

**ENVIRONMENTAL ASSESSMENT
OF THE
GAME MANAGEMENT UNIT 2C
VEGETATIVE TREATMENTS**

**PREPARED BY
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I. INTRODUCTION

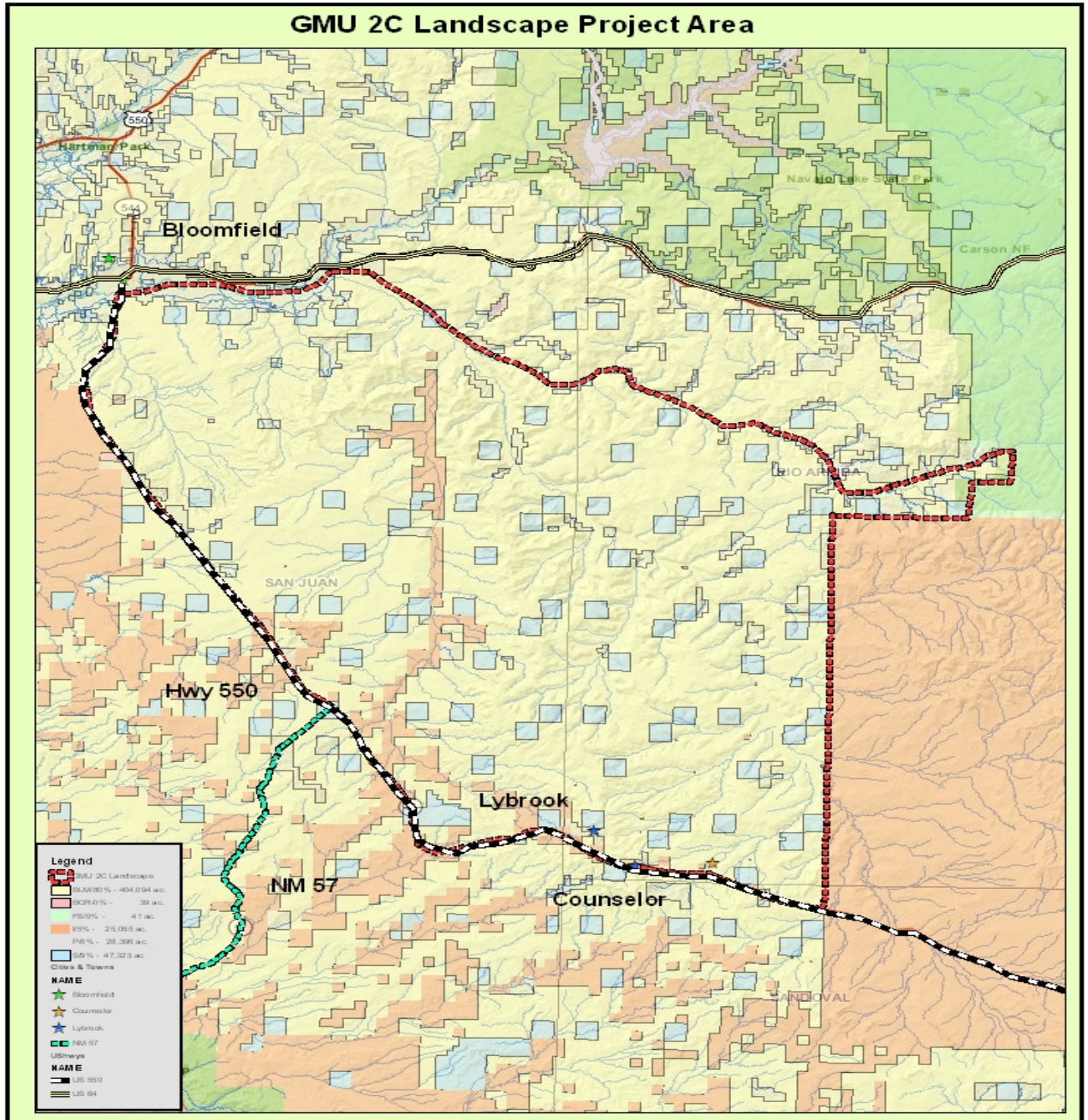
The preparation of this environmental assessment is being done as a means to solicit multidisciplinary as well as interagency input for consideration in selecting the appropriate alternative. This process is mandated by the National Environmental Policy Act of 1969 (as amended) and the Federal Land Policy and Management Act of 1976. The Proposed Action as well as the No Action alternative will be analyzed and compared. A variety of vegetation treatment methods are being proposed for consideration under the Proposed Action, i.e. prescribed fire, roller chopping, hydromowing, Dixie harrow, disking and seeding, chainsaws. The intent of this document is to analyze the impacts of applying these treatment methods to two dominant vegetation types within Game Management Unit (GMU) 2C, which is located in northwest New Mexico. GMU 2C encompasses 505,139 acres of mixed status lands, but primarily public lands administered by the Farmington Field Office of the Bureau of Land Management (see Map 1). While the GMU 2C Vegetation Treatments Project is proposed for BLM lands only, it is the BLM's intent to coordinate with the State Lands Office (SLO), the Jicarilla Apache Nation, the USFS and the NMDGF regarding projects in place or proposed within or adjacent to the project area so as to ensure resource benefits that cross jurisdictional boundaries.

The vegetation types to be considered, relative to the treatment methods listed above, are Wyoming big sagebrush (*Artemisia tridentata Wyomingensis*) and pinyon pine (*Pinus edulis*) / one-seed juniper (*Juniperous monosperma*). A group of site specific vegetation treatments will be presented as part of the Proposed Action in this document. However, these projects do not constitute an end point to this overall effort. It is intended that the environmental analysis for future vegetation treatments in GMU 2C will be tiered back to this document in accordance with the BLM's Manual H-1790-1 National Environmental Policy Act Handbook. Specifically, the administrative mechanism used will be the (DNA) Documentation of Land Use Plan Conformance and National Environmental Policy Act (NEPA) Adequacy. Use of the DNA will provide a concise and expeditious means to review future vegetation treatments and allow for their implementation.

Ia. Need for the Proposed Action: The impetus for the proposed action stems from a desire to increase the fawn:doe ratio of mule deer (*Odocoileus hemionus*) in Game Management Unit 2C and in turn the overall population. This objective is consistent with the New Mexico Department of Game and Fish's (NMDGF) Comprehensive Wildlife Conservation Strategy which lists mule deer as a species of "Greatest Conservation Need". In addition, NMDGF has also identified GMUs 2A, 2B and 2C as deer emphasis units where the goal is to maintain or increase mule deer numbers. Annual helicopter surveys of deer and elk (*Cervus elaphus*) are conducted each winter by NMDGF in various portions of GMU 2A, 2B, and 2C. Typically, the preponderance of the deer observed in GMU 2A and 2B are migrants from southern Colorado or the Jicarilla Ranger District. In both units, but especially where the bulk of the animals summer in Colorado, the fawn:doe ratios have averaged (over the past three years) 61 fawns per 100 does in GMU 2B and 70 fawns per 100 does in GMU 2A. It should be noted however, that for 2A only one year of data (2007) was available. Conversely, the average fawn:doe ratio in

GMU 2C over the past three years (as determined by helicopter surveys) was 38 fawns per 100 does. The significance of this is that most of the deer in GMU 2C are resident animals, especially those found west of the Largo Canyon drainage (J. Hansen, personal

Map 1 – GMU 2C Project Area



observation). Typically, 40 to 50 fawns per 100 does are needed to maintain a viable deer population. Numerous references in the scientific literature suggest that one of the probable causes of this disparity could be the difference in the quality of the summer

range (Dietz et al. (1962), Jensen and Robinette (1955), Julander et al (1961), Verme (1969). This speculation becomes more plausible when one considers the similarities of winter range, which is the other major limiting or influencing factor of a deer population's overall well being. The key winter range in GMU 2B (Rosa Mesa) and 2A (LaPlata) varies from being mostly poor in the Rosa (72% of browse studies are in unsuitable condition) to fair in LaPlata (48% in unsuitable condition). Conversely, winter range in GMU 2C is mostly fair (47% of studies are in unsuitable condition) (See Map 2 – Browse studies in GMU 2) but fawn to doe ratios are significantly lower than either GMU 2A or 2B. While no empirical data exists to substantiate the differences between the summer range in 2C and 2A/B it is apparent through casual observation that the higher elevation habitats in southern Colorado support a more prolific cool season herbaceous plant community than what is generally available in GMU 2C.

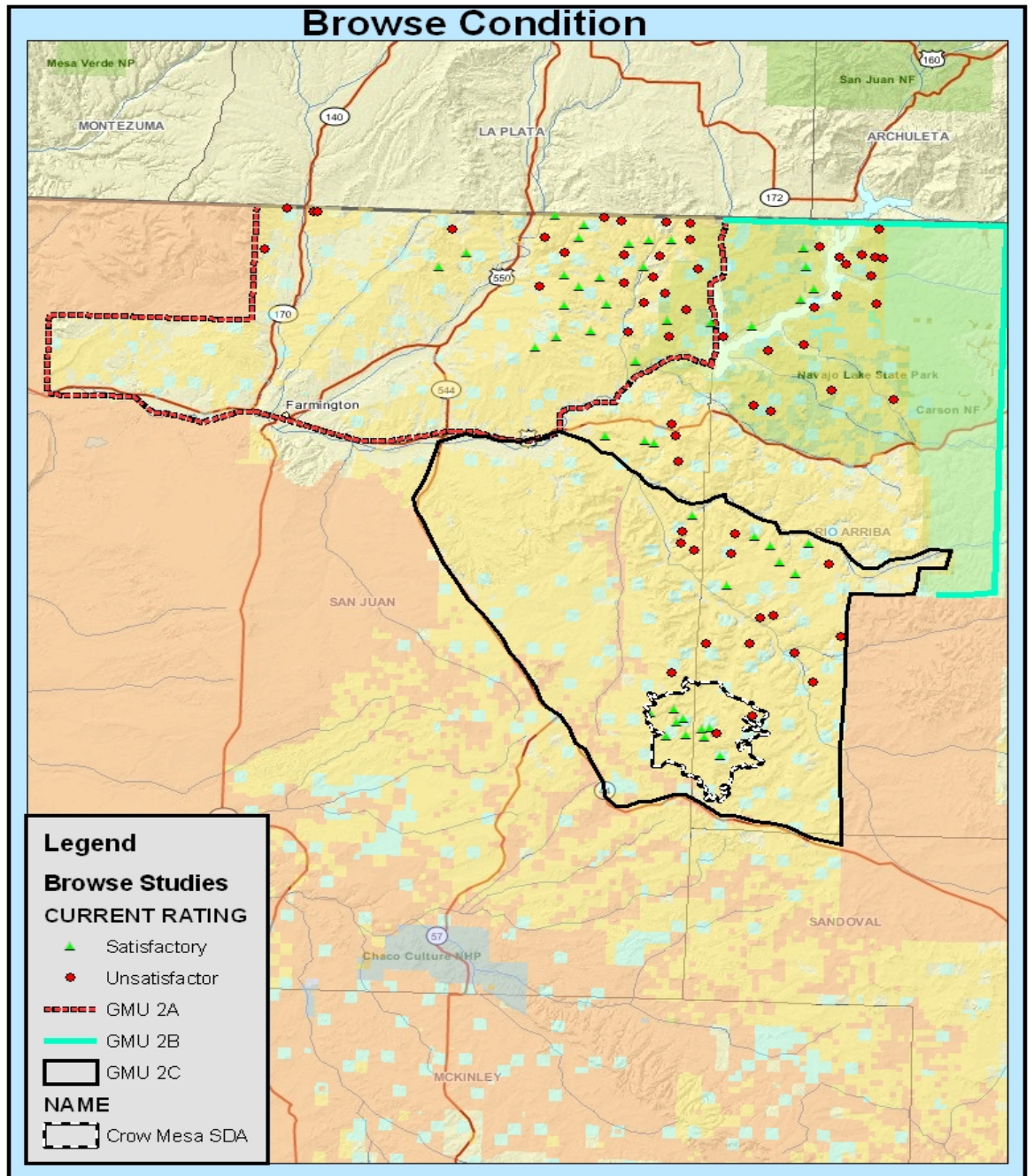
While it is recognized that there may climatic differences between GMU 2C and southern Colorado due to elevation and latitude it is still believed that significant vegetation treatments (as identified in the Proposed Action) can be successfully implemented. Historically, there have been numerous range improvements in GMU 2C where cool season grasses have been established through mechanical treatments. Leckenby et al (1982) identified a number of grass species that are beneficial to mule deer during their early green-up period. Palatability and protein content are highest at this time.

The primary objectives of the vegetative treatments being proposed by this document are:

1. Increase the amount of early season (March – June) herbaceous vegetation as a means to provide high protein forage to lactating mule deer does. Adequate protein is critical to animal maintenance, growth and milk production (Dasman, 1981). Robbins et al. (1981) found that in general, large lactating mammals increased their energy expenditure by 65 to 215 percent beyond that of non-lactating females. Similarly, Dietz et al. (1962) determined that protein content in forbs, grasses and browse in early spring can be as much as 20 to 30 percent compared to only 3 or 4 percent by fall. Cantu and Richardson (1997) reported that forbs comprise approximately 25 percent of a deer's diet and that protein levels often exceed 14 percent. Conversely, grasses on a year-long basis represented about 5 percent of a mule deer's diet. It is important to note, however, that most of this use came during the early spring when grasses were initiating growth and had unusually high protein levels and were palatable to deer. Later in the season, as the grasses grow they develop increased amounts of lignin and cellulose, which inhibit deer's ability to digest them. Therefore, the goal will be to focus treatments on soils conducive to the establishment of cool season grasses and forbs. The anticipated high protein forage should increase the milk production of female deer in the area. It is hoped that the consequence of this will be increased recruitment of young into the resident deer population.

2. Increase the amount of available browse by 50 percent on those pinyon/juniper

Map 2 – Browse Study Locations GMU 2A, 2B and 2C.



sites treated for wintering deer. The rationale in doing this is that it will enable the animals to maintain better body condition through the winter and enter the spring birthing period in better physical condition. This should translate into stronger, healthier young being born with a better chance for survival (Verme, 1962).

3. By the year 2012 increase the fawn to doe ratio by about 20 percent throughout GMU 2C.

Ib. Conformance with the Land Use Plan: The actions identified in this document were included in the description of continuing management guidance described in the Farmington Proposed RMP/Final Environmental Impact Statement (March 2003). The actions conform to the management decisions included in the Final RMP as approved by the September 2003 Record of Decision. In addition to general guidance, the Farmington Resource Management Plan with Record of Decision (December 2003 p. C-159) includes specific management prescriptions for the Crow Mesa Wildlife Area.

Ic. Relationship To Statutes, Regulations, or other Plans: The preparation of this environmental assessment is consistent with the provisions of the National Environmental Policy Act of 1969 (as amended) and the Federal Land Policy and Management Act of 1976. In addition, the Proposed Action is consistent with the mandate of the Endangered Species Act of 1973 and the Fish and Wildlife Coordination Act of 1958. The vegetation treatments and the vegetation types identified in the Proposed Action were also analyzed in the Final Environmental Impact Statement Vegetation Treatment on BLM Lands in Thirteen Western States, dated may 1991.

The actions proposed within this document are also consistent with the State of New Mexico's Department of Game and Fish' Comprehensive Wildlife Conservation Strategy (CWCS). This plan identifies priority wildlife species and habitats, assesses potential threats to their well being, and identifies long-term conservation measures. Within the Intermountain Basins Big Sagebrush Shrubland, the CWCS lists profound vegetation changes that have impacted wildlife populations, including those of mule deer. These changes include a drastic reduction in the cool season perennial grass and forb component of the ecosystem, a corresponding expansion of older age-class, less productive woody shrubs, an invasion of exotic annual grasses, and a long-term net-loss of important browse species. These landscape level changes have reduced habitat quality and quantity for mule deer, along with habitat for bird and small mammal assemblages and associated top-level predators. Title 43 of the Code of Federal Regulations, Part 24 provides guidance and justification for the BLM's support in implementing state CWCS's.

In addition to the above, the actions identified within this document are supported by the Sikes Act Northwest Region 2010-2014 Habitat Improvement Plan.

II. PROPOSED ACTION AND ALTERNATIVES

Iia. Proposed Action: The Proposed Action will take place within the boundaries of GMU 2C (see Map 1). Implementation of the various components will begin in the fall of 2007 and continue for the next five years (2012). Funding will be the primary constraint in determining the rate at which the projects are developed. Other factors such as timing of grazing deferments, inclement weather and personnel issues could also impact progress. Specific projects have been proposed for implementation during the fall of 2007 and 2008 (see Map 3 below). It is anticipated that additional vegetation treatments totaling as much as 10,000 acres will be planned elsewhere within GMU 2C as

the project proceeds.

The following vegetation treatments methods would be employed during the period 2007 through 2012 to attain the resource objectives described above (see Ia.). All of these treatment methods will entail the seeding of plant species that provide early season high protein forage. To the extent possible native species will be utilized; however, there are situations where non-native species will be used to improve the chances for success in meeting the project objectives. The composition of the seed mix may vary with the soil and vegetation type being treated but in all cases the species selected will be beneficial to wildlife. A list of the plant species to be considered is presented in Table 2 below. Additional discussion as to the rationale in using some non-native species follows this table.

1. Roller chopping/Seeding – It is anticipated that approximately 3,000 to 5,000 acres of pinyon/juniper woodlands will be treated in scattered tracts throughout GMU 2C. Roller chopping consists of using a large bulldozer to pull a pair of cylindrical steel drums approximately 4.5 to 6.0 feet in diameter by 8 to 12 feet wide over the target vegetation. The bulldozer pulling the drums will also have its blade lowered to within about 3 feet of the surface of the ground to assist in pushing over some trees but leaving any browse plants intact. The outer surface of the drum is equipped with steel blades that span the width of the drum. Depending upon the size of the drums being used, the weight of the drums will increase from 20,000 to 35,000 pounds empty to 26,500 to 43,000 pounds when filled with water (Zachman, 2003). This method will be used in the treatment of pinyon/juniper stands where the under-story herbaceous vegetation (grasses and forbs) is generally very sparse, e.g. typically comprises 5 percent or less of the basal cover. In addition, it is anticipated that roller chopping will be used on those woodland sites where the over-story canopy cover of pinyon and juniper is 25 percent or less. Only those pinyon/juniper sites where the soils are predominately clay-loam to sandy loam will be treated. Those woodland sites with significant areas (i.e. 40 percent or greater) of sandstone slick-rock outcroppings will be avoided and left as cover. The intent within any block of trees treated will be to create a mosaic of woodland cover interspersed with browse and herbaceous vegetation. All trees 20 feet or greater in height or pinyon 10 inches and juniper 14 inches or greater in diameter (chest high) will be avoided if possible. However, given the width of the equipment and lack of maneuverability, this may be difficult to consistently accomplish. Simultaneous to the roller chopping an electronic seeder mounted on the front of the tractor pulling the roller chopper will be dispensing a mix of cool season grass and forb seed as well as browse species such as antelope bitterbrush and true mountain mahogany. It is anticipated that the soil disturbing action of the tracks of the bulldozer and the roller chopper will result in much of the seed being covered with soil. The optimal time to conduct the roller chopping/seeding operation will be in late fall; preferably during the month of November just prior to a lasting snowfall. Conducting the treatment at this time will accomplish two things: one, there will not be any nesting birds or bats at this time, and two, the snow and cold temperatures will protect the seed from birds, rodents and insects and allow it to lie dormant all winter. In the spring, if sufficient winter snow has fallen, the soil should be very moist and conducive to the seeds germinating.

2. Dixie Harrow/Seeding – The Dixie harrow will be used in the Wyoming big sage vegetation type as a means to establish cool season grasses and forbs. It is comprised of six to eight steel pipes, four inches in diameter by about six feet long that trail behind a spreader bar. The pipes are equipped with steel spikes about four inches long that are placed about eight to ten inches apart. The spikes pipes are attached to the spreader bar by way of a swivel that allows the pipes to rotate as they are pulled through sagebrush. This rotating action accomplishes two things: one, it enables the pipe to shed brush that may have accumulated behind the spikes and two, it allows for more soil disturbance and a greater kill of the sage plants. It is anticipated that about 30 to 70 percent of the sage will be killed with one pass of the Dixie harrow (Vallentine, 1971). Younger sagebrush and seedlings are mostly left intact, ensuring a diversity of sagebrush age classes and herbaceous understory. An important part of the dixie harrow treatment is the reinvigoration of the sagebrush component of the system, especially the younger age class, which is more highly palpable and nutritious. A mix of cool season grasses and forbs will be spread (simultaneous to the harrowing) by a broadcast seeder attached to the front of the rubber tired tractor pulling the harrow.

3. Prescribed Fire/Seeding – Prescribed fire will be used primarily in sagebrush areas that are lacking in desirable under-story herbaceous vegetation as a means to prepare a seedbed for the drilling of cool season grasses, forbs or shrubs (See Table 2). The most notable example of where fire in sage/grass settings will be applied is where cheat grass has overwhelmed a site (e.g. Adam’s Canyon and Blue Mesa Canyon). In these areas prescribed fire will be used to destroy the current year’s crop of cheat grass seed and as much of the residual seed in the top one to two inches of soil as part of a seed bed preparation. Most burns will be relatively small; therefore, ignition will (usually) be by handheld drip torch. Burning in preparation for the disking and seeding will generally take place in late summer or early fall under a relatively hot prescription so as to remove the majority of the project site’s vegetation. Following this, a tractor will be used to pull a disk followed by a rangeland drill over the burned area to seed the desired species. In areas dominated by cheat grass, non-native species such as crested and Siberian wheatgrass, Delar small burnett, and forage kochia (*Kochia prostrata*) will be utilized as a means to compete with the cheat grass re-establishment. Waldron (2002 unpublished presentation) and Wilkinson (2007 personal communication) both reported success in using forage kochia to impede the return of cheat grass to areas that were treated with prescribed fire followed by soil tillage and seeding. They also found that elk, mule deer and cattle used forage kochia extensively.

4. Disk/Seeding – This treatment method will be utilized primarily in areas that are severely degraded due to invasion of non-natives such as cheat grass or a general absence of ground cover. At this point in time areas meeting these criteria are the Adam’s Canyon and Blue Mesa (Canyon) RX Burn/Disk/Seed projects. A tandem disk will be pulled over the project site using a four wheel drive tractor or medium sized bulldozer. The disking/seeding operation will take place either during the monsoon season (July 16 – September 15) or in the late fall prior to lasting snows. The intent of timing the disking/seeding during these periods is to take advantage of the summer monsoon moisture or the dormant season moisture that accumulates in the soil for spring growth.

It is hoped that seeding during either of these times will improve the chances for the seeded species to germinate and become established. Seed mixes will be tailored for each individual site but common to all will be that they contain cool season species that will provide early season, high protein forage. The seed mix proposed for the Adam's Canyon and Blue Mesa projects will adhere to these criteria. In addition, forage kochia (*Kochia prostrata*) will be seeded on these sites as a means to reduce the dominance of the cheat grass as well as provide high protein forage and be able to compete with cheatgrass, if present on site. The forage kochia seed will be broadcast over the area where the other species were drilled. This operation will take place in December or January when there may be snow cover. The intent is to place the seed on or near the soil surface.

5. Hydromowing – This treatment method will consist of thinning stands of pinyon and juniper trees (on a selective basis) as well as Wyoming sage/grass parks using a track driven tractor with a large mower mounted on hydraulic arms located on the front of the vehicle. All of the pinyon and juniper that are 5 to 7 inches or less at the base will be mulched using a machine called a hydromower. Thinning the trees in this manner will result in a mosaic vegetation pattern with a high degree of contrasting vegetative interspersion. Treatment sites bounded by roads will have a 40 to 50 foot tree buffer left adjacent to the roads to provide a visual screen from passing vehicles so that wildlife will feel more secure in using the treated area. In some areas, where the Gamble's oak has become so thick as to be impenetrable by wildlife, the oak will be mulched only to the extent necessary to continue the mosaic pattern, enhance the growth of grasses and forbs, and allow wildlife access. It is desired that significant amounts of mature, mast bearing oak be maintained for use by wildlife. The sage parks will be thinned so as create a mosaic of untreated mature sage interspersed with areas of grasses and forbs. In some cases, where key browse species such as antelope bitterbrush and true mountain mahogany have grown beyond the reach of deer and elk, they will be pruned by the hydromower to a height of about three feet. These will stimulate growth and make it more available to big game animals. Immediately prior to mulching the trees or the sage, seed will be broadcast by individuals walking over the area with hand-held whirlybird seeders. The seed mix and rates may vary from site to site depending upon the soils, aspect and elevation and presence/absence of cheat grass.

6. Chainsaws/Prescribed (RX) Fire/Seeding – Chainsaws will be used to selectively thin the pinyon pine and one-seed juniper trees in areas not conducive to using mechanical equipment such as the hydromower, roller chopper or Dixie harrow. Currently, the Escrito Mesa PJ Treatment (152 acres) is the only project planned for treatment using chainsaws and fire. The thinning prescription will require the falling of all pinyon pine trees 5 inches or less and all one-seed juniper trees 12 inches or less at the base. The trees will not be bucked or in most cases piled except where necessary to avoid burning key vegetation, e.g., cavity nest sites, bat roosts, cultural sites, etc. or to influence fire behavior when burning the slash. Burning of the slash resulting from the thinning operation will occur under a cool prescription so as to not kill desirable browse such as true mountain mahogany, antelope bitterbrush, Fendler bush or significant numbers of the remaining trees will which serve as thermal/escape cover for wildlife. Care will need to

be taken when igniting the project area due to the enhanced dead fuel loading (post thinning) so as to not burn the area too hot. It is desirable to conduct an early spring burn (March 15 – April 15) when soil moisture should be high and night time temperatures low and relative humidity high. This is consistent with the findings of Leege and Hickey (1971) who found that browse mortality was low at this time, it re-sprouted well, and there was adequate time for re-growth of the burned area so that the animals returning the following winter would have something to eat. If conditions are not conducive to burning during this timeframe then a fall burn (mid to late November) may be considered, but this is not the preferred time. Following the burning phase of the Proposed Action the project area will be seeded by hand using whirlybird seeders. A mix of cool season grasses, forbs and shrubby browse species will be used (see Table 2).

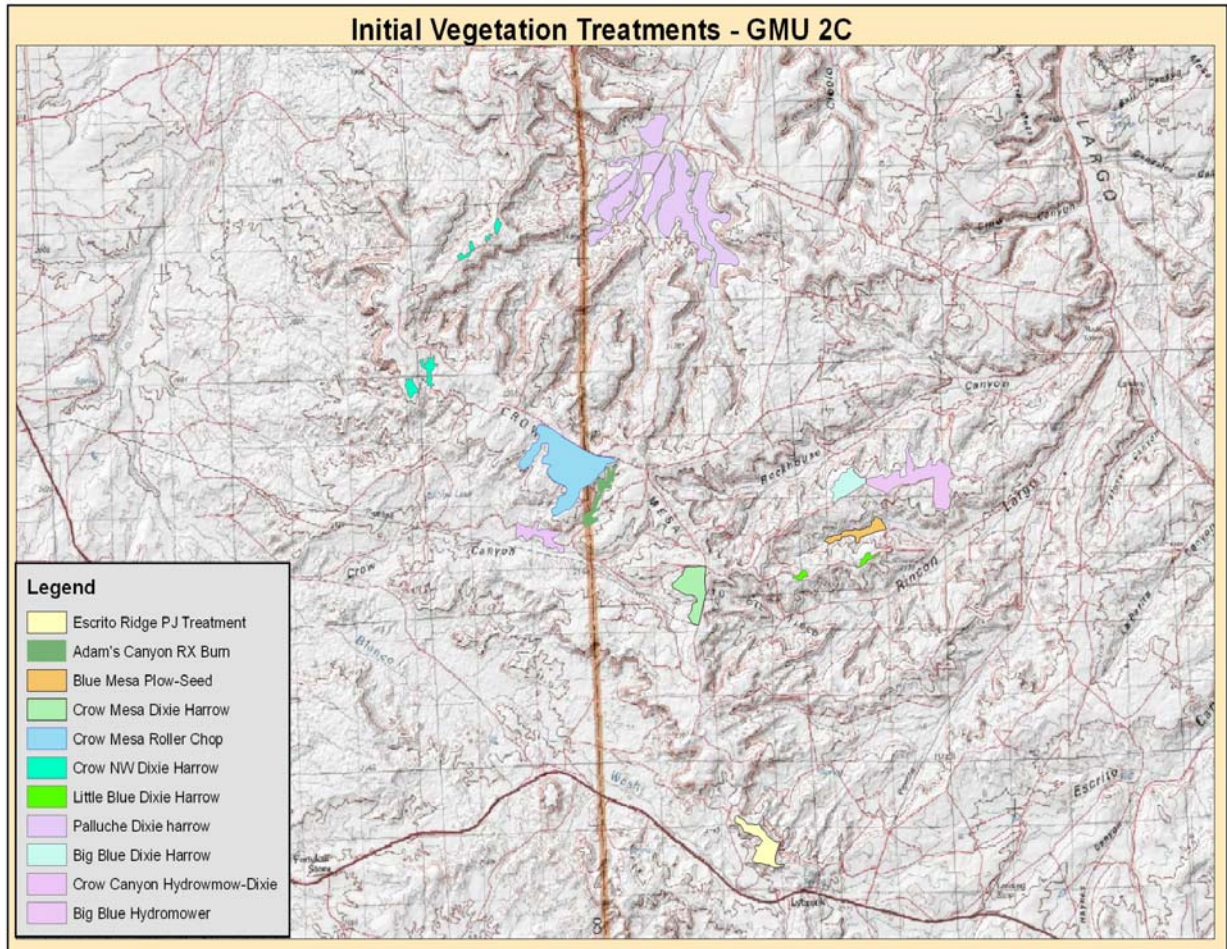
Projects currently identified are listed in Table 1 below.

Table 1. Proposed Vegetation Treatment projects for 2007 - 2008.

Project Name	Acres	Location	Vegetation Type	Implementation Year
Crow Mesa Roller Chop	409	T24N, R7W, Sec. 1, 11, 12, 7	Pinyon/juniper	2007
Crow Mesa Dixie Harrow	169	T24N, R7W, Sec. 20, 21	Wyoming sagebrush	2007
Blue Mesa Dixie Harrow	30	T24N, R7W, Sec. 14, 22, 23	Wyoming sagebrush	2007
Blue Mesa Plow/Seed	79	T24N, R7W, Sec. 14	Wyoming sagebrush	2007
Crow Mesa NW Dixie Harrow	89	T25N, R8W, Sec. 23, 26, 27, 34/ T24N, R8W, Sec. 3, 4	Wyoming sagebrush	2007
Adams Canyon Plow/Seed	75	T24N, R7W, Sec. 7, 18	Wyoming sagebrush	2007
Crow Canyon Dixie Harrow	134	T24N, R8W, Sec. 13, 14	Wyoming sagebrush	2007
Big Blue Dixie Harrow/Hydroxmower (Block A)	100	T24N, R7W, Sec. 11	Wyoming sagebrush	2007
Big Blue Hydroxmower (Block B)	294	T24N, R7W, Sec. 11, 12; T24N, R7W, Sec. 11, 12, 13; T24N, R6W, Sec. 7, 18	Wyoming sagebrush	2007
Escrito Ridge PJ Thin Treatment	152	T23N, R7W, Sec. 4, 9, 10	Pinyon/juniper	2008

Palluche Canyon Dixie Harrow	1,163	T24N, R7W, Portions of Sec. 17-21, 28	Wyoming sagebrush	2008
Total acres:	2,694			

Map 3 - Specific vegetation treatment projects proposed for 2007 -2008.



Field surveys were conducted within each of the proposed project sites listed above for the purpose of determining the vegetative cover, and in some cases, the ecological condition and trend. The method used to collect the cover information was the step-point, four tier cover transect, (USDI/BLM, 1999). In addition to this, range condition and apparent trend in range condition were also determined for the sage/grass sites in accordance with guidance contained in the National Range Handbook H-4410-1, Section 305.5 (USDI/BLM, 1990). These data, and the accompanying analysis, provide the justification for treating these particular plant communities. A summary providing a brief synopsis of the current condition of the various proposed projects is given in Appendix A. Projects in each habitat type, i.e. pinyon pine/one-seed juniper versus Wyoming big

sagebrush/perennial grasses are presented in separate categories.

Table 2 – Potential species to select from in formulating individual treatment area seed mixes.

Species (Cultivar)		
GRASSES	FORBS	SHRUBS
Western Wheatgrass	Globemallow	Winterfat
Snake River Wheatgrass	San Juan Narrowleaf Penstemon	Forage Kochia*
Thickspike Wheatgrass	Palmer Penstemon	Antelope Bitterbrush
Indian Ricegrass	Alfalfa (ladak)*	Mountain Mahogany
Siberian Wheatgrass *	Blue Flax	Fourwing Saltbush
Alkali Sacaton	Showy Goldeneye	Wyoming Sagebrush
Crested Wheatgrass*	Small Burnet (delar)*	Winterfat
Pubescent Wheatgrass *	Yellow Sweetclover	
Basin Wildrye	Aster, Pacific	
Russian Wildrye	Utah Sweetvetch	
Sandberg Bluegrass		
Bluebunch Wheatgrass		
Sideoats Grama		
Blue Grama		
Muttongrass		
Sand Dropseed		
Orchardgrass (Paiute)*		
Bottlebrush Squirreltail		

* Denotes species not native to North America.

IIa.1 – Rationale for use of non-native species: In recent years, cheat grass, a highly invasive species, has spread throughout not only GMU 2C but much of the Farmington Field Office area. Native herbaceous species at some highly disturbed locations are largely absent due to the overwhelming competition from cheatgrass (primarily) and other exotic annual weeds. Past vegetation treatments of Wyoming big sage sites using the herbicide tebuthiuron have not been uniformly successful in advancing the spread of desirable native species into barren interspaces prior to their occupation by cheat grass. In situations such as these it is felt that if one is to reduce the dominance of cheat grass on the site it is felt that plant species possessing a more competitive edge must be utilized. In this regard forage kochia in conjunction with crested wheatgrass, as well as some native species, has proven successful in northern Nevada in displacing cheat grass (Wilkinson, 2007 – personal communication).

Conversely, on sites where cheat grass is not an issue, but harsh site conditions are, the use of some non-natives that have a proven record of ease of establishment and provide high protein forage to wildlife lend themselves well to meeting the overall project objectives. Generally, in these situations the ecological condition has declined over time

with cool season grasses being largely absent. However, it is still the intent to use native species as much as possible, depending upon seed availability and cost, so as to create a self-sustaining diverse herbaceous community.

IIb. No Action Alternative: Under the No Action Alternative there would be no vegetative treatments conducted within GMU 2C. Pursuing this course of non-action would likely result in the natural succession of the pinyon/juniper and sagebrush/grass vegetation types towards plant communities where herbaceous species are generally absent or grossly under-represented. Similarly, in the pinyon/juniper plant community, desirable browse species such as antelope bitterbrush and true mountain mahogany would likely not be attaining their potential in terms of forage production, density of plants and overall reproductive capability. The premise in making this assertion is that over time the competition for soil moisture, nutrients and sunlight from the over-story pinyon/juniper and sagebrush would exceed the herbaceous and shrubby browse plant species ability to compete for these elements. From an overall ecological perspective, succession of this sort within these plant communities would have a negative impact upon many of those animal species that inhabit them. In general, it is desirable that a significant portion of a deer's home range be in an early seral condition as opposed to a climax state (Patton, 1992). Within an early seral stage, there would be a greater amount of perennial herbaceous and shrubby browse vegetation. Both of these plant classes, which are critical to meeting the nutritional needs of deer, would be increasingly deficient under the No Action Alternative. Leckenby et al (1982) suggested the following mix of plant communities to meet the needs of mule deer on a year long basis: forage areas – 55%, hiding cover – 20%, thermal cover – 10%, fawn rearing habitat – 10%, fawning habitat – 5%. In the absence of vegetative treatments it is unlikely that this composition can be attained or maintained. Also, it seems apparent that under a No Action Alternative, cheat grass would keep spreading into the interspaces of both sagebrush and P/J communities.

III. Affected Environment

IIIa. General Setting: The proposed project area encompasses all of Game Management Unit 2C as identified by the New Mexico Department of Game and Fish (See Map 1). It should be noted also that GMU 2C lies within the Colorado Plateau Ecoregion as defined in the NMDGF's Comprehensive Wildlife Conservation Strategy (CWCS) for New Mexico. This strategy has identified numerous "Species of Greatest Conservation Need" (SGCN). Some of the more prominent non T&E species that currently occupy the pinyon/juniper and Wyoming big sagebrush/perennial grass habitat types being proposed for treatment include: pinyon jay (*Gymnorhinus cyanocephalus*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), Gunnison's prairie dog (*Cynomys gunnisoni*), mule deer (*Odocoileus hemionus*) and scaled quail (*Callipepla squamata*). The boundary of GMU 2C creates a somewhat homogenous management area in that there are two dominant vegetative types; pinyon pine/one seed juniper and Wyoming big sagebrush/perennial grass. Other important (but lesser) vegetation types include: greasewood (*Sarcobatus vermiculatus*) / alkali sacaton (*Sporobolus airoides*), Fremont cottonwood (*Populus fremonti*) / willow (*Salix spp*) and, Douglas fir

(*Pseudotsuga menziesii*)/ mixed shrub. At the present time, accurate vegetative type data for GMU 2C is not available.

Elevations range from 5,443 feet along the San Juan River near Bloomfield to 7,569 feet on a mesa northwest of Escrito. The topography throughout GMU 2C is highly variable with rolling hills and sage flats southeast of Bloomfield and major sandy washes in Kutz, Blanco, Largo and Carrizo Canyons. Tributaries to these washes comprise the majority of the unit in the form of deep canyons with steep, rocky, sparsely vegetated hillsides. In between these tributary drainages lie relatively flat mesas that vary from being fairly heavily wooded with pinyon and juniper to mostly open sage parks. Personal observation by BLM and NMDGF personnel have found that many of the canyons contain intermediate benches about mid-slope that have proven to be important sanctuaries for big game in the midst of the pervasive habitat fragmentation present in GMU 2C.

Annual precipitation in GMU 2C varies from about 8 inches at the lower lying elevations (5,600 - 6,400 feet) immediately south of Bloomfield to 12-14 inches on the higher elevations (6,200 – 7,500 feet) at locations such as Crow Mesa and Ensenada Mesa (USDA, 1980).

The production of natural gas, and to a lesser degree oil, is ubiquitous throughout the proposed project area. There are a total of 6,897 natural gas and oil wells and 2,056 miles of road in GMU 2C. This equates to 8.7 wells and 2.6 miles of road per square mile of land surface. Research conducted by Rost and Bailey (1979), Perry and Overly (1976), Hershey and Leege (1976) and others suggest that mule deer and elk tend to avoid the area within 400 meters of roads. If one applies this standard to the network of roads in GMU 2C the loss of effective habitat is nearly the entire unit (See Map 4). With the exception of the Crow Mesa area this impact is common throughout the unit.

IIIb. Critical Elements:

The critical elements subject to requirements specified in statute, regulation, or executive order are listed below. Elements with an asterisk (*) are discussed under the Affected Environment section. Elements without an asterisk are not affected by the proposed action or alternatives to the proposed action. The reasoning for the no affect determinations are discussed later in this section.

Cultural Resources*

Wilderness

Native American Religious Concerns

Riparian/Wetland Areas

Wild and Scenic Rivers

Water Quality*

Environmental Justice

Wildlife*

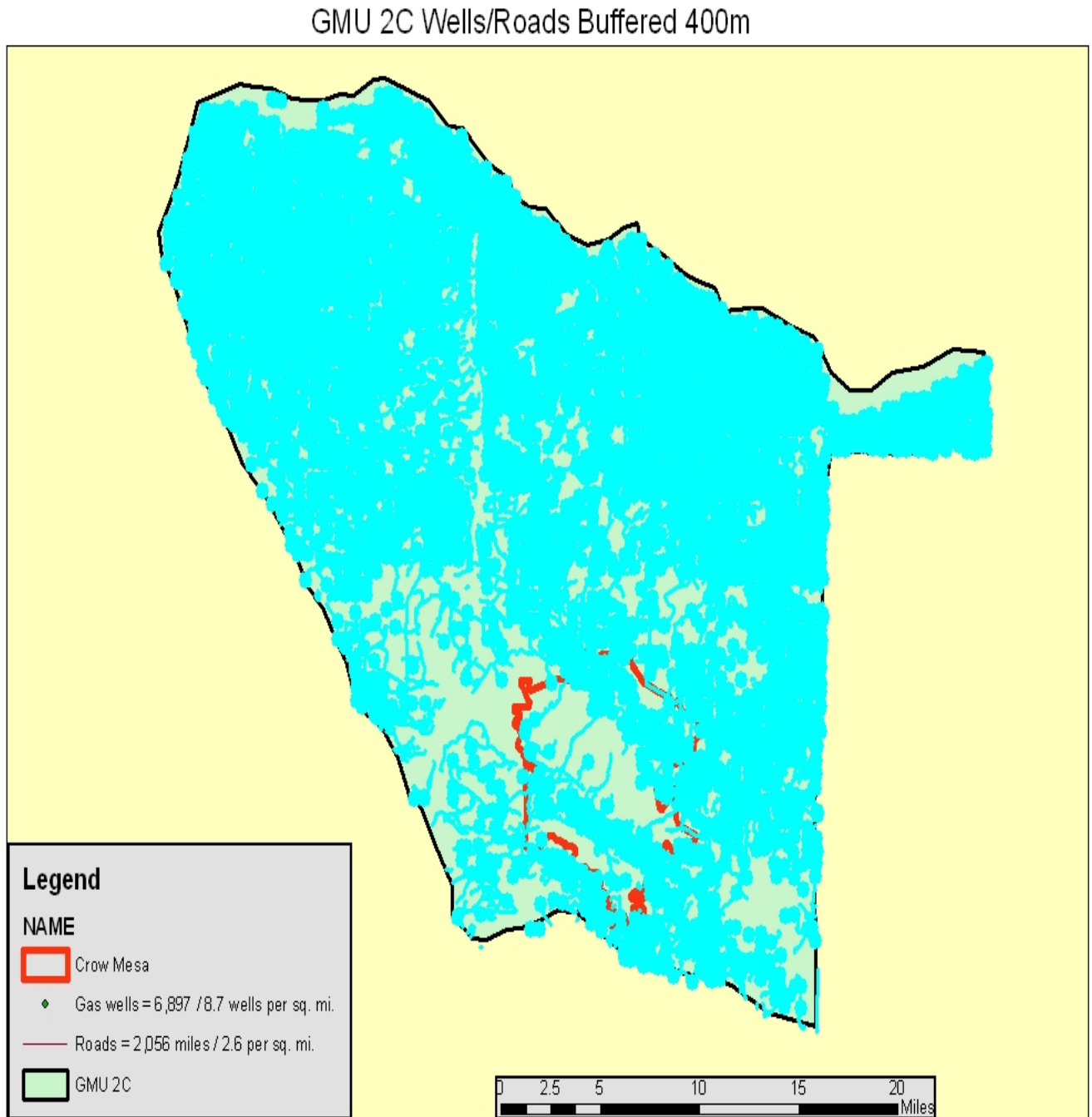
Invasive/Non-native Species*

Migratory Birds of Conservation Concern*

Recreation*

Range (Livestock Grazing)*
Forestry (Fuels)*

Map 4 – GMU 2C Gas Wells/Roads Buffered 400m



The following critical elements are not affected by the proposed action or alternatives to

the proposed action for the reasons stated. These elements will not be discussed further in this document.

1. Wild and Scenic Rivers - There are no designated wild and scenic rivers on public lands managed by the Farmington Field Office.
2. Environmental Justice - None of the alternatives are anticipated to result in impacts that would disproportionately affect low-income groups, minorities, or Indian tribes.
3. Prime/Unique Farmlands - There are no prime/unique farmlands within the project area.
4. Flood Plains - There are no designated flood plains within any of the specific proposed project sites.
5. Hazardous/Solid Waste - None of the alternatives involve the use of hazardous materials/solid waste.
6. Wilderness - The project area is not within or near any designated wilderness area or wilderness study area.

IIIc. Affected Resources:

1. Wildlife: The assemblage of wildlife species utilizing the proposed project area (GMU 2C) is diverse. A general summary by class of animals is as follows:

Big Game: Mule deer, elk and pronghorn antelope (*Antilocapra americana*) are the most common and numerous large mammals observed in GMU 2C. A few barbary sheep (*Ammotragus lervia*) and an occasional black bear (*Ursus americanus*) may also be found here but their presence is fairly rare. Mule deer and elk are the most uniformly distributed of the large mammals in GMU 2C with antelope occurring in primarily two locations; Ensenada Mesa and south of Angel Peak. Unit population estimates based on helicopter surveys are somewhat variable due to differences in the intensity, methodology and weather conditions under which the surveys were conducted. The bulk of the deer and elk use occurs on the wooded mesas and canyons that lie mostly to the east of Blanco Wash. Surveys flown during the first week of January in 2006 and 2007 (See map 5) show the groups of deer and elk detected in GMU 2C. It should be noted, however, that the surveys did not cover the entire unit but rather the areas most likely to contain deer and elk. The estimated resident populations of big game in GMU 2C are as follows: mule deer 500-600, elk <100, antelope 60-75.

Mid-Size Mammals: Animals within this category that reside within GMU 2C are mostly carnivores, i.e. coyotes (*Canis lantrans*), bobcats (*Lynx rufus*), mountain lion (*Felis concolor*) and the badger (*Taxidea taxus*). Probably the most numerous and widespread

species of this group is the coyote. Its' presence, as noted by tracks or scat, can be readily discerned most anywhere in the unit irrespective of habitat type. Conversely, representatives of the other carnivorous species are more specific in their habitat requirements. The mountain lion and bobcat prefer the canyons, ledges and wooded sites adjacent to rocky areas. Mountain lions, which are heavily reliant on deer for the bulk of their diet, are naturally found where the greatest concentrations of deer occur.

Small mammals: There are a host of small mammals that inhabit GMU 2C. In general, small mammals exhibit a very high fecundity rate and low mobility, which translates into a relatively small home range (Patton, 1992). As a consequence, these species are logical candidates as prey for larger (coyote and bobcat) carnivorous mammals with a higher degree of mobility that allows them to occupy a larger home range. Some of the more prominent prey species in unit 2C are: blacktail jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus auduboni*), Gunnison's prairie dog (*Cynomys gunnisoni*), deer mouse (*Peromyscus maniculatus*), whitetail antelope squirrel (*Ammospermophilus leucurus*) and rock squirrel (*Citellus variegates*).

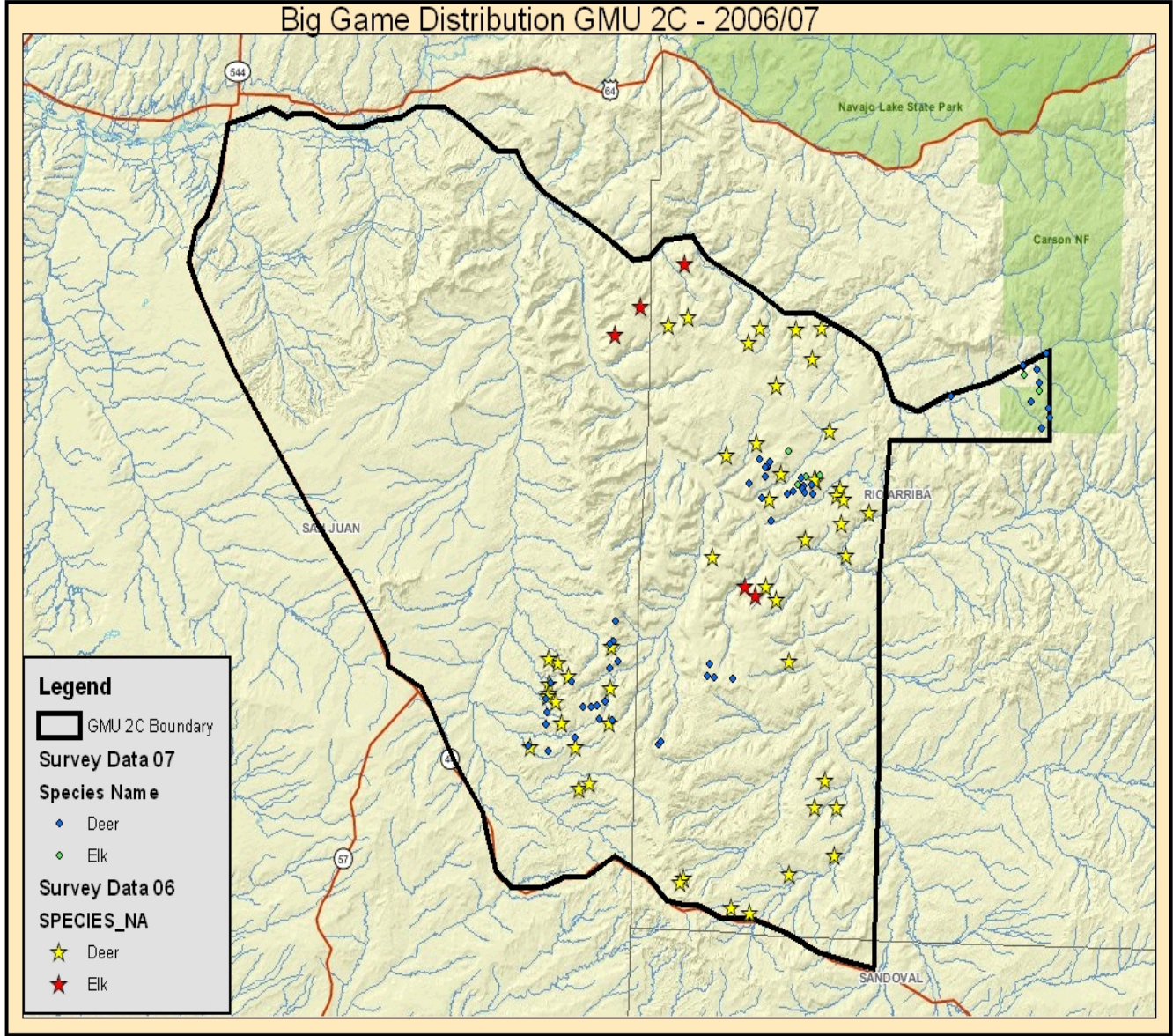
Bats: GMU 2C provides habitat in the form of caves, rock crevices and trees (primarily one-seed and Utah juniper) for a variety of bat species. An inventory of the bat species present in the Farmington Field Office area was conducted by the University of New Mexico. A listing of these species can be found in Appendix B.

Reptiles: Based upon observations by Farmington BLM resource specialists as well as consulting various literature sources (BISON-M, 2007) some of the more prominent reptiles that were determined as likely to occur in GMU 2C are the prairie rattlesnake (*Crotalus viridis viridis*), bull snake (*Pituophis melanoleucus sayi*), short-horned lizard (*Phrynosoma douglassii*) and the common collared lizard (*Crotaphytus collaris*).

Amphibians: No formal surveys of amphibians have been conducted in the project area. However, in years with sufficient precipitation to fill earthen ponds and recharge under ground reserves, anecdotal data suggests that frogs (*Rana* spp.) and/or toads (*Bufo* spp.) are present in considerable numbers. There are an estimated 250 earthen ponds that catch rain/snow runoff, approximately 15 to 20 sumps that rely on a high water table to fill them, and several miles of open, free flowing surface water.

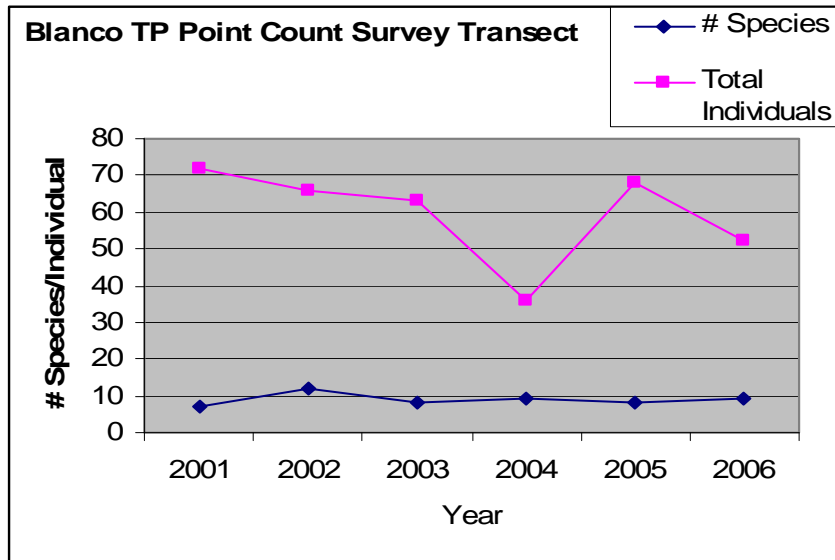
Birds: The variety in vegetation types in GMU 2C lends itself to a considerable number of bird species residing in this area. Most of these birds are seasonal occupants such as the sage sparrow (*Amphispiza belli*) and sage thrasher (*Oreosptes montanus*). These birds, along with many other species, come in the early spring to breed and raise their young during the summer and then leave in the late summer or early fall. Other species, such as the dark-eyed junco (*Junco hyemalis*) are most common in the fall and winter having migrated to this area from more northern latitudes or higher elevations. With respect to the vegetation types being proposed for treatment the pinyon/juniper type has been found to support a very diverse compliment of nesting birds. Ortega et al (2006) found 114 nests of 23 bird species (See Appendix B) at 18 different pinyon/juniper

Map 5 – Big Game Distribution in GMU 2C / 2006-07



locations in GMU 2A that encompassed a total of 104.3 acres. This equates to an average nest density of 1.09 nests per acre. The avifauna diversity within the Wyoming big sagebrush vegetation type, which is the other primary vegetation type to be impacted under the proposed action, is somewhat less diverse than the pinyon/juniper type. Long term monitoring studies (2001 through 2006) have found an average of 8.8 species and 59.5 individuals (See Chart 1) in a mature, never before treated stand of Wyoming big sage in GMU 2C (Hansen, 2007). These data were obtained from a driving point count survey transect near Blanco Trading Post that is 5.5 miles long.

Chart 1 – Blanco Trading Post Point Count Survey Data



NOTE: A listing of all of the avian species represented in Chart 1 above is provided in Appendix D. Additional discussion of the bird species inhabiting the affected habitat types in GMU 2C is presented under the environmental impacts section under “IVa.1f - Birds of Conservation Concern”.

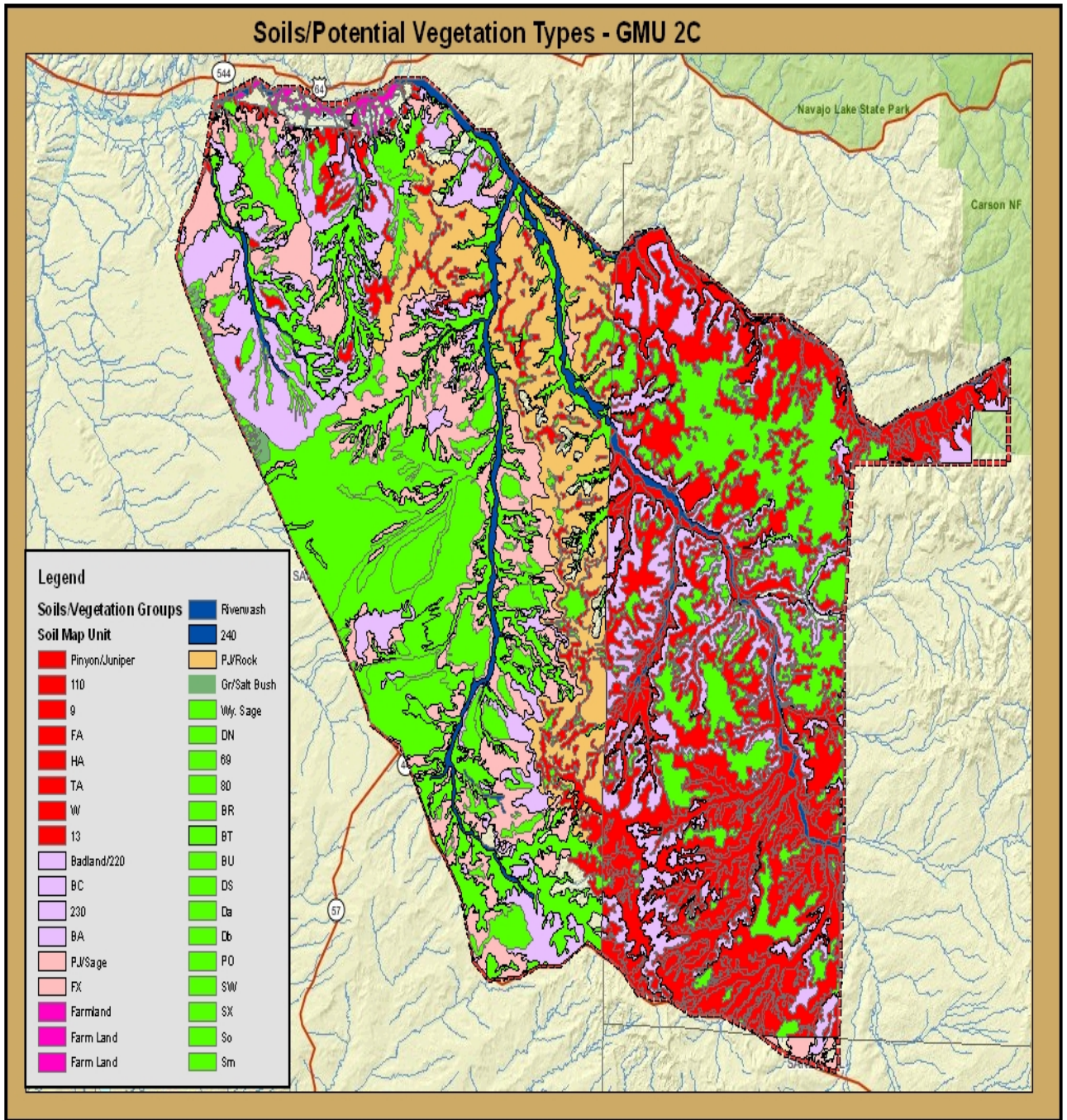
There are also a number of raptor species such as the golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), Cooper’s hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*) and the great horned owl (*Bubo virginianus*) that are yearlong residents.

Birds, which provide recreational hunting opportunities in GMU 2C include scaled quail (*Callipepla squamata*), Gambel’s quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*) and waterfowl species such as the mallard (*Anas platyrhynchos*), American widgeon (*Anas americana*) and green-wing teal (*Anas crecca*). The presence of waterfowl is limited to earthen ponds, sumps and a wetland area in Carrizo Canyon. The occurrence of waterfowl on most of these waters is greatest in the spring and fall when they are migrating.

2. Soils: The soils within GMU 2C are somewhat variable in texture but most were derived from sandstone and shale. There are a number of basic soil groupings within the proposed project area. These groupings, having similar soils and site characteristics such as aspect, vegetation, elevation and percent slope are depicted on Map 6 below. The reader should be aware that these are general associations of similar soil mapping units. In some cases, because it was impossible to break out lesser inclusions of dissimilar soils, the dominant soil within that mapping unit was used as the deciding criteria when grouping the soil mapping units.

Upon completion of this exercise there were eight groupings of similar soils with a common potential (and currently existing) vegetation type. Included in these groupings

Map 6 – Soil Mapping Units/Potential Vegetation Types in GMU 2C



was cultivated farmland, which is depicted for identification purposes only. All information concerning the soil mapping units and potential plant communities were taken from published soil surveys for San Juan (USDA-SCS, 1980) and Rio Arriba and Sandoval (USDA-NRCS, 1987) Counties. These groupings, based on their most dominant potential plant community, are as follows:

(a.) Shallow Soils/Moderately Steep - Pinyon/Juniper: There are eight different soil mapping units (10, 110, 13, 9, FA, HA, TA, and W) comprising 136,644 acres (28%) within this grouping. These soils are characterized as generally shallow, moderate to well drained, and they vary from a sandy loam to clay loam in texture. The erosion hazard, depending on the soil surface texture and percent slope, is also highly variable from moderate to severe. Slopes range from zero to about 45 percent. Precipitation is highly variable, ranging from about eight inches on the west side of GMU 2C to nearly 15 inches at higher elevations on the east side. This variation in precipitation gives rise to changes in the dominance of pinyon as opposed to juniper and the accompanying plant understory. This grouping does have inclusions of rock outcrop but they are approximately 25 percent or less of the total unit. From a management perspective, this grouping has potential to respond to treatments (where needed) within the pinyon/juniper plant community.

(b.) Deep Soils/Gentle Slopes - Wyoming Big Sagebrush/Perennial Grass: There are 16 different soil mapping units (103, 69, 80, BR, BT, BU, DS, DA, Db, PO, SW, SX, SM, and SO) comprising 159,656 (33%) acres within this grouping. These soils are generally deep and well to excessively drained soils. Soil texture ranges from loam to sandy loam with some areas of clay loams. The erosion hazard may be severe in areas with sandy loam soils. Slopes are generally from zero to about eight percent. Precipitation averages about eight to 12 inches. Vegetation on soils in this grouping generally responds well to treatment.

(c.) Poor Soils/Incised, Steep Terrain - Badlands: There are four different soil mapping units (220, 230, BA, and BC) comprising 82,327 (17%) acres in this grouping. This grouping lacks any appreciable soil or vegetative development. The landscape is typically dominated by non-stony, barren shale uplands that are sometimes deeply cut by drainages. Precipitation averages about eight inches annually. This unit has no potential for vegetative treatment.

(d.) Pervasive Rock Outcrop/Steep Slopes - Pinyon/Juniper: This unit is comprised of 42,586 (9%) acres in one soil mapping unit which is the RT – Rock Outcrop/Travessilla/Weska complex, extremely steep. Slopes range from 30 to 70 percent with precipitation averaging about 12 inches annually. Because of the shallow soils, rugged terrain, rock and steep slopes this unit is mostly unsuitable to habitat improvements.

(e.) Moderately Deep Soils/Moderate Slopes - Pinyon/Juniper/Wyoming Big Sage Mix: This grouping is comprised of 14 individual soil mapping units comprising 52,571 acres (11%), they are: 103, 69, 80, BR, BT, BU, DS, DA, DB, DN, PO, SW, SX, SM and SO. The majority of these soils are loam, clay loam to sandy loam with a relatively deep effective rooting depth of about 60 inches and generally high water holding capacity. Precipitation varies from about 8 to 12 inches. The location of these soils is mostly on gentle slopes of zero to about 15 percent. The overall unit is conducive to vegetation treatments for the establishment or perpetuation of cool season grasses and forbs.

(f.) Unstable Soils/Little Vegetation - River Wash: This unit consists of unstable sandy, clayey, or gravelly sediment in flood plains, washes or dry riverbeds. It supports little vegetation and has little potential for treatment. There are approximately 13,347 acres (3%) of this type in the project area.

(g.) Loamy Fine Sand Soils/Gentle Slopes - Perennial Grass/Saltbush: This unit consists of the SD soil mapping unit which totals 1,019 acres (<1%) of the total project area. The soil texture is predominately a loamy fine sand, which has a deep rooting depth (60 inches), with moderate available water holding capacity and moderate to severe erosion hazard.

(h.) Farmland: There are 2,599 acres (<1%) of cultivated farmlands within the project area. Cultivated lands will not be considered for any type of treatment in this document.

3. Cultural Resources: The major emphasis of the BLM Cultural Resource Management Program is the identification, evaluation, protection, preservation, and enhancement of cultural resources for present and future generations. Cultural resources, consisting of archaeological and historic artifacts and features as well as traditional cultural properties, including places of religious and/or cultural importance to Native Americans, are non-renewable and finite resources.

The management and consideration of cultural resource and values on federally managed lands is driven by specific legal requirements, including but not limited to; the Antiquities Act of 1906, the National Environmental Policy Act of 1966, American Indian Religious Freedom Act of 1978, and Executive Order 13007 (Protection of Religious Practices and Sacred Sites 1996). Cultural resources are normally considered within the realm of the National Historic Preservation Act (NHPA) of 1966, as amended, and as mandated by Section 106 of the NHPA. The NHPA requires that federal agencies take into account the effect of the proposed undertakings upon historic properties (significant cultural resources) and ensure that proposed land uses, initiated or authorized by federal agencies, avoid or mitigate potential effects historic properties. The protection and potential criminal or administrative penalties for disturbing important cultural or historic sites is governed by the Archaeological Resources Protection Act of 1979, as amended.

The GMU 2C encompasses 505,139 acres of the Colorado Plateau and San Juan Basin situated in northwestern New Mexico. Portions of six of the twenty watersheds located on lands administered by the FFO are located within the GMU 2C (Carrizo, Largo, Blanco, Upper San Juan, Kutz Canyon, and Chaco Wash watersheds). The diverse landscape and resources found in this region attracted humans to the area for several thousand years resulting in a legacy of significant prehistoric and historic cultural resource sites.

The cultural history of the GMU 2C may be divided into five major periods. The earliest evidence of human occupation in the region is attributed to the Paleoindian period (ca. 10000 B.C. to 5500 B.C). This is followed by the Archaic period (ca. 5500B.C. to A.D. 400), the Basketmaker II and III periods (ca A.D. 1 to 700), the Pueblo I through IV

periods (ca. A.D. 700 to 1540), and the Historic period (ca. A.D. 1540 to present). The Historic period is subdivided to include the early Navajo occupation of the region; Dinétah/Gobernador Phases (ca. A.D. 1500 to 1753), the Cabezon Phase (ca. A.D. 1753 to 1868), and the Reservation Phase (ca. 1868 to present). The historic period is also subdivided to reflect Euro-Anglo period occupation of the region and includes the Spanish Colonial period (ca. A.D. 1540 -1821), the Mexican period (ca. A.D. 1821 to 1848), and the Euro-Anglo period (ca. A.D. 1848 to present). A complete cultural history of the FFO can be found in the Farmington Field Office Resource Management Plan and Final Environmental Impact Statement (2003).

The GMU 2C has been subject to numerous cultural resource inventories with the majority of the inventories completed for oil and gas development projects. Using the most recently available data from the New Mexico Cultural Resource Management System approximately 28,954 acres, or about 6% of the game unit, has been subject to Class III cultural resource inventories. The actual percentage is higher, perhaps by several percentage points, as numerous surveys have not yet been entered into a GIS format analysis. These inventories have resulted in the identification and documentation of approximately 2,584 cultural resource sites within the GMU 2C. By temporal/cultural component, the sites are distributed as follows: 5% Archaic, 17% Anasazi (including Basketmaker) 48% Navajo, 4% non-Native American, and 26% unknown, most of which are likely Native American. Amongst the Navajo sites, about 69% are associated with the Dinétah and or Gobernador phases while the remainders are more recent dating after about 1868. The Old Spanish Trail, listed as a National Historic Trails passes through the unit as do some likely unknown segments of the Chaco North Road, especially between Kutz Canyon and the San Juan River.

The majority of the proposed treatment areas addressed in this EA have not been subject to cultural resource inventory. Due to the limited number and the nature of the previously completed cultural resource inventories in the proposed treatment areas only four cultural resource sites have been documented in these areas to date. No cultural resources have been documented in the Crow Mesa North West Dixie Harrow Treatment Area, the Adams Canyon Prescribed Fire Treatment Area, the Blue Mesa Plow/Seed Treatment Area, the Blue Mesa Dixie Harrow Treatment Area, or the Crow Mesa Dixie Harrow Treatment Area.

One cultural resource site has been documented in the Crow Mesa Roller Chop Treatment Area (NM-01-3955) and another in the Palluche Canyon Dixie Harrow Treatment Area (NM-01-39556). Two cultural resource sites have been documented in the Escrito Ridge Pinyon Juniper Treatment Area (NM-01-36219 and NM-01-32833). These four previously recorded sites are briefly discussed below.

NM-01-3955 is located within the boundaries of the Crow Mesa Roller Chop Treatment Area. NM-01-3995 and is comprised of a prehistoric aceramic artifact scatter. The lack of diagnostic artifacts at this site precludes assigning a temporal or cultural affiliation at more than a gross level for NM-01-3955. This site is considered eligible to the National Register of Historic Places (NRHP). As such, this site will be marked for avoidance prior

to the initiation of treatment activities.

NM-01-39556 is located within the boundaries of the Palluche Canyon Dixie Harrow Treatment Area. NM-01-39556 consists of the remains of a deteriorated historic corral complex and sparse historic artifact scatter. This site is not considered eligible to the NRHP. No further management action is necessary.

NM-01-36219 and NM-01-32833 are located within the boundaries of the Escrito Ridge Pinyon and Juniper Treatment Area. NM-01-36219 is a historic Navajo Dinetah/Gobernador limited activity area comprised of a hearth, soil stains, and an artifact scatter. NM-01-32833 is a prehistoric aceramic fire-cracked-rock and lithic scatter. The lack of diagnostic artifacts at this site precludes assigning a temporal or cultural affiliation at more than a gross level. Both sites are considered eligible to the NRHP. Prior to the initiation of treatment activities these two sites will be marked for avoidance.

Cultural resources related to the Archaic period, Pueblo I through III periods, unknown prehistoric components, Navajo Dinteah/Gobernador phase, Navajo Reservation phase, and the Euro-Anglo period are expected to be encountered during the inventory of the proposed treatment areas. Prehistoric cultural resource site types expected to be encountered include isolated occurrences of artifacts, artifact scatters, temporary camps, hearths, storage structures, masonry and/or pit habitation structures, petroglyphs and pictographs. Historic cultural resource site types expected to be encountered include isolated occurrences of artifacts, hearths, cairns, artifact scatters, temporary camps, culturally modified trees, pueblitos, hogans, sweatlodges, petroglyphs, pictographs, corrals, sheep pens, homesteads, water control features, and historic inscriptions.

Native American Religious Concerns

American Indian religious concerns are legislatively considered under several acts and Executive Orders, namely the American Indian Religious Freedom Act of 1978 (PL 95-341), the Native American Graves Protection and Repatriation Act of 1990 (PL 101-601), and Executive Order 13007 (1996: Indian Sacred Sites). In summary, these require, in concert with other provisions such as those found in the National Historic Preservation Act and the Archaeological Resource Protection Act, that federal government carefully and proactively take into consideration traditional and religious Native American culture and life and ensure, to the degree possible, that access to sacred sites, the treatment of human remains, the possession of sacred items, the conduct of traditional religious practices, and the preservation of important cultural properties are considered and not fully infringed upon. In some cases elements of the landscape without archaeological remains may be involved. Identification of these concerns is normally completed during land use planning efforts, reference to existing studies, or via direct consultation.

A review of existing information indicates that over thirty areas of religious and/or traditional cultural importance to Native Americans occur within the boundaries of the GMU 2C. These areas include places associated with Navajo creation stories, sacred

landmarks, clan origin locales, plant and other resource gathering areas, springs, shrines and other offering places, ceremonial routes, and burials.

Two areas identified as having religious and/or traditional cultural importance to the people of the Navajo Nation are located within or partially within the boundaries of the proposed treatment areas. The Palluche Canyon Dixie Harrow Treatment Area is located partially within the Palluche Canyon area of religious and/or traditional cultural importance. Palluche Canyon has been identified as the ancestral home of several Navajo clans. The Crow Mesa Roller Chop Treatment Area is located partially within the Tazhiike area of religious and/or traditional cultural importance. The Tazhiike area of religious and/or traditional cultural importance is associated with a landmark that is considered sacred by the Navajo people.

Cultural Resource Areas of Critical Environmental Concern

Areas of Critical Environmental Concern (ACEC) have been designated throughout the FFO in order to manage specific resource values. A total of seventy-nine Cultural Resource ACECs have been delineated on lands managed by the FFO. Each Cultural ACEC includes management prescriptions and goals to ensure the long term protection of important cultural resources. Cultural ACECs have been categorized into seven headings; Anasazi Communities (Non-Chacoan), Chacoan Outliers, Chacoan Roads, Early Navajo Defensive Sites and Communities, Historic Sites, Native American Traditional Use and Sacred Areas, and Petroglyph and Pictograph sites.

Thirty-six Cultural ACECs are situated within or partially within the boundaries of the GMU 2C (Table 5). One ACEC has been identified within a treatment area proposed with this EA. A small portion of the proposed Palluche Canyon Dixie Harrow Treatment Area is located within the Superior Mesa ACEC. Management prescriptions stipulated in the RMP will be adhered to for the proposed treatment area that includes a portion of the Superior Mesa ACEC.

Table 5 - Cultural Areas of Critical Environmental Concern

ACEC Name	Cultural Heading	Management Prescriptions (Per RMP, note applicable prescriptions only, refer to RMP for complete list of prescriptions by ACEC)
Albert Mesa	Historic Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Apodaca Homestead	Historic Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Ashiih Naa'a (Salt Point)	Native American Traditional Use and Sacred Areas	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Bi Yaazh	Petroglyph and Pictograph Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Blanco Mesa	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities

ACEC Name	Cultural Heading	Management Prescriptions (Per RMP, note applicable prescriptions only, refer to RMP for complete list of prescriptions by ACEC)
Blanco Star Panel	Petroglyph and Pictograph Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Canyon View	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Cottonwood Divide	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Crow Canyon	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Deer House	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Dogie Canyon School	Historic Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Dzil'na'oodlii (Huerfano Mesa)	Native American Traditional Use and Sacred Areas	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Encinada Mesa - Carrizo Canyon	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Four Yei	Petroglyph and Pictograph Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Gould Pass Camp	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Haynes Trading Post	Historic Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Humming Bird	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Kin Yazhi (Little House)	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Kiva	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Largo Canyon Star Ceiling	Petroglyph and Pictograph Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Martin Homestead	Historic Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Martinez Homestead	Historic Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Martinez Canyon	Petroglyph and Pictograph Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Moss Trail	Historic Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
North Road	Chacoan Roads	Closed to fuel wood cutting/sale, vegetation modification, no surface disturbing activities within 0.25 miles of parallel roads and the 'Kutz Drop-Off'
Pointed Butte	Early Navajo	Close to fuel wood cutting/sale and vegetation

ACEC Name	Cultural Heading	Management Prescriptions (Per RMP, note applicable prescriptions only, refer to RMP for complete list of prescriptions by ACEC)
	Defensive Sites	modification, close to surface disturbing activities
Pork Chop Pass	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Pretty Woman	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Rincon Largo District	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Star Rock	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
String House	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Superior Mesa	Early Navajo Defensive Sites	Close to fuel wood cutting/sale, specific areas closed to vegetation modification, case-by-case basis for approval of vegetation modification, restrict surface disturbing activities
Tapacito and Split Rock	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, restrict surface disturbing activities
Truby's Tower	Early Navajo Defensive Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities
Twin Angels	Chacoan Outliers	Closed to fuel wood cutting/sale, vegetation modification, no surface disturbing activities
Vigil Homestead	Historic Sites	Close to fuel wood cutting/sale and vegetation modification, close to surface disturbing activities

As previously noted, a small portion of the Superior Mesa ACEC is located within the boundaries of the proposed Palluche Canyon Dixie Harrow Treatment Area. Vegetative treatments in the portion of the Superior Mesa ACEC will be restricted as outlined in the RMP and noted in Table 1.

4. Threatened and Endangered Species/Special Status Species: The Game Management Unit 2C falls with three counties in NW New Mexico; San Juan, Rio Arriba, and Sandoval Counties. The project area is outside any federally-listed species habitat no federally-listed species will be affected by the proposed project. Federally listed species within San Juan, Rio Arriba, and Sandoval Counties are listed in Table 6.

Table 6: Habitat Descriptions and Presence of Federal Listed Threatened or Endangered Species. (E = Endangered, T = Threatened, C = Candidate)

Species Name	County	Status	Habitat	Presence*
Knowlton's cactus (<i>Pediocactus knowltonii</i>)	SJ	E	Endemic to MN on rolling gravel hills in the PJ/sagebrush plant community. Known only from an area near the Pine River. Entire wild population is fenced and protected	NP -. The proposed project is outside of any prime or potential mapped habitat for Knowlton's cactus.

			from disturbances.	
Mesa Verde cactus (<i>Sclerocactus mesae-verdae</i>)	SJ	T	Found in soils derived from Mancos, Fruitland, and Lewis Shale. All populations on lands managed by FFO are protected in the Hogback ACEC.	NP- Proposed project is outside of the Hogback ACEC and designated Mesa Verde cactus habitat.
Mancos milkvetch (<i>Astragalus humillimus</i>)	SJ	E	Found in piñon-juniper woodlands and desert shrublands on sandstone rimrock ledges and mesa tops in San Juan County and adjacent Colorado. All populations on lands managed by FFO are protected in the Hogback ACEC.	NP- Proposed project is outside of the Hogback ACEC and designated Mancos Milkvetch habitat.
Colorado pikeminnow (<i>Ptychocheilus lucius</i>)	SJ	E	Inhabits sections of the San Juan River and other rivers in the upper Colorado River basin. No wild Colorado pikeminnows have been detected in the planning area.	NP- No perennial water sources within the PPA
Colorado pikeminnow Critical Habitat (<i>Ptychocheilus lucius</i>) Designated Critical Habitat	SJ	E	Colorado pikeminnow designated critical habitat consists of portions of the San Juan River beginning at the NM Hwy 371 bridge in Farmington and continues downstream to Lake Powell.	NP-Project is located outside of designated critical habitat.
Razorback sucker (<i>Xyrauchen texanus</i>)	SJ	E	Inhabits sections of the San Juan River and other rivers in the upper Colorado River basin.	NP- No perennial water sources within the PPA
Rio Grande silvery minnow (<i>Hybognathus amarus</i>) Designated Critical Habitat	RA S	E	Mainstream portions of rivers	No perennial water sources within the PPA
Bald eagle (<i>Haliaeetus leucocephalus</i>)	SJ RA S	T	Bald eagles migrate & winter in the planning area near perennial waters. Important habitat used by the eagles are protected and managed under FFO land use planning decisions and the Bald Eagle ACEC activity plan of 1992.	NS - The proposed project is outside of any bald eagle ACEC. No perennial water sources within the PPA. Recently de-listed by USFWS. Effective: August
Mexican spotted owl (<i>Strix occidentalis lucida</i>) Designated Critical Habitat	SJ RA S	T	Found in the southwestern U.S., principally in New Mexico and Arizona. Critical habitat designated in 2004. All designated critical habitat in the planning area is located within the boundaries of the Mexican Spotted Owl ACEC.	NP-No potential habitat on proposed project site due to a lack of mixed coniferous forests, steep walled canyons, caves, and cliff edges. The proposed project is outside designated habitat.
Southwestern willow flycatcher (<i>Empidonax</i>)	SJ RA S	E	No breeding southwestern willow flycatchers have been detected in the planning area. All designated potential habitat is protected and	NP- No perennial water sources within the PPA

<i>trillii extimus</i> Designated Critical Habitat			managed under the Southwestern Willow Flycatcher HMP(1998).	
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	SJ RA S	C	Breeds in dense riparian shrubland	NP-No potential habitat in PPA due to lack of riparian areas
Interior least tern (<i>Sterna antillarum</i>)	RA	E	Found along rivers with broad exposed sandbars and lakes with nearby salt flats.	NP-No perennial water sources, flowing rivers, or marshes exist within the PPA
Black-footed ferret (<i>Mustela nigripes</i>) Extirpated	SJ RA S	E	Typically includes large prairie dog colonies larger than 80 hectares in size	NP-No large prairie dog colonies occur within the proposed project area (PPA)

Presence*

- K -Known, documented observation within project area.
- S -Habitat suitable and species suspected to occur within the project area.
- NS -Habitat suitable but species is not suspected to occur within the project area.
- NP -Habitat not present and species unlikely to occur within the project area.
- SJ – San Juan County
- RA – Rio Arriba County
- S- Sandoval County

On July 9, 2007, the U.S. Fish and Wildlife Service issued their ‘Final Rule’ removing the bald eagle in the lower 48 states from the list of endangered and threatened wildlife (<http://www.fws.gov/migratorybirds/issues/BaldEagle/baldeaglefinaldelisting.pdf>). Due to the reduction in the threats to the bald eagle, the population in the lower 48 states has increased from approximately 487 breeding pairs in 1963, to a 2007 estimate of 9,789 breeding pairs. The bald eagle is now flourishing across the nation and no longer needs the protection of the Endangered Species Act (ESA). Bald Eagles will be officially removed from the list of endangered and threatened species on August 8, 2007.

In addition to the species above, there are 36 other “special status” species that may have the potential to occur in the Farmington Field Office area. A listing of these species can be found on pages 2-28 through 2-31 in the Farmington Resource Management Plan. While potential habitat may exist for many of these species in GMU 2C there are some that have no confirmed sightings. And too, for other species they may occur (or potentially occur) in habitats that will not be directly impacted

Among the Special Status Species, the BLM/FFO has some species with special management (Special Management Species). These species include certain raptor species and NM state-listed species. Special Management Species have specific management to help protect these species and their habitat from disturbance-related projects. Special Management Species are listed in Table 7.

Table 7: Habitat Descriptions and impacts to BLM/FFO Special Management Species.

Special Management Species			
Species Name	Status	Habitat	Presence/Impacts to Habitat
Aztec gilia (<i>Aliciella formosa</i>)	BLM-FFO Special Management Species (NM State Endangered)	Salt desert scrub communities in soils of the Nacimiento Formation	NP-No potential habitat in PA.
Brack's fishhook cactus (<i>Sclerocactus cloveriae</i> var. <i>brackii</i>)	BLM-FFO Special Management Species (NM State Threatened)	Salt desert scrub communities in soils of the Nacimiento Formation	NP-No potential habitat in PA.
Mountain plover (<i>Charadrius montanus</i>)	BLM-FFO Special Management Species (NM State Threatened)	Shortgrass prairie within grass of 4" or less.	NP-No potential habitat in PA.
American peregrine falcon (<i>Falco peregrinus anatum</i>)	BLM-FFO Special Management Species (NM State Threatened)	Found in Douglas fir, spruce, ponderosa pine, fir-spruce, aspen(hardwoods), chaparral, and pinyon-juniper forest types. Also found in sagebrush-grasslands in NW NM. Nests in cliffs that tends to dominate the surrounding landscape.	K- Known nest within two miles of PA. Project likely to enhance the prey base and vulnerability of prey species due to a cover reduction.
Prairie falcon (<i>Falco mexicanus</i>)	BLM-FFO Special Management Species	Often found in more exeric habitat than peregrine falcons incl. grasslands, semidesert shrub-grasslands, sagebrush-grasslands, chaparral, and pinyon-juniper. Nests in cliffs.	S-No known nests in PA or surrounding area but may hunt in PA. Project likely to enhance the prey base and vulnerability of prey species due to a cover reduction.
Ferruginous hawk (<i>Buteo regalis</i>)	BLM-FFO Special Management Species	Occurs in dry, open country; grassland, semidesert grass-shrub, sagebrush, badlands and pinyon-juniper. Known nests occurring in mostly badland habitat in NW NM.	NS - No known nests in PA or surrounding area but may hunt in PA.
Golden Eagle (<i>Aquila chrysaetos</i>)	BLM-FFO Special Management Species	Found in grassland, semidesert grassland-shrub, sagebrush-grassland, pinyon-juniper woodland, and ponderosa pine and Douglas-fir forests. Nests in large trees	S-No nesting habitat in PA Project likely to enhance the prey base and hunting efficiency of golden eagles.

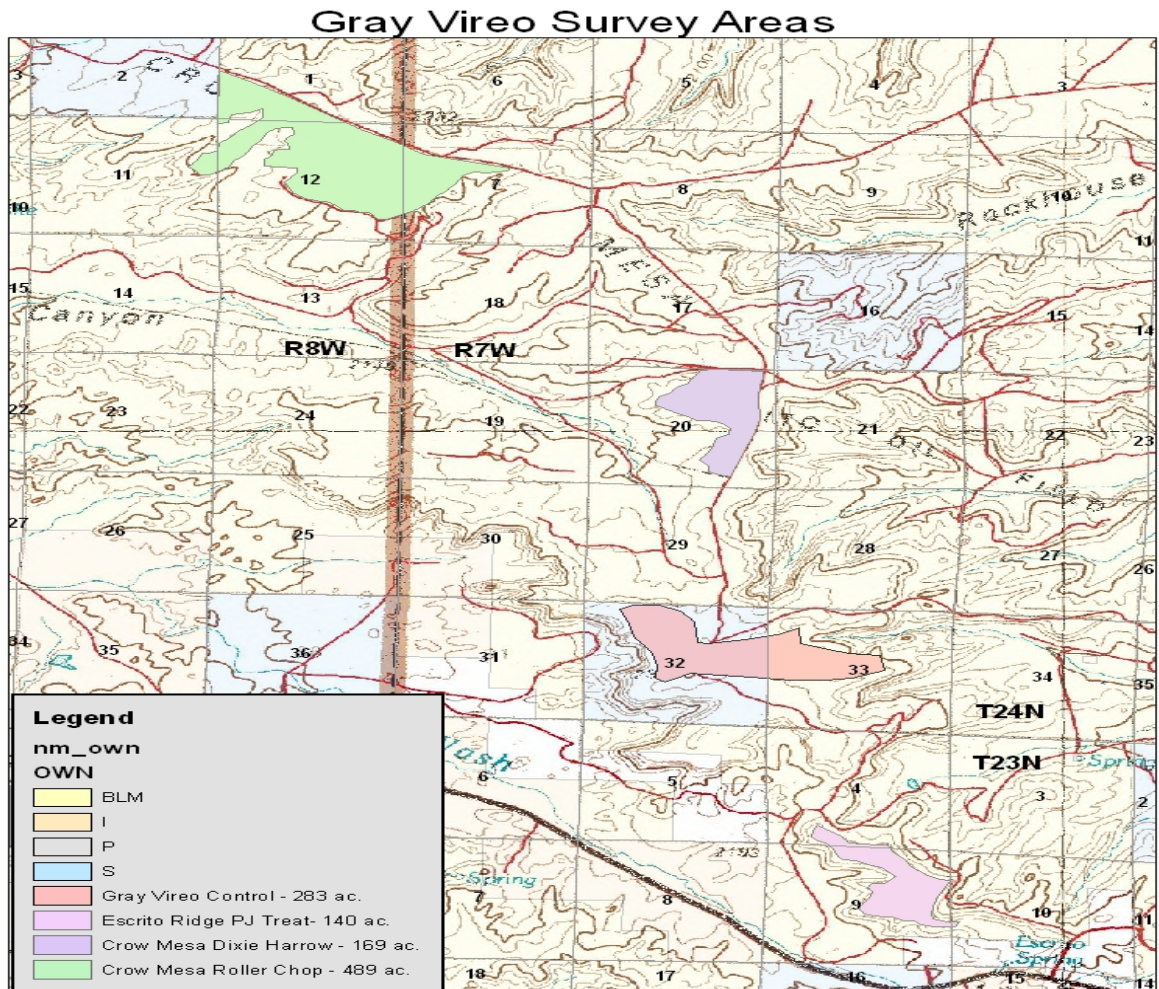
		or cliff ledges.	
Gray Vireo (<i>Vireo vicinior</i>)	Recovery Plan/Management Guidance Under Development	Occupies pinyon pine - Utah/one-seed juniper with interspersions of Wyoming big sagebrush.	K – Known to occur within GMU 2C, specifically Crow Mesa area. Some loss of nesting habitat could occur as a result of the proposed action.

Presence*

- K- Known, documented observation within project area.
- S -Habitat suitable and species suspected to occur within the project area.
- NS-Habitat suitable but species is not suspected to occur within the project area.
- NP-Habitat not present and species unlikely to occur within the project area.

Most known gray vireo nesting areas on BLM/FFO managed lands are north of GMU # 2C. However, surveys (presence/absence) conducted in June of 2007 on Crow Mesa (see Map 9) found approximately 20 gray vireos at several locations. While it is likely

Map 9 – Areas within GMU 2C surveyed for Gray Vireos in June 2007.



that gray vireos are nesting at these locations, actual nest searches to determine the precise substrate that the nests are located in or if young were successfully reared were not done during the recent surveys. The BLM/FFO does not (at the current time) have specific management guidance for the gray vireo. However, FFO participated in the development of the Gray Vireo Recovery Plan, which was recently completed by the New Mexico Department of Game and Fish. In accordance with the recommendations of this plan FFO is collecting additional field data concerning the distribution and habitat preferences of gray vireos. The information collected as a result of this effort will be used in formulating specific management guidance.

5. Recreation: The principle forms of recreation in GMU 2C are hunting and hiking. The hiking is mostly to view archaeological sites while hunting is primarily for big game (deer and elk), upland game birds such as Gambel’s and scaled quail and mourning doves, and small game such as cottontail rabbits and coyotes. At present, big game hunting is on a limited entry basis only.

A summary of the current hunting seasons, number of licenses offered and dates is listed in Table 8 below.

Table 8 – Summary of limited entry big game hunts in GMU 2C – 07/08.

Species	# licenses	Bag Limit	Season	Weapon	Comments
Deer	30	FAD	Nov. 17-21	Any	
Deer	12	FAD	Nov. 17-21	Any	Pvt Land
Deer	50	FAD	Jan. 1-15	Archery	
Deer	12	FAD	Jan. 1-15	Archery	Pvt Land
Deer	30	FAD	Sept. 24-30	Muzzleloader	
Deer	12	FAD	Sept. 24-30	Muzzleloader	Pvt Land
Total	186				
Elk	125	MB	Oct. 13-17	Any	
Elk	100	A	Dec. 1-5	Any	
Elk	50	A	Dec. 1-5	Any	Youth
Elk	150	MB	Oct. 6-10	Muzzleloader	
Elk	240	ES	Sept. 1-22	Archery	
Total	665				

FAD = Forked antler deer
 Mature
 MB = bull
 Either
 ES = sex
 A = Antlerless

Seasons for hunting quail, mourning dove and waterfowl are some times over-lapping but run generally during the period of September 1 (beginning with mourning doves) through

mid February (ending with quail). Hunting for coyotes and rabbits is not restricted to a specific timeframe.

6. Air Quality: Air quality in the San Juan Basin is affected both by nearby industry and by natural terrain. The primary sources of air pollutants in the basin are from electrical power generation plants, oil/gas refineries and treating facilities and compressor stations. Additional air quality impairment results from the cumulative impact of area motor vehicle emissions and dust, and natural gas well pads. Since the San Juan Basin is a natural depression, air masses sometimes stagnate from lack of circulation resulting in diminishing air quality. The New Mexico Air Quality Bureau (NMAQB) is responsible for enforcing the state and national ambient air quality standards in New Mexico. Any emission source must comply with the NMAQB regulations (USDI, BLM 2003b).

The project area lies within the Four Corners Interstate Air Quality Control Region. Initial cumulative air quality analysis was conducted in the final EIS for the Proposed Farmington Resource Management Plan (USDI, BLM 2003a). At the present time, the counties that lie within the jurisdictional boundaries of the FFO are classified as in attainment of all state and national ambient air quality standards as defined in the Clean Air Act of 1972, as amended (USDI, BLM 2003b). However, during the summers of 2000 through 2002, ozone levels in San Juan County were approaching non-attainment. Additional modeling and monitoring was conducted by Alpine Geophysics, LLC and Environ International Corporations, Inc., in 2003 and 2004. Results of the modeling suggest the episodes recorded in 2000 through 2002 were attributable to regional transport and high natural biogenic source emissions. The model also predicted that the region will not violate the ozone NAAQS through 2007 and that the trends in the 8-hr ozone values in the region are declining. There is no indication at this time that the approval of the proposed action would result in a violation of ambient air quality standards. Recently, the San Juan Public Lands Center in Durango, Colorado, a combined U.S. Forest Service and BLM office cooperative prepared a Northern San Juan Basin Environmental Impact Statement (EIS) to address future natural gas development under their jurisdiction. The cumulative air quality impact assessment performed by Durango, which included Farmington's potential emission sources, determined that potential cumulative visibility impacts to federal PSD Class I Areas (Mesa Verde Nation Park and the Wenimuche Wilderness Area) could occur at some time in the future. Additional air quality monitoring and modeling may be required. The two BLM offices will work directly with state regulatory agencies to assure that any data gathered meets state standards. Results may necessitate additional mitigation measures on future projects.

7. Water Quality: Surface waters within GMU 2C are tributary to the San Juan River. Some of the major washes and arroyos include Canyon Largo, Cereza Canyon, Blanco Canyon and Kutz Canyon. The numerous washes and arroyos usually flow only during spring snow melt and after summer thunderstorms. Summer thunderstorms can be very intense but usually highly localized. They can create increased stream flows in the wash channels with flash flooding.

The soil and vegetation type and amount have a major effect on the amount of precipitation that becomes surface runoff. Storms and annual surface runoff vary with the amount of bare soil and amount of vegetation litter. Surface runoff increases as vegetation and litter decreases. Increased runoff causes higher velocities and initiates more erosion and more water that transports sediment.

Topographic features and soil conditions that result in the formation and continual development of canyons, arroyos, and gullies contribute to the production of very poor water quality from many ephemeral flows. Key components that influence water quality are highly erosive and saline soils, sparse vegetative cover, and rapid runoff. Surface runoff usually consists of greater than 10,000 ppm of suspended sediment and more than 1,000 ppm of dissolved solids (TDS). Limited salinity data indicates that moderately saline water (1,000 to 2,000 ppm TDS) are predominate for lands under the jurisdiction FFO (USDI-BLM, 1997).

The major aquifers associated with the FFO are Quaternary gravels, the San Jose, Nacimiento, Ojo Alamo, Gallup, Morrison, Entrada, and San Andreas formations. Recharge into the ground water aquifers is slight to moderate, depending on the porosity and permeability of each aquifer, rainfall, snow melt, etc. Conductivities of the ground water aquifers are variable and can be both laterally and vertically discontinuous, depending on geology.

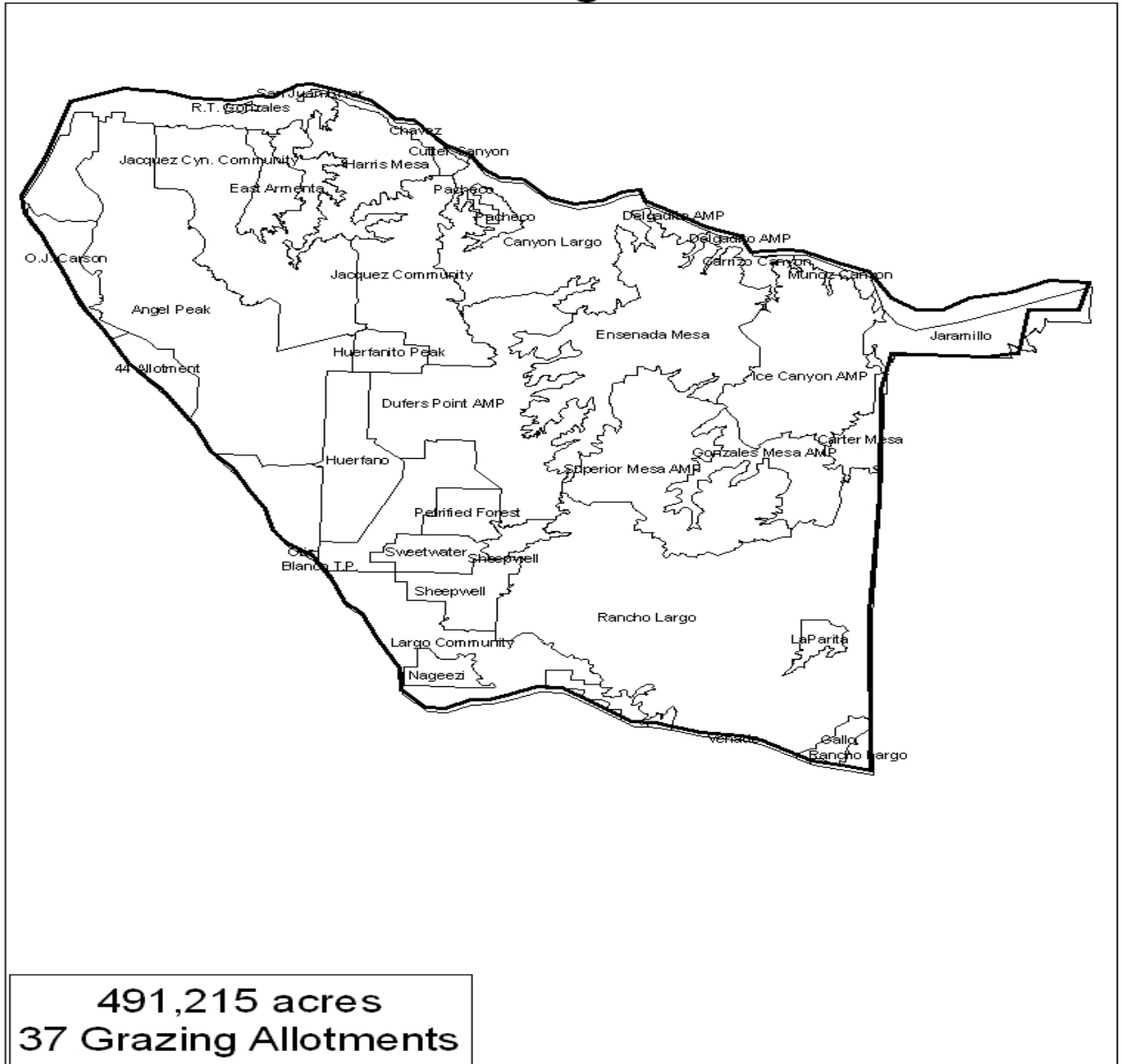
8. Livestock Grazing: The majority (491,215 acres) of the public lands (as well as state and private lands) in GMU 2C are subject to livestock grazing. The predominant class of authorized livestock use is cattle with lesser amounts of sheep and goats, primarily in the Blanco Wash area. Horses are sometimes authorized on a utilitarian basis, in other words, several horses may be needed to work livestock on the allotment and these will be allowed as part of the grazing permit. There are a total of 37 grazing allotments (See Map 7). The majority of these are operated by individual grazing operators. However, there are five allotments with multiple operators that either operate as a grazing association or under a community concept wherein each person has an assigned use area. Much of the grazing use takes place on a yearlong basis under a deferred-rotation grazing system.

9. Invasive/Non-Native Species: There are relatively few non-native or invasive plant species in the proposed project area. However, musk thistle (*Cardus nutans*) exists in some small pockets within and adjacent to the proposed project area. Cheat grass (*Bromus tectorum*) is more widespread dominating the understory of shrub communities that often occupy areas of several hundred acres. Exotic or non-native species such as Russian olive (*Elaeagnus angustifolia*) and salt cedar are also present within GMU 2C but their distribution is limited primarily to riparian areas which will not be subject to any of the proposed vegetation treatment methods.

10. Forestry: The Farmington Field Office of the BLM does not offer any commercial sales of timber for the production of lumber. Woodland products are limited to the cutting or collection of firewood from dead and down or dead standing pinyon pine

Map 7 – Public Land Grazing Allotments within GMU 2C

GMU 2C Grazing Allotments



and juniper (Utah and one-seed). In 2006 the Farmington Field Office sold permits for the collection of 3,779 cords of firewood during the period April 1 through December 31.

There are also approximately 7,400 acres of ponderosa pine (*Pinus ponderosae*) in the FFO area. Management activities concerning this species and isolated stringers of pinyon pine and juniper (BLM-RMP, 2003). The occurrence of ponderosa pine in GMU 2C is confined primarily to a few deep canyons on north and east facing slopes. The exact acreages of the various woodland species in GMU 2C is not known at this time.

11. Riparian: In GMU 2C the riparian habitat is located primarily along the major drainage ways such as Largo, Blanco, Carrizo, Kutz and Palluche Canyons. Collectively, these drainages contain approximately 90.5 miles of riparian habitat that lies primarily within and adjacent to ephemeral washes. Some areas of open, free Douglas fir are limited to stand improvement through thinning these species and/or flowing or standing water do exist but they are the exception. Because of the potential for water and vegetation more succulent than the surrounding uplands, riparian areas are often heavily utilized by a wide assortment of wildlife species.

IV. ENVIRONMENTAL IMPACTS

IVa. Impacts of the Proposed Action:

Implementation of the vegetation treatments identified under the Proposed Action, either individually or collectively, should result in increased herbaceous and shrubby forage and edge effect. In addition, there should also be an increase in the production of arthropods and small mammals due to the improved vegetative ground cover. Conversely, there will be some loss of woodland (over-story) cover, tree nesting habitat, and mast in the form of pinyon nuts and juniper berries. Short term (negative) impacts to soils, water quality and air quality have the potential to occur. A detailed analysis of the impacts of the treatment methods listed above was undertaken in the “Final Environmental Impact Statement – Vegetation Treatment on BLM Lands in Thirteen Western States” (USDI-BLM, 1991). A summary of the effects of these physical changes to the various resources within the GMU 2C project site are presented in Table 9 below.

Table 9 – Summary of effects of the seven proposed vegetation treatment methods.

Resource Value	#1	#2	#3	#4	#5	#6	#7	Summary of Effects
Wildlife	X	X	X	X		X	X	Some cover loss, increased desirable forage.
Cultural	NA	NA	NA	NA	NA	NA	NA	All project sites surveyed prior to work; no impact.
Soils	X	X	X	X	X	NA	X	Short term soil instability due to RX fire, disking & roller chop, but stabilized long term with increased vegetative cover.
Air Quality	NA	NA	X	X	NA	NA	NA	Short term impacts due to RX fire, possibly some reduction in plant community’s potential for carbon sequestration, overall impacts deemed negligible.
Water Quality	X	X	X	X	X	NA	X	Slight possibility some short term impairment due to soil instability, will abate with increased vegetative cover.
Vegetation	X	X	X	X	X	X	X	PJ and sage communities will be altered to restore a more balanced, well functioning state.
Recreation	X	X	X	X	X	X	X	Hunting, which is the primary form of recreation, should be enhanced.
Invasive Species	X	X	X	X	X	NA	X	Potential exists for invasive species wherever ground is disturbed or fire applied unless adequately re-seeded with desirable species.
T&E Species/Special	NA	NA	NA	NA	NA	NA	NA	Surveys will be conducted prior to treatments as needed. No impacts anticipated.

Status Species								
Riparian	X	X	X	X	X	NA	NA	Slight possibility some short term impairment due to soil instability, will abate with increased vegetative cover.
Forestry	X	NA	X	NA	NA	NA	X	Treatments should improve woodland health by reducing competition for moisture & nutrients resulting in more vigorous trees.
Livestock Grazing	X	X	X	X	X	X	X	There will be increased herbaceous forage available which will benefit livestock as well as wildlife.

1. Wildlife:

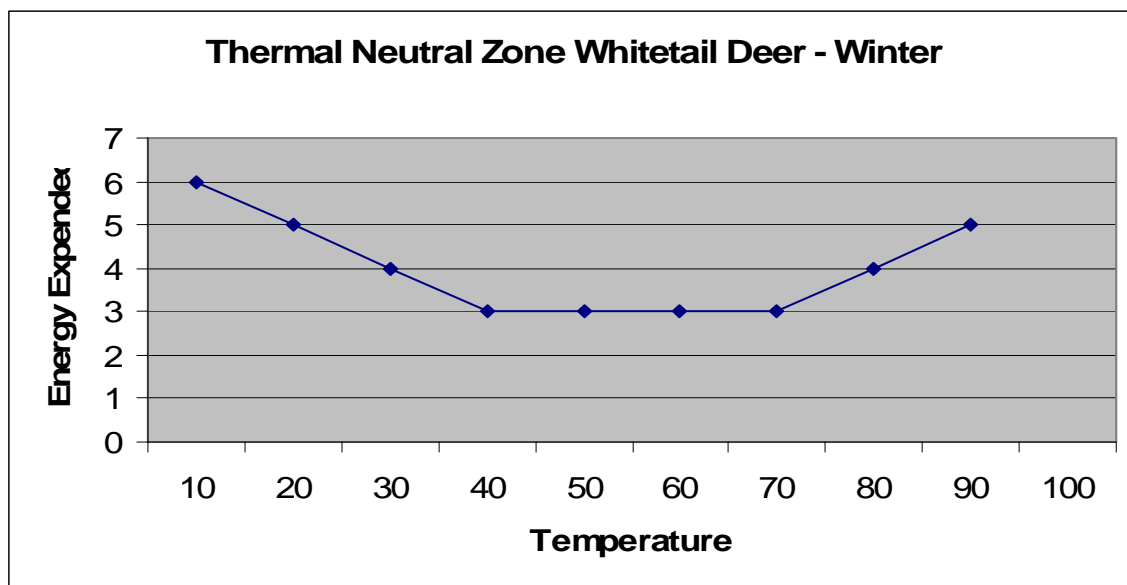
(1a.) Big Game – The principle species that will be affected by the proposed action are mule deer and elk. All of the proposed vegetation treatment methods will result in a reduction of hiding or escape cover and thermal cover. Conversely, there should also be an increase in forage both herbaceous and woody species. All of the treatments currently proposed within this document and those that may be proposed in the future (on the basis of this document’s approval) will be planned so as to provide a mosaic of vegetative cover. The intent will be to create an interspersed of vegetation types, i.e. grasses/forbs/shrubs/trees that are proportional and balanced relative to the needs of wildlife. A ratio of 40% cover to 60% foraging area was suggested as an optimal situation for deer and elk by Black et al. (1976) and Thomas et al. (1979). It is recognized that achieving this goal may be challenging in some areas where road densities associated with oil and gas development have resulted in extremely fragmented habitat. Rost and Bailey (1979) found that mule deer tended to avoid the area within 400 meters of a road (See Map 4). However, anecdotal observations as well as browse and pellet group transects within the Farmington Field Office area suggest that deer and elk may utilize this 400 m buffer area more than what is implied by Rost and Bailey if there is woodland cover sufficient to screen the animals from view of the road and passing vehicles. Therefore, at a minimum any pinyon/juniper treatments conducted adjacent to roads will retain a 50 foot buffer of trees parallel to the road. It is anticipated that this buffer, coupled with the patchy nature of the actual treatment area will meet the hiding cover requirement recommended by Thomas et al. (1979) of concealing 90 percent of a bedded deer’s body at 150 feet or 90 percent of a standing elk at 200 feet or less.

At present there appears to be some debate within the scientific literature as to the value of thermal cover for big game. Cook et al. (2005) conducted a literature review of studies that were designed to assess the effects of thermal cover on animal performance. Their conclusion was that empirical support for the value of thermal cover was based mostly on observations of habitat selection and not animal performance. However, while they downplay the importance of thermal cover they do endorse the need for security cover as an important component in mediating the expenditure of energy when animals are traveling. These findings lend support to the proposed 50 foot buffer of trees (in woodland sites) along roads when implementing vegetation treatments.

In contrast to Cook et al. (2005) the preponderance of scientific literature (Dasman, 1981; Leckenby, 1977; Loveless, 1964; and Moen, 1968) tends to support the more traditional

concept of thermal cover. Leckenby et al. (1982) recommended that “thermal cover should be at least 0.8-2 hectares (2.5 acres) since the area of thermal protection increases with stand widths greater than 90 meters (300 ft). This recommendation should coincide well with any of the proposed methods of vegetation treatment in that the emphasis will be on creating a mosaic of trees, shrubs and herbaceous plants. Treating vegetation in this manner should also be consistent with a corollary of the thermal cover premise and that is the need for an animal to maintain a zone of thermal neutrality as advocated by Brody (1945) and Holter et al. (1975). Essentially, the zone of thermal neutrality is “that range of temperatures over which an animal’s metabolic rate, as measured by heat production, is minimal”. Holter et al. (1975) found that the thermal neutral zone for whitetail deer (not indigenous to GMU 2C) during the winter was between 41 and 68 degrees Fahrenheit. Although whitetail deer are not endemic to the project area, Chart 2 below is provided to illustrate the relationship between temperature fluctuation and energy expenditure. Thomas and Toweill (1982) defined the optimal thermal neutral zone for elk as between 81 and 95 degrees Fahrenheit. Expenditures of energy to compensate for temperature exposure outside these ranges was energy lost that might have otherwise been available for productive processes (Blaxter, 1962). The effective temperature realized by an animal in its zone of thermal neutrality is dictated by the combined effects of three variables; air temperature, wind speed, and radiation (Porter and Gates, 1969). In consideration of this, it becomes clear that sufficient vegetative cover as well as topographic relief and aspect can be mediating factors that are within an animal’s ability to modify (through changing its location) that can help maintain their zone of thermal neutrality. The proposed treatments, whether they are in pinyon/juniper or Wyoming big sagebrush/grass, should not adversely impact the vegetative cover variable noted above to the extent that this component becomes detrimental (as a result of the treatment) to either deer or elk in maintaining their zone of their thermal neutrality.

Chart 2 – Thermal Neutral Zone for Whitetail Deer - Winter



Fawning cover, as defined by Sheehy (1978), is located on slopes of 0 to 30 percent

where forage in June is succulent and abundant. Ideal cover should consist of low shrubs or small trees taller than 2.2 feet with a minimum of 40 percent canopy closure. In addition, this plant community should lie within 160 feet of taller tree cover. Given this description, it would seem that the proposed action may (over time) through secondary succession create fawning habitat. Pinyon/juniper areas that are roller chopped or thinned with saws, burned and seeded or sage areas that are Dixie harrowed or burned and seeded will likely realize an increase in shrubby and herbaceous vegetation. The establishment of seeded species and natural succession of existing shrub and tree species could over a period of eight to ten years result in a plant community similar to the one described by Sheehy. In addition, the taller older trees that Sheehy includes in his description of ideal fawning habitat would be present as a result of having conducted the original treatment in a mosaic fashion.

It is also anticipated that the application of any of the proposed vegetation treatments that incorporates the seeding of cool season (C3) grasses and forbs will help to create a plant community that is more balanced in meeting the yearlong nutritional needs of big game. Even the application of prescribed fire without seeding should enhance the production of forbs (Pechanec and Stewart, 1954.) Research conducted in California chaparral found 57 of 58 perennial forb species re-sprouted after wildfire (Keeley, 1998). Within the sagebrush habitat type, the introduction of C3 grasses and forbs will provide high protein forage at a time of the year when much of the other native vegetation is lacking the protein content that pregnant and/or lactating deer and elk need. In early spring (April – May) C3 grasses such as western wheatgrass can typically have protein levels as high as 31.6 percent (Newell and Moline, 1978).

Similarly, introduced forbs such as Ladak alfalfa have been found to contain 32.8 % crude protein in the vegetative growth stage and 25.6% when fully mature. Conversely, during this same spring/early summer period, warm season ~~or~~ (C4) grasses such as blue grama, which is probably the most dominant grass species in GMU 2C, contains only about 5% crude protein. However, later in the summer when the blue grama emerges from dormancy and begins to grow the protein levels have been reported to increase as much as 18% (Anderson 2003). Protein levels of Wyoming big sagebrush may also increase during the spring green-up but its digestibility is impaired somewhat due to secondary metabolites (monoterpenoids) that it contains. So, while big sagebrush provides an important source of winter protein (12.4%) as opposed to 3.7% for various dormant grasses (Welch and McArthur 1979) it is limited in its usefulness in the spring and summer time due to its secondary defensive compounds. Over the course of a year a mule deer's diet is comprised generally of shrubs and trees (59%), forbs (28%) and grasses (13%), (Van Dyne et al. 1980). Nutritionally, this must equate to about 16-17% crude protein in the diet during critical periods such as fawn rearing (for both the fawn and its mother) (Verme and Ullrey, 1972) and on a yearlong basis about 7% crude protein is needed for basic maintenance (Dietz, 1965).

The justification for manipulating the pinyon/juniper plant community is somewhat different than for the sagebrush type. Understory browse species such as antelope bitterbush and true mountain mahogany (which are the primary shrub species in these woodland stands) are generally more palatable than sagebrush and lack the secondary

defensive compounds that sage contains. As a consequence, both of these species are selected for over sage by the deer. This long-term preferential use coupled with the competition for soil moisture and nutrients from the pinyon and juniper has created a shortage of these forage plants in certain areas.

Nutritionally, both the bitterbrush (8.1-9.6% crude protein; Bissell et al 1955) and the mahogany are desirable, although not superior to sagebrush in their crude protein content. Grasses and forbs, which combined represent 41% of a deer's annual diet, are a very minor component (See Appendix A, projects 1 & 2) within the pinyon/juniper plant community throughout most of GMU 2C. This observation is even more significant given the dominance of C4 grasses such as blue grama (*Bouteloua gracilis*) and galleta (*Hilaria jamesii*). While C3 grasses such as squirreltail (*Sitanion hystrix*), western wheatgrass (*Pascopyrum smithii*), sand dropseed (*Sporobolus cryptandrus*), Indian ricegrass (*Oryzopsis hymenoides*) and cheatgrass (*Bromus tectorum*) do occur, it is felt that the current production is inadequate to meet the needs of an expanding mule deer population. It should be noted also, that the increase of an annual plant such as cheatgrass is not desirable. Cheatgrass may provide early spring forage that is used extensively by deer but the disadvantages of cheatgrass outweigh its advantages. Cheatgrass is considered an invasive species that has a short period of palatability in the spring. Following this approximate one month period it cures out and is useless as forage, possesses sharp awns that can be a hazard to ungulates, poses a fire hazard due to its dryness, and it spreads aggressively to the exclusion of more desirable plants. As a consequence of these negative aspects, vegetative treatments under the proposed action are being designed to reduce the spread of cheatgrass in GMU 2C. It might be worthwhile to note that cheatgrass germinates early in the spring, and without cool season grass and forb competition at this time, cheatgrass will likely come to dominate a site over time.

It is desirable to modify pinyon/juniper and Wyoming big sagebrush communities to increase herbaceous plants and the protein content of the forage produced especially during the spring and summer. The proposed vegetation treatment methods would be helpful in reducing competition and restoring a more balanced plant community. This should help improve the yearlong nutrition available to large ungulates and in turn allow for a modest increase in deer numbers.

(1b.) Mid-Size mammals – Carnivores pre-dominate this category. Implementation of the proposed action and the subsequent increase in herbaceous vegetation should result in a proliferation of animal species that serve as prey (e.g. mice, squirrels, rabbits and deer) for these species. This should be especially true in woodland situations where downed trees provide improved habitat for small mammals (Carey and Johnson 1995).

(1c.) Small mammals - It is expected that small mammals such as mice, squirrels and rabbits will increase as a result of the various vegetation treatments being proposed. This increase in small mammals will not only benefit mammalian carnivores but various raptor species as well. Raptors such as red-tailed hawks, Cooper's hawks, great horned owls and golden eagles should realize an increased food base.

(1d.) Bats – Implementation of the proposed action could inadvertently impact some bat species. Typically, large trees that are dead or partially dead are selected as roost sites (Chung-MacCoubrey and Bogan, 2003). In addition, it is desirable that the tree have loose bark or large cracks, both characteristic of a snag. Trees of this nature pose little competition for soil moisture or nutrients and to the extent possible will be avoided when conducting any of the proposed vegetation treatments. In addition, mechanical treatments of pinyon and juniper will be timed to occur in October – December which is after maternity colony sites have been vacated (Harvey et al, 1999).

(1e.) Amphibians – Significant direct impacts to amphibians as a result of the proposed action are not anticipated. Water quality in ephemeral washes may be improved. What effects this may have on amphibians is difficult to predict or quantify. Conversely, on the uplands there may actually be less runoff entering some earthen ponds due to the increased vegetative ground cover holding precipitation in place. This could cause some ponds to have less water or not at all thereby resulting in less habitat for amphibians.

(1f.) Bird Species of Conservation Concern – In an effort to be compliant with a 1988 amendment to the Fish and Wildlife Conservation Act, which required the U.S. Fish and Wildlife Service (USFWS) to “identify species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973,” the USFWS prepared lists of “Birds of Conservation Concern” in 2002. These lists were correlated to various geographic subdivisions of the United States termed “Bird Conservation Regions (BCRs)”. The USFWS recommended that other federal land managing agencies consult the appropriate list for the BCR in which their proposed project action was located as part of the planning process. The basis for this recommendation stems from the “Responsibilities of Federal Agencies to Protect Migratory Birds” as mandated by Executive Order 13186 and the Migratory Bird Treaty Act of 1918 (USFWS, 2002).

Listed below are those bird species identified for BCR 16 – Southern Rockies/Colorado Plateau that are known to occur in GMU 2C and a brief assessment of the potential impacts of the proposed action.

Table 11. BCR 16 (Southern Rockies/Colorado Plateau) BCC 2002 List.

Species:	Effect:
Northern Harrier	Improved prey base
Swainson's Hawk	Improved prey base
Ferruginous Hawk	Incidental to area, improved prey base
Golden Eagle	Improved prey base
Peregrine Falcon	See discussion under special status species
Prairie Falcon	Improved prey base
Burrowing Owl	See discussion under sensitive status species.
Lewis's Woodpecker	Rare, but may benefit from burned trees for cavity nests.
Gray Vireo	See discussion under T&E/special status species.
Pinyon Jay	Reduction in food supply.
Bendire's Thrasher	Reduction in nesting/foraging habitat.

Virginia's Warbler	Rare, some loss of nesting habitat, but increased food i.e. insects
Black-throated Gray Warbler	Rare, some loss of nesting habitat but increase in food supply (insects)
Sage Sparrow	Reduction in nesting/foraging habitat.
(1, 2) Sage thrasher	Reduction in nesting/foraging habitat
(1) Loggerhead Shrike	Possible loss of nesting habitat, improved prey base.

(1) Identified as a “High Priority” species in Partner In Flight’s Land Bird Conservation Plan for New Mexico.

(2) Identified as a Species of Greatest Conservation Need in the NMDGF’s Comprehensive Wildlife Conservation Strategy for New Mexico.

Summary: Overall, the proposed action will benefit species that feed on arthropods, small mammals and vegetative seed which should be more abundant in the treatment areas. Similarly, there will be additional snags for cavity nesting birds created in wooded areas subjected to prescribed fire. Conversely, those species e.g., sage sparrow and pinyon jay, whose well being is tied closely to specific vegetation such as Wyoming big sagebrush or pinyon pine (respectively) may realize a reduction in optimal habitat.

2. Soils: Implementation of the proposed action should improve the stability and overall soil health on those sites where vegetative treatment is applied. Farmer (1995) reported that on an inter-canopy scale where pinyon/juniper was chained on sandy clay loam and clay loam soils in Utah there was five times less runoff and eight times less sediment than on nearby bare interspaces within untreated pinyon/juniper. Gifford (1973) reported that leaving woody debris in place following chaining pinyon/juniper reduced soil loss by capturing the runoff on site. It is expected that this will hold true where pinyon/juniper is roller chopped or Dixie harrowed. In addition, as the herbaceous and shrub plant community expands the soil stabilizing effects should also increase.

The application of fire in the pinyon/juniper type after thinning with saws may have some short term negative impacts upon the soil porosity if burned too hot. In areas of higher fuel concentrations there may be instances where the organic matter in the top half inch of soil will be destroyed. However, Blaisdell (1953) found that this reduction in organic matter was generally temporary. Prescribed fire also volatilizes nutrients such as N and S but over time, with the appropriate microbiological activity, the availability of these plant nutrients should increase following the burn (Daubenmire, 1968). Ash concentrations following the burn should also provide a seedbed for natural regeneration of perennial grasses and forbs on site as well as seeded species.

Other short-term effects on the soil include a temporary reduction in soil moisture (Daubenmire, 1968) and an increase in soil temperature in the upper two inches (Ahlgren and Ahlgren, 1950). Burning in sagebrush stands or thinned pinyon/juniper sites could result in some short term soil erosion either by wind or water if the burn intensity is such that large areas with little woody debris or live vegetation are created. Generally, however, this effect should last no more than one growing season.

3. Cultural Resources: Potential direct effects to cultural resources are directly related to the proposed ground disturbing vegetative treatments. These treatments include the use of mechanized ground disturbing equipment such as a track driven tractor pulled Dixie Harrow, a track driven tractor pulled disk, a track driven tractor with hydraulic mowers (Hydro mower), and a track driven bull dozer pulled Roller-Chopper. Hand tools, such as chainsaws, shovels, and pulaskis will also be utilized.

Other proposed treatments include the initiation of prescribed fire (broadcast burning and pile burning) within the Adams Canyon Prescribed Fire Treatment Area and the Escrito Ridge Pinyon Juniper Treatment Area. Potential direct effects of prescribed fire to cultural resource sites include the destruction and/or alteration of flammable and nonflammable artifacts and features and soil erosion leading to loss or displacement of cultural deposits.

A potential indirect effect from the proposed treatments is the increased visitor use of the area and consequently the likelihood of removal of artifacts and damage to cultural resource sites. As such, the irretrievable loss of important information pertaining to the history and prehistory of the region is identified as potential indirect effect. However, the benefits to cultural resources derived from the proposed treatments consist of the cultural resource inventories and documentation that will be completed prior to treatment implementation. The documentation and reports produced as the result of necessary cultural resource inventories will add to our understanding of the region's rich and irreplaceable history and prehistory

4. Threatened and Endangered Species/Special Status Species: No federally-listed species is expected to occur in the proposed project area. Implementation of the proposed action will result in a "No Effect" situation for all T&E species that have the potential to occur in San Juan, Rio Arriba, and Sandoval County.

No Special Management Species (SMS) are expected to be impacted by the proposed project area. The only SMS species that have the potential to occur in the project area are the peregrine falcon and bald eagle. However, bald eagles have only been documented to occur on BLM/FFO managed lands in the winter, from November through March. There are no known roost or perch sites within GMU 2C or the surrounding area. With respect to the peregrine falcon, there is a documented eyrie within two miles of one of the treatment areas. This project would occur beyond August 1. Peregrine falcon young are typically fledged off the eyrie by early to mid July. Long-term results from the proposed project are expected to be beneficial to raptor species by enhancing the prey base and vulnerability of prey species from the reduction of cover. No known studies have been conducted in NW New Mexico to document the effects of vegetation treatment to raptors. The California Department of Forestry concluded that peregrine falcons would benefit by vegetation burning if it resulted in an increase of other birds (Nichols and Menke, 1984). Studies conducted on chaparral burning concluded that abundant food was available to raptors immediately following fire because of the vulnerability of prey species due to a cover reduction. Bird species richness and diversity increase in the first few years following fire in chaparral communities (Wirtz, 1982).

The gray vireo (*Vireo vicinior*) has the potential to occur throughout much of the proposed project area. The gray vireo is NM state-listed as 'threatened'. The Gray Vireo inhabits mid-elevation shrublands and pinyon-juniper woodlands in the southwestern United States and northwestern Mexico (Barlow et al. 1999). The species' range, population size, habitats, and breeding biology are not well known, because, in part, it breeds in hot and remote locations not frequently visited by biologists and birdwatchers (Barlow et al. 1999, Schlossberg 2006). In the northern and northwestern parts of the state, the species uses pinyon pine-Utah juniper stands at 5,800-7,200 ft. (Reeves, 1999).

4a. Mitigation Measures to Threatened and Endangered Species/Special Status Species:

- To minimize any impacts the proposed project would have on nesting birds, the proposed project would occur after August 1 (if in potential gray vireo habitat) or July 15 if in a dominant sage habitat type.
- Depending on funding and personnel, the BLM/FFO will conduct presence/absence surveys for vireos prior to any activity within known habitat. Presence/absence surveys for vireos will continue following any habitat disturbance to document any short-term and long-term effects the project may have on gray vireos.
- Any birds and/or active nests observed that have the potential to be harmed or killed by the proposed project must be reported immediately to a BLM/FFO biologist.

5. Recreation: It is anticipated that the overall impact of the proposed action will be an increase in the number of mule deer residing yearlong in GMU 2C. Exactly what this number may be in five or ten years time is difficult to predict. However, it is assumed that a modest increase of 20 to 30 percent is realistic. An increase of this magnitude should translate into additional hunting opportunity. At the present time the demand for mule deer hunting opportunity in New Mexico, especially trophy buck hunting, exceeds the availability. Implementation of the proposed action should help meet this need.

6. Air Quality: There would be some short term impacts to air quality as a result of using prescribed fire on Wyoming sage/grass sites and in burning slash when using chainsaws to thin pinyon/juniper. The effects would be localized and if conducted under the appropriate atmospheric conditions the smoke would be dispersed so as to not impact any populated areas. In a larger sense the smoke may contribute to the air quality problems identified under IIIc.6 – Air Quality. However, it appears that the current situation is experiencing a favorable trend and that if the proposed burns are conducted in accordance with the conditions stipulated by the New Mexico Environmental Department the burns can be implemented without further degrading the air quality.

7. Water Quality: Implementation of the proposed action should improve the soil stability on the uplands due to the increased vegetative ground cover. In turn, there should be less runoff during intense storm events. As a consequence of this there will be less sediment and salts in the runoff from the Largo Canyon or GMU 2C watershed area. The quality of the water in the San Juan River and later the Colorado should be improved under the proposed action.

8 – Livestock Grazing: Most all of the vegetation treatments implemented under the proposed action will be available for livestock use. As a consequence of this there may be better distribution on some grazing allotments due to the more pervasive nature of the forage. Whenever possible, deferment from livestock grazing for two consecutive growing seasons following the vegetation treatment will be achieved. Benefits to livestock will be in increased weight gain and more suitable grazing area. However, an increase in the current stocking level is not the intent of the proposed action.

9. Invasive/Non-Native Species: There is the potential for annual forbs and grasses of an undesirable nature to occur whenever the soil is disturbed or following the use of prescribed fire. All of the treatments listed under the proposed action, with the exception of hydromowing, may be subject to this. Ensuring that prescribed fires do not burn extremely hot and sterilize the soil is one to minimize the invasion of undesirable plants. In terms of mechanical treatments, timing them so that the seeded species as well as the natural species have the most optimal conditions (e.g. late fall or when soil moisture levels are high) for establishment is critical in combating increases in undesirable plants.

10. Forestry: The proposed action should improve the overall health of pinyon/juniper stands as a result of their being thinned. Reducing the density of trees per acre and therefore the competition for soil moisture and nutrients ensures that the remaining trees are stronger and better able to tolerate the effects of drought and attacks by insects such as the Ips beetle (*Ips confusus*).

11. Riparian: There are no vegetative treatments planned for any of the riparian areas in GMU 2C. However, it is anticipated that the indirect impacts to the riparian areas as a result of implementing vegetative treatments on the uplands will be positive. The increased herbaceous vegetation should help stabilize the soils, reduce runoff and increase ground water re-charge.

12. Native American Religious Concerns: Consultation with the Navajo Nation will be initiated to aid in developing specific mitigation measures regarding areas identified as having religious and/or traditional cultural importance to Native Americans. Consultation will also be initiated so as to identify currently unidentified areas of Native American religious and/or traditional cultural importance. Mitigation measures identified during consultation with Native Americans will be implemented prior to project initiation.

IVb. Impacts of the No Action Alternative:

Under the no action alternative there would be no vegetative treatments implemented in

GMU 2C. Changes in plant community composition, soil development and the subsequent impacts to the indigenous fauna would be left largely to the forces of nature. Essentially, this would be driven by the competitive attributes of the flora and fauna interacting as influenced by variables such as precipitation (or drought), fire (or lack of), insects, herbivory and disease. The time frame for the effects of these interactions to manifest themselves into the impacts described below is subject to speculation; however, for the purposes of this document it is assumed that these effects would be realized during the next 15 to 20 years.

1. Wildlife: Under the no action alternative a broad spectrum of wildlife species would be negatively impacted in that the population potentials relative to the available habitat in GMU 2C would not be realized. The creation of more diverse plant communities interspersed with one another would be less likely to happen. Because of the lost opportunity to create more herbaceous ground cover and woody debris through the proposed vegetation treatments there would be less arthropods, and in turn less prey for insectivorous mammals and birds and in turn less prey for small carnivores and raptors. On a larger scale, there would likely be less deer and elk which serve as prey for large carnivores such the mountain lion.

2. Soils: At the present time, any intense thunderstorm generally produces a runoff event that carries with it sediment and salts from the watershed within GMU 2C (USDI-BLM, 1997). Over the past 10 to 15 years herbicide treatments of Wyoming big sage have been undertaken to improve this situation. However, little has been done to improve the ground cover within the pinyon/juniper plant community. Under the no action alternative there would not be a focused effort to treat the pinyon/juniper plant community. In the absence of vegetation treatments that would increase the vegetative ground cover on the pinyon/juniper uplands it is likely that the natural forces of plant succession would continue. The rate at which this change would occur is not certain. Austin (1993) found little detectable differences over a 23 year period in a pinyon/juniper stand in Utah. Floyd et al. (2003) stated that they could not support the “increasing density hypothesis” based upon their observations and data from Mesa Verde Park in southwestern Colorado. Regardless of the time needed for the woodland community to further crowd out the herbaceous ground cover species it would seem that the current amounts of soil loss in GMU 2C are unacceptable and need to be addressed (USDI-BLM, 1997).

3. Cultural Resources: No impacts would occur to cultural resources as a result of a decision for the no action Alternative.

4. Threatened and Endangered Species/Special Status Species: Implementation of the no action alternative would result in a “No Affect” situation for all T&E species that have the potential to occur in San Juan, Rio Arriba, and Sandoval County. The no action Alternative would result in the continuation of the current management of all threatened and endangered, special status, and special management species of in the project area.

5. Recreation: In the absence of the proposed action hunting for big game and upland game birds would continue but probably not at increased levels. Under the no action

alternative maintaining the existing amount of big game hunting opportunity may be a challenge. Having widespread, quality wildlife habitat would ensure a more viable and resilient population of big game. Under the no action alternative this is unlikely to happen.

6. Livestock Grazing: Under the no action alternative there would be no increase in herbaceous vegetation which would be beneficial to livestock as well as wildlife. However, livestock grazing would likely continue at its present level until range conditions warranted an adjustment in numbers. While there would be no increases in livestock numbers as a result of the vegetation treatments identified under the proposed action, implementation of these treatments should result in improved weight gains for livestock and improved range condition.

7. Air Quality: The quality of the air would probably remain unchanged. There would be no use of prescribed fire and it's likely that more trees would remain under natural conditions (as opposed to the proposed treatments) which could serve as a larger carbon sink (Ramanujan, 2002). Given the amount of carbon dioxide emissions in the San Juan Basin having this amount of extensive woodland cover could provide a valuable means of carbon sequestration. However, quantifying these effects would be difficult. The net difference between the trees remaining after the proposed treatments and those trees remaining under the no action alternative, which would include the trees lost to drought and insects, would dictate the actual size of the carbon sink. In addition, there would be an increase in herbaceous and shrubby plants under the proposed action and a gradual decline in these species under the no action alternative. In essence, the differences between the two alternatives relative to air quality, is likely to be negligible unless there were very large reductions in the woodland community.

8. Water Quality: Under the no action alternative there would be no increase in vegetative ground cover or litter on the uplands. Runoff and soil erosion would continue at present levels or increase in the absence of other initiatives to promote herbaceous plant growth. If this were to occur the water quality in the San Juan and possibly the Colorado Rivers would continue to be negatively impacted due to the transport of sediment and salts from the project area watershed.

9. Invasive/Non-Native Species: At the present time the number of invasive/non-native species in GMU 2C that pose a problem to the diversity of native plant communities and indigenous fauna is limited primarily to cheatgrass. Problem areas where cheatgrass has gained dominance to the point that it has crowded out desirable native species would be targeted under the proposed action for treatment. Under the no action alternative this action would not occur.

10. Forestry: Under the no action alternative there could be more trees left intact (as opposed to the proposed action) within the project area. This is assuming that the area does not experience continued drought. In some areas, e.g. the north end of Ensenada mesa, past drought conditions have weakened the defenses of pinyon pine and left them susceptible to attack by the Ips bark beetle (Hansen, 2007). Ips beetles are endemic to the pinyon pine habitat type and under normal climate conditions their role is generally

beneficial in that they create openings in the pinyon forest by taking weaker trees and allowing under-story herbaceous species to thrive. However, in overly dense stands of pinyon/juniper trees that are subjected to drought inter-specific competition between the pinyon pine and the juniper can lead to weakened trees that provide an opportunity for the Ips beetles to increase in numbers. Once this happens, the beetles can overwhelm pinyons and spread. A deterrent to this is either being fortunate enough to have good moisture years so that the pinyon's can produce enough pitch to expel the beetles or selectively thin the pinyon and juniper so that the competition for soil moisture is reduced. This should result in a more healthy stand of trees that can tolerate the effects of drought and still defend themselves against the Ips beetle (Swift et al., 2003).

11. Riparian: The riparian areas within GMU 2C may realize some instability as a result of high runoff events following intense thunderstorms. Under the no action alternative, the pinyon/juniper uplands will not receive the focused treatment identified under the proposed action.

12. Native American Religious Concerns: No impacts would occur to Native American Religious Concerns as a result of a decision for the No-Action Alternative.

V. Cumulative Impacts

Specific vegetation treatments identified under the (initial) proposed action amount to only 561 acres of pinyon/juniper and 2,131 acres of sage/grass for a total of 2,694 acres. However, as described in the proposed action (See Section IIa.) there will be additional vegetation projects planned throughout GMU 2C. The exact acreage of these projects is not known at this time but they may be, in part, follow-up maintenance treatments of existing projects. Descriptions of the soil mapping units depicted on Map 6 appear on pages 26-29 of this document. Soils with the potential for the Wyoming big sagebrush/perennial grass plant community occur on 159,656 acres with an additional 52,571 acres identified as having a potential for pinyon/juniper/Wyoming sage. The combined acreage for these two sites is 212,227 acres. Treatments dating back to the 1960s to the present in these vegetation types total 107,972 acres or about 51 percent. There are no records of any treatments where pinyon/juniper was the target species. Areas in GMU 2C that are dominantly pinyon/juniper and located on soils and slopes that may be conducive to some kind of treatment occupy approximately 136,644 acres.

Given the figures cited above it would appear that the pinyon/juniper community has not been impacted through vegetative treatments whereas the sagebrush plant community has experienced significant change due to planned treatments. However, what is not apparent from Map 6 is the degree of fragmentation that has occurred within the pinyon/juniper due to oil and gas development. The exact number of acres of pinyon/juniper removed as a result of this activity is not known at this point but it is estimated at less than five percent of the total acres occupied by pinyon/juniper. Projected future disturbances throughout the entire FFO area that are associated with oil and gas development are estimated to be 8,569 acres of long term disturbance with a functional habitat loss of 35,200 acres within 660 feet of roads (USDI-BLM, 2003b).

A significant portion of this disturbance will likely occur in GMU 2C.

VI. Monitoring

A variety of studies have been initiated to assess the current condition of the flora and fauna that are anticipated to be impacted by the proposed action. Data will be collected prior to implementation of the proposed action and post treatment. The key ecological elements that will be monitored are as follows:

Flora: There will be several methods of qualitative and quantitative assessment conducted within the pinyon/juniper and Wyoming sagebrush habitat types receiving treatment. These studies consist of step-point vegetative cover transects that determine the percent cover by plant species and entity, i.e. bare ground, rock or litter; and ecological condition and apparent trend in range condition studies co-located with the cover transects (See Appendix A). These studies will be re-read two years after the treatments have been completed.

In addition to the studies above, there are 33 browse condition and pellet group studies located in GMU 2C. These studies have been in place for about 12 to 13 years and provide good baseline data as to the condition of the browse during this time. The current schedule of reading these studies every three years will be maintained.

An important variable that will undoubtedly affect the success of proposed action will be climatic fluctuation, specifically the amount of precipitation received. Therefore, if funding allows a remote automated weather station (RAWS) will be installed on Crow Mesa and Ensenada Mesa to track the various weather components on a yearlong basis. These data will be accessible on a yearlong basis via the internet by anyone with a personal computer.

Fauna: Point count surveys to determine the presence/absence of grey vireo and various avian species in pinyon/juniper sites being proposed for treatment have also been established (See Map 9). A monitoring effort utilizing a point count survey route extending from the southeast corner of the Crow Mesa Wildlife Area to northwest corner (14.5 miles) was also established in 2007 as part of the FFO's long-term bird monitoring program. Data obtained during the winter and spring surveys along this route are on file in the FFO area office.

Helicopter surveys to determine wintering numbers of mule deer and elk have been flown in the past and will continue in the future. Current plans for the 2007-08 winter surveys call for intensive helicopter surveys in the Crow Mesa Wildlife SDA and the Ensenada Mesa Wildlife SDA which will be targeted for vegetation treatments in 2009-10. Fawn to doe ratios as well as total numbers will be calculated and compared against future surveys to see if the stated goals are being achieved.

Application of data: It is anticipated that the data collected during the monitoring process will allow future treatments to be modified based upon the successes and failures of the projects that precede them. Given this assumption, the need for

monitoring project results becomes very important.

VII. Mitigation Measures

1. Vegetation treatments using either mechanical (roller chop, Dixie harrow, disk or plow) or prescribed fire will not be applied during the peak nesting period of May 1 through July 15. In areas determined to be potential gray vireo habitat the closure period would be extended to August 1. The intent of this measure is to minimize the incidental take of either eggs or young of nesting birds.

2. All prescribed fire will be conducted in accordance with a permit issued by the New Mexico Environmental Department – Air Quality.

3. Class III cultural resource inventories will be conducted prior to the implementation of any surface disturbing activities. All cultural resource sites deemed eligible or potentially eligible for inclusion on the National Register of Historic Places will be avoided by the proposed actions. Cultural resource site monitoring will be stipulated on a project by project and site by site basis. All employees of the project, including the Project Sponsor and its contractors and sub-contractors will be informed that cultural sites are to be avoided by all personnel, personal vehicles and company equipment. They will also be notified that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm). Discovery of Cultural Resources in the Presence or Absence of Monitoring: If, in its operations, Project sponsor discovers any previously unidentified historic or prehistoric cultural resources, then work in the vicinity of the discovery will be suspended and the discovery promptly reported to the BLM Field Manager.

4. Surveys for gray vireos will be conducted within those proposed treatment blocks that offer potential habitat for gray vireos prior to any work taking place. Areas that appear to provide exceptional habitat for gray vireos may be avoided.

5. Livestock grazing will be deferred for at least two growing seasons on all vegetation treatments as a means to allow the seeded plant species an opportunity to become well established. After two growing seasons, the range will be evaluated for range readiness.

6. In woodland areas, mechanical treatments or the use of prescribed fire, would be avoided during the period May 1 through August 1 to avoid disturbing or destroying bats on maternity roost sites.

VIII. Consultation and Coordination

External: (New Mexico Department of Game & Fish)
R.J. Kirkpatrick Chief, Wildlife Mgmt. Div.
Barry Hale Deer Program Manager

Donald Auer	Habitat Project Coordinator
Mark Olson	NW Area Habitat Specialist
Kathy Mckim	NW Area Supervisor
Matt Anthony	Largo District Officer
Bob Culp	Law Enforcement Training Coordinator

Other External:		
Ken Wilkinson	Wildlife Biologist	BLM – Elko, NV
Blair Waldron	Research Geneticist	ARS – Logan, UT
Ken Gray	Wildlife Biologist	Nevada Div. of Wildlife
Mike Howard	BLM Botanist	NM State Office
Vicki Herren	BLM T&E Biologist	NM State Office
John Sherman	BLM Wildlife Biologist	NM State Office
Shawn Knox	Wildlife Biologist	NM State Lands Office

Internal (FFO - BLM):		
Jim Copeland	Cultural Res.	//signed// Jim Copeland 8/20/07
Michael Dussinger	Cultural Res.	//signed//M. Dussinger 8/19/07
John Kendall	Special Status Sp.	//signed// John Kendall 8/14/07
Pete Lefebvre	Livestock Grazing	//signed// Pete Lefebvre 8/14/07
Dale Wirth	Soil/Air/Water	//signed// Dale Wirth 8/17/07
Jeff Tafoya	Invasive Species	//signed// Jeff Tafoya 8/15/07
Pat Pacheco	Forestry/RX Fire	//signed Pat Pacheco 8/30/07
Barney Wegener	Riparian	//signed//Barney Wegener 8/14/07
Rich Simmons	Recreation	//signed// Rich Simmons 8/17/07

//signed// John Hansen
Prepared by: 8/10/07
Date:

//signed// Dale Wirth
Approved by: 8/30/07
Date:

FINDING OF NO SIGNIFICANT IMPACT/DECISION RECORD

I have reviewed this environmental assessment including the explanation and resolution of any potentially significant environmental impacts. I have determined that the proposed action with the mitigation measures described below will not have any significant impacts on the human environment and that an EIS is not required. I have determined that the proposed project is in conformance with the approved land use plan. It is my decision to implement the project with the mitigation measures identified below.

Mitigation Measures/Remarks:

1. Vegetation treatments using either mechanical (roller chop, Dixie harrow, disk or plow) or prescribed fire will not be applied during the peak nesting period of May 1 through July 15. In areas determined to be potential gray vireo habitat the closure period would be extended to August 1. The intent of this measure is to minimize the incidental take of either eggs or young of nesting birds.
2. All prescribed fire will be conducted in accordance with a permit issued by the New Mexico Environmental Department – Air Quality.
3. Cultural surveys will be conducted prior to any surface disturbing activities. Any sites discovered will be identified, recorded and avoided.
4. Surveys for gray vireos will be conducted within those proposed treatment blocks that offer potential habitat for gray vireos prior to any work taking place. Areas that appear to provide exceptional habitat for gray vireos may be avoided.
5. Future vegetation treatments, not identified within this document, will be analyzed in accordance with the National Environmental Policy Act as promulgated under Title 40 of the Code of Federal Regulations, part 1502 section 20. Specifically, the administrative mechanism used will be the (DNA) Documentation of Land Use Plan Conformance and National Environmental Policy Act (NEPA) Adequacy. If a DNA determines that impacts of the proposed treatments are outside those analyzed in this EA a new site specific EA will be prepared.
6. Livestock grazing will be deferred for at least two growing seasons on the vegetation treatments. After two growing seasons, the range will be evaluated for range readiness.
7. In woodland areas, mechanical treatments or the use of prescribed fire would be avoided during the period May 1 through August 1 to avoid disturbing or destroying bats on maternity roost sites.

Authorized Official: //signed// Dale Wirth Date: 8/30/07

APPENDICES

A. Project vegetation inventory methods/data: Pinyon pine/One-seed juniper: the qualitative attributes used to define the condition of this habitat type are canopy closure, the percent understory vegetative cover by plant class (grass, forb, shrub), the number and percent of trees by species in different size classes i.e. less than 4 inches, 4-8 inches and greater than 8 inches in diameter at the base. NOTE: The locations for the step point transects were selected on the basis that they were representative of the overall project site. Data were collected at every other step over 100 points or 200 steps. Transect lengths were typically about 450 feet. Each transect was permanently marked with steel rebar and the location recorded using a global positioning system (GPS). For the purposes of long term monitoring the UTM location of each transect is provided for each transect listed below. In order to avoid reporting multiple cover attributes for a single point only the highest level cover entity is shown below. In other words, if a drop of rain were to fall on the site, what intercepts it first e.g. vegetation, bare ground, litter or rock?

1. Crow Mesa Roller Chop:

Location: 263378/4024304 – NAD 83

Size: 409 acres

Percent woodland canopy cover: 21% pinyon; 7% one-seed juniper > Total: 28%

Trees by size class: Pinyon <4" (3); 4-8" (8); >8" (11); Juniper <4" (0); 4-8" (0); >8" (7). Total trees encountered: 29; 75.8% pinyon/24.2% juniper.

Percent basal/1st level vegetative cover:

42% - Bare ground

23% - Litter

1% - Gravel

6% - Shrubs > Antelope bitterbrush

Total: 72 %

Field observations/notes: Saw one deer on site but evidence of considerable past deer use. Encountered no grass at all with few forbs i.e. pinyon-juniper Lousewort (*Pedicularis centranthera*) had two basal hits. Bitterbrush dominant understory vegetation. Degree of hedging mostly moderate to heavy in some places. Mountain mahogany also present but much less so than bitterbrush. Recommend roller chopping both pinyon and juniper up to 10 to 12 inches basal diameter and seeding with cool season grasses and forbs. Treatment pattern should create a vegetative mosaic to provide wildlife cover.

2. Escrito Ridge PJ Treatment:

Location: 0268383/4013717 – NAD 83

Size: 152 acres.

Percent woodland cover: 32% pinyon; 7% one-seed juniper > Total: 39%

Trees by size class: Pinyon <4" (6); 4-8" (12); >8" (15); Juniper <4" (0); 4-8" (0); >8" (8). Total trees encountered: 41; 80.5% pinyon/19.5% juniper.

Percent basal/1st level vegetative cover:

29% - Bare ground

20% - Litter

3% - Gravel

9% - Shrubs: (2%) mountain mahogany; (2%) basin big sagebrush

(*Artemesia tridentata tridentata*); (2%) pricklypear cactus (*Opuntia polyacantha*); (2%) yucca (*Yucca spp.*); (1%) antelope bitterbrush
Total: 61%

Field observations/Notes: Deer use pervasive, lesser amount of elk use. Bitterbrush and mountain mahogany common throughout site as are yucca and pricklypear cactus. Hedging of key browse is heavy but overall health (age and form class) appears fairly good. Vigor of browse plants is also fair to good. Herbaceous plants, especially grasses, are mostly absent. Few forbs present e.g. Compositae and Boraginaceae. Recommend thinning all trees up to 6 inches in diameter at the base followed by burning and seeding. Broadcast seed cool season grasses and forbs into the ashes after burning. The collateral mortality from burning these trees should take out some of the yucca and sage as well as set the bitterbush and mahogany back causing it to re-sprout from the base. Burn in early spring.

Wyoming big sagebrush/perennial grass: step point cover transects were also conducted in sites being proposed for Dixie harrowing, plowing and seeding, and prescribed burning. In addition to these vegetative cover transects the range condition and apparent trend in range condition were also determined for each proposed project site.

3. Crow Mesa Dixie Harrow:

Location: 02670674020443 – NAD 83
Size: 169 acres
Percent cover:
35% - Bare ground
22% - Litter
24% - Shrubs: (24%) Wyoming big sagebrush;
1% - Trees: (1%) pinyon pine;
17% - Grasses: (16%) blue grama (*Bouteloua gracilus*); (1%) galleta (*Hilaria jamesii*)
1% - Forbs: (1%) (Boraginaceae spp.)
Total: 100%

Range condition: Fair condition / ecological score – 48. Apparent trend in range condition: Stationary / score – 11. Estimated production: 400 lbs./ac. Air dry weight.

Field observations/Notes: Fresh deer and elk sign on site. Lots of rabbit use. Vigor of grasses poor to fair. Sage occurs within pinyon/juniper in parks. No cool season grasses observed. Annual grasses such as six weeks fescue (*Vulpia octoflora*) and false buffalo grass (*Monroa squarrosa*) are evident in patches. Forbs noted include: scarlet globemallow (*Sphaeralcea coccinea*), buckwheat (*Eriogonum spp.*), and an unknown Compositae. Estimated overall forb component at 4 percent of the total plant community's annual production. Recommend that the site be Dixie harrowed to remove about half of the sage, which currently comprises approximately 72 percent of the total annual vegetative production. Following this, seed with cool season grasses and forbs.

4. Little Blue Mesa Dixie Harrow:

Location: 0271884/4020961

Size: 30 acres

Percent cover:

54% - Bare ground

27% - Litter

17% - Shrubs (Wyoming sage)

1% - Forbs

1% - Grasses

Total: 100%

Range condition: Fair condition / ecological score – 28. Apparent trend in range condition: declining / score – 8. Estimated production: 280 lbs./ac. Air dry weight.

Field observations/Notes: Few elk and deer have used site within past six months. Rabbit use pervasive. Blue grama, very poor vigor, stunted, saw only three seed heads. Bare ground seems excessive. Species diversity lacking. Definitely benefit from Dixie harrowing and seeding. Need close adjacent road.

5. Blue Mesa (Canyon) RX Fire/Plow/Seed:

Location: 0272145/4021602 – NAD 83

Size: 79 acres

Percent cover:

31% - Bare ground

35% - Litter

9% - Shrubs (Fourwing saltbush – 8%; Basin big sagebrush – 1%)

24% - Grasses (16% - cheatgrass)

1% - Forbs

Total: 100%

Range condition: Fair condition / ecological score – 34. Apparent trend in range condition: declining / score – 5. Estimated production: 350 lbs./ac. Air dry weight.

Field observations/Notes: Fresh elk sign throughout site. Lots of green cheatgrass and forbs. Elk most abundant use but some deer and old cattle use. Most all sage is dead and fourwing is exhibiting poor vigor. Rabbits may have been factor in past but not now, few fresh droppings.

6. Crow Mesa NW Dixie Harrow:

Location: #1 – 0262331/4029760 - NAD 83

#2 – 0260308/4026335 - NAD 83

Size: 89 acres

Site attributes based upon average of cover transects at two different locations.

Percent Cover:

- 46% - Bare ground
- 24% - Litter
- 21% - Shrubs (ARtrw)
- 8% - Grasses
- <1% - Forbs

Total: 100

	Site #1	Site#2
Range condition:	Fair	Fair
Ecological scores:	29	37
Apparent trend scores:	10 (declining)	11(stationary).
Estimated production:	280 lbs.	400 lbs.

Field Observations/Notes:

Site #1: Fresh deer sign (1-2), old elk sign (1-2). All grasses very stunted appear dead but may be dormant with poor vigor. Very few stems or seed heads from last year. Loamy soils. Good candidate for Dixie harrow.

7. Adams Canyon RX Fire/Plow/Seed:

Location: 0264450/4022446 - NAD 83

Size: 75 acres

Percent cover:

- 24% - Bare ground
- 54% - Litter
- 0% - Shrubs (No living shrubs encountered on transect)
- 6% - Grasses (All cheatgrass)
- 16% - Forbs (Mostly mustards – 10%)

Total: 100%

Range condition: Poor condition / ecological score – 18. Apparent trend in range condition: declining – 5. Estimated production: 275 lbs./ac. Air dry weight.

Field Observations/Notes: Deer/elk use throughout site. Rabbit use pervasive. Nearly all sage dead. Weeds and cheat grass comprise most of vegetation on site. May be difficult to get fire to burn without “hot prescription” as all sage is defoliated, just skeletons remain. Site definitely needs re-seeded.

8. Palluche Canyon Dixie Harrow

Location: #1 – 0265715/4030553 – NAD 83

#2 – 0267597/4029557 – NAD 83

Size: 1,163 acres

Percent cover:

- 41% - Bare ground
- 18% - Litter
- 10% - Shrubs (9% - sage, 1% greasewood)
- 26% - Grasses

	5% - Forbs	
Total:	100%	
	Site #1	Site#2
Range condition:	Good	Fair
Ecological scores:	52	50
Apparent trend scores:	13 (Stationary)	12 (Stationary)
Estimated production:	450 lbs./ac.	325 lbs./ac.

Field observations/Notes: Fresh deer and elk sign on site one, mostly deer. Recent cattle use (unauthorized) evident in area, mostly on site two. About 15% of sage on site one appears to be dead or dying. Deer use on sage is light to moderate. Some scattered pinyon/juniper throughout both sites, provides cover for wildlife using sage flats. Forbs patchy, more on site two than one.

9. Big Blue Mesa Hydromower – Block A

Location: 0271195/4022253 – NAD 83

Size: 100 acres

Percent Cover:

34% - Bare Ground

19% - Litter

9% - Shrubs

38% - Grasses

0% - Forbs

Total: 100%

Range Condition: Fair
 Ecological score: 38
 Apparent trend score: 13 (Stationary)
 Estimated production: 425 lbs./ac.

Field observations/Notes: Lots of rabbit use, some old elk and deer use but not overly abundant.

10. Big Blue Mesa Hydromower/Dixie Harrow – Block B

Location: 0274144/4022941 – NAD 83

Size: 294 acres

Percent cover:

22% - Bare Ground

16% - Litter

16% - Shrubs

39% - Grasses

7% - Forbs

Total: 100%

Range Condition: Fair
 Ecological score: 38

Apparent trend score: 15 (Stationary)
Estimated production: 490 lbs./ac.

Field observations/Notes: deer/elk use common. Good plant diversity.

11. Crow Canyon Hydromower/Dixie Harrow

Location: 0263230/4022180 – NAD 83

Size: 134 acres

Percent cover:

27% - Bare Ground

12% - Litter

9% - Shrubs

45% - Grasses (13% Cheatgrass)

7% - Forbs

Total: 100%

Range Condition: Fair

Ecological score: 46

Apparent trend score: 10 (Declining)

Estimated production: 430 lbs./ac.

Field observations: deer/elk use common. Saw four deer on site (in taller sage). Cheatgrass spreading throughout the area. Plant community composition varies throughout the site from relatively heavy cheatgrass with some perennial grasses and forbs to sage and mostly bare ground to fairly decent proportions of sage/grass/forbs with little cheatgrass present. Significant erosion taking place as evidenced by several large gullies.

B. Results of bat surveys conducted in the Farmington Field Office area in 1996-1998.

Species Name: <i>Myotis evotis</i>	long-eared myotis*
<i>Myotis volans</i>	long-legged myotis*
<i>Myotis californicus</i>	California myotis
<i>Myotis ciliolabrum</i>	western small-footed myotis*
<i>Myotis yumanensis</i>	Yuma myotis*
<i>Lasiycteris noctivagans</i>	silver-haired bat
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat
<i>Eptesicus fuscus</i>	big brown bat
<i>Pipistrellus Hesperus</i>	western pipistrelle
<i>Antrozous pallidas</i>	pallid bat
<i>Euderma maculatum</i>	spotted bat*
<i>Idionycteris phyllotis</i>	Allen's big-eared bat
<i>Nyctinomops macrotis</i>	big free-tailed bat*
<i>Plecotus townsendii pallescens</i>	Townsend's big-eared bat*

*BLM Sensitive Species

C. Bird species encountered by Ortega et al in 2006 in pinyon/juniper habitat type in GMU 2A.

SPECIES:	Common Poorwill	(<i>Phalaenoptilus nutallii</i>)
	Black-chinned hummingbird	(<i>Archilochus alexandri</i>)
	Hairy woodpecker	(<i>Picoides villosus</i>)
	Gray flycatcher	(<i>Empidonax wrightii</i>)
	Juniper titmouse	(<i>Baeolophus griseus</i>)
	Bewick's wren	(<i>Thryomanes bewickii</i>)
	Bushtit	(<i>Psaltriparus minimus</i>)
	Blue-gray gnatcatcher	(<i>Polioptila caerulea</i>)
	Western bluebird	(<i>Sialia Mexicana</i>)
	Mountain bluebird	(<i>Sialia currucoides</i>)
	Gray vireo	(<i>Vireo vicinior</i>)
	Virginia's warbler	(<i>Vermivora virginiae</i>)
	Black-throated gray warbler	(<i>Dendroica nigrescens</i>)
	Western tanager	(<i>Piranga ludoviciana</i>)
	Black-headed grosbeak	(<i>Pheucticus melanocephalus</i>)
	Green-tailed towhee	(<i>Pipilo chlorurus</i>)
	Spotted towhee	(<i>Pipilo maculatus</i>)
	Chipping sparrow	(<i>Spizella passerina</i>)
	Red crossbill	(<i>Loxia curvirostra</i>)
	Mourning Dove	(<i>Zenaida macroura</i>)
	Brown Headed Cowbird	(<i>Molothrus ater</i>)
	House finch	(<i>Carduelis pinus</i>)
	Ash throated flycatcher	(<i>Myiarchus cinerascens</i>)

D. Chart 1 - Bird species detected on the Blanco Trading Post point count survey route (mature Wyoming sagebrush) during the spring of 2001-2006.

Species:	01	02	03	04	05	06
Sage sparrow (<i>Amphispiza belli</i>)	34	25	26	15	26	14
Sage thrasher (<i>Oreoscoptes montanus</i>)	20	7	10	4	7	5
Common raven (<i>Corvus corax</i>)	4	3	1	1	2	4
Red-tailed hawk (<i>Buteo jamaicensis</i>)	1	1	1	0	0	0
Horned lark (<i>Eremophila alpestris</i>)	11	16	16	10	20	11
Western meadowlark (<i>Sturnella neglecta</i>)	1	3	0	0	0	0
Brewer's sparrow (<i>Spizella breweri</i>)	0	2	0	0	0	0
Mourning Dove (<i>Zenaida macroura</i>)	0	2	5	0	2	3
Say's Phoebe (<i>Sayornis saya</i>)	0	1	0	0	0	0
Loggerhead shrike (<i>Lanius ludovicianus</i>)	0	0	1	0	2	0

American kestrel (<i>Falco sparverius</i>)	0	0	0	1	0	0
Pinyon Jay (<i>Gymnothinus cyanocephalus</i>)	0	0	0	1	0	0
Brown Headed Cowbird (<i>Molothrus ater</i>)	1	4	3	2	0	7
House finch (<i>Carduelis pinus</i>)	0	1	0	0	0	0
Scaled quail (<i>Callipepla squamata</i>)	0	0	0	0	7	6
Ash throated flycatcher (<i>Myiarchus cinerascens</i>)	0	0	0	0	2	0
Northern mockingbird (<i>Mimus polyglottos</i>)	0	0	0	0	0	1

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