Appendix 2.

Ecological Reference Worksheet

Author(s) / participant(s): Kenneth Alcon

Contact for lead author : John Tunberg **Reference site used? Yes/No** No

Date: 4/26/2005 **MLRA:** 70A **Ecological Site:** Shallow Shale This *must* be verified based on soils and climate (see Ecological Site Description). Current plant community *cannot* be used to identify the ecological site.

Indicators: For each indicator, describe the potential for the site. Where possible, **(1)** use numbers, **(2)** include expected range of values for above and below average years for **each** community within the reference state, when appropriate & **(3)** site data. Continue description on separate sheet.	Indicator Weight
1. Number and extent of rills : None to Slight of flatter slopes. Short, widely spaced rills will be present on steeper slopes.	
2. Presence of water flow patterns: On slopes less than 5% patterns will be broken and irregular in appearance. Flow patterns will be evident as slope increases especially following intense storm events. The water flow patterns can be short and long and connected with occasional debris dams or vegetative barriers. Litter movement will be evident.	
3. Number and height of erosional pedestals or terracettes: Small pedestals and terracettes will exist, ranging in height from .25-.5 inches. They will be few in number and confined to the steeper slo over 10%.	
4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground) : Bare Ground ranges from 40-45%.	
5. Number of gullies and erosion associated with gullies: Typically none. However, on steeper slopes gullies may be up to 5 feet in length and wide-spread, not exceeding 8 inches deep.	
6. Extent of wind scoured, blowouts and/or depositional areas: None to Slight wind scour on exposed areas with no vegetation. However, small depositional areas will occur as slope decreases (i.e. toe slopes).	
7. Amount of litter movement (describe size and distance expected to travel) : Litter movement will be minimal and short on flatter slopes. Small herbaceous litter movement is associated with water flow patterns and may move as much as 1-3 feet down slope during severe storm events, litter movement will be more evident on steeper slopes and move further distances.	
8. Soil surface (top few mm) resistance to erosion (stability) values are averages - most sites will show a range of values for both plant canopy and interspaces, if different): Stability class rating anticipated to be 3-4 in interspaces at soil surface. These values need verification at reference site.	
9. Soil surface structures and SOM content (include type and strength of structure, and A-horizon color and thickness for both plant canopy and interspaces, if different) : Average SOM is 1-2%. Soils are shallow. (Mion) A-0 to 4 inches; grayish brown (2.5 Y 5/2) silty clay loam, dark grayish brown (2.5 Y 4/2) moist; weak very fine granular structure; slightly hard, very friable, sticky and plastic, many very fine and fine roots, 5% thin shale fragments.	
10. Effect of plant community composition (relative proportion of different functional groups) & spatial distribution on infiltration & runoff: Diverse grass, forb, shrub functional/structural groups and diverse roots structure reduces raindrop impact slows overland flow providing increased time for infiltration to occur. Extended drought reduces short/mid bunchgrasses causing decreased infiltration and increased runoff following intense storms. However, the composition of the plant community has less affect on infiltration and runoff than does slope, the amount of exposed shale, or the surface texture modifier (channery).	
11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): None	
12. Functional/Structural Groups (list in order of descending dominance by above-ground weight using symbols: indicate much greater than (>>) , greater than (>) , and equal to (=) : Dominant:Warm Season Short Bunchgrass>Subdominant:Warm Season Mid Bunchgrass=Cool Season Mid Rhizomatous> Minor:Warm Seas Mid Bunchgrass=Warm Season Mid Rhizomatous=Shrubs>Forbs	
13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence) : Typically minimal. Expect short/mid bunchgrass mortality/decadence during and following drought.	
14. Average percent litter cover (10to15 %) and depth (0.25 inches). Litter cover during and following drought can fall under 10%.	
15. Expected annual production (this is TOTAL above-ground production, not just forage production): (Low Production 600 lbs./ac.) (Average RV Production 950lbs./ac.) (High Production 1,300 lbs./ac.) Production can be reduced following extended drought or the first growing season following wildfire.	
16. Potential invasive (including noxious) species (native and non-native). List species which characterize degraded states and which, after a threshold is crossed, "can, and often do , continue to increase regardless of the management of the site and may eventually dominate the site": Invasive plants should not occur in reference plant community. However, cheatgrass, Russian Thistle, kochia, and other non-native annuals may invade following extended drought if a seed source is available. Oneseed Juniper and Pinion may encroach from adjacent sites with lack of fire. Blue Grama and sage species are major native (non-invasive) increasers on this site.	
17. Perennial plant reproductive capability : All plants should be vigorous, healthy and reproductive depending on disturbances i.e.. Drought. Plants should have numerous seedheads, vegetative tillers etc. The only limitations are weather related, wildfire, and natural disease that may temporarily reduce reproductive capability.	

Photograph (s)

MLRA : **Date :**

Ecological Site :

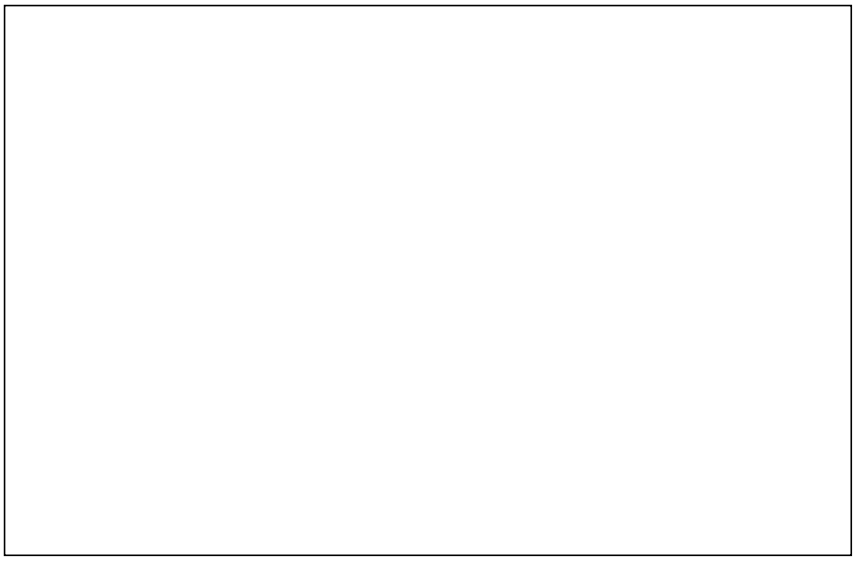

Photo # 1

Comments :

Photo # 2

Comments :

Appendix 4.

Functional / Structural Groups Worksheet

State New Mexico **Office** Las Vegas **Ecological Site** Shallow Shale

Observers Kenneth Alcon **Date** 4/26/05

Functional / Structural Groups			Species List for Functional / Structural Groups
Name	**Potential** [1]	**Actual** [2]	**Plant Names**
Warm Season Short Bunchgrass	D		Blue Grama
Warm Season Mid Bunchgrass	S		Alkali Sacaton
Cool Season Mid Rhizomatous	S		Western Wheat Grass
Warm Season Mid Bunchgrass	M		Sideoats Grama, Little Bluestem,
Warm Season Mid Rhizomatous	M		Galleta
Shrubs	M		Fourwing Saltbush, Various Oak species, winter fat
Warm Season Bunchgrasses	M		Ring Muhly, Spike Muhly, Plains Muhly
Forbs	M		Western Ragweed, Globemallow, Penstemons, Buckwheat species, scurfpea, milkvetches, Fremont Goldenweed, American Vetch
Biological Crust [3]			

Indicate whether each "structural/functional group" is a Dominant (D) (roughly 40-100% composition), a **Sub-dominant (S)** (roughly 10-40%) composition) a **Minor Component (M)** (roughly 2-5% composition), or a **Trace Component (T)** (<2% composition) based on weight or cover composition in the area of interest (e.g., "Actual [2]" column) relative to the "Potential [1]" column derived from information found in the ecological site/description and/or at the ecological reference area.

Biological Crust [3] dominance is evaluated solely on **cover** not composition by weight.