Monitoring Nesting Golden Eagles for the Farmington Field Office, and Nesting Raptors for the Taos Field Office, BLM Resource Areas, New Mexico. 2006 Annual Report

Prepared for:
Bureau of Land Management
Farmington and Taos Field Offices
New Mexico

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20 December 2006

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EXECUTIVE SUMMARY

In 2006, the Farmington Field Office of the Bureau of Land Management (BLM) contracted Hawks Aloft, Inc. (HAI) to document the distribution and reproductive success of Golden Eagles *(Aquila chrysaetos)* in portions of San Juan, McKinley, Rio Arriba, and Sandoval Counties, New Mexico. In the Farmington study area we have monitored known Golden Eagle nests and searched for new ones since 1998. The Taos Field Office of the BLM contracted Hawks Aloft to document the distribution and reproductive success for raptors in the upper Rio Grande Gorge, the Orilla Verde Recreation Area, and the Rio San Antonio Gorge in Taos and Rio Arriba Counties, New Mexico. In the Taos study area we have monitored known raptor nests and searched for new ones since 2000. The data collected for the Farmington Field Office are primarily used by land managers to protect the nests of breeding Golden Eagles in an area that is heavily utilized for gas and oil extraction. The data provided to the Taos Field Office is used to help protect breeding raptors in areas that are primarily utilized for recreational purposes.

Chapter 1 presents data for Golden Eagles in the Farmington study area. A total of 32 territories were occupied by at least one adult Golden Eagle; 20 territories were occupied by breeding pairs and considered active. Of the 20 active nests, seven were new or previously undocumented. The reproductive outcome was determined at 19 nests and, of those, 13 (68%) successfully fledged at least one young. The average productivity per breeding pair was 0.8 young per nest.

Chapter 2 presents data for raptors in the Taos study area. A total of 21 active raptor nests were monitored, nine Golden Eagle, five Prairie Falcon *(Falco mexicanus)*, and seven Red-tailed Hawk *(Buteo jamaicensis)*. One active Golden Eagle nest was a new alternate. In addition, one Golden Eagle, two Prairie Falcon, one Peregrine Falcon *(F. peregrinus)*, one Red-tailed Hawk, and one Great Horned Owl *(Bubo virginianus)* territories were occupied by at least one adult and no evidence of breeding was observed. Reproductive outcome was determined at all active nests, and 16 (76%) successfully fledged at least one young. The average productivity per breeding pair was: 1.3 young for Golden Eagle, 3.0 for Prairie Falcon, 1.0+ for Red-tailed Hawk.

CHAPTER 1:

DISTRIBUTION AND REPRODUCTIVE SUCCESS FOR GOLDEN EAGLES IN SAN JUAN, McKINLEY, RIO ARRIBA, AND SANDOVAL COUNTIES, NEW MEXICO

FARMINGTON FIELD OFFICE, BUREAU OF LAND MANAGEMENT

INTRODUCTION

Since 1998, Hawks Aloft, Inc. has gathered data on the distribution, density, and productivity of Golden Eagles for the Farmington Field Office of the BLM in northwestern New Mexico. Golden Eagles in this region typically nest on the ledges of sandstone cliffs and volcanic rock outcrops that are adjacent to open grassland and shrub-steppe habitats (Hawks Aloft 1999). Long-term surveys indicate declines in the nesting populations in western U.S., but not in Alaska or Canada (Kochert and Steenhof 2002). The increase in human-related activities, as well as land use practices could adversely impact Golden Eagle nesting activity and reproductive success (Spofford 1964, 1988, Benson 1981, Boeker and Nickerson 1975, Glinski 1988, Hawks Aloft 2000). Once Golden Eagles establish a territory, they often remain in that area for many years, and defend an area of approximately 20-30 square kilometers from conspecifics (Kochert et al. 2002). Territories typically contain multiple nests that are maintained and repaired as part of the courtship ritual. Golden Eagles are protected in the United States under the Bald and Golden Eagle Protection Act of 1962, as well as the Migratory Bird Treaty Act.

Of particular concern for Golden Eagle populations in northwestern New Mexico are the long-term effects of the oil and gas extraction industry that, in many areas, can occur in relatively close proximity to historic nesting territories. Current protection measures for active and historic nests do not permit any construction, drilling, or completion activities between 1 March and 30 June within 1/3 mile of active nests. Concerns over the potential effects of noise disturbances to breeding pairs led to a noise disturbance study at active nests located near air exchangers and gas compressors from 2000-2004 (Hawks Aloft 2004). The sample size of the study was small and did not indicate a significant effect. The noise disturbance study was discontinued after 2004. Other concerns involving the activities of the oil and gas industry include habitat fragmentation and the potential for nest site disturbances associated with maintenance operations around wells near active nests.

STUDY AREA

The Farmington study area is located on BLM land in portions of San Juan, McKinley, Rio Arriba, and Sandoval Counties, New Mexico (Figure 1.1). The area's western boundary extends along the Navajo Nation, where it can sometimes become a complex patchwork of tribal and BLM-owned land. The eastern boundary is along the Carson National Forest and the Jicarilla Apache Reservation. The northern boundary is the Colorado-New Mexico state line, and the study area extends south to Chaco Mesa. The nesting areas utilized by Golden Eagle are located on the sandstone cliffs of the Animas and San Jose Formations that are found on the many canyons, arroyos and mesas throughout the area. The mesas in the study area are usually topped with pinyon-juniper woodland. At the base of the cliffs, the vegetation usually includes a narrow band of pinyon-juniper woodland bordered by desert scrubland or desert grassland, with a strong shrub component. The predominant land use is oil and gas extraction, but land is also used for cattle grazing and agriculture. A large number of unpaved roads, many of which are associated with oil and gas operations, allow access into the canyons, arroyos, and mesas of the study area.

METHODS

Beginning in early to mid March, ground searches to determine occupancy of known nests and territories was begun. Surveys were conducted on foot and by vehicle using existing roads and two-tracks. Once nest status was positively determined to be active, a minimum of two follow-up visits were conducted to determine the number of nestlings, and to gather final fledge data. Raptor nests were considered to be active (occupied by a breeding pair) if at least one of the following was observed;

1. eggs were seen in the nest,
2. nestlings or young were observed in or near the nest or,
3. adult was observed on the nest in an incubating posture (Postupalsky 1974).

Nestlings were considered fledged when their age was estimated to be eight to nine weeks old. Nest sites that had documented nesting activity within the past three years were checked first.

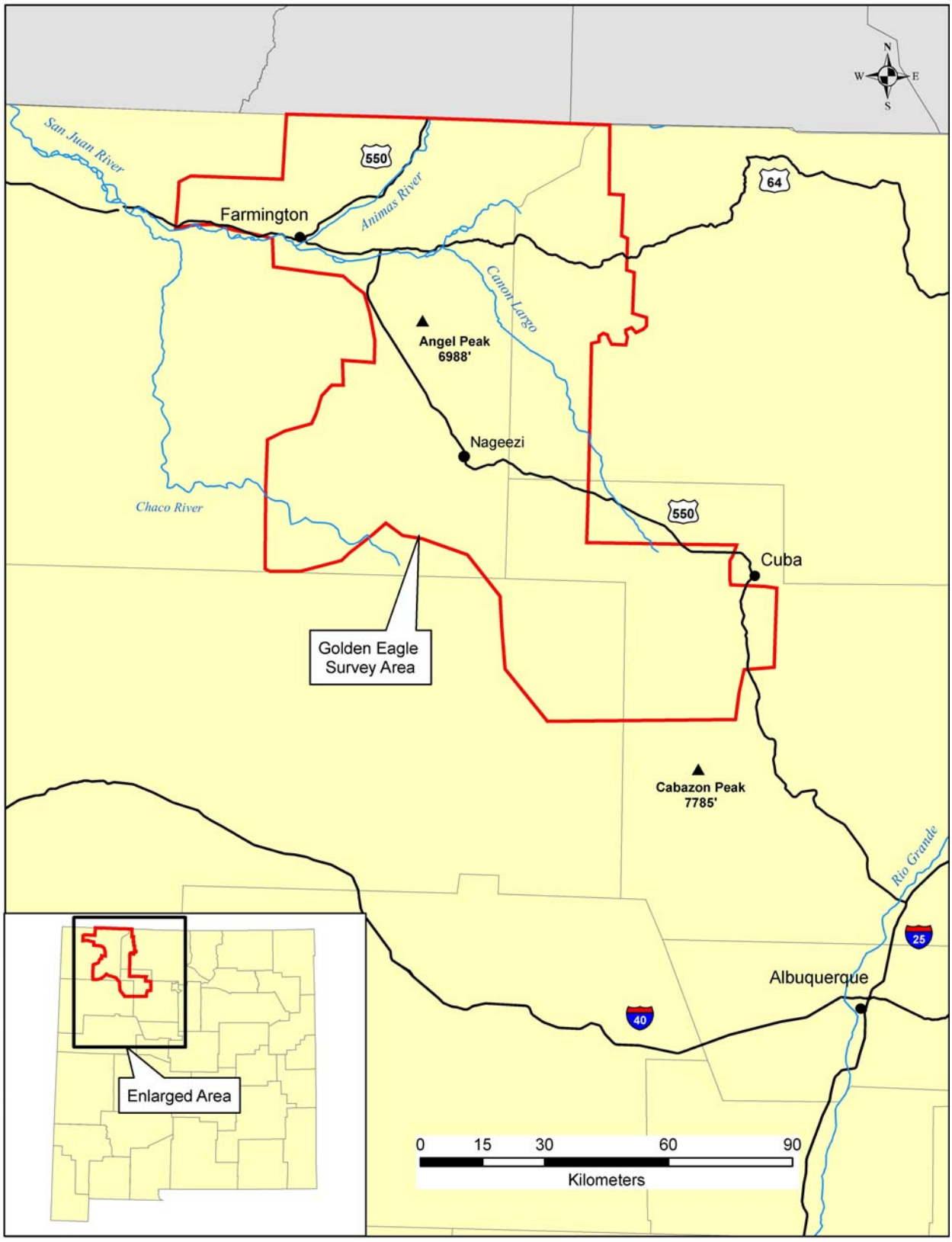

Figure 1.1 Farmington Field Office, Golden Eagle survey area, New Mexico.

After checking the known nests, when time allowed, searches for new nests were conducted in areas that contained appropriate habitat for nesting eagles. The Farmington Field Office was notified as soon as possible of all occupied nests so that protection measures could be implemented to avoid any potential disturbance to the active nest sites as a result of oil and gas industry activities.

Nest sites were determined to be inactive if no raptor activity was observed at or near the nest by the first week of April. A nest site was considered an occupied territory if at least one adult was observed within ½ mile of the nest, or exhibited territorial behavior but no evidence of breeding was observed. Nests sites where the status was initially difficult to determine were revisited until status could be confirmed.

The locations of nest sites were documented using Universal Transverse Mercators (UTMs) in North American Datum 1927 (NAD 27) using hand-held Garmin Global Positioning System (GPS 12) units. We present species, nest locations, nest status, and reproductive success. Nest locations were photographed and plotted on 7.5-minute series USGS quadrangle maps.

RESULTS

We checked 55 Golden Eagle nest sites, including alternate nests. Of those, seven were previously undocumented. Thirty-two nest territories were occupied and, of those, 20 had egg-laying pairs. Six nests failed for reasons that were not determined. The reproductive outcome was determined at 19 of the 20 active nests. Thirteen nests were successful (68% success rate) and fledged a total of 15 young, and 0.8 was the mean number of young fledged per active nest (see Tables 1.1 and 1.2). In addition we present Golden Eagle data from the Socorro, Taos, and Albuquerque resource areas in tables 1.1 and 1.2. The Farmington resource area is the one that contains the highest numbers of nesting Golden Eagles.

Although we monitored a similar number of active nests in 2006 (20) as 2005 (21), we observed an apparent decline in productivity during 2006. The percent success rate declined from 90% in 2005 to 68% in 2006. Productivity also declined from 1.2 young fledged per active nest in 2005

to 0.8 in 2006. We do not know the reason for the drop in productivity from 2005 to 2006, but it might be related to a seasonal decline in the population of the major prey species in the study area.

Table 1.1 Nest activity and average productivity per breeding pair (outcome is known) of Golden Eagles for the Farmington, Socorro, Taos, and Albuquerque resource areas, New Mexico, 2001 – 2006. (n/a = no data collected for that year).

	Total # of Active Nests						**# of Nests with Outcome Known**						**Total # of Young Fledged**						**Productivity per Breeding Pair**					
Study areas	01	02	03	04	05	06	01	02	03	04	05	06	01	02	03	04	05	06	01	02	03	04	05	06
Farmington	11	11	10	14	21	20	4	11	10	14	20	19	4	9	8	13	23	15	1.0	0.8	0.8	0.9	1.2	0.8
Socorro	10	2	10	9	n/a	n/a	9	2	10	9	n/a	n/a	10	3	5	9	n/a	n/a	1.1	1.5	0.5	1.0	n/a	n/a
Taos	n/a	n/a	3	7	8	9	n/a	n/a	3	7	8	9	n/a	n/a	2	6	9	12	n/a	n/a	0.7	0.9	1.1	1.3
Albuquerque	n/a	n/a	n/a	n/a	4	4	n/a	n/a	n/a	n/a	4	4	n/a	n/a	n/a	n/a	6	7	n/a	n/a	n/a	n/a	1.5	1.7
Study Areas Combined	21	13	23	30	33	33	13	13	23	30	32	32	14	12	15	28	38	34	1.1	0.9	0.7	0.9	1.2	1.1

Table 1.2 Number of active nests (outcome known), successful nests, and the percentage that were successful, for Golden Eagles in the Farmington, Socorro, Taos, and Albuquerque resource areas, New Mexico, 2001 – 2006.

	Number of active nests, successful nests and percentage (%) of successful nests					
Study areas	2001	2002	2003	2004	2005	2006
Farmington	4, 3 (75)	11, 9 (82)	10, 6 (60)	14, 10 (71)	20, 18 (90)	19, 13 (68)
Socorro	9, 8 (89)	2, 2 (100)	10, 4 (40)	9, 6 (67)	n/a	n/a
Taos	n/a	n/a	3, 1 (33)	7, 6 (86)	8, 8 (100)	9, 7 (78)
Albuquerque	n/a	n/a	n/a	n/a	4, 4 (100)	4, 4 (100)
Study Areas Combined	13, 11 (85)	13, 11 (85)	23, 11 (48)	30, 22 (73)	32, 30 (94)	32, 24 (75)

In 2005, a well site was undergoing drilling activities during the breeding season near nest number 148A. The drilling activity was just over 1/3 mile from the active nest, and vehicular traffic to the well site briefly passed within the 1/3-mile buffer zone. Despite the sustained human activity and increased noise levels of the drilling operation, this nest did successfully fledged one young. In 2006, nest 148A and B were not active, and no birds were observed on territory.

DISCUSSION

After three consecutive years (2003-2005) of increasing numbers of active nests, successful nests, and young fledged, there was a decline in 2006 (Appendix 1.2 and 1.3). Nest success and productivity in 2005 was the highest recorded for Golden Eagles in the Farmington study area since Hawks Aloft began monitoring this population in 1998. The increasing annual precipitation recorded at the Navajo Dam weather station from October of the previous year through September of the following year, from 2002-2005 (9.96” in 2003, 10.02” in 2004, and 12.35” in 2005), would appear to support the theory that increased levels of precipitation in semi-arid habitats may have a significant positive effect on nest activity and reproductive success (Newton 1979). Rainfall data collected at the Navajo Dam for October 2005 through August 2006, show that 12.64 inches of precipitation had fallen, which is 103% of normal. However, precipitation from October 2005 through June 2006 (the time period that covers the breeding season through fledging) was only 6.42 inches, which is 69% of normal. The prevailing drought conditions leading up to and including the 2006 breeding season for Golden Eagle, may have contributed to the decline in nesting success and productivity when compared to 2005. The dramatic increase in precipitation rates during July and August of 2006 resulted from a particularly active monsoon season and came too late to benefit the prey populations, that nesting Golden Eagles utilize.

We do not know the extent of the Golden Eagle population in the Farmington study area prior to the development of oil and gas reserves and grazing activities. With the data available to date, it is not known whether the long-term population trend is stable or in decline. The number of breeding pairs fluctuates yearly for reasons likely based on food availability. It is believed that the availability of adequate food and suitable nesting sites ultimately determines the density of

raptor breeding populations (Hunt et al. 1995). Because the craggy topography of the study area seems to afford innumerable potential nest sites, it would seem that prey availability for this particular study area is the ultimate determinant of Golden Eagle population density. We also do not know the population of non-territorial adults known as “floaters”. These are individuals that do not nest because all suitable nesting territories are occupied by breeding pairs. A healthy and stable Golden Eagle population must generate adequate numbers of adults in excess of those that are required to fill breeding vacancies (Hunt et al. 1995). A strong indicator of an inadequate floating population would be a high incidence of sub-adults as members of breeding pairs (Newton 1979, Watson 1997). We have documented one breeding territory to date (#28 in 2002) that had an adult female with a sub-adult male. Because typically only females are present during nest checks, and that perched birds can be difficult to age, the actual number of adult / sub-adult pairs in any given year is unknown.

In 2005, the Farmington Field Office issued permits for approximately 800 new wells, about 40% of which were twinned or located on existing pads. In 2006, 940 wells were permitted, of which 16% were twinned. For 2007, there have been requests for approximately 810 new wells, and it is currently unknown how many of those will be twinned. Issues regarding the increase in habitat fragmentation as oil and gas development expands, as well as grazing practices, as it relates to the potential effects upon important prey species in Golden Eagle foraging areas should be addressed. Maintaining the integrity of native shrub communities that are prime habitat for *Leporids*, that are a major prey species, will be critical in the long-term. Kochert 1999 recommends that shrub communities be protected within approximately two miles of nests.

We maintain that as new oil and gas wells continue to increase in number, it will become increasingly difficult to maintain the 1/3-mile buffer zone around existing Golden Eagle nests. Because some studies suggest that Golden Eagles can be sensitive to human disturbance particularly during the incubation period (Fyfe and Olendorff 1976; Watson and Dennis 1992), it will become increasingly important to maintain the integrity of the 1/3-mile buffer zone. Over the years, we have observed some pairs that regularly nest successfully near oil and gas wells and appear to tolerate the higher amounts of human activity associated with the maintenance of oil and gas equipment. Nest failures that have occurred near oil and gas wells, failed for reasons

that were not determined. We currently do not have a good understanding about the types, proximity, duration, and frequency of disturbances that can adversely affect the breeding success of Golden Eagles in the study area. In the case of 148A, it might have been that the pair was not inclined to breed this year as a result of the drilling activities they had experienced during 2005. A study involving Golden Eagle pairs whose young had been banded found that the birds were more likely to use an alternate nest or not breed the following year than those pairs whose young had not been banded (Harmata 2002). A similar tendency not to breed the following year after the nesting Golden Eagles experienced some form of disturbance the previous year (e.g. nearby drilling activities) may have been the case for nest site 148A. Continued monitoring of breeding Golden Eagles is critical to determine if the continued increase in wells will impact the population.

RECOMMENDATIONS

- Continue current nest monitoring efforts to determine the distribution and reproductive success of Golden Eagles, in order to determine if increased levels of oil and gas activity has adverse effects on the population. Intensify the monitoring of active Golden Eagle nests that are within 1/3-mile of sustained oil and gas activities.

- If one does not already exist, the Farmington Field Office should develop a long-term management plan that protects the native shrub communities within two miles of nests.

PERSONNEL

This report was written by Ron Kellermueller, Raptor Projects Coordinator and reviewed by Gail Garber, Executive Director, and Mike Stake, Avian Biologist. Field work was conducted by Ron Kellermueller and Jeremey Knowlton. Some Golden Eagle nests were checked and monitored for activity by Dale Stahlecker. Maps were created by Lorraine McInnes.

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Appendix 1.1 Status of Golden Eagle breeding territories for 2006 and history of nest activity since 1998, for the Farmington Field Office, Bureau of Land Management, New Mexico. (s = successful nest, f = failed nest, nd = outcome not determined).

BLM Nest Number	2006 – Nest Status and Reproductive Outcome	Previous history of nest activity
78	**Occupied territory**	03-occupied territory 02-occupied territory 99-active (s) 98-occupied territory
107	**Occupied territory**	03-occupied territory 01-occupied territory 99-active (s) 98-occupied territory
35	Nest no longer exists	98-active (s)
144	Inactive	
82a,b	**82a Active-Successful** **Fledged one young**	05-active (s) 04-active (s) 03-active (s) 01-active (nd) 99-active (s) 98-active (nd)
83	**Active-Successful** **Fledged one young**	00-active (nd) 99-active (nd) 98-active (s)

BLM Nest Number	2006 – Nest Status and Reproductive Outcome	Previous history of nest activity
84	Inactive	05-active (s) 04-active (s) 03-active (f) 02-occupied territory 00-active (f) 99-active (s) 98-active (nd)
104	Inactive	
120	Inactive	99-active (nd) 02-occupied territory
106	**Occupied territory**	05-active (s) 04-active (s) 02-occupied territory
81	Inactive	
151	**Active-Not determined**	05-active (s)
109	**Occupied territory**	98-active (s)
99	**Active-Failed**	03-active (s) 02-active (s) 00-active (s)
150a, b New	**150b Active-Successful** **Fledged two young**	05-active (s)

BLM Nest Number	2006 – Nest Status and Reproductive Outcome	Previous history of nest activity
127a,b	**Occupied territory**	05-active (f) 00-active (f)
140	**Occupied territory**	05-active (s) 03-occupied territory
135	**Active-Failed**	05-active (f) 04-active (f) 03-occupied territory 01-active (s) 98-occupied territory
121	Inactive	02-occupied territory 00-active (s) 99-active (s) 98-occupied territory
79	**Occupied territory**	05-active (s)
71	Inactive	05-active (s) 03-occupied territory 01-active (s) 00-active (s) 99-active (s) 98-active (nd)
112	**Occupied territory**	01-active (nd) 99-active (f) 98-active (s)
148a,b	Inactive	05-active (s)
128	Inactive	00-active (nd) 99-active (f) 98-active (s)

BLM Nest Number	2006 – Nest Status and Reproductive Outcome	Previous history of nest activity
103a,b,c	**Occupied territory**	05-occupied territory 04-active (f) 03-occupied territory 02-active (f) 01-active (nd) 99-active (s) 98-active (s)
77	**Occupied territory**	
113	Inactive	05-occupied territory 04-active (s) 99-active (f) 98-active (s)
116 b,c	**Occupied territory**	05-occupied territory 99-active (s) 98-active (nd)
141	Inactive	03-active (f)
111	**Occupied territory**	02-active (s) 01-active (nd) 99-active (s)
122 Tribal	**Active-Successful** **Fledged one young**	05-active (s) 04-active (s) 03-active (f) 02-occupied territory 01-occupied territory 99-active (f) 98-occupied territory

BLM Nest Number	2006 – Nest Status and Reproductive Outcome	Previous history of nest activity
13**a**,b	**13a Active-Failed**	05-active (s) 04-active (s) 02-occupied territory 01-active (f) 00-active (s)
117**a**,b	**117a Active-Successful** **Fledged one young**	05-active (s) 04-active (s) 03-occupied territory 02-active (f) 98-occupied territory
80	**Active-Successful** **Fledged two young**	05-active (s) 03-active (s) 02-active (s) 98-active (nd)
123	Inactive	05-active (s) 04-occupied territory 02-active (s) 01-active (nd) 99-active (nd)
55a	Inactive	02-active (s) 01-active (nd)
55b, c	Inactive	05-active (s) 04-active (s) 03-active (s)
55d New	**Active-Successful** **Fledged one young**	

BLM Nest Number	2006 – Nest Status and Reproductive Outcome	Previous history of nest activity
110	**Active-Failed**	05-occupied territory 04-active (s) 03-active (f) 02-active (s) 01-active (nd) 99-active (s) 98-active (s)
136	Inactive	03-occupied territory 02-active (s)
142	Inactive	04-active-(f) 03-active (s)
23a,b	Inactive	
137**a**, b	**(137a) Nest status not determined**	05-active (nd) 04-active (s) 02-active (s)
102**a**,b,c	**102a Active-Successful Fledged one young**	05-active (s) 03-active (s) 02-active (s) 01-occupied territory 00-active (s) 99-active (s) 98-active (s)

BLM Nest Number	2006 – Nest Status and Reproductive Outcome	Previous history of nest activity
105	**Active-Failed**	05-active (s) 04-occupied territory 03-occupied territory 02-occupied territory 01-active (nd) 00-active (s) 99-active (s) 98 active (s)
124a,b, c Tribal	Inactive	05-active (s) 04-active (s) 03-occupied territory 02-occupied territory 99-active (nd)
124d New	**Active-Successful** **Fledged one young**	
28**a**,b,c	**28a Active-Failed**	02-occupied territory 01-occupied territory 00-active (s) 98-active (nd)
114	Inactive	03-occupied territory 99-active (s) 98-active (f)
152 New	**Active-Successful** **Fledged one young**	
153 New	**Active-Successful**	
156 New	**Active-Successful** **Fledged one young**	Probably an alternate nest for #123

BLM Nest Number	2006 – Nest Status and Reproductive Outcome	Previous history of nest activity
157 New	**Active- Successful** **Fledged one young**	

Figure 1.2 Active Nests and Reproductive Success for Golden Eagle 2003-2006
Taos and Farmington Resource Areas

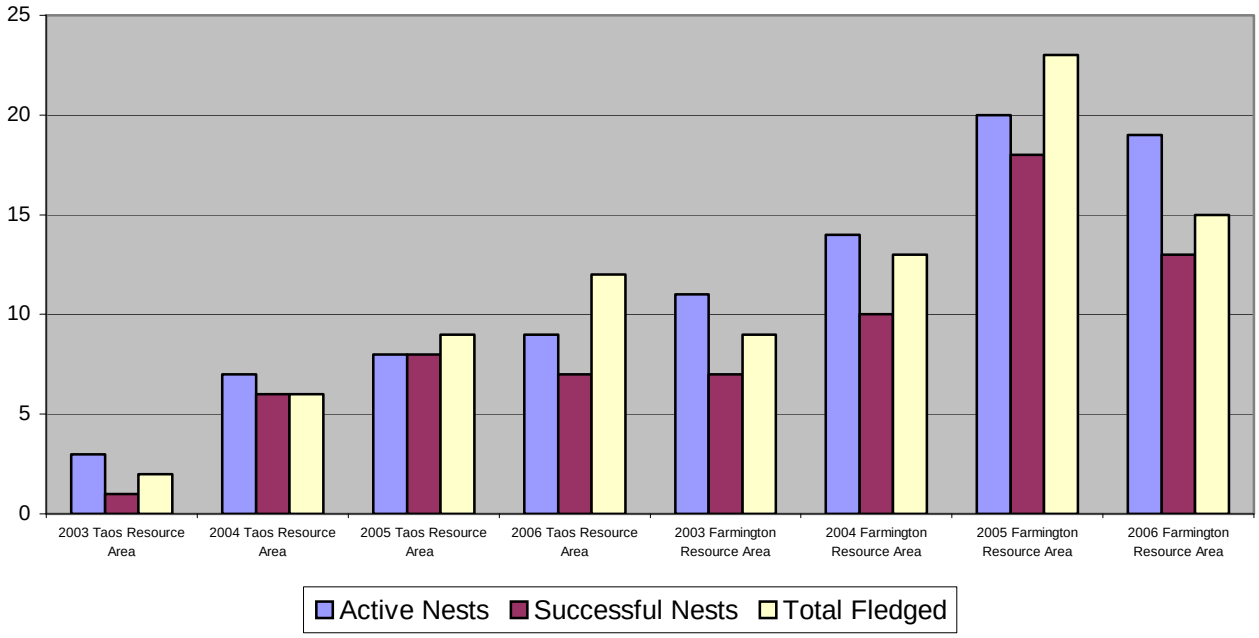
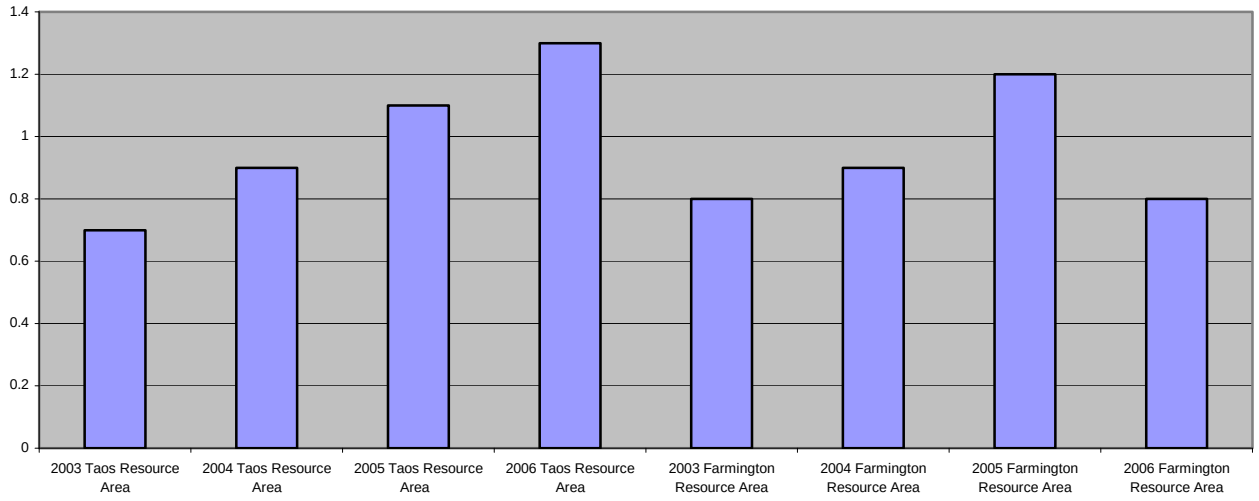


Figure 1.3 Average Productivity per Active Nest for Golden Eagle 2003-2006
Taos and Farmington Resource Areas



CHAPTER 2:

RAPTOR DISTRIBUTION AND REPRODUCTIVE SUCCESS

IN TAOS AND RIO ARRIBA COUNTIES, NEW MEXICO

TAOS FIELD OFFICE, BUREAU OF LAND MANAGEMENT

INTRODUCTION

The upper Rio Grande Gorge and its surrounding habitat is an important region for nesting raptor populations in north-central New Mexico, and it is also a major migration corridor for many other avian species during the spring and fall. Within the past two decades, recreational use of the upper gorge and the Orilla Verde Recreation Area has increased dramatically. This seasonally sustained, low-intensity human disturbance is primarily related to recreational activities that can potentially have adverse impacts on the nesting success of raptors. The raptor species that breed here include Golden Eagle *(Aquila chrysaetos)*, Prairie Falcon *(Falco mexicanus)*, Peregrine Falcon *(F. peregrinus)*, American Kestrel *(Falco sparverius)*, Red-tailed Hawk *(Buteo jamaicensis)*, and Great Horned Owl *(Bubo virginianus)*. Some of these species are sensitive to human disturbance during the nesting season (Harmata et al. 1978, Watson and Dennis 1992), of particular concern is the Golden Eagle.

Despite the concern over recreational impacts, little is known about raptor population trends in the upper Rio Grande Gorge. The purpose of our long-term nesting surveys is to accurately document raptor distribution and breeding success in a consistent manner to determine population trends and identify specific areas of concern for land managers. This will contribute to a long-term management plan that protects the breeding raptor populations, while preserving the public resource benefits of this unique and spectacular area.

In 2000, the Taos Field Office of the Bureau of Land Management (BLM) contracted Hawks Aloft, Inc. (HAI) to conduct an intensive survey for raptor populations in the upper Rio Grande Gorge in northern New Mexico, to update baseline data on the distribution and productivity of nesting raptors. Prior to 2000, very limited data had been collected since the 1980's. Following initial exploratory surveys conducted by Hawks Aloft in 2000, annual surveys were funded for the upper gorge, Orilla Verde Recreation Area, and Rio San Antonio Gorge beginning in 2003. The upper Rio Grande Gorge was designated as a Wild and Scenic River in 1968. The Orilla Verde Recreation Area was added to the Wild and Scenic River designation in 1994. The Rio San Antonio Gorge has been designated as an Area of Critical Environmental Concern (ACEC).

STUDY AREAS

Upper Rio Grande Gorge

The upper Rio Grande gorge survey area covers approximately 66 kilometers of river from the John Dunn Bridge in New Mexico to the Lobatos Bridge in southern Colorado. The John Dunn Bridge is located about four kilometers west of the town Arroyo Hondo, and the Lobatos Bridge crosses the Rio Grande approximately 13 kilometers north of the Colorado New Mexico border.

The Rio Grande begins to cut into the layered basalt of the Taos Plateau just south of the Lobatos Bridge. Technically, the gorge begins here. The gorge is approximately 60 meters wide and 45 meters deep at the New Mexico-Colorado border. The river meanders south and gradually widens and deepens, reaching its most impressive proportions at the Wild Rivers Area where it is approximately one kilometer across and 250 meters deep. Continuing south, the canyon narrows and becomes shallower again. At the John Dunn Bridge the gorge is approximately 0.4 kilometers wide and 100 meters deep.

The Taos Plateau is flanked by the alluvial fans of the Sangre de Cristo mountains to the east, and the Tusas Mountains to the west. The plateau is dotted with numerous cinder cones and a few widely scattered, large shield volcanoes. The elevation of the Taos Plateau along the canyon rim ranges from 2,072 meters at the John Dunn Bridge to about 2316 meters in southern Colorado.

Habitat on the Taos Plateau can be generally categorized as Great Basin desert shrub with big sagebrush *(Artemisia americana)* as the major vegetation component. From the John Dunn Bridge north through the Wild Rivers Area, the east rim of the gorge is predominantly pinyon-juniper woodland, containing Colorado pinyon pine *(Pinus edulis)* and juniper *(Juniperus* sp.*)*. Some of the larger side canyons contain mixed conifer woodland with ponderosa pine *(P. ponderosa)* and Douglas-fir *(Pseudotsuga menziesii).* The west rim is primarily juniper savanna

and shrub/grassland with pinyon-juniper woodland along the Wild Rivers Area. Both the east and west rims, from Sheep Crossing north to the Lobatos Bridge, are mainly shrub/grassland and sparse shrub- grassland with scattered areas of juniper savanna.

The bottom of the Rio Grande Gorge consists of riparian woodland with areas of mixed conifer woodland occurring mainly in the southern portion of the survey area north through the Wild Rivers Area. This reach of the Rio Grande Gorge has large widely scattered, mature ponderosa pines along the canyon bottom in close proximity to the river. North of the Wild Rivers Area to the Lobatos bridge the canyon bottom narrows and few trees are found. Here, the river is lined primarily with grasses and willows. The gorge is considered an inverted ecosystem, in that conditions are much drier at the higher elevations on the rim and canyon walls than at the base of the gorge where the Rio Grande flows.

Orilla Verde Recreation Area

The Orilla Verde Recreation Area begins just north of the town of Pilar and follows the Rio Grande north for approximately 10 kilometers to the point where county road No. 570 climbs to the west rim of the gorge. Riparian habitat here is relatively consistent with the upper gorge area. The east and west rims are also characterized as Great Basin desert shrub. The elevation ranges from 1,830 meters on the canyon bottom to 2,073 meters at the canyon rim. The width of the canyon is about one kilometer at the north end and widens to the south near the town of Pilar. The Orilla Verde Recreation Area is heavily utilized for recreational activities that include rafting, fishing, hiking, camping, picnicking and rock climbing.

Rio San Antonio Gorge

The Rio San Antonio Gorge ACEC is located approximately 35 kilometers north of the town of Tres Piedras, New Mexico and five kilometers west of Highway 285. Its headwaters originate west of San Antonio Mountain at the boundary line of the Tierra Amarilla Land Grant and the Carson National Forest. The study area covers approximately 10 kilometers of the Rio San

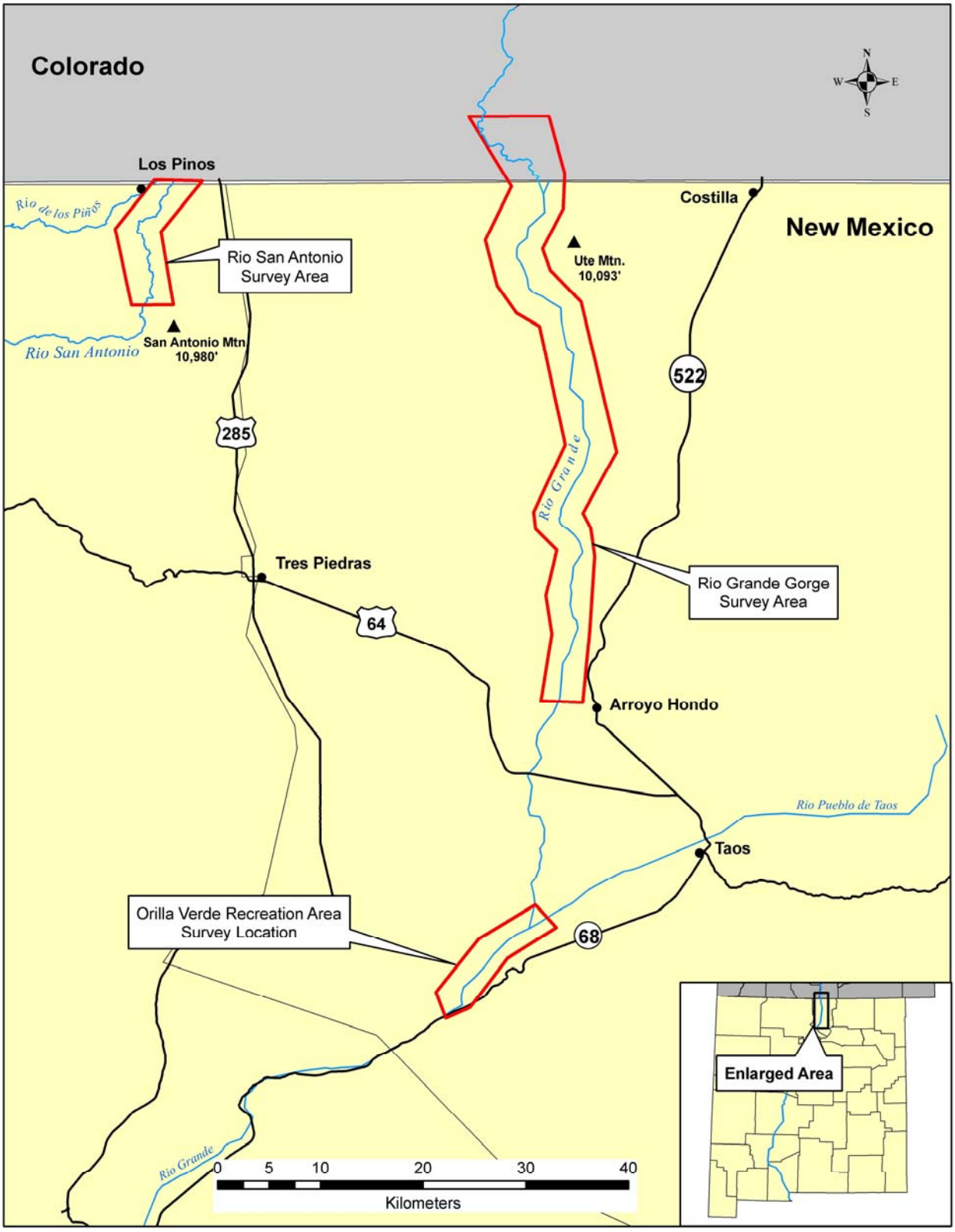


Figure 2.1 Taos Field Office, upper Rio Grande Gorge, Orilla Verde Recreation Area, and Rio San Antonio Gorge survey areas, New Mexico.

Antonio Gorge from just south of the town of Ortiz, Colorado, south to the northwestern flank of San Antonio Mountain. San Antonio Mountain (3,325 meters) is one of several large shield volcanoes that rise above the Taos Plateau. The Rio San Antonio Gorge has been cut through the basaltic rock of the Taos Plateau, with the canyon depth ranging from 15 meters to 46 meters, and its width ranging from approximately 75 meters to 150 meters. At the canyon rim, the elevation ranges from 2,438 meters above sea level at the northern end to 2,621 meters above sea level at the southern end. The Rio San Antonio Gorge is similar in structure to the Rio Grande Gorge, but on a smaller scale. The habitat, in general, is typical of Great Basin Desert Shrub. Ponderosa pine, Douglas fir, and aspen *(Populus tremuloides)* are found along the canyon bottom and at the higher elevations near San Antonio Mountain. The Taos Plateau along the canyon rim is primarily grassland habitat, with widely spaced Colorado pinyon pine and juniper. The grasslands also contain large amounts of prickly pear cactus *(Opuntia* sp.*)*.

METHODS

Surveys were conducted by vehicle and on foot using existing dirt roads and two-track roads. Areas that had previously documented nests and territories were visited first. After all known nests had been checked for activity, searches for previously undocumented nests were conducted along the canyon rim. Observers drove and hiked along the canyon rim or bottom, stopping at observation points at one-kilometer intervals. The canyon wall opposite the observation point was scanned for nests and raptor activity for a minimum of 15 minutes before moving to the next observation point. Surveyors also opportunistically scanned the opposite canyon wall while walking between points. Both sides of the canyon rim were surveyed where logistically feasible. In the northern half of the survey area, accessing the west rim was difficult and time consuming, due to the poor condition of the existing roads and two-tracks. This area was ground surveyed mostly from the east rim. In areas where the gorge was too wide to view the opposite canyon wall adequately with binoculars (e.g. Wild and Scenic Rivers Recreation Area) a 20-60 X 80mm field scope was used to search for new nests and to determine nest occupancy and fledging success at active nests.

The location of nests, nest activity, species, number of nestlings, number of young fledged and

behavioral data were collected and catalogued on field data sheets. All raptor nest locations were recorded in Universal Transverse Mercator (UTM), in North American Datum 1927 (NAD 27) using hand held Garmin Global Positioning System (GPS) units.

Nest sites were considered to be occupied territories if adult or sub-adult birds were observed near the nest or displayed territorial behavior. Nest status was determined to be "active" (occupied by a breeding pair) if an adult was observed in the incubating position, or nestlings were observed in the nest. Nest status at occupied territories was considered to be "unknown" if breeding could not be positively determined. All nests determined to be active during the incubation or brooding periods received a minimum of two additional visits to determine the number of nestlings, and the number of young fledged. Young were considered fledged when fully feathered and estimated to be within 1-2 weeks from leaving the nest.

RESULTS

Study Areas Combined

A total of 66 nests at the three study areas combined were checked for nesting activity. Of those, 21 active raptor nests were located: nine Golden Eagle, five Prairie Falcon, and seven Red-tailed Hawk. One nest was previously undocumented. In addition, one of each, Golden Eagle, American Kestrel, Peregrine Falcon, Red-tailed Hawk, and Great Horned Owl, as well as, two Prairie Falcon territories were occupied by at least one adult, and no evidence of breeding was observed. Reproductive outcome was determined at all active nests, and 16 (76%) successfully fledged at least one young. The average productivity per breeding pair was 1.3 young for Golden Eagle, 3.0 for Prairie Falcon, and 1.0+ for Red-tailed Hawk. No Peregrine Falcons were observed breeding (Table 2.1 and Appendix 2.4).

Table 2.1 Nest activity and average productivity for the upper Rio Grande Gorge, Orilla Verde Recreation Area, and Rio San Antonio Gorge study areas combined, 2003-2006. Taos and Rio Arriba Counties, New Mexico.

	Active Nests				Successful Nests				Ave. Prod. / Active Nest			
Species	03	04	05	06	03	04	05	06	03	04	05	06
Golden Eagle	3	7	8	9	1	6	8	7	0.7	0.9	1.1+	1.3
Red-tailed Hawk	4	5	6	7	4	5	5	4	1.8+	1.6+	1.3	1.0+
Prairie Falcon	3	4	6	5	2	4	4	5	2.3	3.3+	0.8+	3.0
Peregrine Falcon	2	2	3	0	2	0	0	0	1.5+	0	0	0
Total	12	18	23	21	9	15	17	16	1.6+	1.5+	1.0+	1.6+

Upper Rio Grande Gorge (table 2.1, appendix 2.4)

In 2006, we checked 52 raptor nest sites, including alternate nests. Twenty-two nest sites were occupied and, of those, 17 nests had egg-laying pairs. Five nests failed for reasons that were not determined. The reproductive outcome was determined at all active nests. Twelve of the nests (71%) were successful, fledging a total of 27 young. The mean number of young fledged per active nest was 1.6+.

In the upper gorge study area, there were seven active Golden Eagle nests and five were determined to be successful. A total of at least eight young were fledged, for an average productivity of 1.1+ young per breeding pair. We observed the highest number of active Golden Eagle nests in 2006 since beginning the annual raptor survey effort.

Four active Prairie Falcon eyries were documented, and all of the nests were successful. A total of 13 young were fledged. The average productivity per breeding pair was 3.3 young. In addition, two nest territories were occupied, and no evidence of breeding was observed.

No active Peregrine Falcon nests were documented. The last year we documented Peregrine Falcons successfully fledging young was in 2003.

Three of six active Red-tailed Hawk nests were successful in 2006, fledging six young. The average productivity per breeding pair was at least one young per nest. One occupied territory was observed in the Red River canyon, one kilometer from its confluence with the Rio Grande.

Orilla Verde Recreation Area

One active Golden Eagle nest was observed that fledged two young. During 2003 and 2004 this pair had been observed on territory, but no attempt at breeding was documented. In 2005, breeding did occur and a single young was fledged.

The historic Peregrine Falcon eyrie at Orilla Verde was not active, and no birds were observed on territory. This is the first year that we did not observe Peregrine Falcons on territory. In 2005, one mostly downy chick was observed but the nest subsequently failed. This pair did successfully fledge at least two young in 2003.

We documented one Great Horned Owl nest that was occupied by an adult and no evidence of breeding was observed. This nest had successfully fledged two young in 2005. Owls were observed on territory here in 2003, but the actual nest site was not located during that year and breeding was not determined.

Rio San Antonio Gorge

One active Golden Eagle nest was observed that fledged two young. This pair has successfully fledged young the last three years.

One active Red-tailed Hawk nest was observed that successfully fledged one young. This nest is located in a conifer tree, and is the only raptor nest we have found that is not on a cliff. This is the fourth consecutive year that this pair has fledged at least one young.

The historic Prairie Falcon eyrie was active and fledged at least two young. In 2005, this territory was not occupied. This pair had successfully fledged five young during 2003 and five young again in 2004.

An American Kestrel was observed on territory and the nest status was not determined.

Additional Raptor Sightings

Additional raptor species that were observed opportunistically in the study areas during the spring and summer (March-July) include: Osprey *(Pandion haliaetus)*, Northern Harrier *(Circus cyaneus)*, Cooper's Hawk *(Accipiter cooperii)*, Swainson's Hawk *(Buteo swainsoni)*, and Ferruginous Hawk *(Buteo regalis)*. The Swainson's Hawk was observed near agricultural fields near Ute Mountain. The bird was observed incubating in a nest located on a deciduous tree, no chicks were ever observed, and the nest was abandoned. The Osprey and Northern Harrier were migrants observed during the spring migration period. The Cooper's Hawk is a species that commonly breeds in the surrounding mountains and in some of the Rio Grande gorge's side canyons that have stands of mixed conifer habitat. The individual we observed was hunting along the gorge rim and may have been breeding locally. Habitat that appears to be adequate for nesting Ferruginous Hawk was found on the west side of the Rio Grande gorge near the Colorado border. This species could potentially breed in the area but it has not been documented to date.

DISCUSSION

Raptor nest activity and productivity trends from 2003-2006 have not been consistent among species, making general comments about breeding success and the potential factors affecting breeding success difficult. This reinforces the need to continue monitoring breeding raptors, particularly in the upper gorge section of the Rio Grande to acquire long-term data. This will provide a better understanding of the nesting raptor species, and will help identify the potential factors that can influence population trends.

From 2003 through 2006, the number of active Golden Eagle nests, and average productivity per breeding pair has been increasing (table 2.1, Figures 1.2, 1.3). The number of active Red-tailed Hawk nests has also increased; however, the nest success rates during that same time period have been lower, along with a corresponding decline in average productivity per active nest. In the case of the Prairie Falcon, the number of successful nests has been increasing, and average productivity per active nest has generally remained stable, and seems to be adequate to meet the

estimated recruitment standard of 2.0 – 2.5 young per nest to maintain current population levels (Anderson and Squires 1997). The varying nest success rates and productivity among the raptor species might be attributed to asynchronous population cycles of the different major prey species.

The potential effects of ectoparasite infestations on nestlings, such as the Mexican chicken bug *(Haemotosiphon inodorus)* and swallow bedbugs *(Oeciacus vicarius)* on the nesting success of different raptor species is not known. Some species, such as the Prairie Falcon, may be more prone to nestling mortality due to periodic ectoparasitic infestations (Anderson and Squires 1997).

For the Golden Eagle, the increase in nest activity and reproductive success from 2003-2006 seems to coincide with the increase in annual precipitation during that same time period. Data from the Western Regional Climate Center shows that since 1932, annual precipitation at the Cerro, New Mexico weather station near the Wild and Scenic Rivers Recreation Area has averaged about 12.4 inches. Following a severe drought during 2002, when the area received only 5.2 inches of precipitation, we observed only one successful Golden Eagle nest the following year in 2003. Precipitation in 2003 returned to near normal levels at 11.9 inches. In 2004, precipitation was 11.6 inches, and the number of successful nests increased to six. In 2005, precipitation was above normal at 13.7 inches and there were eight successful nests. Rainfall during 2006 started out 71% below normal through the breeding season (January – June), but increased to 123% of normal by September due to an unusually wet monsoon season. Although we had seven successful nests in 2006, compared to eight successful nests in 2005, productivity was higher in 2006. This was because five and possibly six of the seven active nests fledged two young. During the previous three years we had observed one nest in 2003, and one nest (possibly two) in 2005 that fledged two young. This would seem to suggest that abundant prey was available for Golden Eagles during the 2006 breeding season. Black-tailed jackrabbits *(Lepus californicus)* and cottontails *(Sylvilagus* spp.*)* are the major prey species for Golden Eagles in Great Basin Desert Shrub habitats (Kochert et al. 2002). It has been found that the reproductive rates of raptors can be directly influenced by prey abundance, and indirectly by climatic conditions such as precipitation (Newton 1979, Olsen and Olsen 1989). The number of cottontail

rabbits opportunistically observed while conducting field work has appeared to be substantially higher during 2005 and 2006 than in the previous years. At two nest sites we had been able to access in previous years and visually inspect, we found cottontail to be the only identifiable prey. These nests had numerous cottontail remains that were primarily hind legs. The remains of jackrabbit were not observed, suggesting that cottontail might be the major prey species of Golden Eagle during the nesting season in the Taos study area.

Golden Eagle is the species of greatest concern regarding the potential for nest failures resulting from human disturbance, particularly during the incubation period when the potential for nest abandonment is the highest (Fyfe and Olendorff 1976, Watson and Dennis 1992). Studies in Scotland have indicated that Golden Eagles nesting in more remote and inaccessible areas are significantly more likely to fledge young than pairs that nest in close proximity to roads and trails (Watson and Dennis 1992). To date, Hawks Aloft has not documented any nest failures that appeared to be caused by human disturbance. Human activity directly below or above active nest sites for extended periods of time (e.g. camping or fishing), could result in the adults avoiding the nest site area for prolonged time periods and adversely affect nest success. The Golden Eagle nest sites that are potentially the most susceptible to human disturbance (e.g. low cliff height, proximity to river, narrow gorge width) are nests 8, 9a,b and c, 10, 11a and b, 12a and b, 13, 17, 18, 22a and b, 43, 51, and 52. To date, we have not documented a higher nest failure rate at these nests than the other, more inaccessible nest sites. The expanding use of the upper Rio Grande gorge area for recreational purposes will only increase the need for the enforcement of effective nest protection measures during the breeding season, that occurs from February through June, or until the young have fledged.

After documenting a low average productivity of 0.8+ young per breeding pair (n = 6) for Prairie Falcon in 2005, productivity rebounded in 2006 to 3.0+ (n = 5). The reason that productivity numbers seemed to drop so precipitously in 2005 is not known, but might have been related to prey availability. Steenhof (1998) has documented the importance of ground squirrel populations to nest activity and success for Prairie Falcons in Idaho. We do not know the major prey species for Prairie Falcon is in the Taos study area during the breeding season, but ground squirrels are a primary prey species in most areas except southern California and the higher elevations in

Colorado (Steenhof 1998). Preserving habitats that support ground squirrel populations near Prairie Falcon nests is recommended (Hunt 1993). Research to determine the major prey species for Prairie Falcon in the Taos study would be an important aid in determining good management practices for this species.

Based on the number of cavities and slots that have large accumulations of old whitewash, we believe that Prairie Falcons may have nested in considerably larger numbers in the past. Nest sites, particularly in the Rio Grande gorge, are not a limiting factor for breeding Prairie Falcon populations, and it would appear that prey availability is the most likely variable that limits nesting density.

The breeding status of Peregrine Falcon in the Rio Grande gorge remains a perplexing issue. The last year we documented successful Peregrine Falcon nests was in 2003. We had two active nest sites in 2004, and three active nest sites in 2005, but no nests were successful for either year. Since no evidence of breeding was observed at any of the known nest sites in 2006, it would appear that conditions for breeding and the successful rearing of young might be declining. The fact that we did not observe any birds on two of the three known territories may indicate inadequate prey availability, or perhaps adults dying with an inadequate floater population to replace them. In North America, Peregrine Falcons primarily feed on a wide variety of other avian species. Prey items documented in eyries have ranged from hummingbirds to small geese (White et al. 2002). We do not know the major prey species that are utilized by Peregrine Falcon in the Rio Grande gorge and efforts to determine this would be useful for management planning.

We have never documented more than six active Red-tailed Hawk nests in the upper Rio Grande gorge. When comparing this to the twelve active Red-tailed Hawk nests that were documented by Ponton (1980), this might indicate that there are fewer Red-tailed Hawks nesting in the upper gorge than 25 years ago. Because Red-tailed Hawks utilize a wide variety of available prey, it seems difficult to explain why the breeding population in the upper gorge area appears to be less than 50% of the total reported by Ponton in 1980. The only good historic data we have is for the breeding year of 1980, which may have been atypical. These gaps in the data further illustrate the need for long-term monitoring to better determine significant declines in a breeding

population. In other parts of New Mexico, Hawks Aloft has documented large variations in Red-tailed Hawk nest activity that was significantly correlated to the amounts of annual precipitation (Hawks Aloft, Inc. 2005).

The area of the upper Rio Grande gorge, from just south of Ute Mountain to the Colorado border, remains a region where nesting raptor densities are considerably higher than other parts of the gorge. The reason for this is not known, but might have had something to do with the private ownership of Ute Mountain prior to it's acquisition by the BLM in 2003. When Ute Mountain was privately owned, the section along the rim of the gorge was essentially undisturbed, receiving very little use. The area was officially opened for public use in September 2005 with little development other than restricting vehicular traffic to designated existing dirt roads. As public awareness, along with the use of this newly accessible area increases, it will be particularly important to assess the potential disturbance effects on Golden Eagles, Prairie Falcons, and Peregrine Falcons that nest along this section of the gorge.

RECOMMENDATIONS

- In order to determine long-term raptor population trends and productivity for the Taos study area, annual raptor surveys should continue. The raptor distribution and productivity data gathered will assist in land management decisions that protect the long-term health of nesting raptor populations, as well as the surrounding habitat that supports the major prey species.

- Prey base studies for Golden Eagle, Prairie Falcon, and Peregrine Falcon would be helpful in developing a better understanding of the population dynamics that occur in the Taos study area. Knowledge of the major prey species utilized by raptors would help land managers identify and protect critical habitat areas that support these prey populations.

- Limit or restrict the type and level of human disturbance near nesting raptor sites. Suter and Joness (1981) suggest buffer zones of at least one kilometer around active nest sites. The construction of new trails or the rerouting of old ones should take into account the

location of raptor nests, so as to keep all trails and roads at least one kilometer from these areas. Restrictions directed at rock climbing activities near raptor nest sites during the breeding season should be addressed. As new climbing areas are developed, an assessment needs to be made if climbs fall within the buffer zone of raptor nests so that closures can be enforced during the breeding season. Of specific concern is the Great Horned Owl nest site (#49) at the Orilla Verde Recreation Area. This site has fledged young in the past, and it is unknown if climbing activities have caused nest failures in other years. It is recommended that this area be closed to climbing from February until the young have fledged, or until the nest cavity is determined to be inactive.

PERSONNEL

This report was prepared by Ron Kellermueller, Raptor Projects Coordinator, and reviewed by Mike Stake, Avian Biologist and Gail Garber, Executive Director. Field work was conducted by Cary Aloia, Ron Kellermueller, and Jeremey Knowlton. Maps created by Lorraine McInnes.

ACKNOWLEDGMENTS

We thank the Bureau of Land Management, Farmington and Taos Field Offices for funding the projects, and to John Kendall, Barney Wegener, and Valerie Williams for their support and assistance in making these projects possible.

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Appendix 2.1 Non-raptor bird species observed in 2006, Taos and Rio Arriba Counties, New Mexico.

Canada Goose *(Branta americana)*
Mallard *(Anas platyrhynchos)*
Gadwall *(Anas strepera)*
Green-winged Teal *(Anas crecca)*
Common Merganser *(Mergus merganser)*
Turkey Vulture *(Cathartes aura)*
Gambel's Quail *(Callipepla gambelii)*
Scaled Quail *(Callipepla squamata)*
Wild Turkey *(Meleagris gallopavo)*
Killdeer *(Charadrius vociferous)*
Mountain Plover *(Charadrius montanus)*
Rock Dove *(Columba livia)*
Mourning Dove *(Zenaida macroura)*
Common Nighthawk *(Chordeiles minor)*
White-throated Swift *(Aeronautes saxatalis)*
Broad-tailed Hummingbird *(Selasphorus platycercus)*
Belted Kingfisher *(Ceryle alcyon)*
Northern Flicker *(Colaptes auratus)*
Black Phoebe *(Sayornis nigricans)*
Say's Phoebe *(Sayornis saya)*
Ash-throated Flycatcher *(Myiarchus cinerascens)*
Western Kingbird *(Tyrannus verticalis)*
Western Scrub-Jay *(Aphelocoma californica)*
Gray Jay *(Perisoreus canadensis)*
Pinyon Jay *(Gymnorhinus cyanocephalus)*
Clark's Nutcracker *(Nucifraga columbiana)*
American Magpie *(Pica hudsonia)*
American Crow *(Corvus brachyrhynchos)*
Common Raven *(Corvus corax)*
Horned Lark *(Eremophila alpestris)*
Violet-green Swallow *(Tachycineta thalassina)*
Barn Swallow *(Hirundo rustica)*
Cliff Swallow *(Petrochelidon pyrrhonota)*
Juniper Titmouse *(Baeolophus griseus)*
White-breasted Nuthatch *(Sitta carolinensis)*
Bewick's Wren *(Thryomanes bewickii)*
Rock Wren *(Salpinctes obsoletus)*
Canyon Wren *(Catherpes mexicanus)*
American Dipper *(Cinclus mexicanus)*
Western Bluebird *(Sialia mexicana)*
Mountain Bluebird *(Sialia currucoides)*

Townsend's Solitaire *(Myadestes townsendi)*
American Robin *(Turdus migratorius)*
Northern Mockingbird *(Mimus polyglottos)*
Sage Thrasher *(Oreoscoptes montanus)*
Common Yellowthroat *(Geothlypis trichas)*
Yellow-breasted Chat *(Icteria virens)*
Western Tanager *(Piranga ludoviciana)*
Black-headed Grosbeak *(Pheucticus melanocephalus)*
Spotted Towhee *(Pipilo americana)*
Chipping Sparrow *(Spizella passerina)*
Sage Sparrow *(Amphispiza belli)*
Red-winged Blackbird *(Agelaius phoeniceus)*
Western Meadowlark *(Sturnella neglecta)*
House Finch *(Carpodacus mexicanus)*

Appendix 2.2 Mammal species observed in 2006, Taos and Rio Arriba Counties, New Mexico.

Bat *(Myotis sp.)*
Coyote *(Canis latrans)*
Rock Squirrel *(Cittellus variegates)*
Chipmunk *(Eutamias sp.)*
Cottontail *(Sylvilagus sp.)*
Blacktail Jackrabbit *(Lepus californicus)*
Gunnison's Prairie Dog *(Cynomys gunnisoni)*
Elk *(Cervus americana)*
Mule Deer *(Odocoileus hemionus)*
Pronghorn Antelope *(Antilocapra americana)*

Appendix 2.3 Reptile species observed in 2006, Taos and Rio Arriba Counties, New Mexico.

Gopher Snake *(Pituophis catenifer)*
Western Rattlesnake *(Crotalus viridis)*
Western Fence Lizard *(Sceloporus occidentalis)*
Side-blotched Lizard *(Uta stansburiana)*
Greater Short-Horned Lizard *(Phrynosoma hernandesi)*
Western Whiptail *(Cnemidophorus tigris)*

Appendix 2.4 Raptor nesting results and history 2000, 2003-2006 for the Upper Rio Grande Gorge, Orilla Verde Recreation Area, and Rio San Antonio Gorge, Taos and Rio Arriba Counties, New Mexico, (S=successful, F=failed, O=occupied territory, ND=active/outcome not determined). Nest numbers highlighted in red indicate a new or previously undocumented nest.

Study Area / Species	BLM #	2006 Nest Status	2006 # Nestlings	2006 # Fledged	2006 Outcome	2000	2003	2004	2005
Upper Rio Grande Gorge Area									
Golden Eagle	1a,b,c	Active	2	2	S		F	F	S
Golden Eagle	2a,b	Inactive				S			
Golden Eagle	3	Active	unknown	0	F				
Golden Eagle	4	Inactive							
Golden Eagle	5	Inactive							
Red-tailed Hawk	6	Occ. Terr.				O			
Prairie Falcon	7	Inactive				S	F		O
Golden Eagle	8	Inactive							
Golden Eagle	9a,b,c	Occ. Terr.					O	S	
Golden Eagle	10	Inactive							
Golden Eagle	11a,b	Active	2	2	S	S	O	O	S
Golden Eagle	12a	Active	unknown	0	F	S			
Golden Eagle	12b	Inactive					S		
Golden Eagle	13	Inactive				S			
Golden Eagle	14	Inactive							
Golden Eagle	15	Inactive					O		
Golden Eagle	16a,b,c,d	Active	2	1+	S		O	S	S
Golden Eagle	17	Active	1	1	S				
Golden Eagle	18	Inactive						S	S
Golden Eagle	19	Inactive							
Golden Eagle	20	Inactive							
Red-tailed Hawk	21	Active	unknown	0	F	S			O
Golden Eagle	22a,b,c	Active	2	2	S	S	F	S	S
Red-tailed Hawk	23	Inactive				S			
Red-tailed Hawk	24	Active	3	3	S	S	S	S	S
Prairie Falcon	25	Active	4	4	S	S		S	S
Prairie Falcon	26	Inactive				S			F
Prairie Falcon	27	Active	1	1	S	S	F	O	
Golden Eagle	28	Inactive							
Prairie Falcon	29	Inactive				S			
Red-tailed Hawk	30	Inactive				S			O
Red-tailed Hawk	31	Active	1+	0	F	S	O	S	S
Prairie Falcon	32	Inactive				S			O
Prairie Falcon	33	Occ. Terr.				S	O	S	S
Peregrine Falcon	36	Inactive					S	F	F
Red-tailed Hawk	37a,b	Active	2	2	S		S		S
Red-tailed Hawk	38a,b	Active	1+	0	F		S	S	S
Golden Eagle	43	Inactive				S			
Peregrine Falcon	44	Occ. Terr.						F	F
Prairie Falcon	45	Active	4	4	S			O	F
Prairie Falcon	46	Active	4	4	S			S	S
Red-tailed Hawk	47	Active	1+	1+	S			S	F
Prairie Falcon	50	Occ. Terr.							S

Study Area / Species	BLM #	2006 Nest Status	2006 # Nestlings	2006 # Fledged	2006 Outcome 2006	2000	2003	2004	2005
Orilla Verde Recreation Area									
Golden Eagle	39	Inactive						O	S
Golden Eagle	40	Inactive							
Peregrine Falcon	41	Inactive					S	O	F
Golden Eagle	42	Inactive							
Unknown Raptor	48	Inactive							
Great Horned Owl	49	Occ. Terr.					O		S
Golden Eagle	58	Active	2	2	S				
Rio San Antonio Area									
Golden Eagle	51	Inactive							
Golden Eagle	52	Inactive							S
Golden Eagle	53	Active	2	2	S		O	S	
American Kestrel	54	Occ. Terr.					ND		
Prairie Falcon	55	Active	2	2	S		S	S	
Red-tailed Hawk	56	Active	1	1	S		S	S	S
Great Horned Owl	57	Inactive							S