEE	MOUNTAIN COAL COMPANY
		MINE NAME	HUNTINGTON CANYON #4 MINE

	DATE DUE	DATE DONE	RESULT	
☐ 15 DAY INITIAL RESPONSE TO PERMIT CHANGE APPLICATION			☐ ACCEPTED	☐ REJECTED
☐ Notice of Review Status of proposed permit change sent to the Permittee.			COMMENTS	
☐ Responses Received.				
☐ Notice of Affidavit of Publication. (If change is a Significant Revision.)				

REVIEW TRACKING	INITIAL REVIEW		MODIFIED REVIEW		FINAL REVIEW AND FINDINGS	
DOGM REVIEWER	DUE	DONE	DUE	DONE	DUE	DONE
☐ Lead ___						
☐ TA (See Attached) ___						
☐ Reviewers ___			Review sent 10/24/96			
☐ Administrative (AVS) ___						
☐ Biology Susan			Response	20	5/5/97	
☐ Engineering Jess			Received 3/10/97		5/5/97	
☐ Geology ___						
☐ Soils ___						
☐ Hydrology Sharon					5/5/97	

COORDINATED REVIEWS	SENT	DUE	RECEIVED	SENT	DUE	DONE
☐ OSMRE						
☐ US Forest Service						
☐ Bureau of Land Management						
☐ US Fish and Wildlife Service						
☐ US National Parks Service						
☐ UT Environmental Quality						
☐ UT Water Resources						
☐ UT Water Rights						
☐ UT Wildlife Resources						
☐ UT State History (SHPO)						
☐ State Trust Lands						

☐ Public Notice / Comment / Hearing Complete. (If the permit change is a Significant Revision)		☐ Permit Change Approval Form signed and approved effective as of this date. ☐ Permit Change Denied.	
☐ Copies of permit change marked and ready for MRP.		☐ Notice of ☐ Approval ☐ Denial to Permittee.	
☐ Special Conditions/Stipulations written for approval.		☐ Copy of Approved Permit Change to File.	
☐ TA and CHIA modified as required.		☐ Copy of Approved Permit Change to Permittee.	
☐ Permit Change Approval Form ready for approval.		☐ Copies to Other Agencies and Price Field Office.	

<u>R645-301-357</u> - Vegetation information for the last two years of the responsibility period is herein provided.

<u>R645-301-880.330</u> - Amendments have been submitted for the permit to meet the production and species diversity requirements of the Act, as suggested.

We are also working with the U.S. Forest Service to resolve their concern over the reclaimed sediment pond area. I am confident we can show (or ensure) vegetation success on the area without waiting 2 years. The area will be re-evaluated as soon as the site becomes accessible.

It is our hope this information will satisfy the noted deficiencies. If you have any questions, or need further information, please let me know.

Sincerely,

Dan W. Guy
for
Paige B. Beville

cc: Paige Beville
File

MOUNTAIN COAL COMPANY

Huntington Canyon No. 4 Mine

Phase III Bond Release

Water Monitoring Summary

HUNTINGTON CANYON NO. 4 MINE
WATER MONITORING SUMMARY

Introduction - Water monitoring results have been summarized for all stations monitored since reclamation in the fall of 1985. Also included is information on the Little Bear Spring from 1982 through 1996, provided by the Castle Valley Special Services District. Certain monitoring stations (4-1-W, 4-2-W, 4-4-W, 4-5-W) were eliminated prior to - or shortly after - reclamation. All available data for these stations has been provided; however, only 4-1-W (Little Bear Spring), 4-3-W, 4-6-W, 4-7-W, and 4-8-W have been continually monitored over the past 11 years.

Monitoring - The Huntington Canyon No. 4 Mine began operations in 1977, at the location of the old Leamaster Mine which was operated in the 1940's. The mine was temporarily closed in 1978 awaiting approval to enter a new lease. The mine was re-started in 1980 and mined continuously until 1984, when it was permanently closed. The minesite was totally reclaimed in the fall of 1985.

Only minor amounts of water were encountered in the underground mining, and no mine water was discharged from the property. There are no indications of water draining from the sealed portals after nearly 13 years.

Water monitoring has been conducted in accordance with requirements of the Permit and SMCRA.

Water monitoring was designed to show any adverse changes to the flow and/or quality of various water sources around the minesite, including Mill Fork Stream and Little Bear Spring, which is used as a culinary water source. Water data has been summarized and submitted to the Division on an annual basis as required. To date, no adverse effects have been noted to any of the water sources in the area of the No. 4 Mine.

Summary - Based on available data, there is no evidence of subsurface impacts to the area, nor is there any indication of a probability of future impacts. Mining ceased on this site nearly 13 years ago, and the area has been reclaimed over 11 years. Any impacts to the hydrologic regime would certainly be expected to have become evident by this time.

WATER MONITORING SUMMARY
MOUNTAIN COAL COMPANY
LITTLE BEAR SPRING
4-1-W

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
*FLOW (Average)	343	340	326	333	281	267	**244	291	238	300	347
pH-F		NA	CEASED MONITORING - FLOW DATA FROM CASTLE VALLEY SPECIAL SERVICE DISTRICT								
pH-L		NA									
TEMP		NA									
S.C.-F		NA									
S.C.-L		NA									
TDS		315									
TSS		2									
O&G		NA									
$CaCO_3$		NA									
A $CaCO_3$		281									
Al $CaCO_3$		NA									
Hd $CaCO_3$		319									
Ac $CaCO_3$		NA									
HCO_3		NA									
CO_3^{-2}		0									
Cl^-		5									
SO_4^{-2}		36									
Ca		52									
Mg		46									
K		2									
Na		7									
CAT / AN		.21%									
Fe		0.18									
Mn		<.02									

NA- NOT APPLICABLE
* FLOWS FROM CASTLE VALLEY SPECIAL SERVICE DISTRICT.

** LOW FLOW READINGS DUE TO BROKEN PIPE FOUND AT LOWER SPRING.

HUNTINGTON 1992 SPRING FLOWS

	Little Bear Spring		Big Bear Spring		Tie Fork Spring	
Month	Total Flow	Aver GPM Flow	Total Flow	Aver GPM Flow	Total Flow	Aver GPM Flow
January	12,075,000	270	5,638,000	126	3,733,000	84
February	10,878,000	260	5,354,000	128	3,463,000	83
March	11,217,000	251	5,406,000	121	3,687,000	83
April	9,908,000	229	5,414,000	125	3,564,000	83
May	9,640,000	216*	5,517,000*	124	3,725,000	83
June	9,644,000	223*	5,713,000	132	3,576,000	83
July	10,849,000	243	5,472,000	123	3,726,000	83
August	11,254,000	252	5,012,000	112	3,718,000	83
September	11,048,000	247	4,789,000	107	3,546,000	79
October	11,255,000	252	4,781,000	107	3,611,000	81
November	10,631,000	246	4,481,000	104	3,459,000	80
December	10,564,000	237	4,455,000	100	3,524,000	79
Total	128,963,000	244	62,032,000	118	43,332,000	82

*Discovered a broken pipe at lower spring

LITTLE BEAR SPRING
AVERAGE MONTHLY FLOW

YEAR	JAN AVG FLOW	FEB AVG FLOW	MAR AVG FLOW	APR AVG FLOW	MAY AVG FLOW	JUN AVG FLOW	JUL AVG FLOW	AUG AVG FLOW	SEP AVG FLOW	OCT AVG FLOW	NOV AVG FLOW	DEC AVG FLOW
1982	296	291	283	321	435	438	409	356	337	330	325	
1983	320	316	315	311	325	424	430	395	358	339	330	326
1984	325	326	322	324	368	423	409	377	352	340	335	332
1885	332	329	324	227	379	379	357	341	331	332	327	322
1986	326	319	317	304	380	400	383	356	339	331	330	331
1987	326	322	321	315	320	380	388	364	345	345	328	321
1988	313	311	309	304	308	327	340	327	345	366	366	307
1989	256	356	363	363	341	333	332	330	340	334	326	319
1990	308	302	295	282	278	271	270	275	280	277	272	265
1991	257	249	241	229	225	236	296	302	302	298	291	281
1992	270	260	251	229	218*	223*	243	252	247	252	246	237
1993	230	223	218	216	225	354	419	379	346	278	309	300
1994	286	275	262	268	231	229	218	218	223	218	219	212
1995	208	204	199	198	209	282	418	436	402	371	345	328
1996	315	304	292	285	312	427	443	412	378	356	318	323
1997												
1998												
1999												
2000												

NOTE: *DISCOVERED A BROKEN PIPE AT THE LOWER SPRING WHICH DECREASED FLOW

WATER MONITORING SUMMARY
MOUNTAIN COAL COMPANY
UPPER MILL FORK
4-3-W

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FLOW	115	42	272	DRY	DRY	DRY	DRY	550	DRY	DRY	DRY
pH-F	8.04	8.1	8					8.50			
pH-L	7.93	NA	NA					NA			
TEMP	4.53	6	4					4.50			
S.C.-F	541.47	NA	NA					NA			
S.C.-L	602.95	713	180					300			
D.O.	NA	NA	NA					7.80			
TDS	394.75	405	244					250			
TSS	89.2	1	13					64			
O&G	NA	NA	NA					NA			
$CaCO_3$	NA	376	238					NA			
A $CaCO_3$	NA	316	1					NA			
Al $CaCO_3$	232.05	NA	NA					235			
Hd $CaCO_3$	333.1	NA	NA					228			
Ac $CaCO_3$	NA	NA	NA					NA			
HCO_3	275.6	NA	272					286			
CO_3^{-2}	0	0	0					0			
Cl^-	14.08	14	3					3.20			
SO_4^{-2}	96.2	77	21					17			
Ca	57.5	50	59					58			
Mg	46.1	61	22					20			
K	2.04	2	1					3.90			
Na	13.08	13	5					6.40			
CAT / AN	1.71	1.00	.30					2.19			
Fe	4.01	0.07	<0.5					0.22			
Mn	<0.03	<.02	<0.02					<0.02			

NA- NOT APPLICABLE

WATER MONITORING SUMMARY
MOUNTAIN COAL COMPANY
HUNTINGTON CANYON
4-4-W

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FLOW	111.5	CEASED MONITORING									
pH-F	8.06										
pH-L	8.16										
TEMP	4.25										
S.C.-F	464.75										
S.C.-L	612.8										
TDS	367										
TSS	61.61										
O&G	NA										
$CaCO_3$	NA										
A $CaCO_3$	NA										
Al $CaCO_3$	280										
Hd $CaCO_3$	310.38										
Ac $CaCO_3$	NA										
HCO_3	333.7										
CO_3^{-2}	0										
Cl^-	10.5										
SO_4^{-2}	63.5										
Ca	59.75										
Mg	47.75										
K	1.78										
Na	11.18										
CAT / AN	1.98										
Fe	0.39										
Mn	<0.02										

NA- NOT APPLICABLE

WATER MONITORING SUMMARY
MOUNTAIN COAL COMPANY
HUNTINGTON CANYON
4-5-W

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FLOW	98.65	CEASED MONITORING									
pH-F	8.02										
pH-L	8.08										
TEMP	4.42										
S.C.-F	532.2										
S.C.-L	646.2										
TDS	389.14										
TSS	39.28										
O&G	NA										
$CaCO_3$	NA										
A $CaCO_3$	NA										
Al $CaCO_3$	284.57										
Hd $CaCO_3$	360.14										
Ac $CaCO_3$	NA										
HCO_3	330.71										
CO_3^{-2}	0										
Cl^-	62										
SO_4^{-2}	83.42										
Ca	62										
Mg	50										
K	1.98										
Na	14.42										
CAT / AN	0.67										
Fe	0.38										
Mn	<0.02										

NA- NOT APPLICABLE

WATER MONITORING SUMMARY
MOUNTAIN COAL COMPANY
INFLOW TO POND AREA
4-6-W

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FLOW	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
pH-F											
pH-L											
TEMP											
S.C.-F											
S.C.-L											
TDS											
TSS											
O&G											
$CaCO_3$											
A $CaCO_3$											
Al $CaCO_3$											
Hd $CaCO_3$											
Ac $CaCO_3$											
HCO_3											
CO_3^{-2}											
Cl^-											
SO_4^{-2}											
Ca											
Mg											
K											
Na											
CAT / AN											
Fe											
Mn											

WATER MONITORING SUMMARY
MOUNTAIN COAL COMPANY
OUTFLOW FROM POND AREA
4-7-W

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FLOW	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
pH-F											
pH-L											
TEMP											
S.C.-F											
S.C.-L											
TDS											
TSS											
O&G											
$CaCO_3$											
A $CaCO_3$											
Al $CaCO_3$											
Hd $CaCO_3$											
Ac $CaCO_3$											
HCO_3											
CO_3^{-2}											
Cl^-											
SO_4^{-2}											
Ca											
Mg											
K											
Na											
CAT / AN											
Fe											
Mn											

WATER MONITORING SUMMARY
MOUNTAIN COAL COMPANY
LOWER MILL FORK
4-8-W

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FLOW	128.73	69.75	40.25	86	DRY	DRY	DRY	570	DRY	57.20	32.30
pH-F	8.01	8.02	7.9	7.9				8.5		8.97	8.37
pH-L	8.16	NA	NA	NA				NA		NA	NA
TEMP	7.38	7.50	5.5	3				4.50		8.00	8.00
S.C.-F	466.6	629.75	322.5	535				300		7.95	7.95
S.C.-L	423.8	NA	NA	NA				NA		NA	NA
TDS	255	491.75	359.25	341				274		409	409
TSS	14.8	77.50	4.18	17.5				152		<1	<1
O&G	NA	NA	NA	NA				0.39		<1	<1
$CaCO_3$	NA	367.75	313.5	NA				NA		NA	NA
A $CaCO_3$	NA	224.5	<1	NA				NA		NA	NA
Al $CaCO_3$	223.5	NA	NA	312				243		286	286
Hd $CaCO_3$	247	NA	NA	368				247		370	370
Ac $CaCO_3$	NA	NA	NA	<1				NA		NA	NA
HCO_3	268.8	NA	356	378				297		349	349
CO_3^{-2}	1.6	0	0	0				0		0	0
Cl^-	3.4	15.75	11	11.31				4		17	17
SO_4^{-2}	22.6	94.0	78.25	65.85				27		92	92
Ca	45.16	50.5	57.75	44.13				62		60	60
Mg	32.5	62.25	45.25	63.03				23		54	54
K	0.93	2.5	2	1.93				4.70		2	2.00
Na	6.16	14.75	11	11.7				8		14	14
CAT / AN	1.47	1.15	0.31	27				1.28		0.37	0.37
Fe	0.44	.53	.163	.12				0.71		<0.05	<0.05
Mn	<0.02	.03	<.02	<.02				0.05		<0.02	<0.02

NA - NOT APPLICABLE

RECEIVED
MAR 20 1997
DIV. OF OIL, GAS & MINING

REVEGETATION OF THE HUNTINGTON NO. 4 MINE

A TWO-YEAR DATA COMPARISON OF THE RECLAIMED AND REFERENCE AREAS

1994 - 1995

Prepared by

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for

BLACKHAWK ENGINEERING
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March 1997

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VEGETATION SAMPLING (1994-1995) . . . . . Addendum

REVEGETATION OF THE HUNTINGTON NO. 4 MINE

A TWO-YEAR DATA COMPARISON OF THE RECLAIMED AND REFERENCE AREAS

1994-1995

INTRODUCTION

The Huntington No. 4 Mine is located in Mill Fork Canyon about 12 miles northwest of the town of Huntington, Utah. The area is the site of previous coal mining activities that started in the early 1940's and again resumed production in 1977. All surface facilities of the most recent operations were constructed in 1976, with the exception of diversions, sediment ponds and minor culvert work.

Elevation of the area ranges between 7,300 ft and 8,000 ft above sea level. Vegetation types adjacent to the mine area varies from pinyon-juniper and mountain brushland on the drier sites, to associated conifers and riparian areas in the more moist regions.

The mine site has recently been reclaimed and the 10-year responsibility period for bond release has ended. The reclaimed areas consisted primarily of access roads, portal areas, pads and regraded slopes. The largest surface areas that were reclaimed were the access roads of the mine site. Most of the reclaimed areas of the mine site were on the relatively drier pinyon-juniper sites with predominantly south and southwestern exposures.

Quantitative sampling to monitor the success of revegetation was conducted for several years within the 10-year responsibility period. The data recorded in 1994 and 1995 have been provided in separate reports. This document was written to summarize these data sets and to make comparisons between those years, including comparisons between the reclaimed areas and the vegetation reference areas -- or areas selected previously for standards of revegetation success.

METHODS

Quantitative sampling methods between years were virtually identical, therefore comparisons between data sets were much facilitated. In an attempt to simplify this report and to minimize repetition here, the vegetation monitoring reports for the years' 1994 and 1995 have been submitted along with this document in their entirety as an *'Addendum'*. The previous two reports included are called:

Vegetation Sampling:
Reclaimed & Reference Areas
of the Huntington No. 4 Mine
1994

Vegetation Monitoring:
Reclaimed & Reference Areas
of the Huntington No. 4 Mine
1995

Each of the reports provide a 'Methods' section that fully describes the methodologies used for sampling and analyzing the data sets for those years. Methods and parameters previously described include those for sampling and analyzing cover, composition, frequency, woody species

density, productivity, sample adequacy, and diversity. Raw data, summary tables, literature cited, sample maps, graphs, figures, and color photographs were also included in the reports Methods described herein have therefore been limited to procedures and analyses used to compare data for this report.

This document attempts to address comments or concerns made by biologists from the State of Utah, Division of Oil, Gas & Mining (DOGM) following their review of the previous reports. Additionally, the report provides specific data comparisons for those parameters approved in the Mining & Reclamation Plan (MRP) .

Areas of Comparison

The major focus of this report is to provide comparisons for two (2) years of data sets along with the reference areas chosen to be used as standards for revegetation success. Although this report provides separate data summaries for each area sampled, one fundamental difference with this report compared to the previous reports is that it also provides statistical comparisons between the pinyon-juniper reference area with *all the reclaimed pinyon-juniper areas combined.*

Sample Adequacy & Statistical Comparisons

As recommended by DOGM guidelines, sampling adequacy was recalculated using formulas from Cochran (1977), with the goal of 90% confidence level with a 10% change in mean (one-tailed t-

value was used). The formula used is given below.

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

nMIN	= minimum adequate sample
t	= appropriate confidence t-value
s	= standard deviation
x	= sample mean
d	= desired change from mean

Student's t-tests were employed to compare the reclaimed and reference areas of the sites for cover, density and productivity. All sample means, standard deviations, and sample sizes were included in this report to enable the reviewers to check or apply further statistical tests if desired.

RESULTS

Cover

Reclaimed Pinyon-Juniper Communities

Attempts were made during sampling of the reclaimed areas to place sample quadrats on nearly all the reclaimed areas to adequately monitor the area as a whole, or as not to restrict the samples to smaller, more isolated areas. In other words, the reclaimed area should be adequately represented by the sampling design.

Table 1 compares the cover of all reclaimed and reference areas for the 1994 and 1995 sample years. The table shows the means, standard deviations and sample sizes of all areas sampled. As one can note, all cover estimates in each area were quite similar. There were no sample areas that showed significantly greater or more sparse vegetative cover. The table then shows the summaries of all the reclaimed pinyon-juniper areas combined to illustrate the overall success of the reclaimed area and to provide data for statistical comparisons with the pinyon-juniper reference area.

The 1994 overall mean total living cover of the reclaimed pinyon-juniper areas was 40.89%. The mean cover (understory plus overstory) for the pinyon juniper reference area was 37.60%. The 1995 mean cover for the reclaimed and reference areas were 47.74% and 31.13%, respectively. Tables 8 and 9 show the statistical comparisons between the reclaimed and reference areas. Results suggest that there was no significant difference between cover of reclaimed pinyon-juniper its reference area in 1994, whereas, in 1995 the cover was significantly higher in the reclaimed area. Therefore, the reclaimed areas met (or exceeded) the reclamation standards set for cover at the mine site.

Reclaimed Riparian Areas

Table 1 also shows the cover summaries for the reclaimed riparian and comparison areas. For 1994 and 1995, there were no significant differences between the areas. Thus, the reclamation standards were met for cover in this area also.

Density

Reclaimed Pinyon-Juniper Communities

Table 2 is a summary for the woody species density measurements for the reclaimed and reference areas of the Huntington No. 4 Mine. Results indicate that the mean density for all the reclaimed pinyon-juniper areas (combined) in 1994 was 2,283 individuals per acre. The mean density of the reference area the same year was only 279 individuals per acre. Although the differences are obvious, statistical comparisons for density shown on Tables 8 and 9 show that the reclaimed pinyon-juniper communities are significantly greater than the reference area for 1994 and 1995.

Reclaimed Riparian Areas

Because the reclaimed area in the riparian zone was relatively small, a reference area was not needed. However, a standard of 2,000 plants per acre was set for the reclaimed area here. All woody plants in the reclaimed area were counted at a given distance from the creek. The total woody species density of the reclaimed riparian area was 3,340 individuals per acre in 1994 and 2,352 in 1995 -- densities that exceed the standard set for woody species.

Productivity

Reclaimed Pinyon-Juniper Communities

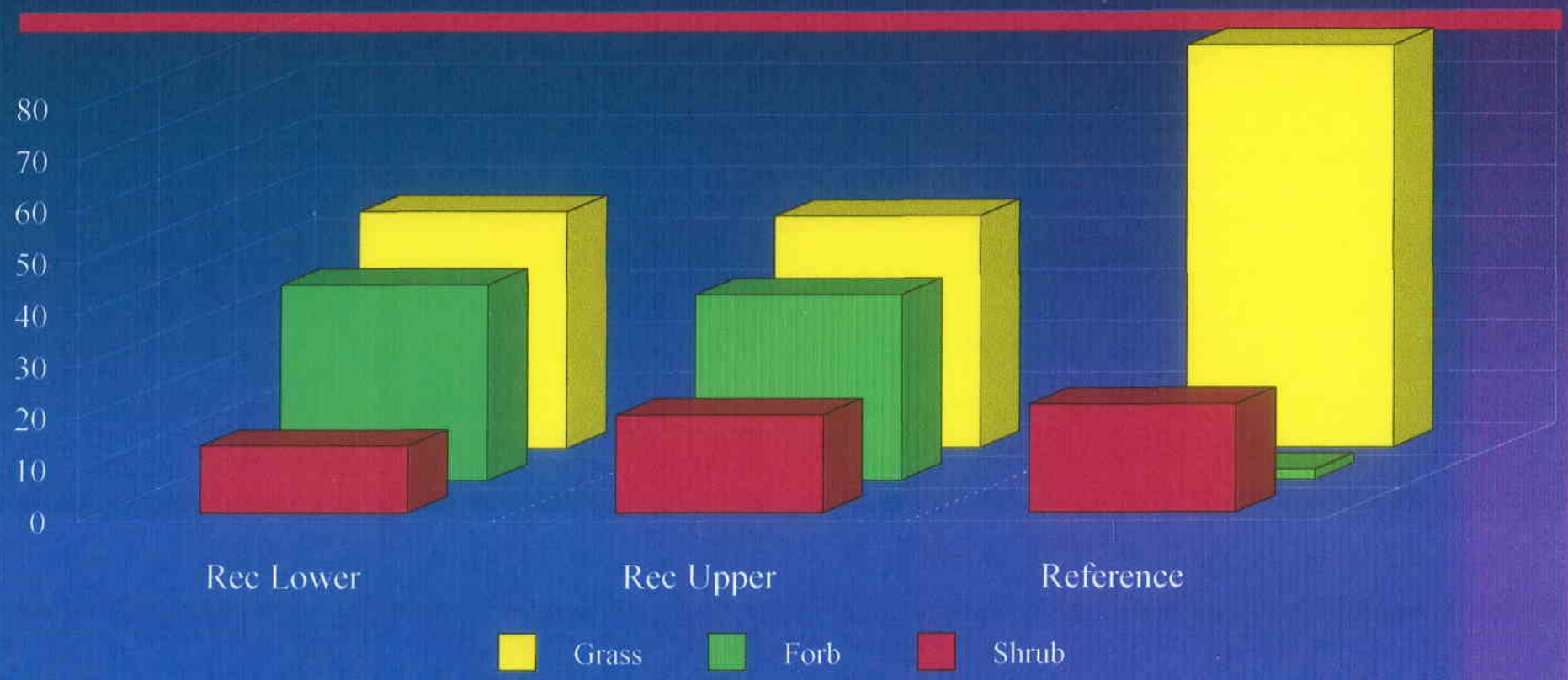
The mean annual biomass production for each of the reclaimed areas are shown on Table 3. The mean production in 1994 for all reclaimed pinyon-juniper communities combined was 467.11 pounds per acre. The reference area was 253.24 pounds per acre for the same year. The 1995 mean production value was 747.41 pounds per acre for the reclaimed areas and 208.36 for the reference area.

Statistical comparisons for productivity for 1994 and 1995 are shown on Tables 8 and 9. Results indicate that the reclaimed areas were significantly higher than the reference area and therefore met or exceeded the standards set for revegetation success.

Reclaimed Riparian Areas

No production standards were set for the reclaimed riparian area, however, it was necessary to consult the USDA Forest Service for approval to cancel their Special Use Permit in the area. In order to receive this approval, the area was deemed appropriately reclaimed by Forest Service standards.

Percent Relative Cover of Reclamed and Reference in 1995.



Diversity

There are several good methods to assess diversity in plant communities. Three diversity measurements have been reported for this document for the reclaimed pinyon-juniper and reference areas, and one for the reclaimed riparian and comparison areas. Results of the diversity measurements are shown on Tables 6 and 7 including: 1) the average number of species per meter square, 2) the total number of species present in the quadrats (richness), and 3) MacArthur's diversity index (total diversity).

The standard set for diversity of the reclaimed pinyon-juniper areas at the Huntington No. 4 Mine was # 3 above. MacArthur's diversity index is an effective diversity measurement and is computed using the equation $1/\sum pi^2$ (MacArthur and Wilson 1976, *The Theory of Island Biogeography,* Princeton: Princeton University Press). In this equation *pi* is the proportion of sum frequency contributed by the *i*th species in the sample area of concern. The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the degree to which frequency of occurrence was equitably distributed among those species. In other words, this index provides greater weight to those species that are present more often (with greater frequency) than those that are merely "present" in one or two quadrats.

The diversity standard for the reclaimed riparian area was #1 above. Due to the extremely small size of the reclaimed riparian area (<.10 acre), a statistically adequate number of samples would be difficult, if not, impossible to obtain in the reclaimed riparian area. For example, *all* woody species in the area were counted for *density* measurements, rather than a random subset of woody species measurements. For *cover* measurements, the area is small enough that a reference area was not required, but as mentioned earlier, another undisturbed area was used as a general 'comparison area'. For this reason, a straightforward *diversity* measurement was used to provide

an idea of similarity between the reclaimed and the riparian 'comparison' areas. This measurement was simply be the average number of species calculated in the meter square quadrats.

To provide comparsons, Tables 4 and 5 show the species present, lifeform, percent cover, relative cover and frequency of each area.

Reclaimed Pinyon-Juniper Communities

Tables 6 shows that total diversity (MacArthur's diversity index) was greater in the reclaimed pinyon-juniper area in 1994 when compared to the reference area used for a standard of revegetation success that same year. Moreover, Table 7 suggests similar results for 1995. Mean number of species per meter square and species richness are also shown for the communities in Tables 6 and 7 -- also suggesting that species diversity is greater in the reclaimed areas when compared to the reference area.

Reclaimed Riparian Areas

The aforementioned tables also show that the mean number of species per meter square in the reclaimed riparian area was greater than the number for the comparison area.

Therefore, the standard for revegetation success for each reclaimed area was met, especially when one compares the additional diversity results shown on Tables 6 and 7 for the pinyon-juniper area. All reclaimed areas suggest greater diversity when compared to the reference or comparison areas.

SUMMARY

This document contains two-year summaries of the data from monitoring vegetation of reclaimed areas and comparing them to the areas chosen to represent standards of success for final revegetation (i.e. reference areas or comparison) at the Huntington No. 4 Mine. Although these data (including all raw data) have been provided in the 1994 and 1995 reports (included as *Addendums*), this document summarizes the data somewhat differently than the earlier reports. One difference is that, not only does it shows the reclaimed areas separately, this document also shows the areas combined as a whole for comparison with the respective reference areas. Additionally, comparisons can also be easily made between years with the tables provided in this report.

The data suggest that for the two consecutive years (1994 and 1995) the standards for cover, density, productivity and diversity have been achieved for all reclaimed areas of the Huntington No. 4 Mine.

TABLE 1: Percent total living cover (overstory + understory) comparisons at the Huntington No. 4 Mine.

	1994				1995			
AREA	$\bar{x}$	s	n	*n*MIN	$\bar{x}$	s	n	*n*MIN
RECLAIMED PJ (A)	39.00	6.63	10	-----	45.50	11.28	10	-----
RECLAIMED PJ (B)	40.00	8.06	10	-----	55.00	9.49	10	-----
RECLAIMED PJ (C)	39.38	5.27	8	-----	34.38	9.16	8	-----
RECLAIMED PJ (D)	39.29	5.62	7	-----	43.57	6.39	7	-----
RECLAIMED PJ (E)	45.63	5.27	8	-----	58.13	7.47	8	-----
RECLAIMED PJ (A-E)	40.58	14.46	43	-----	47.33	16.26	43	-----
RECLAIMED ROAD	41.33	8.46	30	-----	48.33	13.12	30	-----
ALL RECLAIMED PJ	**40.89**	**7.56**	**73**	**6**	**47.74**	**12.72**	**73**	**12**
REFERENCE PJ	**37.60**	**20.72**	**50**	**50**	**31.13**	**14.89**	**40**	**37**

	1994				1995			
AREA	$\bar{x}$	s	n	*n*MIN	$\bar{x}$	s	n	*n*MIN
RECLAIMED RIPARIAN	**64.00**	**7.35**	**5**	**2**	**70.00**	**7.07**	**5**	**2**
RIPARIAN COMPARISON	**57.00**	**9.00**	**10**	**4**	**71.00**	**12.21**	**10**	**5**

$\bar{x}$ = mean percent cover
s = standard deviation
n = sample size
*n*MIN = minimum adequate sample

TABLE 2: Woody species density comparisons at the Huntington No. 4 Mine.

	1994					1995			
AREA	$\bar{x}$	s	n	*n*MIN		$\bar{x}$	s	n	*n*MIN
RECLAIMED PJ (A)	1916.64	807.92	8	-----		1677.06	452.16	8	-----
RECLAIMED PJ (B)	2330.46	639.83	8	-----		3550.14	603.19	8	-----
RECLAIMED PJ (C)	1829.52	261.36	2	-----		1437.48	650.49	8	-----
RECLAIMED PJ (D)	2816.88	324.68	6	-----		1335.84	538.61	6	-----
RECLAIMED PJ (E)	1771.44	545.61	6	-----		1422.96	273.96	6	-----
RECLAIMED PJ (A-E)	2172.19	718.83	30	-----		1940.84	1016.94	36	-----
RECLAIMED ROAD	2337.72	835.20	60	-----		2555.52	863.42	60	-----
ALL RECLAIMED PJ	**2282.54**	**801.86**	**90**	**20**		**2325.02**	**970.72**	**96**	**29**
REFERENCE PJ	**278.78**	**106.46**	**30**	**24**		**429.94**	**184.03**	**30**	**30**

	1994					1995			
AREA	$\bar{x}$	s	n	*n*MIN		$\bar{x}$	s	n	*n*MIN
RECLAIMED RIPARIAN	**3340**	—	—	—		**2352**	—	—	—
RIPARIAN STANDARD	**2000**	—	—	—		**2000**	—	—	—

$\bar{x}$ = mean number of individuals per acre
s = standard deviation
n = sample size
*n*MIN = minimum adequate sample

TABLE 3: Total annual biomass production comparisons at the Huntington No. 4 Mine.

	1994					1995			
AREA	$\bar{x}$	s	n	*n*MIN		$\bar{x}$	s	n	*n*MIN
RECLAIMED PJ (A)	397.59	84.00	10(50)	-----		668.65	229.88	10(50)	-----
RECLAIMED PJ (B)	333.66	94.06	10(50)	-----		880.69	340.82	10(50)	-----
RECLAIMED PJ (C)	428.67	114.67	8(40)	-----		517.96	135.42	8(40)	-----
RECLAIMED PJ (D)	494.43	271.07	7(35)	-----		532.65	189.06	7(35)	-----
RECLAIMED PJ (E)	559.89	175.78	8(40)	-----		764.44	174.90	8(40)	-----
RECLAIMED PJ (A-E)	449.70	170.54	43(215)	-----		689.60	271.96	43(215)	-----
RECLAIMED ROAD	492.06	233.03	30(150)	-----		828.35	429.50	30(150)	-----
ALL RECLAIMED PJ	**467.11**	**199.70**	**73(365)**	**30**		**747.41**	**353.13**	**72(360)**	**37**
REFERENCE PJ	**253.24**	**126.44**	**50(250)**	**41**		**208.36**	**193.43**	**50(250)**	**141**

$\bar{x}$ = mean dry-weight pounds per acre
s = standard deviation
n = sample size
*n*MIN = minimum adequate sample

TABLE 4: Lifeform, cover and frequency comparisons for the understory of the reclaimed and reference areas at the Huntington No. 4. Mine (1994 data).

Reclaimed Pinyon-Juniper Areas (Combined)

SPECIES	Lifeform	%Cover	Relative Cover	Frequency
Astragalus cicer	Forb	11.38	27.84	75.34
Chrysothamnus nauseosus	Shrub	5.75	14.07	52.05
Elymus lanceolatus	Grass	5.66	13.84	49.32
Elymus spicatus	Grass	4.74	11.59	42.47
Agropyron cristatum	Grass	3.22	7.87	42.74
Stipa hymenoides	Grass	2.22	5.43	23.29
Bromus carinatus	Grass	1.68	4.12	23.29
Penstemon pachyphyllus	Forb	1.38	3.38	21.92
Penstemon palmeri	Forb	0.89	2.18	13.70
Dactylis glomeratus	Grass	0.55	1.34	8.22
Machaeranthera canescens	Forb	0.55	1.34	10.96
Elymus hispidus	Grass	0.55	1.34	1.37
Bromus inermis	Grass	0.34	0.84	4.11
Cercocarpus ledifolius	Shrub	0.34	0.84	4.11
Eriogonum corymbosum	Shrub	0.30	0.74	4.11
Cynoglossum officinale	Forb	0.27	0.67	5.48
Elymus salinus	Grass	0.27	0.67	1.37
Melilotus officinalis	Forb	0.21	0.99	4.11
Rosa woodsii	Shrub	0.21	0.50	2.74
Poa pratensis	Forb	0.21	0.50	2.74
Circium sp.	Forb	0.14	0.34	2.74
Gutierrezia sarothrae	Shrub	0.03	0.07	1.37
Totals		40.89	100.00	395.49

Reference Area

Elymus salinus	Grass	20.00	68.03	88.00
Pinus edulis	Tree	5.30	18.03	26.00
Juniperus osteosperma	Tree	1.80	6.12	12.00
Stipa hymenoides	Grass	1.70	5.78	14.00
Cercocarpus ledifolius	Shrub	0.50	1.70	6.00
Cryptantha sp.	Forb	0.10	0.34	2.00
Totals		29.40	100.00	148.00

TABLE 4: (continued)

Reclaimed Riparian Area

SPECIES	Lifeform	Cover	Relative Cover	Frequency
Salix lutea	Shrub	23.00	35.94	80.00
Dactylis glomeratus	Grass	17.00	26.56	100.00
Astragalus cicer	Forb	10.00	15.63	60.00
Equisetum arvensis	Forb	7.00	10.94	60.00
Medicago sativa	Forb	2.00	3.13	40.00
Agoseris aurantiaca	Forb	2.00	3.13	40.00
Geranium richardsonii	Forb	1.00	1.56	20.00
Trifolium pratense	Forb	1.00	1.56	20.00
Mentha arvensis	Forb	1.00	1.56	20.00
Totals		64.00	100.00	440.00

Riparian Comparison Area

Equisetum arvense	Forb	4.00	7.02	20.00
Agrostis stolonifera	Grass	2.50	4.39	10.00
Dactylis glomeratus	Grass	16.00	28.07	70.00
Salix lutea	Shrub	12.00	21.05	50.00
Calamagrostis canadensis	Grass	6.50	11.40	10.00
Phleum alpinum	Grass	2.50	4.39	10.00
Poa pratensis	Grass	2.50	4.39	10.00
Galium bifolium	Forb	2.00	3.51	20.00
Epilobium sp.	Forb	1.50	2.63	20.00
Rosa woodsii	Shrub	1.50	2.63	10.00
Bromus inermis	Grass	2.00	3.51	10.00
Cornus sericea	Tree	4.00	7.02	20.00
Total		57.00	100.00	260.00

TABLE 5: Lifeform, cover and frequency comparisons for the understory of the reclaimed and reference areas at the Huntington No. 4. Mine (1995 data).

Reclaimed Pinyon-Juniper Areas (Combined)

SPECIES	Lifeform	%Cover	Relative Cover	Frequency
Astragalus cicer	Forb	13.18	27.60	75.34
Chrysothamnus nauseosus	Shrub	6.68	14.00	54.79
Elymus spicatus	Grass	5.62	11.76	52.05
Elymus lanceolatus	Grass	5.48	11.48	57.53
Agropyron cristatum	Grass	4.15	8.69	54.79
Stipa hymenoides	Grass	3.12	6.54	39.73
Bromus carinatus	Grass	1.78	3.73	24.66
Bromus inermis	Grass	1.44	3.01	13.70
Penstemon pachyphyllus	Forb	1.12	2.35	19.18
Penstemon palmeri	Forb	0.82	1.72	10.96
Machaeranthera canescens	Forb	0.68	1.43	10.96
Dactylis glomeratus	Grass	0.62	1.29	8.22
Medicago sativa	Forb	0.58	1.21	9.59
Cercocarpus ledifolius	Shrub	0.55	1.15	6.85
Melilotus officinalis	Forb	0.48	1.00	6.85
Poa pratensis	Forb	0.27	0.57	4.11
Mahonia repens	Shrub	0.21	0.43	1.37
Gutierrezia sarothrae	Shrub	0.14	0.29	2.74
Malcomia africana	Forb	0.14	0.29	1.37
Pinus ponderosa	Tree	0.14	0.29	1.37
Astragalus sp.	Forb	0.14	0.29	2.74
Elymus hispidus	Grass	0.14	0.29	2.74
Artemisia ludoviciana	Forb	0.07	0.14	1.37
Eriogonum corymbosum	Shrub	0.07	0.14	1.37
Cynoglossum officinale	Forb	0.07	0.14	1.37
Salsola pestifer	Forb	0.04	0.09	1.37
Iva axillaris	Forb	0.03	0.06	1.37
Totals		47.74	100.00	468.69

Reference Area

Elymus salinus	Grass	18.50	73.84	92.50
Pinus edulis	Tree	3.05	12.19	25.00
Juniperus osteosperma	Tree	1.13	4.52	7.50
Stipa hymenoides	Grass	1.08	4.32	15.00
Cercocarpus ledifolius	Shrub	0.88	3.52	12.50
Descurania pinnata	Forb	0.38	1.52	5.00
Totals		25.02	100.00	157.50

TABLE 5: (continued)

Reclaimed Riparian Area

SPECIES	Lifeform	Cover	Relative Cover	Frequency
Salix lutea	Shrub	22.00	32.35	100.00
Dactylis glomeratus	Grass	13.00	19.12	80.00
Equisetum arvensis	Forb	8.80	12.94	40.00
Agrostis stolonifera	Grass	8.00	11.76	40.00
Phleum alpinum	Grass	5.00	7.35	60.00
Poa secunda	Grass	4.00	5.88	20.00
Medicago sativa	Forb	3.60	5.29	60.00
Geranium richardsonii	Forb	2.20	3.24	40.00
Circium sp.	Forb	1.00	1.47	20.00
Taraxacum officinale	Forb	0.40	0.59	20.00
Totals		68.00	100.00	480.00

Riparian Comparison Area

Equisetum arvense	Forb	19.00	29.69	80.00
Agrostis stolonifera	Grass	14.50	22.66	60.00
Dactylis glomeratus	Grass	6.50	10.16	40.00
Salix lutea	Shrub	6.50	10.16	20.00
Rosa woodsii	Shrub	3.00	4.69	20.00
Catabrosa aquatica	Grass	2.00	3.13	20.00
Bromus inermis	Grass	2.00	3.13	10.00
Geranium richardsonii	Forb	2.00	3.13	30.00
Taraxacum officinale	Forb	1.50	2.34	30.00
Circium sp.	Forb	1.00	1.56	20.00
Nasturtium officinale	Forb	1.00	1.56	10.00
Picea engelmannii	Tree	1.00	1.56	10.00
Juniperus scopulorum	Tree	1.00	1.56	20.00
Juncus sp.	Gramin.	1.00	1.56	20.00
Ranunculus cymbalaria	Forb	0.50	0.78	10.00
Populus tremuloides	Tree	0.50	0.78	10.00
Cornus sericea	Tree	0.50	0.78	10.00
Abies concolor	Tree	0.50	0.78	10.00
Total		64.00	100.00	430.00

TABLE 6: Diversity at the Huntington No. 4 Mine (1994)

AREA	MEAN NO. SPP./M²	RICH-NESS	TOTAL DIVER-SITY*
A.			
Reclaimed PJ	3.84	22.00	9.57
PJ Reference	1.48	6.00	2.49
B.			
Reclaimed Riparian	4.20	**	**
Riparian Reference	2.45	**	**

* $1/\Sigma p_i^2$
** Sample area too small for accurate measurements (see "Diversity" in text).

TABLE 7: Diversity at the Huntington No. 4 Mine (1995)

AREA	MEAN NO. SPP./M²	RICH-NESS	TOTAL DIVER-SITY*
A.			
Reclaimed PJ	4.64	27.00	10.46
PJ Reference	1.58	6.00	2.57
B.			
Reclaimed Riparian	4.80	**	**
Riparian Reference	4.30	**	**

* $1/\Sigma p_i^2$
** Sample area too small for accurate measurements (see "Diversity" in text).

TABLE 8: Statistical summary sheet for the reclaimed areas and reference areas at the Huntington No. 4 Mine (1994).

RECLAIMED PINYON-JUNIPER AREAS (Combined)				
Living Cover*	x=40.89	s=7.56	n=73	nMIN=6
Density	x=2282.54	s=801.86	n=90	nMIN=20
Production	x=467.11	s=199.70	n=73(365)	nMIN=30
REFERENCE AREA				
Living Cover*	x=37.60	s=20.72	n=50	nMIN=50
Density	x=278.78	s=106.46	n=30	nMIN=24
Production	x=253.24	s=126.44	n=50(250)	nMIN=41
STATISTICAL ANALYSES				
Living Cover	t=1.243	df=121	SL=NS	
Density	t=13.609	df=118	SL=p<.005	
Production	t=6.704	df=121	SL=p<.005	
RECLAIMED RIPARIAN AREA				
Living Cover*	x=64.00	s=7.35	n=5	nMIN=2
Density**	x=3340	s= --	n= --	nMIN= --
COMPARISON RIPARIAN AREA				
Living Cover*	x=57.00	s=9.00	n=10	nMIN=4
Density***	x=2000	s= --	n= --	nMIN= --
STATISTICAL ANALYSES				
Living Cover	t=1.499	df=13	SL=NS	

x = sample mean, s = sample standard deviation, n = sample size, nMIN = minimum adequate sample, NS = nonsignificant, (number in parenthesis is sample number with double sampling employed), t = Student's t-value, df = degrees of freedom, SL = significance level

* represents understory and overstory cover combined.

** the entire population was counted.

*** the value represents the standard for success (not a sample result).

TABLE 9: Statistical summary sheet for the reclaimed areas and reference areas at the Huntington No. 4 Mine (1995).

RECLAIMED PINYON-JUNIPER AREAS (Combined)				
Living Cover*	x=47.74	s=12.72	n=73	nMIN=12
Density**	x=2325.02	s=970.72	n=96	nMIN=29
Production	x=747.41	s=353.13	n=72(360)	nMIN=37
REFERENCE AREA				
Living Cover*	x=31.13	s=14.89	n=40	nMIN=37
Density	x=429.94	s=184.03	n=30	nMIN=30
Production	x=208.36	s=193.43	n=50(250)	nMIN=141
STATISTICAL ANALYSES				
Living Cover	t=6.244	df=111	SL=p<.005	
Density	t=10.605	df=124	SL=p<.005	
Production	t=9.812	df=120	SL=p<.005	
RECLAIMED RIPARIAN AREA				
Living Cover	x=70.00	s=7.07	n=5	nMIN=2
Density	x=2352	s= --	n= --	nMIN= --
COMPARISON RIPARIAN AREA				
Living Cover*	x=71.00	s=12.21	n=10	nMIN=5
Density***	x=2000	s= --	n= --	nMIN= --
STATISTICAL ANALYSES				
Living Cover	t=-0.168	df=13	SL=NS	

x = sample mean, s = sample standard deviation, n = sample size, nMIN = minimum adequate sample, NS = nonsignificant, (number in parenthesis is sample number with double sampling employed), t = Student's t-value, df = degrees of freedom, SL = significance level

* represents understory and overstory cover combined.

** the entire population was counted.

*** the value represents the standard for success (not a sample result).

ADDENDUM

Includes:

Vegetation Sampling:
Reclaimed & Reference Areas
of the Huntington No. 4 Mine
1994

Vegetation Monitoring:
Reclaimed & Reference Areas
of the Huntington No. 4 Mine
1995

VEGETATION SAMPLING: RECLAIMED & REFERENCE AREAS OF THE HUNTINGTON NO. 4 MINE

1994

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VEGETATION SAMPLING:

RECLAIMED & REFERENCE AREAS OF THE HUNTINGTON NO. 4 MINE

1994

SCOPE

Similar to the data recorded in 1993, the following report has been prepared to assess the current condition of the vegetation of reclaimed areas at the Huntington No. 4 Mine. The reclaimed areas were compared with undisturbed reference areas that were used as standards for revegetation success.

INTRODUCTION

General Site Description

The study area for the Huntington No. 4 Mine was located in Huntington Canyon, Emery County, Utah. The elevation of the area ranged between 7,300 ft and 8,000 ft above sea level. Vegetation types adjacent to the mine area varied from pinyon-juniper

and mountain brushland on the drier sites, to associated conifers and riparian areas in the more moist regions. The reclaimed areas of the mine site were on the relatively drier sites with primarily south and southwestern exposures.

The reclaimed areas consisted principally of access roads, portal areas, pads and regraded slopes. The largest surface areas that were reclaimed were the access roads of the mine site.

Quantitative sampling was conducted in the area by *MT. NEBO SCIENTIFIC* in 1989, 1990, 1993 and 1994. Qualitative information was assessed in 1991. No vegetation sampling was conducted in 1992. With a few exceptions, sample areas and methodologies in years' 1993 and 1994 were virtually identical. This should facilitate comparisons between the two years.

METHODS

The State of Utah, Division of Oil, Gas and Mining (DOGM) provided guidelines for sample methodologies used in this report . DOGM reviewed the 1993 report and made a few additional recommendations for the 1994 sample year.

Quantitative and qualitative data were taken on the vegetation of the reclaimed

and reference areas. Sampling was conducted from August 28 - 31, 1994. As was done in 1993, and to simplify discussions about them, the reclaimed sites were divided into two (2) major areas -- the *Lower Reclaimed Areas* and the *Upper Reclaimed Access Road Areas*. Each of those areas consisted of several disturbance types (i.e. roads, pads, portals, regraded slopes, etc.). Data summaries, however, have been presented separately and combined in the *Lower Reclaimed Areas* due to heterogeneity of this areas. Since all the *Upper Reclaimed Access Road Areas* were so similar in basic physiognomy, the data were combined for the summary tables. Reporting the data by this method was an attempt to provide information on small, localized areas, yet also provide the average success of the entire mine site.

As previously mentioned and with only a few exceptions, sample areas and methodologies in 1994 were virtually identical to the 1993 sampling. This was done as a means to facilitate comparisons between the two years.

Transect and Quadrat Placement

Transect lines for sampling were placed randomly throughout the reclaimed areas resulting in several sample sites in the *Lower Reclaimed Areas* and the *Upper Reclaimed Access Road Areas* (see Sample Map). Random/regular placement of sampling quadrats were designed to provide unbiased accuracy of the data compiled. Once the transect lines were placed, regular points were then marked on them. From these marks, a random number dictated the direction and distance to place the quadrats

at right angles from the transect lines.

All reclaimed areas were seeded with the same seed mix (with the possible exception of the riparian area) on a variety of slopes, exposures, soil conditions and water relationships, etc. Vegetation sampling methodologies between reclaimed areas and the reference areas were consistent.

Placement of the quadrats in the riparian areas were somewhat constrained by the size of the sample areas. The streamside area that was disturbed was only about 35 ft long. The quadrats were placed every other meter along the streamside for the entire length of the reclaimed and reference area. The *Riparian Reference Area* was considered the undisturbed streamside vegetation 100 ft upstream and 100 ft downstream of the reclaimed area.

Cover and Composition

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 the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "A Utah Flora", (Welsh et al. 1993).

Woody Species Density

Density of woody plant species of the reclaimed and reference areas were made using belt transects. These 5 ft by 50 ft belts were placed randomly throughout the study areas. Total number of individuals by species were counted in each of the belt transects. The average number was then calculated followed by the number of individuals per acre.

Production

Total annual biomass production was estimated by clipping, drying and weighing current annual growth. Herbaceous and woody species were summarized separately. "Double sampling" using four quadrats (three for the riparian areas) were estimated around the clipped and weighed plots.

Sample Adequacy & Statistical Comparisons

Sampling adequacy for cover and woody species density was achieved using formulas from Snedocor and Cochran (1980), insuring that 80% of the samples were within 10% of the true mean for the shrub communities of the area. The following formula was used:

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

where,

nmin = minimum adequate sample
s = standard deviation
x = sample mean
.1 = confidence interval

Student's t-tests were also employed to compare the reclaimed disturbance and reference areas of all sites for cover, density, and productivity. All sample means, standard deviations, and sample sizes were included in this report to enable the reviewers to apply further statistical tests if desired.

Photographs

Color photographs of the sample areas were taken at the time of sampling and have been submitted with this report.

Raw Data

The raw data have been summarized on spreadsheets and have also been included in this report's Appendix.

RESULTS

The Lower Reclaimed Areas (Areas A-E, separated)

When the *Lower Reclaimed Areas* were summarized separately, results of each were similar. Area "A" had a mean cover of 39.00% and was dominated by grasses that comprised 55.47% of the living cover (Table 1). Dominant plant species by cover and frequency shown on Table 2 were cicer milkvetch (*Astragalus cicer*), thickspike wheatgrass (*Elymus lanceolatus*) and bluebunch wheatgrass (*Elymus spicatus*). Woody species density was estimated as 3,833 individuals per acre (Table 3). Total annual biomass production was measured to be 397.59 pounds per acre (Table 4).

Area "B" had similar living cover (40.00%) and was again dominated by grasses (Table 5). Similar species dominated this site but it had greater occurrences of rubber rabbitbrush (*Chrysothamnus nauseosus*) and crested wheatgrass (*Agropyron cristatum*). For cover and frequency by species, refer to Table 6. Woody species per acre was recorded as 4,661 individuals per acre (Table 7), whereas, annual biomass production was 333.66 pounds per acre (Table 8).

Area "C" also had very similar results with 39.38% total living cover (Table 9) which was dominated by the same species mentioned above (Table 10). Woody species density was similar to Area "A" and was estimated to be 3,659 individuals per

acre with rubber rabbitbrush easily outnumbering the other woody species (Table 11). Total annual production was somewhat higher than the areas above, estimated to be 428.67 pounds per acre (Table 12).

Area "D" again had very similar living cover results (39.29%), but forbs edged out the grasses to dominate the cover (Table 13). The same plant species, however, were the common (Table 14). Woody species density in this area was the highest, estimated at 5,634 individuals per acre (Table 15). Total annual production was also higher than the previous reported data at 494.43 pounds per acre (Table 16).

Total living cover and production was highest of the five areas in "Area E" of the *Lower Reclaimed Areas.* They were estimated to be 45.63% (Table 17) and 559.89 pounds per acre (Table 20), respectively. Dominate plant species also varied when compared to the other areas. There was less rubber rabbitbrush and more intermediate wheatgrass (*Elymus hispidus*) and mountain bromegrass (*Bromus carinatus*). For a list of the species by cover and frequency, refer to Table 18. Woody species density was consistent with the previous mentioned areas, estimated as 3,543 individuals per acre (Table 19).

<u>The Lower Reclaimed Areas</u> (Areas A-E, combined)

As one would expect due to the similarity of the results reported above for each separate area, results of the Areas A-E combined were also similar. The total mean

cover of these areas combined was 40.58% (Table 21). Grasses dominated the living cover comprising nearly half of the living cover (Table 21). Dominant plant species by cover and frequencies were cicer milkvetch, thickspike wheatgrass, bluebunch wheatgrass, and rubber rabbitbrush (Table 22).

Woody species density of the combined data of the *Lower Reclaimed Areas* was 4,531 individuals per acre (Table 23). Total biomass production was measured to be 449.70 pounds per acre, most of which were herbaceous species (Table 24).

Upper Reclaimed Access Road Areas

Total living cover of the *Upper Reclaimed Access Road Areas* was estimated to be 41.33%. Grasses again dominated the living cover comprising 47.67% of the living cover, followed by forbs at 33.58% (Table 25). Dominate plant species of the area was similar to the aforementioned summaries. These species were cicer milkvetch, rubber rabbitbrush and thickspike wheatgrass (Table 26). Indian ricegrass (*Stipa hymenoides*), however, was a important component of the composition of this area comprising a total cover of 3.50% and was observed in 37.67% of the quadrats.

Total woody species density was 2,302 individuals per acre with rubber rabbitbrush the most common shrub by far (Table 27). Total annual biomass production was 492.06 pounds per acre (Table 28).

Reference Area

The sample results for living understory cover of the *Reference Area* was 29.40% (Table 29). Because this area was a mature pinyon-juniper community, overstory cover was also an important component of the total cover. Overstory cover was estimated at 8.20%. If one combines the overstory and understory cover to represent "total living cover" the results has a mean of 37.60%, with a standard deviation of 20.70. As was noted in the reclaimed areas, grasses were the dominant lifeform. Forbs, however, were much less common (Table 29). The most common plant species by cover and frequency were Salina wildrye (*Elymus salinus*), pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). For cover and frequency results by species refer to Table 30.

Woody species density was much less than the reclaimed area. Total number of individuals per acre was 279 (Table 31) with the most common species being mountain mahogany (*Cercocarpus ledifolius*) and bitterbrush (*Purshia tridentata*). Total annual biomass production was estimated to be 253.24 pounds per acre, about half of what the reclaimed areas were (Table 32).

Reclaimed Riparian Area

Total living cover of the *Reclaimed Riparian* area was 64.00%. Forbs and shrubs were nearly equally represented as a proportion of the cover, representing

36.88% and 36.79%, respectively. Grasses followed these proportions at 26.33% (Table 33). Dominant plant species by cover and frequency were willow (*Salix lutea*), cicer milkvetch, and orchardgrass (*Dactylis glomeratus*). For cover by species refer to Table 34. Total woody species density was 3,340 individuals per acre, with willow comprising the majority of it (Table 35). Total annual biomass production was calculated to be 480.74 pounds per acre with herbaceous and woody species about equal (Table 36).

Riparian Reference Area

Total living cover of the *Riparian Reference Area* was 57.00%, with grasses comprising the majority of the cover (Table 37). The most common species in this area were very similar to those of the reclaimed riparian area. These species, shown on Table 38 were orchardgrass, willow, and bluejoint reedgrass (*Calamagrostis canadensis*). Woody species density was nearly identical to the reclaimed area estimated at 3,223 individuals per acre (Table 39). Results from production measurements indicated this area to support 359.07 pounds per acre (Table 40), which was somewhat less than the reclaimed area.

DISCUSSION

The total living cover of each of the sample areas were quite similar. Fig. 1 graphically compares each sample area with the *Reference Area*, including the mean of Areas A-E combined. Student's t-tests were also employed to compare the *Lower Reclaimed Areas* (combined) with the *Reference Area*. These differences were not significant statistically (Table 41). The *Upper Reclaimed Access Road Areas* were also statistically compared with the *Reference Area*. Again, the comparison suggested no significant difference between the two areas (Table 41).

Fig. 2 graphically compares the lifeform or species composition of the reclaimed road, individual areas, and the combined data. As can be noted by the graph, forbs were much more important in the reclaimed areas when compared to the *Reference area*.

Woody species densities were much higher in the reclaimed areas when they were compared to the *Reference Area* (Fig. 3). The species represented in the *Reference Area* were different than the reclaimed areas. These species are shown on their respective summary tables. Differences in total annual biomass production have also be illustrated graphically (Fig. 4). Each reclaimed area was more productive when compared to the *Reference Area*. The differences were statistically significant (Table 41).

Similar graphs and statistical comparisons were also made comparing the *Reclaimed Riparian Area* with the *Riparian Reference Area*. Total living covers were shown on Fig. 5. Differences between the two were not significant (Table 41). Lifeform species composition comparisons have been illustrated on Fig. 6. Woody species density and annual production values have been graphically compared on Fig.'s 7 and 8, respectively. Differences between them were again not significant statistically (Table 41).

TABLE 1: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Area "A", see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	39.00	6.63	10
Litter	17.50	6.42	10
Bareground	23.00	10.77	10
Rock	20.50	7.89	10
COMPOSITION			
Shrubs	10.08	13.40	10
Forbs	34.45	27.04	10
Grasses	55.47	25.71	10

TABLE 2: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Area "A", see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	4.00	5.39	10	40.00
Gutierrezia sarothrae	0.20	0.60	10	10.00
FORBS				
Astragalus cicer	12.50	10.55	10	80.00
Machaeranthera canescens	0.50	1.50	10	10.00
Penstemon palmeri	1.50	2.29	10	30.00
GRASSES				
Agropyron cristatum	2.30	30	10	40.00
Bromus carinatus	4.50	30	10	60.00
Dacytylis glomeratus	1.50	30	10	30.00
Elymus spicatus	4.50	30	10	60.00
Elymus lanceolatus	6.50	30	10	80.00
Stipa hymenoides	1.00	30	10	10.00

TABLE 3: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Area "A", see Sample Map).

	NUMBER/ACRE
Cercocarpus ledifolius	348.48
Chrysothamnus nauseosus	3354.12
Eriogonum corymbosum	43.56
Purshia tridentata	87.12
TOTAL	3833.28

TABLE 4: Dry weight annual production for the reclaimed areas of the Huntington No. 4 Mine (Area "A", see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	336.48	114.30	10.(50)
Woody Spp.	61.11	75.89	10.(50)
TOTAL PRODUCTION	397.59	84.00	10.(50)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 5: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Area "B", see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	40.00	8.06	10
Litter	9.50	1.50	10
Bareground	31.00	7.68	10
Rock	19.50	4.72	10
COMPOSITION			
Shrubs	24.61	25.14	10
Forbs	33.85	21.71	10
Grasses	41.54	18.63	10

TABLE 6: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Area "B", see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	6.50	7.76	10	60.00
Cercocarpus ledifolius	0.50	1.50	10	10.00
Eriogonum corymbosum	1.70	3.47	10	20.00
FORBS				
Astragalus cicer	12.50	11.46	10	90.00
Penstemon palmeri	2.00	3.32	10	30.00
GRASSES				
Agropyron cristatum	5.70	5.69	10	60.00
Elymus spicatus	1.60	3.20	10	20.00
Elymus lanceolatus	8.50	6.34	10	70.00
Stipa hymenoides	1.00	3.00	10	10.00

TABLE 7: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Area "B", see Sample Map).

	NUMBER/ACRE
Chrysothamnus nauseosus	3571.92
Eriogonum corymbosum	958.32
Gutierrezia sarothrae	43.56
Pinus ponderosa	87.12
TOTAL	4660.92

TABLE 8: Dry weight annual production for the reclaimed areas of the Huntington No. 4 Mine (Area "B", see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	226.28	86.82	10.(50)
Woody Spp.	107.38	114.04	10.(50)
TOTAL PRODUCTION	333.66	94.06	10.(50)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 9: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Area "C", see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	39.38	5.27	8
Litter	12.50	7.07	8
Bareground	18.13	7.47	8
Rock	30.00	10.90	8
COMPOSITION			
Shrubs	12.72	13.99	8
Forbs	37.99	26.19	8
Grasses	49.29	23.67	8

TABLE 10: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Area "C", see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	3.75	5.45	8	37.50
Eriogonum corymbosum	0.63	1.65	8	12.50
Rosa woodsii	0.63	1.65	8	12.50
FORBS				
Astragalus cicer	13.75	11.66	8	75.00
Melilotus officinalis	0.63	1.65	8	12.50
Penstemon palmeri	1.25	2.17	8	25.00
GRASSES				
Agropyron cristatum	4.38	3.00	8	75.00
Bromus carinatus	1.25	2.17	8	25.00
Elymus spicatus	4.38	6.34	8	50.00
Elymus lanceolatus	5.38	6.96	8	50.00
Stipa hymenoides	3.38	4.72	8	37.50

TABLE 11: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Area "C", see Sample Map).

	NUMBER/ACRE
Chrysothamnus nauseosus	2613.60
Eriogonum corymbosum	871.20
Gutierrezia sarothrae	174.24
TOTAL	3659.04

TABLE 12: Dry weight annual production for the reclaimed areas of the Huntington No. 4 Mine (Area "C", see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	364.59	86.72	8.(40)
Woody Spp.	64.08	76.98	8.(40)
TOTAL PRODUCTION	428.67	114.67	8.(40)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 13: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Area "D", see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	39.29	5.62	7
Litter	9.29	4.95	7
Bareground	15.00	14.88	7
Rock	36.43	13.29	7
COMPOSITION			
Shrubs	21.80	16.96	7
Forbs	39.49	21.42	7
Grasses	38.71	22.26	7

TABLE 14: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Area "D", see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	7.14	6.47	7	71.43
Rosa woodsii	1.43	3.50	7	14.29
FORBS				
Astragalus cicer	10.00	4.63	7	100.00
Machaeranthera canescens	2.14	2.47	7	42.86
Melilotus officinalis	0.71	1.75	7	14.29
Penstemon palmeri	2.14	5.25	7	14.29
GRASSES				
Agropyron cristatum	4.29	4.16	7	57.14
Elymus spicatus	7.14	7.95	7	71.43
Elymus lanceolatus	2.86	3.64	7	42.86
Stipa hymenoides	1.43	3.50	7	14.29

TABLE 15: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Area "D", see Sample Map).

	NUMBER/ACRE
Brickelia microphylla	
Cercocarpus ledifolius	348.48
Eriogonum corymbosum	58.08
Chrysothamnus nauseosus	4936.80
Purshia tridentata	58.08
Rosa woodsii	232.32
TOTAL	5633.76

TABLE 16: Dry weight annual production for the reclaimed areas of the Huntington No. 4 Mine (Area "D", see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	369.17	204.27	7.(35)
Woody Spp.	125.27	118.01	7.(35)
TOTAL PRODUCTION	494.43	271.07	7.(35)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 17: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Area "E", see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	45.63	5.27	8
Litter	18.13	9.98	8
Bareground	21.88	16.76	8
Rock	14.38	11.02	8
COMPOSITION			
Shrubs	5.59	7.91	8
Forbs	34.68	19.14	8
Grasses	59.73	17.91	8

TABLE 18: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Area "E", see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	2.50	3.54	8	37.50
FORBS				
Astragalus cicer	10.00	10.90	8	62.50
Circium sp.	1.25	2.17	8	25.00
Cynoglossum officinale	1.88	2.42	8	37.50
Machaeranthera canescens	1.25	2.17	8	25.00
Melilotus officinalis	0.63	1.65	8	12.50
Penstemon palmeri	0.63	1.65	8	12.50
GRASSES				
Agropyron cristatum	2.50	3.54	8	37.50
Bromus carinatus	4.38	3.90	8	62.50
Dacytylis glomeratus	1.25	3.31	8	12.50
Elymus lanceolatus	3.13	4.96	8	37.50
Elymus hispidus	5.00	13.23	8	12.50
Poa pratensis	1.88	3.48	8	25.00

TABLE 19: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Area "E", see Sample Map).

	NUMBER/ACRE
Cercocarpus ledifolius	116.16
Chrysothamnus nauseosus	2729.76
Pinus ponderosa	58.08
Rosa woodsii	638.88
TOTAL	3542.88

TABLE 20: Dry weight annual production for the reclaimed areas of the Huntington No. 4 Mine (Area "E", see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	493.15	196.87	8.(40)
Woody Spp.	66.75	127.03	8.(40)
TOTAL PRODUCTION	559.89	175.78	8.(40)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 21: Total cover and composition summary for the combined reclaimed areas of the Huntington No. 4 Mine (Areas A-E, see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	40.58	14.46	43
Litter	13.49	7.51	43
Bareground	22.44	13.00	43
Rock	23.49	12.23	43
COMPOSITION			
Shrubs	15.02	18.32	43
Forbs	35.83	23.55	43
Grasses	49.14	23.25	43

TABLE 22: Species cover and frequency summary for the combined reclaimed areas of the Huntington No. 4 Mine (Areas A-E, see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	4.77	6.19	43	48.84
Cercocarpus ledifolius	0.12	0.75	43	2.33
Eriogonum corymbosum	0.51	1.95	43	6.98
Gutierrezia sarothrae	0.05	0.30	43	2.33
Rosa woodsii	0.35	1.67	43	4.65
FORBS				
Astragalus cicer	11.86	10.46	43	81.40
Circium sp.	0.23	1.05	43	4.65
Cynoglossum officinale	0.35	1.27	43	6.98
Machaeranthera canescens	0.70	1.73	43	13.95
Melilotus officinalis	0.35	1.27	43	6.98
Penstemon palmeri	1.51	3.15	43	23.26
GRASSES				
Agropyron cristatum	3.84	4.31	43	53.49
Bromus carinatus	2.09	3.45	43	30.23
Dacytylis glomeratus	0.58	1.93	43	9.30
Elymus spicatus	*5.14*	*7.18*	*43*	*48.84*
Elymus lanceolatus	*5.53*	*6.06*	*43*	*58.14*
Elymus hispidus	*0.93*	*6.03*	*43*	*2.33*
Poa pratensis	0.35	1.67	43	4.65
Stipa hymenoides	1.33	3.39	43	13.95

TABLE 23: Woody species densities of the combined reclaimed areas of the Huntington No. 4 Mine (Areas A-E, see Sample Map).

	NUMBER/ACRE
Brickelia microphylla	
Cercocarpus ledifolius	185.92
Chrysothamnus nauseosus	3555.72
Gutierrezia sarothrae	23.24
Eriogonum corymbosum	336.98
Pinus ponderosa	34.84
Purshia tridentata	34.84
Rosa woodsii	174.30
TOTAL	4530.88

TABLE 24: Dry weight annual production for the combined reclaimed areas of the Huntington No. 4 Mine (Areas A-E, see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	362.46	162.73	43.(215)
Woody Spp.	87.25	109.86	43.(215)
TOTAL PRODUCTION	449.70	170.54	43.(215)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 25: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Revegetated Road Areas, see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	41.33	8.46	30
Litter	16.83	8.31	30
Bareground	18.83	11.45	30
Rock	23.00	11.37	30
COMPOSITION			
Shrubs	18.74	18.82	30
Forbs	33.58	26.39	30
Grasses	47.67	25.57	30

TABLE 26: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Revegetated Road Areas, see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	7.17	8.03	30	56.67
Cercocarpus ledifolius	0.67	1.70	30	13.33
FORBS				
Astragalus cicer	10.70	11.74	30	66.67
Cynoglossum officinale	0.17	0.90	30	3.33
Machaeranthera canescens	0.33	1.25	30	6.67
Penstemon pachyphullus	3.37	3.59	30	53.33
GRASSES				
Agropyron cristatum	2.33	4.61	30	26.67
Bromus inermis	0.83	2.61	30	10.00
Bromus carinatus	1.10	3.01	30	13.33
Dacytylis glomeratus	0.50	1.98	30	6.67
Elymus lanceolatus	5.83	9.41	30	36.67
Elymus spicatus	4.17	6.84	30	33.33
Elymus salinus	*0.67*	*3.59*	*30*	*3.33*
Stipa hymenoides	3.50	5.94	30	36.67

TABLE 27: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Revegetated Road Areas, see Sample Map).

	NUMBER/ACRE
Brickelia microphylla	
Ceratoides ledifolius	159.50
Chrysothamnus nauseosus	2093.80
Gutierrezia sarothrae	14.50
Eriogonum corymbosum	5.80
Pinus ponderosa	2.90
Purshia tridentata	23.20
Symphoricarpos oreophilus	2.90
TOTAL	2302.60

TABLE 28: Dry weight annual production of the reclaimed areas of the Huntington No. 4 Mine (Revegetated Road Areas, see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	356.67	155.74	30.(150)
Woody Spp.	135.40	166.39	30.(150)
TOTAL PRODUCTION	492.06	233.03	30.(150)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 29: Total cover and composition summary for the Reference Area of the Huntington No. 4 Mine (see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Overstory	8.20	14.20	50
Understory	29.40	10.80	50
Combined*	37.60	20.72	50
Litter	21.70	13.21	50
Bareground	14.90	11.64	50
Rock	34.00	18.97	50
COMPOSITION			
Shrubs	22.50	32.30	50
Forbs	0.50	3.50	50
Grasses	77.00	32.53	50

* Overstory and understory cover combined (shows total living cover).

TABLE 30: Species cover and frequency summary for the Reference Area of the Huntington No. 4 Mine (see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Cercocarpus ledifolius	0.50	2.29	50	6.00
Juniperus osteosperma	1.80	7.40	50	12.00
Pinus edulis	5.30	10.97	50	26.00
FORBS				
Cryptantha sp.	0.10	.70	50	2.00
GRASSES				
Elymus salinus	20.00	12.45	50	88.00
Stipa hymenoides	1.70	5.35	50	14.00

TABLE 31: Woody species densities of the Reference Area of the Huntington No. 4 Mine (see Sample Map).

	NUMBER/ACRE
Cercocarpus ledifolius	116.20
Gutierrezia sarothrae	17.43
Juniperus osteosperma	34.86
Pinus edulis	110.39
Purshia tridentata	
TOTAL	278.88

TABLE 32: Dry weight annual production of the Reference Area of the Huntington No. 4 Mine (see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	163.37	106.25	50.(250)
Woody Spp.	89.86	143.24	50.(250)
TOTAL PRODUCTION	253.24	126.44	50.(250)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 33: Total cover and composition summary for the Riparian Area of the Huntington No. 4 Mine (see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	64.00	7.35	5
Litter	18.00	6.78	5
Bareground	5.00	0.00	5
Rock	13.00	8.12	5
COMPOSITION			
Shrubs	36.79	24.68	5
Forbs	36.88	17.88	5
Grasses	26.33	20.33	5

TABLE 34: Species cover and frequency summary for the Riparian Area of the Huntington No. 4 Mine (see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Salix lutea	23.00	16.00	5	80.00
FORBS				
Agoseris aurantiaca	2.00	2.45	5	40.00
Astragalus cicer	10.00	10.49	5	60.00
Equisetum arvensis	7.00	9.27	5	60.00
Geranium richardsonii	1.00	2.00	5	20.00
Medicago sativa	2.00	2.45	5	40.00
Mentha arvensis	1.00	2.00	5	20.00
Trifolium pratensis	1.00	2.00	5	20.00
GRASSES				
Dactylis glomeratus	17.00	14.35	5	100.00

TABLE 35: Woody species densities of the Riparian Area of the Huntington No. 4 Mine (see Sample Map).

	NUMBER/ACRE
Cercocarpus ledifolius	
Chrysothamnus nauseosus	290.40
Cornus sericea	145.20
Rosa woodsii	145.20
Salix lutea	2758.80
TOTAL	3339.60

TABLE 36: Dry weight annual production of the Riparian Area of the Huntington No. 4 Mine (see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	201.61	121.40	5.(25)
Woody Spp.	279.13	290.35	5.(25)
TOTAL PRODUCTION	480.74	198.61	5.(25)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 37: Total cover and composition summary for the Riparian Reference Area of the Huntington No. 4 Mine (see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	57.00	9.00	10
Litter	18.00	6.78	10
Bareground	15.80	11.77	10
Rock	9.20	10.03	10
COMPOSITION			
Shrubs	30.70	19.54	10
Forbs	12.48	21.33	10
Grasses	56.81	27.96	10

TABLE 38: Species cover and frequency summary for the Riparian Reference Area of the Huntington No. 4 Mine (see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Cornus sericea	4.00	8.31	10	20.00
Rosa woodsii	1.50	4.50	10	10.00
Salix lutea	12.00	14.35	10	50.00
FORBS				
Epilobium sp.	1.50	3.20	10	20.00
Equisetum arvense	4.00	8.00	10	20.00
Galium bifolium	2.00	4.00	10	20.00
GRASSES				
Agrostis stolonifera	2.50	7.50	10	10.00
Bromus inermis	2.00	6.00	10	10.00
Calamagrostis canadensis	6.65	19.50	10	10.00
Dactylis glomeratus	16.00	13.19	10	70.00
Phleum alpinum	2.50	7.50	10	10.00
Poa pratensis	2.50	7.50	10	10.00

TABLE 39: Woody species densities of the Riparian Reference Area of the Huntington No. 4 Mine (see Sample Map).

	NUMBER/ACRE
Abies concolor	43.56
Acer negundo	43.56
Cornus stolonifera	827.64
Populus tremuloides	261.36
Populus angustifolia	43.56
Rosa woodsii	871.20
Salix lutea	1132.56
TOTAL	3223.44

TABLE 40: Dry weight annual production of the Riparian Reference Area of the Huntington No. 4 Mine (see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	186.85	129.08	10.(50)
Woody Spp.	156.56	143.39	10.(50)
TOTAL PRODUCTION	359.07	159.47	10.(50)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 41: Statistical summary sheet for the Reclaimed Areas and Reference Areas at the Huntington No. 4 Mine.

LOWER RECLAIMED AREAS (A-E Combined)			
Living Cover*	x=40.58	s=14.46	n=43
Density	x=4530.88	s= --	n=30
Production	x=449.70	s=170.54	n=43
REFERENCE AREA			
Living Cover*	x=37.60	s=20.72	n=50
Density	x=278.88	s= --	n=30
Production	x=253.24	s=126.44	n=50
STATISTICAL ANALYSES			
Living Cover	t=0.792	df=91	SL=NS
Density	t=**	df= --	SL= --
Production	t=6.364	df=91	SL=p<.001

UPPER RECLAIMED ACCESS ROAD AREAS			
Living Cover	x=41.33	s=8.46	n=30
Density	x=2302.60	s= --	n=60
Production	x=492.06	s=233.03	n=30
REFERENCE AREA			
Living Cover*	x=37.60	s=20.72	n=50
Density	x=278.88	s= --	n=30
Production	x=253.24	s=126.44	n=50
STATISTICAL ANALYSES			
Living Cover	t=0.938	df=78	SL=NS
Density	t=**	df= --	SL= --
Production	t=5.947	df=78	SL=p<.001

x = sample mean, s = sample standard deviation,
n = sample size, NS = nonsignificant,
* represents understory and overstory cover combined.
** not calculated (differences obvious)

TABLE 41: (Continued)

RECLAIMED RIPARIAN AREA			
Living Cover	x=64.00	s=7.35	n=5
Density	x=3339.60	s= --	n=2
Production	x=480.74	s=198.61	n=5
RIPARIAN REFERENCE AREA			
Living Cover*	x=57.00	s=9.00	n=10
Density	x=3223.44	s= --	n=4
Production	x=359.07	s=159.47	n=10
STATISTICAL ANALYSES			
Living Cover	t=1.499	df=13	SL=NS
Density	t=**	df= --	SL= NS
Production	t=1.288	df=13	SL=NS

x = sample mean, s = sample standard deviation,
n = sample size, NS = nonsignificant,
* represents understory and overstory cover combined.
** not calculated (similarities obvious)

COLOR PHOTOGRAPHS

Area "A"

Area "B"

Area "C"

Area "D"

Area "E"

Reclaimed Road (1 of 2)

Reclaimed Road (2 of 2)

Reference Area (1 of 2)

Reference Area (2 of 2)

Reclaimed Riparian Area

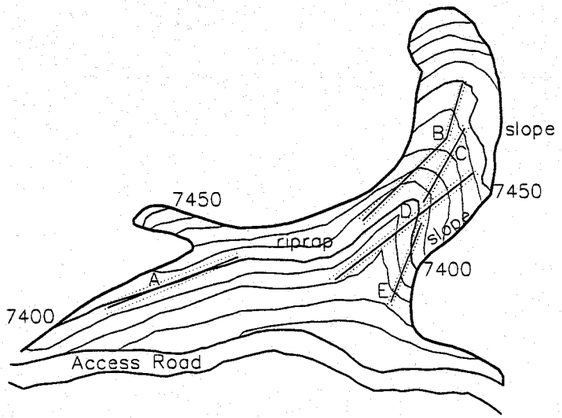
Riparian Reference Area (1 of 2)

Riparian Reference Area (2 of 2)

SAMPLE MAP

RECEIVED
MAR 20 1997
DIV. OF OIL, GAS & MINING

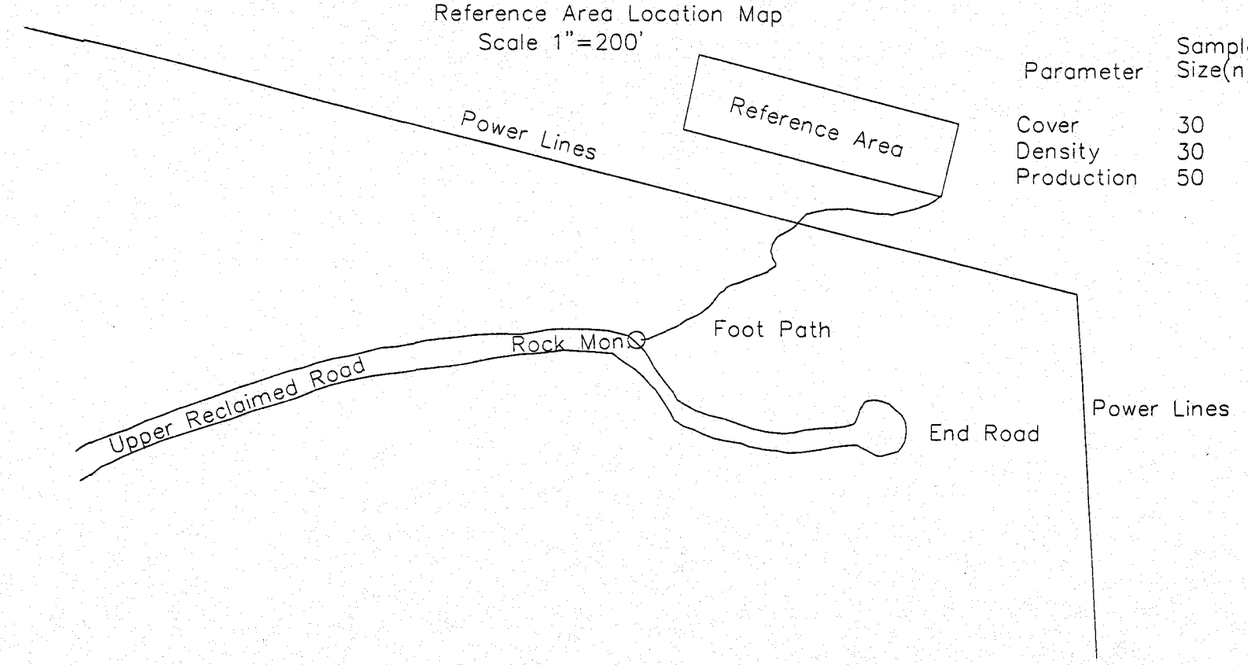
Lower Reclaimed Areas



Scale 1"=200'

Sample Area	Parameter	Sample Size(n)
A	Cover	10
	Density	8
	Production	10
B	Cover	10
	Density	8
	Production	10
C	Cover	8
	Density	8
	Production	7
D	Cover	7
	Density	6
	Production	7
E	Cover	8
	Density	6
	Production	8
Comb.	Cover	43
	Density	30
	Production	43

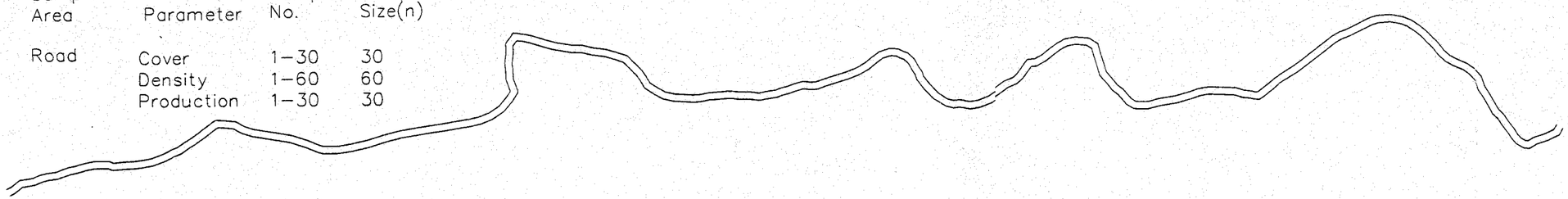
Reference Area Location Map
Scale 1"=200'



Parameter	Sample Size(n)
Cover	30
Density	30
Production	50

Upper Reclaimed Areas
Scale 1"=500'

Sample Area	Parameter	Sample No.	Sample Size(n)
Road	Cover	1–30	30
	Density	1–60	60
	Production	1–30	30



HUNTINGTON NO.4 MINE
SAMPLE LOCATION MAP
1994

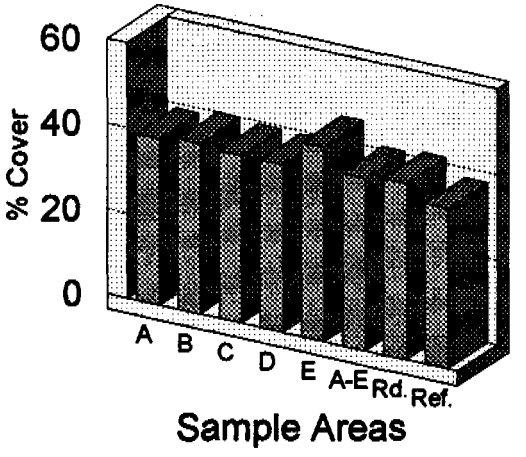
MT. NEBO SCIENTIFIC
RESEARCH AND CONSULTING

DRAWN	J. MAGENO	HUNT4.DWG
CHECKED	P. COLLINS	
DATE	3-21-95	
SCALE	varies	

FIGURES

Fig. 1: Total Living Cover

Reclaimed vs. Reference (1994)



A-E = Areas Combined
Rd. = Reclaimed Read
Ref = Reference Area

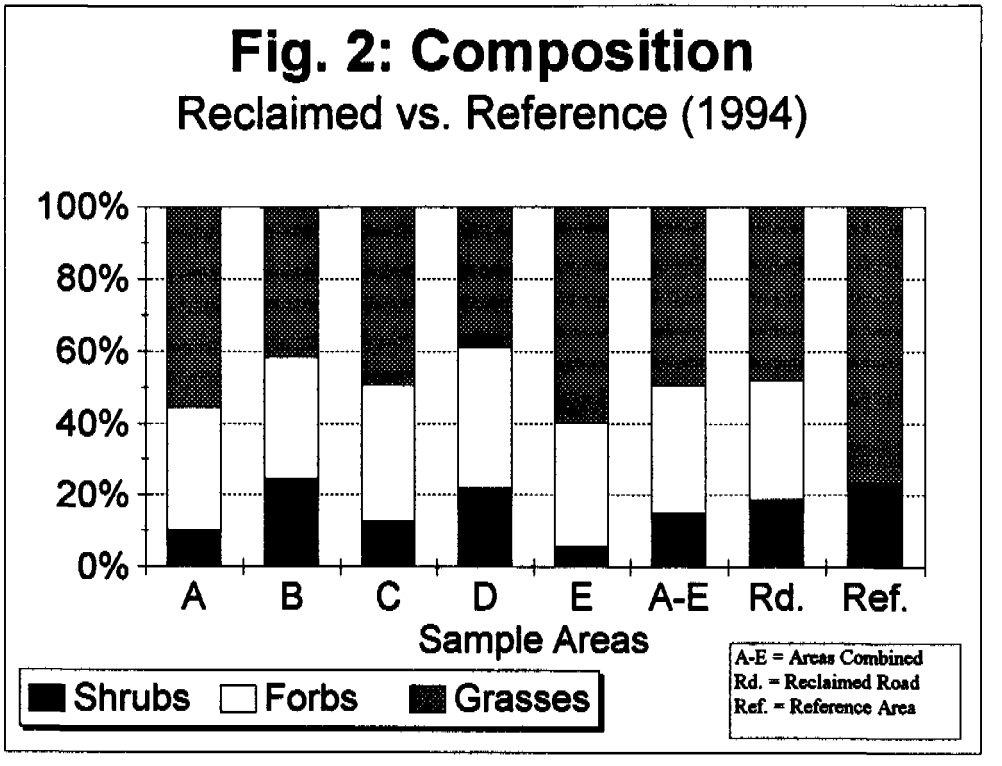


Fig. 2: Composition
Reclaimed vs. Reference (1994)
100%
80%
60%
40%
20%
0%
A
B
C
D
E
A-E
Rd.
Ref.
Sample Areas
Shrubs
Forbs
Grasses
A-E = Areas Combined
Rd. = Reclaimed Road
Ref. = Reference Area

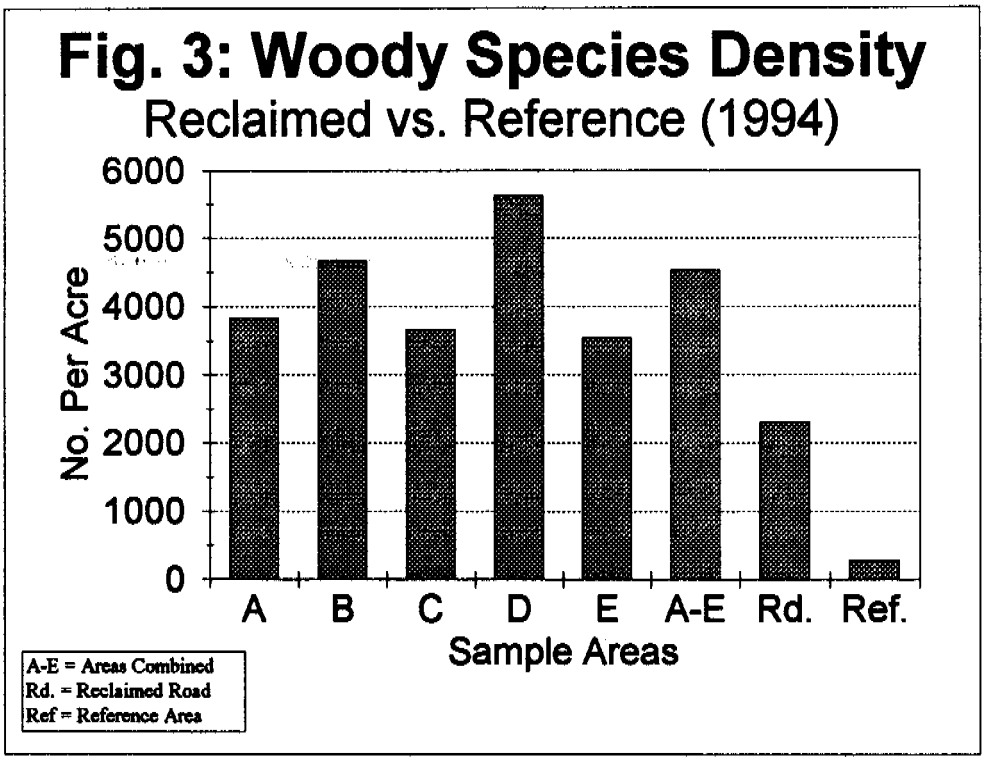


Fig. 3: Woody Species Density
Reclaimed vs. Reference (1994)
6000
5000
4000
3000
2000
1000
0
No. Per Acre
A
B
C
D
E
A-E
Rd.
Ref.
Sample Areas
A-E = Areas Combined
Rd. = Reclaimed Road
Ref = Reference Area

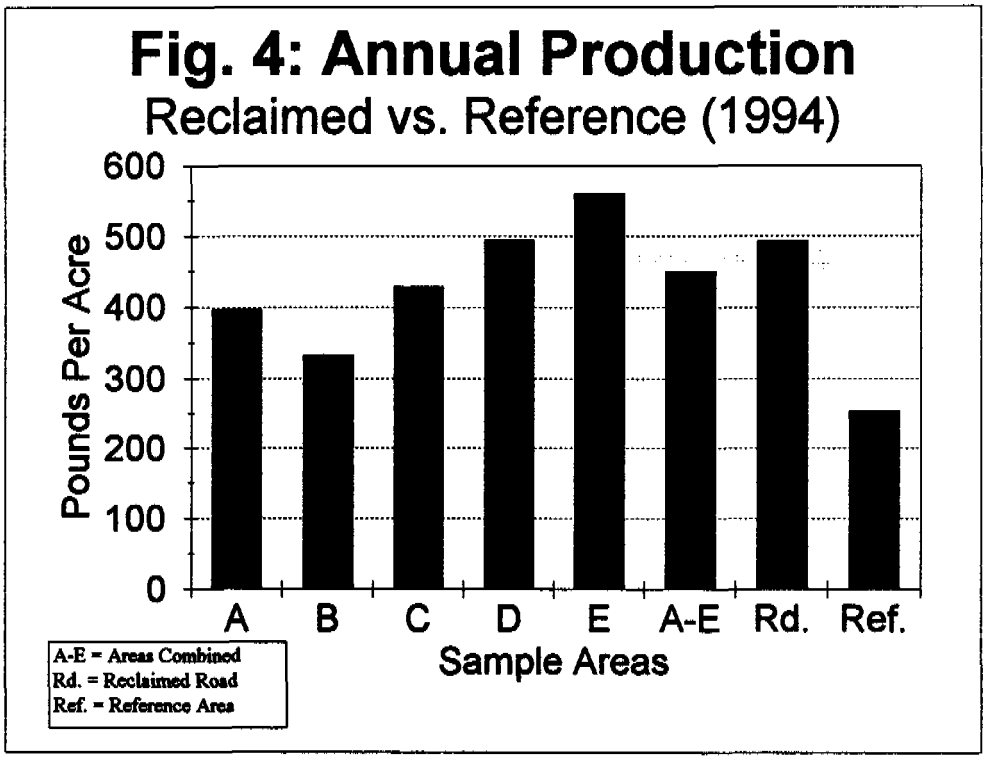
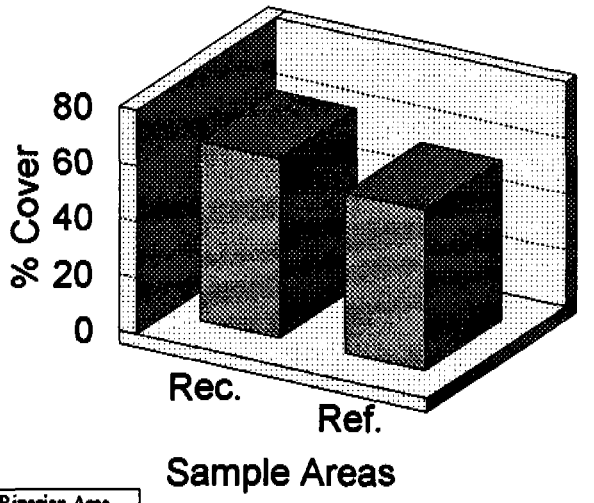


Fig. 4: Annual Production
Reclaimed vs. Reference (1994)
Pounds Per Acre
600
500
400
300
200
100
0
A
B
C
D
E
A-E
Rd.
Ref.
Sample Areas
A-E = Areas Combined
Rd. = Reclaimed Road
Ref. = Reference Area

Fig. 5: Total Living Cover

Reclaimed Riparian vs. Reference -1994



Rec. = Reclaimed Riparian Area
Ref. = Riparian Reference Area

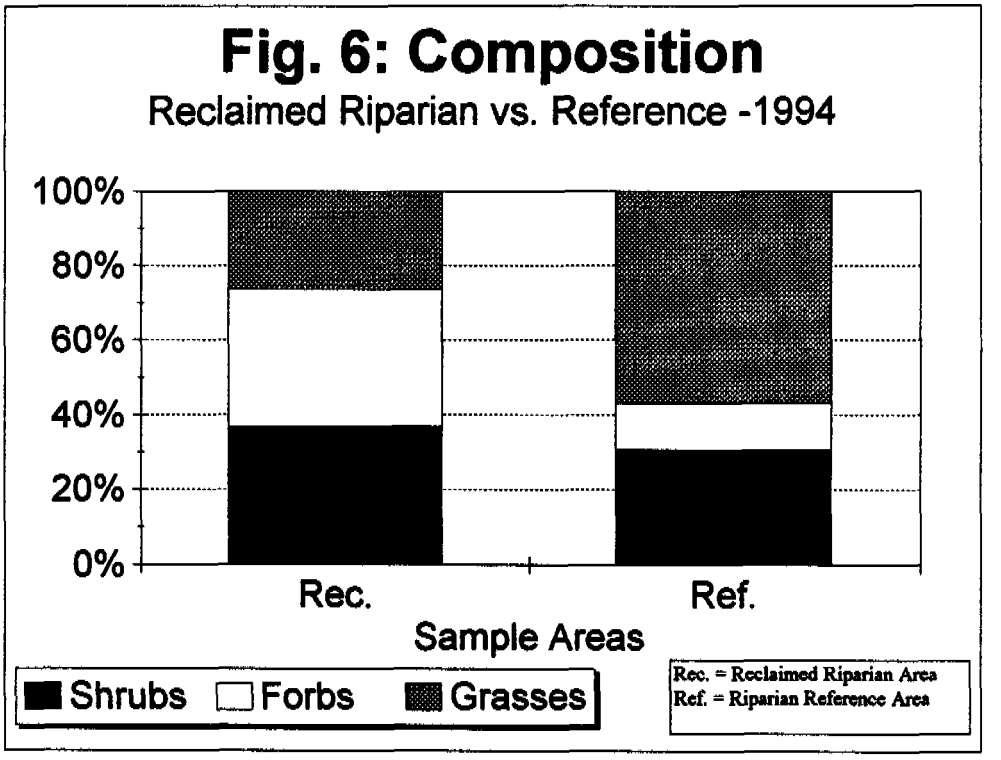


Fig. 6: Composition
Reclaimed Riparian vs. Reference -1994
100%
80%
60%
40%
20%
0%
Rec.
Ref.
Sample Areas
Shrubs
Forbs
Grasses
Rec. = Reclaimed Riparian Area
Ref. = Riparian Reference Area

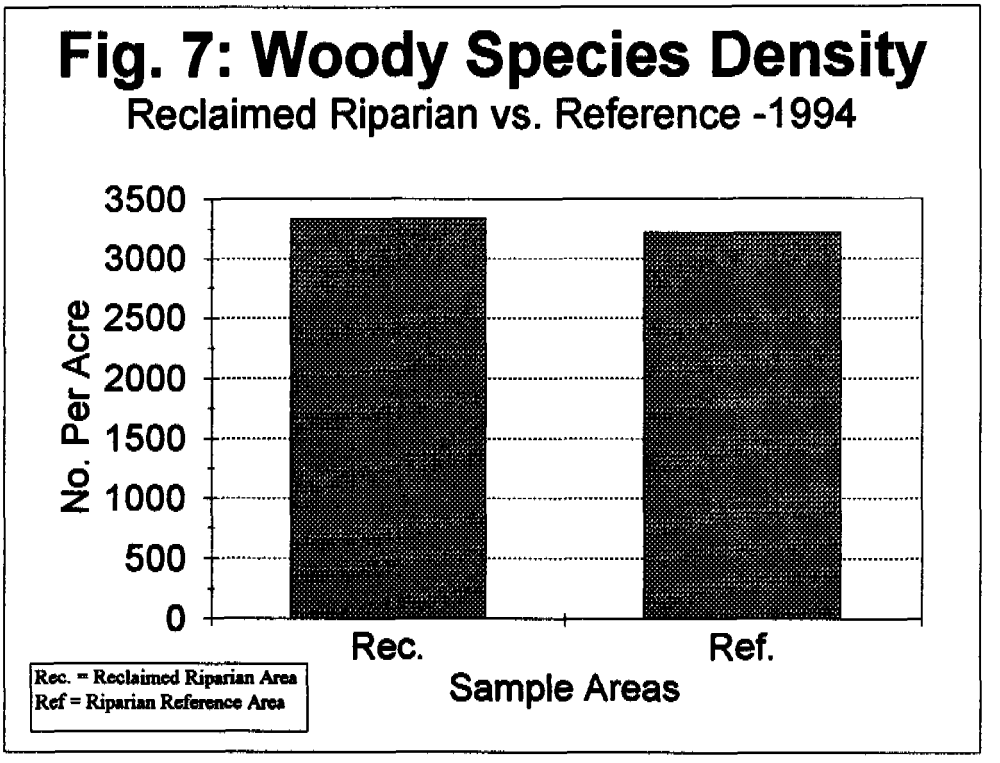


Fig. 7: Woody Species Density
Reclaimed Riparian vs. Reference -1994
3500
3000
2500
2000
1500
1000
500
0
No. Per Acre
Rec.
Ref.
Sample Areas
Rec. = Reclaimed Riparian Area
Ref = Riparian Reference Area

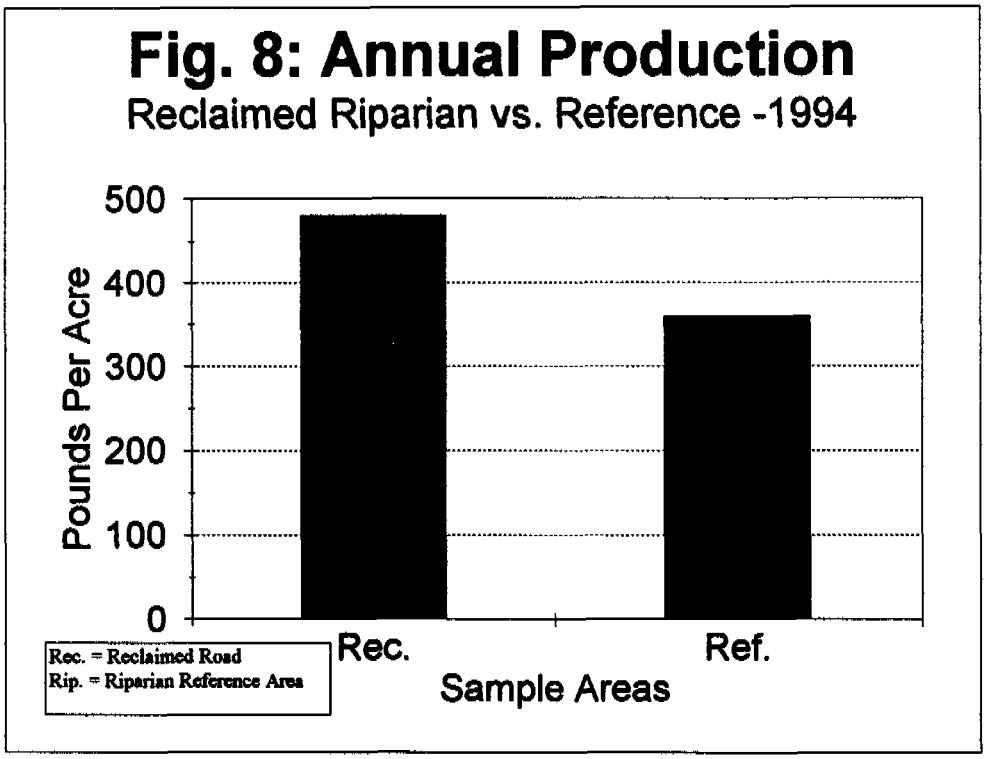


Fig. 8: Annual Production
Reclaimed Riparian vs. Reference -1994
500
400
300
200
100
0
Pounds Per Acre
Rec.
Ref.
Sample Areas
Rec. = Reclaimed Road
Rip. = Riparian Reference Area

APPENDIX A:

RAW DATA
(Cover, Composition, Frequency)

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
A - Lower Area South (1-10)
Exposure: Variable
Slope: Variable

Sample Date: 29 Aug 1994	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	10.00	15.00	5.00	10.00	0.00
FORBS										
Macharanthera canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Astragalus cicer	0.00	20.00	0.00	30.00	15.00	10.00	5.00	5.00	10.00	30.00
Penstemon palmeri	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	0.00	5.00
GRASSES										
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
Elymus spicatus	0.00	0.00	5.00	5.00	5.00	10.00	5.00	0.00	15.00	0.00
Bromus carinatus	10.00	10.00	10.00	5.00	5.00	5.00	0.00	0.00	0.00	0.00
Agropyron cristatum	5.00	0.00	0.00	0.00	0.00	3.00	5.00	10.00	0.00	0.00
Dactylis glomeratus	0.00	5.00	0.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	20.00	5.00	10.00	0.00	5.00	5.00	10.00	0.00	5.00	5.00
COVER										
Total Living Cover	35.00	40.00	25.00	45.00	35.00	50.00	40.00	35.00	40.00	45.00
Litter	25.00	25.00	25.00	15.00	10.00	25.00	15.00	10.00	15.00	10.00
Bareground	15.00	15.00	35.00	20.00	30.00	15.00	15.00	45.00	10.00	30.00
Rock	25.00	20.00	15.00	20.00	25.00	10.00	30.00	10.00	35.00	15.00
% COMPOSITION										
Shrubs	0.00	0.00	0.00	0.00	0.00	24.00	37.50	14.29	25.00	0.00
Forbs	0.00	50.00	0.00	66.67	42.86	30.00	12.50	28.57	25.00	88.89
Grasses	100.00	50.00	100.00	33.33	57.14	46.00	50.00	57.14	50.00	11.11

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
A - Lower Area South (1-10)
Exposure: Variable
Slope: Variable
Sample Date: 29 Aug 1994

Mean	SDev	Freq	
			TREES & SHRUBS
0.20	0.60	10.00	Gutierrezia sarothrae
4.00	5.39	40.00	Chrysothamnus nauseosus
			FORBS
0.50	1.50	10.00	Macharanthera canescens
12.50	10.55	80.00	Astragalus cicer
1.50	2.29	30.00	Penstemon palmeri
			GRASSES
1.00	3.00	10.00	Stipa hymenoides
4.50	4.72	60.00	Elymus spicatus
4.50	4.15	60.00	Bromus carinatus
2.30	3.26	40.00	Agropyron cristatum
1.50	2.29	30.00	Dactylis glomeratus
6.50	5.50	80.00	Elymus lanceolatus

		COVER
39.00	6.63	Total Living Cover
17.50	6.42	Litter
23.00	10.77	Bareground
20.50	7.89	Rock
		% COMPOSITION
10.08	13.40	Shrubs
34.45	27.04	Forbs
55.47	25.71	Grasses

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
B - Lower Area North (11-20)
Exposure: Variable
Slope: Variable

Sample Date: 29 Aug 1994	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Chrysothamnus nauseosus	5.00	0.00	5.00	10.00	0.00	15.00	25.00	0.00	5.00	0.00
Cercocarpus ledifolius	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eriogonums corymbosum	10.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS										
Astragalus cicer	5.00	40.00	10.00	5.00	15.00	5.00	0.00	5.00	15.00	25.00
Penstemon palmeri	0.00	0.00	5.00	0.00	0.00	10.00	0.00	0.00	5.00	0.00
GRASSES										
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
Elymus spicatus	0.00	8.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agropyron cristatum	0.00	7.00	5.00	0.00	0.00	0.00	10.00	15.00	15.00	5.00
Elymus lanceolatus	10.00	0.00	0.00	10.00	20.00	10.00	0.00	15.00	10.00	10.00
COVER										
Total Living Cover	35.00	55.00	40.00	25.00	35.00	40.00	35.00	45.00	50.00	40.00
Litter	10.00	10.00	10.00	10.00	10.00	10.00	5.00	10.00	10.00	10.00
Bareground	25.00	25.00	30.00	45.00	40.00	30.00	40.00	25.00	20.00	30.00
Rock	30.00	10.00	20.00	20.00	15.00	20.00	20.00	20.00	20.00	20.00
% COMPOSITION										
Shrubs	57.14	0.00	30.00	40.00	0.00	37.50	71.43	0.00	10.00	0.00
Forbs	14.29	72.73	37.50	20.00	42.86	37.50	0.00	11.11	40.00	62.50
Grasses	28.57	27.27	32.50	40.00	57.14	25.00	28.57	88.89	50.00	37.50

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
B - Lower Area North (11-20)
Exposure: Variable
Slope: Variable
Sample Date: 23 Aug 1994

Mean	SDev	Freq	
			TREES & SHRUBS
6.50	7.76	60.00	Chrysothamnus nauseosus
0.50	1.50	10.00	Cercocarpus ledifolius
1.70	3.47	20.00	Eriogonums corymbosum
			FORBS
12.50	11.46	90.00	Astragalus cicer
2.00	3.32	30.00	Penstemon palmeri
			GRASSES
1.00	3.00	10.00	Stipa hymenoides
1.60	3.20	20.00	Elymus spicatus
5.70	5.69	60.00	Agropyron cristatum
8.50	6.34	70.00	Elymus lanceolatus

		COVER
40.00	8.06	Total Living Cover
9.50	1.50	Litter
31.00	7.68	Bareground
19.50	4.72	Rock
		% COMPOSITION
24.61	25.14	Shrubs
33.85	21.71	Forbs
41.54	18.63	Grasses

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
C - Lower Area Slopes (21-28)
Exposure: Variable
Slope: Variable

Sample Date: 30 Aug 1994	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	Mean	SDev	Freq
TREES & SHRUBS											
Chrysothamnus nauseosus	0.00	15.00	10.00	5.00	0.00	0.00	0.00	0.00	3.75	5.45	37.50
Eriogonum corymbosum	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Rosa woodsii	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
FORBS											
Melilotus officinalis	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Astragalus cicer	5.00	0.00	10.00	25.00	35.00	20.00	15.00	0.00	13.75	11.66	75.00
Penstemon palmeri	0.00	0.00	5.00	0.00	0.00	0.00	5.00	0.00	1.25	2.17	25.00
GRASSES											
Stipa hymenoides	0.00	12.00	10.00	0.00	5.00	0.00	0.00	0.00	3.38	4.72	37.50
Elymus spicatus	5.00	0.00	0.00	0.00	0.00	20.00	5.00	5.00	4.38	6.34	50.00
Agropyron cristatum	10.00	0.00	5.00	5.00	5.00	0.00	5.00	5.00	4.38	3.00	75.00
Bromus carinatus	5.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	1.25	2.17	25.00
Elymus lanceolatus	0.00	13.00	0.00	0.00	5.00	0.00	5.00	20.00	5.38	6.96	50.00
COVER											
Total Living Cover	40.00	40.00	40.00	35.00	50.00	40.00	40.00	30.00	39.38	5.27	
Litter	20.00	10.00	15.00	5.00	5.00	15.00	25.00	5.00	12.50	7.07	
Bareground	15.00	30.00	25.00	25.00	20.00	10.00	10.00	10.00	18.13	7.47	
Rock	25.00	20.00	20.00	35.00	25.00	35.00	25.00	55.00	30.00	10.90	
% COMPOSITION											
Shrubs	25.00	37.50	25.00	14.29	0.00	0.00	0.00	0.00	12.72	13.99	
Forbs	25.00	0.00	37.50	71.43	70.00	50.00	50.00	0.00	37.99	26.19	
Grasses	50.00	62.50	37.50	14.29	30.00	50.00	50.00	100.00	49.29	23.67	

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
D - Below Slopes (29-35)
Exposure: Variable
Slope: Variable

Sample Date: 30 Aug 1994	1.00	2.00	3.00	4.00	5.00	6.00	7.00	Mean	SDev	Freq
TREES & SHRUBS										
Chrysothamnus nauseosus	10.00	0.00	5.00	20.00	5.00	10.00	0.00	7.14	6.47	71.43
Rosa woodsii	0.00	0.00	0.00	0.00	10.00	0.00	0.00	1.43	3.50	14.29
FORBS										
Penstemon palmeri	0.00	0.00	15.00	0.00	0.00	0.00	0.00	2.14	5.25	14.29
Astragalus cicer	10.00	5.00	10.00	5.00	10.00	10.00	20.00	10.00	4.63	100.00
Melilotus officinalis	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71	1.75	14.29
Machaeranthera canescens	0.00	0.00	0.00	0.00	5.00	5.00	5.00	2.14	2.47	42.86
GRASSES										
Stipa hymenoides	0.00	0.00	0.00	10.00	0.00	0.00	0.00	1.43	3.50	14.29
Elymus spicatus	5.00	25.00	5.00	5.00	10.00	0.00	0.00	7.14	7.95	71.43
Agropyron cristatum	0.00	5.00	0.00	0.00	10.00	10.00	5.00	4.29	4.16	57.14
Elymus lanceolatus	0.00	5.00	0.00	0.00	0.00	5.00	10.00	2.86	3.64	42.86
COVER										
Total Living Cover	30.00	40.00	35.00	40.00	50.00	40.00	40.00	39.29	5.62	
Litter	15.00	5.00	5.00	5.00	15.00	15.00	5.00	9.29	4.95	
Bareground	10.00	45.00	30.00	5.00	5.00	5.00	5.00	15.00	14.88	
Rock	45.00	10.00	30.00	50.00	30.00	40.00	50.00	36.43	13.29	
% COMPOSITION										
Shrubs	33.33	0.00	14.29	50.00	30.00	25.00	0.00	21.80	16.96	
Forbs	50.00	12.50	71.43	12.50	30.00	37.50	62.50	39.49	21.42	
Grasses	16.67	87.50	14.29	37.50	40.00	37.50	37.50	38.71	22.26	

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
E - Lowest Area (36-43)
Exposure: Variable
Slope: Variable

Sample Date: 30 Aug 1994	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	Mean	SDev	Freq
TREES & SHRUBS											
Chrysothamnus nauseosus	5.00	0.00	10.00	5.00	0.00	0.00	0.00	0.00	2.50	3.54	37.50
FORBS											
Machaeranthera canescens	0.00	0.00	5.00	5.00	0.00	0.00	0.00	0.00	1.25	2.17	25.00
Circium sp.	0.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	1.25	2.17	25.00
Melilotus officinalis	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Astragalus cicer	0.00	5.00	0.00	0.00	10.00	25.00	10.00	30.00	10.00	10.90	62.50
Cynoglossum officinale	0.00	5.00	0.00	5.00	0.00	0.00	5.00	0.00	1.88	2.42	37.50
Penstemon palmeri	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
GRASSES											
Elymus lanceolatus	0.00	0.00	0.00	0.00	15.00	0.00	5.00	5.00	3.13	4.96	37.50
Dactylis glomeratus	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	1.25	3.31	12.50
Poa pratensis	0.00	10.00	0.00	5.00	0.00	0.00	0.00	0.00	1.88	3.48	25.00
Agropyron cristatum	0.00	0.00	10.00	0.00	0.00	5.00	5.00	0.00	2.50	3.54	37.50
Bromus carinatus	5.00	0.00	5.00	10.00	10.00	0.00	5.00	0.00	4.38	3.90	62.50
Elymus hispidus	40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	13.23	12.50
Elymus spicatus	0.00	25.00	0.00	0.00	0.00	20.00	20.00	10.00	9.38	10.14	50.00
COVER											
Total Living Cover	50.00	50.00	45.00	40.00	35.00	50.00	50.00	45.00	45.63	5.27	
Litter	40.00	10.00	15.00	5.00	15.00	20.00	25.00	15.00	18.13	9.98	
Bareground	5.00	5.00	30.00	50.00	45.00	20.00	10.00	10.00	21.88	16.76	
Rock	5.00	35.00	10.00	5.00	5.00	10.00	15.00	30.00	14.38	11.02	
% COMPOSITION											
Shrubs	10.00	0.00	22.22	12.50	0.00	0.00	0.00	0.00	5.59	7.91	
Forbs	0.00	30.00	22.22	50.00	28.57	50.00	30.00	66.67	34.68	19.14	
Grasses	90.00	70.00	55.56	37.50	71.43	50.00	70.00	33.33	59.73	17.91	

BEAVERCREEK/BLACKHAWK
Huntington #4
Sites A thru E Combined
Exposure: Variable
Slope: Variable

A = 1 thru 10

Sample Date: 30 Aug 1994	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	10.00	15.00	5.00	10.00	0.00
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00
Cercocarpus ledifolius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eriogonum corymbosum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rosa woodsii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS										
Penstemon palmeri	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	0.00	5.00
Astragalus cicer	0.00	20.00	0.00	30.00	15.00	10.00	5.00	5.00	10.00	30.00
Melilotus officinalis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cynoglossum officinale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machaeranthera canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Circium sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES										
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
Elymus spicatus	0.00	0.00	5.00	5.00	5.00	10.00	5.00	0.00	15.00	0.00
Agropyron cristatum	5.00	0.00	0.00	0.00	0.00	3.00	5.00	10.00	0.00	0.00
Bromus carinatus	10.00	10.00	10.00	5.00	5.00	5.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	20.00	5.00	10.00	0.00	5.00	5.00	10.00	0.00	5.00	5.00
Dacytylis glomeratus	0.00	5.00	0.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00
Poa pratensis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus hispidus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER										
Total Living Cover	35.00	40.00	25.00	45.00	35.00	50.00	40.00	35.00	40.00	45.00
Litter	25.00	25.00	25.00	15.00	10.00	25.00	15.00	10.00	15.00	10.00
Bareground	15.00	15.00	35.00	20.00	30.00	15.00	15.00	45.00	10.00	30.00
Rock	25.00	20.00	15.00	20.00	25.00	10.00	30.00	10.00	35.00	15.00
% COMPOSITION										
Shrubs	0.00	0.00	0.00	0.00	0.00	24.00	37.50	14.29	25.00	0.00
Forbs	0.00	50.00	0.00	66.67	42.86	30.00	12.50	28.57	25.00	88.89
Grasses	100.00	50.00	100.00	33.33	57.14	46.00	50.00	57.14	50.00	11.11

B = 11 thru 20 C = 21 thru 28

11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00
5.00	0.00	5.00	10.00	0.00	15.00	25.00	0.00	5.00	0.00	0.00	15.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	10.00	0.00	0.00	5.00	0.00	0.00	0.00	5.00
5.00	40.00	10.00	5.00	15.00	5.00	0.00	5.00	15.00	25.00	5.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	12.00	10.00
0.00	8.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	7.00	5.00	0.00	0.00	0.00	10.00	15.00	15.00	5.00	10.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
10.00	0.00	0.00	10.00	20.00	10.00	0.00	15.00	10.00	10.00	0.00	13.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35.00	55.00	40.00	25.00	35.00	40.00	35.00	45.00	50.00	40.00	40.00	40.00	40.00
10.00	10.00	10.00	10.00	10.00	10.00	5.00	10.00	10.00	10.00	20.00	10.00	15.00
25.00	25.00	30.00	45.00	40.00	30.00	40.00	25.00	20.00	30.00	15.00	30.00	25.00
30.00	10.00	20.00	20.00	15.00	20.00	20.00	20.00	20.00	20.00	25.00	20.00	20.00
57.14	0.00	30.00	40.00	0.00	37.50	71.43	0.00	10.00	0.00	25.00	37.50	25.00
14.29	72.73	37.50	20.00	42.86	37.50	0.00	11.11	40.00	62.50	25.00	0.00	37.50
28.57	27.27	32.50	40.00	57.14	25.00	28.57	88.89	50.00	37.50	50.00	62.50	37.50

D = 29 thru 35

24.00	25.00	26.00	27.00	28.00	29.00	30.00	31.00	32.00	33.00	34.00	35.00	36.00
5.00	0.00	0.00	0.00	0.00	10.00	0.00	5.00	20.00	5.00	10.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00
25.00	35.00	20.00	15.00	0.00	10.00	5.00	10.00	5.00	10.00	10.00	20.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
0.00	0.00	20.00	5.00	5.00	5.00	25.00	5.00	5.00	10.00	0.00	0.00	0.00
5.00	5.00	0.00	5.00	5.00	0.00	5.00	0.00	0.00	10.00	10.00	5.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	5.00	0.00	5.00	20.00	0.00	5.00	0.00	0.00	0.00	5.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.00
35.00	50.00	40.00	40.00	30.00	30.00	40.00	35.00	40.00	50.00	40.00	40.00	50.00
5.00	5.00	15.00	25.00	5.00	15.00	5.00	5.00	5.00	15.00	15.00	5.00	40.00
25.00	20.00	10.00	10.00	10.00	10.00	45.00	30.00	5.00	5.00	5.00	5.00	5.00
35.00	25.00	35.00	25.00	55.00	45.00	10.00	30.00	50.00	30.00	40.00	50.00	5.00
14.29	0.00	0.00	0.00	0.00	33.33	0.00	14.29	50.00	30.00	25.00	0.00	10.00
71.43	70.00	50.00	50.00	0.00	50.00	12.50	71.43	12.50	30.00	37.50	62.50	0.00
14.29	30.00	50.00	50.00	100.00	16.67	87.50	14.29	37.50	40.00	37.50	37.50	90.00

BEAVERCREEK/BLACKHAWK
Huntington #4
Sites A thru E Combined
Exposure: Variable
Slope: Variable
Sample Date: 30 Aug 1994

E = 36 thru 43

37.00	38.00	39.00	40.00	41.00	42.00	43.00	Mean	SDev	Freq	
										TREES & SHRUBS
0.00	10.00	5.00	0.00	0.00	0.00	0.00	4.77	6.19	48.84	Chrysothamnus nauseosus
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.30	2.33	Gutierrezia sarothrae
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.75	2.33	Cercocarpus ledifolius
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	1.95	6.98	Eriogonum corymbosum
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	1.67	4.65	Rosa woodsii
										FORBS
0.00	0.00	5.00	0.00	0.00	0.00	0.00	1.51	3.15	23.26	Penstemon palmeri
5.00	0.00	0.00	10.00	25.00	10.00	30.00	11.86	10.46	81.40	Astragalus cicer
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.35	1.27	6.98	Melilotus officinalis
5.00	0.00	5.00	0.00	0.00	5.00	0.00	0.35	1.27	6.98	Cynoglossum officinale
0.00	5.00	5.00	0.00	0.00	0.00	0.00	0.70	1.73	13.95	Machaeranthera canescens
5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.23	1.05	4.65	Circium sp.
										GRASSES
0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	3.39	13.95	Stipa hymenoides
25.00	0.00	0.00	0.00	20.00	20.00	10.00	5.14	7.18	48.84	Elymus spicatus
0.00	10.00	0.00	0.00	5.00	5.00	0.00	3.84	4.31	53.49	Agropyron cristatum
0.00	5.00	10.00	10.00	0.00	5.00	0.00	2.09	3.45	30.23	Bromus carinatus
0.00	0.00	0.00	15.00	0.00	5.00	5.00	5.53	6.06	58.14	Elymus lanceolatus
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.58	1.93	9.30	Dacytylis glomeratus
10.00	0.00	5.00	0.00	0.00	0.00	0.00	0.35	1.67	4.65	Poa pratensis
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	6.03	2.33	Elymus hispidus
										COVER
50.00	45.00	40.00	35.00	50.00	50.00	45.00	40.58	14.46	*	Total Living Cover
10.00	15.00	5.00	15.00	20.00	25.00	15.00	13.49	7.51		Litter
5.00	30.00	50.00	45.00	20.00	10.00	10.00	22.44	13.00		Bareground
35.00	10.00	5.00	5.00	10.00	15.00	30.00	23.49	12.23		Rock
										% COMPOSITION
0.00	22.22	12.50	0.00	0.00	0.00	0.00	15.02	18.32		Shrubs
30.00	22.22	50.00	28.57	50.00	30.00	66.67	35.83	23.55		Forbs
70.00	55.56	37.50	71.43	50.00	70.00	33.33	49.14	23.25		Grasses

BEAVERCREEK/BLACKHAWK
Huntington #4
Reclaimed Road
Exposure: Variable
Slope: Variable

Sample Date: 30 Aug 1994	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Chrysothamnus nauseosus	10.00	0.00	30.00	15.00	15.00	15.00	5.00	10.00	10.00	0.00
Cercocarpus ledifolius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
FORBS										
Machaeranthera canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Penstemon pachyphyllus	5.00	5.00	0.00	7.00	5.00	2.00	5.00	0.00	7.00	0.00
Astragalus cicer	0.00	5.00	0.00	5.00	0.00	3.00	0.00	5.00	8.00	0.00
Cynoglossum officinale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES										
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	5.00	0.00
Bromus inermis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
Dactylis glomerata	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agropyron cristatum	5.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	5.00	10.00
Bromus carinatus	10.00	10.00	10.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	20.00	10.00	10.00	0.00	0.00	10.00	25.00	0.00	0.00	15.00
Elymus spicatus	0.00	5.00	0.00	0.00	15.00	5.00	0.00	0.00	0.00	0.00
Elymus salinus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER										
Total Living Cover	50.00	40.00	50.00	30.00	35.00	40.00	40.00	40.00	35.00	25.00
Litter	25.00	25.00	30.00	5.00	10.00	10.00	25.00	25.00	25.00	10.00
Bareground	5.00	15.00	5.00	25.00	5.00	20.00	25.00	15.00	25.00	45.00
Rock	20.00	20.00	15.00	40.00	50.00	30.00	10.00	20.00	15.00	20.00
% COMPOSITION										
Shrubs	20.00	0.00	60.00	50.00	42.86	37.50	12.50	37.50	28.57	0.00
Forbs	10.00	25.00	0.00	40.00	14.29	12.50	12.50	12.50	42.86	0.00
Grasses	70.00	75.00	40.00	10.00	42.86	50.00	75.00	50.00	28.57	100.00

11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00
0.00	5.00	0.00	0.00	15.00	5.00	15.00	20.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	5.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	0.00	0.00
10.00	0.00	0.00	10.00	5.00	5.00	10.00	0.00	0.00	5.00	0.00	10.00	0.00
5.00	15.00	20.00	40.00	5.00	20.00	0.00	0.00	0.00	10.00	0.00	25.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	5.00	5.00	10.00	0.00	15.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
20.00	10.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	5.00	35.00	0.00	0.00	0.00
0.00	0.00	20.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00
50.00	40.00	45.00	50.00	50.00	45.00	35.00	40.00	35.00	50.00	25.00	35.00	40.00
20.00	10.00	30.00	5.00	25.00	10.00	10.00	25.00	10.00	25.00	5.00	10.00	25.00
10.00	25.00	5.00	5.00	5.00	20.00	35.00	5.00	30.00	5.00	25.00	35.00	30.00
20.00	25.00	20.00	40.00	20.00	25.00	20.00	30.00	25.00	20.00	45.00	20.00	5.00
0.00	12.50	11.11	0.00	30.00	22.22	42.86	50.00	28.57	0.00	0.00	0.00	0.00
30.00	37.50	44.44	100.00	20.00	55.56	28.57	0.00	14.29	30.00	20.00	100.00	50.00
70.00	50.00	44.44	0.00	50.00	22.22	28.57	50.00	57.14	70.00	80.00	0.00	50.00

BEAVERCREEK/BLACKHAWK
Huntington #4
Reclaimed Road
Exposure: Variable
Slope: Variable
Sample Date: 30 Aug 1994

24.00	25.00	26.00	27.00	28.00	29.00	30.00	Mean	SDev	Freq	
										TREES & SHRUBS
5.00	0.00	20.00	15.00	0.00	0.00	0.00	7.17	8.03	56.67	Chrysothamnus nauseosus
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	1.70	13.33	Cercocarpus ledifolius
										FORBS
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	1.25	6.67	Machaeranthera canescens
0.00	0.00	5.00	5.00	0.00	0.00	0.00	3.37	3.59	53.33	Penstemon pachyphyllus
5.00	25.00	15.00	30.00	0.00	35.00	25.00	10.70	11.74	66.67	Astragalus cicer
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.90	3.33	Cynoglossum officinale
										GRASSES
0.00	0.00	0.00	5.00	25.00	5.00	5.00	3.50	5.94	36.67	Stipa hymenoides
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	2.61	10.00	Bromus inermis
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.98	6.67	Dactylis glomerata
0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.33	4.61	26.67	Agropyron cristatum
0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	3.01	13.33	Bromus carinatus
25.00	0.00	0.00	0.00	0.00	0.00	0.00	5.83	9.41	36.67	Elymus lanceolatus
0.00	25.00	15.00	0.00	0.00	10.00	10.00	4.17	6.84	33.33	Elymus spicatus
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	3.59	3.33	Elymus salinus
										COVER
40.00	50.00	55.00	55.00	25.00	50.00	40.00	41.33	8.46		Total Living Cover
10.00	25.00	5.00	20.00	20.00	10.00	15.00	16.83	8.31		Litter
40.00	20.00	20.00	20.00	20.00	20.00	5.00	18.83	11.45		Bareground
10.00	5.00	20.00	5.00	35.00	20.00	40.00	23.00	11.37		Rock
										% COMPOSITION
12.50	0.00	36.36	27.27	0.00	0.00	0.00	18.74	18.82		Shrubs
25.00	50.00	36.36	63.64	0.00	70.00	62.50	33.58	26.39		Forbs
62.50	50.00	27.27	9.09	100.00	30.00	37.50	47.67	25.57		Grasses

BEAVERCREEK/BLACKHAWK
Huntington #4
Reference Area
Exposure: SSW
Slope: 34 deg.

Sample Date: 31 Aug 1994	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Pinus edulis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	5.00
Cercocarpus ledifolius	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00
Juniperus osteosperma	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS										
Cryptantha sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES										
Elymus salinus	15.00	35.00	40.00	10.00	25.00	20.00	45.00	20.00	30.00	20.00
Stipa hymenoides	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER										
OverStory	0.00	0.00	0.00	35.00	20.00	0.00	0.00	0.00	25.00	35.00
Understory	15.00	35.00	40.00	30.00	40.00	20.00	45.00	20.00	40.00	25.00
Litter	5.00	25.00	15.00	25.00	45.00	10.00	30.00	5.00	30.00	10.00
Bareground	10.00	10.00	5.00	10.00	5.00	20.00	10.00	50.00	20.00	35.00
Rock	70.00	30.00	40.00	35.00	10.00	50.00	15.00	25.00	10.00	30.00
% COMPOSITION										
Shrubs	0.00	0.00	0.00	50.00	37.50	0.00	0.00	0.00	25.00	20.00
Forbs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grasses	100.00	100.00	100.00	50.00	62.50	100.00	100.00	100.00	75.00	80.00

11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00
20.00	0.00	0.00	0.00	20.00	15.00	30.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	50.00	35.00	20.00	15.00	20.00	5.00	0.00	15.00	20.00	15.00	25.00	35.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	20.00	0.00	10.00	0.00	0.00	0.00
0.00	50.00	0.00	15.00	0.00	0.00	0.00	0.00	10.00	10.00	0.00	10.00	0.00
35.00	50.00	35.00	25.00	35.00	40.00	35.00	20.00	20.00	30.00	15.00	35.00	35.00
25.00	40.00	20.00	20.00	25.00	10.00	25.00	25.00	25.00	20.00	5.00	15.00	25.00
10.00	5.00	5.00	30.00	5.00	15.00	5.00	10.00	10.00	5.00	5.00	25.00	15.00
30.00	5.00	40.00	25.00	35.00	35.00	35.00	45.00	45.00	45.00	75.00	25.00	25.00
57.14	0.00	0.00	20.00	57.14	37.50	85.71	0.00	25.00	0.00	0.00	28.57	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42.86	100.00	100.00	80.00	42.86	62.50	14.29	100.00	75.00	100.00	100.00	71.43	100.00

24.00	25.00	26.00	27.00	28.00	29.00	30.00	31.00	32.00	33.00	34.00	35.00	36.00
30.00	0.00	10.00	0.00	50.00	0.00	0.00	20.00	0.00	0.00	35.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	50.00	5.00	0.00	0.00	0.00	0.00	5.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	10.00	15.00	15.00	0.00	0.00	0.00	5.00	35.00	40.00	0.00	15.00	20.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.00	0.00	10.00	0.00	35.00	0.00	0.00	0.00	0.00	20.00	50.00	0.00	0.00
40.00	20.00	35.00	15.00	50.00	50.00	5.00	25.00	35.00	40.00	35.00	20.00	20.00
50.00	5.00	10.00	35.00	5.00	20.00	5.00	65.00	10.00	25.00	25.00	10.00	55.00
5.00	5.00	10.00	25.00	5.00	10.00	5.00	5.00	20.00	10.00	20.00	10.00	20.00
5.00	70.00	45.00	25.00	40.00	20.00	85.00	5.00	35.00	25.00	20.00	60.00	5.00
75.00	25.00	28.57	0.00	100.00	100.00	100.00	80.00	0.00	0.00	100.00	25.00	0.00
0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	50.00	71.43	100.00	0.00	0.00	0.00	20.00	100.00	100.00	0.00	75.00	100.00

37.00	38.00	39.00	40.00	41.00	42.00	43.00	44.00	45.00	46.00	47.00	48.00
0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.00	25.00	20.00	30.00	20.00	40.00	25.00	10.00	20.00	30.00	15.00	35.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00
20.00	25.00	20.00	45.00	20.00	40.00	25.00	15.00	20.00	35.00	15.00	35.00
15.00	25.00	10.00	15.00	25.00	25.00	15.00	10.00	25.00	25.00	40.00	30.00
40.00	5.00	5.00	20.00	30.00	15.00	5.00	25.00	25.00	30.00	5.00	15.00
25.00	45.00	65.00	20.00	25.00	20.00	55.00	50.00	30.00	10.00	40.00	20.00
0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	100.00	100.00	66.67	100.00	100.00	100.00	100.00	100.00	85.71	100.00	100.00

BEAVERCREEK/BLACKHAWK
Huntington #4
Reference Area
Exposure: SSW
Slope: 34 deg.
Sample Date: 31 Aug 1994

49.00	50.00	Mean	SDev	Freq	
					TREES & SHRUBS
0.00	0.00	5.30	10.97	26.00	Pinus edulis
0.00	0.00	0.50	2.29	6.00	Cercocarpus ledifolius
0.00	0.00	1.80	7.40	12.00	Juniperus osteosperma
					FORBS
0.00	0.00	0.10	0.70	2.00	Cryptantha sp.
					GRASSES
15.00	0.00	20.00	12.45	88.00	Elymus salinus
0.00	30.00	1.70	5.35	14.00	Stipa hymenoides
					COVER
0.00	0.00	8.20	14.20		OverStory
15.00	30.00	29.40	10.80		Understory
15.00	10.00	21.70	13.21		Litter
50.00	5.00	14.90	11.64		Bareground
20.00	55.00	34.00	18.97		Rock
					% COMPOSITION
0.00	0.00	22.50	32.30		Shrubs
0.00	0.00	0.50	3.50		Forbs
100.00	100.00	77.00	32.53		Grasses

BEAVERCREEK/BLACKHAWK
Huntington #4
Riparian
Exposure: E
Slope: 2 deg

Sample Date: 31 Aug 1994	1.00	2.00	3.00	4.00	5.00	Mean	SDev	Freq
TREES & SHRUBS								
Salix lutea	20.00	50.00	20.00	25.00	0.00	23.00	16.00	80.00
FORBS								
Trifolium pratense	0.00	0.00	0.00	0.00	5.00	1.00	2.00	20.00
Agoseris aurantiaca	0.00	0.00	5.00	5.00	0.00	2.00	2.45	40.00
Mentha arvensis	0.00	0.00	5.00	0.00	0.00	1.00	2.00	20.00
Astragalus cicer	5.00	0.00	25.00	0.00	20.00	10.00	10.49	60.00
Geranium richardsonii	5.00	0.00	0.00	0.00	0.00	1.00	2.00	20.00
Equisetum arvensis	5.00	5.00	0.00	25.00	0.00	7.00	9.27	60.00
Medicago sativa	0.00	0.00	5.00	5.00	0.00	2.00	2.45	40.00
GRASSES								
Dactylis glomeratus	15.00	10.00	10.00	5.00	45.00	17.00	14.35	100.00
COVER								
Total Living Cover	50.00	65.00	70.00	65.00	70.00	64.00	7.35	
Litter	20.00	25.00	5.00	20.00	20.00	18.00	6.78	
Bareground	5.00	5.00	5.00	5.00	5.00	5.00	0.00	
Rock	25.00	5.00	20.00	10.00	5.00	13.00	8.12	
% COMPOSITION								
Shrubs	40.00	76.92	28.57	38.46	0.00	36.79	24.68	
Forbs	30.00	7.69	57.14	53.85	35.71	36.88	17.88	
Grasses	30.00	15.38	14.29	7.69	64.29	26.33	20.33	

BEAVERCREEK/BLACKHAWK
Huntington #4
Riparian Reference Area
Exposure: E
Slope: 2 deg

Sample Date: 31 Aug 1994	1 thru 5 West					6 thru 10 East				
	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Salix lutea	20.00	25.00	15.00	0.00	0.00	0.00	45.00	15.00	0.00	0.00
Cornus sericea	0.00	0.00	0.00	15.00	25.00	0.00	0.00	0.00	0.00	0.00
Rosa woodsii	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00
FORBS										
Epilobium sp.	0.00	0.00	10.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
Equisetum arvense	0.00	0.00	20.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00
Galium bifolium	0.00	0.00	0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00
GRASSES										
Dactylis glomeratus	30.00	25.00	5.00	0.00	20.00	15.00	0.00	35.00	30.00	0.00
Calamagrostis canadensis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.00
Bromus inermis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00
Poa pratensis	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00
Agrostis stolonifera	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00
Phleum alpinum	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00
COVER										
Total Living Cover	50.00	50.00	50.00	75.00	55.00	55.00	70.00	50.00	50.00	65.00
Litter	20.00	25.00	20.00	20.00	10.00	5.00	25.00	25.00	10.00	20.00
Bareground	25.00	20.00	25.00	4.00	30.00	35.00	4.00	5.00	5.00	5.00
Rock	5.00	5.00	5.00	1.00	5.00	5.00	1.00	20.00	35.00	10.00
% COMPOSITION										
Shrubs	40.00	50.00	30.00	20.00	45.45	27.27	64.29	30.00	0.00	0.00
Forbs	0.00	0.00	60.00	46.67	18.18	0.00	0.00	0.00	0.00	0.00
Grasses	60.00	50.00	10.00	33.33	36.36	72.73	35.71	70.00	100.00	100.00

BEAVERCREEK/BLACKHAWK
Huntington #4
Riparian Reference Area
Exposure: E
Slope: 2 deg
Sample Date: 31 Aug 1994

10.00	Mean	SDev	Freq	
				TREES & SHRUBS
0.00	12.00	14.35	50.00	Salix lutea
0.00	4.00	8.31	20.00	Cornus sericea
0.00	1.50	4.50	10.00	Rosa woodsii
				FORBS
0.00	1.50	3.20	20.00	Epilobium sp.
0.00	4.00	8.00	20.00	Equisetum arvense
0.00	2.00	4.00	20.00	Galium bifolium
				GRASSES
0.00	16.00	13.19	70.00	Dactylis glomeratus
65.00	6.50	19.50	10.00	Calamagrostis canadensis
0.00	2.00	6.00	10.00	Bromus inermis
0.00	2.50	7.50	10.00	Poa pratensis
0.00	2.50	7.50	10.00	Agrostis stolonifera
0.00	2.50	7.50	10.00	Phleum alpinum
				COVER
65.00	57.00	9.00		Total Living Cover
20.00	18.00	6.78		Litter
5.00	15.80	11.77		Bareground
10.00	9.20	10.03		Rock
				% COMPOSITION
0.00	30.70	19.54		Shrubs
0.00	12.48	21.33		Forbs
100.00	56.81	27.96		Grasses

APPENDIX B:

RAW DATA
(Production)

BLACKHAWK: HUNTINGTON #4

[illegible]er Reveg.

[illegible]DUCTION

8/29/94

AREA "A"	Wt.Herb.g/m2	Proportion	Tot.Herb.g/m	Tot.Herb.lbs/m2	Herb.lbs/Ac	Wt.Wood.g/m2	Proportion	Tot.Wood.g/m	Tot.Wood.lbs/m2	Wood.lbs/Ac	Tot.lbs/Ac	Prop. a
1.00	21.00	0.50	42.00	0.09	374.78	0.00	0.50	0.00	0.00	0.00	374.78	0.70
2.00	33.00	0.50	66.00	0.15	588.94	0.00	0.50	0.00	0.00	0.00	588.94	0.50
3.00	16.00	0.50	32.00	0.07	285.55	0.00	0.50	0.00	0.00	0.00	285.55	1.00
4.00	23.00	0.50	46.00	0.10	410.47	0.00	0.50	0.00	0.00	0.00	410.47	2.00
5.00	18.00	0.50	36.00	0.08	321.24	0.00	0.50	0.00	0.00	0.00	321.24	1.00
6.00	12.00	0.50	24.00	0.05	214.16	12.00	0.50	24.00	0.05	214.16	428.32	0.80
7.00	10.00	0.50	20.00	0.04	178.47	10.00	0.50	20.00	0.04	178.47	356.93	1.00
8.00	15.00	0.50	30.00	0.07	267.70	8.00	0.50	16.00	0.04	142.77	410.47	1.00
9.00	22.00	0.50	44.00	0.10	392.63	8.00	0.50	16.00	0.04	142.77	535.40	0.70
10.00	29.00	0.50	58.00	0.13	517.55	0.00	0.50	0.00	0.00	0.00	517.55	0.70
AREA "B"												
11.00	6.00	0.50	12.00	0.03	107.08	10.00	0.50	20.00	0.04	178.47	285.55	1.00
12.00	40.00	0.50	80.00	0.18	713.87	0.00	0.50	0.00	0.00	0.00	713.87	0.25
13.00	18.00	0.50	36.00	0.08	321.24	13.00	0.50	26.00	0.06	232.01	553.25	1.00
14.00	5.00	0.50	10.00	0.02	89.23	7.00	0.50	14.00	0.03	124.93	214.16	1.00
15.00	9.00	0.50	18.00	0.04	160.62	0.00	0.50	0.00	0.00	0.00	160.62	1.30
16.00	17.00	0.50	34.00	0.07	303.39	11.00	0.50	22.00	0.05	196.31	499.71	0.50
17.00	6.00	0.50	12.00	0.03	107.08	22.00	0.50	44.00	0.10	392.63	499.71	1.00
18.00	16.00	0.50	32.00	0.07	285.55	0.00	0.50	0.00	0.00	0.00	285.55	0.75
19.00	34.00	0.50	68.00	0.15	606.79	1.00	1.00	1.00	0.00	8.92	615.71	0.20
20.00	35.00	0.50	70.00	0.15	624.63	0.00	0.50	0.00	0.00	0.00	624.63	0.25
AREA "C"												
21.00	11.00	0.50	22.00	0.05	196.31	5.00	0.50	10.00	0.02	89.23	285.55	1.00
22.00	18.00	0.50	36.00	0.08	321.24	7.00	0.50	14.00	0.03	124.93	446.17	2.00
23.00	22.00	0.50	44.00	0.10	392.63	10.00	0.50	20.00	0.04	178.47	571.09	1.50
24.00	27.00	0.50	54.00	0.12	481.86	0.00	0.50	0.00	0.00	0.00	481.86	1.00
25.00	53.00	0.50	106.00	0.23	945.87	0.00	0.50	0.00	0.00	0.00	945.87	0.50
26.00	25.00	0.50	50.00	0.11	446.17	0.00	0.50	0.00	0.00	0.00	446.17	1.00
27.00	28.00	0.50	56.00	0.12	499.71	0.00	0.50	0.00	0.00	0.00	499.71	0.50
28.00	12.00	0.50	24.00	0.05	214.16	0.00	0.50	0.00	0.00	0.00	214.16	3.00

aHerb.lbs/Ac	aWood.lbs/Ac	aTot.lbs/Ac	Prop. b	bHerb.lbs/Ac	bWood.lbs/Ac	bTot.lbs/Ac	Prop. c	cHerb.lbs/Ac	cWood.lbs/Ac	cTot.lbs/Ac	Prop. d	dHerb.lbs/Ac
262.35	0.00	262.35	0.70	262.35	0.00	262.35	1.00	374.78	0.00	374.78	1.00	374.78
294.47	0.00	294.47	1.00	588.94	0.00	588.94	0.25	147.23	0.00	147.23	0.25	147.23
285.55	0.00	285.55	1.00	285.55	0.00	285.55	0.70	199.88	0.00	199.88	1.50	428.32
820.95	0.00	820.95	1.25	513.09	0.00	513.09	1.00	410.47	0.00	410.47	1.50	615.71
321.24	0.00	321.24	1.00	321.24	0.00	321.24	3.00	963.72	0.00	963.72	1.00	321.24
171.33	171.33	342.66	0.50	107.08	107.08	214.16	0.60	128.50	128.50	256.99	0.40	85.66
178.47	178.47	356.93	1.00	178.47	178.47	356.93	1.00	178.47	178.47	356.93	1.00	178.47
267.70	142.77	410.47	1.00	267.70	142.77	410.47	1.50	401.55	214.16	615.71	1.25	334.62
274.84	99.94	374.78	0.75	294.47	107.08	401.55	1.00	392.63	142.77	535.40	1.00	392.63
362.29	0.00	362.29	0.70	362.29	0.00	362.29	1.00	517.55	0.00	517.55	0.50	258.78
107.08	178.47	285.55	1.50	160.62	267.70	428.32	0.75	80.31	133.85	214.16	1.00	107.08
178.47	0.00	178.47	0.25	178.47	0.00	178.47	0.25	178.47	0.00	178.47	0.35	249.85
321.24	232.01	553.25	1.00	321.24	232.01	553.25	1.00	321.24	232.01	553.25	1.00	321.24
89.23	124.93	214.16	2.00	178.47	249.85	428.32	1.00	89.23	124.93	214.16	2.00	178.47
208.81	0.00	208.81	1.00	160.62	0.00	160.62	1.30	208.81	0.00	208.81	1.00	160.62
151.70	98.16	249.85	1.00	303.39	196.31	499.71	1.00	303.39	196.31	499.71	0.50	151.70
107.08	392.63	499.71	0.30	32.12	117.79	149.91	1.00	107.08	392.63	499.71	0.75	80.31
214.16	0.00	214.16	0.75	214.16	0.00	214.16	1.50	428.32	0.00	428.32	1.00	285.55
121.36	1.78	123.14	0.50	303.39	4.46	307.85	0.50	303.39	4.46	307.85	0.30	182.04
156.16	0.00	156.16	0.50	312.32	0.00	312.32	0.50	312.32	0.00	312.32	0.20	124.93
196.31	89.23	285.55	1.00	196.31	89.23	285.55	1.50	294.47	133.85	428.32	1.00	196.31
642.48	249.85	892.33	1.00	321.24	124.93	446.17	2.00	642.48	249.85	892.33	1.00	321.24
588.94	267.70	856.64	1.00	392.63	178.47	571.09	1.00	392.63	178.47	571.09	1.00	392.63
481.86	0.00	481.86	0.70	337.30	0.00	337.30	0.50	240.93	0.00	240.93	1.00	481.86
472.94	0.00	472.94	0.30	283.76	0.00	283.76	0.25	236.47	0.00	236.47	0.25	236.47
446.17	0.00	446.17	0.50	223.08	0.00	223.08	0.70	312.32	0.00	312.32	0.50	223.08
249.85	0.00	249.85	1.20	599.65	0.00	599.65	0.75	374.78	0.00	374.78	1.00	499.71
642.48	0.00	642.48	2.00	428.32	0.00	428.32	1.00	214.16	0.00	214.16	1.00	214.16

dWood.lbs/Ac	dTot.lbs/Ac	MeanHerb	StdHerb	MeanWood	StdWood	MeanTot	StdTot
0.00	374.78	329.81	55.08	0.00	0.00	329.81	55.08
0.00	147.23	353.36	199.72	0.00	0.00	353.36	199.72
0.00	428.32	296.97	73.58	0.00	0.00	296.97	73.58
0.00	615.71	554.14	153.58	0.00	0.00	554.14	153.58
0.00	321.24	449.74	256.99	0.00	0.00	449.74	256.99
85.66	171.33	141.35	46.13	141.35	46.13	282.69	92.26
178.47	356.93	178.47	0.00	178.47	0.00	356.93	0.00
178.47	513.09	307.85	53.54	164.19	28.55	472.04	82.09
142.77	535.40	349.44	53.26	127.07	19.37	476.51	72.63
0.00	258.78	403.69	100.36	0.00	0.00	403.69	100.36
		Tot.Mean Herb=	Tot.Std. Herb=	Tot.Mean Woody=	Tot.Std. Woody=	Tot.Mean Total=	Tot.Std. Total=
		336.48	*114.30*	*61.11*	*75.89*	*397.59*	*84.00*
178.47	285.55	112.43	26.23	187.39	43.72	299.82	69.94
0.00	249.85	299.82	208.86	0.00	0.00	299.82	208.86
232.01	553.25	321.24	0.00	232.01	0.00	553.25	0.00
249.85	428.32	124.93	43.72	174.90	61.20	299.82	104.92
0.00	160.62	179.89	23.61	0.00	0.00	179.89	23.61
98.16	249.85	242.71	74.32	157.05	48.09	399.77	122.40
294.47	374.78	86.73	29.21	318.03	107.09	404.76	136.30
0.00	285.55	285.55	78.20	0.00	0.00	285.55	78.20
2.68	164.71	303.39	167.28	4.46	2.46	307.85	169.74
0.00	124.93	306.07	177.11	0.00	0.00	306.07	177.11
		Tot.Mean Herb=	Tot.Std. Herb=	Tot.Mean Woody=	Tot.Std. Woody=	Tot.Mean Total=	Tot.Std. Total=
		226.28	*86.82*	*107.38*	*114.04*	*333.66*	*94.06*
89.23	285.55	215.94	39.26	98.16	17.85	314.10	57.11
124.93	446.17	449.74	157.37	174.90	61.20	624.63	218.58
178.47	571.09	431.89	78.53	196.31	35.69	628.20	114.22
0.00	481.86	404.76	99.22	0.00	0.00	404.76	99.22
0.00	236.47	435.10	269.86	0.00	0.00	435.10	269.86
0.00	223.08	330.16	100.16	0.00	0.00	330.16	100.16
0.00	499.71	444.74	120.76	0.00	0.00	444.74	120.76
0.00	214.16	342.66	171.33	0.00	0.00	342.66	171.33
		Tot.Mean Herb=	Tot.Std. Herb=	Tot.Mean Woody=	Tot.Std. Woody=	Tot.Mean Total=	Tot.Std. Total=
		364.69	*86.72*	*64.06*	*78.98*	*428.67*	*114.67*

AREA "D"

29.00	8.00	0.50	16.00	0.04	142.77	7.00	0.50	14.00	0.03	124.93	267.70	1.00
30.00	12.00	0.50	24.00	0.05	214.16	0.00	0.50	0.00	0.00	0.00	214.16	1.00
31.00	26.00	0.50	52.00	0.11	464.01	5.00	0.50	10.00	0.02	89.23	553.25	1.70
32.00	22.00	0.50	44.00	0.10	392.63	14.00	0.50	28.00	0.06	249.85	642.48	1.00
33.00	21.00	0.50	42.00	0.09	374.78	17.00	0.50	34.00	0.07	303.39	678.17	1.00
34.00	36.00	0.50	72.00	0.16	642.48	13.00	0.50	26.00	0.06	232.01	874.49	1.00
35.00	21.00	0.50	42.00	0.09	374.78	0.00	0.50	0.00	0.00	0.00	374.78	2.00

AREA "E"

36.00	26.00	0.50	52.00	0.11	464.01	6.00	0.50	12.00	0.03	107.08	571.09	0.75
37.00	26.00	0.50	52.00	0.11	464.01	0.00	0.50	0.00	0.00	0.00	464.01	0.50
38.00	14.00	0.50	28.00	0.06	249.85	22.00	0.50	44.00	0.10	392.63	642.48	0.50
39.00	25.00	0.50	50.00	0.11	446.17	2.00	0.50	4.00	0.01	35.69	481.86	2.00
40.00	24.00	0.50	48.00	0.11	428.32	0.00	0.50	0.00	0.00	0.00	428.32	1.00
41.00	43.00	0.50	86.00	0.19	767.41	0.00	0.50	0.00	0.00	0.00	767.41	2.00
42.00	28.00	0.50	56.00	0.12	499.71	0.00	0.50	0.00	0.00	0.00	499.71	1.00
43.00	18.00	0.50	36.00	0.08	321.24	0.00	0.50	0.00	0.00	0.00	321.24	2.00

142.77	124.93	267.70	1.00	142.77	124.93	267.70	1.00	142.77	124.93	267.70	1.50	214.16
214.16	0.00	214.16	1.00	214.16	0.00	214.16	1.00	214.16	0.00	214.16	1.00	214.16
788.82	151.70	940.52	1.00	464.01	89.23	553.25	1.00	464.01	89.23	553.25	0.70	324.81
392.63	249.85	642.48	1.00	392.63	249.85	642.48	1.50	588.94	374.78	963.72	0.50	196.31
374.78	303.39	678.17	1.00	374.78	303.39	678.17	1.00	374.78	303.39	678.17	1.50	562.17
642.48	232.01	874.49	1.50	963.72	348.01	1311.73	1.50	963.72	348.01	1311.73	0.30	192.74
749.56	0.00	749.56	3.00	1124.34	0.00	1124.34	1.00	374.78	0.00	374.78	1.00	374.78

348.01	80.31	428.32	1.50	696.02	160.62	856.64	0.10	46.40	10.71	57.11	0.75	348.01
232.01	0.00	232.01	0.70	324.81	0.00	324.81	0.70	324.81	0.00	324.81	1.30	603.22
124.93	196.31	321.24	0.50	124.93	196.31	321.24	1.00	249.85	392.63	642.48	2.00	499.71
892.33	71.39	963.72	1.00	446.17	35.69	481.86	1.50	669.25	53.54	722.79	2.00	892.33
428.32	0.00	428.32	0.50	214.16	0.00	214.16	1.00	428.32	0.00	428.32	1.00	428.32
1534.81	0.00	1534.81	1.00	767.41	0.00	767.41	1.00	767.41	0.00	767.41	1.00	767.41
499.71	0.00	499.71	1.00	499.71	0.00	499.71	1.00	499.71	0.00	499.71	1.00	499.71
642.48	0.00	642.48	1.00	321.24	0.00	321.24	2.00	642.48	0.00	642.48	1.00	321.24

187.39	401.55	157.05	28.55	137.42	24.99	294.47	53.54
0.00	214.16	214.16	0.00	0.00	0.00	214.16	0.00
62.46	387.27	501.13	153.62	96.37	29.54	597.51	183.16
124.93	321.24	392.63	124.16	249.85	79.01	642.48	203.17
455.09	1017.26	412.26	74.96	333.73	60.68	745.99	135.63
69.60	262.35	681.03	283.27	245.93	102.29	926.96	385.57
0.00	374.78	599.65	299.82	0.00	0.00	599.65	299.82
		Tot.Mean Herb=	Tot.Std. Herb=	Tot.Mean Woody=	Tot.Std. Woody=	Tot.Mean Total=	Tot.Std. Total=
		369.17	***204.27***	***125.27***	***118.01***	***494.43***	***271.07***

80.31	428.32	380.49	209.89	87.81	48.44	468.30	258.32
0.00	603.22	389.77	129.92	0.00	0.00	389.77	129.92
785.25	1284.96	249.85	136.85	392.63	215.05	642.48	351.90
71.39	963.72	669.25	199.53	53.54	15.96	722.79	215.49
0.00	428.32	385.49	85.68	0.00	0.00	385.49	85.68
0.00	767.41	920.89	306.96	0.00	0.00	920.89	306.96
0.00	499.71	499.71	0.00	0.00	0.00	499.71	0.00
0.00	321.24	449.74	157.37	0.00	0.00	449.74	157.37
		Tot.Mean Herb=	Tot.Std. Herb=	Tot.Mean Woody=	Tot.Std. Woody=	Tot.Mean Total=	Tot.Std. Total=
		493.15	***196.87***	***66.75***	***127.03***	***559.89***	***175.78***

BLACKHAWK: HUNTINGTON #4

ver Reveg.

ODUCTION

8/29/94

AREA "A"	Wt.Herb.g/m2	Proportion	Tot.Herb.g/m	Tot.Herb.lbs/m2	Herb.lbs/Ac	Wt.Wood.g/m2	Proportion	Tot.Wood.g/m	Tot.Wood.lbs/m2	Wood.lbs/Ac	Tot.lbs/Ac
1.00	21.00	0.50	42.00	0.09	374.78	0.00	0.50	0.00	0.00	0.00	374.78
2.00	33.00	0.50	66.00	0.15	588.94	0.00	0.50	0.00	0.00	0.00	588.94
3.00	16.00	0.50	32.00	0.07	285.55	0.00	0.50	0.00	0.00	0.00	285.55
4.00	23.00	0.50	46.00	0.10	410.47	0.00	0.50	0.00	0.00	0.00	410.47
5.00	18.00	0.50	36.00	0.08	321.24	0.00	0.50	0.00	0.00	0.00	321.24
6.00	12.00	0.50	24.00	0.05	214.16	12.00	0.50	24.00	0.05	214.16	428.32
7.00	10.00	0.50	20.00	0.04	178.47	10.00	0.50	20.00	0.04	178.47	356.93
8.00	15.00	0.50	30.00	0.07	267.70	8.00	0.50	16.00	0.04	142.77	410.47
9.00	22.00	0.50	44.00	0.10	392.63	8.00	0.50	16.00	0.04	142.77	535.40
10.00	29.00	0.50	58.00	0.13	517.55	0.00	0.50	0.00	0.00	0.00	517.55
AREA "B"											
11.00	6.00	0.50	12.00	0.03	107.08	10.00	0.50	20.00	0.04	178.47	285.55
12.00	40.00	0.50	80.00	0.18	713.87	0.00	0.50	0.00	0.00	0.00	713.87
13.00	18.00	0.50	36.00	0.08	321.24	13.00	0.50	26.00	0.06	232.01	553.25
14.00	5.00	0.50	10.00	0.02	89.23	7.00	0.50	14.00	0.03	124.93	214.16
15.00	9.00	0.50	18.00	0.04	160.62	0.00	0.50	0.00	0.00	0.00	160.62
16.00	17.00	0.50	34.00	0.07	303.39	11.00	0.50	22.00	0.05	196.31	499.71
17.00	6.00	0.50	12.00	0.03	107.08	22.00	0.50	44.00	0.10	392.63	499.71
18.00	16.00	0.50	32.00	0.07	285.55	0.00	0.50	0.00	0.00	0.00	285.55
19.00	34.00	0.50	68.00	0.15	606.79	1.00	1.00	1.00	0.00	8.92	615.71
20.00	35.00	0.50	70.00	0.15	624.63	0.00	0.50	0.00	0.00	0.00	624.63
AREA "C"											
21.00	11.00	0.50	22.00	0.05	196.31	5.00	0.50	10.00	0.02	89.23	285.55
22.00	18.00	0.50	36.00	0.08	321.24	7.00	0.50	14.00	0.03	124.93	446.17
23.00	22.00	0.50	44.00	0.10	392.63	10.00	0.50	20.00	0.04	178.47	571.09
24.00	27.00	0.50	54.00	0.12	481.86	0.00	0.50	0.00	0.00	0.00	481.86
25.00	53.00	0.50	106.00	0.23	945.87	0.00	0.50	0.00	0.00	0.00	945.87
26.00	25.00	0.50	50.00	0.11	446.17	0.00	0.50	0.00	0.00	0.00	446.17
27.00	28.00	0.50	56.00	0.12	499.71	0.00	0.50	0.00	0.00	0.00	499.71
28.00	12.00	0.50	24.00	0.05	214.16	0.00	0.50	0.00	0.00	0.00	214.16
AREA "D"											
29.00	8.00	0.50	16.00	0.04	142.77	7.00	0.50	14.00	0.03	124.93	267.70
30.00	12.00	0.50	24.00	0.05	214.16	0.00	0.50	0.00	0.00	0.00	214.16
31.00	26.00	0.50	52.00	0.11	464.01	5.00	0.50	10.00	0.02	89.23	553.25
32.00	22.00	0.50	44.00	0.10	392.63	14.00	0.50	28.00	0.06	249.85	642.48
33.00	21.00	0.50	42.00	0.09	374.78	17.00	0.50	34.00	0.07	303.39	678.17
34.00	36.00	0.50	72.00	0.16	642.48	13.00	0.50	26.00	0.06	232.01	874.49
35.00	21.00	0.50	42.00	0.09	374.78	0.00	0.50	0.00	0.00	0.00	374.78
AREA "E"											
36.00	26.00	0.50	52.00	0.11	464.01	6.00	0.50	12.00	0.03	107.08	571.09
37.00	26.00	0.50	52.00	0.11	464.01	0.00	0.50	0.00	0.00	0.00	464.01
38.00	14.00	0.50	28.00	0.06	249.85	22.00	0.50	44.00	0.10	392.63	642.48
39.00	25.00	0.50	50.00	0.11	446.17	2.00	0.50	4.00	0.01	35.69	481.86
40.00	24.00	0.50	48.00	0.11	428.32	0.00	0.50	0.00	0.00	0.00	428.32
41.00	43.00	0.50	86.00	0.19	767.41	0.00	0.50	0.00	0.00	0.00	767.41
42.00	28.00	0.50	56.00	0.12	499.71	0.00	0.50	0.00	0.00	0.00	499.71
43.00	18.00	0.50	36.00	0.08	321.24	0.00	0.50	0.00	0.00	0.00	321.24

Prop. a	aHerb.lbs/Ac	aWood.lbs/Ac	aTot.lbs/Ac	Prop. b	bHerb.lbs/Ac	bWood.lbs/Ac	bTot.lbs/Ac	Prop. c	cHerb.lbs/Ac	cWood.lbs/Ac	cTot.lbs/Ac	Prop. d	dHerb.lbs/Ac
0.70	262.35	0.00	262.35	0.70	262.35	0.00	262.35	1.00	374.78	0.00	374.78	1.00	374.78
0.50	294.47	0.00	294.47	1.00	588.94	0.00	588.94	0.25	147.23	0.00	147.23	0.25	147.23
1.00	285.55	0.00	285.55	1.00	285.55	0.00	285.55	0.70	199.88	0.00	199.88	1.50	428.32
2.00	820.95	0.00	820.95	1.25	513.09	0.00	513.09	1.00	410.47	0.00	410.47	1.50	615.71
1.00	321.24	0.00	321.24	1.00	321.24	0.00	321.24	3.00	963.72	0.00	963.72	1.00	321.24
0.80	171.33	171.33	342.66	0.50	107.08	107.08	214.16	0.60	128.50	128.50	256.99	0.40	85.66
1.00	178.47	178.47	356.93	1.00	178.47	178.47	356.93	1.00	178.47	178.47	356.93	1.00	178.47
1.00	267.70	142.77	410.47	1.00	267.70	142.77	410.47	1.50	401.55	214.16	615.71	1.25	334.62
0.70	274.84	99.94	374.78	0.75	294.47	107.08	401.55	1.00	392.63	142.77	535.40	1.00	392.63
0.70	362.29	0.00	362.29	0.70	362.29	0.00	362.29	1.00	517.55	0.00	517.55	0.50	258.78
1.00	107.08	178.47	285.55	1.50	160.62	267.70	428.32	0.75	80.31	133.85	214.16	1.00	107.08
0.25	178.47	0.00	178.47	0.25	178.47	0.00	178.47	0.25	178.47	0.00	178.47	0.35	249.85
1.00	321.24	232.01	553.25	1.00	321.24	232.01	553.25	1.00	321.24	232.01	553.25	1.00	321.24
1.00	89.23	124.93	214.16	2.00	178.47	249.85	428.32	1.00	89.23	124.93	214.16	2.00	178.47
1.30	208.81	0.00	208.81	1.00	160.62	0.00	160.62	1.30	208.81	0.00	208.81	1.00	160.62
0.50	151.70	98.16	249.85	1.00	303.39	196.31	499.71	1.00	303.39	196.31	499.71	0.50	151.70
1.00	107.08	392.63	499.71	0.30	32.12	117.79	149.91	1.00	107.08	392.63	499.71	0.75	80.31
0.75	214.16	0.00	214.16	0.75	214.16	0.00	214.16	1.50	428.32	0.00	428.32	1.00	285.55
0.20	121.36	1.78	123.14	0.50	303.39	4.46	307.85	0.50	303.39	4.46	307.85	0.30	182.04
0.25	156.16	0.00	156.16	0.50	312.32	0.00	312.32	0.50	312.32	0.00	312.32	0.20	124.93
1.00	196.31	89.23	285.55	1.00	196.31	89.23	285.55	1.50	294.47	133.85	428.32	1.00	196.31
2.00	642.48	249.85	892.33	1.00	321.24	124.93	446.17	2.00	642.48	249.85	892.33	1.00	321.24
1.50	588.94	267.70	856.64	1.00	392.63	178.47	571.09	1.00	392.63	178.47	571.09	1.00	392.63
1.00	481.86	0.00	481.86	0.70	337.30	0.00	337.30	0.50	240.93	0.00	240.93	1.00	481.86
0.50	472.94	0.00	472.94	0.30	283.76	0.00	283.76	0.25	236.47	0.00	236.47	0.25	236.47
1.00	446.17	0.00	446.17	0.50	223.08	0.00	223.08	0.70	312.32	0.00	312.32	0.50	223.08
0.50	249.85	0.00	249.85	1.20	599.65	0.00	599.65	0.75	374.78	0.00	374.78	1.00	499.71
3.00	642.48	0.00	642.48	2.00	428.32	0.00	428.32	1.00	214.16	0.00	214.16	1.00	214.16
1.00	142.77	124.93	267.70	1.00	142.77	124.93	267.70	1.00	142.77	124.93	267.70	1.50	214.16
1.00	214.16	0.00	214.16	1.00	214.16	0.00	214.16	1.00	214.16	0.00	214.16	1.00	214.16
1.70	788.82	151.70	940.52	1.00	464.01	89.23	553.25	1.00	464.01	89.23	553.25	0.70	324.81
1.00	392.63	249.85	642.48	1.00	392.63	249.85	642.48	1.50	588.94	374.78	963.72	0.50	196.31
1.00	374.78	303.39	678.17	1.00	374.78	303.39	678.17	1.00	374.78	303.39	678.17	1.50	562.17
1.00	642.48	232.01	874.49	1.50	963.72	348.01	1311.73	1.50	963.72	348.01	1311.73	0.30	192.74
2.00	749.56	0.00	749.56	3.00	1124.34	0.00	1124.34	1.00	374.78	0.00	374.78	1.00	374.78
0.75	348.01	80.31	428.32	1.50	696.02	160.62	856.64	0.10	46.40	10.71	57.11	0.75	348.01
0.50	232.01	0.00	232.01	0.70	324.81	0.00	324.81	0.70	324.81	0.00	324.81	1.30	603.22
0.50	124.93	196.31	321.24	0.50	124.93	196.31	321.24	1.00	249.85	392.63	642.48	2.00	499.71
2.00	892.33	71.39	963.72	1.00	446.17	35.69	481.86	1.50	669.25	53.54	722.79	2.00	892.33
1.00	428.32	0.00	428.32	0.50	214.16	0.00	214.16	1.00	428.32	0.00	428.32	1.00	428.32
2.00	1534.81	0.00	1534.81	1.00	767.41	0.00	767.41	1.00	767.41	0.00	767.41	1.00	767.41
1.00	499.71	0.00	499.71	1.00	499.71	0.00	499.71	1.00	499.71	0.00	499.71	1.00	499.71
2.00	642.48	0.00	642.48	1.00	321.24	0.00	321.24	2.00	642.48	0.00	642.48	1.00	321.24

dWood.lbs/Ac	dTot.lbs/Ac	MeanHerb	StdHerb	MeanWood	StdWood	MeanTot	StdTot
0.00	374.78	329.81	55.08	0.00	0.00	329.81	55.08
0.00	147.23	353.36	199.72	0.00	0.00	353.36	199.72
0.00	428.32	296.97	73.58	0.00	0.00	296.97	73.58
0.00	615.71	554.14	153.58	0.00	0.00	554.14	153.58
0.00	321.24	449.74	256.99	0.00	0.00	449.74	256.99
85.66	171.33	141.35	46.13	141.35	46.13	282.69	92.26
178.47	356.93	178.47	0.00	178.47	0.00	356.93	0.00
178.47	513.09	307.85	53.54	164.19	28.55	472.04	82.09
142.77	535.40	349.44	53.26	127.07	19.37	476.51	72.63
0.00	258.78	403.69	100.36	0.00	0.00	403.69	100.36
178.47	285.55	112.43	26.23	187.39	43.72	299.82	69.94
0.00	249.85	299.82	208.86	0.00	0.00	299.82	208.86
232.01	553.25	321.24	0.00	232.01	0.00	553.25	0.00
249.85	428.32	124.93	43.72	174.90	61.20	299.82	104.92
0.00	160.62	179.89	23.61	0.00	0.00	179.89	23.61
98.16	249.85	242.71	74.32	157.05	48.09	399.77	122.40
294.47	374.78	86.73	29.21	318.03	107.09	404.76	136.30
0.00	285.55	285.55	78.20	0.00	0.00	285.55	78.20
2.68	184.71	303.39	167.28	4.46	2.46	307.85	169.74
0.00	124.93	306.07	177.11	0.00	0.00	306.07	177.11
89.23	285.55	215.94	39.26	98.16	17.85	314.10	57.11
124.93	446.17	449.74	157.37	174.90	61.20	624.63	218.58
178.47	571.09	431.89	78.53	196.31	35.69	628.20	114.22
0.00	481.66	404.76	99.22	0.00	0.00	404.76	99.22
0.00	236.47	435.10	269.86	0.00	0.00	435.10	269.86
0.00	223.08	330.16	100.16	0.00	0.00	330.16	100.16
0.00	499.71	444.74	120.76	0.00	0.00	444.74	120.76
0.00	214.16	342.66	171.33	0.00	0.00	342.66	171.33
187.39	401.55	157.05	28.55	137.42	24.99	294.47	53.54
0.00	214.16	214.16	0.00	0.00	0.00	214.16	0.00
62.46	387.27	501.13	153.62	96.37	29.54	597.51	183.16
124.93	321.24	392.63	124.16	249.85	79.01	642.48	203.17
455.09	1017.26	412.26	74.96	333.73	60.68	745.99	135.63
69.60	262.35	681.03	283.27	245.93	102.29	926.96	385.57
0.00	374.78	599.65	299.82	0.00	0.00	599.65	299.82
80.31	428.32	380.49	209.89	87.81	48.44	468.30	258.32
0.00	603.22	389.77	129.92	0.00	0.00	389.77	129.92
785.25	1284.96	249.85	136.85	392.63	215.05	642.48	351.90
71.39	963.72	669.25	199.53	53.54	15.96	722.79	215.49
0.00	428.32	385.49	85.66	0.00	0.00	385.49	85.66
0.00	767.41	920.89	306.96	0.00	0.00	920.89	306.96
0.00	499.71	499.71	0.00	0.00	0.00	499.71	0.00
0.00	321.24	449.74	157.37	0.00	0.00	449.74	157.37

Tot.Mean Herb=	Tot.Std. Herb=	Tot.Mean Woody=	Tot.Std. Woody=	Tot.Mean Total=	Tot.Std. Total=
362.46	*162.73*	*87.25*	*109.86*	*449.70*	*170.54*

BLACKHAWK: HUNTINGTON #4

laimed Road

ODUCTION

8/30/94

AREA	Wt.Herb.g/m2	Proportion	Tot.Herb.g/m	Tot.Herb.lbs/m2	Herb.lbs/Ac	Wt.Wood.g/m2	Proportion	Tot.Wood.g/m	Tot.Wood.lbs/m2	Wood.lbs/Ac	Tot.lbs/Ac	Prop. a
1.00	29.00	0.50	58.00	0.13	517.55	5.00	0.50	10.00	0.02	89.23	606.79	0.75
2.00	37.00	1.00	37.00	0.08	330.16	0.00	0.50	0.00	0.00	0.00	330.16	1.00
3.00	11.00	0.50	22.00	0.05	196.31	13.00	0.50	26.00	0.06	232.01	428.32	1.00
4.00	23.00	1.00	23.00	0.05	205.24	13.00	1.00	13.00	0.03	116.00	321.24	0.75
5.00	19.00	1.00	19.00	0.04	169.54	27.00	1.00	27.00	0.06	240.93	410.47	0.75
6.00	28.00	1.00	28.00	0.06	249.85	36.00	1.00	36.00	0.08	321.24	571.09	0.75
7.00	15.00	1.00	15.00	0.03	133.85	8.00	1.00	8.00	0.02	71.39	205.24	1.00
8.00	30.00	1.00	30.00	0.07	267.70	31.00	1.00	31.00	0.07	276.62	544.32	0.50
9.00	36.00	1.00	36.00	0.08	321.24	15.00	1.00	15.00	0.03	133.85	455.09	3.00
10.00	7.00	1.00	7.00	0.02	62.46	0.00	1.00	0.00	0.00	0.00	62.46	3.00
11.00	45.00	0.50	90.00	0.20	803.10	0.00	1.00	0.00	0.00	0.00	803.10	1.00
12.00	31.00	0.50	62.00	0.14	553.25	1.00	0.50	2.00	0.00	17.85	571.09	1.00
13.00	35.00	0.50	70.00	0.15	624.63	1.00	1.00	1.00	0.00	8.92	633.56	0.25
14.00	41.00	0.50	82.00	0.18	731.71	0.00	0.50	0.00	0.00	0.00	731.71	0.50
15.00	20.00	0.50	40.00	0.09	356.93	14.00	0.50	28.00	0.06	249.85	606.79	2.00
16.00	27.00	0.50	54.00	0.12	481.86	7.00	0.50	14.00	0.03	124.93	606.79	0.25
17.00	22.00	0.50	44.00	0.10	392.63	0.00	0.50	0.00	0.00	0.00	392.63	1.00
18.00	8.00	0.50	16.00	0.04	142.77	24.00	0.50	48.00	0.11	428.32	571.09	0.50
19.00	18.00	0.50	36.00	0.08	321.24	6.00	0.50	12.00	0.03	107.08	428.32	1.00
20.00	11.00	0.50	22.00	0.05	196.31	0.00	0.50	0.00	0.00	0.00	196.31	1.00
21.00	22.00	0.50	44.00	0.10	392.63	0.00	0.50	0.00	0.00	0.00	392.63	0.50
22.00	33.00	0.50	66.00	0.15	588.94	0.00	0.50	0.00	0.00	0.00	588.94	1.50
[illegible].00	26.00	0.50	52.00	0.11	464.01	0.00	0.50	0.00	0.00	0.00	464.01	1.00
24.00	14.00	0.50	28.00	0.06	249.85	1.00	0.50	2.00	0.00	17.85	267.70	1.50
25.00	25.00	0.50	50.00	0.11	446.17	0.00	0.50	0.00	0.00	0.00	446.17	1.50
26.00	24.00	0.50	48.00	0.11	428.32	20.00	0.50	40.00	0.09	356.93	785.25	0.50
27.00	29.00	0.50	58.00	0.13	517.55	27.00	0.50	54.00	0.12	481.86	999.41	0.50
28.00	12.00	0.50	24.00	0.05	214.16	0.00	0.50	0.00	0.00	0.00	214.16	1.00
29.00	38.00	0.50	76.00	0.17	678.17	38.00	0.50	76.00	0.17	678.17	1356.35	1.00
30.00	30.00	0.50	60.00	0.13	535.40	30.00	0.50	60.00	0.13	535.40	1070.80	0.50

aHerb.lbs/Ac	aWood.lbs/Ac	aTot.lbs/Ac	Prop. b	bHerb.lbs/Ac	bWood.lbs/Ac	bTot.lbs/Ac	Prop. c	cHerb.lbs/Ac	cWood.lbs/Ac	cTot.lbs/Ac	Prop. d	dHerb.lbs/Ac
388.16	66.92	455.09	0.80	414.04	71.39	485.43	0.75	388.16	66.92	455.09	0.65	336.41
330.16	0.00	330.16	1.00	330.16	0.00	330.16	1.00	330.16	0.00	330.16	1.00	330.16
196.31	232.01	428.32	0.75	147.23	174.00	321.24	0.75	147.23	174.00	321.24	0.35	68.71
153.93	87.00	240.93	1.20	246.28	139.20	385.49	1.00	205.24	116.00	321.24	1.00	205.24
127.16	180.70	307.85	1.50	254.31	361.39	615.71	1.00	169.54	240.93	410.47	1.00	169.54
187.39	240.93	428.32	1.00	249.85	321.24	571.09	1.20	299.82	385.49	685.31	1.00	249.85
133.85	71.39	205.24	0.80	107.08	57.11	164.19	0.70	93.69	49.97	143.67	0.80	107.08
133.85	138.31	272.16	0.50	133.85	138.31	272.16	0.50	133.85	138.31	272.16	2.00	535.40
963.72	401.55	1365.27	1.00	321.24	133.85	455.09	1.00	321.24	133.85	455.09	1.50	481.86
187.39	0.00	187.39	1.00	62.46	0.00	62.46	2.00	124.93	0.00	124.93	2.00	124.93
803.10	0.00	803.10	0.50	401.55	0.00	401.55	0.50	401.55	0.00	401.55	1.00	803.10
553.25	17.85	571.09	0.25	138.31	4.46	142.77	1.00	553.25	17.85	571.09	1.00	553.25
156.16	2.23	158.39	0.50	312.32	4.46	316.78	0.50	312.32	4.46	316.78	1.00	624.63
365.86	0.00	365.86	1.00	731.71	0.00	731.71	1.00	731.71	0.00	731.71	1.00	731.71
713.87	499.71	1213.57	1.00	356.93	249.85	606.79	1.00	356.93	249.85	606.79	1.00	356.93
120.46	31.23	151.70	0.50	240.93	62.46	303.39	1.00	481.86	124.93	606.79	0.50	240.93
392.63	0.00	392.63	0.50	196.31	0.00	196.31	0.50	196.31	0.00	196.31	0.25	98.16
71.39	214.16	285.55	1.00	142.77	428.32	571.09	0.50	71.39	214.16	285.55	1.00	142.77
321.24	107.08	428.32	0.70	224.87	74.96	299.82	2.00	642.48	214.16	856.64	2.00	642.48
196.31	0.00	196.31	1.00	196.31	0.00	196.31	1.50	294.47	0.00	294.47	1.00	196.31
196.31	0.00	196.31	1.00	392.63	0.00	392.63	1.00	392.63	0.00	392.63	0.50	196.31
883.41	0.00	883.41	1.00	588.94	0.00	588.94	1.00	588.94	0.00	588.94	0.50	294.47
464.01	0.00	464.01	0.50	232.01	0.00	232.01	1.00	464.01	0.00	464.01	1.00	464.01
374.78	26.77	401.55	1.50	374.78	26.77	401.55	1.50	374.78	26.77	401.55	1.50	374.78
669.25	0.00	669.25	0.20	89.23	0.00	89.23	1.00	446.17	0.00	446.17	1.00	446.17
214.16	178.47	392.63	0.75	321.24	267.70	588.94	1.00	428.32	356.93	785.25	0.70	299.82
258.78	240.93	499.71	0.75	388.16	361.39	749.56	0.25	129.39	120.46	249.85	0.15	77.63
214.16	0.00	214.16	1.00	214.16	0.00	214.16	3.00	642.48	0.00	642.48	4.00	856.64
678.17	678.17	1356.35	0.50	339.09	339.09	678.17	0.75	508.63	508.63	1017.26	1.00	678.17
267.70	267.70	535.40	1.00	535.40	535.40	1070.80	1.00	535.40	535.40	1070.80	2.00	1070.80

dWood.lbs/Ac	dTot.lbs/Ac	MeanHerb	StdHerb	MeanWood	StdWood	MeanTot	StdTot
58.00	394.41	408.87	59.91	70.49	10.33	479.36	70.24
0.00	330.16	330.16	0.00	0.00	0.00	330.16	0.00
81.20	149.91	151.16	46.70	178.64	55.20	329.81	101.90
116.00	321.24	203.18	29.31	114.84	16.57	318.03	45.88
240.93	410.47	178.02	41.53	252.98	59.02	431.00	100.54
321.24	571.09	247.35	35.69	318.03	45.88	565.38	81.57
57.11	164.19	115.11	16.06	61.39	8.57	176.50	24.63
553.25	1088.65	240.93	156.09	248.96	161.30	489.89	317.39
200.77	682.63	481.86	248.83	200.77	103.68	682.63	352.51
0.00	124.93	112.43	46.74	0.00	0.00	112.43	46.74
0.00	803.10	642.48	196.72	0.00	0.00	642.48	196.72
17.85	571.09	470.26	165.97	15.17	5.35	485.43	171.33
8.92	633.56	406.01	187.39	5.80	2.68	411.81	190.07
0.00	731.71	658.54	146.34	0.00	0.00	658.54	146.34
249.85	606.79	428.32	142.77	299.82	99.94	728.14	242.71
62.46	303.39	313.21	144.56	81.20	37.48	394.41	182.04
0.00	98.16	255.21	117.79	0.00	0.00	255.21	117.79
428.32	571.09	114.22	34.97	342.66	104.92	456.87	139.89
214.16	856.64	430.46	176.65	143.49	58.88	573.95	235.54
0.00	196.31	215.94	39.26	0.00	0.00	215.94	39.26
0.00	196.31	314.10	96.17	0.00	0.00	314.10	96.17
0.00	294.47	588.94	186.24	0.00	0.00	588.94	186.24
0.00	464.01	417.61	92.80	0.00	0.00	417.61	92.80
26.77	401.55	349.79	49.97	24.99	3.57	374.78	53.54
0.00	446.17	419.40	186.32	0.00	0.00	419.40	186.32
249.85	549.68	338.37	81.72	281.98	68.10	620.35	149.82
72.28	149.91	274.30	162.51	255.39	151.31	529.69	313.82
0.00	856.64	428.32	270.89	0.00	0.00	428.32	270.89
678.17	1356.35	576.45	135.63	576.45	135.63	1152.89	271.27
1070.80	2141.60	588.94	262.29	588.94	262.29	1177.88	524.58

Tot.Mean Herb=	Tot.Std. Herb=	Tot.Mean Woody=	Tot.Std. Woody=	Tot.Mean Total=	Tot.Std. Total=
356.67	*155.74*	*135.40*	*166.39*	*492.06*	*233.03*

BLACKHAWK: HUNTINGTON #4

FERENCE

RODUCTION

8/31/94

AREA	Wt.Herb.g/m2	Proportion	Tot.Herb.g/m	Tot.Herb.lbs/m2	Herb.lbs/Ac	Wt.Wood.g/m2	Proportion	Tot.Wood.g/m	Tot.Wood.lbs/m2	Wood.lbs/Ac	Tot.lbs/Ac	Prop. a
1.00	9.00	0.50	18.00	0.04	160.62	0.00	0.50	0.00	0.00	0.00	160.62	3.00
2.00	17.00	0.50	34.00	0.07	303.39	0.00	0.50	0.00	0.00	0.00	303.39	0.50
3.00	14.00	0.50	28.00	0.06	249.85	0.00	0.50	0.00	0.00	0.00	249.85	1.00
4.00	15.00	0.50	30.00	0.07	267.70	0.00	0.50	0.00	0.00	0.00	267.70	1.00
5.00	12.00	0.50	24.00	0.05	214.16	1.00	0.50	2.00	0.00	17.85	232.01	1.00
6.00	8.00	0.50	16.00	0.04	142.77	0.00	0.50	0.00	0.00	0.00	142.77	2.00
7.00	18.00	0.50	36.00	0.08	321.24	0.00	0.50	0.00	0.00	0.00	321.24	0.75
8.00	4.00	0.50	8.00	0.02	71.39	0.00	0.50	0.00	0.00	0.00	71.39	3.00
9.00	7.00	0.50	14.00	0.03	124.93	9.00	0.50	18.00	0.04	160.62	285.55	0.50
10.00	7.00	0.50	14.00	0.03	124.93	5.00	0.50	10.00	0.02	89.23	214.16	1.00
11.00	7.00	0.50	14.00	0.03	124.93	8.00	0.50	16.00	0.04	142.77	267.70	1.00
12.00	19.00	0.50	38.00	0.08	339.09	0.00	0.50	0.00	0.00	0.00	339.09	0.10
13.00	10.00	0.50	20.00	0.04	178.47	0.00	0.50	0.00	0.00	0.00	178.47	0.50
14.00	6.00	0.50	12.00	0.03	107.08	2.00	0.50	4.00	0.01	35.69	142.77	1.00
15.00	4.00	0.50	8.00	0.02	71.39	14.00	0.50	28.00	0.06	249.85	321.24	1.00
16.00	9.00	0.50	18.00	0.04	160.62	18.00	0.50	36.00	0.08	321.24	481.86	0.10
17.00	3.00	1.00	3.00	0.01	26.77	17.00	0.50	34.00	0.07	303.39	330.16	1.00
18.00	3.00	0.50	6.00	0.01	53.54	0.00	0.50	0.00	0.00	0.00	53.54	2.00
19.00	2.00	0.50	4.00	0.01	35.69	7.00	0.50	14.00	0.03	124.93	160.62	4.00
20.00	9.00	0.50	18.00	0.04	160.62	0.00	0.50	0.00	0.00	0.00	160.62	0.50
21.00	3.00	0.50	6.00	0.01	53.54	0.00	0.50	0.00	0.00	0.00	53.54	4.00
22.00	9.00	0.50	18.00	0.04	160.62	6.00	0.50	12.00	0.03	107.08	267.70	1.00
23.00	12.00	0.50	24.00	0.05	214.16	0.00	0.50	0.00	0.00	0.00	214.16	1.50
24.00	4.00	0.50	8.00	0.02	71.39	22.00	0.50	44.00	0.10	392.63	464.01	2.00
25.00	11.00	0.50	22.00	0.05	196.31	3.00	0.50	6.00	0.01	53.54	249.85	1.00
26.00	9.00	0.50	18.00	0.04	160.62	0.00	0.50	0.00	0.00	0.00	160.62	1.00
27.00	5.00	0.50	10.00	0.02	89.23	0.00	0.50	0.00	0.00	0.00	89.23	2.00
28.00	0.00	0.50	0.00	0.00	0.00	17.00	0.25	68.00	0.15	606.79	606.79	1.00
29.00	0.00	0.50	0.00	0.00	0.00	28.00	0.50	56.00	0.12	499.71	499.71	0.01
30.00	0.00	0.50	0.00	0.00	0.00	18.00	0.50	36.00	0.08	321.24	321.24	1.00
31.00	2.00	0.50	4.00	0.01	35.69	19.00	0.50	38.00	0.08	339.09	374.78	1.00
32.00	17.00	0.50	34.00	0.07	303.39	0.00	0.50	0.00	0.00	0.00	303.39	0.70
33.00	16.00	0.50	32.00	0.07	285.55	0.00	0.50	0.00	0.00	0.00	285.55	0.50
34.00	0.00	0.50	0.00	0.00	0.00	16.00	0.50	32.00	0.07	285.55	285.55	0.50
35.00	11.00	0.50	22.00	0.05	196.31	9.00	0.50	18.00	0.04	160.62	356.93	4.00
36.00	6.00	0.50	12.00	0.03	107.08	0.00	0.50	0.00	0.00	0.00	107.08	0.50
37.00	8.00	0.50	12.00	0.03	107.08	0.00	0.50	0.00	0.00	0.00	107.08	1.00
38.00	12.00	0.50	24.00	0.05	214.16	0.00	0.50	0.00	0.00	0.00	214.16	2.00
39.00	6.00	0.50	12.00	0.03	107.08	0.00	0.50	0.00	0.00	0.00	107.08	3.00
40.00	7.00	0.50	14.00	0.03	124.93	9.00	0.50	18.00	0.04	160.62	285.55	0.20
41.00	4.00	0.50	8.00	0.02	71.39	0.00	0.50	0.00	0.00	0.00	71.39	2.00
42.00	22.00	0.50	44.00	0.10	392.63	0.00	0.50	0.00	0.00	0.00	392.63	0.25
43.00	13.00	0.50	26.00	0.06	232.01	0.00	0.50	0.00	0.00	0.00	232.01	0.50
44.00	6.00	0.50	12.00	0.03	107.08	0.00	0.50	0.00	0.00	0.00	107.08	1.00
45.00	9.00	0.50	18.00	0.04	160.62	0.00	0.50	0.00	0.00	0.00	160.62	3.00
46.00	10.00	0.50	20.00	0.04	178.47	10.00	0.50	20.00	0.04	178.47	356.93	0.50
47.00	5.00	0.50	10.00	0.02	89.23	0.00	0.50	0.00	0.00	0.00	89.23	3.00
48.00	9.00	0.50	18.00	0.04	160.62	0.00	0.50	0.00	0.00	0.00	160.62	1.00
49.00	4.00	0.50	8.00	0.02	71.39	0.00	0.50	0.00	0.00	0.00	71.39	1.00
50.00	9.00	1.00	9.00	0.02	80.31	0.00	0.50	0.00	0.00	0.00	80.31	1.00

aHerb.lbs/Ac	aWood.lbs/Ac	aTot.lbs/Ac	Prop. b	bHerb.lbs/Ac	bWood.lbs/Ac	bTot.lbs/Ac	Prop. c	cHerb.lbs/Ac	cWood.lbs/Ac	cTot.lbs/Ac	Prop. d	dHerb.lbs/Ac
481.86	0.00	481.86	2.00	321.24	0.00	321.24	3.00	481.86	0.00	481.86	7.00	1124.34
151.70	0.00	151.70	1.00	303.39	0.00	303.39	0.75	227.54	0.00	227.54	1.00	303.39
249.85	0.00	249.85	1.00	249.85	0.00	249.85	0.25	62.46	0.00	62.46	1.00	249.85
267.70	0.00	267.70	1.00	267.70	0.00	267.70	1.00	267.70	0.00	267.70	4.00	1070.80
214.16	17.85	232.01	1.00	214.16	17.85	232.01	5.00	1070.80	89.23	1160.03	1.00	214.16
285.55	0.00	285.55	2.00	285.55	0.00	285.55	3.00	428.32	0.00	428.32	1.00	142.77
240.93	0.00	240.93	0.50	160.62	0.00	160.62	0.25	80.31	0.00	80.31	0.25	80.31
214.16	0.00	214.16	2.00	142.77	0.00	142.77	3.00	214.16	0.00	214.16	5.00	356.93
62.46	80.31	142.77	1.50	187.39	240.93	428.32	0.50	62.46	80.31	142.77	1.00	124.93
124.93	89.23	214.16	1.00	124.93	89.23	214.16	0.25	31.23	22.31	53.54	3.00	374.78
124.93	142.77	267.70	1.00	124.93	142.77	267.70	1.00	124.93	142.77	267.70	1.00	124.93
33.91	0.00	33.91	0.25	84.77	0.00	84.77	0.30	101.73	0.00	101.73	0.75	254.31
89.23	0.00	89.23	2.00	356.93	0.00	356.93	1.00	178.47	0.00	178.47	1.00	178.47
107.08	35.69	142.77	1.00	107.08	35.69	142.77	1.00	107.08	35.69	142.77	2.00	214.16
71.39	249.85	321.24	0.25	17.85	62.46	80.31	1.00	71.39	249.85	321.24	1.00	71.39
16.06	32.12	48.19	1.00	160.62	321.24	481.86	0.20	32.12	64.25	96.37	1.00	160.62
26.77	303.39	330.16	0.10	2.68	30.34	33.02	0.25	6.69	75.85	82.54	2.00	53.54
107.08	0.00	107.08	3.00	160.62	0.00	160.62	2.00	107.08	0.00	107.08	3.00	160.62
142.77	499.71	642.48	1.00	35.69	124.93	160.62	2.00	71.39	249.85	321.24	2.00	71.39
80.31	0.00	80.31	0.15	24.09	0.00	24.09	0.50	80.31	0.00	80.31	0.20	32.12
214.16	0.00	214.16	2.00	107.08	0.00	107.08	3.00	160.62	0.00	160.62	1.00	53.54
160.62	107.08	267.70	1.00	160.62	107.08	267.70	2.00	321.24	214.16	535.40	1.00	160.62
321.24	0.00	321.24	2.00	428.32	0.00	428.32	0.50	107.08	0.00	107.08	1.00	214.16
142.77	785.25	928.03	1.00	71.39	392.63	464.01	1.00	71.39	392.63	464.01	2.00	142.77
196.31	53.54	249.85	1.00	196.31	53.54	249.85	0.25	49.08	13.38	62.46	0.50	98.16
160.62	0.00	160.62	1.00	160.62	0.00	160.62	0.10	16.06	0.00	16.06	1.00	160.62
178.47	0.00	178.47	2.00	178.47	0.00	178.47	1.00	89.23	0.00	89.23	2.00	178.47
0.00	606.79	606.79	1.00	0.00	606.79	606.79	1.00	0.00	606.79	606.79	0.25	0.00
0.00	5.00	5.00	0.10	0.00	49.97	49.97	1.50	0.00	749.56	749.56	0.05	0.00
0.00	321.24	321.24	1.00	0.00	321.24	321.24	3.00	0.00	963.72	963.72	1.00	0.00
35.69	339.09	374.78	1.00	35.69	339.09	374.78	2.00	71.39	678.17	749.56	0.50	17.85
212.38	0.00	212.38	3.00	910.18	0.00	910.18	0.10	30.34	0.00	30.34	0.25	75.85
142.77	0.00	142.77	1.00	285.55	0.00	285.55	0.25	71.39	0.00	71.39	1.00	285.55
0.00	142.77	142.77	1.00	0.00	285.55	285.55	1.00	0.00	285.55	285.55	0.50	0.00
785.25	642.48	1427.73	1.00	196.31	160.62	356.93	1.00	196.31	160.62	356.93	0.50	98.16
53.54	0.00	53.54	1.00	107.08	0.00	107.08	1.00	107.08	0.00	107.08	2.00	214.16
107.08	0.00	107.08	1.00	107.08	0.00	107.08	1.00	107.08	0.00	107.08	2.00	214.16
428.32	0.00	428.32	0.25	53.54	0.00	53.54	1.00	214.16	0.00	214.16	0.50	107.08
321.24	0.00	321.24	0.10	10.71	0.00	10.71	1.00	107.08	0.00	107.08	1.50	160.62
24.99	32.12	57.11	0.80	99.94	128.50	228.44	0.50	62.46	80.31	142.77	1.50	187.39
142.77	0.00	142.77	1.00	71.39	0.00	71.39	3.00	214.16	0.00	214.16	1.00	71.39
98.16	0.00	98.16	0.50	196.31	0.00	196.31	1.50	588.94	0.00	588.94	0.50	196.31
116.00	0.00	116.00	1.00	232.01	0.00	232.01	1.00	232.01	0.00	232.01	3.00	696.02
107.08	0.00	107.08	1.00	107.08	0.00	107.08	2.00	214.16	0.00	214.16	3.00	321.24
481.86	0.00	481.86	2.00	321.24	0.00	321.24	0.50	80.31	0.00	80.31	0.50	80.31
89.23	89.23	178.47	1.00	178.47	178.47	356.93	1.00	178.47	178.47	356.93	1.00	178.47
267.70	0.00	267.70	2.00	178.47	0.00	178.47	2.00	178.47	0.00	178.47	2.00	178.47
160.62	0.00	160.62	1.00	160.62	0.00	160.62	0.50	80.31	0.00	80.31	0.50	80.31
71.39	0.00	71.39	0.50	35.69	0.00	35.69	0.25	17.85	0.00	17.85	4.00	285.55
80.31	0.00	80.31	2.00	160.62	0.00	160.62	1.00	80.31	0.00	80.31	1.00	80.31

dWood.lbs/Ac	dTot.lbs/Ac	MeanHerb	StdHerb	MeanWood	StdWood	MeanTot	StdTot
0.00	1124.34	513.98	327.60	0.00	0.00	513.98	327.60
0.00	303.39	257.88	60.68	0.00	0.00	257.88	60.68
0.00	249.85	212.38	74.96	0.00	0.00	212.38	74.96
0.00	1070.80	428.32	321.24	0.00	0.00	428.32	321.24
17.85	232.01	385.49	342.66	32.12	28.55	417.61	371.21
0.00	142.77	256.99	106.84	0.00	0.00	256.99	106.84
0.00	80.31	176.68	93.66	0.00	0.00	176.68	93.66
0.00	356.93	199.88	94.71	0.00	0.00	199.88	94.71
160.62	285.55	112.43	46.74	144.56	60.10	256.99	106.84
267.70	642.48	156.16	115.18	111.54	82.27	267.70	197.45
142.77	267.70	124.93	0.00	142.77	0.00	267.70	0.00
0.00	254.31	162.76	114.79	0.00	0.00	162.76	114.79
0.00	178.47	196.31	87.43	0.00	0.00	196.31	87.43
71.39	285.55	128.50	42.83	42.83	14.28	171.33	57.11
249.85	321.24	60.68	21.42	212.38	74.96	273.05	96.37
321.24	481.86	106.01	67.08	212.02	134.15	318.03	201.23
606.79	660.33	23.29	18.11	263.95	205.23	287.24	223.34
0.00	160.62	117.79	40.07	0.00	0.00	117.79	40.07
249.85	321.24	71.39	39.10	249.85	136.85	321.24	175.95
0.00	32.12	75.49	48.61	0.00	0.00	75.49	48.61
0.00	53.54	117.79	62.44	0.00	0.00	117.79	62.44
107.08	267.70	192.74	64.25	128.50	42.83	321.24	107.08
0.00	214.16	256.99	109.20	0.00	0.00	256.99	109.20
785.25	928.03	99.94	34.97	549.68	192.35	649.62	227.32
26.77	124.93	147.23	62.08	40.15	16.93	187.39	79.01
0.00	160.62	131.71	57.82	0.00	0.00	131.71	57.82
0.00	178.47	142.77	43.72	0.00	0.00	142.77	43.72
151.70	151.70	0.00	0.00	515.77	182.04	515.77	182.04
24.99	24.99	0.00	0.00	265.84	303.75	265.84	303.75
321.24	321.24	0.00	0.00	449.74	256.99	449.74	256.99
169.54	187.39	39.26	17.49	373.00	166.12	412.26	183.60
0.00	75.85	306.43	317.10	0.00	0.00	306.43	317.10
0.00	285.55	214.16	90.30	0.00	0.00	214.16	90.30
142.77	142.77	0.00	0.00	228.44	69.94	228.44	69.94
80.31	178.47	294.47	248.32	240.93	203.17	535.40	451.49
0.00	214.16	117.79	52.46	0.00	0.00	117.79	52.46
0.00	214.16	128.50	42.83	0.00	0.00	128.50	42.83
0.00	107.08	203.45	128.50	0.00	0.00	203.45	128.50
0.00	160.62	141.35	102.13	0.00	0.00	141.35	102.13
240.93	428.32	99.94	55.31	128.50	71.11	228.44	126.42
0.00	71.39	114.22	57.11	0.00	0.00	114.22	57.11
0.00	196.31	294.47	175.59	0.00	0.00	294.47	175.59
0.00	696.02	301.61	202.26	0.00	0.00	301.61	202.26
0.00	321.24	171.33	85.66	0.00	0.00	171.33	85.66
0.00	80.31	224.87	155.73	0.00	0.00	224.87	155.73
178.47	356.93	160.62	35.69	160.62	35.69	321.24	71.39
0.00	178.47	178.47	56.44	0.00	0.00	178.47	56.44
0.00	80.31	128.50	39.34	0.00	0.00	128.50	39.34
0.00	285.55	96.37	96.83	0.00	0.00	96.37	96.83
0.00	80.31	96.37	32.12	0.00	0.00	96.37	32.12

Tot.Mean Herb=	Tot.Std. Herb=	Tot.Mean Woody=	Tot.Std. Woody=	Tot.Mean Total=	Tot.Std. Total=
163.37	*106.25*	*89.86*	*143.24*	*253.24*	*126.44*

BLACKHAWK: HUNTINGTON #4

[illegible]ver Reveg.

[illegible]ARIAN

8/13/94

REF. EAST	Wt.Herb.g/m2	Proportion	Tot.Herb.g/m	Tot.Herb.lbs/m2	Herb.lbs/Ac	Wt.Wood.g/m2	Proportion	Tot.Wood.g/m	Tot.Wood.lbs/m2	Wood.lbs/Ac	Tot.lbs/Ac	Prop. a
1.00	11.00	0.50	22.00	0.05	196.31	10.00	0.50	20.00	0.04	178.47	374.78	1.00
2.00	5.00	0.50	10.00	0.02	89.23	12.00	0.50	24.00	0.05	214.16	303.39	2.00
3.00	6.00	0.30	20.00	0.04	178.47	12.00	0.50	24.00	0.05	214.16	392.63	1.00
4.00	15.00	0.30	50.00	0.11	446.17	3.00	0.50	6.00	0.01	53.54	499.71	1.00
5.00	7.00	0.25	28.00	0.06	249.85	16.00	0.25	64.00	0.14	571.09	820.95	0.50
REF. WEST												
6.00	6.00	0.50	12.00	0.03	107.08	4.00	0.50	8.00	0.02	71.39	178.47	1.00
7.00	3.00	0.50	6.00	0.01	53.54	15.00	0.50	30.00	0.07	267.70	321.24	1.00
8.00	7.00	0.50	14.00	0.03	124.93	4.00	0.25	16.00	0.04	142.77	267.70	1.00
9.00	14.00	0.50	28.00	0.06	249.85	0.00	0.50	0.00	0.00	0.00	249.85	0.50
10.00	15.00	0.50	30.00	0.07	267.70	0.00	0.50	0.00	0.00	0.00	267.70	0.50
REVEG.												
1.00	6.00	0.50	12.00	0.03	107.08	13.00	0.50	26.00	0.06	232.01	339.09	3.00
2.00	2.00	0.50	4.00	0.01	35.69	19.00	0.25	76.00	0.17	678.17	713.87	2.00
3.00	12.00	0.25	48.00	0.11	428.32	9.00	0.50	18.00	0.04	160.62	588.94	1.00
4.00	6.00	0.50	12.00	0.03	107.08	10.00	0.50	20.00	0.04	178.47	285.55	1.00
5.00	15.00	0.50	30.00	0.07	267.70	0.00	0.50	0.00	0.00	0.00	267.70	0.75

aHerb.lbs/Ac	aWood.lbs/Ac	aTot.lbs/Ac	Prop. b	bHerb.lbs/Ac	bWood.lbs/Ac	bTot.lbs/Ac	Prop. c	cHerb.lbs/Ac	cWood.lbs/Ac	cTot.lbs/Ac	MeanHerb	StdHerb
196.31	178.47	374.78	1.00	196.31	178.47	374.78	0.50	98.16	89.23	187.39	171.77	42.50
178.47	428.32	606.79	1.00	89.23	214.16	303.39	1.00	89.23	214.16	303.39	111.54	38.64
178.47	214.16	392.63	1.00	178.47	214.16	392.63	1.00	178.47	214.16	392.63	178.47	0.00
446.17	53.54	499.71	2.00	892.33	107.08	999.41	1.00	446.17	53.54	499.71	557.71	193.20
124.93	285.55	410.47	1.00	249.85	571.09	820.95	0.50	124.93	285.55	410.47	187.39	62.46
107.08	71.39	178.47	1.00	107.08	71.39	178.47	1.00	107.08	71.39	178.47	107.08	0.00
53.54	267.70	321.24	2.00	107.08	535.40	642.48	1.60	85.66	428.32	513.98	74.96	22.72
124.93	142.77	267.70	1.00	124.93	142.77	267.70	1.00	124.93	142.77	267.70	124.93	0.00
124.93	0.00	124.93	0.50	124.93	0.00	124.93	1.00	249.85	0.00	249.85	187.39	62.46
133.85	0.00	133.85	0.50	133.85	0.00	133.85	0.50	133.85	0.00	133.85	167.31	57.96
											Tot.Mean Herb=	**Tot.Std. Herb=**
											186.85	***129.08***
321.24	696.02	1017.26	1.00	107.08	232.01	339.09	1.00	107.08	232.01	339.09	160.62	92.73
71.39	1356.35	1427.73	1.00	35.69	678.17	713.87	0.50	17.85	339.09	356.93	40.15	19.45
428.32	160.62	588.94	0.50	214.16	80.31	294.47	0.75	321.24	120.46	441.70	348.01	88.79
107.08	178.47	285.55	2.00	214.16	356.93	571.09	1.00	107.08	178.47	285.55	133.85	46.37
200.77	0.00	200.77	1.00	267.70	0.00	267.70	1.50	401.55	0.00	401.55	284.43	72.93
											Tot.Mean Herb=	**Tot.Std. Herb=**
											201.61	***121.40***

MeanWood	StdWood	MeanTot	StdTot
156.16	38.64	327.93	81.14
267.70	92.73	379.24	131.37
214.16	0.00	392.63	0.00
66.92	23.18	624.63	216.38
428.32	142.77	615.71	205.24
0.00			
71.39	0.00	178.47	0.00
374.78	113.58	449.74	136.29
142.77	0.00	267.70	0.00
0.00	0.00	187.39	62.46
0.00	0.00	167.31	57.96

Tot.Mean Woody=	Tot.Std. Woody=	Tot.Mean Total=	Tot.Std. Total=
156.66	*143.39*	*359.07*	*159.47*

348.01	200.92	508.63	293.66
762.94	369.51	803.10	388.96
130.50	33.29	478.51	122.08
223.08	77.28	356.93	123.65
0.00	0.00	284.43	72.93

Mean Woody=	Tot.Std. Woody=	Tot.Mean Total=	Tot.Std. Total=
279.13	*290.35*	*480.74*	*198.61*

VEGETATION MONITORING: RECLAIMED & REFERENCE AREAS OF THE HUNTINGTON NO. 4 MINE

1995

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VEGETATION MONITORING:

RECLAIMED & REFERENCE AREAS OF THE HUNTINGTON NO. 4 MINE

1995

SCOPE

Similar to the data recorded in 1993 and 1994, the following report has been prepared to assess the current condition of the vegetation of reclaimed areas at the Huntington No. 4 Mine. The vegetation of the reclaimed areas were compared with undisturbed reference areas that were used as standards for revegetation success.

INTRODUCTION

General Site Description

The study area for the Huntington No. 4 Mine was located in Huntington Canyon, Emery County, Utah. The elevation of the area ranged between 7,300 ft and 8,000 ft above sea level. Vegetation types adjacent to the mine area varied from pinyon-juniper

and mountain brushland on the drier sites, to associated conifers and riparian areas in the more moist regions. The reclaimed areas of the mine site were on the relatively drier sites with primarily south and southwestern exposures.

The reclaimed areas consisted principally of access roads, portal areas, pads and regraded slopes. The largest surface areas that were reclaimed were the access roads of the mine site.

Quantitative sampling was conducted in the area by *MT. NEBO SCIENTIFIC, INC.* in 1989, 1990, 1993, 1994 and 1995. Qualitative information was assessed in 1991. No vegetation sampling was conducted in 1992. With a few exceptions, sample areas and methodologies in years' 1993, 1994 and 1995 were virtually identical. This should facilitate comparisons between years.

METHODS

The State of Utah, Division of Oil, Gas and Mining (DOGM) provided guidelines for some of the sample methodologies used in this report. After reviewing the 1993 report DOGM made a few additional recommendations for the 1994 sample year. The 1995 sample procedures also followed these recommendations.

Quantitative and qualitative data were taken on the vegetation of the reclaimed and reference areas at the Huntington No. 4 Mine. Sampling was conducted from August 15-18 , 1995. Similar to the 1993 and 1994 sample years, to simplify discussions about each area the reclaimed sites were divided into major areas -- the *Lower Reclaimed Areas* , the *Upper Reclaimed Access Road Areas*, and the *Riparian Areas*. Each of those areas consisted of several disturbance types (i.e. roads, pads, portals, regraded slopes, etc.). Data summaries, however, have been presented separately and combined in the *Lower Reclaimed Areas* due to heterogeneity of these areas. Since all the *Upper Reclaimed Access Road Areas* were so similar in basic physiognomy, the data were combined for the summary tables. Reporting the data by this method was an attempt to provide information on small, localized areas, yet also provide the average success of larger areas and the entire mine site.

As previously mentioned with few exceptions, sample areas and methodologies in 1995 were virtually identical to the 1993 and 1994 sampling. This was done as a means to simplify comparisons between years.

Transect and Quadrat Placement

Transect lines for sampling were placed randomly throughout the reclaimed areas resulting in several sample sites in the *Lower Reclaimed Areas* and the *Upper Reclaimed Access Road Areas* (see Sample Map). Random/regular placement of sampling quadrats were designed to provide unbiased accuracy of the data compiled.

Once the transect lines were placed, regular points were then marked on them. From these marks, a random number dictated the direction and distance to place the quadrats at right angles from the transect lines.

All reclaimed areas were seeded with the same seed mix (with the possible exception of the riparian area) on a variety of slopes, exposures, soil conditions and water relationships, etc. Vegetation sampling methodologies between reclaimed areas and the reference areas were consistent.

Placement of the quadrats in the riparian areas were somewhat constrained by the size of the sample areas. The stream side area that was disturbed was only about 35 ft long. The quadrats were placed every other meter along the stream side for the entire length of the reclaimed and reference areas. The *Riparian Reference Area* was considered to be the undisturbed streamside vegetation 100 ft upstream and 100 ft downstream of the reclaimed area.

Cover and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition was also assessed from the quadrat data. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "A Utah Flora", (Welsh et al. 1993).

Frequency

Frequency of a given species was the relative number of times that it occurred in the square meter quadrats.

Woody Species Density

Density of woody plant species of the reclaimed and reference areas were made using belt transects. These 5 ft by 50 ft belts were placed randomly throughout the study areas. Total number of individuals by species were counted in each of the belt transects. The average number was then calculated followed by the number of individuals per acre.

Production

Total annual biomass production was estimated by clipping, drying and weighing current annual growth. Herbaceous and woody species were summarized separately. "Double sampling" using four quadrats (three for the riparian areas) were estimated around the clipped plots.

Sample Adequacy & Statistical Comparisons

Sampling adequacy for cover and woody species density was achieved using

formulas from Snedocor and Cochran (1980), insuring that 80% of the samples were within 10% of the true mean for the shrub communities of the area. The following formula was used:

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

where,

nmin = minimum adequate sample
s = standard deviation
x = sample mean
.1 = confidence interval

Student's t-tests were also employed to compare the reclaimed disturbance and reference areas of all sites for cover, density, and productivity. All sample means, standard deviations, and sample sizes were included in this report to enable the reviewers to apply further statistical tests if desired.

Diversity

Diversity was measured by several methods. First, the relative cover by species was used for diversity comparisons. This was calculated by dividing the cover of a given species by the total sum cover times 100, or

$$Relative\ Cover = \frac{Cover\ by\ Species}{Summation\ of\ Total\ Cover} x100$$

For another comparison, the average number of vascular species per meter square quadrat was obtained by summing the frequency of all species in an area and dividing by 100. Still another diversity measurement was species richness or simply the total number of species encountered in the quadrats for each area. Finally, total diversity was measured by using the MacArthur and Wilson's (1967) formula where the proportion of the sum frequency of each species of an area was calculated. The proportion of each species was squared and the values for all species in the area were summed. This index integrates the number of species encountered and the degree to which frequency of occurrence is equitably distributed among those species. The formula is given below:

$$Total\ Diversity = \frac{1}{\sum P_i^2}$$

where,

$P_i =$ the proportion of the sum frequency for a community contributed by the ith species.

Photographs

Color photographs of the sample areas were taken at the time of sampling and have been submitted with this report.

Raw Data

The raw data have been summarized on spreadsheets and have also been included in theAppendix.

RESULTS

The Lower Reclaimed Areas (Areas A-E, separated)

When the *Lower Reclaimed Areas* were summarized separately, results of each area were similar but had some variability due to basic physiognomic changes. Area "A" had a mean cover of 44.50% and was dominated by grasses that comprised 55.88% of the living cover (Table 1). Dominant plant species by cover and frequency shown on Table 2 were cicer milkvetch (*Astragalus cicer*) and thickspike wheatgrass (*Elymus lanceolatus*). Woody species density was estimated as 1,677 individuals per acre (Table 3). Total annual biomass production was measured to be 668.65 pounds per acre (Table 4).

Area "B" had a living cover of 55.00% and was again dominated by grasses (Table 5). Similar species dominated this site but it had greater occurrences of rubber rabbitbrush (*Chrysothamnus nauseosus*), crested wheatgrass (*Agropyron cristatum*)

and Indian ricegrass (*Stipa hymenoides*). For cover and frequency by species, refer to Table 6. Woody species per acre was recorded as 3,550 individuals per acre (Table 7), whereas, annual biomass production was 880.69 pounds per acre (Table 8).

Area "C" data showed the area to have 34.38% total living cover (Table 9) which was dominated by similar species as was mentioned above but with a somewhat greater representation of forb species (Tables 9 & 10). Woody species density was similar to Area "A" and was estimated to be 1,437 individuals per acre with rubber rabbitbrush easily outnumbering the other woody species (Table 11). Total annual production was somewhat higher than the areas above, estimated to be 517.96 pounds per acre (Table 12).

Area "D" had living cover results at 53.57%, but forbs were more common than grasses to dominant the cover (Table 13). Similar plant species were common (Table 14). Woody species density in this area were estimated at 1,336 individuals per acre (Table 15). Total annual production was also higher than the previous reported data at 532.65 pounds per acre (Table 16).

Total living cover was highest of the five areas in "Area E" of the *Lower Reclaimed Areas*. It was estimated to be 58.13% (Table 17). Production was also one of the higher figures at 746.44 pounds per acre (Table 20). Dominant plant species also changrd when compared to the other areas. There was less rubber rabbitbrush and more smooth bromegrass (*Bromus inermis*), crsted wheatgrass (*Agropyron cristatum*),

and bluebunch wheatgrass (*Elymus spicatus*). For a list of the species by cover and frequency, refer to Table 18. Woody species density was consistent with most of the previous mentioned areas, estimated as 1,423 individuals per acre (Table 19).

The Lower Reclaimed Areas (Areas A-E, combined)

As one would expect due to the similarity of the results reported above for each separate area, results of the Areas A-E combined were also similar. The total mean cover of these areas combined was 47.33% (Table 21). Grasses dominated the living cover comprising nearly half of the living cover. Dominant plant species by cover and frequencies in descending order were cicer milkvetch, rubber rabbitbrush, thickspike wheatgrass, and bluebunch wheatgrass (Table 22).

Woody species density of the combined data of the *Lower Reclaimed Areas* was 1,941 individuals per acre (Table 23). Total biomass production was measured to be 689.60 pounds per acre, most of which were herbaceous species (Table 24).

Upper Reclaimed Access Road Areas

Total living cover of the *Upper Reclaimed Access Road Areas* was estimated to be 48.33%. Grasses once again dominated comprising 46.45% of the living cover, followed by forbs at 35.47% (Table 25). Dominant plant species of the area were similar to the aforementioned summaries. These species were cicer milkvetch, rubber

rabbitbrush, bluebunch wheatgrass, and thickspike wheatgrass (Table 26). Indian ricegrass and crested wheatgrass were also important components of the composition in this area.

Total woody species density was 2,552 individuals per acre with rubber rabbitbrush the most common shrub by far (Table 27). Total annual biomass production was 828.35 pounds per acre (Table 28).

Reference Area

The sample results for living understory cover of the *Reference Area* was 25.00% (Table 29). Because this area was a mature pinyon-juniper community, overstory cover was also an important component of the total cover. Overstory cover was estimated at 6.13%. If one combines the overstory and understory cover to represent "total living cover" the results has a mean of 31.13%, with a standard deviation of 14.89. Consistent with the reclaimed areas, grasses were the dominant lifeform but forbs were much less common (Table 29). The most common plant species by cover and frequency were Salina wildrye (*Elymus salinus*), pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). For cover and frequency results by species refer to Table 30.

Woody species density was much less in this area when compared to the reclaimed area. Total number of individuals per acre was 430 (Table 31) with the most

common species being mountain mahogany (*Cercocarpus ledifolius*) and pinyon pine (*Pinus edulis*). Total annual biomass production was estimated to be 208.36 pounds per acre, about one-third of what the reclaimed areas were (Table 32).

Reclaimed Riparian Area

Total living understory cover of the *Reclaimed Riparian* area was 68.00%, whereas overstory cover was 2.00%. Grasses comprised of 45.04% of the total ground cover, followed by woody species and forbs (Table 33). Dominant plant species by cover and frequency were willow (*Salix lutea*), orchardgrass (*Dactylis glomeratus*), horsetail (*Equisetum arvense*), and redtop (*Agrostis stolonifera*). For cover by species refer to Table 34. Total woody species density was 2,352 individuals per acre, with willow comprising the majority of it (Table 35). Total annual biomass production was calculated to be 270.38 pounds per acre, most of it from herbaceous species (Table 36).

Riparian Reference Area

Total living understory cover of the *Riparian Reference Area* was 64.00%, with grasses and forbs comprising the majority of it (Table 37). Overstory cover was estimated at 7.00%. Many of the most common species in this area were similar to those of the reclaimed riparian area. These species, shown on Table 38 were orchardgrass, willow, and redtop. Woody species density was estimated at 1,461

individuals per acre (Table 39), somewhat lower than the reclaimed riparian area. Results from production measurements indicated this area to be 463.66 pounds per acre (Table 40), which was somewhat more than the reclaimed area.

DISCUSSION

Cover

Figure 1 graphically shows the cover differences for the reclaimed and reference areas. Total living cover for each of the areas in the *Lower Reclaimed Areas* (A-E) were all greater than the Reference Area. Student's t-test were employed as a statistical comparison between the means of *Lower Reclaimed Areas* A-E (combined). Results indicated that the living cover of Areas A-E were significantly greater than that of the Reference Area (t = 4.723, Table 41).

Statistical tests comparing the total living cover of the *Upper Reclaimed Access Road Areas* with the *Reference Area* also suggest a significantly greater cover in the reclaimed area (t = 5.0, Table 41).

When cover was compared between the *Reclaimed Riparian Area* and the *Riparian Reference Area,* results suggested no significant difference (t = -0.168, Table

41, Figure 5).

Composition

Composition, or the relative number of woody species, forbs and grasses was different when one compares the reclaimed areas to the Pinyon-Juniper *Reference Area*. Figure 2 illustrates the comparison. The difference was the reclaimed areas have much better representation of forb species when compared to the Pinyon-Junper *Reference Area* that heavily favors grasses. Composition of the *Reclaimed Riparian Area* was similar to its *Reference Area* (Figure 6).

Density

Figure 3 shows each area's total number of woody plants per acre. Woody species density was also much greater in the *Lower Reclaimed Areas* and *Upper Reclaimed Access Road Area* when compared to the *Reference Area* (t = 8.013; t = 13.276, respectively, Table 41). The density of the *Reclaimed Riparian Area* was also significantly greater than the *Riparian Reference Area* (t = 3.203, Table 41). Figure 7 shows this graph comparison.

Production

Production, or total annual biomass, was also much higher in the reclaimed

areas when compared to the *Reference Area*. The *Lower Reclaimed Areas* (A-E combined) had 3 times the amount of production, whereas, the *Upper Reclaimed Road Areas* had nearly 4 times the production when compared to the *Reference Area*. These differences were statistically significant (Table 41). The differences are shown graphically on Figure 4.

The *Reclaimed Riparian Area*, however, had less annual production when compared to its *Riparian Reference Area* (Table 41, Figure 8). The results in the riparian areas may be somewhat less reliable because the areas were so small which consequently resulted in small sample sizes.

Diversity

Part of the success criteria for reclaimed lands as a result of SMCRA (Surface Mining Control and Reclamation Act) is that the final plant communities have "diverse, effective and permanent vegetative cover". Perhaps the most controversial is what constitutes a "diverse" vegetation.

Although habitat diversity can be subject to interpretation, it is an important goal for final vegetation especially when wildlife habitat is one of the primary postmining land-uses. Diversity of habitat can result from soils, revegetation techniques, species mixtures, erosion control measures, micro-environments, solar exposure, and so on. Vegetation diversity can range from plant species diversity, foliage height diversity,

openings and shape ratios, edge contrasts, or special features i.e. snags and downed dead-fall. Habitat diversity can also be a measured by several parameters but many investigators use diversity indices as a measurement for these plant communities. However, many argue that these indices do not reflect the true biotic diversity of the habitat because they do not provide a measure of the *spatial* configurations of the plant species and communities.

Diversity Using Cover Data

Because there are many ways to explore a diverse vegetative cover, this report will attempt to address diversity of the revegetated areas by several approaches. First, a straightforward method outlined by S.L. Emrich (Colorado Mined Land Reclamation Division) utilizes cover data. In this method each plant species is ranked by relative importance and listed by lifeform, total cover, and relative cover. These variables are later compared with the reference area that have been chosen as a standard for revegetation success. This does not mean that the same species must become established on the reclaimed land, but rather the community characters are compared. In this method the combined relative importance of a set number of species established on the reclaimed land should not exceed 75% relative importance, whereas, a maximum dominance of 40% relative importance is set for each species. This insures that the goal is to establish several species that will complement each other in the utilization of the resources.

Table 42 shows the necessary data (including frequency) for the: 1) *Lower*

Reclaimed Areas (A-E), 2) *Upper Reclaimed Areas* (Access Road), 3) Pinyon-Juniper *Reference Area*, 4) *Reclaimed Riparian Area*, and 5) *Riparian Reference Area*. These data show 6 species in the *Lower Reclaimed Areas* with a relative cover of 5.00% or greater (4 grass, 1 shrub, 1 forb). Six species in the *Upper Reclaimed Area* also had a relative cover greater than 5.00% (4 grass, 1 shrub, 1 forb) . No single species had a maximum dominance greater than 40.00%. The Pinyon-Juniper *Reference Area* had only 2 species with greater than 5.00% relative cover (1 tree, 1 grass) and did exceed 40.00% with Salina wildrye, thus not meeting standards set for diversity. These data suggest the reclaimed areas are diverse by the relative importance of several species. The *Reclaimed Riparian Area* and the *Riparian Reference Area* met both standards, although the *Reclaimed Riparian Area* had 7 species with greater that 5.00% relative cover compared to 4 in the *Reference Area*.

Diversity Indices

Diversity indices were also used to address diversity of the reclaimed and reference areas at the Huntington No. 4 Mine. The indices used were 1) the average number of species per meter square, 2) richness, and 3) total diversity. As one can observe, all three indices

TABLE 43: Diversity at the Huntington No. 4 Mine

AREA	MEAN NO. SPP./M^2	RICH-NESS	TOTAL DIVER-SITY*
Lower Reclaimed (A-E)	5.00	24.00	11.53
Upper Reclaimed (Rd.)	4.35	14.00	8.47
PJ Reference	1.58	6.00	2.57
Reclaimed Riparian	4.80	10.00	7.78
Riparian Reference	4.30	18.00	11.21

* $1/\sum P_i^2$

had a greater value in the *Upper and Lower Reclaimed Areas* when compared with the Pinyon Juniper *Reference Area* (Table 43). Results were variable but similar when the *Reclaimed Riparian Area* was compared to the *Riparian Reference Area*.

Spacial Diversity

Spacial diversity or the configurations of the vegetation by openings, edges or structural changes can also be important for wildlife habitat. These variables were not measured quantitatively, but the photographs included in this report suggest diversity in these aspects also. Furthermore, when one examines the raw data there is often much diversity of vegetation within and between each transect line, also suggesting habitat diversity.

SUMMARY

The reclaimed areas of the Huntington No. 4 Mine were compared with reference areas that were used as success standards for final revegetation. To summarize the results of this report, the reclaimed areas almost without exception performed significantly better for cover, frequency, woody species density, productivity and diversity.

TABLE 1: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Area "A", see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	44.50	11.28	10
Litter	17.50	14.87	10
Bareground	20.50	10.83	10
Rock	17.50	9.29	10
COMPOSITION			
Shrubs	5.83	9.90	10
Forbs	38.29	22.96	10
Grasses	55.88	22.00	10

TABLE 2: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Area "A", see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	1.00	3.00	10	10.00
Gutierrezia sarothrae	0.50	1.50	10	10.00
Pinus ponderosa	1.00	3.00	10	10.00
FORBS				
Astragalus cicer	12.00	13.45	10	70.00
Astragalus sp.	1.00	2.00	10	20.00
Machaeranthera canescens	1.00	2.00	10	20.00
Melilotus officinalis	1.50	3.20	10	20.00
Penstemon pachyphllus	1.50	3.20	10	20.00
GRASSES				
Agropyron cristatum	1.50	3.20	10	40.00
Bromus carinatus	1.00	2.00	10	70.00
Dacytylis glomeratus	1.50	2.29	10	30.00
Elymus lanceolatus	7.50	11.67	10	50.00
Elymus spicatus	1.50	3.20	10	60.00

TABLE 3: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Area "A", see Sample Map).

	NUMBER/ACRE
Cercocarpus ledifolius	87.12
Chrysothamnus nauseosus	1154.34
Eriogonum corymbosum	43.56
Gutierrezia sarothrae	370.26
Purshia tridentata	21.78
TOTAL	1677.06

TABLE 4: Dry weight annual production for the reclaimed areas of the Huntington No. 4 Mine (Area "A", see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	633.80	219.15	10.(50)
Woody Spp.	34.85	82.15	10.(50)
TOTAL PRODUCTION	668.65	229.88	10.(50)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 5: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Area "B", see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	55.00	9.49	10
Litter	8.50	5.94	10
Bareground	22.50	8.14	10
Rock	14.00	10.20	10
COMPOSITION			
Shrubs	26.10	16.21	10
Forbs	28.80	18.86	10
Grasses	45.10	12.54	10

TABLE 6: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Area "B", see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	13.00	9.54	10	90.00
Eriogonum corymbosum	0.50	1.50	10	10.00
Gutierrezia sarothrae	0.50	1.50	10	10.00
FORBS				
Astragalus cicer	13.50	11.63	10	80.00
Penstemon palmeri	2.00	3.32	10	30.00
Machaeranthera canescens	1.00	3.00	10	10.00
GRASSES				
Agropyron cristatum	5.50	6.10	10	60.00
Bromus carinatus	0.50	1.50	10	10.00
Elymus spicatus	5.00	6.71	10	40.00
Elymus lanceolatus	6.00	4.90	10	70.00
Stipa hymenoides	7.50	3.35	10	90.00

TABLE 7: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Area "B", see Sample Map).

	NUMBER/ACRE
Ceratoides lanata	43.56
Chrysothamnus nauseosus	2918.52
Eriogonum corymbosum	522.72
Pinus ponderosa	43.56
Purshia tridentata	21.78
TOTAL	3550.14

TABLE 8: Dry weight annual production for the reclaimed areas of the Huntington No. 4 Mine (Area "B", see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	599.87	321.68	10.(50)
Woody Spp.	280.82	250.12	10.(50)
TOTAL PRODUCTION	880.69	340.82	10.(50)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 9: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Area "C", see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	34.38	9.16	8
Litter	5.63	1.65	8
Bareground	23.13	18.70	8
Rock	36.88	14.56	8
COMPOSITION			
Shrubs	11.74	10.28	8
Forbs	38.59	18.41	8
Grasses	49.68	20.51	8

TABLE 10: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Area "C", see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	4.13	4.08	8	62.50
FORBS				
Astragalus cicer	5.63	9.82	8	37.50
Iva axillaris	0.25	0.66	8	12.50
Macharanthera canescens	1.25	2.17	8	25.00
Malcomia africana	1.25	3.31	8	10.00
Medicago sativa	2.13	2.80	8	37.50
Melilotus officinalis	0.63	1.65	8	12.50
Penstemon pachyphyllus	0.63	1.65	8	12.50
Penstemon palmeri	2.50	5.00	8	25.00
GRASSES				
Agropyron cristatum	2.25	2.33	8	50.00
Bromus carinatus	0.63	1.65	8	12.50
Bromus inermis	0.63	1.65	8	12.50
Elymus spicatus	0.63	1.65	8	12.50
Elymus lanceolatus	8.75	4.84	8	87.50
Stipa hymenoides	3.13	3.48	8	50.00

TABLE 11: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Area "C", see Sample Map).

	NUMBER/ACRE
Cercocarpus ledifolius	21.78
Chrysothamnus nauseosus	1197.90
Eriogonum corymbosum	174.24
Gutierrezia sarothrae	43.56
TOTAL	1437.48

TABLE 12: Dry weight annual production for the reclaimed areas of the Huntington No. 4 Mine (Area "C", see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	439.38	187.14	8.(40)
Woody Spp.	78.58	74.66	8.(40)
TOTAL PRODUCTION	517.96	135.42	8.(40)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 13: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Area "D", see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	43.57	6.39	7
Litter	7.14	2.47	7
Bareground	20.71	15.68	7
Rock	28.57	15.97	7
COMPOSITION			
Shrubs	18.48	12.21	7
Forbs	45.12	7.32	7
Grasses	36.39	13.14	7

TABLE 14: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Area "D", see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	7.86	4.52	7	85.71
FORBS				
Artemisia ludoviciana	0.71	1.75	7	14.29
Astragalus cicer	10.71	7.28	7	85.71
Machaeranthera canescens	2.14	3.64	7	28.57
Medicago sativa	2.14	2.47	7	42.86
Melilotus officinalis	1.43	3.50	7	14.29
Penstemon pachyphyllus	0.71	1.75	7	14.29
Penstemon palmeri	2.14	3.64	7	28.57
GRASSES				
Agropyron cristatum	2.14	2.47	7	42.86
Elymus spicatus	2.86	3.64	7	42.86
Elymus lanceolatus	3.57	3.50	7	57.14
Poa pratensis	1.43	2.26	7	28.57
Stipa hymenoides	3.57	3.50	7	57.14

TABLE 15: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Area "D", see Sample Map).

	NUMBER/ACRE
Chrysothamnus nauseosus	1335.84
TOTAL	1335.84

TABLE 16: Dry weight annual production for the reclaimed areas of the Huntington No. 4 Mine (Area "D", see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	422.89	168.66	7.(35)
Woody Spp.	109.76	67.27	7.(35)
TOTAL PRODUCTION	532.65	189.06	7.(35)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 17: Total cover and composition summary for the reclaimed areas of the Huntington No. 4 Mine (Area "E", see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	58.13	7.47	8
Litter	14.38	9.50	8
Bareground	13.13	8.64	8
Rock	14.38	11.02	8
COMPOSITION			
Shrubs	10.75	13.68	8
Forbs	34.82	19.63	8
Grasses	54.42	22.09	8

TABLE 18: Species cover and frequency summary for the reclaimed areas of the Huntington No. 4 Mine (Area "E", see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	4.38	4.64	8	50.00
Cercocarpus ledifolius	1.25	3.31	8	12.50
FORBS				
Astragalus cicer	17.50	14.14	8	87.50
Cynoglossum officinale	0.63	1.65	8	12.50
Machaeranthera canescens	0.63	1.65	8	12.50
Medicago sativa	1.25	3.31	8	12.50
Melilotus officinalis	0.63	1.65	8	12.50
Penstemon pachyphyllus	0.63	1.65	8	12.50
GRASSES				
Agropyron cristatum	5.00	4.33	8	62.50
Bromus carinatus	0.63	1.65	8	12.50
Bromus inermis	8.75	11.66	8	62.50
Dacytylis glomeratus	3.75	4.84	8	37.50
Elymus lanceolatus	4.38	3.90	8	62.50
Elymus hispidus	1.25	2.17	8	25.00
Elymus spicatus	6.25	4.15	8	75.00
Poa pratensis	1.25	3.31	8	12.50

TABLE 19: Woody species densities of the reclaimed areas of the Huntington No. 4 Mine (Area "E", see Sample Map).

	NUMBER/ACRE
Brickelia microphylla	29.04
Chrysothamnus nauseosus	1190.64
Chrysothamnus viscidiflorus	29.04
Pinus ponderosa	29.04
Purshia tridentata	29.04
Rosa woodsii	116.16
TOTAL	1422.96

TABLE 20: Dry weight annual production for the reclaimed areas of the Huntington No. 4 Mine (Area "E", see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	655.66	167.86	8.(40)
Woody Spp.	108.78	151.17	8.(40)
TOTAL PRODUCTION	764.44	174.90	8.(40)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 21: Total cover and composition summary for the combined reclaimed areas of the Huntington No. 4 Mine (Areas A-E, see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	47.33	16.26	43
Litter	10.93	9.96	43
Bareground	20.12	13.18	43
Rock	21.63	15.20	43
COMPOSITION			
Shrubs	14.67	14.79	43
Forbs	36.47	19.34	43
Grasses	48.85	19.74	43

TABLE 22: Species cover and frequency summary for the combined reclaimed areas of the Huntington No. 4 Mine (Areas A-E, see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	6.12	7.25	43	58.14
Cercocarpus ledifolius	0.23	1.51	43	2.33
Eriogonum corymbosum	0.12	0.75	43	2.33
Gutierrezia sarothrae	0.23	1.05	43	4.65
Pinus ponderosa	0.23	1.51	43	2.33
FORBS				
Astragalus cicer	11.98	12.30	43	72.09
Astragalus sp.	0.23	1.05	43	4.65
Cynoglossum officinale	0.12	0.75	43	2.33
Iva axillaris	0.04	0.30	43	2.33
Machaeranthera canescens	1.16	2.61	43	18.60
Malcomia africana	0.23	1.51	43	2.33
Medicago sativa	0.98	2.33	43	16.28
Melilotus officinalis	0.81	2.39	43	11.63
Penstemon palmeri	1.28	3.25	43	16.28
Penstemon pachyphyllus	0.70	2.04	43	11.63
GRASSES				
Agropyron cristatum	3.56	4.35	43	51.16
Bromus carinatus	1.86	3.24	43	27.91
Bromus inermis	1.86	6.10	43	16.28
Dacytylis glomeratus	1.05	2.76	43	13.95
Elymus hispidus	0.23	1.05	43	4.65
Elymus lanceolatus	6.16	7.06	43	65.12
Elymus spicatus	4.77	6.38	43	46.51
Poa pratensis	0.47	1.81	43	6.98
Stipa hymenoides	2.91	3.92	43	39.53

TABLE 23: Woody species densities of the combined reclaimed areas of the Huntington No. 4 Mine (Areas A-E, see Sample Map).

	NUMBER/ACRE
Brickelia microphylla	4.86
Cercocarpus ledifolius	33.88
Chrysothamnus nauseosus	1592.36
Chrysothamnus viscidiflorus	4.86
Gutierrezia sarothrae	91.96
Eriogonum corymbosum	164.56
Pinus ponderosa	14.52
Purshia tridentata	14.52
Rosa woodsii	19.36
TOTAL	1940.84
	(1017.77)*

* Number in parenthesis represents the standard deviation.

TABLE 24: Dry weight annual production for the combined reclaimed areas of the Huntington No. 4 Mine (Areas A-E, see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	562.33	246.96	43.(215)
Woody Spp.	127.27	175.20	43.(215)
TOTAL PRODUCTION	689.60	271.96	43.(215)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 25: Total cover and composition summary for the upper reclaimed areas of the Huntington No. 4 Mine (Revegetated Road Areas, see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	48.33	13.12	30
Litter	8.83	4.95	30
Bareground	20.33	11.69	30
Rock	22.50	13.95	30
COMPOSITION			
Shrubs	18.08	20.55	30
Forbs	35.47	26.99	30
Grasses	46.45	19.30	30

TABLE 26: Species cover and frequency summary for the upper reclaimed areas of the Huntington No. 4 Mine (Revegetated Road Areas, see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Chrysothamnus nauseosus	7.50	10.55	30	50.00
Cercocarpus ledifolius	1.00	2.71	30	15.33
Mahonia repens	0.50	2.69	30	3.33
FORBS				
Artemisia ludoviciana	0.17	0.90	30	3.33
Astragalus cicer	14.90	13.46	30	80.00
Penstemon pachyphullus	1.73	2.97	30	30.00
Penstemon palmeri	0.17	0.90	30	3.33
Salsola pestifer	0.10	0.54	30	3.33
GRASSES				
Agropyron cristatum	5.00	5.63	30	60.00
Bromus inermis	0.83	2.27	30	13.33
Bromus carinatus	1.67	3.73	30	20.00
Elymus lanceolatus	4.50	5.22	30	50.00
Elymus spicatus	6.83	7.17	30	63.33
Stipa hymenoides	3.43	4.85	30	40.00

TABLE 27: Woody species densities of the upper reclaimed areas of the Huntington No. 4 Mine (Revegetated Road Areas, see Sample Map).

	NUMBER/ACRE
Amalanchier utahensis	2.90
Artemisia frigida	2.90
Artemisia tridentata	5.80
Ceratoides ledifolius	127.60
Chrysothamnus nauseosus	2354.80
Chrysothamnus viscidiflorus	11.60
Gutierrezia sarothrae	26.10
Eriogonum corymbosum	2.90
Pinus ponderosa	2.90
Purshia tridentata	14.50
TOTAL	2552.00
	(863.42)*

* Number in parenthesis represents the standard deviation.

TABLE 28: Dry weight annual production of the upper reclaimed areas of the Huntington No. 4 Mine (Revegetated Road Areas, see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	632.78	444.94	30.(150)
Woody Spp.	195.58	199.63	30.(150)
TOTAL PRODUCTION	828.35	429.54	30.(150)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 29: Total cover and composition summary for the Pinyon-Juniper Reference Area of the Huntington No. 4 Mine (see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Overstory	6.13	11.75	40
Understory	25.02	8.73	40
Combined*	31.13	14.89	40
Litter	20.38	18.21	40
Bareground	14.13	8.72	40
Rock	40.50	20.85	40
COMPOSITION			
Shrubs	18.23	25.83	40
Forbs	1.25	5.45	40
Grasses	80.52	26.72	40

* Overstory and understory cover combined (shows total living cover).

TABLE 30: Species cover and frequency summary for the Pinyon-Juniper Reference Area of the Huntington No. 4 Mine (see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Cercocarpus ledifolius	0.88	2.71	40	12.50
Juniperus osteosperma	1.13	4.94	40	7.50
Pinus edulis	3.05	5.92	40	25.00
FORBS				
Descurania pinnata	0.38	1.73	40	5.00
GRASSES				
Elymus salinus	18.50	9.89	40	92.50
Stipa hymenoides	1.08	2.71	40	15.00

TABLE 31: Woody species densities of the Pinyon-Juniper Reference Area of the Huntington No. 4 Mine (see Sample Map).

	NUMBER/ACRE
Cercocarpus ledifolius	191.73
Gutierrezia sarothrae	46.48
Juniperus osteosperma	29.05
Pinus edulis	162.68
TOTAL	429.94
	(184.03)*

* Number in parenthesis represents the standard deviation.

TABLE 32: Dry weight annual production of the Pinyon-Juniper Reference Area of the Huntington No. 4 Mine (see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	103.95	64.72	50.(250)
Woody Spp.	104.41	193.54	50.(250)
TOTAL PRODUCTION	208.36	193.43	50.(250)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 33: Total cover and composition summary for the reclaimed riparian area of the Huntington No. 4 Mine (see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Overstory	2.00	4.00	5
Understory	68.00	5.10	5
Combined*	70.00	7.07	5
Litter	7.00	2.45	5
Bareground	8.00	2.45	5
Rock	17.00	5.10	5
COMPOSITION			
Shrubs	31.65	13.81	5
Forbs	23.31	21.34	5
Grasses	45.04	27.59	5

* Overstory and understory cover combined (shows total living cover).

TABLE 34: Species cover and frequency summary for the riparian area of the Huntington No. 4 Mine (see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Salix lutea	22.00	10.30	5	100.00
FORBS				
Circium sp.	1.00	2.00	5	20.00
Equisetum arvensis	8.80	13.18	5	40.00
Geranium richardsonii	2.20	3.92	5	40.00
Medicago sativa	3.60	3.72	5	60.00
Taraxicum officinale	0.40	0.80	5	20.00
GRASSES				
Agrostis stolonifera	8.00	11.66	5	40.00
Dactylis glomeratus	13.00	10.77	5	80.00
Phleum alpinum	5.00	4.47	5	60.00
Poa secunda	4.00	8.00	5	20.00

TABLE 35: Woody species densities of the reclaimed riparian area of the Huntington No. 4 Mine (see Sample Map).

	NUMBER/ACRE
Cornus sericea	
Picea engelmanii	174.24
Populus tremuloides	348.48
Rosa woodsii	87.12
Salix lutea	1742.40
TOTAL	3339.60
	(435.60)*

* Number in parenthesis represents the standard deviation.

TABLE 36: Dry weight annual production of the riparian area of the Huntington No. 4 Mine (see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	174.00	71.83	5.(25)
Woody Spp.	96.37	73.51	5.(25)
TOTAL PRODUCTION	270.38	141.08	5.(25)

* Sample size shows the number of sample locations. The number of estimates recorded including "double sampling" is shown in parentheses.

TABLE 37: Total cover and composition summary for the riparian reference area of the Huntington No. 4 Mine (see Sample Map).

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Overstory	7.00	6.78	10
Understory	64.00	8.31	10
Combined*	71.00	12.21	10
Litter	10.40	9.37	10
Bareground	17.40	13.41	10
Rock	8.20	11.25	10
COMPOSITION			
Shrubs	19.95	10.41	10
Forbs	36.67	26.16	10
Grasses	43.38	30.81	10

* Overstory and understory cover combined (shows total living cover).

TABLE 38: Species cover and frequency summary for the riparian reference area of the Huntington No. 4 Mine (see Sample Map).

SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
TREES & SHRUBS				
Abies concolor	0.50	1.50	10	10.00
Cornus sericea	0.50	1.50	10	10.00
Juniperus scopulorum	1.00	2.00	10	20.00
Picea engelmannii	1.00	3.00	10	10.00
Populus tremuloides	0.50	1.50	10	10.00
Rosa woodsii	3.00	6.40	10	20.00
Salix lutea	6.50	13.43	10	20.00
FORBS				
Circium sp.	1.00	2.00	10	20.00
Equisetum arvense	19.00	20.47	10	80.00
Geranium richardsonii	2.00	3.32	10	30.00
Nasturtium officinale	1.00	3.00	10	10.00
Ranunculus cymbalaria	0.50	1.50	10	10.00
Taraxicum officinale	1.50	2.29	10	30.00
GRASSES				
Agrostis stolonifera	14.50	16.65	10	60.00
Bromus inermis	2.00	6.00	10	10.00
Catabrosa aquatica	2.00	4.00	10	20.00
Dactylis glomeratus	6.50	10.01	10	40.00
Juncus sp.	1.00	2.00	10	20.00

TABLE 39: Woody species densities of the riparian reference area of the Huntington No. 4 Mine (see Sample Map).

	NUMBER/ACRE
Abies concolor	43.56
Cornus stolonifera	174.24
Juniperus scopulorum	43.56
Picea engelmannii	43.56
Populus tremuloides	392.04
Rosa woodsii	261.36
Salix lutea	522.72
TOTAL	1481.04
	(261.36)*

* Number in parenthesis represents the standard deviation.

TABLE 40: Dry weight annual production of the riparian reference area of the Huntington No. 4 Mine (see Sample Map).

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	339.62	145.04	10.(50)
Woody Spp.	124.03	133.94	10.(50)
TOTAL PRODUCTION	463.66	165.66	10.(50)

TABLE 41: Statistical summary sheet for the reclaimed areas and reference areas at the Huntington No. 4 Mine.

LOWER RECLAIMED AREAS (A-E Combined)				
Living Cover*	x=47.33	s=16.26	n=43	nMin=19
Density	x=1940.84	s=1017.77	n=36	nMin=45
Production	x=689.60	s=271.96	n=43(215)	nMin=25
REFERENCE AREA				
Living Cover*	x=31.13	s=14.89	n=40	nMin=37
Density	x=429.94	s=184.03	n=30	nMin=30
Production	x=208.36	s=193.43	n=50(250)	nMin=141
STATISTICAL ANALYSES				
Living Cover	t=4.723	df=81	SL=p<.005	
Density	t=8.013	df=64	SL=p<.005	
Production	t=9.931	df=91	SL=p<.005	

UPPER RECLAIMED ACCESS ROAD AREAS				
Living Cover	x=48.33	s=13.12	n=30	nMin=12
Density	x=2552.00	s=863.42	n=60	nMin=19
Production	x=828.35	s=429.54	n=30(150)	nMin=44
REFERENCE AREA				
Living Cover*	x=31.13	s=14.89	n=40	nMin=37
Density	x=429.94	s=184.03	n=30	nMin=30
Production	x=208.36	s=193.43	n=50(250)	nMin=141
STATISTICAL ANALYSES				
Living Cover	t=5.029	df=68	SL=p<.005	
Density	t=13.276	df=88	SL=p<.005	
Production	t=8.846	df=78	SL=p<.005	

x = sample mean, s = sample standard deviation, n = sample size, nMin = minimun adequate sample, NS = nonsignificant, (number in parenthesis is sample number with double sampling employed), t = Student's t-value, df = degrees of freedom, SL = significance level
* represents understory and overstory cover combined.

TABLE 41: (Continued)

RECLAIMED RIPARIAN AREA				
Living Cover	x=70.00	s=7.07	n=5	nMin=2
Density	x=2352.24	s=435.60	n=2	nMin=6
Production	x=270.38	s=141.08	n=5(25)	nMin=45
RIPARIAN REFERENCE AREA				
Living Cover*	x=71.00	s=12.21	n=10	nMin=5
Density	x=1481.04	s=261.36	n=4	nMin=5
Production	x=463.66	s=165.66	n=10(50)	nMin=21
STATISTICAL ANALYSES				
Living Cover	t=-0.168	df=13	SL=NS	
Density	t=3.203	df=4	SL=p<.005	
Production	t=-2.226	df=13	SL=p<.05	

x = sample mean, s = sample standard deviation, n = sample size, nMin = minimun adequate sample, NS = nonsignificant, (number in parenthesis is sample number with double sampling employed), t = Student's t-value, df = degrees of freedom, SL = significance level
* represents understory and overstory cover combined.

TABLE 42: Lifeform, cover and frequency comparisons for each area sampled at the Huntington No. 4. Mine

Reclaimed Lower Areas (A-E Combined)

SPECIES	Lifeform	%Cover	Relative Cover	Frequency
Astragalus cicer	Forb	11.98	25.31	72.09
Elymus lanceolatus	Grass	6.16	13.01	65.12
Chrysothamnus nauseosus	Shrub	6.12	12.93	58.14
Elymus spicatus	Grass	4.77	10.08	46.51
Agropyron cristatum	Grass	3.56	7.52	51.16
Stipa hymenoides	Grass	2.91	6.13	39.53
Bromus carinatus	Grass	1.86	3.93	27.91
Bromus inermis	Grass	1.86	3.93	16.28
Penstemon palmeri	Forb	1.28	3.80	16.28
Machaeranthera canescens	Forb	1.16	2.45	18.60
Dacytylis glomeratus	Grass	1.05	2.22	13.95
Medicago sativa	Forb	0.98	2.07	16.28
Melilotus officinalis	Forb	0.81	1.71	11.63
Penstemon pachyphyllus	Forb	0.70	1.48	11.63
Poa pratensis	Forb	0.47	0.99	6.98
Malcomia africana	Forb	0.23	0.49	2.33
Astragalus sp.	Forb	0.23	0.49	4.65
Pinus ponderosa	Tree	0.23	0.49	2.33
Gutierrezia sarothrae	Shrub	0.23	0.49	4.65
Elymus hispidus	Grass	0.23	0.49	4.65
Cercocarpus ledifolius	Shrub	0.23	0.49	2.33
Eriogonum corymbosum	Shrub	0.12	0.25	2.33
Cynoglossum officinale	Forb	0.12	0.25	2.33
Iva axillaris	Forb	0.04	0.08	2.33
Totals		47.33	100.00	500.02

Reclaimed Upper Access Road Areas

Astragalus cicer	Forb	14.90	30.83	80.00
Chrysothamnus nauseosus	Shrub	7.50	15.52	50.00
Elymus spicatus	Grass	6.83	14.13	63.33
Agropyron cristatum	Grass	5.00	10.35	60.00
Elymus lanceolatus	Grass	4.50	9.31	50.00
Stipa hymenoides	Grass	3.43	7.10	40.00
Penstemon pachyphullus	Forb	1.73	3.58	30.00
Bromus carinatus	Grass	1.67	3.46	20.00
Cercocarpus ledifolius	Shrub	1.00	2.07	15.33
Bromus inermis	Grass	0.83	1.72	13.33
Mahonia repens	Shrub	0.50	1.03	3.33
Artemisia ludoviciana	Forb	0.17	0.35	3.33
Penstemon palmeri	Forb	0.17	0.35	3.33
Salsola pestifer	Forb	0.10	0.21	3.33
Totals		48.33	100.00	435.31

Reference Area

Elymus salinus	Grass	18.50	73.84	92.50
Pinus edulis	Tree	3.05	12.19	25.00
Juniperus osteosperma	Tree	1.13	4.52	7.50
Stipa hymenoides	Grass	1.08	4.32	15.00
Cercocarpus ledifolius	Shrub	0.88	3.52	12.50
Descurania pinnata	Forb	0.38	1.52	5.00
Totals		25.02	100.00	157.50

TABLE 42: (continued)

SPECIES	Lifeform	Cover	Relative Cover	Frequency
Reclaimed Riparian Area				
Salix lutea	Shrub	22.00	32.35	100.00
Dactylis glomeratus	Grass	13.00	19.12	80.00
Equisetum arvensis	Forb	8.80	12.94	40.00
Agrostis stolonifera	Grass	8.00	11.76	40.00
Phleum alpinum	Grass	5.00	7.35	60.00
Poa secunda	Grass	4.00	5.88	20.00
Medicago sativa	Forb	3.60	5.29	60.00
Geranium richardsonii	Forb	2.20	3.24	40.00
Circium sp.	Forb	1.00	1.47	20.00
Taraxicum officinale	Forb	0.40	0.59	20.00
Totals		68.00	100.00	480.00
Riparian Reference Area				
Equisetum arvense	Forb	19.00	29.69	80.00
Agrostis stolonifera	Grass	14.50	22.66	60.00
Dactylis glomeratus	Grass	6.50	10.16	40.00
Salix lutea	Shrub	6.50	10.16	20.00
Rosa woodsii	Shrub	3.00	4.69	20.00
Catabrosa aquatica	Grass	2.00	3.13	20.00
Bromus inermis	Grass	2.00	3.13	10.00
Geranium richardsonii	Forb	2.00	3.13	30.00
Taraxicum officinale	Forb	1.50	2.34	30.00
Circium sp.	Forb	1.00	1.56	20.00
Nasturtium officinale	Forb	1.00	1.56	10.00
Picea engelmannii	Tree	1.00	1.56	10.00
Juniperus scopulorum	Tree	1.00	1.56	20.00
Juncus sp.	Gramin.	1.00	1.56	20.00
Ranunculus cymbalaria	Forb	0.50	0.78	10.00
Populus tremuloides	Tree	0.50	0.78	10.00
Cornus sericea	Tree	0.50	0.78	10.00
Abies concolor	Tree	0.50	0.78	10.00
Total		64.00	100.00	430.00

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Snedecor, G.W. and W.G. Cochran. 1980. Statistical methods. The Iowa State University Press, Ames, Iowa.

Welsh, S.L., N.D. Atwood, S. Goodrich and L.C. Higgins. 1993. A Utah flora. Print Services, Brigham Young University, Provo, Utah.

COLOR PHOTOGRAPHS

Photo 1: Habitat Diversity (1 of 2)

Photo 2: Habitat Diversity (2 of 2)

Photo 3: Lower Area "A"

Photo 4: Lower Area "B"

Photo 5: Lower Area "C"

Photo 6: Lower Area "D"

Photo 7: Lower Area "E"

Photo 8: Upper Area Road (1 of 4)

Photo 9: Upper Area Road (2 of 4)

Photo 10: Upper Area Road (3 of 4)

Photo 11: Upper Area Road (4 of 4)

Photo 12: Pinyon-Juniper Reference Area (1 of 3)

Photo 13: Pinyon-Juniper Reference Area (2 of 3)

Photo 14: Pinyon-Juniper Reference Area (3 of 3)

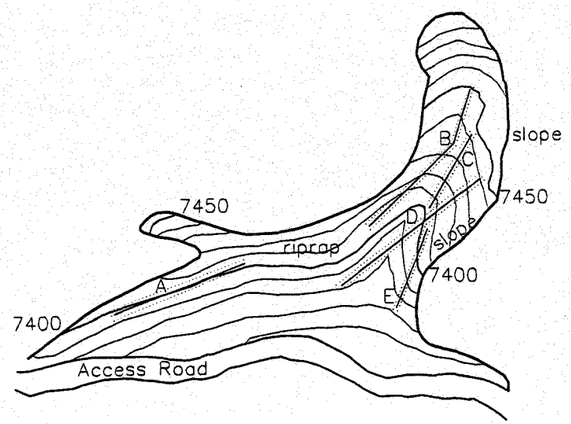
Photo 15: Reclaimed Riparian Area

Photo 16: Riparian Reference Area

SAMPLE MAP

SAMPLE MAP

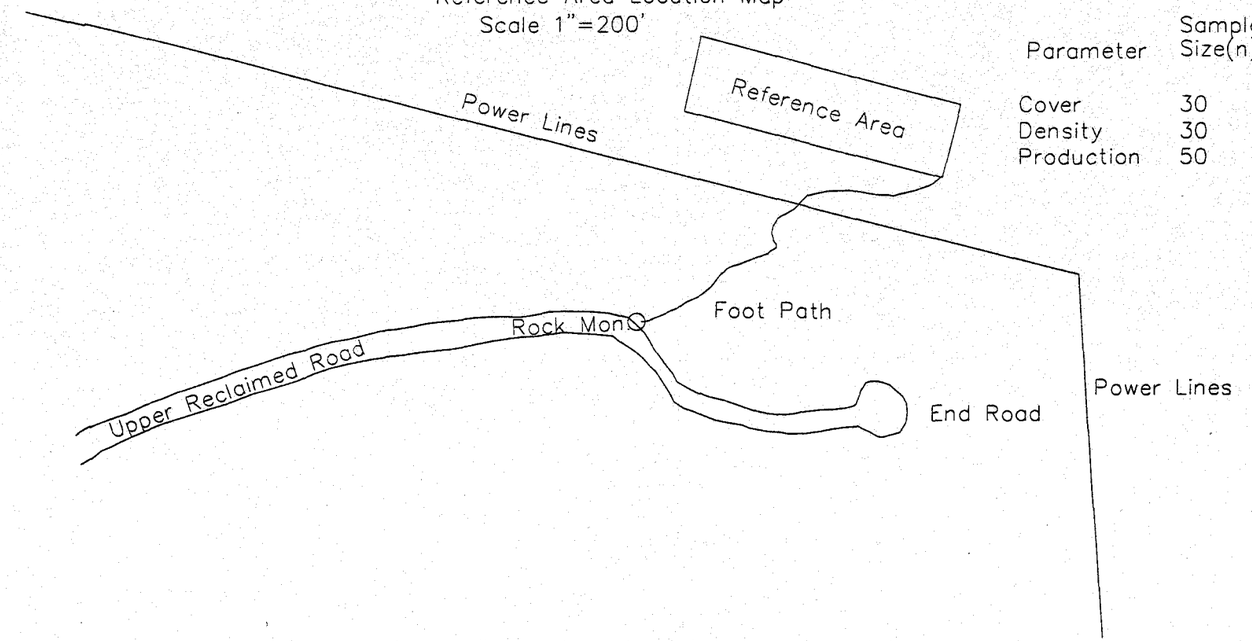
Lower Reclaimed Areas



Scale 1"=200'

Sample Area	Parameter	Sample Size(n)
A	Cover	10
	Density	8
	Production	10
B	Cover	10
	Density	8
	Production	10
C	Cover	8
	Density	8
	Production	7
D	Cover	7
	Density	6
	Production	7
E	Cover	8
	Density	6
	Production	8
Comb.	Cover	43
	Density	30
	Production	43

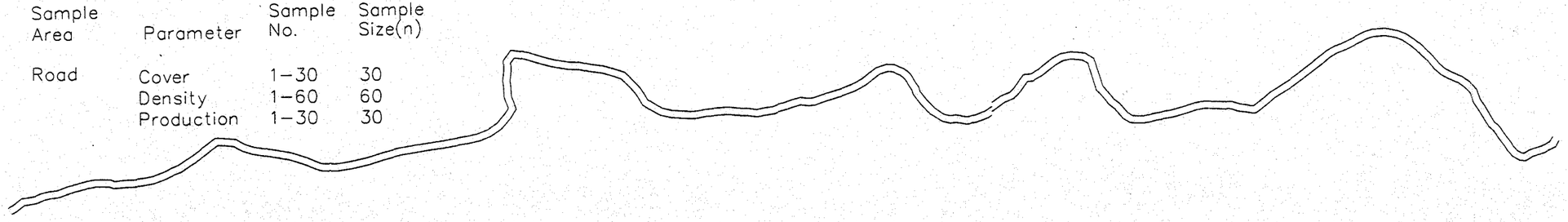
Reference Area Location Map
Scale 1"=200'



Parameter	Sample Size(n)
Cover	30
Density	30
Production	50

Upper Reclaimed Areas
Scale 1"=500'

Sample Area	Parameter	Sample No.	Sample Size(n)
Road	Cover	1–30	30
	Density	1–60	60
	Production	1–30	30



HUNTINGTON NO.4 MINE
SAMPLE LOCATION MAP
1994

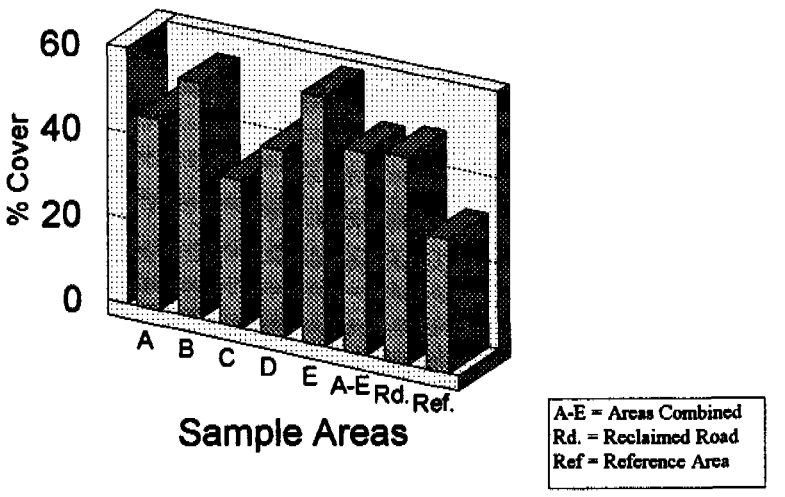
MT. NEBO SCIENTIFIC
RESEARCH AND CONSULTING

DRAWN	J. MAGENO	HUNT4.DWG
CHECKED	P. COLLINS	
DATE	3-21-95	
SCALE	varies	

FIGURES

Fig. 1: Total Living Cover

Reclaimed vs. Reference (1995)



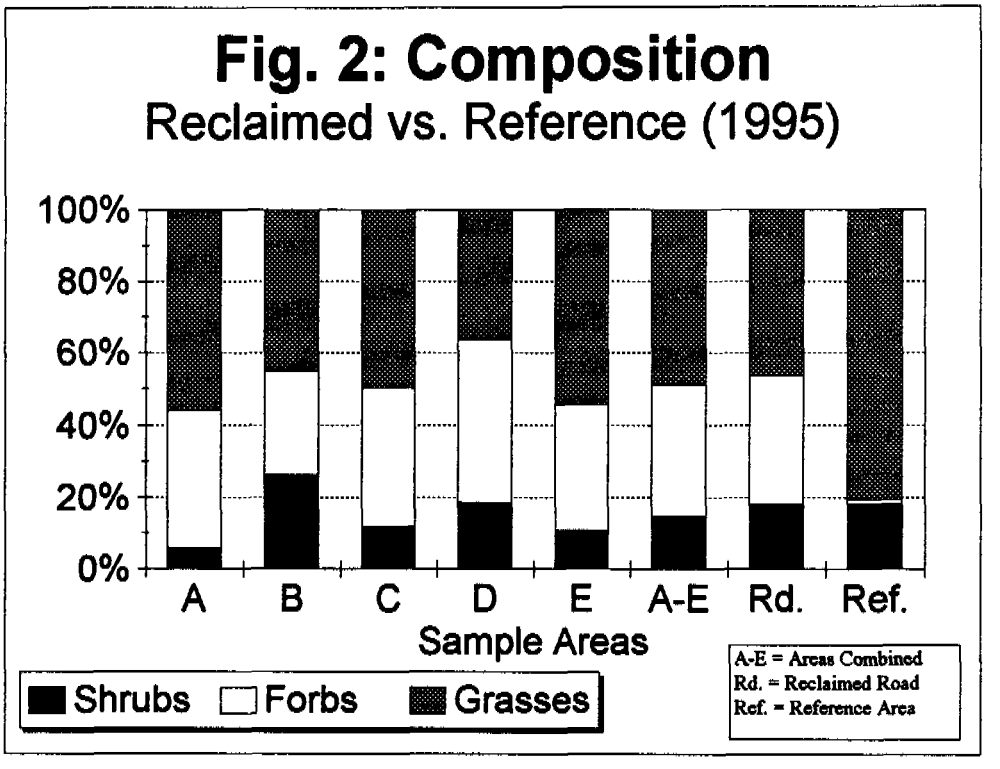


Fig. 2: Composition
Reclaimed vs. Reference (1995)
100%
80%
60%
40%
20%
0%
A
B
C
D
E
A-E
Rd.
Ref.
Sample Areas
Shrubs
Forbs
Grasses
A-E = Areas Combined
Rd. = Reclaimed Road
Ref. = Reference Area

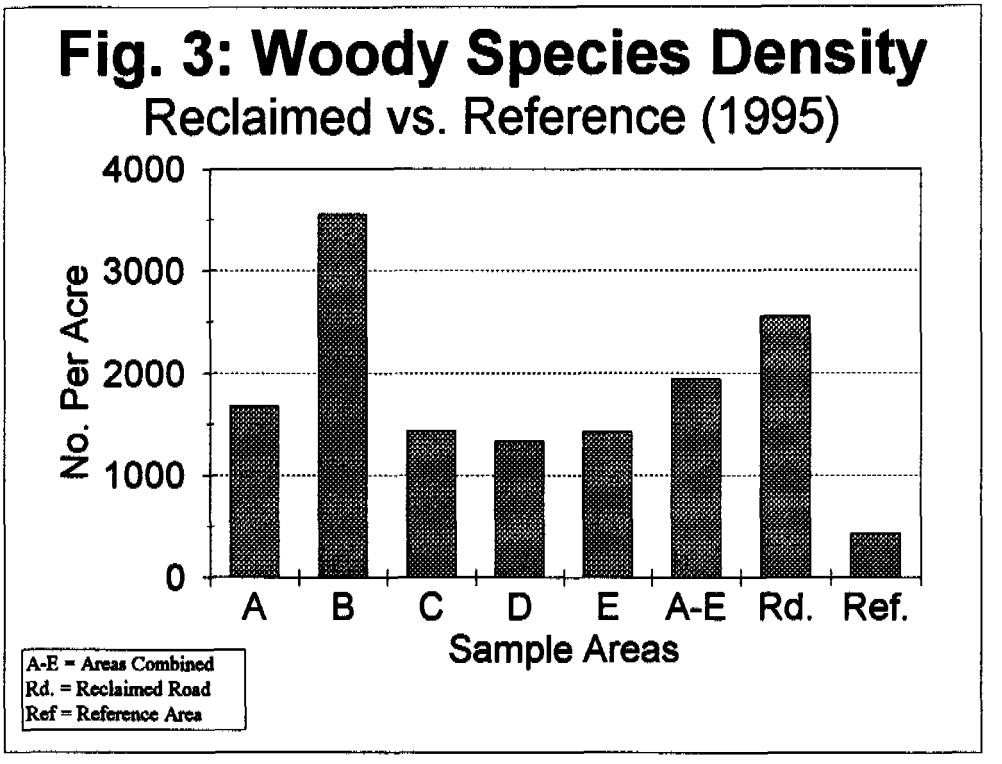


Fig. 3: Woody Species Density
Reclaimed vs. Reference (1995)
4000
3000
2000
1000
0
No. Per Acre
A
B
C
D
E
A-E
Rd.
Ref.
Sample Areas
A-E = Areas Combined
Rd. = Reclaimed Road
Ref = Reference Area

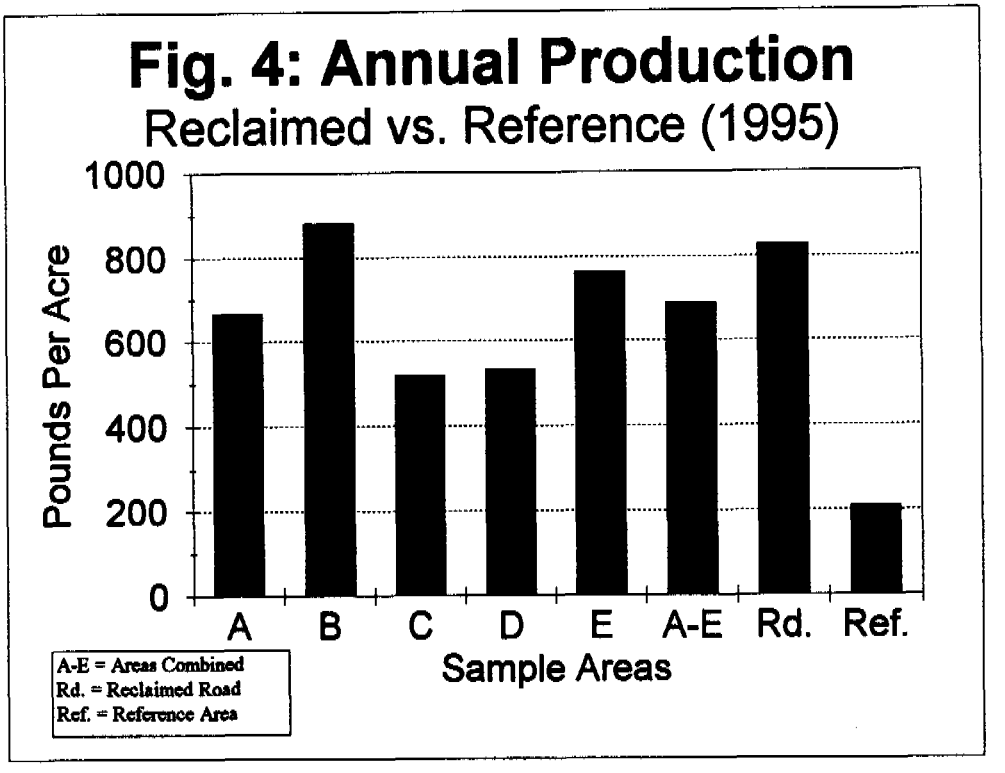
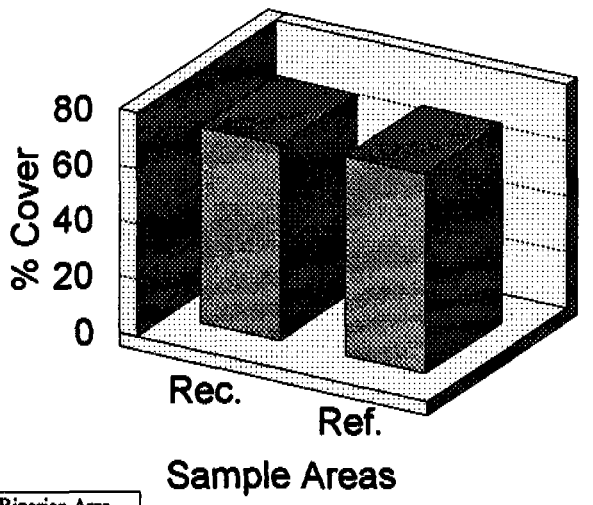


Fig. 4: Annual Production
Reclaimed vs. Reference (1995)
Pounds Per Acre
1000
800
600
400
200
0
A
B
C
D
E
A-E
Rd.
Ref.
Sample Areas
A-E = Areas Combined
Rd. = Reclaimed Road
Ref. = Reference Area

Fig. 5: Total Living Cover

Reclaimed Riparian vs. Reference -1995



Rec. = Reclaimed Riparian Area
Ref. = Riparian Reference Area

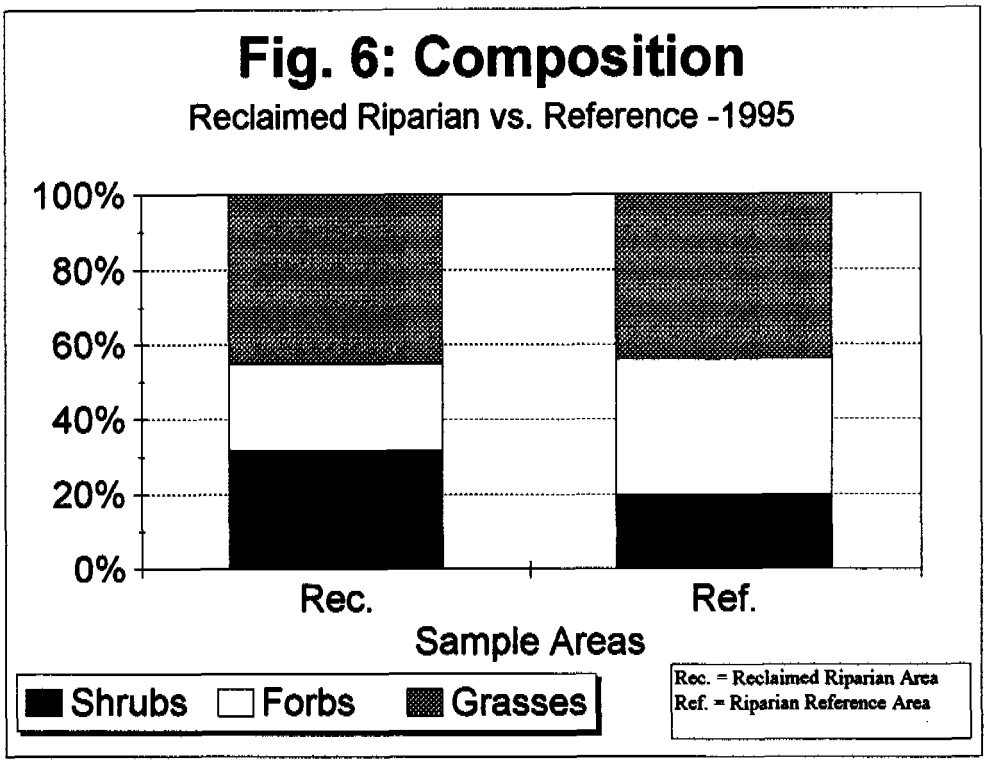


Fig. 6: Composition
Reclaimed Riparian vs. Reference -1995
100%
80%
60%
40%
20%
0%
Rec.
Ref.
Sample Areas
Shrubs
Forbs
Grasses
Rec. = Reclaimed Riparian Area
Ref. = Riparian Reference Area

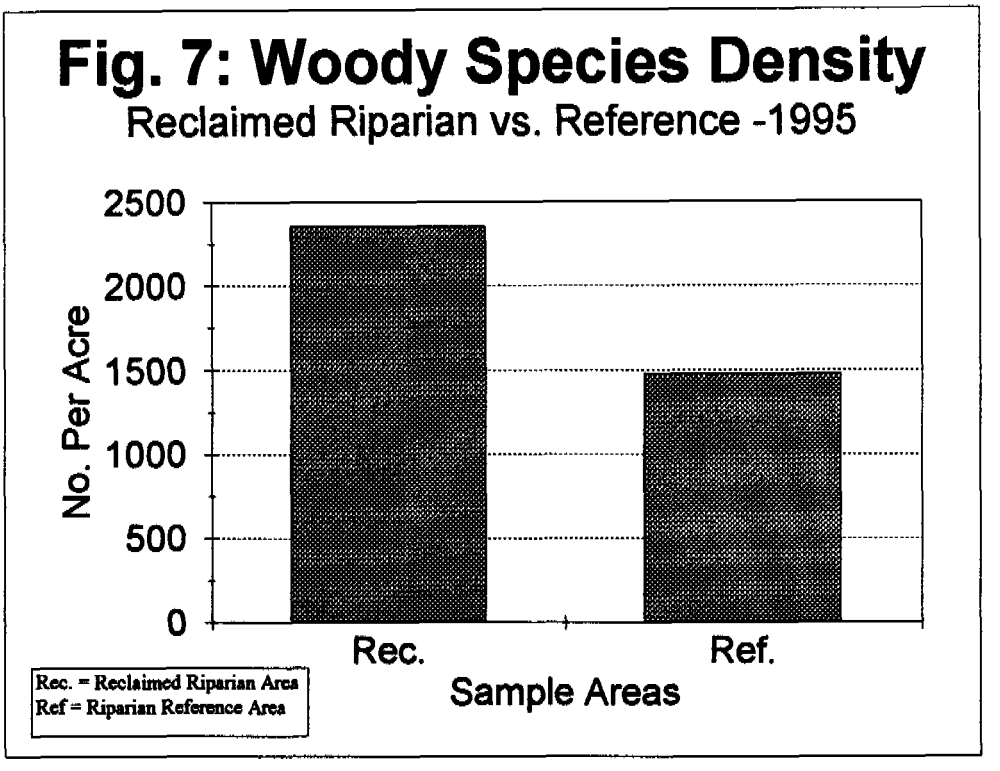


Fig. 7: Woody Species Density
Reclaimed Riparian vs. Reference -1995
2500
2000
1500
1000
500
0
No. Per Acre
Rec.
Ref.
Sample Areas
Rec. = Reclaimed Riparian Area
Ref = Riparian Reference Area

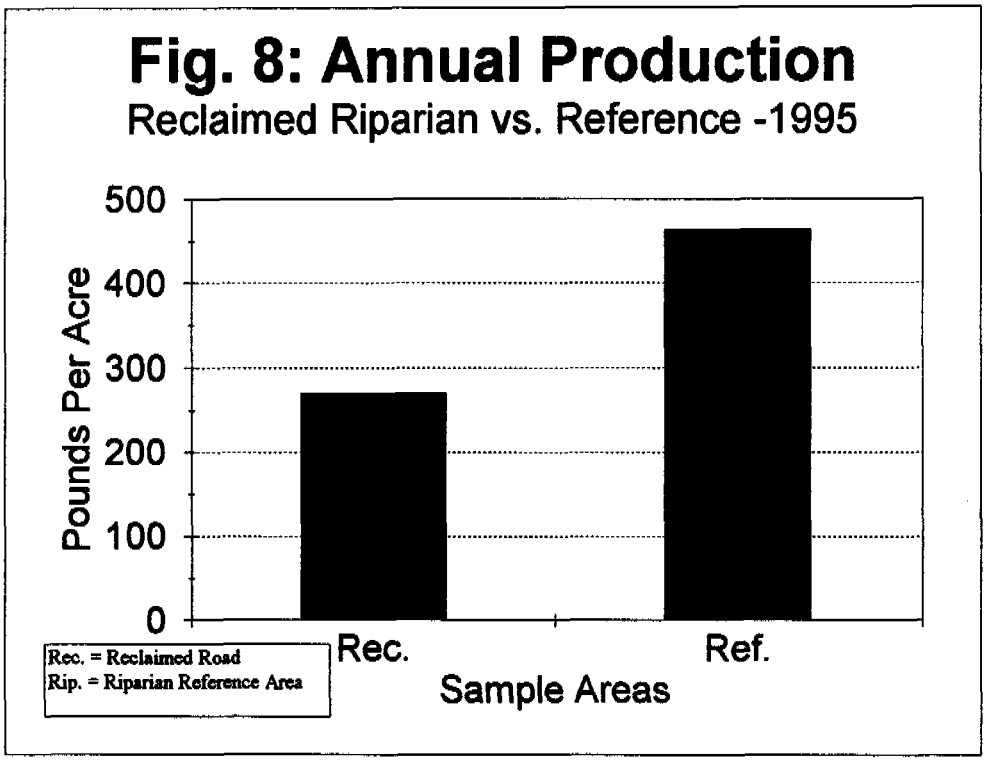


Fig. 8: Annual Production
Reclaimed Riparian vs. Reference -1995
500
400
300
200
100
0
Pounds Per Acre
Rec.
Ref.
Sample Areas
Rec. = Reclaimed Road
Rip. = Riparian Reference Area

APPENDIX A:

RAW DATA
(Cover, Composition, Frequency)

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
A - Lower Area South (1-10)
Exposure: Variable
Slope: Variable

Sample Date: 15 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
Pinus ponderosa	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
FORBS										
Machaeranthera canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00
Astragalus cicer	0.00	10.00	45.00	5.00	0.00	5.00	25.00	15.00	15.00	0.00
Melilotus officinalis	10.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Astragalus sp.	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	5.00
Penstemon pachyphyllus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	5.00
GRASSES										
Elymus spicatus	0.00	5.00	0.00	20.00	0.00	5.00	0.00	25.00	15.00	10.00
Bromus carinatus	10.00	10.00	0.00	10.00	10.00	5.00	5.00	0.00	0.00	5.00
Agropyron cristatum	0.00	0.00	0.00	5.00	5.00	0.00	0.00	10.00	0.00	5.00
Dactylis glomeratus	5.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	0.00	5.00	10.00	0.00	40.00	10.00	10.00	0.00	0.00	0.00
COVER										
Total Living Cover	25.00	35.00	60.00	40.00	60.00	40.00	40.00	60.00	45.00	40.00
Litter	10.00	25.00	5.00	50.00	25.00	35.00	5.00	5.00	5.00	10.00
Bareground	30.00	20.00	15.00	5.00	10.00	15.00	45.00	15.00	25.00	25.00
Rock	35.00	20.00	20.00	5.00	5.00	10.00	10.00	20.00	25.00	25.00
% COMPOSITION										
Shrubs	0.00	0.00	0.00	0.00	0.00	25.00	0.00	8.33	0.00	25.00
Forbs	40.00	42.86	75.00	12.50	0.00	25.00	62.50	33.33	66.67	25.00
Grasses	60.00	57.14	25.00	87.50	100.00	50.00	37.50	58.33	33.33	50.00

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
A - Lower Area South (1-10)
Exposure: Variable
Slope: Variable
Sample Date: 15 Aug 1995

Mean	SDev	Freq	
			TREES & SHRUBS
0.50	1.50	10.00	Gutierrezia sarothrae
1.00	3.00	10.00	Chrysothamnus nauseosus
1.00	3.00	10.00	Pinus ponderosa
			FORBS
1.00	2.00	20.00	Machaeranthera canescens
12.00	13.45	70.00	Astragalus cicer
1.50	3.20	20.00	Melilotus officinalis
1.00	2.00	20.00	Astragalus sp.
1.50	3.20	20.00	Penstemon pachyphyllus
			GRASSES
1.50	3.20	60.00	Elymus spicatus
1.00	2.00	70.00	Bromus carinatus
1.50	3.20	40.00	Agropyron cristatum
1.50	2.29	30.00	Dactylis glomeratus
7.50	11.67	50.00	Elymus lanceolatus

		COVER
44.50	11.28	Total Living Cover
17.50	14.87	Litter
20.50	10.83	Bareground
17.50	9.29	Rock
		% COMPOSITION
5.83	9.90	Shrubs
38.29	22.96	Forbs
55.88	22.00	Grasses

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
B - Lower Area North (11-20)
Exposure: Variable
Slope: Variable

Sample Date: 15 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Chrysothamnus nauseosus	10.00	5.00	25.00	0.00	20.00	10.00	5.00	20.00	30.00	5.00
Gutierrezia sarothrae	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
Eriogonum corymbosum	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS										
Astragalus cicer	30.00	5.00	5.00	15.00	0.00	30.00	30.00	10.00	0.00	10.00
Penstemon palmeri	5.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Machaeranthera canescens	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES										
Stipa hymenoides	10.00	10.00	10.00	5.00	0.00	10.00	10.00	5.00	10.00	5.00
Elymus spicatus	0.00	10.00	0.00	10.00	20.00	0.00	10.00	0.00	0.00	0.00
Agropyron cristatum	0.00	0.00	0.00	5.00	20.00	10.00	0.00	5.00	5.00	10.00
Elymus lanceolatus	5.00	0.00	0.00	5.00	0.00	10.00	5.00	15.00	10.00	10.00
Bromus carinatus	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER										
Total Living Cover	65.00	35.00	50.00	55.00	60.00	70.00	60.00	55.00	55.00	45.00
Litter	5.00	5.00	10.00	5.00	10.00	10.00	5.00	5.00	25.00	5.00
Bareground	20.00	20.00	20.00	35.00	25.00	15.00	15.00	30.00	10.00	35.00
Rock	10.00	40.00	20.00	5.00	5.00	5.00	20.00	10.00	10.00	15.00
% COMPOSITION										
Shrubs	15.38	28.57	50.00	9.09	33.33	14.29	8.33	36.36	54.55	11.11
Forbs	53.85	14.29	30.00	45.45	0.00	42.86	50.00	18.18	0.00	33.33
Grasses	30.77	57.14	20.00	45.45	66.67	42.86	41.67	45.45	45.45	55.56

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
B - Lower Area North (11-20)
Exposure: Variable
Slope: Variable
Sample Date: 15 Aug 1995

Mean	SDev	Freq	
			TREES & SHRUBS
13.00	9.54	90.00	Chrysothamnus nauseosus
0.50	1.50	10.00	Gutierrezia sarothrae
0.50	1.50	10.00	Eriogonum corymbosum
			FORBS
13.50	11.63	80.00	Astragalus cicer
2.00	3.32	30.00	Penstemon palmeri
1.00	3.00	10.00	Machaeranthera canescens
			GRASSES
7.50	3.35	90.00	Stipa hymenoides
5.00	6.71	40.00	Elymus spicatus
5.50	6.10	60.00	Agropyron cristatum
6.00	4.90	70.00	Elymus lanceolatus
0.50	1.50	10.00	Bromus carinatus
			COVER
55.00	9.49		Total Living Cover
8.50	5.94		Litter
22.50	8.14		Bareground
14.00	10.20		Rock
			% COMPOSITION
26.10	16.21		Shrubs
28.80	18.86		Forbs
45.10	12.54		Grasses

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
C - Lower Area Slopes (21-28)
Exposure: Variable
Slope: Variable

Sample Date: 15 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	Mean	SDev	Freq
TREES & SHRUBS											
Chrysothamnus nauseosus	5.00	5.00	13.00	0.00	5.00	0.00	5.00	0.00	4.13	4.08	62.50
FORBS											
Melilotus officinalis	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Astragalus cicer	5.00	0.00	0.00	0.00	0.00	0.00	10.00	30.00	5.63	9.82	37.50
Malcomia africana	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	1.25	3.31	10.00
Iva axillaris	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.25	0.66	12.50
Penstemon palmeri	0.00	0.00	5.00	15.00	0.00	0.00	0.00	0.00	2.50	5.00	25.00
Penstemon pachyphyllus	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Medicago sativa	5.00	7.00	5.00	0.00	0.00	0.00	0.00	0.00	2.13	2.80	37.50
Machaeranthera canescens	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	2.17	25.00
GRASSES											
Stipa hymenoides	5.00	5.00	5.00	10.00	0.00	0.00	0.00	0.00	3.13	3.48	50.00
Elymus spicatus	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Agropyron cristatum	5.00	3.00	5.00	0.00	0.00	5.00	0.00	0.00	2.25	2.33	50.00
Bromus carinatus	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Elymus lanceolatus	5.00	5.00	0.00	10.00	10.00	15.00	10.00	15.00	8.75	4.84	87.50
Bromus inermis	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
COVER											
Total Living Cover	40.00	40.00	45.00	35.00	25.00	20.00	25.00	45.00	34.38	9.16	
Litter	5.00	5.00	5.00	10.00	5.00	5.00	5.00	5.00	5.63	1.65	
Bareground	5.00	30.00	10.00	10.00	10.00	45.00	60.00	15.00	23.13	18.70	
Rock	50.00	25.00	40.00	45.00	60.00	30.00	10.00	35.00	36.88	14.56	
% COMPOSITION											
Shrubs	12.50	12.50	28.89	0.00	20.00	0.00	20.00	0.00	11.74	10.28	
Forbs	37.50	55.00	26.67	42.86	40.00	0.00	40.00	66.67	38.59	18.41	
Grasses	50.00	32.50	44.44	57.14	40.00	100.00	40.00	33.33	49.68	20.51	

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
D - Below Slopes (29-35)
Exposure: Variable
Slope: Variable

Sample Date: 15 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	Mean	SDev	Freq
TREES & SHRUBS										
Chrysothamnus nauseosus	10.00	10.00	5.00	10.00	5.00	15.00	0.00	7.86	4.52	85.71
FORBS										
Penstemon palmeri	5.00	10.00	0.00	0.00	0.00	0.00	0.00	2.14	3.64	28.57
Astragalus cicer	15.00	10.00	5.00	10.00	25.00	0.00	10.00	10.71	7.28	85.71
Melilotus officinalis	0.00	0.00	0.00	0.00	0.00	10.00	0.00	1.43	3.50	14.29
Machaeranthera canescens	0.00	0.00	0.00	5.00	0.00	0.00	10.00	2.14	3.64	28.57
Artemisia ludoviciana	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.71	1.75	14.29
Penstemon pachyphyllus	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.71	1.75	14.29
Medicago sativa	0.00	0.00	5.00	0.00	0.00	5.00	0.00	1.43	2.26	28.57
Medicago sativa	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.71	1.75	14.29
GRASSES										
Stipa hymenoides	5.00	5.00	0.00	0.00	10.00	0.00	5.00	3.57	3.50	57.14
Elymus spicatus	0.00	5.00	5.00	0.00	0.00	0.00	10.00	2.86	3.64	42.86
Agropyron cristatum	5.00	0.00	5.00	0.00	5.00	0.00	0.00	2.14	2.47	42.86
Elymus lanceolatus	5.00	0.00	5.00	10.00	0.00	0.00	5.00	3.57	3.50	57.14
Poa pratensis	0.00	0.00	0.00	5.00	5.00	0.00	0.00	1.43	2.26	28.57
Bromus carinatus	0.00	5.00	0.00	0.00	0.00	5.00	0.00	1.43	2.26	28.57
Bromus inermis	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.71	1.75	14.29
COVER										
Total Living Cover	45.00	50.00	35.00	50.00	50.00	35.00	40.00	43.57	6.39	
Litter	5.00	10.00	5.00	5.00	10.00	10.00	5.00	7.14	2.47	
Bareground	35.00	25.00	15.00	5.00	10.00	5.00	50.00	20.71	15.68	
Rock	15.00	15.00	45.00	40.00	30.00	50.00	5.00	28.57	15.97	
% COMPOSITION										
Shrubs	22.22	20.00	14.29	20.00	10.00	42.86	0.00	18.48	12.21	
Forbs	44.44	50.00	28.57	50.00	50.00	42.86	50.00	45.12	7.32	
Grasses	33.33	30.00	57.14	30.00	40.00	14.29	50.00	36.39	13.14	

BEAVERCREEK/BLACKHAWK
Huntington #4
Reveg Lower Pads, Slopes etc.
E - Lowest Area (36-43)
Exposure: Variable
Slope: Variable

Sample Date: 15 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	Mean	SDev	Freq
TREES & SHRUBS											
Chrysothamnus nauseosus	0.00	0.00	0.00	10.00	5.00	10.00	0.00	10.00	4.38	4.64	50.00
Cercocarpus ledifolius	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	1.25	3.31	12.50
FORBS											
Machaeranthera canescens	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Medicago sativa	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	1.25	3.31	12.50
Melilotus officinalis	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Astragalus cicer	40.00	20.00	5.00	10.00	40.00	15.00	0.00	10.00	17.50	14.14	87.50
Cynoglossum officinale	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Penstemon pachyphyllus	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.63	1.65	12.50
GRASSES											
Elymus lanceolatus	0.00	10.00	0.00	5.00	5.00	5.00	10.00	0.00	4.38	3.90	62.50
Dactylis glomeratus	0.00	10.00	0.00	0.00	0.00	10.00	0.00	10.00	3.75	4.84	37.50
Poa pratensis	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	1.25	3.31	12.50
Agropyron cristatum	5.00	0.00	10.00	0.00	5.00	10.00	0.00	10.00	5.00	4.33	62.50
Bromus carinatus	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.65	12.50
Elymus hispidus	0.00	5.00	0.00	0.00	5.00	0.00	0.00	0.00	1.25	2.17	25.00
Elymus spicatus	10.00	10.00	10.00	5.00	10.00	5.00	0.00	0.00	6.25	4.15	75.00
Bromus inermis	5.00	0.00	20.00	5.00	0.00	0.00	35.00	5.00	8.75	11.66	62.50
COVER											
Total Living Cover	65.00	60.00	60.00	50.00	70.00	60.00	55.00	45.00	58.13	7.47	
Litter	10.00	10.00	20.00	5.00	5.00	20.00	35.00	10.00	14.38	9.50	
Bareground	15.00	25.00	5.00	5.00	20.00	5.00	5.00	25.00	13.13	8.54	
Rock	10.00	5.00	15.00	40.00	5.00	15.00	5.00	20.00	14.38	11.02	
% COMPOSITION											
Shrubs	0.00	0.00	0.00	40.00	7.14	16.67	0.00	22.22	10.75	13.68	
Forbs	69.23	33.33	33.33	30.00	57.14	33.33	0.00	22.22	34.82	19.63	
Grasses	30.77	66.67	66.67	30.00	35.71	50.00	100.00	55.56	54.42	22.09	

BEAVERCREEK/BLACKHAWK
Huntington #4
Sites A thru E Combined
Exposure: Variable
Slope: Variable

A = 1 thru 10

Sample Date: 15 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
Cercocarpus ledifolius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eriogonum corymbosum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pinus ponderosa	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
FORBS										
Penstemon palmeri	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Astragalus cicer	0.00	10.00	45.00	5.00	0.00	5.00	25.00	15.00	15.00	0.00
Melilotus officinalis	10.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cynoglossum officinale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machaeranthera canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00
Penstemon pachyphyllus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	5.00
Astragalus sp.	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	5.00
Malcomia africana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iva axillaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medicago sativa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES										
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus spicatus	0.00	5.00	0.00	20.00	0.00	5.00	0.00	25.00	15.00	10.00
Agropyron cristatum	0.00	0.00	0.00	5.00	5.00	0.00	0.00	10.00	0.00	5.00
Bromus carinatus	10.00	10.00	0.00	10.00	10.00	5.00	5.00	0.00	0.00	5.00
Elymus lanceolatus	0.00	5.00	10.00	0.00	40.00	10.00	10.00	0.00	0.00	0.00
Dacytylis glomeratus	5.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
Poa pratensis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus hispidus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromus inermis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER										
Total Living Cover	25.00	35.00	60.00	40.00	60.00	40.00	40.00	60.00	45.00	40.00
Litter	10.00	25.00	5.00	50.00	25.00	35.00	5.00	5.00	5.00	10.00
Bareground	30.00	20.00	15.00	5.00	10.00	15.00	45.00	15.00	25.00	25.00
Rock	35.00	20.00	20.00	5.00	5.00	10.00	10.00	20.00	25.00	25.00
% COMPOSITION										
Shrubs	0.00	0.00	0.00	0.00	0.00	25.00	0.00	8.33	0.00	25.00
Forbs	40.00	42.86	75.00	12.50	0.00	25.00	62.50	33.33	66.67	25.00
Grasses	60.00	57.14	25.00	87.50	100.00	50.00	37.50	58.33	33.33	50.00

B = 11 thru 20										C = 21 thru 28		
11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00
10.00	5.00	25.00	0.00	20.00	10.00	5.00	20.00	30.00	5.00	5.00	5.00	13.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	5.00
30.00	5.00	5.00	15.00	0.00	30.00	30.00	10.00	0.00	10.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	7.00	5.00
10.00	10.00	10.00	5.00	0.00	10.00	10.00	5.00	10.00	5.00	5.00	5.00	5.00
0.00	10.00	0.00	10.00	20.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	5.00	20.00	10.00	0.00	5.00	5.00	10.00	5.00	3.00	5.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
5.00	0.00	0.00	5.00	0.00	10.00	5.00	15.00	10.00	10.00	5.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
65.00	35.00	50.00	55.00	60.00	70.00	60.00	55.00	55.00	45.00	40.00	40.00	45.00
5.00	5.00	10.00	5.00	10.00	10.00	5.00	5.00	25.00	5.00	5.00	5.00	5.00
20.00	20.00	20.00	35.00	25.00	15.00	15.00	30.00	10.00	35.00	5.00	30.00	10.00
10.00	40.00	20.00	5.00	5.00	5.00	20.00	10.00	10.00	15.00	50.00	25.00	40.00
15.38	28.57	50.00	9.09	33.33	14.29	8.33	36.36	54.55	11.11	12.50	12.50	28.89
53.85	14.29	30.00	45.45	0.00	42.86	50.00	18.18	0.00	33.33	37.50	55.00	26.67
30.77	57.14	20.00	45.45	66.67	42.86	41.67	45.45	45.45	55.56	50.00	32.50	44.44

D = 29 thru 35

24.00	25.00	26.00	27.00	28.00	29.00	30.00	31.00	32.00	33.00	34.00	35.00	36.00
0.00	5.00	0.00	5.00	0.00	10.00	10.00	5.00	10.00	5.00	15.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	0.00	0.00	0.00	0.00	5.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	10.00	30.00	15.00	10.00	5.00	10.00	25.00	0.00	10.00	40.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00	5.00	0.00	0.00
10.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00	10.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00	0.00	10.00	10.00
0.00	0.00	5.00	0.00	0.00	5.00	0.00	5.00	0.00	5.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	5.00	0.00	0.00
10.00	10.00	15.00	10.00	15.00	5.00	0.00	5.00	10.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	5.00
35.00	25.00	20.00	25.00	45.00	45.00	50.00	35.00	45.00	50.00	35.00	40.00	65.00
10.00	5.00	5.00	5.00	5.00	5.00	10.00	5.00	5.00	10.00	10.00	5.00	10.00
10.00	10.00	45.00	60.00	15.00	35.00	25.00	15.00	5.00	10.00	5.00	50.00	15.00
45.00	60.00	30.00	10.00	35.00	15.00	15.00	45.00	45.00	30.00	50.00	5.00	10.00
0.00	20.00	0.00	20.00	0.00	22.22	20.00	14.29	22.22	10.00	42.86	0.00	0.00
42.86	40.00	0.00	40.00	66.67	44.44	50.00	28.57	44.44	50.00	42.86	50.00	69.23
57.14	40.00	100.00	40.00	33.33	33.33	30.00	57.14	33.33	40.00	14.29	50.00	30.77

BEAVERCREEK/BLACKHAWK
Huntington #4
Sites A thru E Combined
Exposure: Variable
Slope: Variable
Sample Date: 15 Aug 1995

E = 36 thru 43

37.00	38.00	39.00	40.00	41.00	42.00	43.00	Mean	SDev	Freq	
										TREES & SHRUBS
0.00	0.00	10.00	5.00	10.00	0.00	10.00	6.12	7.25	58.14	Chrysothamnus nauseosus
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	1.05	4.65	Gutierrezia sarothrae
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.23	1.51	2.33	Cercocarpus ledifolius
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.75	2.33	Eriogonum corymbosum
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	1.51	2.33	Pinus ponderosa
										FORBS
0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.28	3.25	16.28	Penstemon palmeri
20.00	5.00	10.00	40.00	15.00	0.00	10.00	11.98	12.30	72.09	Astragalus cicer
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.81	2.39	11.63	Melilotus officinalis
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.75	2.33	Cynoglossum officinale
0.00	5.00	0.00	0.00	0.00	0.00	0.00	1.16	2.61	18.60	Machaeranthera canescens
0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.70	2.04	11.63	Penstemon pachyphyllus
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	1.05	4.65	Astragalus sp.
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	1.51	2.33	Malcomia africana
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.30	2.33	Iva axillaris
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.98	2.33	16.28	Medicago sativa
										GRASSES
0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.91	3.92	39.53	Stipa hymenoides
10.00	10.00	5.00	10.00	5.00	0.00	0.00	4.77	6.38	46.51	Elymus spicatus
0.00	10.00	0.00	5.00	10.00	0.00	10.00	3.56	4.35	51.16	Agropyron cristatum
5.00	0.00	0.00	0.00	0.00	0.00	0.00	1.86	3.24	27.91	Bromus carinatus
10.00	0.00	5.00	5.00	5.00	10.00	0.00	6.16	7.06	65.12	Elymus lanceolatus
10.00	0.00	0.00	0.00	10.00	0.00	10.00	1.05	2.76	13.95	Dacytylis glomeratus
0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.47	1.81	6.98	Poa pratensis
5.00	0.00	0.00	5.00	0.00	0.00	0.00	0.23	1.05	4.65	Elymus hispidus
0.00	20.00	5.00	0.00	0.00	35.00	5.00	1.86	6.10	16.28	Bromus inermis
										COVER
60.00	60.00	50.00	70.00	60.00	55.00	45.00	47.33	16.26		Total Living Cover
10.00	20.00	5.00	5.00	20.00	35.00	10.00	10.93	9.96		Litter
25.00	5.00	5.00	20.00	5.00	5.00	25.00	20.12	13.18		Bareground
5.00	15.00	40.00	5.00	15.00	5.00	20.00	21.63	15.20		Rock
										% COMPOSITION
0.00	0.00	40.00	7.14	16.67	0.00	22.22	14.67	14.79		Shrubs
33.33	33.33	30.00	57.14	33.33	0.00	22.22	36.47	19.34		Forbs
66.67	66.67	30.00	35.71	50.00	100.00	55.56	48.85	19.74		Grasses

BEAVERCREEK/BLACKHAWK
Huntington #4
Reclaimed Road
Exposure: Variable
Slope: Variable

Sample Date: 17 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Chrysothamnus nauseosus	40.00	25.00	10.00	10.00	25.00	0.00	5.00	0.00	0.00	0.00
Cercocarpus ledifolius	0.00	5.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
Mahonia repens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00
FORBS										
PEPAL	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
Penstemon pachyphyllus	0.00	5.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
Astragalus cicer	0.00	0.00	5.00	5.00	0.00	0.00	5.00	45.00	10.00	15.00
Artemisia ludoviciana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
Salsola pestifer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES										
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	5.00	0.00
Bromus inermis	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromus carinatus	0.00	15.00	10.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
Agropyron cristatum	5.00	0.00	0.00	0.00	10.00	5.00	0.00	5.00	5.00	20.00
Elymus lanceolatus	5.00	15.00	0.00	0.00	0.00	10.00	10.00	0.00	5.00	15.00
Elymus spicatus	10.00	0.00	10.00	20.00	5.00	25.00	10.00	5.00	0.00	0.00
COVER										
Total Living Cover	65.00	65.00	40.00	40.00	40.00	55.00	40.00	55.00	50.00	50.00
Litter	10.00	5.00	10.00	20.00	10.00	5.00	10.00	10.00	5.00	10.00
Bareground	10.00	5.00	20.00	10.00	30.00	20.00	45.00	20.00	25.00	25.00
Rock	15.00	25.00	30.00	30.00	20.00	20.00	5.00	15.00	20.00	15.00
% COMPOSITION										
Shrubs	61.54	46.15	25.00	25.00	62.50	0.00	37.50	0.00	30.00	0.00
Forbs	0.00	7.69	25.00	25.00	0.00	9.09	12.50	81.82	30.00	30.00
Grasses	38.46	46.15	50.00	50.00	37.50	90.91	50.00	18.18	40.00	70.00

11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00
0.00	15.00	20.00	0.00	5.00	5.00	0.00	0.00	5.00	30.00	0.00	0.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00
32.00	15.00	15.00	45.00	5.00	10.00	35.00	0.00	10.00	5.00	10.00	25.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	10.00	0.00	5.00	15.00	0.00	0.00	3.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00
0.00	10.00	15.00	5.00	5.00	20.00	0.00	5.00	0.00	5.00	10.00	5.00	5.00
5.00	0.00	15.00	0.00	0.00	0.00	10.00	0.00	0.00	5.00	0.00	10.00	5.00
5.00	15.00	0.00	0.00	0.00	23.00	5.00	17.00	10.00	10.00	5.00	0.00	5.00
50.00	65.00	65.00	60.00	30.00	60.00	55.00	25.00	35.00	55.00	35.00	40.00	55.00
5.00	5.00	10.00	5.00	5.00	25.00	10.00	20.00	5.00	5.00	10.00	10.00	5.00
40.00	20.00	15.00	15.00	25.00	5.00	5.00	30.00	35.00	20.00	10.00	45.00	35.00
5.00	10.00	10.00	20.00	40.00	10.00	30.00	25.00	25.00	20.00	45.00	5.00	5.00
0.00	23.08	30.77	0.00	16.67	8.33	0.00	0.00	28.57	54.55	0.00	0.00	27.27
70.00	23.08	23.08	75.00	16.67	20.00	63.64	0.00	28.57	9.09	42.86	62.50	36.36
30.00	53.85	46.15	25.00	66.67	71.67	36.36	100.00	42.86	36.36	57.14	37.50	36.36

BEAVERCREEK/BLACKHAWK
Huntington #4
Reclaimed Road
Exposure: Variable
Slope: Variable
Sample Date: 17 Aug 1995

24.00	25.00	26.00	27.00	28.00	29.00	30.00	Mean	SDev	Freq	
										TREES & SHRUBS
10.00	0.00	0.00	5.00	0.00	0.00	0.00	7.50	10.55	50.00	Chrysothamnus nauseosus
0.00	0.00	0.00	10.00	0.00	0.00	0.00	1.00	2.71	13.33	Cercocarpus ledifolius
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	2.69	3.33	Mahonia repens
										FORBS
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.90	3.33	PEPAL
0.00	0.00	5.00	0.00	0.00	10.00	10.00	1.73	2.97	30.00	Penstemon pachyphyllus
25.00	40.00	20.00	0.00	25.00	20.00	10.00	14.90	13.46	80.00	Astragalus cicer
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.90	3.33	Artemisia ludoviciana
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.54	3.33	Salsola pestifer
										GRASSES
10.00	0.00	0.00	15.00	0.00	10.00	10.00	3.43	4.85	40.00	Stipa hymenoides
10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	2.27	13.33	Bromus inermis
0.00	0.00	0.00	0.00	10.00	0.00	0.00	1.67	3.73	20.00	Bromus carinatus
0.00	10.00	0.00	0.00	5.00	0.00	0.00	5.00	5.63	60.00	Agropyron cristatum
5.00	10.00	0.00	0.00	10.00	0.00	0.00	4.50	5.22	50.00	Elymus lanceolatus
5.00	10.00	0.00	0.00	0.00	10.00	0.00	6.83	7.17	63.33	Elymus spicatus
										COVER
65.00	70.00	25.00	30.00	50.00	50.00	30.00	48.33	13.12		Total Living Cover
10.00	5.00	5.00	5.00	10.00	10.00	5.00	8.83	4.95		Litter
20.00	5.00	20.00	25.00	5.00	20.00	5.00	20.33	11.69		Bareground
5.00	20.00	50.00	40.00	35.00	20.00	60.00	22.50	13.95		Rock
										% COMPOSITION
15.38	0.00	0.00	50.00	0.00	0.00	0.00	18.08	20.55		Shrubs
38.46	57.14	100.00	0.00	50.00	60.00	66.67	35.47	26.99		Forbs
46.15	42.86	0.00	50.00	50.00	40.00	33.33	46.45	19.30		Grasses

BEAVERCREEK/BLACKHAWK
Huntington #4
Reference Area
Exposure: SSW
Slope: 34 deg.

Sample Date: 16 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Pinus edulis	0.00	0.00	0.00	0.00	0.00	10.00	7.00	0.00	0.00	0.00
Cercocarpus ledifolius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Juniperus osteosperma	0.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS										
Descurainia pinnata	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
GRASSES										
Elymus salinus	35.00	30.00	30.00	0.00	20.00	5.00	0.00	15.00	15.00	20.00
Stipa hymenoides	0.00	0.00	0.00	5.00	0.00	0.00	8.00	0.00	0.00	5.00
COVER										
OverStory	0.00	0.00	0.00	5.00	30.00	50.00	30.00	0.00	0.00	0.00
Understory	35.00	30.00	30.00	35.00	20.00	20.00	15.00	15.00	15.00	30.00
Litter	10.00	20.00	30.00	20.00	70.00	70.00	40.00	10.00	10.00	5.00
Bareground	10.00	5.00	30.00	5.00	5.00	5.00	5.00	20.00	20.00	25.00
Rock	45.00	45.00	10.00	40.00	5.00	5.00	40.00	55.00	55.00	40.00
% COMPOSITION										
Shrubs	0.00	0.00	0.00	85.71	0.00	50.00	46.67	0.00	0.00	16.67
Forbs	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00
Grasses	100.00	100.00	100.00	14.29	100.00	25.00	53.33	100.00	100.00	83.33

11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00
0.00	0.00	10.00	15.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	10.00	0.00
0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35.00	15.00	25.00	10.00	15.00	10.00	10.00	10.00	20.00	25.00	10.00	25.00	20.00
0.00	0.00	0.00	0.00	5.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
10.00	40.00	20.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	10.00	0.00
35.00	30.00	35.00	25.00	20.00	10.00	10.00	35.00	30.00	25.00	10.00	35.00	20.00
5.00	60.00	50.00	5.00	5.00	5.00	15.00	5.00	5.00	25.00	5.00	25.00	60.00
10.00	5.00	10.00	10.00	5.00	20.00	5.00	20.00	10.00	20.00	20.00	15.00	10.00
50.00	5.00	5.00	60.00	70.00	65.00	70.00	40.00	55.00	30.00	65.00	25.00	10.00
0.00	50.00	28.57	60.00	0.00	0.00	0.00	42.86	33.33	0.00	0.00	28.57	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	50.00	71.43	40.00	100.00	100.00	100.00	57.14	66.67	100.00	100.00	71.43	100.00

24.00	25.00	26.00	27.00	28.00	29.00	30.00	31.00	32.00	33.00	34.00	35.00	36.00
10.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	25.00	25.00	35.00	30.00	10.00	25.00	15.00	20.00	15.00	25.00	40.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
10.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35.00	30.00	30.00	35.00	40.00	20.00	25.00	20.00	20.00	15.00	25.00	40.00	20.00
25.00	5.00	25.00	10.00	25.00	15.00	20.00	25.00	20.00	5.00	15.00	10.00	25.00
10.00	15.00	20.00	10.00	20.00	5.00	5.00	35.00	5.00	10.00	20.00	20.00	20.00
30.00	50.00	25.00	45.00	15.00	60.00	50.00	20.00	55.00	70.00	40.00	30.00	35.00
28.57	16.67	16.67	0.00	0.00	50.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71.43	83.33	83.33	100.00	75.00	50.00	100.00	75.00	100.00	100.00	100.00	100.00	100.00

BEAVERCREEK/BLACKHAWK
Huntington #4
Reference Area
Exposure: SSW
Slope: 34 deg.
Sample Date: 16 Aug 1995

37.00	38.00	39.00	40.00	Mean	SDev	Freq	
							TREES & SHRUBS
25.00	0.00	0.00	15.00	3.05	5.92	25.00	Pinus edulis
0.00	0.00	0.00	0.00	0.88	2.71	12.50	Cercocarpus ledifolius
0.00	0.00	0.00	0.00	1.13	4.94	7.50	Juniperus osteosperma
							FORBS
0.00	0.00	0.00	0.00	0.38	1.73	5.00	Descurainia pinnata
							GRASSES
0.00	15.00	10.00	15.00	18.50	9.89	92.50	Elymus salinus
0.00	0.00	0.00	0.00	1.08	2.71	15.00	Stipa hymenoides
							COVER
10.00	0.00	0.00	10.00	6.13	11.75		OverStory
25.00	15.00	10.00	30.00	25.00	8.73		Understory
20.00	5.00	5.00	5.00	20.38	18.21		Litter
35.00	5.00	10.00	30.00	14.13	8.72		Bareground
20.00	75.00	75.00	35.00	40.50	20.85		Rock
							% COMPOSITION
100.00	0.00	0.00	50.00	18.23	25.83		Shrubs
0.00	0.00	0.00	0.00	1.25	5.45		Forbs
0.00	100.00	100.00	50.00	80.52	26.72		Grasses

BEAVERCREEK/BLACKHAWK
Huntington #4
Reclaimed Riparian
Exposure: E
Slope: 2 deg

Sample Date: 18 Aug 1995	1.00	2.00	3.00	4.00	5.00	Mean	SDev	Freq
TREES & SHRUBS								
Salix lutea	10.00	25.00	35.00	10.00	30.00	22.00	10.30	100.00
FORBS								
Medicago officinalis	10.00	5.00	0.00	0.00	3.00	3.60	3.72	60.00
Circium sp.	5.00	0.00	0.00	0.00	0.00	1.00	2.00	20.00
Taraxicum officinale	0.00	0.00	0.00	0.00	2.00	0.40	0.80	20.00
Geranium richardsonii	0.00	0.00	10.00	0.00	1.00	2.20	3.92	40.00
Equisetum arvensis	10.00	0.00	0.00	0.00	34.00	8.80	13.18	40.00
GRASSES								
Dactylis glomeratus	30.00	20.00	5.00	10.00	0.00	13.00	10.77	80.00
Poa secunda	0.00	20.00	0.00	0.00	0.00	4.00	8.00	20.00
Phleum alpinum	0.00	5.00	10.00	10.00	0.00	5.00	4.47	60.00
Agrostis stonifera	0.00	0.00	10.00	30.00	0.00	8.00	11.66	40.00
COVER								
Overstory	0.00	0.00	0.00	0.00	10.00	2.00	4.00	
Understory	65.00	75.00	70.00	60.00	70.00	68.00	5.10	
Litter	5.00	5.00	5.00	10.00	10.00	7.00	2.45	
Bareground	5.00	5.00	10.00	10.00	10.00	8.00	2.45	
Rock	25.00	15.00	15.00	20.00	10.00	17.00	5.10	
% COMPOSITION								
Shrubs	15.38	33.33	50.00	16.67	42.86	31.65	13.81	
Forbs	38.46	6.67	14.29	0.00	57.14	23.31	21.34	
Grasses	46.15	60.00	35.71	83.33	0.00	45.04	27.59	

BEAVERCREEK/BLACKHAWK
Huntington #4
Riparian Reference Area
Exposure: E
Slope: 2 deg

Sample Date: 18 Aug 1995	1 thru 5 Upstream					6 thru 10 Downstream				
	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
TREES & SHRUBS										
Juniperus scopulorum	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Picea engelmannii	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rosa woodsii	0.00	0.00	20.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
Cornus stolonifera	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Abies concolor	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Populus tremuloides	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salix lutea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	40.00
FORBS										
Circium sp.	0.00	5.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
Equisetum arvense	60.00	55.00	25.00	10.00	15.00	10.00	5.00	0.00	0.00	10.00
Geranium richardsonii	0.00	5.00	0.00	0.00	0.00	5.00	10.00	0.00	0.00	0.00
Taraxicum officinale	0.00	0.00	5.00	0.00	0.00	0.00	5.00	0.00	5.00	0.00
Nasturtium officinale	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
Ranunculus cymbalaria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
GRASSES										
Dactylis glomeratus	0.00	0.00	0.00	0.00	0.00	30.00	5.00	20.00	10.00	0.00
Juncus sp.	0.00	0.00	0.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00
Bromus inermis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00
Catabrosa aquatica	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	10.00
Agrostis stolonifera	0.00	0.00	10.00	30.00	45.00	5.00	40.00	15.00	0.00	0.00
COVER										
Overstory	10.00	10.00	15.00	10.00	20.00	5.00	0.00	0.00	0.00	0.00
Understory	75.00	75.00	70.00	55.00	65.00	50.00	70.00	55.00	65.00	60.00
Litter	20.00	5.00	28.00	5.00	1.00	5.00	5.00	5.00	25.00	5.00
Bareground	2.00	19.00	1.00	39.00	33.00	10.00	20.00	35.00	5.00	10.00
Rock	3.00	1.00	1.00	1.00	1.00	35.00	5.00	5.00	5.00	25.00
Over + Understory	85.00	85.00	85.00	65.00	85.00	55.00	70.00	55.00	65.00	60.00
% COMPOSITION										
Shrubs	20.00	13.33	42.86	0.00	0.00	0.00	0.00	18.18	38.46	66.67
Forbs	80.00	86.67	42.86	36.36	23.08	30.00	35.71	0.00	15.38	16.67
Grasses	0.00	0.00	14.29	63.64	76.92	70.00	64.29	81.82	46.15	16.67

BEAVERCREEK/BLACKHAWK
Huntington #4
Riparian Reference Area
Exposure: E
Slope: 2 deg
Sample Date: 10 Aug 1995

Mean	SDev	Freq	
			TREES & SHRUBS
1.00	2.00	20.00	Juniperus scopulorum
1.00	3.00	10.00	Picea engelmannii
3.00	6.40	20.00	Rosa woodsii
0.50	1.50	10.00	Cornus stolonifera
0.50	1.50	10.00	Abies concolor
0.50	1.50	10.00	Populus tremuloides
6.50	13.43	70.00	Salix lutea
			FORBS
1.00	2.00	20.00	Circium sp.
19.00	20.47	80.00	Equisetum arvense
2.00	3.32	30.00	Geranium richardsonii
1.50	2.29	30.00	Taraxicum officinale
1.00	3.00	10.00	Nasturtium officinale
0.50	1.50	10.00	Ranunculus cymbalaria
			GRASSES
6.50	10.01	40.00	Dactylis glomeratus
1.00	2.00	20.00	Juncus sp.
2.00	6.00	10.00	Bromus inermis
2.00	4.00	20.00	Catabrosa aquatica
14.50	16.65	60.00	Agrostis stolonifera

		COVER
7.00	6.78	Overstory
64.00	8.31	Understory
10.40	9.37	Litter
17.40	13.41	Bareground
8.20	11.25	Rock
71.00	12.21	

		% COMPOSITION
19.95	21.65	Shrubs
36.67	26.16	Forbs
43.38	30.81	Grasses

APPENDIX B:

RAW DATA
(Production)

BLACKHAWK HUNTINGTON 4 LOWER RECLAIM PRODUCTION 8-15-95

AREA-A	Wt Herb g/m2	Proportion	Tot.Herb g/m	Tot.Herb lbs/m2	Herb lbs/Ac	Wt wood g/m2	Proportion	Tot.wood g/m	Tot.Wood lbs/m2	Wood lbs/Ac	Tol. lbs/Ac	Prop. a
1.00	11.00	0.50	22.00	0.05	196.31	0.00	0.50	0.00	0.00	0.00	196.31	1.00
2.00	17.00	0.50	34.00	0.07	303.39	0.00	0.50	0.00	0.00	0.00	303.39	1.25
3.00	45.00	0.35	128.57	0.28	1147.28	0.00	0.50	0.00	0.00	0.00	1147.28	0.25
4.00	29.00	0.50	58.00	0.13	517.55	0.00	0.50	0.00	0.00	0.00	517.55	0.80
5.00	50.00	0.50	100.00	0.22	892.33	0.00	0.50	0.00	0.00	0.00	892.33	0.70
6.00	26.00	0.50	52.00	0.11	464.01	13.00	0.50	26.00	0.06	232.01	696.02	1.25
7.00	28.00	0.50	56.00	0.12	499.71	0.00	0.50	0.00	0.00	0.00	499.71	1.00
8.00	43.00	0.50	86.00	0.19	767.41	4.00	0.50	8.00	0.02	71.39	838.79	1.00
9.00	36.00	0.50	72.00	0.16	642.48	0.00	0.50	0.00	0.00	0.00	642.48	1.00
10.00	31.00	0.50	62.00	0.14	553.25	0.00	0.50	0.00	0.00	0.00	553.25	0.70

AREA-B	Wt Herb g/m2	Proportion	Tot.Herb g/m	Tot.Herb lbs/m2	Herb lbs/Ac	Wt wood g/m2	Proportion	Tot.wood g/m	Tot.Wood lbs/m2	Wood lbs/Ac	Tol. lbs/Ac	Prop. a
1.00	66.00	0.40	165.00	0.36	1472.35	6.00	0.50	12.00	0.03	107.08	1579.43	1.00
2.00	24.00	0.50	48.00	0.11	428.32	9.00	0.50	18.00	0.04	160.62	588.94	0.60
3.00	25.00	0.50	50.00	0.11	446.17	22.00	0.50	44.00	0.10	392.63	838.79	0.75
4.00	46.00	0.40	115.00	0.25	1026.18	2.00	0.50	4.00	0.01	35.69	1061.88	0.50
5.00	15.00	0.50	30.00	0.07	267.70	19.00	0.50	38.00	0.08	339.09	606.79	0.85
6.00	25.00	0.50	50.00	0.11	446.17	5.00	0.50	10.00	0.02	89.23	535.40	0.60
7.00	52.00	0.50	104.00	0.23	928.03	1.00	0.50	2.00	0.00	17.85	945.87	0.50
8.00	47.00	0.50	94.00	0.21	838.79	27.00	0.50	54.00	0.12	481.86	1320.65	0.60
9.00	8.00	0.50	16.00	0.04	142.77	43.00	0.50	86.00	0.19	767.41	910.18	1.50
10.00	45.00	0.50	90.00	0.20	803.10	14.00	0.50	28.00	0.06	249.85	1052.95	1.20

AREA-C	Wt Herb g/m2	Proportion	Tot.Herb g/m	Tot.Herb lbs/m2	Herb lbs/Ac	Wt wood g/m2	Proportion	Tot.wood g/m	Tot.Wood lbs/m2	Wood lbs/Ac	Tol. lbs/Ac	Prop. a
1.00	14.00	0.50	28.00	0.06	249.85	7.00	0.50	14.00	0.03	124.93	374.78	1.50
2.00	21.00	0.50	42.00	0.09	374.78	2.00	0.50	4.00	0.01	35.69	410.47	1.20
3.00	12.00	0.50	24.00	0.05	214.16	12.00	0.50	24.00	0.05	214.16	428.32	1.00
4.00	44.00	0.50	88.00	0.19	785.25	0.00	0.50	0.00	0.00	0.00	785.25	1.00
5.00	14.00	0.50	28.00	0.06	249.85	5.00	0.50	10.00	0.02	89.23	339.09	0.50
6.00	17.00	0.50	34.00	0.07	303.39	0.00	0.50	0.00	0.00	0.00	303.39	1.00
7.00	17.00	0.50	34.00	0.07	303.39	2.00	0.50	4.00	0.01	35.69	339.09	1.50

Herb.lbs/Ac	a Wood lbs/Ac	a Tot lbs/Ac	Prop. b	b Herb.lbs/Ac	b Wood lbs/Ac	b Tot lbs/Ac	Prop. c	c Herb.lbs/Ac	c Wood lbs/Ac	c Tot lbs/Ac	Prop. d	d Herb.lbs/Ac
196.31	0.00	196.31	1.00	196.31	0.00	196.31	1.00	196.31	0.00	196.31	1.00	196.31
379.24	0.00	379.24	1.00	303.39	0.00	303.39	1.00	303.39	0.00	303.39	1.00	303.39
286.82	0.00	286.82	0.30	344.19	0.00	344.19	1.00	1147.28	0.00	1147.28	0.70	803.10
414.04	0.00	414.04	1.40	724.57	0.00	724.57	2.00	1035.11	0.00	1035.11	1.00	517.55
624.63	0.00	624.63	1.00	892.33	0.00	892.33	1.00	892.33	0.00	892.33	1.00	892.33
580.02	290.01	870.02	0.80	371.21	185.61	556.82	0.30	139.20	69.60	208.81	2.50	1160.03
499.71	0.00	499.71	2.50	1249.27	0.00	1249.27	3.00	1499.12	0.00	1499.12	1.00	499.71
767.41	71.39	838.79	1.50	1151.11	107.08	1258.19	1.00	767.41	71.39	838.79	0.90	690.67
642.48	0.00	642.48	1.00	642.48	0.00	642.48	2.00	1284.96	0.00	1284.96	1.40	899.47
387.27	0.00	387.27	1.00	553.25	0.00	553.25	1.00	553.25	0.00	553.25	1.30	719.22

a Herb.lbs/Ac	a Wood lbs/Ac	a Tot lbs/Ac	Prop. b	b Herb.lbs/Ac	b Wood lbs/Ac	b Tot lbs/Ac	Prop. c	c Herb.lbs/Ac	c Wood lbs/Ac	c Tot lbs/Ac	Prop. d	d Herb.lbs/Ac
1472.35	107.08	1579.43	1.00	1472.35	107.08	1579.43	0.50	736.17	53.54	789.71	0.70	1030.64
256.99	96.37	353.36	1.00	428.32	160.62	588.94	1.00	428.32	160.62	588.94	2.50	1070.80
334.62	294.47	629.09	1.00	446.17	392.63	838.79	1.00	446.17	392.63	838.79	1.25	557.71
513.09	17.85	530.94	0.30	307.85	10.71	318.56	0.25	256.55	8.92	265.47	0.50	513.09
227.54	288.22	515.77	0.80	214.16	271.27	485.43	1.25	334.62	423.86	758.48	1.20	321.24
267.70	53.54	321.24	1.00	446.17	89.23	535.40	1.00	446.17	89.23	535.40	0.75	334.62
464.01	8.92	472.94	0.75	696.02	13.38	709.40	0.25	232.01	4.46	236.47	0.50	464.01
503.28	289.12	792.39	1.00	838.79	481.86	1320.65	1.00	838.79	481.86	1320.65	1.75	1467.89
214.16	1151.11	1365.27	0.85	121.36	652.30	773.65	1.00	142.77	767.41	910.18	1.20	171.33
963.72	299.82	1263.54	1.00	803.10	249.85	1052.95	2.00	1606.20	499.71	2105.91	1.00	803.10

a Herb.lbs/Ac	a Wood lbs/Ac	a Tot lbs/Ac	Prop. b	b Herb.lbs/Ac	b Wood lbs/Ac	b Tot lbs/Ac	Prop. c	c Herb.lbs/Ac	c Wood lbs/Ac	c Tot lbs/Ac	Prop. d	d Herb.lbs/Ac
374.78	187.39	562.17	0.50	124.93	62.46	187.39	1.00	249.85	124.93	374.78	1.00	249.85
449.74	42.83	492.57	1.20	449.74	42.83	492.57	1.00	374.78	35.69	410.47	2.00	749.56
214.16	214.16	428.32	1.00	214.16	214.16	428.32	1.20	256.99	256.99	513.98	1.20	256.99
785.25	0.00	785.25	0.50	392.63	0.00	392.63	1.00	785.25	0.00	785.25	1.00	785.25
124.93	44.62	169.54	1.00	249.85	89.23	339.09	1.00	249.85	89.23	339.09	1.00	249.85
303.39	0.00	303.39	2.00	606.79	0.00	606.79	2.00	606.79	0.00	606.79	4.00	1213.57
455.09	53.54	508.63	1.00	303.39	35.69	339.09	5.00	1516.97	178.47	1695.43	1.00	303.39

Wood lbs/Ac	d Tot lbs/Ac	Mean Herb	Std Herb	Mean Wood	Std Wood	Mean Tot	Std Tot
0.00	196.31	196.31	0.00	0.00	0.00	196.31	0.00
0.00	303.39	318.56	30.34	0.00	0.00	318.56	30.34
0.00	803.10	745.74	373.53	0.00	0.00	745.74	373.53
0.00	517.55	641.77	221.04	0.00	0.00	641.77	221.04
0.00	892.33	838.79	107.08	0.00	0.00	838.79	107.08
580.02	1740.05	542.90	340.85	271.45	170.43	814.34	511.28
0.00	499.71	849.50	435.63	0.00	0.00	849.50	435.63
64.25	754.91	828.80	163.87	77.10	15.24	905.90	179.12
0.00	899.47	822.37	251.80	0.00	0.00	822.37	251.80
0.00	719.22	553.25	104.97	0.00	0.00	553.25	104.97
		Tot Mean Herb=	**Tot Std Herb=**	**Tot Mean Wood=**	**Tot Std Herb=**	**Tot Mean Total=**	**Tot Std Total=**
		633.80	**219.15**	**34.85**	**82.15**	**668.65**	**229.88**

d Wood lbs/Ac	d Tot lbs/Ac	Mean Herb	Std Herb	Mean Wood	Std Wood	Mean Tot	Std Tot
74.96	1105.60	1236.77	303.18	89.95	22.05	1326.72	325.22
401.55	1472.35	522.55	282.04	195.96	105.77	718.51	387.81
490.78	1048.49	446.17	70.55	392.63	62.08	838.79	132.62
17.85	530.94	523.35	272.28	18.20	9.47	541.56	281.75
406.90	728.14	273.05	48.33	345.87	61.22	618.92	109.56
66.92	401.55	388.16	74.12	77.63	14.82	465.80	88.95
8.92	472.94	556.82	236.60	10.71	4.55	567.52	241.15
843.25	2311.14	897.51	313.40	515.59	180.04	1413.10	493.44
920.89	1092.22	158.48	32.05	851.82	172.28	1010.30	204.33
249.85	1052.95	995.84	311.45	309.82	96.90	1305.66	408.35
		Tot Mean Herb=	**Tot Std Herb=**	**Tot Mean Wood=**	**Tot Std Herb=**	**Tot Mean Total=**	**Tot Std Total=**
		599.97	**321.69**	**290.82**	**250.12**	**890.69**	**340.82**

d Wood lbs/Ac	d Tot lbs/Ac	Mean Herb	Std Herb	Mean Wood	Std Wood	Mean Tot	Std Tot
124.93	374.78	249.85	79.01	124.93	39.51	374.78	118.52
71.39	820.95	479.72	139.02	45.69	13.24	525.41	152.26
256.99	513.98	231.29	20.98	231.29	20.98	462.59	41.97
0.00	785.25	706.73	157.05	0.00	0.00	706.73	157.05
89.23	339.09	224.87	49.97	80.31	17.85	305.18	67.82
0.00	1213.57	606.79	332.35	0.00	0.00	606.79	332.35
35.69	339.09	576.45	473.92	67.82	55.75	644.26	529.67
		Tot Mean Herb=	**Tot Std Herb=**	**Tot Mean Wood=**	**Tot Std Herb=**	**Tot Mean Total=**	**Tot Std Total=**
		439.38	**187.14**	**78.58**	**74.66**	**517.96**	**135.42**

AREA-D	Wt Herb g/m2	Proportion	Tot.Herb g/m	Tot.Herb lbs/m2	Herb lbs/Ac	Wt wood g/m2	Proportion	Tot.wood g/m	Tot.Wood lbs/m2	Wood lbs/Ac	Tol. lbs/Ac	Prop. a
1.00	34.00	0.50	68.00	0.15	606.79	7.00	0.50	14.00	0.03	124.93	731.71	0.75
2.00	32.00	0.50	64.00	0.14	571.09	12.00	0.50	24.00	0.05	214.16	785.25	1.00
3.00	21.00	0.50	42.00	0.09	374.78	2.00	0.50	4.00	0.01	35.69	410.47	1.00
4.00	30.00	0.50	60.00	0.13	535.40	5.00	0.50	10.00	0.02	89.23	624.63	0.75
5.00	33.00	0.50	66.00	0.15	588.94	10.00	0.50	20.00	0.04	178.47	767.41	0.75
6.00	7.00	0.50	14.00	0.03	124.93	15.00	0.50	30.00	0.07	267.70	392.63	0.30
7.00	19.00	0.50	38.00	0.08	339.09	0.00	0.50	0.00	0.00	0.00	339.09	1.00

AREA-E	Wt Herb g/m2	Proportion	Tot.Herb g/m	Tot.Herb lbs/m2	Herb lbs/Ac	Wt wood g/m2	Proportion	Tot.wood g/m	Tot.Wood lbs/m2	Wood lbs/Ac	Tol. lbs/Ac	Prop. a
1.00	53.00	0.50	106.00	0.23	945.87	0.00	0.50	0.00	0.00	0.00	945.87	0.75
2.00	60.00	0.50	120.00	0.26	1070.80	0.00	0.50	0.00	0.00	0.00	1070.80	0.50
3.00	38.00	0.50	76.00	0.17	678.17	0.00	0.50	0.00	0.00	0.00	678.17	0.70
4.00	28.00	0.50	56.00	0.12	499.71	26.00	0.50	52.00	0.11	464.01	963.72	1.00
5.00	37.00	0.25	148.00	0.33	1320.65	4.00	0.50	8.00	0.02	71.39	1392.04	0.75
6.00	35.00	0.50	70.00	0.15	624.63	13.00	0.50	26.00	0.06	232.01	856.64	0.75
7.00	28.00	0.50	56.00	0.12	499.71	0.00	0.50	0.00	0.00	0.00	499.71	1.00
8.00	19.00	0.50	38.00	0.08	339.09	5.00	0.50	10.00	0.02	89.23	428.32	1.50

a Herb.lbs/Ac	a Wood lbs/Ac	a Tot lbs/Ac	Prop. b	b Herb.lbs/Ac	b Wood lbs/Ac	b Tot lbs/Ac	Prop. c	c Herb.lbs/Ac	c Wood lbs/Ac	c Tot lbs/Ac	Prop. d	d Herb.lbs/Ac
455.09	93.69	548.78	1.00	606.79	124.93	731.71	1.50	910.18	187.39	1097.57	1.00	606.79
571.09	214.16	785.25	1.00	571.09	214.16	785.25	1.00	571.09	214.16	785.25	0.50	285.55
374.78	35.69	410.47	1.00	374.78	35.69	410.47	1.00	374.78	35.69	410.47	1.00	374.78
401.55	66.92	468.47	1.00	535.40	89.23	624.63	0.75	401.55	66.92	468.47	1.00	535.40
441.70	133.85	575.55	1.00	588.94	178.47	767.41	0.80	471.15	142.77	613.92	1.00	588.94
37.48	80.31	117.79	0.30	37.48	80.31	117.79	0.50	62.46	133.85	196.31	1.00	124.93
339.09	0.00	339.09	1.00	339.09	0.00	339.09	1.00	339.09	0.00	339.09	1.00	339.09

a Herb.lbs/Ac	a Wood lbs/Ac	a Tot lbs/Ac	Prop. b	b Herb.lbs/Ac	b Wood lbs/Ac	b Tot lbs/Ac	Prop. c	c Herb.lbs/Ac	c Wood lbs/Ac	c Tot lbs/Ac	Prop. d	d Herb.lbs/Ac
709.40	0.00	709.40	0.80	756.70	0.00	756.70	1.00	945.87	0.00	945.87	1.00	945.87
535.40	0.00	535.40	0.50	535.40	0.00	535.40	1.00	1070.80	0.00	1070.80	0.50	535.40
474.72	0.00	474.72	1.00	678.17	0.00	678.17	1.00	678.17	0.00	678.17	1.00	678.17
499.71	464.01	963.72	1.00	499.71	464.01	963.72	1.25	624.63	580.02	1204.65	0.50	249.85
990.49	53.54	1044.03	0.70	924.46	49.97	974.43	0.50	660.33	35.69	696.02	0.50	660.33
468.47	174.00	642.48	0.75	468.47	174.00	642.48	1.50	936.95	348.01	1284.96	1.50	936.95
499.71	0.00	499.71	1.00	499.71	0.00	499.71	1.00	499.71	0.00	499.71	0.50	249.85
508.63	133.85	642.48	1.50	508.63	133.85	642.48	2.00	678.17	178.47	856.64	1.00	339.09

d Wood lbs/Ac	d Tot lbs/Ac	Mean Herb	Std Herb	Mean Wood	Std Wood	Mean Tot	Std Tot
124.93	731.71	637.13	148.63	131.17	30.60	768.30	179.23
107.08	392.63	513.98	114.22	192.74	42.83	706.73	157.05
35.69	410.47	374.78	0.00	35.69	0.00	410.47	0.00
89.23	624.63	481.86	65.57	80.31	10.93	562.17	76.50
178.47	767.41	535.93	65.58	162.40	19.87	698.34	85.45
267.70	392.63	77.45	39.82	165.97	65.33	243.43	125.15
0.00	339.09	339.09	0.00	0.00	0.00	339.09	0.00
		Tot Mean Herb=	**Tot Std Herb=**	**Tot Mean Wood=**	**Tot Std Herb=**	**Tot Mean Total=**	**Tot Std Total=**
		422.89	**168.66**	**109.76**	**67.27**	**532.65**	**189.06**

d Wood lbs/Ac	d Tot lbs/Ac	Mean Herb	Std Herb	Mean Wood	Std Wood	Mean Tot	Std Tot
0.00	945.87	860.74	105.33	0.00	0.00	860.74	105.33
0.00	535.40	749.56	262.29	0.00	0.00	749.56	262.29
0.00	678.17	637.48	81.38	0.00	0.00	637.48	81.38
232.01	481.86	474.72	122.40	440.81	113.66	915.53	236.06
35.69	696.02	911.25	244.94	49.26	13.24	960.51	258.18
348.01	1284.96	687.10	211.82	255.21	78.68	942.30	290.50
0.00	249.85	449.74	99.94	0.00	0.00	449.74	99.94
89.23	428.32	474.72	126.87	124.93	33.39	599.65	160.26
		Tot Mean Herb=	**Tot Std Herb=**	**Tot Mean Wood=**	**Tot Std Herb=**	**Tot Mean Total=**	**Tot Std Total=**
		655.66	**167.86**	**108.78**	**151.17**	**764.44**	**174.90**

BLACKHAWK HUNTINGTON 4 LOWER RECLAIM A-E (combined) PRODUCTION 8-15-95

AREA		Wt Herb g/m2	Proportion	Tot.Herb g/m	Tot.Herb lbs/m2	Herb lbs/Ac	Wt wood g/m2	Proportion	Tot.wood g/m	Tot.Wood lbs/m	Wood lbs/Ac	Tot. lbs/Ac
Area A	1.00	11.00	0.50	22.00	0.05	196.31	0.00	0.50	0.00	0.00	0.00	196.31
	2.00	17.00	0.50	34.00	0.07	303.39	0.00	0.50	0.00	0.00	0.00	303.39
	3.00	45.00	0.35	128.57	0.28	1147.28	0.00	0.50	0.00	0.00	0.00	1147.28
	4.00	29.00	0.50	58.00	0.13	517.55	0.00	0.50	0.00	0.00	0.00	517.55
	5.00	50.00	0.50	100.00	0.22	892.33	0.00	0.50	0.00	0.00	0.00	892.33
	6.00	26.00	0.50	52.00	0.11	464.01	13.00	0.50	26.00	0.06	232.01	696.02
	7.00	28.00	0.50	56.00	0.12	499.71	0.00	0.50	0.00	0.00	0.00	499.71
	8.00	43.00	0.50	86.00	0.19	767.41	4.00	0.50	8.00	0.02	71.39	838.79
	9.00	36.00	0.50	72.00	0.16	642.48	0.00	0.50	0.00	0.00	0.00	642.48
	10.00	31.00	0.50	62.00	0.14	553.25	0.00	0.50	0.00	0.00	0.00	553.25
Area B	1.00	66.00	0.40	165.00	0.36	1472.35	6.00	0.50	12.00	0.03	107.08	1579.43
	2.00	24.00	0.50	48.00	0.11	428.32	9.00	0.50	18.00	0.04	160.62	588.94
	3.00	25.00	0.50	50.00	0.11	446.17	22.00	0.50	44.00	0.10	392.63	838.79
	4.00	46.00	0.40	115.00	0.25	1026.18	2.00	0.50	4.00	0.01	35.69	1061.88
	5.00	15.00	0.50	30.00	0.07	267.70	19.00	0.50	38.00	0.08	339.09	606.79
	6.00	25.00	0.50	50.00	0.11	446.17	5.00	0.50	10.00	0.02	89.23	535.40
	7.00	52.00	0.50	104.00	0.23	928.03	1.00	0.50	2.00	0.00	17.85	945.87
	8.00	47.00	0.50	94.00	0.21	838.79	27.00	0.50	54.00	0.12	481.86	1320.65
	9.00	8.00	0.50	16.00	0.04	142.77	43.00	0.50	86.00	0.19	767.41	910.18
	10.00	45.00	0.50	90.00	0.20	803.10	14.00	0.50	28.00	0.06	249.85	1052.95
Area C	1.00	14.00	0.50	28.00	0.06	249.85	7.00	0.50	14.00	0.03	124.93	374.78
	2.00	21.00	0.50	42.00	0.09	374.78	2.00	0.50	4.00	0.01	35.69	410.47
	3.00	12.00	0.50	24.00	0.05	214.16	12.00	0.50	24.00	0.05	214.16	428.32
	4.00	44.00	0.50	88.00	0.19	785.25	0.00	0.50	0.00	0.00	0.00	785.25
	5.00	14.00	0.50	28.00	0.06	249.85	5.00	0.50	10.00	0.02	89.23	339.09
	6.00	17.00	0.50	34.00	0.07	303.39	0.00	0.50	0.00	0.00	0.00	303.39
	7.00	17.00	0.50	34.00	0.07	303.39	2.00	0.50	4.00	0.01	35.69	339.09
Area D	1.00	34.00	0.50	68.00	0.15	606.79	7.00	0.50	14.00	0.03	124.93	731.71
	2.00	32.00	0.50	64.00	0.14	571.09	12.00	0.50	24.00	0.05	214.16	785.25
	3.00	21.00	0.50	42.00	0.09	374.78	2.00	0.50	4.00	0.01	35.69	410.47
	4.00	30.00	0.50	60.00	0.13	535.40	5.00	0.50	10.00	0.02	89.23	624.63
	5.00	33.00	0.50	66.00	0.15	588.94	10.00	0.50	20.00	0.04	178.47	767.41
	6.00	7.00	0.50	14.00	0.03	124.93	15.00	0.50	30.00	0.07	267.70	392.63
	7.00	19.00	0.50	38.00	0.08	339.09	0.00	0.50	0.00	0.00	0.00	339.09
Area E	1.00	53.00	0.50	106.00	0.23	945.87	0.00	0.50	0.00	0.00	0.00	945.87
	2.00	60.00	0.50	120.00	0.26	1070.80	0.00	0.50	0.00	0.00	0.00	1070.80
	3.00	38.00	0.50	76.00	0.17	678.17	0.00	0.50	0.00	0.00	0.00	678.17
	4.00	28.00	0.50	56.00	0.12	499.71	26.00	0.50	52.00	0.11	464.01	963.72
	5.00	37.00	0.25	148.00	0.33	1320.65	4.00	0.50	8.00	0.02	71.39	1392.04
	6.00	35.00	0.50	70.00	0.15	624.63	13.00	0.50	26.00	0.06	232.01	856.64
	7.00	28.00	0.50	56.00	0.12	499.71	0.00	0.50	0.00	0.00	0.00	499.71
	8.00	19.00	0.50	38.00	0.08	339.09	5.00	0.50	10.00	0.02	89.23	428.32

op. a	a Herb.lbs/Ac	a Wood lbs/Ac	a Tot lbs/Ac	Prop. b	b Herb.lbs/Ac	b Wood lbs/Ac	b Tot lbs/Ac	Prop. c	c Herb.lbs/Ac	c Wood lbs/Ac	c Tot lbs/Ac
1.00	196.31	0.00	196.31	1.00	196.31	0.00	196.31	1.00	196.31	0.00	196.31
1.25	379.24	0.00	379.24	1.00	303.39	0.00	303.39	1.00	303.39	0.00	303.39
0.25	286.82	0.00	286.82	0.30	344.19	0.00	344.19	1.00	1147.28	0.00	1147.28
0.80	414.04	0.00	414.04	1.40	724.57	0.00	724.57	2.00	1035.11	0.00	1035.11
0.70	624.63	0.00	624.63	1.00	892.33	0.00	892.33	1.00	892.33	0.00	892.33
1.25	580.02	290.01	870.02	0.80	371.21	185.61	556.82	0.30	139.20	69.60	208.81
1.00	499.71	0.00	499.71	2.50	1249.27	0.00	1249.27	3.00	1499.12	0.00	1499.12
1.00	767.41	71.39	838.79	1.50	1151.11	107.08	1258.19	1.00	767.41	71.39	838.79
1.00	642.48	0.00	642.48	1.00	642.48	0.00	642.48	2.00	1284.96	0.00	1284.96
0.70	387.27	0.00	387.27	1.00	553.25	0.00	553.25	1.00	553.25	0.00	553.25
1.00	1472.35	107.08	1579.43	1.00	1472.35	107.08	1579.43	0.50	736.17	53.54	789.71
0.60	256.99	96.37	353.36	1.00	428.32	160.62	588.94	1.00	428.32	160.62	588.94
0.75	334.62	294.47	629.09	1.00	446.17	392.63	838.79	1.00	446.17	392.63	838.79
0.50	513.09	17.85	530.94	0.30	307.85	10.71	318.56	0.25	256.55	8.92	265.47
0.85	227.54	288.22	515.77	0.80	214.16	271.27	485.43	1.25	334.62	423.86	758.48
0.60	267.70	53.54	321.24	1.00	446.17	89.23	535.40	1.00	446.17	89.23	535.40
0.50	464.01	8.92	472.94	0.75	696.02	13.38	709.40	0.25	232.01	4.46	236.47
0.60	503.28	289.12	792.39	1.00	838.79	481.86	1320.65	1.00	838.79	481.86	1320.65
1.50	214.16	1151.11	1365.27	0.85	121.36	652.30	773.65	1.00	142.77	767.41	910.18
1.20	963.72	299.82	1263.54	1.00	803.10	249.85	1052.95	2.00	1606.20	499.71	2105.91
1.50	374.78	187.39	562.17	0.50	124.93	62.46	187.39	1.00	249.85	124.93	374.78
1.20	449.74	42.83	492.57	1.20	449.74	42.83	492.57	1.00	374.78	35.69	410.47
1.00	214.16	214.16	428.32	1.00	214.16	214.16	428.32	1.20	256.99	256.99	513.98
1.00	785.25	0.00	785.25	0.50	392.63	0.00	392.63	1.00	785.25	0.00	785.25
0.50	124.93	44.62	169.54	1.00	249.85	89.23	339.09	1.00	249.85	89.23	339.09
1.00	303.39	0.00	303.39	2.00	606.79	0.00	606.79	2.00	606.79	0.00	606.79
1.50	455.09	53.54	508.63	1.00	303.39	35.69	339.09	5.00	1516.97	178.47	1695.43
0.75	455.09	93.69	548.78	1.00	606.79	124.93	731.71	1.50	910.18	187.39	1097.57
1.00	571.09	214.16	785.25	1.00	571.09	214.16	785.25	1.00	571.09	214.16	785.25
1.00	374.78	35.69	410.47	1.00	374.78	35.69	410.47	1.00	374.78	35.69	410.47
0.75	401.55	66.92	468.47	1.00	535.40	89.23	624.63	0.75	401.55	66.92	468.47
0.75	441.70	133.85	575.55	1.00	588.94	178.47	767.41	0.80	471.15	142.77	613.92
0.30	37.48	80.31	117.79	0.30	37.48	80.31	117.79	0.50	62.46	133.85	196.31
1.00	339.09	0.00	339.09	1.00	339.09	0.00	339.09	1.00	339.09	0.00	339.09
0.75	709.40	0.00	709.40	0.80	756.70	0.00	756.70	1.00	945.87	0.00	945.87
0.50	535.40	0.00	535.40	0.50	535.40	0.00	535.40	1.00	1070.80	0.00	1070.80
0.70	474.72	0.00	474.72	1.00	678.17	0.00	678.17	1.00	678.17	0.00	678.17
1.00	499.71	464.01	963.72	1.00	499.71	464.01	963.72	1.25	624.63	580.02	1204.65
0.75	990.49	53.54	1044.03	0.70	924.46	49.97	974.43	0.50	660.33	35.69	696.02
0.75	468.47	174.00	642.48	0.75	468.47	174.00	642.48	1.50	936.95	348.01	1284.96
1.00	499.71	0.00	499.71	1.00	499.71	0.00	499.71	1.00	499.71	0.00	499.71
1.50	508.63	133.85	642.48	1.50	508.63	133.85	642.48	2.00	678.17	178.47	856.64

p. d	d Herb.lbs/Ac	d Wood lbs/Ac	d Tot lbs/Ac	Mean Herb	Std Herb	Mean Wood	Std Wood	Mean Tot	Std Tot
1.00	196.31	0.00	196.31	196.31	0.00	0.00	0.00	196.31	0.00
1.00	303.39	0.00	303.39	318.56	30.34	0.00	0.00	318.56	30.34
0.70	803.10	0.00	803.10	745.74	373.53	0.00	0.00	745.74	373.53
1.00	517.55	0.00	517.55	641.77	221.04	0.00	0.00	641.77	221.04
1.00	892.33	0.00	892.33	838.79	107.08	0.00	0.00	838.79	107.08
2.50	1160.03	580.02	1740.05	542.90	340.85	271.45	170.43	814.34	511.28
1.00	499.71	0.00	499.71	849.50	435.63	0.00	0.00	849.50	435.63
0.90	690.67	64.25	754.91	828.80	163.87	77.10	15.24	905.90	179.12
1.40	899.47	0.00	899.47	822.37	251.80	0.00	0.00	822.37	251.80
1.30	719.22	0.00	719.22	553.25	104.97	0.00	0.00	553.25	104.97
0.70	1030.64	74.96	1105.60	1236.77	303.18	89.95	22.05	1326.72	325.22
2.50	1070.80	401.55	1472.35	522.55	282.04	195.96	105.77	718.51	387.81
1.25	557.71	490.78	1048.49	446.17	70.55	392.63	62.08	838.79	132.62
0.50	513.09	17.85	530.94	523.35	272.28	18.20	9.47	541.56	281.75
1.20	321.24	406.90	728.14	273.05	48.33	345.87	61.22	618.92	109.56
0.75	334.62	66.92	401.55	388.16	74.12	77.63	14.82	465.80	88.95
0.50	464.01	8.92	472.94	556.82	236.60	10.71	4.55	567.52	241.15
1.75	1467.89	843.25	2311.14	897.51	313.40	515.59	180.04	1413.10	493.44
1.20	171.33	920.89	1092.22	158.48	32.05	851.82	172.28	1010.30	204.33
1.00	803.10	249.85	1052.95	995.84	311.45	309.82	96.90	1305.66	408.35
1.00	249.85	124.93	374.78	249.85	79.01	124.93	39.51	374.78	118.52
2.00	749.56	71.39	820.95	479.72	139.02	45.69	13.24	525.41	152.26
1.20	256.99	256.99	513.98	231.29	20.98	231.29	20.98	462.59	41.97
1.00	785.25	0.00	785.25	706.73	157.05	0.00	0.00	706.73	157.05
1.00	249.85	89.23	339.09	224.87	49.97	80.31	17.85	305.18	67.82
4.00	1213.57	0.00	1213.57	606.79	332.35	0.00	0.00	606.79	332.35
1.00	303.39	35.69	339.09	576.45	473.92	67.82	55.75	644.26	529.67
1.00	606.79	124.93	731.71	637.13	148.63	131.17	30.60	768.30	179.23
0.50	285.55	107.08	392.63	513.98	114.22	192.74	42.83	706.73	157.05
1.00	374.78	35.69	410.47	374.78	0.00	35.69	0.00	410.47	0.00
1.00	535.40	89.23	624.63	481.86	65.57	80.31	10.93	562.17	76.50
1.00	588.94	178.47	767.41	535.93	65.58	162.40	19.87	698.34	85.45
1.00	124.93	267.70	392.63	77.45	39.82	165.97	85.33	243.43	125.15
1.00	339.09	0.00	339.09	339.09	0.00	0.00	0.00	339.09	0.00
1.00	945.87	0.00	945.87	860.74	105.33	0.00	0.00	860.74	105.33
0.50	535.40	0.00	535.40	749.56	262.29	0.00	0.00	749.56	262.29
1.00	678.17	0.00	678.17	637.48	81.38	0.00	0.00	637.48	81.38
0.50	249.85	232.01	481.86	474.72	122.40	440.81	113.66	915.53	236.06
0.50	660.33	35.69	696.02	911.25	244.94	49.26	13.24	960.51	258.18
1.50	936.95	348.01	1284.96	687.10	211.82	255.21	78.68	942.30	290.50
0.50	249.85	0.00	249.85	449.74	99.94	0.00	0.00	449.74	99.94
1.00	339.09	89.23	428.32	474.72	126.87	124.93	33.39	599.65	160.26
				Tot Mean Herb=	**Tot Std Herb=**	**Tot Mean Wood=**	**Tot Std Herb=**	**Tot Mean Total=**	**Tot Std Total=**
				562.33	**246.96**	**127.27**	**175.20**	**689.60**	**271.96**

BLACKHAWK HUNTINGTON 4 RECLAIMED RD. PRODUCTION 8-17-95

EA	Wt Herb g/m2	Proportion	Tot.Herb g/m	Tot.Herb lbs/m2	Herb lbs/Ac	Wt wood g/m2	Proportion	Tot.wood g/m	Tot.Wood lbs/m2	Wood lbs/Ac	Tot. lbs/Ac	Prop. a
1.00	17.00	0.50	34.00	0.07	303.39	23.00	0.50	46.00	0.10	410.47	713.87	0.50
2.00	25.00	0.50	50.00	0.11	446.17	18.00	0.50	36.00	0.08	321.24	767.41	1.00
3.00	9.00	0.50	18.00	0.04	160.62	28.00	0.50	56.00	0.12	499.71	660.33	1.00
4.00	14.00	0.50	28.00	0.06	249.85	13.00	0.50	26.00	0.06	232.01	481.86	0.80
5.00	1.00	0.50	2.00	0.00	17.85	30.00	0.50	60.00	0.13	535.40	553.25	1.00
6.00	40.00	0.50	80.00	0.18	713.87	0.00	0.50	0.00	0.00	0.00	713.87	0.75
7.00	17.00	0.50	34.00	0.07	303.39	12.00	0.50	24.00	0.05	214.16	517.55	0.40
8.00	36.00	0.50	72.00	0.16	642.48	0.00	0.50	0.00	0.00	0.00	642.48	0.75
9.00	36.00	0.50	72.00	0.16	642.48	2.00	0.50	4.00	0.01	35.69	678.17	1.50
10.00	43.00	0.50	86.00	0.19	767.41	0.00	0.50	0.00	0.00	0.00	767.41	1.00
11.00	52.00	0.50	104.00	0.23	928.03	0.00	0.50	0.00	0.00	0.00	928.03	1.50
12.00	38.00	0.25	152.00	0.34	1356.35	25.00	0.50	50.00	0.11	446.17	1802.51	1.00
13.00	40.00	0.50	80.00	0.18	713.87	44.00	0.50	88.00	0.19	785.25	1499.12	1.25
14.00	47.00	0.25	188.00	0.41	1677.59	4.00	0.50	8.00	0.02	71.39	1748.97	0.70
15.00	13.00	0.50	26.00	0.06	232.01	10.00	0.50	20.00	0.04	178.47	410.47	1.00
16.00	43.00	0.50	86.00	0.19	767.41	6.00	1.00	6.00	0.01	53.54	820.95	1.25
17.00	62.00	0.50	124.00	0.27	1106.49	0.00	0.50	0.00	0.00	0.00	1106.49	0.85
18.00	24.00	1.00	24.00	0.05	214.16	0.00	0.50	0.00	0.00	0.00	214.16	0.80
19.00	14.00	0.50	28.00	0.06	249.85	7.00	0.50	14.00	0.03	124.93	374.78	1.00
20.00	18.00	0.50	36.00	0.08	321.24	26.00	0.50	52.00	0.11	464.01	785.25	0.85
21.00	13.00	0.50	26.00	0.06	232.01	0.00	0.50	0.00	0.00	0.00	232.01	2.00
22.00	47.00	0.50	94.00	0.21	838.79	0.00	0.50	0.00	0.00	0.00	838.79	1.00
23.00	26.00	0.50	52.00	0.11	464.01	13.00	0.50	26.00	0.06	232.01	696.02	0.50
24.00	41.00	0.25	164.00	0.36	1463.43	14.00	0.50	28.00	0.06	249.85	1713.28	1.50
25.00	49.00	0.25	196.00	0.43	1748.97	0.00	0.50	0.00	0.00	0.00	1748.97	1.00
26.00	22.00	0.50	44.00	0.10	392.63	0.00	0.50	0.00	0.00	0.00	392.63	1.00
27.00	1.00	0.50	2.00	0.00	17.85	8.00	0.50	16.00	0.04	142.77	160.62	1.00
28.00	23.00	0.25	92.00	0.20	820.95	23.00	0.50	46.00	0.10	410.47	1231.42	1.00
29.00	29.00	0.50	58.00	0.13	517.55	29.00	0.50	58.00	0.13	517.55	1035.11	1.00
30.00	19.00	0.50	38.00	0.08	339.09	19.00	0.50	38.00	0.08	339.09	678.17	1.00

Herb.lbs/Ac	a Wood lbs/Ac	a Tot lbs/Ac	Prop. b	b Herb.lbs/Ac	b Wood lbs/Ac	b Tot lbs/Ac	Prop. c	c Herb.lbs/Ac	c Wood lbs/Ac	c Tot lbs/Ac	Prop. d	d Herb.lbs/Ac
151.70	205.24	356.93	1.00	303.39	410.47	713.87	1.25	379.24	513.09	892.33	0.75	227.54
446.17	321.24	767.41	1.00	446.17	321.24	767.41	1.00	446.17	321.24	767.41	0.80	356.93
160.62	499.71	660.33	1.00	160.62	499.71	660.33	0.50	80.31	249.85	330.16	0.80	128.50
199.88	185.61	385.49	0.75	187.39	174.00	361.39	1.00	249.85	232.01	481.86	0.80	199.88
17.85	535.40	553.25	0.25	4.46	133.85	138.31	0.25	4.46	133.85	138.31	1.00	17.85
535.40	0.00	535.40	1.00	713.87	0.00	713.87	1.50	1070.80	0.00	1070.80	0.30	214.16
121.36	85.66	207.02	1.50	455.09	321.24	776.33	1.25	379.24	267.70	646.94	1.00	303.39
481.86	0.00	481.86	0.80	513.98	0.00	513.98	0.80	513.98	0.00	513.98	1.00	642.48
963.72	53.54	1017.26	1.00	642.48	35.69	678.17	2.00	1284.96	71.39	1356.35	1.00	642.48
767.41	0.00	767.41	1.00	767.41	0.00	767.41	1.00	767.41	0.00	767.41	4.00	3069.62
1392.04	0.00	1392.04	1.50	1392.04	0.00	1392.04	1.00	928.03	0.00	928.03	1.00	928.03
1356.35	446.17	1802.51	0.50	678.17	223.08	901.26	0.75	1017.26	334.62	1351.88	0.10	135.63
892.33	981.57	1873.90	1.25	892.33	981.57	1873.90	1.00	713.87	785.25	1499.12	0.50	356.93
1174.31	49.97	1224.28	1.00	1677.59	71.39	1748.97	1.00	1677.59	71.39	1748.97	1.50	2516.38
232.01	178.47	410.47	1.20	278.41	214.16	492.57	2.50	580.02	446.17	1026.18	1.50	348.01
959.26	66.92	1026.18	1.25	959.26	66.92	1026.18	2.00	1534.81	107.08	1641.89	0.50	383.70
940.52	0.00	940.52	0.60	663.90	0.00	663.90	1.00	1106.49	0.00	1106.49	1.50	1659.74
171.33	0.00	171.33	1.20	256.99	0.00	256.99	2.00	428.32	0.00	428.32	0.50	107.08
249.85	124.93	374.78	1.00	249.85	124.93	374.78	0.50	124.93	62.46	187.39	1.00	249.85
273.05	394.41	667.46	1.00	321.24	464.01	785.25	1.00	321.24	464.01	785.25	1.00	321.24
464.01	0.00	464.01	2.00	464.01	0.00	464.01	1.00	232.01	0.00	232.01	1.20	278.41
838.79	0.00	838.79	1.00	838.79	0.00	838.79	1.00	838.79	0.00	838.79	1.00	838.79
232.01	116.00	348.01	1.00	464.01	232.01	696.02	0.50	232.01	116.00	348.01	1.00	464.01
2195.14	374.78	2569.92	1.00	1463.43	249.85	1713.28	0.75	1097.57	187.39	1284.96	0.50	731.71
1748.97	0.00	1748.97	1.00	1748.97	0.00	1748.97	1.00	1748.97	0.00	1748.97	0.30	524.69
392.63	0.00	392.63	1.50	588.94	0.00	588.94	2.00	785.25	0.00	785.25	1.00	392.63
17.85	142.77	160.62	1.00	17.85	142.77	160.62	1.00	17.85	142.77	160.62	1.00	17.85
820.95	410.47	1231.42	1.00	820.95	410.47	1231.42	1.70	1395.61	697.80	2093.41	0.80	656.76
517.55	517.55	1035.11	1.00	517.55	517.55	1035.11	1.00	517.55	517.55	1035.11	1.00	517.55
339.09	339.09	678.17	1.00	339.09	339.09	678.17	1.00	339.09	339.09	678.17	1.00	339.09

Wood lbs/Ac	d Tot lbs/Ac	Mean Herb	Std Herb	Mean Wood	Std Wood	Mean Tot	Std Tot
307.85	535.40	273.05	77.35	369.43	104.65	642.48	182.00
256.99	613.92	428.32	35.69	308.39	25.70	736.71	61.39
399.77	528.26	138.13	31.47	429.75	97.92	567.88	129.40
185.61	385.49	217.37	26.91	201.85	24.99	419.22	51.90
535.40	553.25	12.49	6.56	374.78	196.72	387.27	203.28
0.00	214.16	649.62	278.68	0.00	0.00	649.62	278.68
214.16	517.55	312.49	110.89	220.58	78.28	533.08	189.17
0.00	642.48	558.96	69.20	0.00	0.00	558.96	69.20
35.69	678.17	835.22	256.99	46.40	14.28	881.62	271.27
0.00	3069.62	1227.85	920.89	0.00	0.00	1227.85	920.89
0.00	928.03	1113.63	227.32	0.00	0.00	1113.63	227.32
44.62	180.25	908.75	461.16	298.93	151.70	1207.68	612.85
392.63	749.56	713.87	195.50	785.25	215.05	1499.12	410.55
107.08	2623.46	1744.69	432.28	74.24	18.40	1818.93	450.68
267.70	615.71	334.09	130.09	256.99	100.07	591.08	230.16
26.77	410.47	920.89	372.01	64.25	25.95	985.14	397.97
0.00	1659.74	1095.43	325.24	0.00	0.00	1095.43	325.24
0.00	107.08	235.58	108.36	0.00	0.00	235.58	108.36
124.93	374.78	224.87	49.97	112.43	24.99	337.30	74.96
464.01	785.25	311.60	19.27	450.09	27.84	761.70	47.12
0.00	278.41	334.09	107.43	0.00	0.00	334.09	107.43
0.00	838.79	838.79	0.00	0.00	0.00	838.79	0.00
232.01	696.02	371.21	113.66	185.61	56.83	556.82	170.49
124.93	856.84	1390.25	485.36	237.36	82.87	1627.61	568.23
0.00	524.69	1504.12	489.71	0.00	0.00	1504.12	489.71
0.00	392.63	510.41	157.05	0.00	0.00	510.41	157.05
142.77	160.62	17.85	0.00	142.77	0.00	160.62	0.00
328.38	985.14	903.04	254.36	451.52	127.18	1354.56	381.54
517.55	1035.11	517.55	0.00	517.55	0.00	1035.11	0.00
339.09	678.17	339.09	0.00	339.09	0.00	678.17	0.00
		Tot Mean Herb=	**Tot Std Herb=**	**Tot Mean Wood=**	**Tot Std Herb=**	**Tot Mean Total=**	**Tot Std Total=**
		632.78	**444.94**	**195.58**	**199.63**	**828.35**	**429.54**

BLACKHAWK HUNTINGTON 4 REFERENCE AREA PRODUCTION 8-16-95

REA	Wt Herb g/m2	Proportion	Tot.Herb g/m	Tot.Herb lbs/m2	Herb lbs/Ac	Wt wood g/m2	Proportion	Tot.wood g/m	Tot.Wood lbs/m2	Wood lbs/Ac	Tot. lbs/Ac	Prop. a
1.00	11.00	0.50	22.00	0.05	196.31	0.00	0.50	0.00	0.00	0.00	196.31	0.50
2.00	16.00	0.50	32.00	0.07	285.55	0.00	0.50	0.00	0.00	0.00	285.55	1.70
3.00	10.00	0.50	20.00	0.04	178.47	0.00	0.50	0.00	0.00	0.00	178.47	0.75
4.00	1.00	0.50	2.00	0.00	17.85	0.00	0.50	0.00	0.00	0.00	17.85	1.00
5.00	7.00	0.50	14.00	0.03	124.93	0.00	0.50	0.00	0.00	0.00	124.93	0.35
6.00	7.00	0.50	14.00	0.03	124.93	8.00	0.50	16.00	0.04	142.77	267.70	1.00
7.00	2.00	0.50	4.00	0.01	35.69	21.00	0.50	42.00	0.09	374.78	410.47	2.00
8.00	3.00	0.50	6.00	0.01	53.54	0.00	0.50	0.00	0.00	0.00	53.54	1.00
9.00	5.00	0.50	10.00	0.02	89.23	0.00	0.50	0.00	0.00	0.00	89.23	1.00
10.00	4.00	0.50	8.00	0.02	71.39	3.00	0.50	6.00	0.01	53.54	124.93	0.20
11.00	12.00	0.50	24.00	0.05	214.16	0.00	0.50	0.00	0.00	0.00	214.16	0.50
12.00	7.00	0.50	14.00	0.03	124.93	14.00	0.50	28.00	0.06	249.85	374.78	1.00
13.00	7.00	0.50	14.00	0.03	124.93	19.00	0.50	38.00	0.08	339.09	464.01	0.50
14.00	2.00	0.50	4.00	0.01	35.69	14.00	0.50	28.00	0.06	249.85	285.55	1.00
15.00	3.00	0.50	6.00	0.01	53.54	0.00	0.50	0.00	0.00	0.00	53.54	1.00
16.00	1.00	0.50	2.00	0.00	17.85	0.00	0.50	0.00	0.00	0.00	17.85	3.00
17.00	3.00	0.50	6.00	0.01	53.54	0.00	0.50	0.00	0.00	0.00	53.54	1.00
18.00	0.00	0.50	0.00	0.00	0.00	21.00	0.50	42.00	0.09	374.78	374.78	0.20
19.00	7.00	0.50	14.00	0.03	124.93	16.00	0.50	32.00	0.07	285.55	410.47	1.00
20.00	5.00	0.50	10.00	0.02	89.23	0.00	0.50	0.00	0.00	0.00	89.23	1.00
21.00	3.00	0.50	6.00	0.01	53.54	0.00	0.50	0.00	0.00	0.00	53.54	3.00
22.00	5.00	0.50	10.00	0.02	89.23	24.00	0.50	48.00	0.11	428.32	517.55	0.50
23.00	1.00	0.50	2.00	0.00	17.85	0.00	0.50	0.00	0.00	0.00	17.85	1.00
24.00	4.00	0.50	8.00	0.02	71.39	9.00	0.50	18.00	0.04	160.62	232.01	2.00
25.00	10.00	0.50	20.00	0.04	178.47	4.00	0.50	8.00	0.02	71.39	249.85	0.10
26.00	10.00	0.50	20.00	0.04	178.47	0.00	0.50	0.00	0.00	0.00	178.47	1.00
27.00	12.00	0.50	24.00	0.05	214.16	0.00	0.50	0.00	0.00	0.00	214.16	0.50
28.00	6.00	0.50	12.00	0.03	107.08	0.00	0.50	0.00	0.00	0.00	107.08	0.50
29.00	1.00	0.50	2.00	0.00	17.85	3.00	0.50	6.00	0.01	53.54	71.39	1.00
30.00	13.00	0.50	26.00	0.06	232.01	0.00	0.50	0.00	0.00	0.00	232.01	0.50
31.00	5.00	0.50	10.00	0.02	89.23	0.00	0.50	0.00	0.00	0.00	89.23	1.00
32.00	4.00	0.50	8.00	0.02	71.39	0.00	0.50	0.00	0.00	0.00	71.39	1.00
33.00	6.00	0.50	12.00	0.03	107.08	0.00	0.50	0.00	0.00	0.00	107.08	2.00
34.00	10.00	0.50	20.00	0.04	178.47	0.00	0.50	0.00	0.00	0.00	178.47	0.10
35.00	11.00	0.50	22.00	0.05	196.31	0.00	0.50	0.00	0.00	0.00	196.31	0.25
36.00	6.00	0.50	12.00	0.03	107.08	0.00	0.50	0.00	0.00	0.00	107.08	1.00
37.00	2.00	0.50	4.00	0.01	35.69	0.00	0.50	0.00	0.00	0.00	35.69	4.00
38.00	0.00	0.50	0.00	0.00	0.00	24.00	0.50	48.00	0.11	428.32	428.32	1.00
39.00	0.00	0.50	0.00	0.00	0.00	25.00	0.50	50.00	0.11	446.17	446.17	1.00
40.00	10.00	0.50	20.00	0.04	178.47	0.00	0.50	0.00	0.00	0.00	178.47	1.00
41.00	3.00	0.50	6.00	0.01	53.54	0.00	0.50	0.00	0.00	0.00	53.54	2.00
42.00	1.00	0.50	2.00	0.00	17.85	0.00	0.50	0.00	0.00	0.00	17.85	3.00
43.00	2.00	0.50	4.00	0.01	35.69	0.00	0.50	0.00	0.00	0.00	35.69	1.00
44.00	17.00	0.50	34.00	0.07	303.39	0.00	0.50	0.00	0.00	0.00	303.39	0.50
45.00	5.00	0.50	10.00	0.02	89.23	12.00	0.50	24.00	0.05	214.16	303.39	2.00
46.00	4.00	0.50	8.00	0.02	71.39	32.00	0.50	64.00	0.14	571.09	642.48	1.00
47.00	4.00	0.50	8.00	0.02	71.39	0.00	0.50	0.00	0.00	0.00	71.39	0.50
48.00	5.00	0.50	10.00	0.02	89.23	0.00	0.50	0.00	0.00	0.00	89.23	1.00
49.00	4.00	0.50	8.00	0.02	71.39	0.00	0.50	0.00	0.00	0.00	71.39	1.00
50.00	9.00	0.50	18.00	0.04	160.62	0.00	0.50	0.00	0.00	0.00	160.62	0.25

Herb.lbs/Ac	a Wood lbs/Ac	a Tot lbs/Ac	Prop. b	b Herb.lbs/Ac	b Wood lbs/Ac	b Tot lbs/Ac	Prop. c	c Herb.lbs/Ac	c Wood lbs/Ac	c Tot lbs/Ac	Prop. d	d Herb.lbs/Ac
98.16	0.00	98.16	0.10	19.63	0.00	19.63	0.10	19.63	0.00	19.63	0.75	147.23
485.43	0.00	485.43	0.35	99.94	0.00	99.94	1.50	428.32	0.00	428.32	0.75	214.16
133.85	0.00	133.85	1.00	178.47	0.00	178.47	1.25	223.08	0.00	223.08	1.00	178.47
17.85	0.00	17.85	1.00	17.85	0.00	17.85	1.00	17.85	0.00	17.85	0.15	2.68
43.72	0.00	43.72	0.35	43.72	0.00	43.72	1.00	124.93	0.00	124.93	1.50	187.39
124.93	142.77	267.70	1.00	124.93	142.77	267.70	2.00	249.85	285.55	535.40	0.50	62.46
71.39	749.56	820.95	0.70	24.99	262.35	287.33	1.00	35.69	374.78	410.47	2.00	71.39
53.54	0.00	53.54	3.00	160.62	0.00	160.62	1.00	53.54	0.00	53.54	0.75	40.15
89.23	0.00	89.23	0.50	44.62	0.00	44.62	1.00	89.23	0.00	89.23	3.00	267.70
14.28	10.71	24.99	3.00	214.16	160.62	374.78	0.50	35.69	26.77	62.46	1.00	71.39
107.08	0.00	107.08	2.00	428.32	0.00	428.32	3.00	642.48	0.00	642.48	1.50	321.24
124.93	249.85	374.78	0.50	62.46	124.93	187.39	1.00	124.93	249.85	374.78	0.75	93.69
62.46	169.54	232.01	1.00	124.93	339.09	464.01	1.00	124.93	339.09	464.01	1.00	124.93
35.69	249.85	285.55	1.00	35.69	249.85	285.55	0.50	17.85	124.93	142.77	4.00	142.77
53.54	0.00	53.54	4.00	214.16	0.00	214.16	3.00	160.62	0.00	160.62	2.00	107.08
53.54	0.00	53.54	4.00	71.39	0.00	71.39	3.00	53.54	0.00	53.54	5.00	89.23
53.54	0.00	53.54	2.00	107.08	0.00	107.08	1.00	53.54	0.00	53.54	1.00	53.54
0.00	74.96	74.96	1.00	0.00	374.78	374.78	1.00	0.00	374.78	374.78	0.70	0.00
124.93	285.55	410.47	1.00	124.93	285.55	410.47	0.50	62.46	142.77	205.24	4.00	499.71
89.23	0.00	89.23	2.00	178.47	0.00	178.47	0.50	44.62	0.00	44.62	1.00	89.23
160.62	0.00	160.62	3.00	160.62	0.00	160.62	0.50	26.77	0.00	26.77	3.00	160.62
44.62	214.16	258.78	0.50	44.62	214.16	258.78	2.00	178.47	856.64	1035.11	2.00	178.47
17.85	0.00	17.85	2.00	35.69	0.00	35.69	2.00	35.69	0.00	35.69	1.00	17.85
142.77	321.24	464.01	1.00	71.39	160.62	232.01	0.70	49.97	112.43	162.40	0.10	7.14
17.85	7.14	24.99	3.00	535.40	214.16	749.56	1.00	178.47	71.39	249.85	0.25	44.62
178.47	0.00	178.47	0.70	124.93	0.00	124.93	0.25	44.62	0.00	44.62	0.50	89.23
107.08	0.00	107.08	0.50	107.08	0.00	107.08	0.30	64.25	0.00	64.25	0.50	107.08
53.54	0.00	53.54	1.00	107.08	0.00	107.08	1.00	107.08	0.00	107.08	0.50	53.54
17.85	53.54	71.39	2.00	35.69	107.08	142.77	1.00	17.85	53.54	71.39	1.50	26.77
116.00	0.00	116.00	1.00	232.01	0.00	232.01	0.30	69.60	0.00	69.60	1.00	232.01
89.23	0.00	89.23	1.00	89.23	0.00	89.23	0.50	44.62	0.00	44.62	1.00	89.23
71.39	0.00	71.39	1.50	107.08	0.00	107.08	2.00	142.77	0.00	142.77	2.00	142.77
214.16	0.00	214.16	1.00	107.08	0.00	107.08	1.00	107.08	0.00	107.08	1.00	107.08
17.85	0.00	17.85	1.00	178.47	0.00	178.47	0.50	89.23	0.00	89.23	1.70	303.39
49.08	0.00	49.08	0.25	49.08	0.00	49.08	0.50	98.16	0.00	98.16	0.35	68.71
107.08	0.00	107.08	1.00	107.08	0.00	107.08	1.50	160.62	0.00	160.62	0.25	26.77
142.77	0.00	142.77	2.00	71.39	0.00	71.39	1.00	35.69	0.00	35.69	1.00	35.69
0.00	428.32	428.32	2.00	0.00	856.64	856.64	0.25	0.00	107.08	107.08	1.00	0.00
0.00	446.17	446.17	1.00	0.00	446.17	446.17	1.00	0.00	446.17	446.17	0.35	0.00
178.47	0.00	178.47	0.50	89.23	0.00	89.23	1.00	178.47	0.00	178.47	0.50	89.23
107.08	0.00	107.08	1.50	80.31	0.00	80.31	4.00	214.16	0.00	214.16	2.00	107.08
53.54	0.00	53.54	6.00	107.08	0.00	107.08	10.00	178.47	0.00	178.47	5.00	89.23
35.69	0.00	35.69	1.00	35.69	0.00	35.69	2.00	71.39	0.00	71.39	3.00	107.08
151.70	0.00	151.70	0.50	151.70	0.00	151.70	0.50	151.70	0.00	151.70	0.10	30.34
178.47	428.32	606.79	3.00	267.70	642.48	910.18	1.00	89.23	214.16	303.39	0.50	44.62
71.39	571.09	642.48	2.00	142.77	1142.19	1284.96	3.00	214.16	1713.28	1927.44	1.00	71.39
35.69	0.00	35.69	0.25	17.85	0.00	17.85	1.00	71.39	0.00	71.39	0.70	49.97
89.23	0.00	89.23	2.00	178.47	0.00	178.47	3.00	267.70	0.00	267.70	1.00	89.23
71.39	0.00	71.39	1.00	71.39	0.00	71.39	1.00	71.39	0.00	71.39	1.00	71.39
40.15	0.00	40.15	0.50	80.31	0.00	80.31	0.50	80.31	0.00	80.31	0.10	16.06

Wood lbs/Ac	d Tot lbs/Ac	Mean Herb	Std Herb	Mean Wood	Std Wood	Mean Tot	Std Tot
0.00	147.23	96.19	69.79	0.00	0.00	96.19	69.79
0.00	214.16	302.68	140.30	0.00	0.00	302.68	140.30
0.00	178.47	178.47	28.22	0.00	0.00	178.47	28.22
0.00	2.68	14.81	6.07	0.00	0.00	14.81	6.07
0.00	187.39	104.94	54.94	0.00	0.00	104.94	54.94
71.39	133.85	137.42	61.20	157.05	69.94	294.47	131.15
749.56	820.95	47.83	19.63	502.20	206.09	550.03	225.72
0.00	40.15	72.28	44.47	0.00	0.00	72.28	44.47
0.00	267.70	116.00	77.79	0.00	0.00	116.00	77.79
53.54	124.93	81.38	69.89	61.04	52.41	142.42	122.30
0.00	321.24	342.66	184.23	0.00	0.00	342.66	184.23
187.39	281.08	106.19	24.99	212.38	49.97	318.56	74.96
339.09	464.01	112.43	24.99	305.18	67.82	417.61	92.80
999.41	1142.19	53.54	45.15	374.78	316.04	428.32	361.19
0.00	107.08	117.79	62.44	0.00	0.00	117.79	62.44
0.00	89.23	57.11	23.68	0.00	0.00	57.11	23.68
0.00	53.54	64.25	21.42	0.00	0.00	64.25	21.42
262.35	262.35	0.00	0.00	292.33	117.08	292.33	117.08
1142.19	1641.89	187.39	158.02	428.32	361.19	615.71	519.21
0.00	89.23	98.16	43.72	0.00	0.00	98.16	43.72
0.00	160.62	112.43	59.62	0.00	0.00	112.43	59.62
856.64	1035.11	107.08	60.52	513.98	290.50	621.06	351.02
0.00	17.85	24.99	8.74	0.00	0.00	24.99	8.74
16.06	23.20	68.53	43.91	154.20	98.80	222.73	142.72
17.85	62.46	190.98	184.57	76.38	73.83	267.34	258.40
0.00	89.23	123.14	51.85	0.00	0.00	123.14	51.85
0.00	107.08	119.93	49.95	0.00	0.00	119.93	49.95
0.00	53.54	85.66	26.23	0.00	0.00	85.66	26.23
80.31	107.08	23.20	7.14	69.60	21.42	92.80	28.55
0.00	232.01	176.32	69.76	0.00	0.00	176.32	69.76
0.00	89.23	80.31	17.85	0.00	0.00	80.31	17.85
0.00	142.77	107.08	31.93	0.00	0.00	107.08	31.93
0.00	107.08	128.50	42.83	0.00	0.00	128.50	42.83
0.00	303.39	153.48	96.17	0.00	0.00	153.48	96.17
0.00	68.71	92.27	55.04	0.00	0.00	92.27	55.04
0.00	26.77	101.73	42.83	0.00	0.00	101.73	42.83
0.00	35.69	64.25	41.63	0.00	0.00	64.25	41.63
428.32	428.32	0.00	0.00	449.74	238.48	449.74	238.48
156.16	156.16	0.00	0.00	388.16	116.00	388.16	116.00
0.00	89.23	142.77	43.72	0.00	0.00	142.77	43.72
0.00	107.08	112.43	54.60	0.00	0.00	112.43	54.60
0.00	89.23	89.23	54.13	0.00	0.00	89.23	54.13
0.00	107.08	57.11	28.55	0.00	0.00	57.11	28.55
0.00	30.34	157.76	86.67	0.00	0.00	157.76	86.67
107.08	151.70	133.85	79.81	321.24	191.55	455.09	271.36
571.09	642.48	114.22	57.11	913.75	456.87	1027.97	513.98
0.00	49.97	49.26	20.74	0.00	0.00	49.26	20.74
0.00	89.23	142.77	71.39	0.00	0.00	142.77	71.39
0.00	71.39	71.39	0.00	0.00	0.00	71.39	0.00
0.00	16.06	75.49	49.14	0.00	0.00	75.49	49.14
		Tot Mean Herb=	**Tot Std Herb=**	**Tot Mean Wood=**	**Tot Std Herb=**	**Tot Mean Total=**	**Tot Std Total=**
		103.95	**64.72**	**104.41**	**193.54**	**208.36**	**193.43**

BLACKHAWK HUNTINGTON 4 RIPARIAN REFERENCE PRODUCTION 8-18-95

AREA	Wt Herb g/m2	Proportion	Tot.Herb g/m	Tot.Herb lbs/m2	Herb lbs/Ac	Wt wood g/m2	Proportion	Tot.wood g/m	Tot.Wood lbs/m2	Wood lbs/Ac	Tol. lbs/Ac	Prop. a
1.00	24.00	0.50	48.00	0.11	428.32	6.00	0.50	12.00	0.03	107.08	535.40	1.00
2.00	17.00	0.50	34.00	0.07	303.39	5.00	0.50	10.00	0.02	89.23	392.63	1.00
3.00	24.00	0.50	48.00	0.11	428.32	10.00	0.50	20.00	0.04	178.47	606.79	1.00
4.00	17.00	0.50	34.00	0.07	303.39	15.00	0.30	50.00	0.11	446.17	749.56	1.00
5.00	37.00	0.50	74.00	0.16	660.33	0.00	0.50	0.00	0.00	0.00	660.33	1.00
6.00	20.00	0.50	40.00	0.09	356.93	0.00	0.50	0.00	0.00	0.00	356.93	1.00
7.00	22.00	0.50	44.00	0.10	392.63	0.00	0.50	0.00	0.00	0.00	392.63	0.50
8.00	10.00	0.50	20.00	0.04	178.47	1.00	0.50	2.00	0.00	17.85	196.31	1.00
9.00	22.00	0.50	44.00	0.10	392.63	10.00	0.50	20.00	0.04	178.47	571.09	1.00
10.00	3.00	0.50	6.00	0.01	53.54	13.00	0.50	26.00	0.06	232.01	285.55	1.00

BLACKHAWK HUNTINGTON 4 RECLAIMED RIPARIAN PRODUCTION 8-18-95

AREA	Wt Herb g/m2	Proportion	Tot.Herb g/m	Tot.Herb lbs/m2	Herb lbs/Ac	Wt wood g/m2	Proportion	Tot.wood g/m	Tot.Wood lbs/m2	Wood lbs/Ac	Tol. lbs/Ac	Prop. a
1.00	9.00	0.50	18.00	0.04	160.62	3.00	0.50	6.00	0.01	53.54	214.16	1.00
2.00	13.00	0.50	26.00	0.06	232.01	9.00	0.50	18.00	0.04	160.62	392.63	1.00
3.00	12.00	0.50	24.00	0.05	214.16	9.00	0.50	18.00	0.04	160.62	374.78	1.00
4.00	4.00	0.50	8.00	0.02	71.39	3.00	0.50	6.00	0.01	53.54	124.93	2.00
5.00	8.00	0.50	16.00	0.04	142.77	0.00	0.50	0.00	0.00	0.00	142.77	0.75

Herb.lbs/Ac	a Wood lbs/Ac	a Tot lbs/Ac	Prop. b	b Herb.lbs/Ac	b Wood lbs/Ac	b Tot lbs/Ac	Prop. c	c Herb.lbs/Ac	c Wood lbs/Ac	c Tot lbs/Ac	Mean Herb	Std Herb
428.32	107.08	535.40	1.00	428.32	107.08	535.40	1.00	428.32	107.08	535.40	428.32	0.00
303.39	89.23	392.63	1.00	303.39	89.23	392.63	1.00	303.39	89.23	392.63	303.39	0.00
428.32	178.47	606.79	1.00	428.32	178.47	606.79	1.00	428.32	178.47	606.79	428.32	0.00
303.39	446.17	749.56	1.00	303.39	446.17	749.56	1.00	303.39	446.17	749.56	303.39	0.00
660.33	0.00	660.33	1.00	660.33	0.00	660.33	0.80	528.26	0.00	528.26	627.31	57.19
356.93	0.00	356.93	1.00	356.93	0.00	356.93	1.00	356.93	0.00	356.93	356.93	0.00
196.31	0.00	196.31	1.00	392.63	0.00	392.63	1.00	392.63	0.00	392.63	343.55	85.01
178.47	17.85	196.31	1.00	178.47	17.85	196.31	1.00	178.47	17.85	196.31	178.47	0.00
392.63	178.47	571.09	1.00	392.63	178.47	571.09	0.80	314.10	142.77	456.87	373.00	34.00
53.54	232.01	285.55	1.00	53.54	232.01	285.55	1.00	53.54	232.01	285.55	53.54	0.00
											Tot Mean Herb=	**Tot Std Herb=**
											339.62	**145.04**

a Herb.lbs/Ac	a Wood lbs/Ac	a Tot lbs/Ac	Prop. b	b Herb.lbs/Ac	b Wood lbs/Ac	b Tot lbs/Ac	Prop. c	c Herb.lbs/Ac	c Wood lbs/Ac	c Tot lbs/Ac	Mean Herb	Std Herb
160.62	53.54	214.16	1.00	160.62	53.54	214.16	1.00	160.62	53.54	214.16	160.62	0.00
232.01	160.62	392.63	1.00	232.01	160.62	392.63	2.00	464.01	321.24	785.25	290.01	100.46
214.16	160.62	374.78	1.00	214.16	160.62	374.78	1.00	214.16	160.62	374.78	214.16	0.00
142.77	107.08	249.85	1.00	71.39	53.54	124.93	1.00	71.39	53.54	124.93	89.23	30.91
107.08	0.00	107.08	0.75	107.08	0.00	107.08	0.75	107.08	0.00	107.08	116.00	15.46
											Tot Mean Herb=	**Tot Std Herb=**
											174.00	**71.83**

an Wood	Std Wood	Mean Tot	Std Tot
107.08	0.00	535.40	0.00
89.23	0.00	392.63	0.00
178.47	0.00	606.79	0.00
446.17	0.00	749.56	0.00
0.00	0.00	627.31	57.19
0.00	0.00	356.93	0.00
0.00	0.00	343.55	85.01
17.85	0.00	196.31	0.00
169.54	15.46	542.54	49.46
232.01	0.00	285.55	0.00
Tot Mean Wood=	**Tot Std Herb=**	**Tot Mean Total=**	**Tot Std Total=**
124.03	**133.94**	**463.66**	**165.66**

Mean Wood	Std Wood	Mean Tot	Std Tot
53.54	0.00	214.16	0.00
200.77	69.55	490.78	170.01
160.62	0.00	374.78	0.00
66.92	23.18	156.16	54.09
0.00	0.00	116.00	15.46
Mean Wood=	**Tot Std Herb=**	**Tot Mean Total=**	**Tot Std Total=**
96.37	**73.51**	**270.38**	**141.08**