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Feral Cattle in the White Rock Canyon Reserve at Los Alamos National Laboratory

Charles D. Hathcock and Leslie A. Hansen

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SUMMARY

At the request of the Los Alamos Field Office (the Field Office), Los Alamos National Security (LANS) biologists placed remote-triggered wildlife cameras in and around the mouth of Ancho Canyon in the White Rock Canyon Reserve (the Reserve) to monitor use by feral cattle. The cameras were placed in October 2012 and retrieved in January 2013. Two cameras were placed upstream in Ancho Canyon away from the Rio Grande along the perennial flows from Ancho Springs, two cameras were placed at the north side of the mouth to Ancho Canyon along the Rio Grande, and two cameras were placed at the south side of the mouth to Ancho Canyon along the Rio Grande. The cameras recorded three different individual feral cows using this area as well as a variety of local native wildlife. This report details our results and issues associated with feral cattle in the Reserve.

Feral cattle pose significant risks to human safety, impact cultural and biological resources, and affect the environmental integrity of the Reserve. Regional stakeholders have communicated to the Field Office that they support feral cattle removal.

INTRODUCTION

The Reserve was established in October 1999 by former Secretary of Energy Bill Richardson, through a Department of Energy (DOE) Proclamation, as part of a nationwide Land Conservation Initiative at DOE sites. The Reserve is located on DOE/National Nuclear Security Administration (NNSA) land at Los Alamos National Laboratory (LANL) in north-central New Mexico. The Reserve is located on the eastern side of LANL in White Rock Canyon and is bounded on the south by Bandelier National Monument (Bandelier) and on the north by the County of Los Alamos. The Rio Grande defines the Reserve's eastern boundary and across the river are Santa Fe National Forest lands (Figure 1). The Reserve encompasses approximately 1,000 acres of remote and relatively undisturbed land and is intended to function as an ecological and cultural resources reserve.

An ongoing issue in White Rock Canyon, including the Reserve, is impacts to sensitive resources from feral cattle. Feral cattle are wild living domestic cattle. Feral cattle are different from branded and tagged cattle, because they do not have an owner to take responsibility for them. Both Bandelier and the County of Los Alamos have reported problems with feral cattle on their properties along the Rio Grande. To investigate this issue further, program managers at the Field Office asked LANS biologists to deploy remote-triggered wildlife cameras to document use of the Reserve by feral cattle.

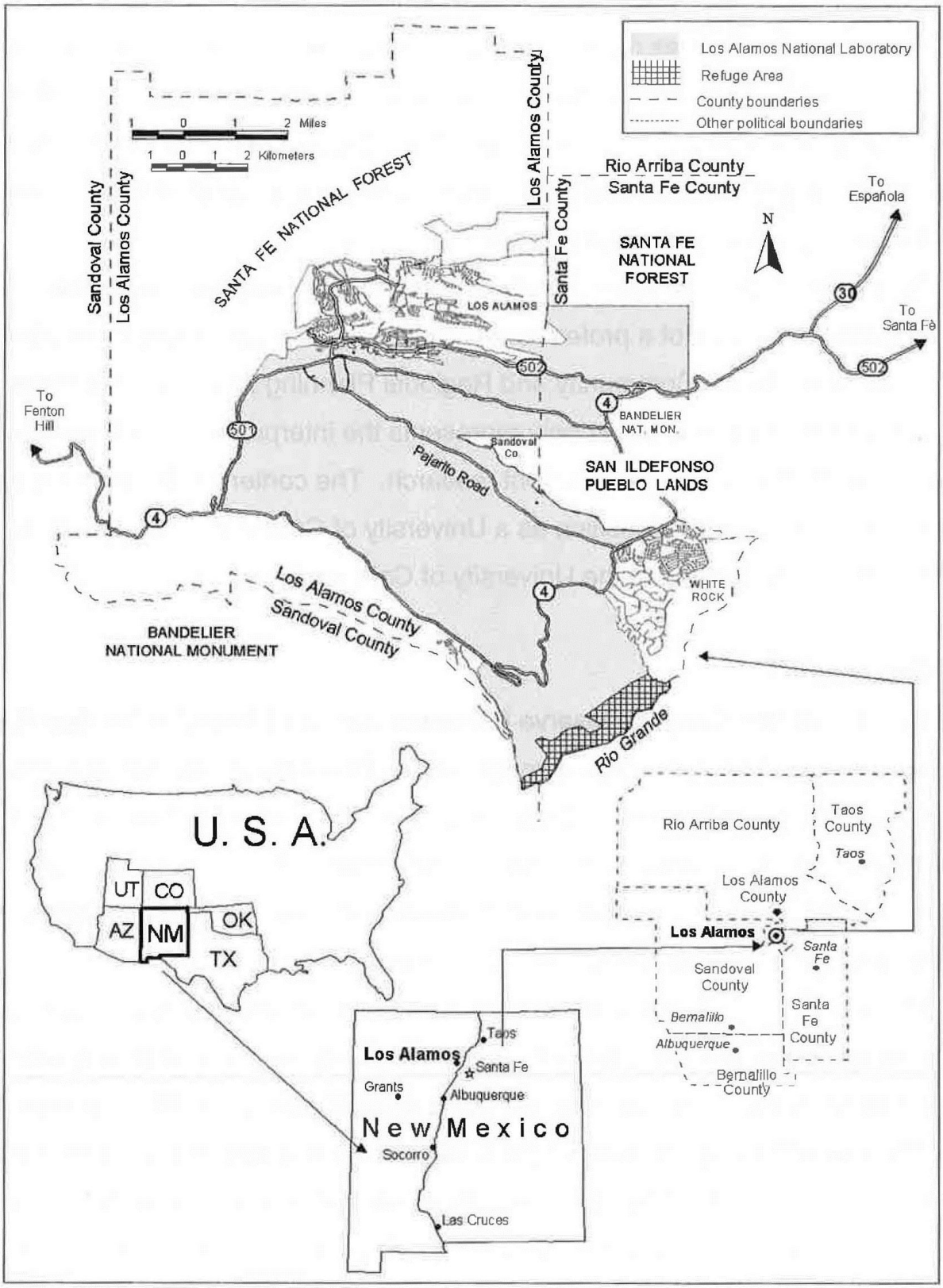

Figure 1. Location of the White Rock Canyon Reserve along LANL's eastern boundary

PROBLEMS ASSOCIATED WITH FERAL CATTLE

Public Safety

The Reserve is open to recreational hiking and is frequently used by local residents. Feral cattle have been documented to charge and threaten visitors and staff at Bandelier and on County of Los Alamos property. There are no signs or any other warnings posted for visitors to the Reserve that indicate possible threats from feral cattle. In 2012, one of the feral cows from White Rock Canyon wandered north onto San Ildefonso Pueblo property, was threatening human safety, and was shot.

Cultural Resource Issues and Concerns

Trampling, trails, and bedding areas from feral cattle may damage cultural resources in the Reserve. Theses impacts range from increased erosion to direct damage by crushing or fracturing artifacts or breaking building structures on archaeological sites.

Biological Resource Issues and Concerns

Feral cattle have impacted fragile biological resources within the Reserve, including wetlands and springs. The Reserve has numerous natural springs and seeps that feed into the Rio Grande (Purtymun et al. 1980). Trampling and foraging by feral cattle have greatly reduced the vitality of these habitats by destroying vegetation; also, feces and urine from feral cattle affect the water quality. Additionally, grazing by feral cattle along the Rio Grande poses a high risk to riverside willow habitats. The browsing effects on willows impact potential breeding habitat for the endangered Southwestern Willow Flycatcher.

PAST SIGHTINGS AND CONTROL EFFORTS

Reports of feral cattle and their control efforts are well documented at Bandelier, but no work has been done to control the problem on DOE/NNSA lands in the adjacent Reserve. Feral cattle have been found crossing between DOE and Bandelier since the 1970s (Bandelier National Monument, unpublished data). Between 1983 and 1989, management practices at Cochiti Reservoir caused frequent inundation of White Rock Canyon which precluded cattle from entering Bandelier for much of that time. By 1990 the feral cattle herd grew and various efforts were employed by Bandelier to remove the cattle, including advertising their intent to dispose of the animals and allowing those who claimed to own the animals to remove them without penalty.

In 1993 Bandelier wrote an Environmental Assessment (BNM 1993) to assess various removal options for feral cattle. In 1994 the final decision on a preferred method was direct reduction by shooting and later that year 14 feral cattle were shot.

By 2008, the feral cattle herd had again grown in number on Bandelier. On November 19, 2008, Bandelier staff undertook an alternative method for elimination of feral cattle. Working with the New Mexico State Farm and Livestock Board (NMSFLB), the park retained private individuals (cowboys) to herd feral cattle from the mouth of Frijoles Canyon, up the Falls Trail and to a holding pen near the park headquarters. By the end of the sixth day of herding, following enormous effort, only four calves were successfully removed from the park. A total of six cows and two calves died from stress along the trail below the Lower Falls. One aggressive bull with horns charged and injured a horse. The bull continued to threaten the safety of the cowboys and the horses and was shot.

Park staff concluded that this alternative elimination method was a failure, as it exposed the participants to significant safety risks, it imposed unnecessary suffering on the animals, and the animals that died during the removal attempt did so near waterways and trails such that water quality and visitor experience were impacted for months (BNM 2010).

By 2010, the feral cattle herd had again grown on Bandelier. Bandelier discussed control measures in their November 2010 Newsletter (Appendix 1). In early 2011, the NMSFLB again hired cowboys to herd more feral cattle out of White Rock Canyon; however, the herding was unsuccessful and so the cattle were shot.

CAMERA PLACEMENT IN ANCHO CANYON IN 2012

To document feral cattle use on DOE/NNSA property, and to possibly identify any brands or tags if they exist on the cattle, camera stations were placed in a standard 2-camera configuration along two heavily used trails for three months from October 2012 through January 2013. This camera station configuration consists of each digital camera facing one another in order to get images of both sides of the same animal, in order to possibly identify individuals (York et al. 2001; Tobler et al. 2008). Camera stations were set up on the north and south side of the mouth of Ancho Canyon. The Bushnell Trophy Cam was the camera model used in this project. All cameras were locked in a secure lock box and appropriately labeled.

Two more camera stations were placed away from the Rio Grande at a wetland and further upstream at a beaver pond along the perennial stream flow in Ancho Canyon. At these camera stations, a single camera was directed across the habitat. All camera locations are shown in Figure 2 and an example of a camera placement is shown in Figure 3.

The cameras were powered with Energizer Ultimate Lithium AA batteries and 16 GB SD cards were used so that the cameras could operate without maintenance for several months. The cameras were set to have a 20 minute interval between encounters to maximize battery life.

After retrieval, the images were reviewed for animal encounters and data were summarized by date, time and location. An encounter was any photo or group of photos of a single animal or group of animals at any one point in time. At camera stations with two cameras, if both cameras captured the same animal, then only one encounter was recorded.

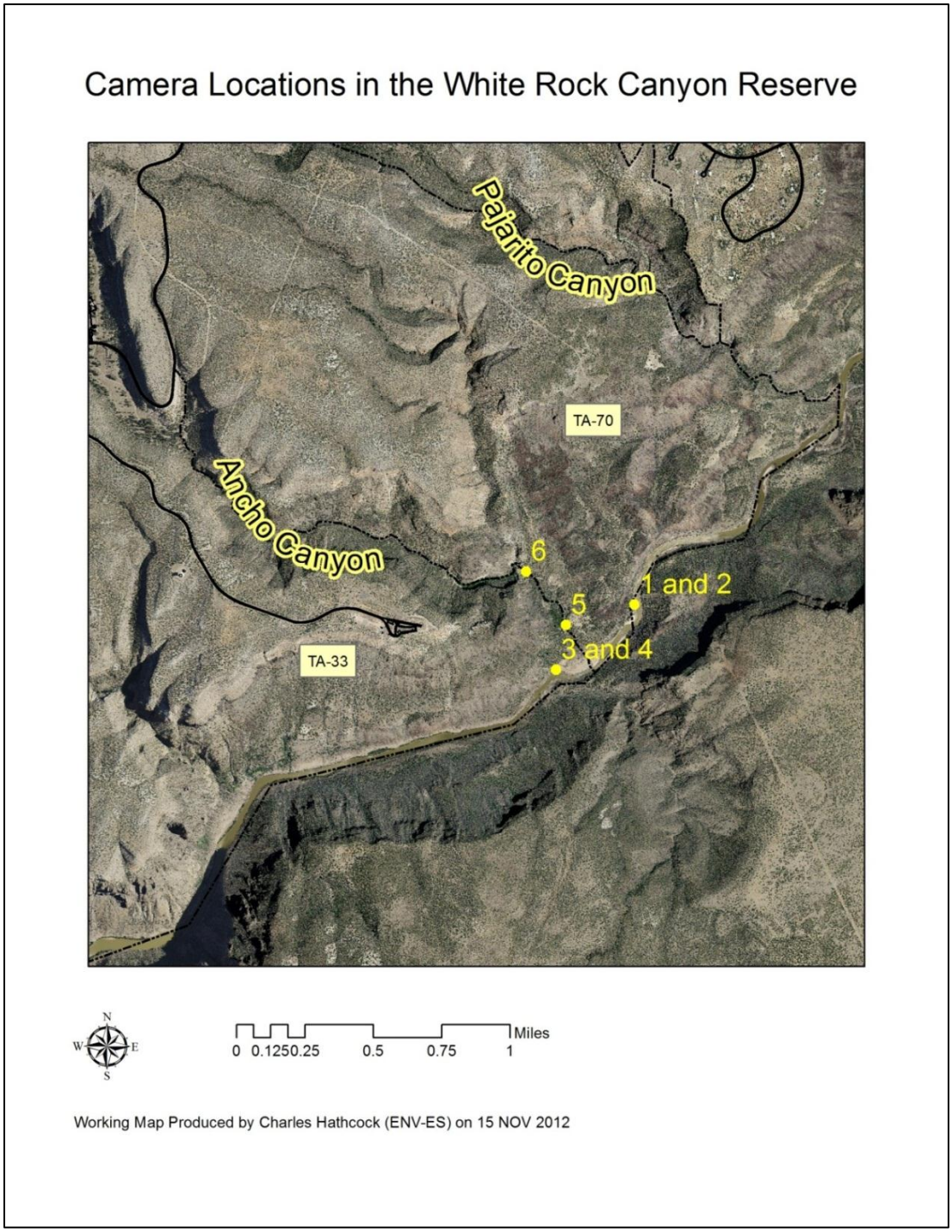

Figure 2. Camera locations for this project around the mouth of Ancho Canyon


Figure 3. Camera number one on the north side of the mouth of Ancho Canyon

RESULTS

The cameras were placed on 11 October 2012 and retrieved on 23 January 2013. There were no signs of tampering with any of the cameras. The cameras still had full battery power and had used less than 10% of the available space on the SD cards. Therefore, these cameras could have operated for several more months without maintenance.

A total of 2,616 images were recorded on the six cameras. The two cameras that were facing the Rio Grande at the paired camera stations had a large number of images without animals; which LANS biologists presume were triggered by the moving action of the river itself.

Various images of native wildlife, recreational hikers, and feral cattle were captured. A summary of the encounters is listed in Table 1 and samplings of images are in Appendix 2. The total number of encounters by species, camera location, and date are in Appendix 3.

Animal Species	Number of Encounters
American Robin	1
Black Bear	3
Bobcat	2
Canada Goose	1
Domestic dog	2
Unknown Duck Species	2
Feral Cow	8
Gray Fox	12
Human	16
Mallard	1
Mountain Lion	11
Unknown Mouse Species	1
Mule Deer	7
Red-shafted Flicker	1
Rock Squirrel	3
Striped Skunk	3
Unknown	6

Table 1. Species encountered and the number of encounters

DISCUSSION

Feral cattle were detected at both the inland camera stations, which were in sensitive riparian/wetland habitat, and the camera station on the north side of the mouth of Ancho Canyon along the trail next to the Rio Grande. At least three separate individuals were detected. During winter months the only green forage available is along the perennial flows from Ancho Springs; therefore, the feral cattle use these areas extensively. Evidence of damage from the cattle can be seen all along the Rio Grande (Figures 3 and 4).

Several mountain lion encounters were captured by the cameras. They are the largest predator in the area and their normal prey item is mule deer, which commonly weigh less than 200 pounds. Most of the feral cattle in the Reserve weigh upwards of 800 pounds, likely too large to be prey for a mountain lion. Mule deer were also frequently detected by the cameras, indicating that the natural food source for the mountain lions is available.

Figure 3. Soil and vegetation disturbance from a cattle bedding or wallowing area in the Reserve. Photo taken in May 2008.

Figure 4. Dead feral cow contaminating the Rio Grande in the Reserve. Photo taken in May 2008.

ACKNOWLEDGEMENTS

We'd like to thank the following people for support during this project: Stephen Fettig, Hallie Mahowald, Craig Martin, Dan Pava, and Jennifer Payne.

LITERATURE CITED

Bandelier National Monument (BNM). 1993. An Environmental Assessment to Decide How to Eliminate Feral Cattle from Bandelier National Monument. National Park Service, U.S. Department of Interior.

Bandelier National Monument (BNM). 2010. Feral Cattle Management Action 2010-11. Bandelier National Monument Newsletter. National Park Service, U.S. Department of Interior.

Purtymun, W.D., R.J. Peters, and J. W. Owens. 1980. Geohydrology of White Rock Canyon of the Rio Grande from Otowi to Frijoles Canyon. Los Alamos National Laboratory report LA-8635-MS.

Tobler, Carrillo-Percastegui, Pitman, Mares, and Powell. 2008. An evaluation of camera traps for inventorying large- and medium-sized terrestrial rainforest mammals. Animal Conservation 11:169–178.

York, E. C., T. L. Moruzzi, T. K. Fuller, J. F. Organ, R. M. Sauvajot, and R. M. DeGraaf. 2001. Description and evaluation of a remote camera and triggering system to monitor carnivores. Wildlife Society Bulletin 29:1228- 1237.

APPENDIX 1. NEWSLETTER FROM BANDELIER NATIONAL MONUMENT IN NOVEMBER 2010 REGARDING FERAL CATTLE

Bandelier National Monument

National Park Service
U.S. Department of the Interior

Feral Cattle Management Action 2010-11 *November 10, 2010*

The National Park Service (NPS) is considering a management action to address intrusion of feral (wild) cattle on park lands within Bandelier National Monument. The action consists of direct reduction, with the goal of preventing or mitigating impacts on monument cultural and natural resources and providing for visitor safety. The action would be as established through the "Decision Record on How to Eliminate Feral Cattle from Bandelier National Monument," which was developed through an Environmental Assessment and Finding of No Significant Effect. This document is available at http://parkplanning.nps.gov/27502.

Current Status

Park rangers have observed one bull and numerous tracks within the Monument, near the mouth of Frijoles Canyon. The bull is untagged and unbranded and is part of a larger group of seven seen on Department of Energy land adjacent to the monument. The herd is considered a visitor safety risk, as feral animals in the past have charged and threatened visitors and monument staff.

Background on Feral (Wild) Cattle

Feral cattle are the wild offspring of domestic cattle that were raised on land adjacent to the monument. They gain access to the monument along the Rio Grande, where seasonal fluctuations in water level allow access across the river and past monument fences. Feral cattle are different from branded and tagged cattle, because they do not have an owner to take responsibility for them. When monument staff encounter tagged and branded trespass cattle in the monument, brand identification allows for identification of the owners, who will be contacted and who will have the responsibility for removing their livestock from the monument.

Reports of trespass cattle in the monument began in 1968 and continued at regular intervals until 1993, in numbers ranging from a single animal to groups of up to twenty animals. Staff managed the cattle by citation of owners (for branded cattle), efforts to herd them out of the monument, public appeals for owners to come forward and claim their animals, and shooting of aggressive individual animals. During the 1980s and 90s, the feral cattle population grew to a herd of 20-30 feral cattle located along the environmentally sensitive Rio Grande portion of Bandelier National Monument. Following comprehensive environmental study, the monument undertook management of feral cattle through direct reduction by shooting.

Feral cattle management is an issue common to Bandelier National Monument and its neighbors: Santa Fe National Forest, the Department of Energy, and Los Alamos County. The monument minimizes its exposure to feral cattle by maintaining boundary fences in good condition along the Rio Grande. However, seasonal low water levels render the fences ineffective and allow ongoing cattle intrusion.

Significance of Bandelier National Monument

Bandelier was designated as a National Monument in 1916 by President Wilson (Presidential Proclamation No. 1322; 39 Stats. 1794), largely because of its "tremendous ethnographic, scientific and educational value." Bandelier National Monument contains approximately 2,900 recorded archeological sites ranging from the Paleoindian period (10,000 years ago) to the historic period. The monument includes ancient hunting camps, "cavate" structures (unique to the Bandelier area), 20 to 300+-room pueblos, small farming hamlets, and the remains of historic corrals and log cabins. In Frijoles Canyon, the monument has one of the largest collections of buildings constructed by the Civilian Conservation Corps (CCC) between 1933 and 1942. The Frijoles Canyon area was designated a National Historic Landmark in 1987, commemorating the accomplishments of the CCC. To recognize the wilderness values of the monument, President Gerald Ford signed into law in October 1976 the 23,267 –acre Bandelier Wilderness (Public Law 94-567).

Cultural Resource Issues and Concerns

Cattle impact archeological sites where they exist within the monument. There are three categories of impacts to archeological sites from the presence of the animals. These include 1) trampling, 2) trailing and 3) bedding areas. Trampling occurs in areas of where animals congregate, such as watering holes or feeding areas. The primary impact from trampling is fracturing or crushing artifacts. Structural features are also impacted by displacing or breaking of building elements (commonly stone masonry elements) found on archeological sites.

Trailing is a common impact in areas where cattle are present. Trailing initiates and increases soil erosion, which has direct impacts on archeological sites. Erosion caused by livestock grazing affects structural features and also causes scattering of artifacts.

Impacts from bedding areas include displacing artifacts and disturbance of surface and subsurface artifacts and stratigraphy. Bedding areas also impact structural features found on archeological sites.

Natural Resource Issues and Concerns

Cattle impact biological resources within the monument, including aquatic and plant resources. Feral cattle living along the Rio Grande occupy an area inundated by Cochiti Reservoir during the mid-1980's, which effectively killed all the vegetation (native and exotic) and deposited many feet of nutrient rich, fine sediments. Within a couple of years after this water holding event the system was almost entirely exotic in composition; by the early to mid-1990's native

vegetation was beginning to establish (especially willow along the banks of the river).

Cattle grazing on the herbaceous component (mostly exotic), breaking standing woody brush (i.e. willow), soil disturbance (hoof action and wallowing), and fecal droppings have all contributed to maintaining exotic vegetation along the river corridor (including establishment and spread of several noxious weeds). Aesthetically, the cattle trampling, wallows, trails, and droppings all create a negative visual environment which degrades an otherwise dramatic wilderness river canyon setting.

Additionally, grazing by cattle along the Rio Grande may pose a high risk to riverside willow habitats, which support a diverse animal community. The browsing impacts on willows may have indirect impacts on potential endangered southwestern Willow Flycatcher breeding habitat. At least one occurrence of this flycatcher has been documented above Cochiti since 2000, and park managers seek to encourage habitat within the park that would allow this bird to become established locally.

Management Action

Park staff developed a plan to eliminate feral cattle in 1994, and since then have managed feral cattle through direct reduction (by shooting). Numerous comments were received and considered in developing the plan to eliminate feral cattle, and the resulting decisions have served the park well in managing trespass feral cattle for the last sixteen years.

Commissioned park rangers use either a direct head shot or a heart/lung shot under conditions of good visibility, with the goal of speediest feasible cessation of neurological activity. Rangers do not attempt reductions under adverse conditions that would not allow for humane management of the animals. The carcasses are left on site, available for scavenging by native wildlife.

Under the established plan to eliminate feral cattle, reduction actions are calendared from November to March. NPS is considering action during that time period in 2010-11.

The park acted on November 19, 2008 to undertake an alternative method for elimination of feral cattle. Working in concert with the New Mexico State Farm & Livestock Board, the park retained private individuals (cowboys), who assessed the feral cattle and concluded that they could herd them from the mouth of Frijoles Canyon, up the Falls Trail, to a holding pen near park headquarters. During the operation, all attempts to herd these animals failed. By the end of the sixth day of herding, following enormous effort, four (4) calves were successfully removed from the park. A total of six (6) cows and two (2) calves died from stress along the trail below the Lower Falls. One aggressive bull with horns charged and injured a horse. The bull continued to threaten the safety of the cowboys and the horses and was killed.

Park staff concluded that this alternative elimination method was a failure, as it exposed the participants to significant safety risks, it imposed unnecessary suffering on the animals, and the animals that died during the removal attempt did so near waterways and trails such that water quality and visitor experience were impacted for months.

What does this comment request mean?

NPS' experience has been that direct reduction is the most effective and humane means of eliminating feral cattle from Bandelier National Monument. However, NPS is amenable to receiving comments on reduction methods that are feasible under federal law and policy, provide for resource protection and visitor and staff safety, are appropriate under park conditions of terrain, weather and access, and provide for humane management of the animals.

Please let us know by November 24, 2010

- If you wish to comment on the park's management action to eliminate trespass feral cattle within Bandelier National Monument.

You may submit your comments in the following ways:

- A copy of this newsletter and other relevant documents will be posted to the NPS Planning Environment and Public Comment (PEPC) system. This system allows for users to submit comments electronically. It can be accessed at http://parkplanning.nps.gov.

- You may submit written comments to: Superintendent, Bandelier National Monument,15 Entrance Road, Los Alamos, NM 87544-9508.

- Or you may hand deliver comments to Bandelier National Monument at the above address.

If you wish to be added to the park's mailing list for this and other announcements please indicate that in your response.

APPENDIX 2. A SAMPLING OF IMAGES FROM THIS PROJECT

Two feral cows following the Rio Grande at camera two

A hiker seen at camera two

Single feral cow wallowing in a spring below the view of the camera at camera five

A hiker seen at camera five

Gray Fox at camera one

Very rotund Black Bear at camera one

A family of mountain lions, an adult and two young, at camera three

A Mule Deer buck on camera two

A Bobcat at camera two

A Striped Skunk on camera two

APPENDIX 3. TABLE OF TOTAL NUMBER OF ANIMALS BY THE DATE AND CAMERA LOCATION

Species and Date	Camera One	Camera Two	Camera Three	Camera Four	Camera Five	Camera Six
American Robin			1			
11/22/2012			1			
Black Bear	1	1	1	1		
11/2/2012	1					
11/3/2012			1	1		
11/13/2012		1				
Bobcat		2				
11/1/2012		1				
12/1/2012		1				
Canada Goose				1		
1/20/2013				1		
Domestic dog		1			1	
11/11/2012		1				
1/13/2013					1	
Unknown Duck			2			
12/11/2012			1			
12/22/2012			1			
Feral Cow	3	3			3	1
11/8/2012					1	1
12/11/2012	1				1	
12/12/2012					1	
12/20/2012	1	2				
1/1/2013		1				
1/7/2013	1					
Gray Fox	6	1	5	2		
10/12/2012	1	1				
10/13/2012	1					
10/14/2012	1					
10/16/2012	1			1		
10/17/2012	1		1			
11/4/2012	1					
12/4/2012			1			
12/9/2012			1			
1/12/2013			1			
1/20/2013			1	1		
Human	1	2	6	13	3	1
10/14/2012			1	10		
10/19/2012					2	
12/1/2012					1	1
1/5/2013				1		

1/10/2013		1	2			
1/14/2013	1	1	2	1		
1/19/2013			1	1		
Mallard			1			
12/21/2012			1			
Mountain Lion	4	1	8	5		
10/17/2012			3	2		
10/20/2012	1		1	1		
12/4/2012	1					
12/5/2012	1					
12/9/2012			1	1		
12/12/2012			1			
12/30/2012		1	1			
1/5/2013	1		1	1		
Unknown Mouse			1			
12/22/2012			1			
Mule Deer	2	8	3	1		
11/2/2012	2	3	1			
11/7/2012		1				
11/14/2012		3				
12/2/2012			1			
12/4/2012		1				
12/27/2012			1	1		
Red-shafted Flicker				1		
1/14/2013				1		
Rock Squirrel	1	1		1		
10/18/2012				1		
10/29/2012	1					
12/12/2012		1				
Striped Skunk	1	2	1			
10/18/2012	1	1				
10/27/2012		1				
11/13/2012			1			
Unknown	4		1		1	
10/12/2012	1					
10/17/2012	1					
10/26/2012	1					
12/4/2012			1			
12/6/2012					1	
12/18/2012	1					