Appendix 15.B

Floristic Survey and Ecological Study of BHP Area 4 North,

San Juan County, 2004

FLORISTIC SURVEY AND ECOLOGICAL STUDY OF BHP AREA IV, SAN JUAN COUNTY, NEW MEXICO

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1.0 INTRODUCTION

This vegetation resource baseline report has been prepared to update permitting information pertinent to the continuation of coal extraction in Area IV North of Navajo Mine on the Navajo Reservation, approximately 15 miles southwest of Farmington, New Mexico. Specifically, this vegetation baseline report addresses the entire existing Area IV North lease area totaling approximately 4,000 acres. This baseline data has been collected to provide the Office of Surface Mining (OSM) with current vegetation data necessary to prepare National Environmental Protection Act (NEPA) documentation for continued coal extraction in Area IV North. The data was collected in May, 2004. With this purpose in mind the following ecological research and floristic inventory objectives were deemed as essential: 1.) Conduct an ecological study estimating the structure (cover, density, and frequency) of the natural scrubland vegetation in Area IV; 2.) Undertake a floristic survey to identify all vascular plant species that occur in Area IV; 3.) Assess the presence or absence of plants with special protection or conservation status according to Federal, State, and Navajo Nation wildlife management agencies.

2.0 STUDY AREA

2.1 Location

Area IV North is found on the Hogback S, Kirtland SW, Newcomb NE, and The Pillar NW 7.5-minutes USGS Quadrangles (Figure 1).

2.2 Area IV Vegetation Community Types

Ecologists categorize the natural vegetation in Area IV as Great Basin Desertscrub (Brown, 1994). This type of vegetation is known as “cold desert”, a name assigned due to the climatic combination of cold winters, low precipitation (less than 250 mm/yr), and wide fluctuations in both daily and seasonal temperature extremes. Eight months of each year have monthly rainfall averages between 12 and 17 mm. The four months with monthly rainfall amounts greater than 20 mm (20-30 mm per month) are July to October. Maximum daily temperatures remain below freezing during many days of the three coldest months: December, January and February.

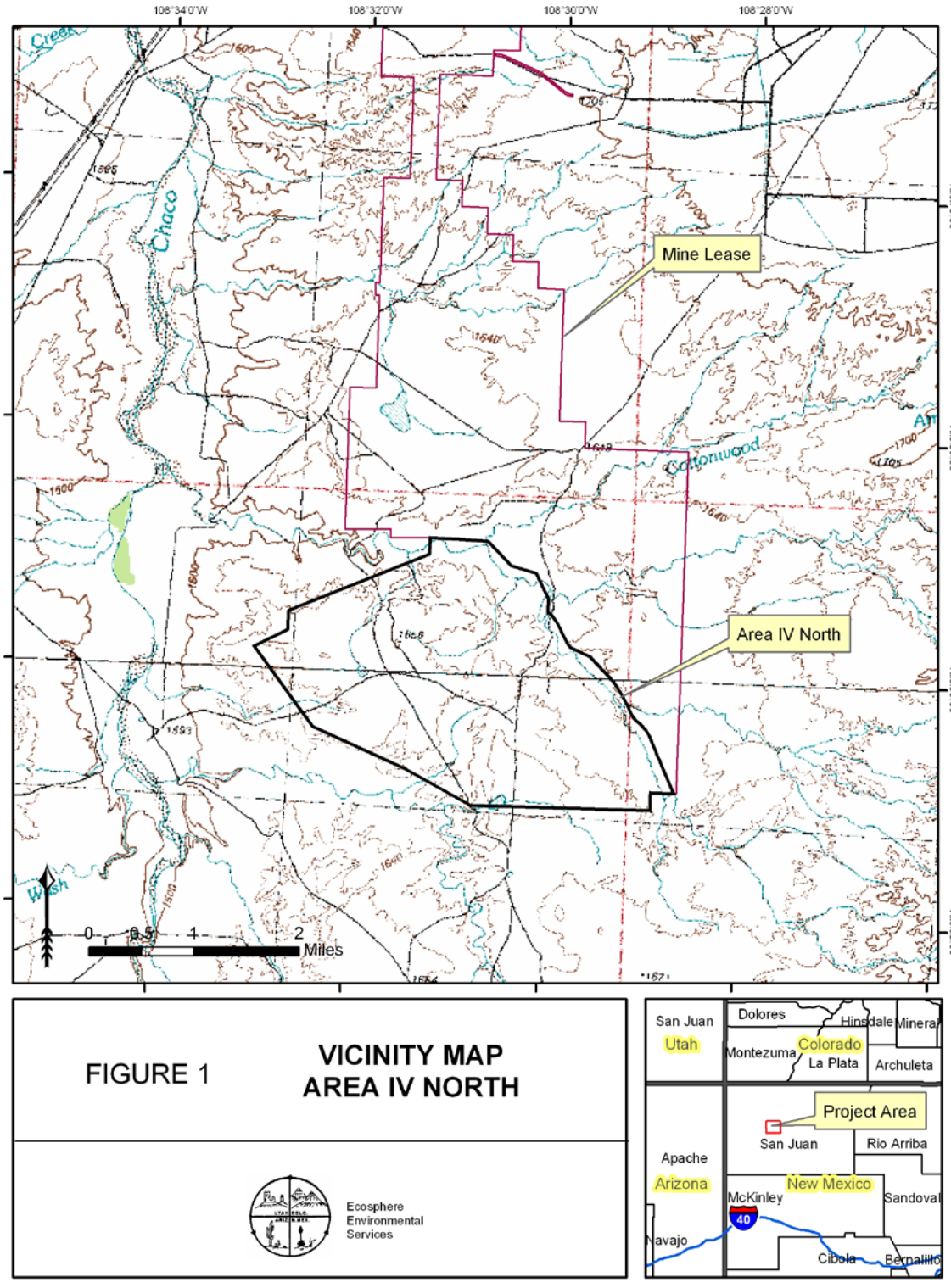


FIGURE 1 **VICINITY MAP AREA IV NORTH**

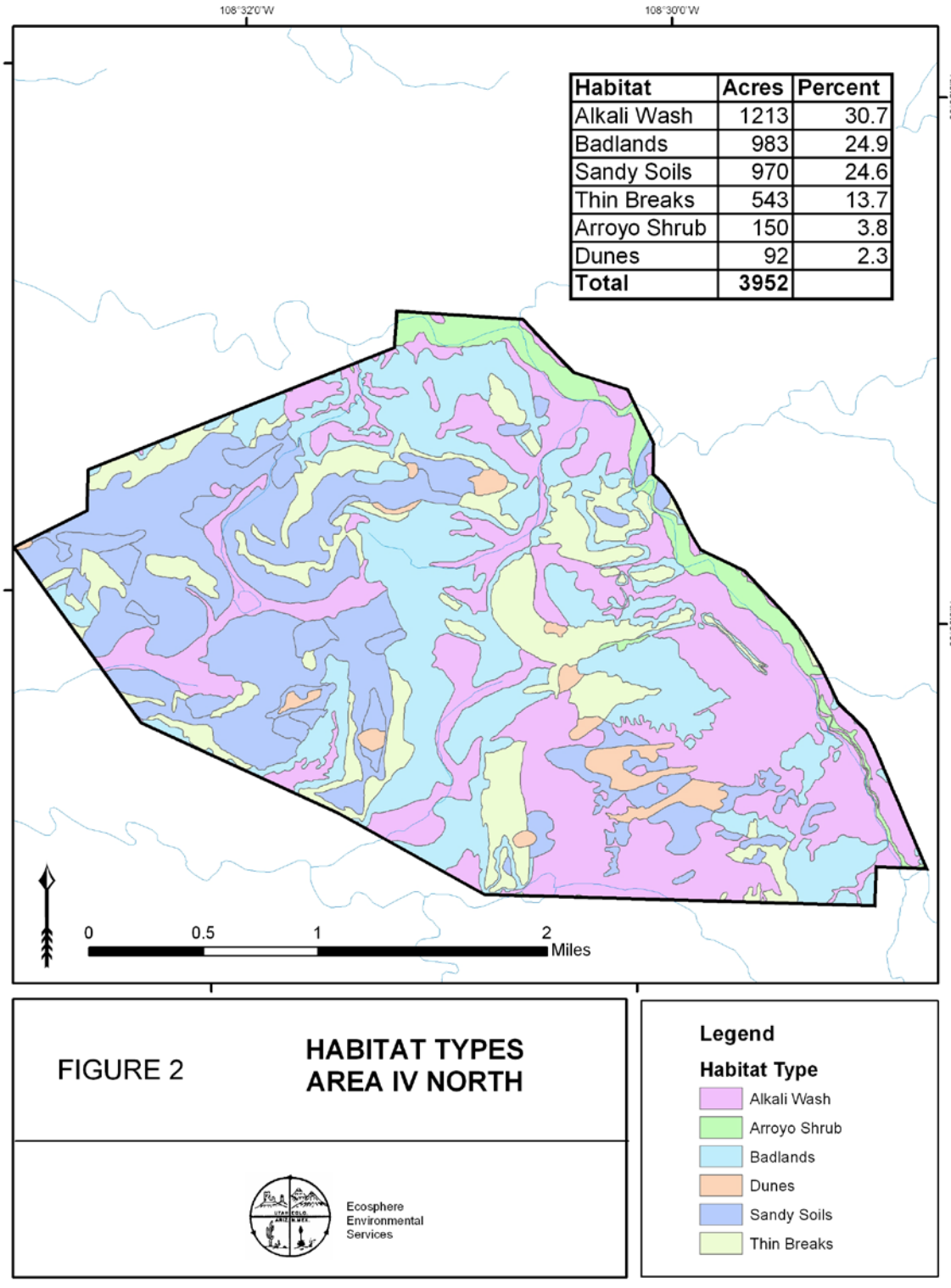
Ecosphere Environmental Services

The Great Basin Desertscrub is characteristically dominated by halophytes and has few cacti (Brown, 1994). Both these statements are true for Area IV where six species of *Atriplex* often occur as dominants and where there are only two cacti species. The only cacti present are the infrequent *Opuntia polyacantha* (plains prickly pear) and an even more infrequent *Sclerocactus cloveriae* subsp *cloveriae* (clover fishhook cactus). *Atriplex confertifolia* (shadescale), *Atriplex gardneri* (Gardner saltbush), *Ericameria nauseosus* (rubber rabbitbursh), *Gutierrezia sarothrae* (snakeweed), *Sarcobatus vermiculatus* (black greasewood), *Pleuraphis jamesii* (galleta), and *Sporobolus airoides* (alkali sacaton) are locally common in Area IV. This makes Area IV a part of the shadescale series of the Great Basin Desertscrub (Brown, 1994).

As a whole, the plant species diversity of this Great Basin Desertscrub series is typically less than other types of desert scrublands. Within the shadscale series of the Great Basis Desertscrub (Area IV) there is considerable variation in plant species diversity among habitats. For example, sand dunes have much greater species diversity than badlands. In recognition of variations in species richness that can occur among habitats, six habitat types within the Great Basin Desertscrub of Area IV were identified from aerial photographs (Figure 2). Although many of the more than 160 plant species that occur here are present in two or more habitats, each habitat had a few unique or characteristic plant species and a few are listed as characteristic of two habitats. The following brief descriptions list a few of the more characteristic or unique plant species for each habitat. These six habitats are listed in descending order, beginning with the habitat with the greatest species richness and amount of vegetation and proceeding to the habitat with less vegetation and with fewer plant species.

2.2.1 Dunes

The deep sands of dunes allows for deep, but more consistent water availability. Since only deep-rooted perennial plants can exploit this deep water, the dunes have several unique plant species. Among the unique dune plant species are *Ericameria nauseosa* var. *arenaria* (sand rabbibrush), *Chrysothamnus pulchellus, Evolvulus nuttallianus, Dalea leporina,* and *Caesalpinia jamesii*. Besides these species, *Abonia fragrans* and *Mentzelia pumila* are perennials that can be locally abundant on dunes.


108°32'0"W
108°30'0"W
36°32'0"N
36°30'0"N
Habitat | Acres | Percent
Alkali Wash | 1213 | 30.7
Badlands | 983 | 24.9
Sandy Soils | 970 | 24.6
Thin Breaks | 543 | 13.7
Arroyo Shrub | 150 | 3.8
Dunes | 92 | 2.3
Total | 3952
0 0.5 1 2 Miles
FIGURE 2
HABITAT TYPES
AREA IV NORTH
Ecosphere Environmental Services
Legend
Habitat Type
Alkali Wash
Arroyo Shrub
Badlands
Dunes
Sandy Soils
Thin Breaks

2.2.2 Sandy Soils

Sandy soils comprise the largest proportion of Area IV. As with dunes, the deeper penetration of rainwater into sandy soil allows for greater water availability and increases plant species diversity. The types of sand in this habitat can vary from saline to calcareous. This sand habitat often transitions to and can be mixed with thin break habitat. In years with high amounts of spring rainfall, such as the spring of 2004, sandy soils display an abundance of annuals, especially of *Phacelia crenulata, Townsendia annua,* and *Cryptantha crassisepala*. To a lesser extent *Dimorphocarpa wislizenii* (spectacle pod), *Malacothrix sonchoides* (desert dandelion), and *Streptanthella longirostris* are common. In regard to shrubs *Ephedra torreyana* (Torrey ephedra) and *Krascheninnidovia lanata* (winterfat) occur on sandy soils.

2.2.3 Arroyo Shrub

This is the habitat of major waterways, such as Pinabete and Cottonwood Creeks. Shrubs and perennials characteristic of this Area IV habitat include *Sarcobatus vermiculatus* (greasewood), *Isocoma azteca* (burroweed), *Psoralidium lanceolatum* (lemon scurf-pea), *Cycloloma atriplicifolia* (winged pigweed), *Parryella filifolia* (dune), *Lycium pallidum* (wolfberry), and *Distichlis spicata* (saltgrass). Also established along major waterways and behind checkdams is the exotic *Tamarix chinensis* (salt cedar) and the poisonous *Suckleya suckleyana* (poison suckleya).

2.2.4 Alkali Wash

This is the habitat of minor waterways. These areas can be broad and level, sometimes with small, dense patches of *Pleuraphis jamesii* (galleta) and *Sporobolus airoides* (alkali sacaton). Other plants that are locally common in alkali washes include *Chamaesaracha coronpus* (false nightshade), *Lycium pallidum* (wolfberry), *Eriogonum corymbosum* (corymb buckwheat), *Monolepis nuttalliana* (poverty weed), *Eremopyrum triticeum* (annual wheatgrass), and *Suaeda moquini* (seepweed).

2.2.5 Thin Breaks

These are rocky areas, sometimes with loose rock and sometimes with large pieces of rock, usually shale, that are firmly embedded in the ground. Thin breaks are typically upland habitats,

with surface rock as a unifying feature. Flat surface rocks allow for greater water to runoff and to accumulate in crevices or fissures between rocks. Thin-break plant species that occur in these fissures include *Artemisia bigelovii* (Bigelow sagebrush), *Brickellia oblongifolia* (Mojave brickellbush), *Euphorbia fendleri* (Fendler's spurge) and *Platyschkuhria integrifolia* (obling bahia). This habitat can abruptly shift to another habitat type or gradually shift to badlands or sandy soil habitats.

2.2.6 Badlands

The badlands have the least vegetation of any Area IV habitat. Among the more common plants along the small relief channels of these barren areas are *Atriplex gardnerii* (Gardner's saltbush), *Atriplex powellii* (Powell's saltbush), *Cleome lutea* (yellow beeplant), *Camissonia scapoidea*, and *Monolepis nuttalliana* (poverty weed). This habitat can abruptly shift to another habitat type or gradually transition to alkali wash or thin break habitats.

3.0 STUDY METHODS

Vegetation structure is essential baseline data, especially when an area is destined for revegetation. With this purpose in mind, the vegetation information of greatest interest for this study is plant cover, plant density and frequency. To estimate these aspects of vegetation structure it is necessary to obtain ecological data from field plots. The timing of this fieldwork was in May (May 5-16, 2004). This was the optimal time to estimate both annual and perennial plant cover, density and frequency.

3.1 Ecological Study

Before fieldwork began 197 plot locations were randomly designated. This number of plots allowed each plot to represent about 20 hectares, a fairly intensive sampling scheme. Plot locations were selected at random to ensure that data points were representative of the entire area. Plot locations were selected by plotting computer-generated random coordinates onto a map of Area IV. After these 197 randomly generated points were plotted on a map, the proportion of plots in each of the six major habitat types was calculated. These proportions were: 5% dune, 21% thin break, 30 % sand, 21% badland, 20% alkali wash and 8% arroyo shrub. With one exception these proportions were similar to the overall proportions of land with this habitat. The

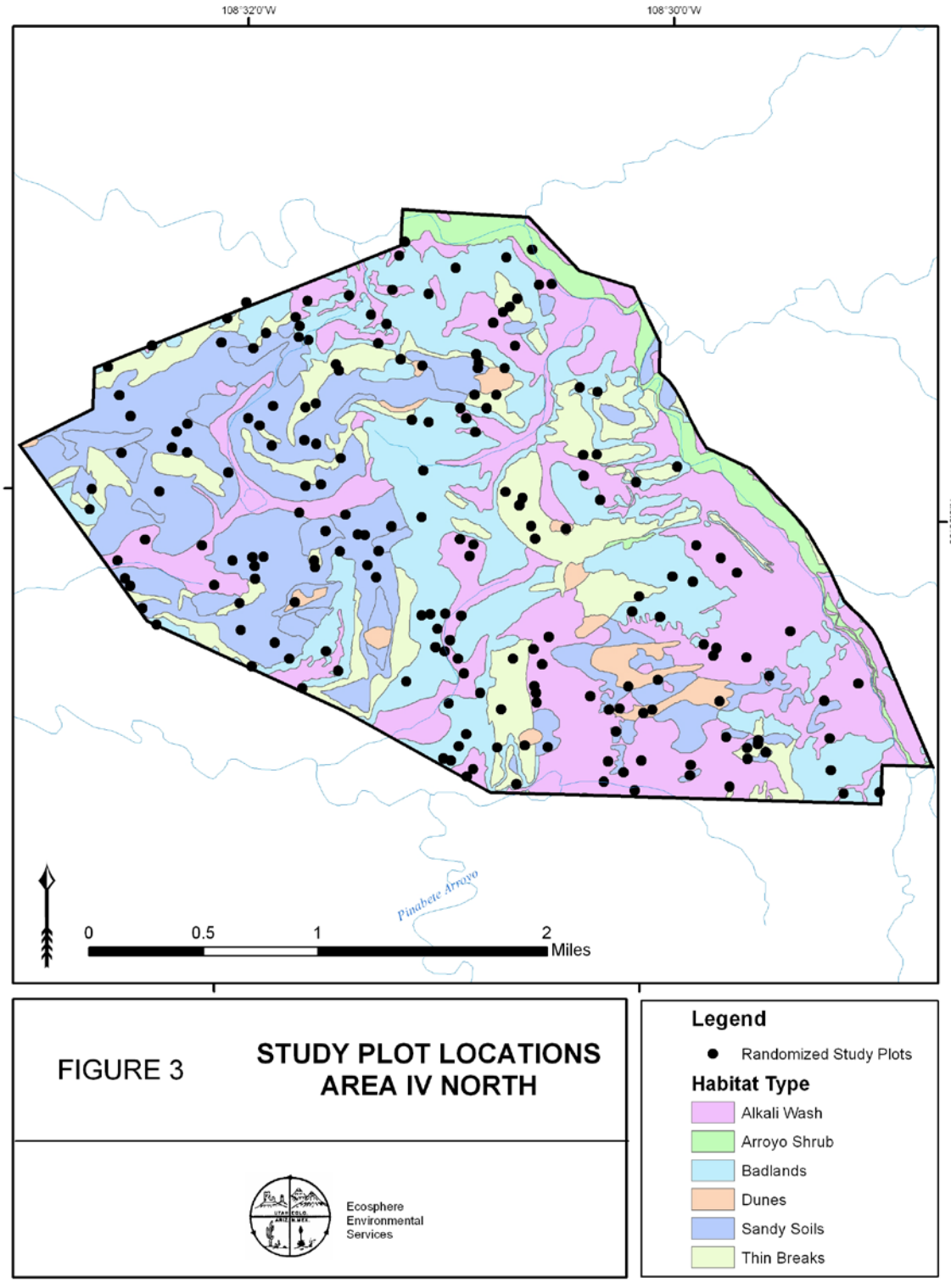
exception was the arroyo shrub, a habitat that was somewhat under-represented by plots. To compensate for this random under sampling, two additional arroyo shrub plots were established. These two additions increased the total number of study plots in Area IV to 199 (Figure 3).

Plots points were located in the field by the use of detailed U.S. Geological Survey (USGS) 7.5-minute quadrangle maps. Global positioning systems (G.P.S.) were used to triangulate signals from satellites and thereby locate random plots in areas where landmarks were scarce. Once a plot was located a portable G.P.S. was used to determine the Universal Transverse Mercater (U.T.M.) coordinates of the plot. The U.T.M. coordinates, date, plot number, and names of the field investigators were recorded on field data sheets.

After a plot point was located in the field, a decision had to be made regarding the direction to extend a 30 m line transect, the line that would also be the central axis for a temporary plot. This direction to extend the transect line from the starting point was determined by selecting an azimuth direction from a table of randomly generated azimuth numbers. This random number was the compass heading direction where the transect line was extended. On a few occasions, the random azimuth direction extended into another habitat type. When this happened, another azimuth number was randomly selected until an azimuth heading was a line that was within a single habitat type.

To determine shrub densities, the number and species of all shrubs rooted within one meter of the 30 transect line were tallied and recorded. For each plot the shrub density figures are from this rectangular plot (30 x 2 meters in size) that covers an area of 60 m^2. For each shrub species present within the 30 x 2 meter plot, the height of one individual was recorded. The individual measured for height was the one closest to the beginning point of the line transect.

Next, the canopy intercept distance (cover) along the entire 30 m length of the transect line was recorded to the nearest centimeter. This was done by visually following one edge of the extended tape; imagining a millimeter thin line, along the entire length of the 30 m transect line. To facilitate data collection, the line-intercept data was recorded on the data sheet in six columns. These corresponded to 0-5, 5-10, 10-15, 15-20, 20-25, and 25-30 m intervals along the 30 m


108°32'0"W
108°30'0"W
36°30'0"N
Pinabete Arroyo
0
0.5
1
2
Miles
FIGURE 3
STUDY PLOT LOCATIONS
AREA IV NORTH
Ecosphere
Environmental
Services
Legend
Randomized Study Plots
Habitat Type
Alkali Wash
Arroyo Shrub
Badlands
Dunes
Sandy Soils
Thin Breaks

transect line. Within each of these 5 meter intervals the amounts of rock and litter intercepted by the transect line were recorded. Rock was defined as any piece of rock larger than a grain of sand. Litter was defined as dead plant material (wood, leaves or fruits) or other organic matter, such as occasional animal droppings.

Vegetation cover (dominance) data for all living plant species was collected for these same six 5-meter intervals along the 30 m transect line. Whenever a living plant intercepted the line the distance of the intercept was recorded to the nearest centimeter. If a plant crossed the line at a distance of less than 1 cm, a minimal value of 1 cm was recorded. This assured that each plant species present along the transect line was recorded.

After the transect line was extended, care was taken to walk only along one side of the line. This is important because the rock, litter, and vegetation along the untrampled side of the line are to be used as plot locations to collect plant density, plant frequency, rock cover, litter cover, annual plant cover and perennial plant cover data. The large 30 x 2 m plot was used to collect data on shrub density and frequency, but five smaller plots, each 0.25 m^2 in size were used to collect density and frequency information for non-shrubs. These 5 square plots were 0.5 x 0.5 m in size and were systematically located along the untrampled side of the extended transect line at the 5.0-5.5, 10.0-10.5, 15.0-15.5, 20.0-20.5 and 25.0-25.5 m locations.

For each of these 0.25 m^2 plots, the species and number of every individual plant rooted inside the plot area was counted and recorded. It was recognized that the estimates of individuals were less exact for perennial grasses than for annual plants. Also within each 0.25 m^2 plot visual estimates of the percentage of the area covered by rock, litter, and living vegetation were made. After an estimate was made of total vegetation cover (perennial and annual plants), the amount of this total cover that was annual plants was estimated and recorded. This separate estimate for annuals is an indication of the relative importance of annual plants to total vegetation cover. Based on observer experience at the mine and in the region, the abundance of annuals in Area IV was noticeably greater in 2004 than in the previous low-rainfall years. Therefore, the proportion of annual vegetation cover to total vegetation in 2004 will reflect the cover of annuals during a year with high amounts of spring rainfall.

This fieldwork took 10 days with 3-6 investigators in the field each day (average of 4 per day). Transects were read by teams of 2 people, with an experienced botanist on each team. This amounted to a total of 40 person-days of fieldwork to collect the line transect data from Area IV.

3.2 Floristic Survey Methods

All plant species seen in Area IV during the 2 weeks of transect work were identified. This was done by either keying plants to species with the aid of regional floras (Welsh, et. al., Weber and Taylor) or by personal consultation with local plant identification experts.

Prior to the field surveys a list of all rare plants in San Juan County was secured (Table 1). Key field characters of plants were studied and a visit was made to the San Juan College herbarium to examine herbarium specimens of these rare plants. Notes were taken at the herbarium to ensure that these plants could be accurately identified if encountered during the field survey.

The 199 transects were located in all sections and in all habitats of Area IV. As these were read, a list of plants for all of Area IV was compiled. As transects were read, additional time was spent searching for plant species in species-rich habitats and in unique micro-sites such as in sand dunes, along drainages, and in soil-filled seams below rock slicks. Not including the time spent collecting the line-transect data; another 4 person-days were spent searching unique habitats and micro-sites in Area IV for plant species.

4.0 RESULTS

4.1 Rare Plants of Area IV

According to the New Mexico Rare Plant Council, there are 18 plant species in San Juan County, New Mexico listed as “rare” (Table 1). For the purpose of this baseline report, the term rare refers to a taxon that is narrowly endemic to a specific geographic feature (e.g., rock outcrops) or subset area of a phytogeographic region (e.g., southern Rocky Mountains, northern Chihuahuan desert). It can be locally abundant within its narrow range, but typically will not extend more than 100 miles in length of range. Included on this list are all federally listed threatened and endangered plants and species listed on the Navajo Endangered Species List (NESL).

Table 1. Rare Plant Species Known To Occur In San Juan County, New Mexico.

Species	Family	Federal	State of NM	Navajo Nation
**Abronia bloackii*	Nyctaginaceae	-	Species of concern	-
Aletes macdougalii ssp. breviradiatus	Brassicaceae	-	Species of concern	-
Aliciella formosa	Polemoniaceae	Species of concern	Endangered	-
**Asclepias sanjuanensis*	Asclepiadaceae	-	Species of concern	Group 4
Astragalus chuskanus	Fabaceae	-	Species of concern	-
Astragalus cottamii	Fabaceae	-	-	-
Astragalus humillus	Fabaceae	Endangered	Endangered	Group 2
Astragalus micromerius	Fabaceae	-	Species of concern	-
Astragalus naturitensis	Fabaceae	-	Species of concern	Group 4
Astragalus oocalycis	Fabaceae	-	Species of concern	-
Pediocactus knowltonii	Cactaceae	Endangered	Endangered	-
Penstemon breviculus	Scrophulariaceae		Species of concern	-
Penstemon lentus	Scrophulariaceae	-	-	-
Phlox cluteana	Polemoniiaceae	-	Species of concern	-
**Proatriplex pleiantha*	Chenopodiaceae	-	Species of concern	-
**Puccinellia parshii*	Poaceae	Species of concern	Endangered	Group 3
Sclerocactus cloveriae ssp. brackii	Cactaceae	Species of concern	Endangered	-
Sclerocactus mesae-verde	Cactaceae	Threatened	Endangered	Group 3

Source: New Mexico Rare Plant Technical Council

The only plant from this table to occur in BHP Area IV is *Ascelpias sanjuanensis* (Ascelpiadaceae). Field survey personnel were aware of the possible occurrence all 18 plant species (Table 1). Special attention was given to four plant species (preceded by an asterisk) known to occur near Area IV. Even though the San Juan milkweed was the only one of the four species encountered, habitat and distribution information for all four rare plant species that occur near Area IV plant are summarized here.

4.1.1 **Abronia bolackii** N. D. Atwood, S. L. Welsh & K. D. Heil (Nyctaginaceae)

This rare plant species was only recently described (Atwood and others, 2002). It is known from only four locations in San Juan County, New Mexico. One of these locations is 10 miles SSW of Waterflow on the Navajo Mine Lease land west of the Neck region. This is approximately two miles from the Area IV survey area. Since this is near the Area IV survey area, special attention was given to areas with gypsiferous clay lens soils of the Ojo Alamo Formation, a preferred substrate for this plant. This species differs from *Abronia fragrans*, a common plant in Area IV, by having rhizomes, occurring in colonies, and having a shorter corolla tube. Whenever patches of *Abronia* were encountered that appeared to be clonal, these were closely examined. No *A. blackii* plants have yet been discovered in Area IV.

4.1.2 **Asclepias sanjuanensis** Heil, Porter, & Welsh (Asclepiadaeae)

This milkweed was encountered at 4 widely dispersed locations in Area IV. Eight or more individual milkweed plants were encountered at each of these locations. The stems of this perennial milkweed grow from a woody taproot and are 4-8 cm. tall. Stems are typically prostrate with leaves 2-4 cm long. Diagnostic characters of this milkweed are the white, tomentulose leaf margins, and a terminal inflorescence with a reddish-violet flowers. This milkweed flowers in April and has mature fruits in mid to late May. (Ecosphere Environmental Services, 1995). The characteristic habitat of this plant is sandy soil, sometimes occurring in pinyon-juniper woodlands. In Area IV this plant occurs in sandy soil, dune habitats and along small sandy gullies.

There are no federal, State of New Mexico or Navajo Nation protections for this species. The State recommends that these plants be protected from land use impacts when possible. The Navajo Nation Department of Fish and Wildlife (NNDFW) does not currently have sufficient information to support this species being listed as G2 or G3 on the NESL. According to Daniela Roth, NNDFW Botanist, this species may be locally abundant or more abundant than was previously thought. However, the NNDFW does request that discoveries be reported in order to further assess the status of this plant on the reservation. Based on what is currently known about this plant, it is unlikely that any special protection measures for this species would be applied by the NNDFW on mining in Area IV (Personal communication w/Daniela Roth, 2004).

4.1.3 **Proatriplex pleiantha** (W. A. Weber) Stutz & Chu (Chenopodiaceae)

Proatriplex pleiantha is an annual herb with alternate, succulent, petioled, and entire leaves (Welsh, 2003). This species has been collected from 15 locations in Montezuma County Colorado, from one location in San Juan County Utah, and from 15 locations in San Juan County New Mexico. All but four of the New Mexico collections are from between Chinle Wash and Cottonwood Arroyo. This cluster of collections for this species in San Juan County includes collections from the Navajo Mine Lease (Marron,Taschеck, Knight, Inc. and Ecosphere Environmental Service, Inc.,1991). The 1991 report summarized the taxonomic history of this rare plant species (first called *Atriplex pleiantha*), and had maps of the known locations for this plant on and near the Navajo Mine

The above cited 1991 report surveyed two areas for *P. pleiantha:* Areas A and B. Area A was a badland area situated west and adjacent to the Navajo Mine Lease, included 2,300 acres of land east of Chaco River and included the Navajo Mine Lease section known as "The Neck". In these areas 31 of 52 *P. pleiantha* locations were reported to occur on Navajo Mine Lease lands. It is of significance that this cluster of locations is considered the "core cluster" of *P. pleiantha* individuals for San Juan County, where densities are relatively high. The other area surveyed in 1991 was 2,939 acres of land located east of the Navajo Mine, in the Cottonwood Arroyo Drainage, in an area just south of the Navajo Irrigation Project. In this area 21 locations of *P. pleiantha* were discovered, but these locations were more scattered and were less concentrated than in Area A.

Since *P. pleiantha* occurs about 2 miles northeast of Survey Area IV, it was expected to occur in this survey area. In preparation of the Area IV floristic survey the following information on the potential habitat for this plant was obtained from the literature. Stutz (1998) summarized the status of *P. pleiantha* and considered it to be abundant enough to not be officially classified as rare or threatened. In his Master of Arts thesis Foote (1989) did work on the germination success and requirements of this species. Stutz and others (1990) reported that *P. pleiantha* plants often occur in clusters within areas 10-50 m^2 in size. *Proatriplex pleiantha* plants located in the vicinity of Area IV region occurred in densities as great as 50-80 plants per m^2.

Proatriplex pleiantha is loosely associated with stratigraphic horizons of the Kirtland formation, Mancos shale, Lewis shale and Morrison formation (Adrian Hunt, Museum of Natural History expert on the Cretaceous: cited in 1991 report). The typical habitat for this plant is badland landscape, typically occurring in association with other halpophytic plants such as *Kochia americana, Suaeda torreyana*, *Atriplex obovata*, *Monolepis nuttallian*a and *Distichlis spicata*. Whenever these plant species were located (occasionally) and whenever these stratgraphic horizons were encountered (seldom), a more intense search was made for this plant species.

4.1.4 **Puccinellia parishii** A.S. Hitchc. (Poaceae)

This grass occurs in alkali swales. This grass is to be looked for among halpophytic plants such as *Kochia americana*, *Suaeda torreyana*, *Atriplex obovata*, *Monolepis nuttallian*a and *Distichlis spicata*. It has not yet been located in Area IV.

In regard to the other rare plants in San Juan County (Table 1) *Astagalus cottamii* and *Astragalus humillimu*s occur about 10 miles southwest of Area IV. However, these occur on very different substrates are not expected on BHP lease lands. *Sclerocactus mesae-verde* (Mesa Verde cactus) also occurs about 6 miles WNW of the Area IV, but since it occurs on very different substrates it too is not expected to occur on BHP lease lands. The remaining 11 plant species in Table 1 occur at more distant locations of San Juan County and do not have potential to occur in Area IV.

4.2 Line Intercept Data

The BHP study area was sampled by the random placement of 199 transect lines. These fell 27% in alkali wash, 25% in sand, 23% in badlands, 18% in thin breaks, 4% in dune, and 3% in arroyo-shrub habitat (Table 2). Table 2 also indicates the vegetation intercept distances (a measure of dominance) for three lifeforms (forbs, grasses, and shrubs). For the entire site the forb lifeform was most dominant, comprising 54% of the vegetation that was intercepted. By this same measure shrubs made of 32% and grasses 15% of the vegetation intercept.

Table 2. Total line intercept distance measured at the BHP Area IV North study site compared to vegetation intercept distances for three lifeforms and six habitat types. Within each habitat the percentage of the total transect area in each lifeform is in parenthesis. The proportions in parentheses in the total vegetation column are this habitats' contribution to the total vegetation cover of the entire study site.

Habitat Type	Number Of Transects	Total Transect Distance (% of each habitat total)	Vegetation Intercept by Lifeform (m)			Total Vegetation Intercept (m) (% of all intercepts)
			Forbs	Grasses	Shrubs	
Alkali Wash	57	1,710 (27%)	26.85 (49%)	8.91 (16%)	19.52 (35%)	55.28 (23%)
Sand	49	1,470 (25%)	74.98 (61%)	20.50 (17%)	27.32 (22%)	122.80 (53%)
Badlands	45	1,350 (23%)	9.10 (62%)	1.34 (10%)	4.13 (28%)	14.57 (6.1%)
Thin Breaks	36	1,080 (18%)	8.21 (36%)	3.54 (15%)	11.14 (49%)	22.89 (9.6%)
Dune	7	210 (4%)	6.58 (50%)	1.55 (12%)	4.96 (38%)	13.09 (5.5%)
Arroyo Shrub	5	150 (3%)	3.18 (37%)	0.16 (2%)	5.23 (62%)	8.57 (3.6%)
All Habitats	**199**	**5,970**	**128.9 (54%)**	**36.00 (15%)**	**72.30 (32%)**	**237.2 (100%)**

When the total vegetation intercept (all lifeforms combined) of 237.2 m is compared with the entire length of the transect area, an area vegetation cover value of 4.00% was obtained. This 4 percent value was lower than the 5.2 percent vegetation cover obtained from quadrat data (Table 2). However, since a bias of at least 2 percent is not unusual in either sample technique, the similarity of these two estimates provides a good baseline estimate for vegetation cover at this study site.

Although forbs were the dominate lifeform overall, there were two habitats where forbs were not the most dominant vegetation (Table 2). In both the thin breaks and the arroyo shrub habitat shrubs were the dominant lifeform. Grasses were the least dominant of these three lifeforms in every habitat.

4.2.1 Shrub Height

The mean height of shrubs at the BHP study site was 23.4 cm (Table 3). This value is based on height values from randomly selected shrubs from every transect line. The two habitats with the greatest shrub densities (dune and arroyo shrub) were also the two habitats with the greatest mean shrub heights. In like fashion, the two habitats with the lowest shrub densities (badlands and thin breaks) were the two habitats with the lowest mean shrub height. There was considerable variation in shrub height among habitats, ranging from some shrubs over a meter high in the dune and arroyo shrub habitats to some shrubs that were less than 10 cm high in every habitat.

Table 3. Average shrub heights and total shrub densities (listed from the highest to the least densities) the six main vegetation types at the BHP study site.

Habitat Type	Density (shrubs / m^2)	Mean shrub height (cm.) (range in ht. values)
Dune	0.94	31.5 (6-125)
Arroyo Shrub	0.34	35.0 (2-115)
Alkali Wash	0.24	26.4 (6-86)
Sand	0.16	24.8 (6-85)
Badlands	0.10	19.2 (4-61)
Thin Breaks	0.01	18.4 (4-41)
All Habitats	**0.15**	**23.4**

4.2.2 Shrub Density

The greatest shrub density was clearly at the dune habitat, where there was 0.94 shrubs/m^2: nearly one shrub per square meter (Table 3). Second and third in shrub densities were the arroyo shrub and the alkali wash habitats. The sand habitat had 0.16 shrubs/m^2 and the badlands habitat had 0.1 shrubs/m^2. The habitat with the least shrubs was thin breaks, where there were only 0.01 shrubs/m^2.

4.2.3 Dominant Plant Species

Plant species dominance values were calculated for each life form. The rankings were based on the total line transect distance for each species. Based on the total line intercept distance for each lifeform of 54% forb, 15% grass, and 32% shrubs (Table 2), the relative dominance of forbs, grasses, and shrubs were calculated for each lifeform (Table 4).

For the entire study site two forb species made up over 50% of the forb line intersect distance (Table 4). The first was the exotic tumbleweed (*Salsola tragus*), which covered over 28% of the distance. Second was *Phacelia crenulata*, which covered over 22% of the distance. The annual, exotic *Salsola tragus* was the most dominant forb at the study site, but it was not the most dominant form at the sand or at the dune habitats. At these sites *Phacelia crenulata* and *Cryptantha crassisepala* were the most dominant forbs. Other habitat specific variations in forb dominance are apparent on Table 4. For example, *Phacelia integrifolia* and *Mentzelia pumila* were present only on the dune and the sand habitat. Eleven of the 12 most dominant forbs at the BHP study site were annual forbs. The only perennial forb (seventh in rank) was *Sphaeralcea coccinea* (scarlet globe mallow, yerba de la negrita). A total of 63 forb species were encountered and identified along the transect lines.

For the entire site two grass species made up over 75% of the grass intersect distance (Table 4). The first was *Sporobolus airoides* (alkali sacaton) at over 41% and the second was *Pleuraphis jamesii* (galleta) at over 38%. Both of these grass species are perennials. Seven of the 10 most dominant grass species were perennials. The annuals collectively made up only 5% of the grass transect distance. These annuals were the exotic *Bromus tectorum* (cheatgrass) and two native grasses: *Vulpia octoflora* (six-week fescue) and *Eremopyrum triticeum* (annual wheatgrass). The

Table 4. The most common forbs, grasses, cacti, and shrubs in each of the six BHP habitat types. For this table the most common species are those with the greatest overall line intercept distances (data is in meters). For each lifeform the species are listed in order with the species with the greatest intercept distance first. The species with the greatest relative dominance in each habitat and lifeform are indicated with an asterisk.

Plant Species	**Overall**	**Transect Area (m)**					
Top 12 Forb Species	**128.9 m**	**Alkali Shrub**	**Sand**	**Badland**	**Thin Breaks**	**Dune**	**Arroyo Shrub**
1. Salsola tragus	28.4%	13.0*	14.1	4.7*	3.8*	0.2	1.0
2. Phacelia crenulata	22.2%	4.4	21.6*	0.4	2.2	0.1	0
3. Cryptantha crassisepala	17.6%	1.8	16.9	< 0.1	0.2	3.4*	0.2
4. Townsendia annua	7.0%	4.2	2.3	0.8	0.9	< 0.1	1.0*
5. Phacelia integrifolia	4.6%	0	5.5	0	< 0.1	0.5	0
6. Abronia fragrans	4.4%	< 0.1	5.5	0	0	< 0.1	0
7. Sphaeralcea coccinea	1.8%	< 0.1	1.2	0.7	0.3	< 0.1	0
8. Townsendia incana	1.7%	0.2	1.2	0.8	< 0.1	0	< 0.1
8. Descurainia pinnata	1.3%	0.6	0.6	0.3	< 0.1	< 0.1	0.2
9. Mentzelia pumila	1.2%	0	0.9	0	0	0.4	0
10. Lappula occidentalis var. cupulata	< 1%	0	0	0	0.2	0	0.4
11. Stephanomeria exigua	< 1%	0	0	0	0	0.3	0
12. Astragalus fucatus	< 1%	0	0	0	0	0.2	0
51 other forbs:	9 %						

Table 5 – Continued

Cacti	1.26	Alkali Shrub	Sand	Badland	Thin Breaks	Dune	Arroyo Shrub
1. Opuntia polyacantha	96%	0.4*	0.7*	0.1*	0.1*	0	0
2. Sclerocactus cloveriae	4%	0	0	0	0.1	0	0
Top 10 Grass species	**36.0 m**						
1. Sporobolus airoides	41.5%	3.7	7.9	0.4	2.5*	0.4*	< 0.1
2. Pleuraphis jamesii (Hilaria)	38.5%	4.6*	8.0*	0.3	0.7	0.4	< 0.1
3. Sporobolus cryptandrus	7.8%	0.1	2.2	0.2	< 0.1	0.4	0.1*
4. Sporobolus contractus	2.9%	0	1.0	0	0	< 0.1	0
5. Bromus tectorum	2.8%	0.1	< 0.1	0.5*	< 0.1	0	0
6. Achnatherum hymenoides (Oryzopsis)	2.5%	< 0.1	0.7	0.1	0.1	0.1	0
7. Vulpia octoflora	1.6%	0.1	0.4	0	< 0.1	0	< 0.1
8. Aristida purpurea	1.3%	0	0.2	< 0.1	0.3	< 0.1	< 0.1
9. Eremopyrum triticeum	0.6%	0.1	0	0.1	0	0	< 0.1
10. Stipa comata	0.4%	0	< 0.1	0	0	0.1	0
6 other grasses:	0.1						

Table 5 – Continued

Top 11 Shrub species	72.3 m	Alkali Shrub	Sand	Badland	Thin Breaks	Dune	Arroyo Shrub
1. Atriplex confertifolia	26.9%	3.1	7.4	1.0	6.8*	0.7	0.5
2. Gutierrezia sarothrae	22.3%	0.6	12.7*	0	1.6	1.3*	0
3. Atriplex obovata	17.0%	6.8*	< 0.1	2.3*	1.3	0	1.9
4. Sarcobatus vermiculatus	9.8%	4.2	0	0	0	0	2.9*
5. Ephedra torreyana	5.4%	0.3	2.1	0	0.4	1.2	0
6. Ericameria nauseosa	4.0%	1.2	1.0	0	0	0.7	0
7. Atriplex gardnerii	3.1%	1.3	0	0.5	0.2	0	0
8. Eriogonum leptocladon	2.3%	0	1.1	0	0	0.5	0
9. Atriplex canescens	2.1%	0.9	0.7	< 0.1	0	0	0
10. Krascheninnikovia lanata	1.7%	0	1.2	0	0	0	0
11. Artemisia bigelovii	1.1%	0	0.1	0	0.8	0	0
8 other shrubs	4.3%						

two habitats with the least grasses (badlands and arroyo shrub) were also the only two locations where alkali sacaton and galleta were not the most common grasses. The most dominant grass on the badlands (still very infrequent) was *Bromus inermis* (cheatgrass). The most dominant grass in the arroyo shrub habitat was *Sporobolus cryptandrus* (sand dropseed). A total of 16 grass species were encountered and identified along the transect lines.

For the entire study site two shrub species made up over 50% of the shrub intersect distance (Table 4). These were *Atriplex confertifolia* (shadscale) at about 27% and *Gutierrezia sarothrae* (snakeweed) at over 22%. Despite its overall dominance, *Atriplex confertifolia* was the most dominant shrub only in the thin break habitat. *Gutierrezia sarothrae* was the most dominant

shrub in both the sand and the dune habitats. The third most dominant shrub was *Atriplex obovata* (New Mexico saltbush), a species that was the most dominant shrub in both the alkali shrub and the badland habitats. The final habitat, the arroyo shrub, had *Sarcobatus vermiculatus* (greasewood) as the most dominant shrub. A total of 19 shrub species were encountered and identified along transect lines.

Although cacti line intersect distances were included both within the shrub intercept data and as a separate lifeform category on Table 4. Cacti made up only 1.4% of the intersect area of shrubs and only 0.01 percent of the overall transect distance. Cacti are conspicuous, but were not a dominant plant at this study site.

A complete listing of vegetation documented in Area IV is provided as Attachment 1 to this baseline report.

5.0 DATA SUMMARY

The data in Tables 2-4 in this report quantify the vegetation cover by lifeform, the rock cover, the litter cover, the shrub densities, and mean shrub height data for the six habitat types. Table 4 indicates the dominant plant species by lifeform for each habitat. This table clearly shows the mosaic nature of habitat dominance by species and lifeform types. In like fashion, there is also a mosic pattern of rock, litter, and vegetation cover amounts among the six habitats.

Further data analyses are possible on the extensive amount of data that were collected during this study. For example, statistical tests could be done to affirm the trends identified here with statistical tests. There may be significant differences in the densities or intercept distances among species, habitats, and lifeforms identified in the tables of this report. Also, relative frequency information could be obtained by tallying the occurrences of each species in the 6 sections (each 5 m) for each transect line.

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Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
1	4041286	722314	Thin Break

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
Grasses								
SPAI	2	1						
Shrubs/ Trees								
ATOB							16	13
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
2	4043110	720790	SA SA

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	6		6		5	10		
PHCR	12		1			1,10		
TOAN	2			10	5	2,6		
DEPI		2						
CRCR		7				1		
CHSST		1	9		2	1,1		
SPPA				2				
Grasses								
SPAI		1		5	4	2,2		
VUOC	1	2	1	2	1	2		
Shrubs/ Trees								
ATCO				8	9		8	36
GUSA		9	25	15	22	4,9	183	14
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:					
3	4041407	720846	ALKALI WASH					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
HAGL			1	1				
CHGL								
Grasses								
Shrubs/ Trees								
ATCO	9		5				66	6
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
4	404532	7021978	TH / BR

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
Grasses								
SPAI	30							
Shrubs/ Trees								
ATOB		13					3	13,20
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
5	4041626	721182	SA SA

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
CRCR	4,2,5	6	3		6			
VUOC	1,2			2				
SATR	1		1		1			
PHCR	24,14	14	6,31	12,14	12,7,5	13,14,21		
TOAN	5,3	8,2,2	4		1			
SPPA		4						
PLPA		5,2						
STEX			1					
GILE						1		
Grasses								
ORHY	7	1						
SPCR	5	3						
SPAI		14	1,3					
HIJA				2				
Shrubs/ Trees								
ATCO	6						4	52

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
6	4040151	723885	ALKALI WASH

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR		6						
HAGL					2			
Grasses								
Shrubs/ Trees								
ATOB							5	15,9
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
7A	4043082	721017	SA SA

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
CRCR	15	15	20	20	15	4		
ABFR	4							
SPPA	2	3						
SATR	1		1	2	20	5		
STEX	1							
PHIN	8	15						
OEPA		2	2					
CHER				2		4		
Grasses								
HIJA	1,1	1	2,1	5	30	8		
SPCR	1	4			2			
ORHY				1				
Shrubs/ Trees								
GUSA	1	5		3		6	64	11
ATCO							1	33
ATCA							3	34
OPPO					40			
Total Veg Cover								
Bare Ground								

Litter	
Rock	

Transect Number:	**N Coordinate:**	**E Coordinate:**	**Habitat Type:**
7B	**4043082**	**722602**	**SAND**

5/12
HAZ +
ADB

Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**	**Height**
Forbs								
CRCR	23	33,14	20,14	18	20,7	6		
ASFU	3	2						
STLO	2				8			
CYBU	1							
SEPI		1						
STEX			2,1	2				
OEPA			3,1					
SPCOC				1				
PHCR					3,4	39		
Grasses								
BRTE	1							
SPAI		1	1			3		
HIJA		3	2,10					
SPCO				3	7			
DEPI				1				
Shrubs/ Trees								
ERLEP		4			3		29	35
GUSA						10,11	42	14
ATCO					20		3	28
ATCA					15	11	2	39

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
9	4041587	720965	SA SA

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
CRCR	6	8	7,2	3,12,4,3	23,3,1	5,7,1,9		
TOAN	2,4		1	5	2			
SATR	4,1			3	2	4,3		
PHCR	1	12,12	21,4	2	1,3	1,21		
PLPA				2	2	2,3,1,5		
OEPA					4			
CYAC					1			
Grasses								
VUOC	1,1			1				
SPCR	5,2	3	10	1	3	5		
SPAI		1						
Shrubs/ Trees								
ATCO	10		5				8	23
GUSA	7	3					9	15
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
10	4040791	723148	ALKALI WASH

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
TOAN					2,3,6	3,5		
Grasses								
Shrubs/ Trees								
ATOB							10	8
GUSA							2	
OPPO		23					1	
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:					
11	4040392	722902	TH BR					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
ATSA			1					
HAGL				4				
Grasses								
SPCR	1			3				
HIJA	4							
Shrubs/ Trees								
ATCO					14	11	11	24
GUSA							2	6
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
12	4041042	722492	THIN BREAKS

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
TOAN		3	2,5,5					
SATR		6	5,4					
PHCR		3	28,22					
Grasses								
HIJA		14						
SPAI			4					
Shrubs/ Trees								
ATOB	15	16			3	2	12	26
ATGA	12						1	10
GUSA							2	14
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 13	N Coordinate: 4040924	E Coordinate: 721405	Habitat Type: SA SA					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SPCOC			2			3,2		
Grasses								
SPAI	1	5,2	3					
HIJA		3,3				3		
Shrubs/ Trees								
GUSA				1		8	37	14
ATCO	25	28	6,2		18		18	17
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 14	N Coordinate: 4041067	E Coordinate: 722425	Habitat Type: BADLAND					
Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**	**Height**
Forbs								
PLIN	2							
SATR				1,1,1		2		
TOAN						5		
Grasses								
Shrubs/ Trees								
ATOB		5	6		23		2	23
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
15	4040996	725406	ALKALI WASH

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
TOAN	4							
SATR	1		1		14,2	3,3,5,1		
Grasses								
ERTR	5							
SPAI	12							
Shrubs/ Trees								
ATOB				15	5		14	7,17
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
16	4043282	720820	BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
ATPO			1					
SATR						1		
Grasses								
Shrubs/ Trees								
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 17	N Coordinate: 4041825	E Coordinate: 721833	Habitat Type: SA

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
CRCR	17	2						
LEER	3				1			
SATR		4						
PHCR		4						
Grasses								
HIJA	3,8,1	10	7	13	9	7		
Shrubs/ Trees								
ATCO			22				14	29
GUSA	3	12	6	4	9		177	6
EPTO							1	33
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 18	N Coordinate: 4042153	E Coordinate: 722972	Habitat Type: Alkali Wash

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
ASMO		5						
LEER		2						
PEAN				17				
PHCR					2,4	3,11		
CYAC						6		
Grasses								
HIJA		3			5			
SPAI				2,4				
Shrubs/ Trees								
EPTO						26	2	22
ATCO		9,21	27		36	2	16	22
GUSA							21	11
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 19	N Coordinate: 4042099	E Coordinate: 722951	Habitat Type: Alkali Wash					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
TOAN	1	1	3	4,1				
SATR		4,2	3					
PHCO		6		7,16,18,8	6	3,7		
DEPI			1					
ASMO					7			
STLO						1		
ATSA			1					
Grasses								
SPAI					1	3		
Shrubs/ Trees								
ATCO	2						7	23
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 20	N Coordinate: 4042411	E Coordinate: 721190	Habitat Type: SAND					
Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**	**Height**
PHCR	20,33,13	10,13	11,14		8	3		
SATR	2,15	18	1,4	2	3	22		
SPCOC		6						
TOAN			4					
Grasses								
SPAI		5	1					
ORHY			1					
Shrubs/ Trees								
ATCO							2	
GUSA							5	
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:

21	4041896	724210	ALKALI WASH					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	2				1			
CRCR	1							
Grasses								
Shrubs/ Trees								
ATOB			2		5		6	15,12
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 22	**N Coordinate: 4041895**	**E Coordinate: 722064**	**Habitat Type: SAND DUNE**					
Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**	**Height**
Forbs								
CRCR	8,17	4	5,1	10,2	9,7,8	4,17		
EVNU	1		4	5				
STEX			5	1	1			
LEER			1					
GAPI				5				
ABFR				3				
SATR					1			
Grasses								
SPCR	5,5	1,5	3		2	3		
STCO			7	5				
HIJA			2			4		
ORHY					2	2		
ARPU						2		
Shrubs/ Trees								
ATCO						26,48	6	23
ATCA							1	23
EPTO	1			35	1		2	41
GUSA			2	15			31	9
Total Veg Cover								
Bare Ground								
Litter								
Rock								
Transect Number: 23	N Coordinate: 4042688	E Coordinate: 722539	Habitat Type: BADLAND					

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR				1				
ATPO						1		
LARE						1		
Grasses								
Shrubs/ Trees								
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
24	4043369	722688	BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
Grasses								
Shrubs/ Trees								
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
25	4041212	720355	THIN BREAKS

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR		2	1	1	2,2,1	3		
TOAN						7		
Grasses								
SPAI	4,3	5	3		1,3	2		
Shrubs/ Trees								
ATCO					7		8	25
GUSA							4	13

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
26	4042310	723761	BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	2,1		1	2	2			
CLLU			2	6	2			
ATPO			3					
CRCR				1				
Grasses								
Shrubs/ Trees								
ATOB	4						1	22,16

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
28	4043141	722583	BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
DEPI		3						
MEAL		2						
SATR		4,6	12			2		
TOAN		3						
PHIV			3					
Grasses								
Shrubs/ Trees								
ATCO			26			10	8	10

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
29	4041334	724905	ALKALI WASH

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	5,4	7	12	6	2,2			
TOAN		20	3	28	3,8	67		
CLLU				1				
PLPA						2		
Grasses								
SPAI	1				10,2			
ATGA		10						
HIJA		15	9					
Shrubs/ Trees								
ATOB						20		21,15

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:					
30	4043314	721940	ALKALI WASH					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	17	25,13	17,9	6,3,9,4	9,9	6		
CHIN	4	3	3	4	2	1		
SLLU						3,3		
DEPI		8						
ABFR		2						
MEAL					2			
Grasses								
Shrubs/ Trees								
ATCO				28,2			2	28
SAVE					28		1	55
ATGA							1	10
Total Veg Cover								
Bare Ground								
Litter								
Rock								
Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:					
31	4041961	723044	Alkali Wash					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
TOAN			4			3		
CRCR				5		1		
SATR			2	7,1,3	1	2,1		
LYGR					6			
PHCR	2	1,7	17,13	7,1	4	6		
LEER	1,6,13	2						
OEAL				3		3		
CHST					5			
PLPA						5,3		
Grasses								
HIJA	6	2						
SPAI	1		3					
Shrubs/ Trees								
GUSA		3					24	8
ATOB							3	28
ATCO		5,8	11				14	27
Total Veg Cover								

Bare Ground	
Litter	
Rock	

Transect Number:	**N Coordinate:**	**E Coordinate:**	**Habitat Type:**
32	**4043796**	**722000**	**ALKALI WASH**

Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**	**Height**
Forbs								
SATR	12,17	18	12,7	13,11	22	13		
CHIN	3	4						
Grasses								
Shrubs/ Trees								
ATOB					17		3	15

Total Veg Cover								
Bare Ground								
Litter								
Rock								
Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:					
33	4043555	721966	THIN BREAK					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SCTR	3	2	1	5	1			
SPCOC				3				
Grasses								
Shrubs/ Trees								
ATCO							2	
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 34	N Coordinate: 4041872	E Coordinate: 723076	Habitat Type: Alkali Wash					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
TOAN	1,12	8						
SATR		2						
CRCR		2						
PHCR		3						
Grasses								
HIJA		9						
SPAI				1				
VUOC					1			
Shrubs/ Trees								
OPPO							1	14
TESP					25		2	41
ATOB	29						5	21
ATCO		6			29		5	24

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number: 35	N Coordinate: 4042954	E Coordinate: 723325	Habitat Type: BD					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR		5,11,1,4	4,8,1	1		4		
CHST		3	6			3		
PHCR		8				2		
AGGL		4						
EUGL			3					
DEPI			4			3		
MEAL			1					
TOAN			2			9,2,3		
STEX						2		
PUPA						3		
SPCOC						8,13		
Grasses								
SPAI			2					
Shrubs/ Trees								
ATOB			2	8	18,7	9	8	16

ATGA							2	13
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 36	**N Coordinate: 4041537**	**E Coordinate: 720158**	**Habitat Type: Alkali Wash**					
Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**	**Height**
Forbs								
SATR	11	9	4		2	7		
TOAN	4					24		
DEPI	1	1				2		
MEAL			1					
PLPA						5		
CRCR						1		
Grasses								
HIJA				7	15			
SPAI				5				
Shrubs/ Trees								
ATCA				10			2	72
ATCO						5	2	34
CHNAG					57		2	62
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 37	N Coordinate:	E Coordinate:	Habitat Type:					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
Grasses								
Shrubs/ Trees								
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 38	N Coordinate: 4043174	E Coordinate: 721891	Habitat Type: BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	20,14	15	22	5,1	4	13,12		
ATSA		2,2	1	1				
CHIN		2		3		6		
LARE		1						
HAGL				1		4		
TOAN						1		
Grasses								
BRTE	11	1		7	20	8		
Shrubs/ Trees								
OPPO						5	3	11
ATGA							1	20

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number: 39	N Coordinate: 4042556	E Coordinate: 720184	Habitat Type: Sand

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
PHCR	10	30	50	50	40	30		
SATR	2			1				
LIPO		4						
STLO		1						
SP 2		1						
TOAN					2	1		
Grasses								
HIJA	14	2	1	1		1		
Shrubs/ Trees								
ATCO					25		12	23
GUSA	35		5			20	>0	10

Total Veg Cover
Bare Ground
Litter

Rock

Transect Number: 40	N Coordinate: 4042188	E Coordinate: 722849	Habitat Type: Th. Br.

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	10		1	1	4			
HAGL				1				
Grasses								
SPAI	9			1				
Shrubs/ Trees								
ATOB			3		10		4	12

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number: 41	N Coordinate: 4040838	E Coordinate: 723136	Habitat Type: ALKALI WASH

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
TOAN	1			17,7	6,13	6,4		
CLLU	11							
PHCR	11			6				
SATR				2				
CRCR				3				
Grasses								
SPAI					3			
Shrubs/ Trees								
ATOB					15		14	
OPPO								

Total Veg Cover
Bare Ground
Litter

Rock

Transect Number: 42	N Coordinate: 4042479	E Coordinate: 723378	Habitat Type: Th. Br.

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
HAGL		1						
Grasses								
Shrubs/ Trees								
SCCL						2	2	4
ARGA							2	10
ATOB							2	16
ATCO		13				9	2	37

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number: 43	N Coordinate: 4040815	E Coordinate: 724442	Habitat Type: SA SA

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
CHER	1					1		
PHIN	10		16,10	7,4	11,1,27			
CRCR	3	2	6,11	4	6,2,4			
PHCR		2						
STEX		2						
SATR		1			5			
OEPA			1,6					
ABFR					3,17,2			
CRCA						2		
Grasses								
HIJA	4,4,2	2,2	4	3,1	2	6,2,3		
ORHY					1,1			

Shrubs/ Trees								
ERLEP							2	
EPTO		75			5		2	33,52
GUSA								
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 44	**N Coordinate: 4041322**	**E Coordinate: 721420**	**Habitat Type: DUNE**					
Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**	**Height**
Forbs								
MEPU	6,3							
MASO	1							
CRCR	1,1,8,8	1		3,8,11	6,5,3,15	3,2,31,9		
ABFR	4							
SATR	1		1					
DEPI			1					
STEX					1			
PHCR					10			
Grasses								
ORHY		1,1						
HIJA		4	3	3	2,3			
SPCR						1		
Shrubs/ Trees								
GUSA	10	4	23		7,5	13	202	16
ERLEP	1	3					13	25
ATCA							1	42
OPPO							1	6
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 45	**N Coordinate: 4043371**	**E Coordinate: 721829**	**Habitat Type: SAND**

Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**	**Height**
Forbs								
PHCR	11	1	11,2	5,8	13	8,28		
SATR	2	3,1,2	2	2,2	2,1	2		
CRCR				1		2		

TOAN						6		
Grasses								
SPAI				3				
Shrubs/ Trees								
ATCO						45	3	29

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number:	**N Coordinate:**	**E Coordinate:**	**Habitat Type:**
46	**4041679**	**720741**	**ALKALI WASH**

Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**	**Height**
Forbs								
TOAN	5	4,1,2		4,1	1	1		
CRCR		3						
DEPI			1					
SATR				8,5,1	19	9		
Grasses								
SPAI	16,12		22					
HIJA	29,3,7	15,15	16					
SPCR				1				
Shrubs/ Trees								
ATCO							1	
GUSA			4	11			2	

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number:	**N Coordinate:**	**E Coordinate:**	**Habitat Type:**
47	**4042464**	**721414**	**THIN BREAK**

Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**	**Height**
Forbs								
SATR	3	1	3			2		
IPPU		1						
TOAN		3						

PHCR			2	1	1			
LIAR						4		
CYAC					3	2		
Grasses								
Shrubs/ Trees								
ATCO							8	12
GUSA							5	12

Total Veg Cover								
Bare Ground								
Litter								
Rock								
Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:					
48	4043042	722600	SAND					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
STLO	4			2				
SATR	1							
PHCR	1	10,10,5	17		3	1,5,13		
SPCOC		4		12	8,6	3		
STEX				1				
MACA						11		
Grasses								
HIJA	11,1,1,6	3	7,3	1,3,21,3	8,2	3		
SPAI		6	6			2,12		
SPCO					4			
STCO					2			
ORHY						1		
Shrubs/ Trees								
ATCO				1			15	32
GUSA	5		4	2	19	2,7	69	8
EPTO						6	1	14
ERLEP						14		17
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:					
49	4043073	722055	THIN BREAK					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
CHST				2				
PHCR					2,3,2			
Grasses								
HIJA	7							
SPAI		10	4,5	2				
Shrubs/ Trees								
BROB							1	24
CHNA							1	40
GUSA							14	10
ATCO			17	24	14	3	13	27
ARBI						2	5	30
APTO						9,20	8	26
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:					
50	4041470	721129	SA SA					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
TOAN	5,1	3,2		1	1	2		
CRCR	6,3,1	10		3	8,16	2,2		
SATR	1			1				
PHCR	3		9,6	7,5	8,4,2,2	3,3,2,3,1		
CHST				4				
Grasses								
SPAI	6,6	1,8,6,6	5,4		2,1	1		
HIJA	5	6,7	9,8	5,12	4			
SPCR			1					
VUOC		2						
ORHY				2				
Shrubs/ Trees								
ATCO							14	33
GUSA							2	
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 51	N Coordinate:	E Coordinate:	Habitat Type:					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
Grasses								
Shrubs/ Trees								
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
52	4042593	721014	ALKALI WASH

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
HAGL	1			5		2		
CRCR			3,2		2			
DEPI			10	5		1		
CLLU				3				
SATR				1	1,1	12		
Grasses								
Shrubs/ Trees								
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
53	4041612	721912	SAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
TOIN	7	3,9,3	7					
SATR	2	3	3	3,4	1,2	2,3		
PHCR	13	7,8,12	5,2	20,21,11	14	4,6,3		
GILE		1			1			
TOAN	3							
Grasses								
VUOC		2	1					
SPAI		3			2			
Shrubs/ Trees								
ATCO				47			4	30
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
54	4041307	722479	BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR			6					
PLIN			4					
PLPA			2					
MAAF			12	2				
Grasses								
Shrubs/ Trees								
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
55	4042172	723517	BD

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	6	14,18	12					
PHCOR	4							
ATPO		2						
Grasses								
ERTR		2	4					
Shrubs/ Trees								
ATGA							3	23
ATOB			22				1	28

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
56	4042695	720099	Sand

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SPCOC	8,1	4		5				
PHCR	2	4	2	8				
SATR	3	2	1		3			
MACA	2	4	4					
CRCR		1						
LYGR				1				
Grasses								
SPAI	4,1		1		3	4		
VUOC	1							
Shrubs/ Trees								
GUSA	30	40	35	40	30	15	210	8
ATCO	30	12				40	27	18

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
57	4043736	722401	ARROYO SHRUB

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	9	5,2	14		12	6		
CHIN	2	1	3					
TOAN			7		5			
Grasses								
Shrubs/ Trees								
ATCO	30,20						8	19
SAVE				26		25	4	48
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
58	4042313	723761	ALKALI WASH

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	1,2,7	5,7	5,3,3	4,4	1	4,7,4		
DEPI		4,3	1	2,9				
CHIN			1			1		
SPPA				5				
PHCR				15				
CRCR						1		
Grasses								
Shrubs/ Trees								
ATOB					9,3		10	21,15
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
59	4040555	723729	SA SA

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
ABFR	10,9,3	7,8			8			
CRCR	1,2,1,1	6	4,2,6	4	4,3,6,3			
SATR	1,2	1,1	2,3	2	4	1		
PLPA						1		
Grasses								
SPCO	1,5	2,1	3,3,5,1	4,35,7	6,6	2,2		
ORHY						1		
Shrubs/ Trees								
GUSA	9,15						44	10,5

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
60	4042350	721680	THIN BREAK

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	1	2,1	11,1	5,11		8		
MEAL		2						
Grasses								
SPAI		1						
Shrubs/ Trees								
ATCO				30			9	30
ERSA						2		

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
61	4040243	725601	THIN BREAK

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
ERSA				2				
Grasses								
Shrubs/ Trees								
ATOB						40	1	20

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
62	4042291	720137	Sa. Sa.

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
ABFR	15	12				3		
CRCR	4							
SATR	1	1	2,3	8	4	1,3,2		
CHCR		5				1		
PHCOR				4				
DEPI					1			
SPCOC						3		
Grasses								
SPAI								
HIJA	3,5		2,10	3	5,3,9,6	2,4,4		
VUOC			1					
SPCR					1			
Shrubs/ Trees								
ATCA							2	
GUSA	34	5,16	4	4,17	11,3,5	20,10,3,42	404	
ERLEP	3	1		15	24,4		17	
KRLA			35				1	

Total Veg Cover	
Bare Ground	

Litter			
Rock			
Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
63	4041124	722523	ALKALI WASH

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
CRCR	5					12,6,2		
CHIN	1							
SATR		1,2	1		6,10	5,2,3		
GILE				1				
TOAN						2,6		
Grasses								
HIJA				35,2		18,6,93,12		
BRTE				10				
ELEL				10				
SPAI				15	28,10	6,7		
Shrubs/ Trees								
ATOB						55	4	13
ATCA			75				1	92
CHNA				48			4	72

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
64	4042767	722679	TH BR

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SPCOC	6							
PHCR			2	6	2	1		
SATR				1		2		
Grasses								
SPAI	4	2,2	5	2				
Shrubs/ Trees								
GUSA	2,10		15	14	12	15	270	8
ATCO	45			4		12	36	17
ATOB						2	2	5

Total Veg Cover
Bare Ground

Litter								
Rock								
Transect Number: 65	N Coordinate:	E Coordinate:	Habitat Type:					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
Grasses								
Shrubs/ Trees								
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	**N Coordinate:**	**E Coordinate:**	**Habitat Type:**
66	**4043654**	**722995**	Arroy. Shrub trans. Alk. Wash

Species	**0-5 m**	**5-10 m**	**10-15 m**	**15-20 m**	**20-25 m**	**25-30 m**	**Density**
Forbs							
CRCR	1						
SATR						2	
Grasses							
Shrubs/ Trees							
ATOB			55	4	30,10,15		29
SAVE		10				35	5
Total Veg Cover							
Bare Ground							
Litter							
Rock							

Transect Number: 67	N Coordinate: 4040723	E Coordinate: 721508	Habitat Type: BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR					4			
CRCR						7		
DEPI						2		
Grasses								
HIJA					3			
Shrubs/ Trees								
ATCO							5	55

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number: 68	N Coordinate: 4040475	E Coordinate: 724788	Habitat Type: SA SA

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
PHIN	2,20,12,13	2	15,7,6	6,4	15,11	16,10,11,4		
ASFU	2							
SATR		2,5			1			
ABFR			8					
CRCR			2		4			
TOIN				5		2,3		
PLPA						3		
Grasses								
SPAI	2,1		1,3	1,3	3,5,7	1,2,2		
Shrubs/ Trees								
GUSA	2						3	42,39
EPTO		100					1	
ATCA								

Total Veg Cover
Bare Ground
Litter
Rock

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
69	4040352	724265	ALKALI WASH

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
CRCR	16,10,6,5	16,9,6	3		5			
SATR	7	3		1	1	3		
SPAI	1,1	1						
PHCO		20,13	9,10	1,3	17,28			
TOAN				2				
PLPA				5				
SPCR					3			
Grasses								
Shrubs/ Trees								
ATOB							1	34,19

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
70	4040719	723743	ALKALI WASH

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
HAGL	1	1	1					
CRCR				5				
SATR				1,1	1,2,1,2			
TOAN				1				
PLPA				1				
Grasses								
Shrubs/ Trees								
ATOB	5,3	2	4		1,4,6	13,4	38	10,10

Total Veg Cover	
Bare Ground	
Litter	

Rock Transect Number: 71	N Coordinate: 4041104	E Coordinate: 720460	Habitat Type: THIN BREAK					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	2					1		
SPCOC		1						
Grasses								
SPAI			4					
Shrubs/ Trees								
ATCO				45	4		9	
ATGA							6	
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number: 72	N Coordinate: 4040281	E Coordinate: 724266	Habitat Type: SA SA

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
AMAC	1,1		1		1,3			
CRCR	7,8	1,3,9,6	5,6,9,10		5,8,2,3,8			
DEPI	1							
SATR		1	2,5	3,4	1,2,2,3			
SPAI	8,1,3,4	5,1	3,3,13	5,3,5,6	3,13			
GILE	1	1						
PHIN		6						
Grasses								
Shrubs/ Trees								
GUSA		3					7	14
EPTO								45
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
74	4042439	724042	BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SAIB			1			1		
LARE			6					
SPCOC			18					
ATSA				2		2		
HAGL					5	1		
Grasses								
Shrubs/ Trees								
ATOB				25	4		9	26

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
75	4040292	722529	BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR		2,2,4	2					
SPCOC						12		
CASC						1		
Grasses								
HIJA	1							
Shrubs/ Trees								
ATOB	3	2					10	11
ATCO								14

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number: 76	N Coordinate: 4040860	E Coordinate: 721755	Habitat Type: BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
PLIN	2							
PHCR	4	1						
SATR	3	2	1					
Grasses								
HIJA	2							
Shrubs/ Trees								
ATOB							3	25

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number: 77	N Coordinate: 4041380	E Coordinate: 723986	Habitat Type: BADLAND

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
PLPA	3							
SATR						1		
Grasses								
Shrubs/ Trees								

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Transect Number: 78	N Coordinate: 4042526	E Coordinate: 720587	Habitat Type: Sa. Sa.

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height

Forbs								
ABFR	5,10,1,8,5	2,8	2,3,13,10	3	6,4,9	1,8		
SPPA								
CRCR		1	2	3	9	4,5,3		
CAJA	8							
MEPU	1		8	1				
LUPU		4						
OEPA		1						
DEPI			1					
SATR					3			
Grasses								
ARPU	1			6				
HIJA		2	9,6	7				
ORHY		1						
Shrubs/ Trees								
GUSA	6,17,15	2	17,10,6	1			109	8
ERLE				7,6			31	17
EPTO							1	42
KRLA							1	35

Total Veg Cover								
Bare Ground								
Litter								
Rock								
Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:					
79	4042963	721630	THIN BREAK					
Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
PLIN	2							
SATR	2		1,1					
TOAN			1			2		
IPPU					3			
PHCR						2		
Grasses								
SPAI					1			
Shrubs/ Trees								
ATCO			2	12	10		18	40
GUSA							27	8
OPPO			6				1	15
Total Veg Cover								
Bare Ground								
Litter								
Rock								

Transect Number:	N Coordinate:	E Coordinate:	Habitat Type:
80	4043898	722035	ARROYO SHRUB

Species	0-5 m	5-10 m	10-15 m	15-20 m	20-25 m	25-30 m	Density	Height
Forbs								
SATR	4	1	1					
TOAN			11,8	4,5	18,22	9		
LARE			1,4		11,6	4,6		
DEPI					4	4		
Grasses								
SPAI				2				
ERTR					2			
HIJA						1		
VUOC						1		
Shrubs/ Trees								
ATOB	15	4,3	4	22	8		28	11
SARE							1	29

Total Veg Cover	
Bare Ground	
Litter	
Rock	

Habitat Type	*Transect Number*	*Plot Number*	*Total # of Species*	*Total Veg Cover*	*Annual Veg Cover*	*Rock*	*Litter*
THIN BREAK	1	1	1	<1	<1	80	4
THIN BREAK	1	2	1	<1	<1	80	2
THIN BREAK	1	3	0	0	0	85	0
THIN BREAK	1	4	0	0	0	40	4
THIN BREAK	1	5	2	1	1	0	25
SA SA	2	1	2	12	<1	3	4
SA SA	2	2	5	8	3	0	35
SA SA	2	3	3	4	<1	1	3
SA SA	2	4	6	10	2	<1	6
SA SA	2	5	5	15	6	<1	15
Alkali Wash	3	1	1	<1	<1	15	<1
Alkali Wash	3	2	2	1	1	10	<1
Alkali Wash	3	3	3	4	4	10	2
Alkali Wash	3	4	1	1	0	12	1
Alkali Wash	3	5	1	<1	<1	20	<1
THIN BREAK	4	1	3	18	1	20	4
THIN BREAK	4	2	2	<1	<1	20	2
THIN BREAK	4	3	2	<1	<1	50	25
THIN BREAK	4	4	1	<1	<1	30	8
THIN BREAK	4	5	1	0	0	20	60
SA SA	5	1	2	20	20	<1	4
SA SA	5	2	2	4	4	1	3
SA SA	5	3	2	20	20	<1	2
SA SA	5	4	3	15	15	0	3
SA SA	5	5	6	7	3	<1	4
Alkali Wash	6	5	0	0	0	25	0
Alkali Wash	6	10	0	0	0	30	<1
Alkali Wash	6	15	0	0	0	25	0
Alkali Wash	6	20	3	<1	<1	25	0
Alkali Wash	6	25	0	0	0	25	0
SA SA	7A	1	5	15	5	<1	10
SA SA	7A	2	3	15	8	0	4
SA SA	7A	3	3	30	25	0	2
SA SA	7A	4	3	12	8	0	1
SA SA	7A	5	4	30	29	0	10
SAND	7B	1	3	3	2	1	4
SAND	7B	2	4	5	2	2	2

SAND	7B	3	4	6	3	0	1
SAND	7B	4	2	25	25	2	3
SAND	7B	5	6	8	6	1	2
	8	1					
	8	2					
	8	3					
	8	4					
	8	5					
SA SA	9	1	7	35	34	<1	2
SA SA	9	2	8	20	17	1	1
SA SA	9	3	6	5	4	<1	4
SA SA	9	4	5	15	11	0	5
SA SA	9	5	6	7	7	<1	3
Alkali Wash	10	1	0	0	0	10	1
Alkali Wash	10	2	0	0	0	8	<1
Alkali Wash	10	3	0	0	0	30	<1
Alkali Wash	10	4	1	<1	0	40	<1
Alkali Wash	10	5	4	20	0	15	5
THIN BREAK	11	1	1	<1	<1	10	2
THIN BREAK	11	2	2	<1	<1	15	8
THIN BREAK	11	3	2	<1	<1	15	<1
THIN BREAK	11	4	2	<1	<1	1	7
THIN BREAK	11	5	2	1	<1	<1	30
THIN BREAK	12	1	0	0	0	20	<1
THIN BREAK	12	2	0	0	0	15	<1
THIN BREAK	12	3	1	20	0	10	3
THIN BREAK	12	4	1	2	2	6	<1
THIN BREAK	12	5	2	2	1	18	1
SA SA	13	1	2	12	0	10	8
SA SA	13	2	3	8	0	5	10
SA SA	13	3	1	5	0	50	5
SA SA	13	4	0	0	0	40	15
SA SA	13	5	1	<1	0	20	2
BADLAND	14	1	0	0	0	50	0
BADLAND	14	2	2	<1	<1	95	1
BADLAND	14	3	0	0	0	98	0
BADLAND	14	4	2	1	1	20	1
BADLAND	14	5	0	0	0	98	0

Alkali Wash	15	1	1	0	0	0	<1
Alkali Wash	15	2	0	0	0	0	0
Alkali Wash	15	3	0	0	0	0	0
Alkali Wash	15	4	2	<1	<1	0	<1
Alkali Wash	15	5	3	5	5	0	1
BADLAND	16	1	0	0	0	80	0
BADLAND	16	2	0	0	0	5	0
BADLAND	16	3	0	0	0	10	1
BADLAND	16	4	0	0	0	8	<1
BADLAND	16	5	0	0	0	6	<1
SA	17	1	7	10	5	0	4
SA	17	2	3	10	0.02	1	8
SA	17	3	3	20	0	<1	13
SA	17	4	2	25	0	<1	18
SA	17	5	3	50	0	0	10
Alkali Wash	18	25	1	2	2	1	0
Alkali Wash	18	20	3	2	1	<1	5
Alkali Wash	18	15	0	0	0	4	1
Alkali Wash	18	10	3	12	<1	<1	4
Alkali Wash	18	5	0	0	0	5	2
Alkali Wash	19	25	0	0	0	20	<1
Alkali Wash	19	20	3	10	10	0	5
Alkali Wash	19	15	2	5	5	1	15
Alkali Wash	19	10	1	<1	<1	5	5
Alkali Wash	19	5	2	<1	<1	25	<1
SAND	20	1	4	10	10	1	5
SAND	20	2	1	<1	<1	1	1
SAND	20	3	1	<1	<1	1	<1
SAND	20	4	1	1	1	2	2
SAND	20	5	4	10	10	1	70
Alkali Wash	21	1	1	0	0	85	0
Alkali Wash	21	2	0	0	0	80	10
Alkali Wash	21	3	1	<1	<1	3	1
Alkali Wash	21	4	1	<1	21	10	1
Alkali Wash	21	5	1	<1	0	1	5
SAND DUNE	22	1	5	8	7	0	3
SAND DUNE	22	2	4	5	2	0	10
SAND DUNE	22	3	3	13	12	0	4

SAND DUNE	22	4	4	15	14	0	3
SAND DUNE	22	5	4	4	3	0	1
BADLAND	23	1	1	<1	<1	<1	2
BADLAND	23	2	1	<1	<1	<1	1
BADLAND	23	3	0	0	0	<1	3
BADLAND	23	4	0	0	0	2	<1
BADLAND	23	5	0	0	0	0	0
BADLAND	24	1	0	0	0	10	<1
BADLAND	24	2	0	0	0	15	0
BADLAND	24	3	0	0	0	18	1
BADLAND	24	4	1	0	0	5	<1
BADLAND	24	5	0	0	0	2	0
THIN BREAK	25	1	1	<1	<1	30	<1
THIN BREAK	25	2	0	0	0	20	<1
THIN BREAK	25	3	0	0	0	5	2
THIN BREAK	25	4	2	2	1	15	3
THIN BREAK	25	5	0	0	0	20	1
BADLAND	26	1	0	0	0	0	0
BADLAND	26	2	4	5	5	2	0
BADLAND	26	3	0	0	0	0	0
BADLAND	26	4	4	1	1	<1	<1
BADLAND	26	5	3	<1	<1	0	<1
	27						
	27						
	27						
	27						
	27						
BADLAND	28	1	0	0	0	30	<1
BADLAND	28	2	0	0	0	20	0
BADLAND	28	3	0	0	0	20	0
BADLAND	28	4	3	5	5	3	3
BADLAND	28	5	2	2	1	4	<1
Alkali Wash	29	1	1	2	2	<1	<1
Alkali Wash	29	2	3	20	5	0	60
Alkali Wash	29	3	3	15	15	<1	2
Alkali Wash	29	4	3	3	3	0	3
Alkali Wash	29	5	1	1	0	0	<1
Alkali Wash	30	1	2	7	7	6	<1

Alkali Wash	30	2	2	<1	<1	6	0
Alkali Wash	30	3	3	1	1	5	0
Alkali Wash	30	4	2	<1	<1	2	<1
Alkali Wash	30	5	1	2	2	2	1
Alkali Wash	31	25	2	15	1	<1	5
Alkali Wash	31	20	1	<1	<1	<1	8
Alkali Wash	31	15	3	10	10	0	5
Alkali Wash	31	10	2	15	3	<1	7
Alkali Wash	31	5	3	15	6	0	4
Alkali Wash	32	1	1	7	7	<1	1
Alkali Wash	32	2	1	3	3	1	<1
Alkali Wash	32	3	1	4	4	3	<1
Alkali Wash	32	4	2	10	10	<1	1
Alkali Wash	32	5	5	15	15	1	<1
THIN BREAK	33	1	1	<1	<1	80	<1
THIN BREAK	33	2	1	<1	<1	80	<1
THIN BREAK	33	3	1	1	1	70	1
THIN BREAK	33	4	1	<1	<1	80	1
THIN BREAK	33	5	1	<1	<1	60	<1
Alkali Wash	34	25	0	0	0	8	<1
Alkali Wash	34	20	2	20	0	0	25
Alkali Wash	34	15	5	1	1	5	1
Alkali Wash	34	10	4	2	>1	3	1
Alkali Wash	34	5	3	5	3	<1	1
BADLAND	35	25	3	5	5	1	1
BADLAND	35	20	0	0	0	50	<1
BADLAND	35	15	6	8	<1	3	1
BADLAND	35	10	1	10	10	<1	3
BADLAND	35	5	0	0	0	40	30
Alkali Wash	36	1	4	60	5	>1	>1
Alkali Wash	36	2	2	4	1	0	25
Alkali Wash	36	3	2	20	>1	0	75
Alkali Wash	36	4	1	4	4	0	>1
Alkali Wash	36	5	5	0	0	0	1
	37						
	37						
	37						
	37						

	37						
BADLAND	38	1	4	10	10	2	<1
BADLAND	38	2	2	<1	<1	2	0
BADLAND	38	3	5	5	<1	3	0
BADLAND	38	4	0	0	0	1	<1
BADLAND	38	5			8	1	1
Sand	39	1	2	25	3	0	15
Sand	39	2	3	2	2	5	3
Sand	39	3	2	30	30	2	10
Sand	39	4	2	15	14	1	4
Sand	39	5	3	8	4	1	3
THIN BREAK	40	1	0	0	0	35	3
THIN BREAK	40	2	1	2	2	25	20
THIN BREAK	40	3	0	0	0	60	3
THIN BREAK	40	4	0	0	0	60	1
THIN BREAK	40	5	0	0	0	40	4
Alkali Wash	41	1	3	<1	<1	85	
Alkali Wash	41	2	0	0	0	15	<1
Alkali Wash	41	3	4	20	1	10	12
Alkali Wash	41	4	4	10	0	<1	10
Alkali Wash	41	5	2	3	3	<1	25
THIN BREAK	42	25	2	<1	<1	10	<1
THIN BREAK	42	20	1	<1	<1	70	0
THIN BREAK	42	15	1	<1	<1	60	<1
THIN BREAK	42	10	0	0	0	80	0
THIN BREAK	42	5	0	0	0	80	<1
SA SA	43	1	4	3	1	0	2
SA SA	43	2	5	30	27	0	5
SA SA	43	3	5	5	1	0	3
SA SA	43	4	6	8	7	0	2
SA SA	43	5	3	1	1	0	2
DUNE	44	1	3	4	1	<1	2
DUNE	44	2	4	6	1	1	3
DUNE	44	3	4	6	1	0	5
DUNE	44	4	4	20	20	0	3
DUNE	44	5	7	20	3	1	3
SAND	45	1	4	2	2	2	1
SAND	45	2	2	10	10	0	10

SAND	45	3	1	<1	<1	3	1
SAND	45	4	2	1	1	2	2
SAND	45	5	5	<1	<1	3	1
Alkali Wash	46	1	2	1	1	1	<1
Alkali Wash	46	2	5	5	5	0	<1
Alkali Wash	46	3	3	3	3	<1	<1
Alkali Wash	46	4	5	5	1	0	1
Alkali Wash	46	5	2	4	4	1	1
THIN BREAK	47	1	1	<1	<1	35	1
THIN BREAK	47	2	0	0	0	50	1
THIN BREAK	47	3	2	1	1	50	1
THIN BREAK	47	4	1	<1	<1	40	1
THIN BREAK	47	5	1	1	1	25	4
SAND	48	1	4	2	1	1	1
SAND	48	2	3	3	1	1	1
SAND	48	3	4	4	1	2	3
SAND	48	4	5	20	5	<1	5
SAND	48	5	4	18	8	1	4
THIN BREAK	49	1	0	0	0	95	0
THIN BREAK	49	2	2	<1	<1	70	3
THIN BREAK	49	3	0	0	0	35	1
THIN BREAK	49	4	1	10	0	3	5
THIN BREAK	49	5	0	0	0	80	1
SA SA	50	1	3	5	5	2	2
SA SA	50	2	3	20	1	<1	8
SA SA	50	3	5	10	3	1	3
SA SA	50	4	4	20	12	1	3
SA SA	50	5	5	10	8	<1	2
	51						
	51						
	51						
	51						
	51						
Alkali Wash	52	1	2	<1	<1	5	1
Alkali Wash	52	2	3	1	1	5	2
Alkali Wash	52	3	1	4	4	10	1
Alkali Wash	52	4	1	<1	<1	8	0
Alkali Wash	52	5	2	1	1	3	<1

SAND	53	1	4	3	2	1	4
SAND	53	2	2	2	1	1	40
SAND	53	3	2	20	1	1	6
SAND	53	4	5	10	10	1	3
SAND	53	5	4	8	8	1	1
BADLAND	54	1	0	0	0	8	0
BADLAND	54	2	0	0	0	20	0
BADLAND	54	3	0	0	0	10	0
BADLAND	54	4	0	0	0	45	0
BADLAND	54	5	0	0	0	25	0
BADLAND	55	25	0	0	0	20	0
BADLAND	55	20	0	0	0	3	<1
BADLAND	55	15	0	0	0	10	0
BADLAND	55	10	3	10	10	0	1
BADLAND	55	5	2	2	2	<1	<1
Sand	56	1	2	15	>1	4	4
Sand	56	2	5	14	2	2	4
Sand	56	3	4	20	4	>1	4
Sand	56	4	6	8	>1	0	7
Sand	56	5	2	30	0	>1	5
ARROYO SHRUB	57	1	3	1	1	0	1
ARROYO SHRUB	57	2	1	8	8	0	3
ARROYO SHRUB	57	3	3	5	5	0	1
ARROYO SHRUB	57	4	3	4	4	0	3
ARROYO SHRUB	57	5	3	12	1	0	25
Alkali Wash	58	1	5	20	20	5	1
Alkali Wash	58	2	1	1	1	15	1
Alkali Wash	58	3	4	10	9	20	1
Alkali Wash	58	4	1	3	3	20	<1
Alkali Wash	58	5	4	3	3	1	4
SA SA	59	1	4	10	10	0	2
SA SA	59	2	5	8	4	0	3
SA SA	59	3	4	1	1	0	1
SA SA	59	4	3	12	6	0	2
SA SA	59	5	4	2	1	0	1
THIN BREAK	60	1	2	5	5	5	3
THIN BREAK	60	2	2	<1	<1	10	<1
THIN BREAK	60	3	1	<1	<1	6	<1

THIN BREAK	60	4	2	3	3	4	<1
THIN BREAK	60	5	2	1	1	5	1
THIN BREAK	61	1	0	0	0	30	0
THIN BREAK	61	2	0	0	0	70	0
THIN BREAK	61	3	4	<1	0	80	0
THIN BREAK	61	4	0	0	0	10	0
THIN BREAK	61	5	0	0	0	85	0
Sa. Sa.	62	1	6	8	1	5	4
Sa. Sa.	62	2	4	23	1	2	1
Sa. Sa.	62	3	5	5	1	3	4
Sa. Sa.	62	4	6	8	1	1	20
Sa. Sa.	62	5	4	17	6	5	1
Alkali Wash	63	1	5	2	1	1	3
Alkali Wash	63	2	5	22	2	0	3
Alkali Wash	63	3	1	25	0	0	3
Alkali Wash	63	4	1	1	1	0	1
Alkali Wash	63	5	2	1	1	2	<1
THIN BREAK	64	1	2	25	0	15	7
THIN BREAK	64	2	1	4	0	10	2
THIN BREAK	64	3	3	13	1	1	6
THIN BREAK	64	4	2	6	0	7	3
THIN BREAK	64	5	3	7	1	8	6
	65	1					
	65	2					
	65	3					
	65	4					
	65	5					
)y. Shrub trans. Alk. W	66	1	3	20	1	0	5
)y. Shrub trans. Alk. W	66	2	2	7	1	1	2
)y. Shrub trans. Alk. W	66	3	0	0	0	15	1
)y. Shrub trans. Alk. W	66	4	2	>1	>1	15	>1
)y. Shrub trans. Alk. W	66	5	2	>1	>1	10	>1
BADLAND	67	1	0	0	0	95	1
BADLAND	67	2	0	0	0	99	<1
BADLAND	67	3	1	<1	<1	95	0
BADLAND	67	4	0	0	0	75	8
BADLAND	67	5	2	4	4	90	1
SA SA	68	1	1	5	5	0	3

SA SA	68	2	4	3	3	0	15
SA SA	68	3	2	4	0	0	6
SA SA	68	4	2	10	10	0	10
SA SA	68	5	2	15	12	0	5
Alkali Wash	69	1	4	20	10	<1	10
Alkali Wash	69	2	3	30	30	1	3
Alkali Wash	69	3	5	12	5	<1	5
Alkali Wash	69	4	1	<1	<1	1	5
Alkali Wash	69	5	2	2	2	5	5
Alkali Wash	70	1	2	1	1	2	<1
Alkali Wash	70	2	4	<1	<1	3	1
Alkali Wash	70	3	2	5	<1	15	2
Alkali Wash	70	4	2	<1	<1	45	2
Alkali Wash	70	5	2	<1	<1	40	<1
THIN BREAK	71	1	0	0	0	95	<1
THIN BREAK	71	2	1	25	0	75	0
THIN BREAK	71	3	1	2	0	95	3
THIN BREAK	71	4	1	1	1	95	2
THIN BREAK	71	5	0	0	0	40	<1
SA SA	72	5	5	15	5	0	7
SA SA	72	10	2	12	2	0	3
SA SA	72	15	2	15	1	0	10
SA SA	72	20	3	1	1	0	2
SA SA	72	25	4	4	1	0	4
	73	1					
	73	2					
	73	3					
	73	4					
	73	5					
BADLAND	74	1	1	2	0	60	2
BADLAND	74	2	2	3	3	5	1
BADLAND	74	3	3	<1	0	25	6
BADLAND	74	4	0	0	0	8	1
BADLAND	74	5	0	0	0	15	0
BADLAND	75	1	0	0	0	90	<1
BADLAND	75	2	0	0	0	80	0
BADLAND	75	3	0	0	0	90	0
BADLAND	75	4	0	0	0	90	<1

BADLAND	75	5	0	0	0	90	<1
BADLAND	76	1	1	<1	<1	15	1
BADLAND	76	2	1	1	1	20	15
BADLAND	76	3	1	<1	<1	10	<1
BADLAND	76	4	0	0	0	5	1
BADLAND	76	5	0	0	0	15	1
BADLAND	77	1	0	0	0	1	0
BADLAND	77	2	0	0	0	40	0
BADLAND	77	3	0	<1	0	60	2
BADLAND	77	4	0	0	0	30	0
BADLAND	77	5	1	<1	0	80	0
Sa. Sa.	78	5	3	3	3	<1	2
Sa. Sa.	78	10	4	5	2	1	2
Sa. Sa.	78	15	4	3	1	1	1
Sa. Sa.	78	20	4	10	9	<1	5
Sa. Sa.	78	25	3	12	2	<1	1
THIN BREAK	79	1	0	0	0	15	3
THIN BREAK	79	2	0	0	0	70	<1
THIN BREAK	79	3	3	10	0	15	5
THIN BREAK	79	4	1	<1	<1	75	<1
THIN BREAK	79	5	2	3	0	80	<1
ARROYO SHRUB	80	1	5	20	20	0	2
ARROYO SHRUB	80	2	2	10	10	0	2
ARROYO SHRUB	80	3	2	10	10	0	1
ARROYO SHRUB	80	4	4	1	1	0	<1
ARROYO SHRUB	80	5	2	15	<1	0	25
	81	1					
	81	2					
	81	3					
	81	4					
	81	5					
	82	1					
	82	2					
	82	3					
	82	4					
	82	5					
	83	1					
	83	2					