Appendix 2.

Ecological Reference Worksheet

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

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

Date: 5/5/2005 **MLRA:** 70A **Ecological Site:** Malpais Upland 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	
2. Presence of water flow patterns: Typically none. However with increased slope over 15% some minor evidence of water flow patterns less than 1 foot in length.	
3. Number and height of erosional pedestals or terracettes: None	
4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground) : Bare Ground 20-25%	
5. Number of gullies and erosion associated with gullies: None	
6. Extent of wind scoured, blowouts and/or depositional areas: None	
7. Amount of litter movement (describe size and distance expected to travel) : Typically none. However with increased slope over 15% some minor (small fine) litter movement can occur within water flow patterns.	
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 4-5 is anticipated on soil within interspaces. These values will need to be verified at the 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) : SOM 1-3% (Apache) A11-0 to 3 inches; dark grayish brown (10YR 4/2) very stony loam, very dark grayish brown (10YR 3/2) moist, moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 20% stones, 20% cobble and 10% pebbles.	
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 root structure/patterns reduces raindrop impact slows overland flow providing increased time for infiltration to occur. Extended drought reduces short and mid bunchgrasses causing decreased infiltration and increased runoff following intense storm events especially in bare patch areas if present.	
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 (=) : Dominate:Warm Season Mid Bunchgrass=Warm Season Short Bunchgrass>Subdominate:Warm Season Tall Bunchgrass=Cool Season Rhizomatous>Warm Season Short Bunchgrass and Mid Bunchgrass>Minor:Cool Season Grasses=Forbs=Shrubs	
13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence) : Typically minimal. Expect short/mid bunchgrasses mortality/decadence during or following drought.	
14. Average percent litter cover (5to10 %) and depth (.25-.5 inches). Litter amounts can be reduced during or following extended drought, wildfire can also lead to decreased litter amounts.	
15. Expected annual production (this is TOTAL above-ground production, not just forage production): (Low Production 650 lbs./ac.) (Average RV Production 1,075lbs./ac.) (High Production 1,500 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. 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** Malpais Upland

Observers Kenneth Alcon **Date** 5/5/05

Functional / Structural Groups			Species List for Functional / Structural Groups
Name	**Potential** [1]	**Actual** [2]	**Plant Names**
Warm Season Mid Bunchgrass	D		Little Bluestem
Warm Season Short Bunchgrass	D		Blue Grama
Warm Season Tall Bunchgrass	S		Big Bluestem
Cool Season Mid Rhizomatous	S		Western Wheat Grass
Warm Season Short Bunchgrass and Mid Bunchgrass	S		Hairy Grama, Side oats Grama
Cool Season Grasses	M		New Mexico Feather Grass Needle and Thread
Forbs	M		Prairie Clover, Globe mallow, Feather Marigold, Penstemons
Shrubs	M		Fringed Sage, Skunk bush Sumac, Yucca, Mountain Mahogany
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.