

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

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Prepared for
Resources Management

by
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Research Purpose

The purpose of this project is to monitor selected plots over time to see what effects grazing and any exotic species invasion has had on the monument. By setting up photo monitoring plots and taking pictures each year within two weeks period from the start of the project. We can compare these pictures and over time to view and compare condition of the flora of the monument.

Research Objective

The research objective is to take photos of selected plots over time, and compare these photos to show the transitional regrowth of natural flora. The project will further monitor any exotic species invasion after years of grazing throughout the Monument. The project will have eight grazes plots. Four on the east side and four on the west side of the Monument. Each plot will be 3 meters by 3 meters, and placed in areas of heavy grazing. Placing a one foot piece of rebar steel will mark each plot at each corner and a metal identification tag placed at two of the corners. A GPS reading will be taken and recorded so each plot can be easily located each year. The rebar will be driven into the ground six to eight inches. Five pictures will be taken of each plot, one of the whole plot and four taken of each quarter section of the plot. Placing fixed plots makes monitoring consistent and more accurate. This also enables the person or persons who conduct the study each year to find and monitor the same plots, even if it is a different researcher each year.

There will also be three transect plots set up to photo monitor erosion rate along the arroyos by Sandstone Bluffs area. These three transects will be marked by placing three foot pieces of rebar on each side of the arroyo across from each other and a metal identification tags placed on each piece of rebar. A GPS reading will be taken so these transects can be found easily each year and allow for more accurate data collection. Each transect will be marked by placing rebar on opposite sides of the bank. There will be five pictures taken of each transect, one overall picture, two from the top of arroyo and two from the bottom of the arroyo. Measurements will be taken at the top, from the rebar to the edge of the arroyo. A marked rope will be stretched from one piece of rebar to the other piece of rebar and three measurements taken along the marked rope to the bottom of the arroyo.

All the study plots will be marked on a quad map and placed with the main project file. With the use of the map and the GPS readings for each plot the researcher will find all plots each year the study is conducted.

Vegetation Plot Size

Each plot will be 3 meters by 3 meters

8 plots total

4 on East side of Monument

4 on West side of Monument

Erosion Transect Plot size

Due to the variations of erosion size and location of arroyos, giving a single accurate size of plots is difficult.

Materials Needed

The following items are only necessary if plots have been removed or destroyed.

32 pieces of rebar two foot long and 6 pieces of rebar three foot long.

22 metal marking tags.

Hand held GPS unit.

Hammer and metric measuring tapes.

Line for across arroyo's, pre-marked at vertical intervals.

Plot Locations

West Side Vegetation Plots

Plot number 1 west plot is near the Zuni-Acoma Trail Register off highway 53.

Walk 60 yards from the ZAT register northeast to locate the plot, at GPS coordinates Lat. $34^{\circ} 57' 20''$ N, Long. $107^{\circ} 56' 28''$ W. On San Rafael Quad Map at R. 10 W, T. 8 N, Sect. 1.

Plot number 2 west is on the road leading to the Big Tubes Area by the large land cattle tank. Site is located southeast of large cattle tank, park at the two pines and walk 72 yards east of Big Tubes Road before the yellow cattle guard. GPS coordinates are Lat. $34^{\circ} 57' 41''$ N, Long. $108^{\circ} 07' 40''$ W. On Ice Caves Quad Map at R. 12 W, T. 9 N, sect. 32.

Plot number 3 west is in the open meadow near Little Hole in the Wall sign. Stop 20 yards past the Little Hole in the Wall sign and walk 10 yards east from road to plot. GPS coordinates Lat. $34^{\circ} 55' 13''$ N, Long. $108^{\circ} 05' 47''$ W. On Ice Caves Quad Map at R. 12 W, T. 8 N, Sect 15.

Plot number 4 west is in the meadow by the old road to Navajo Ice Cave. Stop at the Pack trail head and walk 50 yards to plot. GPS Coordinates Lat. $34^{\circ} 54' 46''$ N,

Long. 108° 05' 00 W. On Ice Caves Quad Map at R.12 W, T. 8 N, Sect.22.

East Side Vegetation Plots

Plot number 1 east is near the road leading to the Sandstone Bluffs overlook. Park on the east side of the Sandstone Bluffs road across from the old homestead and walk 30 yards to plot. GPS coordinates Lat. 34° 57' 10 N, Long. 107° 49' 48 W. On Los Pilares Quad Map at R. 9 W, T. 8 N, Sect. 6.

Plot number 2 east is in the meadow just south of the Narrows. Park on the east side of highway 117, 4/10 of a mile past mile marker number 35 and walk out 50 yards toward the lava to plot. GPS coordinates Lat. 34° 49' 44 N, long. 107° 54' 34 W. On North Pasture Quad Map at R. 10 W, T. 7 N, Sect. 17.

Plot number 3 east is near the meadow by the old North Pasture windmill/corral. Park at mile marker number 33 on highway 117 and walk 50 yards west toward the lava to plot location. GPS coordinates 34° 48' 28 N, Long. 107° 54' 51 W. On North Pasture Quad Map at R. 10 w, T. 7 N, Sect. 29.

Plot number 4 east is in the meadow down from the old Malpais windmill site. Park 2/10 of a mile past mile marker 30 on highway 117 by the dead dog grave and walk out toward the northwest 60 yards. GPS coordinates Lat. 34° 46' 16 N, Long. 107° 56' 56 W. On North Pasture Quad Map at R. 10 W, T. 6 N, Sect. 1.

Erosion Study Plots

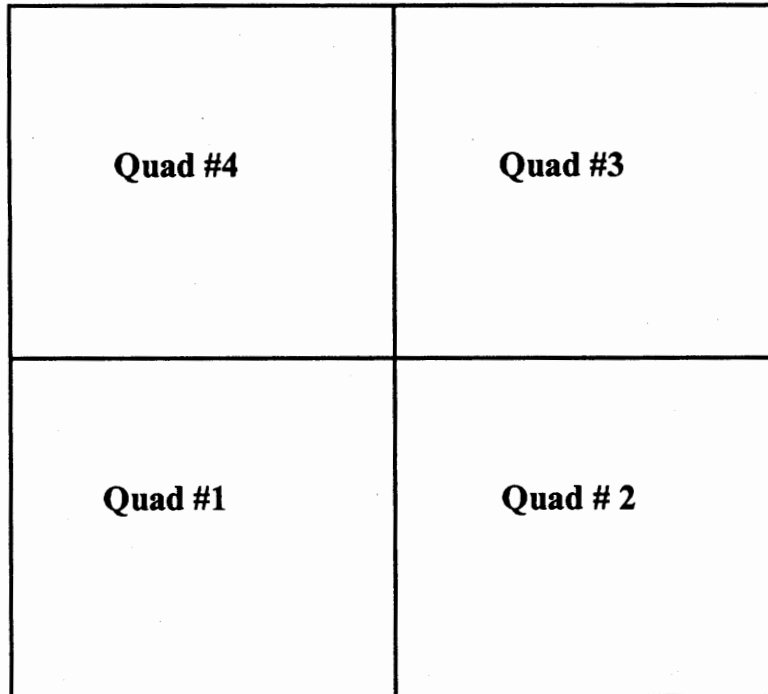
Transect number 1 is placed on the north side of the arroyo off the sandstone bluff road. Park 4/10 of a mile up Sandstone Bluffs Road on north side of the road and walk 2 yards to the plot. GPS coordinates Lat. 34° 57' 30 N, Long. 107° 49' 28 W. On Los Pilares Quad Map at R. 9 W, T. 8 N, Sect. 6.

Transect number 2 is placed on the south side in a arroyo. Park about 3/10 of a mile up the Sandstone Bluffs Road on the left side of the road and walk south 65 yards to the arroyo. GPS coordinates Lat. 34° 57' 29 N, Long. 107° 49' 21 W. On Los Pilares Quad Map at R. 9 W, T. 8 N, Sect. 6.

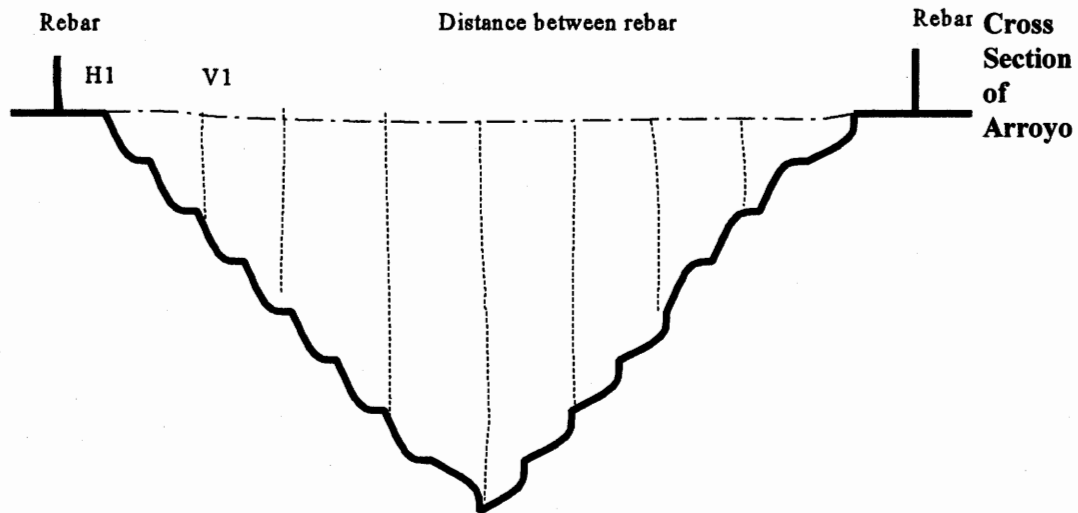
Transect number 3 is placed 3/10 of a mile past the Sandstone Bluffs Road. Park along NM Highway 117, and walk out 35 yards west to arroyo and plot. GPS coordinates Lat. 34° 57' 09 N, Long. 107° 49' 09 W. On Los Pilares Quad Map at R. 9 W, T. 8 N, Sect. 6.

Design Layout of Vegetation Plots

Study Plot Design



Design Layout of Erosion Plots:



Monitoring Frequency

All study plots will be monitored once a year starting at the end of July 1997 and will be conducted each year within two or three weeks of the previous years visitation date.

Monitoring Procedures

1. Photos will be taken of each plot by placing the first tape measure around the rebar corners of the plot. Take two tape measures and find your center of plots, this will divide the plot into four quads. Each plot will have four pieces of rebar placed at each corner and two metal tags at two corners. When taking photos, observers will take one picture of whole plot and one photo of each quad, for a total of five photos for each plot in the study. To take quad pictures stand between the two pieces of rebar with two metal tags on them and take the first photo of quad #1 on your left then take photo of quad #2 to your right and then quad #3 above quad #2 and then take photo of quad #4 to your left of quad #3. (Refer to Design Layout of Vegetation Plots)

2. Record percentage of vegetation and dominant species, ground, lava, exotic species and overall conditions on photo monitoring data sheets.
3. On the three erosion monitoring plots the distance from rebar to the edge of the arroyo will be taken on both sides and a line will be stretched from one side to the other side and hooked on to the rebar. Measurements will be taken at three sections along the line to record erosion depth of fill in arroyo.

Monitoring Equipment

35mm Camera
Film
Hand held GPS unit to find plots
3 Measuring tapes
30 ft rope
5 paper tags with grazing plot name and quads 1 thru 4 marked on them
3 paper tags with erosion plots and quads 1 and 2 marked on them
Or
Dry erase board with black dry erase marker
Data sheets for all plots.
Maps with plot locations on it.

Monitoring Data Sheets

1. Photo monitoring Data Sheet.
2. Graze monitoring Data Sheet.
3. Erosion monitoring Data Sheet.

Conclusions

The results from 1998 show an increase of grass in all monitoring plots. There is more grass on the east side plots compared with the west side plots. This is caused by the continuation of trespass cattle grazing on the west side of the Monument. After Acoma Point was fenced off, in the spring of 1998, the cattle were prohibited from grazing and the grass has recovered on the east. There are fewer exotics in the study plots this year than last year. This is due to fewer overall cattle grazing on the Monument. I also believe that an increase in moisture this year compared to last year also contributed to an increase of more grass within the study plots. Results show a slight increase of erosion on erosion plot one and three. The increase on erosion plot one occurred mostly on the north wall of the arroyo. The increase on erosion plot three occurred mostly on the east wall of the arroyo. At

erosion plot two there was more erosion over a one year period. On the north wall of erosion plot two there was three-meters of soil erosion. This caused the realignment of the plot. The rebar stake on the north side was buried under the three-meter collapse of soil on the north wall.

Recommendations

The grass on the west side of the Monument would recover faster, if the west side of the Monument was fenced off and all trespass cattle kept off. I recommend that the west side of the Monument be fenced off.

I also recommend that some type of barrier or barriers be built too slow or correct the soil erosion around the Sandstone Bluffs area.

Data Sheets for 1998

Pages 8 - 15: Graze Monitoring

Pages 16 - 18: Erosion Monitoring

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet

Location: Park at ZAT trail head off Highway 117 and walk 50yds from trail head gate north to plot.	GPS Cord.: 34° 57' 20 N 107° 56' 28 W	Observers: Robert Alexander/Mellisa Peterson		Date: 8/19/98
Plot Name: Plot #1 West	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad #1	60% grass Blue grama	35% Bare ground	5% lupine	grass in good shape with new grass growing.
Quad #2:	60 % grass Blue grama Western wheat	35% Bare ground	5% lupine rabbitbrush	grass in good shape with new grass growing.
Quad #3	60% grass Blue grama Western wheat	35% Bare ground	5% lupine rabbitbrush	grass in good shape with new grass and a few exotic present.
Quad #4	60% grass Blue grama Western wheat	35% Bare ground	5% lupine, aster, fleabane, rabbitbrush	grass in good shape with new grass growing.
Remarks: This plot is in good condition and shows 60% of it is grass and 35% of it is bare ground, with about 5% of exotic species present. There is an increase of grass from last year and this show that if cattle are kept off of this area it will return back to native grassland.				

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet

Location: Road to Big Tubes, southeast of large cattle tank, park by two pines next to Big Tubes Road and walk out 72yds east.	GPS Cord.: 34° 57' 41 N 108° 07' 40 W	Observers: Robert Alexander/Mellisa Peterson		Date: 8/19/98
Plot Name: Plot #2 West	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad #1:	50% grass Blue grama, western wheat, longleaf squirreltail	30% bare ground, lava rock and lichen	20%,NM fleabane, larkspur, rabbitbush, pestrum, indian paintbrush, snakeweed, nodding onion, plain mustard	in this quad the grass is about 50% and the rest is bare ground and exotics.
Quad #2:	30% grass Blue grama, western wheat, longleaf squirreltail	45% bare ground, lava rock with lichen	25%, aster, nodding onion, plain mustard, NM fleabane, indian paintbrush, cinquefoil	mostly bare ground & exotics, grass that is growing in good shape.
Quad #3:	30% grass Blue grama, western wheat, longleaf squirreltail	45% bare ground, lava rock with lichen	25%,aster, nodding onion, plain mustard, fleabane, paintbrush, rabbitbrush	mostly bare ground & exotics, grass that is growing in good shape.
Quad #4:	45% grass Blue grama, western wheat, longleaf squirreltail	35% bare ground, lava rock with lichen	20%four winged salt brush, fleabane, nodding onion, paintbrush, aster, mustard	over half is bare ground & exotics, grass that is growing in good shape
Remarks: This plot has about 60% exotics, bare ground, lava and rock with lichen, 40% grass, which is about a 5% increase of grass from last year and the grass is in good shape. If the cattle are kept off it this area will recovery.				

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet

Location: Park 20 yards past Little Hole in the Wall sign and walk 10 yds east to plot.	GPS Cord.: 34° 55' 13 N 108° 05'47 W	Observers: Robert Alexander/Mellisa Peterson		Date: 8/19/98
Plot Name: Plot #3 West	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad #1	30% blue grama and indian rice grass	50% bare ground and lava	20% aster, lupine, snakeweed, rabbit-brush, paintbrush	grass is tall and in good shape & shows new growth.
Quad #2	50% blue grama and indian rice grass	30% bare ground and lava	20% aster, lupine, snakeweed, rabbit-brush, paintbrush	grass is tall and in good shape & shows new growth.
Quad #3	15% blue grama and indian rice grass	65% bare ground and lava	20% aster, lupine, snakeweed, rabbit-brush, paintbrush	grass is tall and in good shape& shows new growth.
Quad #4	30% blue grama and indian rice grass	55% bare ground and lava	15% aster, lupine, snakeweed, rabbit-brush, paintbrush	grass is tall and in good shape & shows new growth.
Remarks: Slight increase in grass growth from last year. But it will take longer for the grass to recover here as long as we have trespass cattle grazing in this area of the Monument.				

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet

Location: Park at the NIC pack trail, trail head and walk 50 yds down trail to plot.	GPS Cord.: 34° 54' 46 N 108° 05' 00 W	Observers: Robert Alexander/Mellisa Peterson		Date: 8/19/98
Plot Name: Plot #4 West	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad #1	45% blue grama	40% bare ground and lava	15% lupine, aster, sage & rabbit brush, snakeweed, nodding onion, napeweed	more grass and in real good shape/with new growth
Quad #2	45% blue grama	40% bare ground and lava	15% lupine, nodding onion, sage & rabbit bush, paintbrush, aster, napeweed	more grass and in real good shape/with new growth
Quad #3	45% blue grama	35% bare ground and lava	20% lupine, nodding onion, sage & rabbit brush, paintbrush, aster, penstrum	more grass and in real good shape/with new growth
Quad #4	45% blue grama	35% bare ground and lava	20% penstrum, aster, sage & rabbit brush, napeweed, nodding onion, paintbrush	more grass and in real good shape/with new growth
Remarks: This plot is in good shape with plenty of grass even though the grass is short. It shows signs of new growth throughout the plot. Exotics are not as bad as last year, I believe this is because of less cattle grazing with in the Monument.				

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet

Location: On the south side of Sandstone Bluffs road, park across from homestead site and walk out 30 yds to plot.	GPS Cord.: 34° 57' 10 N 107° 49' 48 W	Observers: Robert Alexander/Mellisa Peterson		Date: 8/20/98
Plot Name: Plot #1 East	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad #1	30% blue grama, indian rice grass, needle and thread grass	50% bare ground and rock	20% rabbitbrush, russian thistle, broom snakeweed, gumweed	mostly bare ground with some exotics.
Quad #2	40% blue grama, indian rice grass, needle and thread grass	50% bare ground and rock	10% rabbitbrush, russian thistle, broom snakeweed, gumweed	less exotics, but still lots of bare ground.
Quad #3	55% blue grama, indian rice grass, needle and thread grass	40% bare ground and rock	5% rabbitbrush, russian thistle, broom snakeweed, gumweed	less exotics and bare ground and grass in real good shape.
Quad #4	40% blue grama, indian rice grass, needle and thread grass	50% bare ground and rock	10% rabbitbrush, russian thistle, broom snakeweed, gumweed	less exotics, but still plenty of bare ground.
Remarks: There is an increase of grass from last year and the grass that is present is in good shape. This is due to the fencing off of Acoma Point that has kept cattle off this area of the Monument . If this area is left alone and cattle kept off it will recover back to its natural setting.				

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet

Location: Park on the east side of highway 117, 4/10 of a mile past mile marker 35, then walk out 50 yds to plot.	GPS Cord.: 34° 49' 44 N 107° 54' 34 W	Observers: Robert Alexander/Mellisa Peterson		Date: 8/20/98
Plot Name: Plot #2 East	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad #1	50% western wheatgrass, big bluestem	40% bare ground	10% fleabane, common purslane, gumweed, thistle	grass in good shape and looks to be improving.
Quad #2	65% western wheatgrass, big bluestem	25% bare ground	10% fleabane, common purslane, gumweed, thistle	grass in good shape and looks to be improving.
Quad #3	70% western wheatgrass, big bluestem	20% bare ground	10% fleabane, common purslane, gumweed, thistle	grass in good shape and looks to be improving.
Quad #4	70% western wheatgrass, big bluestem	20% bare ground	10% fleabane, common purslane, gumweed, thistle	grass in good shape and looks to be improving.
Remarks: This grass in this plot is in good shape. This plot is made up of big bluestem and western wheatgrass, with few exotics and less bare ground compared to the other plots in this study.				

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet

Location: Park at mile marker #33 on the east side of highway 117 and walk west 50 yds. Toward lava to plot.	GPS Cord.: 34° 48' 28 N 107° 54' 51 W	Observers: Robert Alexander/Mellisa Peterson		Date: 8/20/98
Plot Name: Plot #3 East	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad #1	65% big bluestem, western wheatgrass	25% bare ground	10% gumweed, common purslane	grass in good shape with new growth.
Quad #2	75% big bluestem, western wheatgrass	22% bare ground	3% gumweed	grass in good shape with new growth.
Quad #3	40% big bluestem, western wheatgrass	35% bare ground	25% gumweed, sunflower, common purslane	grass good shape/ with lots of exotics present in this quad.
Quad #4	70% big bluestem, western wheatgrass	20% bare ground	105 gumweed, common purslane	grass in good shape with new growth.
Remarks: This plot is in good shape with plenty of grass and shows new growth, with only one quad showing an increase of exotics from last year. If area is left undisturbed it will recover over time.				

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet

Location: Park 2/10 of a mile past mile marker 30 on NM 117 by the dead dog grave and walk out 50 yds SE to plot.	GPS Cord.: 34° 46' 16 N 107° 56' 56 W	Observers: Robert Alexander/Mellisa Peterson		Date: 8/20/98
Plot Name: Plot #4 East	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad #1	35% blue grama	50% bare ground	15% russian thistle, gumweed, sunflowers	more grass, less bare ground and exotics.
Quad #2	30% blue grama	50% bare ground	20% russian thistle, gumweed, sunflowers	more grass, less bare ground and about the same amount exotics.
Quad #3	40% blue grama	50% bare ground	10% russian thistle, gumweed, sunflowers	more grass, less bare ground and exotics.
Quad #4	40% blue grama	50% bare ground	10% russian thistle, gumweed, sunflowers	more grass, less bare ground and exotics.

Remarks: There is more grass growth and less exotics this year than last year. This could be due to more rain this season than last season or no grazing. The effect of the reduction in grazing pressure could be why the grass is coming back. Overall this plot is in good shape and if this area is allowed to continued at this rate it will return to its natural setting.

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Erosion Plot Monitoring Sheet			
Location: Drive 4/10 of a mile up the Sandstone Bluffs road, park on the north side of road and walk 2 yds. North to plot.	GPS Cord.: 34° 57' 30 N 107° 49' 28 W	Observers: Robert Alexander/ Mellisa Peterson	Date: 8/24/98
Plot # : Erosion Plot #1	Length of Soil Erosion:		
Horizontal.	Total length = 4.53 meters	Edge south side length =1.15 meters	Edge north side length = .93 meters
Vertical #1	length = 1.34 meters		
Vertical #2	length = 1.46 meters		
Vertical #3	length = 1.04 meters		
Remarks: There is a slight increase on vertical #1, and about half a meter decrease on vertical #2, and a 2cm increase on vertical #3. From last year to this year there has been some increase along the edges of the arroyo and some filling in of dirt in the center of the arroyo.			

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Erosion Plot Monitoring Sheet			
Location: Drive about 3/10 of a mile up Sandstone Bluffs road and park on the south side of road and walk 65 yds south to plot.	GPS Cord.: 34° 57' 29 N 107° 49' 21 W	Observers: Robert Alexander Mellisa Peterson	Date: 8/24/98
Plot # : Erosion Plot #2	Length of Soil Erosion:		
Horizontal #1	Total length = 10.96 meters	Edge south side length = 0.65 meters	Edge north side length = 1.60 meters
Vertical #1	length = 1.44 meters		
Vertical #2	length = 1.75 meters		
Vertical #3	length = 1.27 meters		
Remarks: Approximately two weeks after this plot was put in last year 3 meters of the north wall of the arroyo collapsed. This year I moved the stake on the north side back on to the top of the arroyo. Since then there has been a slight increase of erosion in the arroyo. On the south edge there has been about .20 meters erosion. Vertical 1, 2 and 3 had to be reestablished due to the collapse of the north wall of the arroyo. Hopefully next year during the study we can get a more accurate picture of erosion in this arroyo.			

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Erosion Plot Monitoring Sheet			
Location: Park 3/10 of a mile from Sandstone Bluffs road along NM 117, park on the west side of the road and walk out 35 yds to plot.	GPS Cord.: 34° 57' 09 N 107° 49' 09 W	Observers: Robert Alexander Mellisa Peterson	Date: 08/24/98
Plot # : Erosion Plot #3	Length of Soil Erosion:		
Horizontal #1	Total length = 5.58 meters	Edge west side length = 0.83 meters	Edge east side length = 0.70 meters
Vertical #1	length = 2.1 meters		
Vertical #2	length = 2.83 meters		
Vertical #3	length = 2.33 meters		
Remarks: After one year the study shows an increase of erosion due to the runoff along highway 117. There is an increase of erosion in all three vertical points. Vertical 2 and 3 have only a slight increase, but vertical 1 has an increase of 1.35 meters which is double from last year. This shows more erosion along the east wall of the arroyo.			

Photo Monitoring Data Sheet				
Location: from brochure post, turn left and walk toward the lichen covered lava pressure ridge 30-40 m	UTM coordinates: 3872195.578 m N. 779369.016 m E. Zone 12 N.	Observers: Ann Whealan Work done by White on 23. July 1999 shown in Arial.		Date: 4. August 1999
Plot Name: Plot #1 West	% Grasses	% Bare Ground or Lava	% Forbes and Other Non-Grasses	Overall Condition
Quad Name and #: 1 (SW)	64% Blue Grama (<i>Bouteloua gracilis</i>)	35%	0-1%	
Quad Name and #: 2 (SE)	58% Sideoats grama- (<i>Bouteloua curtipendula</i>) Blue Grama (<i>Bouteloua gracilis</i>)	40%	0-1%	Cow pies 0-1%
Quad Name and #: 3 (NE)	53% Blue Grama (<i>Bouteloua gracilis</i>)	40%	5% - a wormwood?	Cow pies 2%
Quad Name and #: 4 (NW)	52% Blue Grama (<i>Bouteloua gracilis</i>) Needle-and-Thread grass? (<i>Stipa Comata</i>)	40%	8%	
Remarks: grass in well spaced clumps, very evenly distributed across the quads, no large bare spaces				

8-04-99

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet				
Location:	UTM GPS Cord.: 779369.010 E 387295.578 m N	Observers: WHITE	Date: 7/23/99	
Plot Name: #1 WEST	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad Name and #: 1 #13 #12	100% Blue grama	35%		
Quad Name and #: 2 #11 #10		40%		
Quad Name and #: 3 #19		40%		
Quad Name and #: 4		40%		
Remarks:				

#14 1D

22214

Photo Monitoring Data Sheet					
Location:	UTM coordinates:	Observers: David Chappell, Charlotte White, Ann Whealan, Tyler Rork		Date:	
Plot Name: ZAT	% Vegetation Cover & Dominant Species Present	% Bare Ground or Lava	% Exotic Species	Overall Condition	
Quad Name and #:		is lushest	0-1		
Quad Name and #: 2	side oats		0-1	cow peas 0-1	
Quad Name and #:	blue gramma		about 5%	5% wormwood?	cow peas 2
Quad Name and #: 4	needle & thread?		is barest	8%	
Remarks: grass on well spaced clumps very evenly distributed ground uneven higher around grass, eroded elsewhere					

Photo Monitoring Data Sheet				
Location : southeast of large cattle tank (same side of road)	UTM coordinates: 3872298.503 m N. 762272.825 m E. Zone 12 N.	Observers: Ann Whealan		Date: 7. August 1991
Plot Name: Plot #2 West Big Tubes	% Grasses	% Bare Ground or Lava	% Forbes and Other Non-Grasses	Overall Condition
Quad Name and #: 1 (SE)	40%- Western Wheatgrass- (<i>Elymus smithii</i>) Sideoats grama- (<i>Bouteloua curtipendula</i>)	20% rock 20% ground	20%- Indian Paintbrush rabbit brush- (<i>Chrysothamnus nauseosus</i>) white aster	
Quad Name and #: 2 (NE)	15%- Sideoats grama- (<i>Bouteloua curtipendula</i>) Western Wheatgrass- (<i>Elymus smithii</i>)	10-15% lava 35% ground	25%- rabbit brush- (<i>Chrysothamnus nauseosus</i>) Indian Paintbrush (<i>Castilleja confusa</i>)	
Quad Name and #: 3 (NW)	5% - Sideoats grama- (<i>Bouteloua curtipendula</i>)	20% lava 25% ground	50%- Rabbit brush- (<i>Chrysothamnus nauseosus</i>)	
Quad Name and #: 4 (SW)	15%- Sideoats grama- (<i>Bouteloua curtipendula</i>)	20% lava 20 % ground	50%- rabbit brush- (<i>Chrysothamnus nauseosus</i>) Indian Paintbrush (<i>Castilleja confusa</i>)	
Remarks- sketch of plot site available				

mm

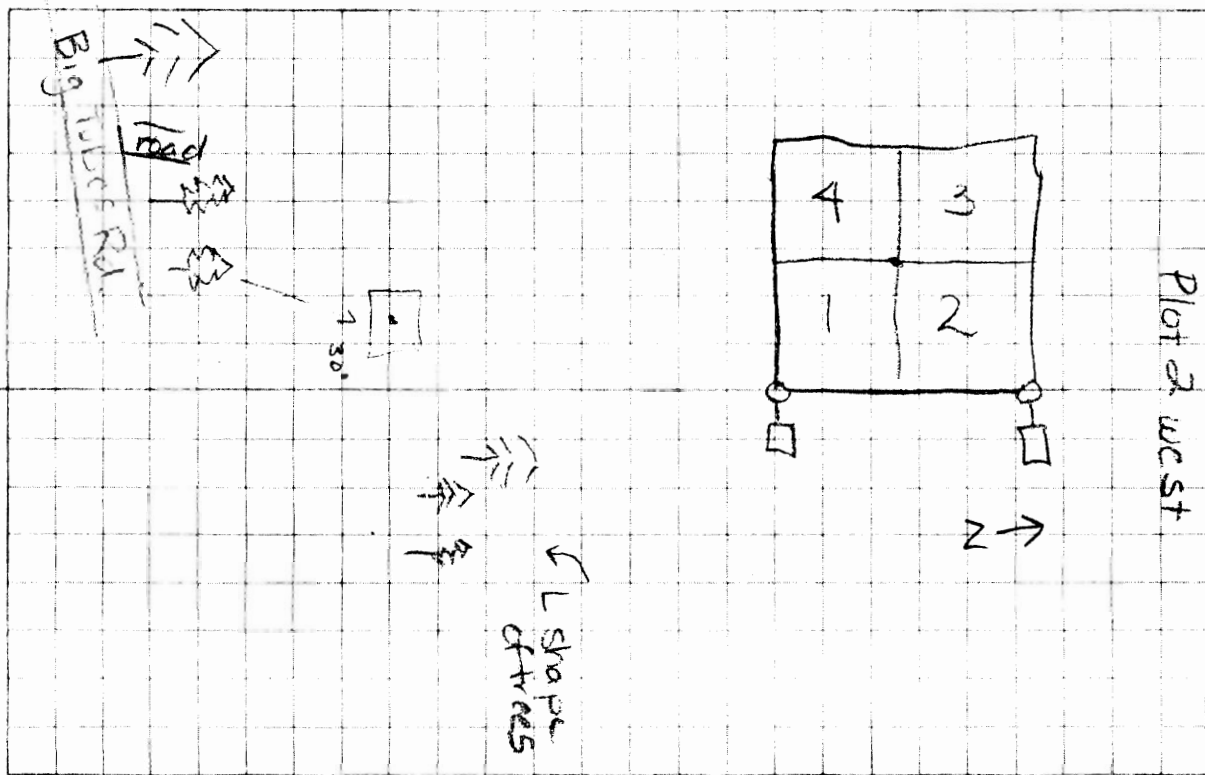


Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet				
Location: Big tubes	GPS Cord.: 3972298.503m N 762272.825m E	Observers: <i>White</i>		Date: 7/29/99
Plot Name: #2 west	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad Name and #: 1		20% 25% gravel		
Quad Name and #: 2		10% lava 35% gravel		
Quad Name and #: 3		5% lava 45% gravel		
Quad Name and #: 4		10% lava 10% gravel		
Remarks:				

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet

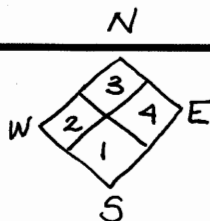
Location:	GPS Cord.:	Observers: David Chappell	Ann Whealan	Date: 22. July 1999
Plot Name: plot 2E	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad Name and #: 1 5		46	9 non grass 4%	
Quad Name and #: 2 W		55	3 thistle 1 plant 9 non grass	
Quad Name and #: 3 EN		30	1%	
Quad Name and #: 4 E 4		25	10% non-grasses	

Remarks:

ground very soggy - standing water visible
further up road

grasses appear largely dead

GM 2



small plants
leaves - opposite red stem
small succulent red stem

12 N

Photo Monitoring Data Sheet

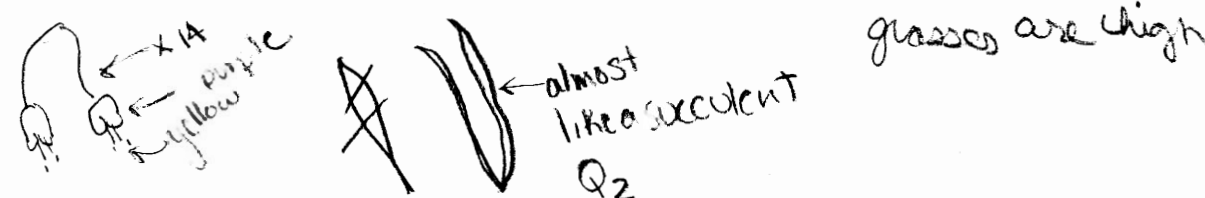
Location:	UTM coordinates: 3872298.503 m N 762272.825 m E	Observers: Ann Whealan		Date:
Plot Name: Plot #2 West	% Grasses	% Bare Ground or Lava	% Forbes and Other Non-grasses	Overall Condition
Quad Name and #: 1 SE	western wheat side oats grama 45	Rock 28% dirt 515	20% sage indian paintbrush rabbitbrush, aster	
Quad Name and #: 2 NE	15 grasses both	15% - 10 rock bare wash 35	no aster 25%	
Quad Name and #: 3 NW	grasses 5% no wheat	rock - 20 bare 25	no aster no IP 50	
Quad Name and #: 4 SW	grass 15 no wheat	20 lava 20 bare	aster 50	
Remarks 				

Photo Monitoring Data Sheet				
Location: 20 yards past the "Little Hole in the Wall" sign, plot is off the road to the left 10 yards in from road	UTM coordinates: file S073018A 3867847.121 m N 765300.136 m E Zone 12 North	Observers: Ann Whealan, Tyler Rork		Date: 30. July 1999
Plot Name: Plot #3 West-Little Hole in the Wall	% Vegetation Cover & Dominant Species Present	% Bare Ground or Lava	% Forbes and other Non-grasses	Overall Condition
Quad Name and #: 1 (SW)	37%- Blue Grama (<i>Bouteloua gracilis</i>)	50%	10%- snakeweed-(<i>Gutierrezia sarothrea</i>) rabbit brush-(<i>Chrysothamnus nauseosus</i>)	Cow pies 3%
Quad Name and #: 2 (NW)	69%- Indian Rice Grass (<i>Stipa hymenoides</i>) Blue Grama (<i>Bouteloua gracilis</i>)	20%	10% - %- snakeweed-(<i>Gutierrezia sarothrea</i>) rabbit brush-(<i>Chrysothamnus nauseosus</i>) Indian Paintbrush (<i>Castilleja confusa</i>)	Cow pies 1%
Quad Name and #: 3 (NE)	15%- Indian Rice Grass (<i>Stipa hymenoides</i>) Blue Grama (<i>Bouteloua gracilis</i>)	65%	20%- %- snakeweed-(<i>Gutierrezia sarothrea</i>) rabbit brush-(<i>Chrysothamnus nauseosus</i>) Indian Paintbrush (<i>Castilleja confusa</i>)	
Quad Name and #: 4 (SE)	55%- Indian Rice Grass (<i>Stipa hymenoides</i>) Blue Grama (<i>Bouteloua gracilis</i>)	40%	5%- %- snakeweed-(<i>Gutierrezia sarothrea</i>) rabbit brush-(<i>Chrysothamnus nauseosus</i>) Indian Paintbrush (<i>Castilleja confusa</i>)	
Remarks: SW rebar is missing. Two sides of the plot are oriented roughly N-NE. The north ½ of the plot is the "top" and the south ½ is the "bottom" of the plot. Soil may be washing into the area. Two of the corner rebar markers were buried. Some of the disturbance to the quad occurred while digging up the markers. No lupine or asters were observed. From 98 photos, west edge set as base.				

7-08-99

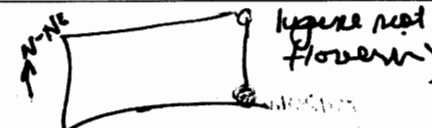
Photo Monitoring Data Sheet

Location: 20 yards past the "Little Hole in the Wall" sign, plot is off the road to the left 10 yards in from road <i>plot #</i>	UTM coordinates: file S073018A 3867847.121 m N 765300.136 m E Zone 12 North	Observers: Ann Whealan, Tyler Rork		Date: 30. July 1999
Plot Name: 3 West- Little Hole in the Wall	% Vegetation Cover & Dominant Species Present	% Bare Ground or Lava	% Forbes and other Non-grasses	Overall Condition
Quad Name and #: 1 (SW)	37%- Blue Grama (<i>Bouteloua gracilis</i>)	50%	10%- snakeweed-(<i>Gutierrezia sarothrea</i>) rabbit brush-(<i>Chrysothamnus nauseosus</i>)	Cow pies 3%
Quad Name and #: 2 (NW)	69%- Indian Rice Grass (<i>Stipa hymenoides</i>) Blue Grama (<i>Bouteloua gracilis</i>)	20%	10% - %- snakeweed-(<i>Gutierrezia sarothrea</i>) rabbit brush-(<i>Chrysothamnus nauseosus</i>) Indian Paintbrush (<i>Castilleja confusa</i>)	Cow pies 1%
Quad Name and #: 3 (NE)	15%- Indian Rice Grass (<i>Stipa hymenoides</i>) Blue Grama (<i>Bouteloua gracilis</i>)	65%	20%- %- snakeweed-(<i>Gutierrezia sarothrea</i>) rabbit brush-(<i>Chrysothamnus nauseosus</i>) Indian Paintbrush (<i>Castilleja confusa</i>)	
Quad Name and #: 4 (SE)	55%- Indian Rice Grass (<i>Stipa hymenoides</i>) Blue Grama (<i>Bouteloua gracilis</i>)	40%	5%- %- snakeweed-(<i>Gutierrezia sarothrea</i>) rabbit brush-(<i>Chrysothamnus nauseosus</i>) Indian Paintbrush (<i>Castilleja confusa</i>)	
Remarks: SW rebar is missing. Two sides of the plot are oriented roughly N-NE. The north ½ of the plot is the "top" and the south ½ is the "bottom" of the plot. Soil may be washing into the area. Two of the corner rebar markers were buried. Some of the disturbance to the quad occurred while digging up the markers. No lupine or asters were observed. From 98 photos, west edge set as base.				

Photo Monitoring Data Sheet

Location: <i>Little Hole in the Wall</i>	UTM coordinates: <i>GPS d N 3867847.121m 073018 A 765300136m</i>	Observers: <i>David Chappell, Charlotte White, Ann Whealan, Tyler Rork</i>		Date: <i>30 July 1999</i>
Plot Name: <i>SE</i>	% Vegetation Cover & Dominant Species Present <i>blue grama 40% - 3</i>	% Bare Ground or Lava <i>50%</i>	% Exotic Species <i>Snakeweed, rabbit brush 10%</i>	Overall Condition <i>cow pies 3%</i>
Quad Name and #: <i>2 NE</i>	<i>Indian rice grass 70 - 1</i>	<i>20%</i>	<i>Indian paintbrush 10</i>	<i>cow pies 3% cow pies 2% 1</i>
Quad Name and #: <i>NW 3</i>	<i>15%</i>	<i>65%</i>	<i>Indian paintbrush 20</i>	
Quad Name and #: <i>1 SW</i>	<i>55% grass</i>	<i>40%</i>	<i>5%</i>	
Quad Name and #: <i>reoriented</i>				
Remarks: <i>rebar is sunk plot barely visible missing from SW corner</i>				

*2 sides plot oriented roughly N-NE
these are the sides of plot
(from photos)*



*eroded - deposited from hill
no wet
no asters*

*Plot
3W*

Photo Monitoring Data Sheet

Location: Park at the road closure, travel along old road for 40 paces, turn left and travel for 10 paces (scale 50 paces to log blocking the road) 1≈1 yard (see below for more)	UTM coordinates: file S073018B 3867074.110 m North 766497.541 m East Zone 12 North	Observers: , Charlotte White, Ann Whealan, Tyler Rork		Date: 27. July 1999 and 30. July 1999
Plot Name: Plot #4 West Located at the Navajo Ice Caves pack trailhead	% Vegetation Cover & Dominant Grass Species Present	% Bare Ground or Lava	% Forbes and Other Non-grasses	Overall Condition
Quad Name and #: 1 (SW) Bottom left quad	60 %- Sideoats grama (<i>Bouteloua curtipendula</i>) Blue Grama (<i>Bouteloua gracilis</i>) Purple threeawn (<i>Aristida purpurea</i>)	30%	10%- Sagebrush- Artemesia snakeweed, (<i>Gutierrezia sarothrea</i>) rabbitbrush-(<i>Chrysothamnus nauseosus</i>)	
Quad Name and #: 2 (SE) Bottom right quad	40% -Blue Grama (<i>Bouteloua gracilis</i>) Sideoats grama (<i>Bouteloua curtipendula</i>)	40%	15%-25%- Sagebrush- Artemesia snakeweed, (<i>Gutierrezia sarothrea</i>) rabbitbrush-(<i>Chrysothamnus nauseosus</i>)	
Quad Name and #: 3 (NE) Top right quad	60% - Blue Grama (<i>Bouteloua gracilis</i>) Sideoats grama (<i>Bouteloua curtipendula</i>)	25%	15%- Sagebrush- Artemesia snakeweed, (<i>Gutierrezia sarothrea</i>) rabbitbrush-(<i>Chrysothamnus nauseosus</i>)	
Quad Name and #: 4 (NW) Top left	55%- Blue Grama (<i>Bouteloua gracilis</i>) Sideoats grama (<i>Bouteloua curtipendula</i>)	25%	20%- Sagebrush- Artemesia snakeweed, (<i>Gutierrezia sarothrea</i>) rabbitbrush,a white aster (possibly <i>Chaetopappa ericoides</i>)	
Remarks: This plot is aligned with magnetic north. The photographer stood at the southern edge of the square for all photographs. The plot is approximately 50 yards from the wooden "road closed" sign on a bearing of 100°. The presence of the lava and lichen make bare earth estimations extremely difficult. To the best of this recorder's knowledge the plot was aligned as it had been in the 1998 survey. The bottom of the plot is the side between the two tagg				

7-27-99

EL MALPIAS NATIONAL MONUMENT RESOURCE MANAGEMENT

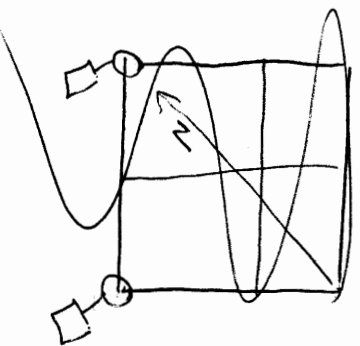
Photo Log

Roll # Film Type Kodak # Exp. 24 Start Date 16 Jun 1998 Date to Process 04 Aug 1998 Speed 100
 Lens 35-70 mm zoom
 Filter UV haze filter Color XX B W

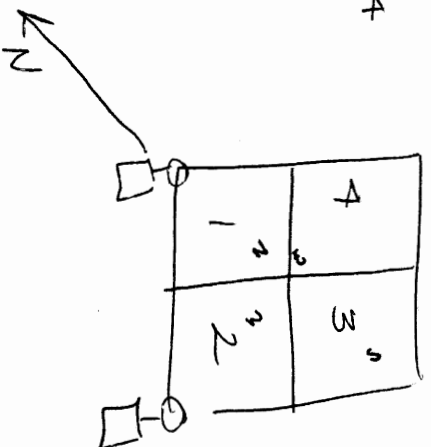
Exp. #	Date	Subject	Orientation	UTM	GPS	Person Taking Photos	Special Comments
1	16 Jun	Burn loading film				M. Peterson	
2		Navajo Ice Cave Ice Formations					Not good
3			W/ Jeannie in Last Chamber				
4			Last Chamber				
5							
6							
7		Ice Ribbon	Last chamber on Rubble mound				
8							
9		1	2nd Chamber	location	views		Not Good
10		NIC Ceiling Formations					
11							
12							
13			Far North corner				
14		Ceiling					
15			On trail				Local board
16		NIC Ring Structure	From trail looking North				
17							
18		Former Stock Pond	Looking South East				View from on top of the Lava
19	Jun 20	Lava Falls old road					
20		New Ballards on Lava Falls Road	Looking South				From Lava Falls Parking Area
21							
22							
23							
24							
25							

N-S
117 NM
NE - SW

~~Plot 4~~ Nest Plot 4
16 Aug 1999



Plot 4



1
grass - pygmy-tail plover
non - globe mallow - something
60% bare

5%

2 dead wood 2%
poles 2
grass - ~~70%~~ 20
bare 78%

3 1% live wood
grass - squirrel tail or 2% pole cills
poles 4% smaller than 11 very widespread 50-55%

4 68% bare 3% poles
6-1 stems Savergrass

3-4 years no cattle
King vanner pole off 3-4 no cattle whole thicket there
~~to 2%~~ Super high more not clear

Photo Monitoring Data Sheet				
Location: Navajo for Cave Pass trail	UTM coordinates: 5073018 B	Observers: David Chappell, Charlotte White, Ann Whealan, Tyler Rork 38° 7074.110 m N 76° 6497.541 m		Date:
Plot Name: 4 West Navajo for Cave	% Vegetation Cover & Dominant Species Present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad Name and #: 1 SW	~~mesquite~~ 60 sideweed blue grama	30	Sage 10% sideweed rabbit brush	lichen
Quad Name and #: 2 SE	40	40	↓ 15-20	
Quad Name and #: 3 NE		25	15	
Quad Name and #: 4 NW	55	25	aster - white 20	
Remarks: lichen and lava make base earth. 100° from sign (road closed) 40 paces up trail left 10 paces (N of trail)				

Photo Monitoring Data Sheet

Location: ~~Plot #4 West~~ Park at the road closure, travel along old road for 40 paces, turn left and travel for 10 paces (scale 50 paces to log blocking the road) 1≈1 yard (see below for more) <i>Plot #</i>	UTM coordinates: file S073018B 3867074.110 m North 766497.541 m East Zone 12 North	Observers: , Charlotte White, Ann Whealan, Tyler Rork		Date: 27. July 1999 and 30. July 1999
Plot Name: 4 West Located at the Navajo Ice Caves pack trailhead	% Vegetation Cover & Dominant Grass Species Present	% Bare Ground or Lava	% Forbes and Other Non-grasses	Overall Condition
Quad Name and #: 1 (SW) Bottom left quad	60 %- Sideoats grama (<i>Bouteloua curtipendula</i>) Blue Grama (<i>Bouteloua gracilis</i>) Purple threeawn (<i>Aristida purpurea</i>)	30%	10%- Sagebrush- Artemesia snakeweed, (<i>Gutierrezia sarothrea</i>) rabbitbrush-(<i>Chrysothamnus nauseosus</i>)	
Quad Name and #: 2 (SE) Bottom right quad	40% -Blue Grama (<i>Bouteloua gracilis</i>) Sideoats grama (<i>Bouteloua curtipendula</i>)	40%	15%-25%- Sagebrush- Artemesia snakeweed, (<i>Gutierrezia sarothrea</i>) rabbitbrush-(<i>Chrysothamnus nauseosus</i>)	
Quad Name and #: 3 (NE) Top right quad	60% - Blue Grama (<i>Bouteloua gracilis</i>) Sideoats grama (<i>Bouteloua curtipendula</i>)	25%	15%- Sagebrush- Artemesia snakeweed, (<i>Gutierrezia sarothrea</i>) rabbitbrush-(<i>Chrysothamnus nauseosus</i>)	
Quad Name and #: 4 (NW) Top left	55%- Blue Grama (<i>Bouteloua gracilis</i>) Sideoats grama (<i>Bouteloua curtipendula</i>)	25%	20%- Sagebrush- Artemesia snakeweed, (<i>Gutierrezia sarothrea</i>) rabbitbrush,a white aster (possibly <i>Chaetopappa ericoides</i>)	
Remarks: This plot is aligned with magnetic north. The photographer stood at the southern edge of the square for all photographs. The plot is approximately 50 yards from the wooden "road closed" sign on a bearing of 100°. The presence of the lava and lichen make bare earth estimations extremely difficult. To the best of this recorder's knowledge, the plot was aligned as it had been in the 1998 survey. The bottom of The plot is the side between the two tagged pieces of rebar.				

NPS - ELMA

PLOT # 1

WEST

08-01-97

NPS - ELMA

PLOT # 2

WEST

08-01-97

NPS - ELMA

PLOT #3

WEST

08-01-97

NPS - ELMA

PLOT # 4

WEST

08-01-97

QUAD # 1

QUAD # 2

QUAD # 3

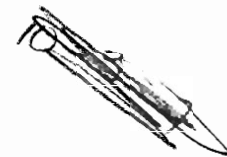
QUAD # 4

Photo Monitoring Data Sheet				
Location: on the south side of Sandstone Bluffs Access road. Park across from Garrett Homestead. Walk out 30 yds.	UTM coordinates: 3872194.205 m N. 789505.194 m E. Zone 12 North	Observers: David Chappell, Charlotte White, Ann Whealan		Date: 20. July 1999 and 29. July 1999
Plot Name: Plot #1 East- located across from the Garrett Homestead at Sandstone Bluffs	% Vegetation Cover & Dominant Species Present	% Bare Ground or Lava	% Forbes and Other Non-grasses	Overall Condition
Quad Name and #: 1 (SW)	Blue Grama, Indian Rice Grass, No needle & thread grass observed Purple three-awn- (<i>Aristida purpurea</i>)	70%	Thistle appears dead 2%, prickly pear- 2 small plants	Very bare
Quad Name and #: 2 (SE)	Blue Grama, Indian Rice Grass, (<i>Oryzopsis hymenoides</i>) No needle & thread grass observed Purple three-awn- (<i>Aristida purpurea</i>) Sideoats grama- (<i>Bouteloua curtipendula</i>) Galleta grass (<i>Hilaria jamesii</i>)	70%	10% forbes	Grasses growing together surrounded by completely bare areas
Quad Name and #: 3 (NE)	35%- Indian Rice Grass (<i>Oryzopsis hymenoides</i>) Sideoats grama- (<i>Bouteloua curtipendula</i>)	60%	5% forbes	cover growing in clumps, surrounded by bare patches
Quad Name and #: 4 (NW)	Indian Rice Grass, (<i>Oryzopsis hymenoides</i>) Purple three-awn, (<i>Aristida purpurea</i>) No sideoats grama observed	50%	5%	Vegetative cover evenly distributed
Remarks: Thistle observed only in the first Quadrant The observers have vegetation cover estimates that are much lower than those produced in previous years. The observers do not believe that vegetation has been removed during 1998-1999. The previous observations were most likely over-estimates. The pictures, rather than the numerical data, should be compared.				

7-20-99

Photo Monitoring Data Sheet

Location: on the south side of Sandstone Bluffs Access road. Park across from Garrett Homestead. Walk out 30 yds.	UTM coordinates: 387 2194, 205 w N 789505, 199 m E	Observers: David Chappell, Charlotte White, Ann Whealan		Date: 20. July 1999 and 29. July 1999
Plot Name: #1 East- located across from the Garrett Homestead at Sandstone Bluffs	% Vegetation Cover & Dominant Species Present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad Name and #: 1 SW	Blue Grama, Indian Rice Grass, No needle & thread grass observed Purple three-awn- (Aristida purpurea)	70%	Thistle appears dead 2%, prickly pear- 2 small plants	Very bare
Quad Name and #: 2 SE	Blue Grama, Indian Rice Grass, No needle & thread grass observed Purple three-awn- (Aristida purpurea) Sideoats grama- (Bouteloua curtipendula) Galleta grass (Hilaria jamesii)	70%	10% forbes	Grasses growing together surrounded by completely bare areas
Quad Name and #: 3 NE	35%- Indian Rice Grass (Oryzopsis hymenoides) Sideoats grama- (Bouteloua curtipendula)	60%	5% forbes, mostly ? ↑	Vegetative cover growing together in clumps, surrounded by patches with no cover
Quad Name and #: 4 NW	Indian Rice Grass Purple three-awn No sideoats grama observed <i>potential rank</i>	50%	5% forbes	Vegetative cover evenly distributed



Remarks: Thistle observed only in the first Quadrant. The observers have vegetation cover estimates that are much lower than those produced in previous years. The observers do not believe that vegetation has been removed during 1998-1999. People tend to overestimate the percentage of a surface occupied by a dark material on a light background. The previous observations were most likely overestimates. The pictures, rather than the numerical data, should be compared. The date on the 1999 photographs is incorrect. The plot cards show the date as 21. July. The observations were made on 20. July.

Two edges of the plot are aligned somewhere between N and NE. We selected these for the as the sides of the plot and the roughly east-west trending sides were used as the “top” and “bottom” of the plot.

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet				
Location: On the south side of Sandstone Bluffs road, Park across from homestead site/walk out 30 yds to Plot	GPS Cord.:	Observers: D. Chappell, A. Whealan C. White		Date: 7 20 99
Plot Name: 21, July 1999 G.M. #1 EAST	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad Name and #: 1 SW	② Indian rice grass 523 ② blue grama ① S1, S2 no needle i thred	~~70~~ bare 70	2% thistle? dead prickly pear 1 of dead 5 S2? 3?	bare
Quad Name and #:	Q1 S1, Q2 blue grama, indian rice grass no thistle Q2 S1	50/50	Q1 S3	grass evenly distributed
Quad Name and #:	Q2 S1 blue grama all wet indian rice grass grass	60	5% forbs few scattered plants in with grass	grass patch in clump surrounded by very open earth
Quad Name and #:	Indian Rice Grass Q	70	3% forbs 10%	grass in clump else very bare
Remarks: The grass feels very nice on my feet - ground				

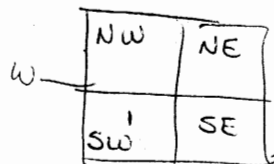


Photo Monitoring Data Sheet				
Location: Park 4/10 of a mile past mile marker 35 on NM 117, walk out 50 yards to the plot	UTM coordinates: 3858234.780 m N. 782682.157 m E. Zone 12 North	Observers: David Chappell, Ann Whealan,		Date: 22. July 1999
Plot Name: Plot #2 East	% Vegetation Cover & Dominant Species Present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad Name and #: 1 (W)	42%	55%	3%-Pursline (<i>Portulaca oleracea</i>) 1 thistle plant	
Quad Name and #: 2 (S)	66%	40%	4%- pursline (<i>Portulaca oleracea</i>)	
Quad Name and #: 3 (E) (photo originally labeled quad 4)	65%	25%	10%- pursline (<i>Portulaca oleracea</i>)	
Quad Name and #: 4 (N)	69%	30%	1%- pursline (<i>Portulaca oleracea</i>)	
Remarks: In the marker 35.4 area there is a curve sign (50 mph). Walk to the third t-post (white topped) south of the sign then walk straight out from the road (very roughly west). Alternatively, walk 50 yards out at bearing 230 from the curve sign. The ground was very soggy. Some standing water was visible along the side of the road further north. The grasses appeared to be largely dead. No fleabane was observed. Quad 3 was mislabeled as quad 4 in the photograph, so the correct number was marked on the appropriate photos.				

7-22-99

Photo Monitoring Data Sheet

Location: Park 4/10 of a mile past mile marker 35 on NM 117, walk out 50 yards to the plot	UTM coordinates: ~~358234.780m~~ 782682.157 m		Observers: David Chappell, Ann Whealan,	Date: 22. July 1999
Plot Name: Plot #2 East	% Vegetation Cover & Dominant Species Present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad Name and #: 1 (S)	66%	40%	4%- pursline (<i>Portulaca oleracea</i>)	
Quad Name and #: 2 (W)	42%	55%	3%-Pursline (<i>Portulaca oleracea</i>) 1 thistle plant	
Quad Name and #: 3 (N)	69%	30%	1%- pursline (<i>Portulaca oleracea</i>)	
Quad Name and #: 4 (E)	65%	25%	10%- pursline (<i>Portulaca oleracea</i>)	
Remarks: In the marker 35.4 area there is a curve sign (50 mph). Walk to the third post south of the sign then walk straight out from the road (very roughly west). The ground was very soggy. Some standing water was visible along the side of the road further north. The grasses appeared to be largely dead. No fleabane observed.				

Photo Monitoring Data Sheet				
Location: Park at mile marker #33 NM 117. Walk west 50 yards at bearing 320.	UTM coordinates: 3855886.313 m N 782314.494 m E.	Observers: David Chappell, Charlotte White, Ann Whealan, Tyler Rork		Date: 22. July 1999
Plot Name: Plot #3 East	% Vegetation Cover & Dominant Species Present	% Bare Ground or Lava	% Forbes or other Non-grasses	Overall Condition
Quad Name and #: 1 NW (photo originally labeled quad 4)	50% - grasses	40%	10%- pursline (<i>Portulaca oleracea</i>) Scarlet Globemallow (<i>Sphaeralcea coccinea</i>)	
Quad Name and #: 2 SW (photo originally labeled quad 1)	75% - bluestem other grasses	20%	0-5%- pursline (<i>Portulaca oleracea</i>)	
Quad Name and #: 3 SE (photo originally labeled quad 2)	29%- grasses	40%	31%- Scarlet globe mallow (<i>Sphaeralcea coccinea</i>) pursline (<i>Portulaca oleracea</i>)	
Quad Name and #: 4 NE (photo originally labeled quad 3)	65%- grasses	30%	10%- pursline (<i>Portulaca oleracea</i>) Scarlet Globemallow (<i>Sphaeralcea coccinea</i>)	
Remarks: The plot is slightly north of the mileage marker, perhaps about 10 yards. The photos for this plot were taken rotating counter clockwise, but the plot numbers may not agree. Note that the position of the quads is given in the name and number box.				

7-22-99

12N
3855886313m North
782314.494m East

Photo Monitoring Data Sheet				
Location: Park at mile marker #33 NM 117. Walk west (in from highway) 50 yards. (The plot is slightly north of the mile marker).	UTM coordinates: 3872194.205m 789505.194m	Observers: David Chappell, Charlotte White, Ann Whealan, Tyler Rork		Date: 22. July 1999
Plot Name: <u>Plot #3 East</u>	% Vegetation Cover & Dominant Species Present	% Bare Ground or Lava	% Forbes or other Non-grasses	Overall Condition
Quad Name and #: 1 SW	75% - bluestem other grasses	20%	0-5%- pursline (<i>Portulaca oleracea</i>)	
Quad Name and #: 2 SE	29%- grasses	40%	31%- Scarlet globe mallow (<i>Sphaeralcea coccinea</i>), pursline (<i>Portulaca oleracea</i>)	
Quad Name and #: 3 NE	65%- grasses	30%	10%- pursline (<i>Portulaca oleracea</i>), Scarlet Globemallow (<i>Sphaeralcea coccinea</i>)	
Quad Name and #: 4 NW	50% - grasses	40%	10%- pursline (<i>Portulaca oleracea</i>), Scarlet Globemallow (<i>Sphaeralcea coccinea</i>)	
Remarks:				

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Photo Monitoring Data Sheet

Location:	GPS Cord.:	Observers: David Chappell Ann Whealan		Date: 22 July 1999
Plot Name: plot 3 E	% Vegetation & Dominant species present	% Bare Ground or Lava	% Exotic Species	Overall Condition
Quad Name and #: 1 SW	1 grass species big bluestem	20	little redish piece 11 little white pods 2/10 1	
Quad Name and #: ~~NE~~ SE 2	some pluff & white pods 50/50 with white each ~ 29	40	9 little 3 3%	
Quad Name and #: ~~NE~~ NE 3	white pod 5	30	1 little red succ	
Quad Name and #: ~~SE~~ NW 4	Hot grass	40	20 white things 2 red paces - 1	

Remarks:

Photo Monitoring Data Sheet

Location: from dead dog plot. Walk N. along the fence to point ½ way between the 7 th and 8 th t posts. Walk out perpendicular to road. Or along 134° from 8 th post	UTM coordinates: 3851705.153 m North 779256.201 m East Zone 12 North	Observers: Ann Whealan and Jeanne Ratlief		Date: 06. August 1999
Plot Name: Plot #4 East-Dead Dog Plot	% Grasses	% Bare Ground or Lava	% Forbes and Other Non-grasses	Overall Condition
Quad Name and #: 1 (N)	35%- Squirreltail – (<i>Sitanion</i>) Sideoats grama- (<i>Bouteloua curtipendula</i>)	60%	5% - Scarlet globe mallow (<i>Sphaeralcea coccinea</i>) others	
Quad Name and #: 2 (W)	20%- Squirreltail – (<i>Sitanion</i>) Sideoats grama- (<i>Bouteloua curtipendula</i>)	70 %	8% - Scarlet globe mallow (<i>Sphaeralcea coccinea</i>) others	2% deadwood
Quad Name and #: 3 (S)	40%- Squirreltail – (<i>Sitanion</i>) Sideoats grama- (<i>Bouteloua curtipendula</i>) (only ≈ 2%)	50-55%	4% - Scarlet globe mallow (<i>Sphaeralcea coccinea</i>) others	1% deadwood (fewer forbes than quad 1 but widespread)
Quad Name and #: 4 (E)	44%- Squirreltail – (<i>Sitanion</i>) Sideoats grama- (<i>Bouteloua curtipendula</i>)	60% bare	3%- Scarlet globe mallow (<i>Sphaeralcea coccinea</i>) others	0-1 % sticks
Remarks This plot has had no cattle on it for 3-4 years. The King ranch sold off the grazing rights. There were no cattle on it when Herschel Schulz began working at the monument. The tallest grasses were approximately 2 feet high.				

8-06-99

22. July 1999
Grazing Management

ELMA - GM

#2 E

Plot 1

22. July 1999
Grazing Management

ELMA - GM

#2 E

Plot 2

22. July 1999
Grazing Management

ELMA - GM

#2 E

Plot 3

22. July 1999
Grazing Management

ELMA - GM

#2 E

Plot 4

Handwritten notes in the top right corner, including "22 July 1999" and "Grazing Management".

22. July 1999

Grazing Management

ELMA - GM

#2 E

Overall

NPS

ELMA

Plot #1 East

7-31-97

243

NPS - ELMA

PLOT # 2

EAST T

7-31-97

NPS-ELMA
PLOT #3
EAST T 7.31.97

NPS - ELMA

PLOT ~~XX~~ 4

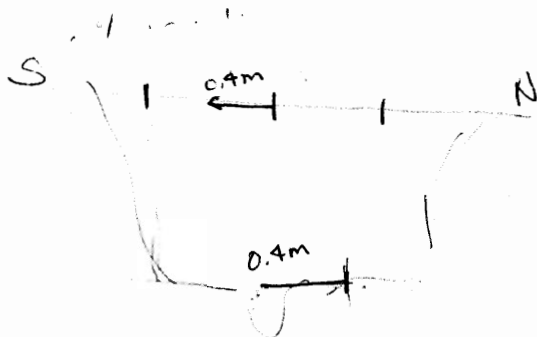
EAST 4.31.97

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

#

Erosion Plot Monitoring Sheet

Location: Drive 4/10 of a mile up S.S. Butts rd. park on the north side of road and walk 2yds. N to plot.	GPS Reading:	Observers: Cwhite, A, Whealan D. Chappell	Date: 7-20-99
Erosion #1 Plot #:	~~Overall Appearance:~~	Length of Soil Erosion:	% of Soil Erosion:
Horizontal #1 Whole Plot:		North side Edge .9 } meters South side Edge 1 }	
Vertical #1 Quad #1:	David 1.3m		
Vertical #2	1.45m		
Vertical #3 Quad #2:	1.95m new vertical	.4m Rd side measurement	
Vertical #4	.9m		
Remarks: added new vertical mark (deepest section) ~~Path side~~ South → N measured			



465 11
2

EROSION

POINT # 1

EROSION

POINT # 2

EROSION

POINT # 3

EROSION

POINT # 4

EROSION

PLOT # 1

OVERALL

08-05-97

EROSION

PLOT # 2

OVERALL

08-05-97

EROSION

PLOT # 3

OVERALL

08-05-97

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Erosion Plot Monitoring Sheet			
Location: <i>3/10 of a mile from S.S. Bluffs Rd. along NM117, park on the west side of the Rd. and walk out 35 yds to pit</i>	GPS Reading:	Observers:	Date: <i>7-20-99</i>
Erosion # <i>3</i> ~~Plot #~~	Overall Appearance: ~~—~~	Length of Soil Erosion:	% of Soil Erosion:
Horizontal # <i>1</i> ~~Whole Plot~~ horiz. edge dist. <i>0.65m</i>			
Vertical # <i>1</i> <i>2.5m</i> ~~Quad #~~			
Vertical # <i>2</i> <i>2.95m</i>			
Vertical # <i>3</i> <i>2.2m</i> ~~Quad #~~ horiz. edge dist. <i>0.78m</i>			
Remarks: <i>E. To W. measured.</i>			

7-20-99

Photo Monitoring Research Project of Grazed & Erosion Areas in the Monument

Erosion Plot Monitoring Sheet			
Drive 3/10 of a mile up S.S. Bluffs Park on South side of rd. Location: and walk 65yds to plot.		GPS Reading:	Observers: David Crispell Charlotte White, Ann Whelan Date: 7-20-99
Erosion #2 Plot #:	~~Overall Appearance:~~	Length of Soil Erosion:	% of Soil Erosion:
Horizontal #1 Whole Plot:			
Vertical #1 ~~Quad #1:~~	1.81 N most		
Vertical #2	1.80 middle		
Vertical #3 ~~Quad #2:~~	1.60 point most		
N - 1.58m Stake 0.40m N. to South measured. Remarks: depth - 2.27m .95m Soft middle marker			

7-20-99