

Northern Aplomado Falcon Surveys and Habitat Assessment on Black Mountain Training Area



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Introduction

The New Mexico Army National Guard (NMARNG) operates the Black Mountain Training Area (BMTA) as a small arms firing range (NMARNG 2007). BMTA consists of 2,081 acres in Luna County in southwestern New Mexico, approximately 6 mi northwest of Deming. State-owned land and private property surround the training area. This area lies within the historic range of the now federally endangered northern aplomado falcon (APFA, *Falco femoralis*, Keddy-Hector 2000) and also potentially contains suitable breeding habitat for the falcon (NMARNG 2007).

The NMARNG Integrated Natural Resource Management Plan (INRMP) calls for surveys to determine if the APFA is present at BMTA and if suitable habitat for the falcon exists there (NMARNG 2007). We report here on our 2007 surveys on and around BMTA.

Young et al. (2005) created a habitat model for the northern aplomado falcon in southern New Mexico, west Texas, and northern Chihuahua, Mexico. This study used habitat information from areas used by APFAs in northern Chihuahua, Mexico to predict habitat in the other areas. We used this model to look for areas to survey for falcons and evaluated the model's usefulness in the field.

Biology

Historically, APFAs ranged from Tierra del Fuego in Argentina to southeastern Arizona, southern New Mexico, and west Texas. They are medium-sized, colorful falcons, with slate to bluish upperparts, a bold black and white facial pattern, and a cinnamon belly. Individuals in the southwest U.S. and Mexico are of the subspecies *septentrionalis*. Compared to the species as a whole, this subspecies is large with an extensive, complete black band across the belly and light gray upperparts (Keddy-Hector 2000).

The original APFA habitat in the U.S. was coastal prairies and desert grasslands with scattered yuccas (*Yucca torreyi*, *Y. elata*, *Y. treculeana*) and mesquites (*Prosopis glandulosa*), oak woodlands, and riparian gallery forests in desert grasslands. Habitat in Mexico is diverse, ranging from seasonally flooded coastal savanna and marshlands to rolling terrain containing deciduous woodlands adjacent to agricultural fields and seasonally burned pasture (Keddy-Hector 2000). Captive reared falcons released in southern Texas in 1993 and 1994 foraged in habitat with 2.6 woody plants per hectare and roosted in areas with 3.6 woody plants per hectare (Perez et al. 1996).

Mated pairs of APFAs often hunt cooperatively, taking prey on the ground as well as in the air. In terms of both prey numbers and biomass, they feed mainly on insectivorous and omnivorous birds (Hector 1985). They also eat insects and small mammals such as kangaroo rats (*Dipodomys* spp.), and they have been recorded to eat bats. They hunt from a perch, while soaring, or while flying at high speed just above or through dense shrubs

and trees. APFAs often hunt after sunset and well before sunrise (Keddy-Hector 2000). They are not known to prey on swallows and swifts, which may be too fast for them (Hector 1985).

APFAs often klepto-parasitize other birds of prey; males and females work together to steal prey from white-tailed kites (*Elanus leucurus*), American kestrels (*Falco sparverius*), northern harriers (*Circus cyaneus*), herons, and kingfishers. They are not known to construct their own nests and use the nests of other raptors or corvids (Keddy-Hector 2000).

Conservation

The APFA was listed as endangered by the USFWS in 1986 (USFWS 1986) and by the State of New Mexico in 1990 (NMDGF 1991). Their population in the U.S. decreased around the 1930s and 1940s, until the last nesting pair was documented in 1952 at Deming, NM. Suggested reasons for their decline include: decreases in grazing by black-tailed prairie dogs, which allows prey animals the cover of taller vegetation (Truett 2002), encroachment of brush into grasslands (Keddy-Hector 2000, USFWS 2005), loss of native grasslands to farming (Keddy-Hector 2000), and use of DDT (USFWS 2005). APFAs are probably especially vulnerable to DDT exposure because they top extensive food chains (Hector 1985).

Beginning in 1985, an ongoing USFWS program has reintroduced northern APFAs in south Texas (USFWS 2005). Reintroduction in west Texas began in 2002 (USFWS 2005), including a release of 115 birds in 2006 (Peregrine Fund 2007a). As of 2006, 44 pairs were breeding in coastal and west Texas (USFWS 2006). Eleven falcons were released in August 2006 at the privately owned Armendaris Ranch near Truth or Consequences, New Mexico (Figure 1; USFWS 2006). Two of the birds released in New Mexico in 2006 bred at the Armendaris Ranch in 2007. Eleven falcons were also released in 2007 at a site about 25 miles southeast of Socorro, NM (Peregrine Fund 2007b). The northern APFAs were released in New Mexico under the 10(j) provision of the Endangered Species Act (ESA), by which they are considered a non-essential, experimental population. Releases in New Mexico are planned through the year 2016. In addition to these releases, there was an individual APFA sighted north-northwest of BMTA 35 km in 2007 (Angel Montoya pers. comm.).

Methods

Surveys

In the summer of 2007, we spent five days in the field at BMTA surveying for northern APFAs. Following methods described in Young et al. (2002, pp. 21-22), we surveyed the training site and as much of the surrounding area as we could access, given road and private land limitations. We stopped every few hundred meters and used binoculars and a 600 mm 20x spotting scope to search for falcons and other birds of prey. In addition to surveying the area on BMTA proper and the area around the photo points (Figure 2), we

surveyed the area north of the Interstate 10 frontage road on Clabber Top Road for about 5 km, and the area north on U.S. Highway 180 from Deming to County Road D018 and west on that road 3 km.

Habitat evaluation

We surveyed the area on and around BMTA for suitable habitat, focusing on areas that the recent model (Young et al. 2005) indicated would be suitable and areas that Angel Montoya (pers. comm. 2007) indicated as good habitat. We took pictures of the habitat at 26 photo points (Figure 2) to document suitable APFA habitat.

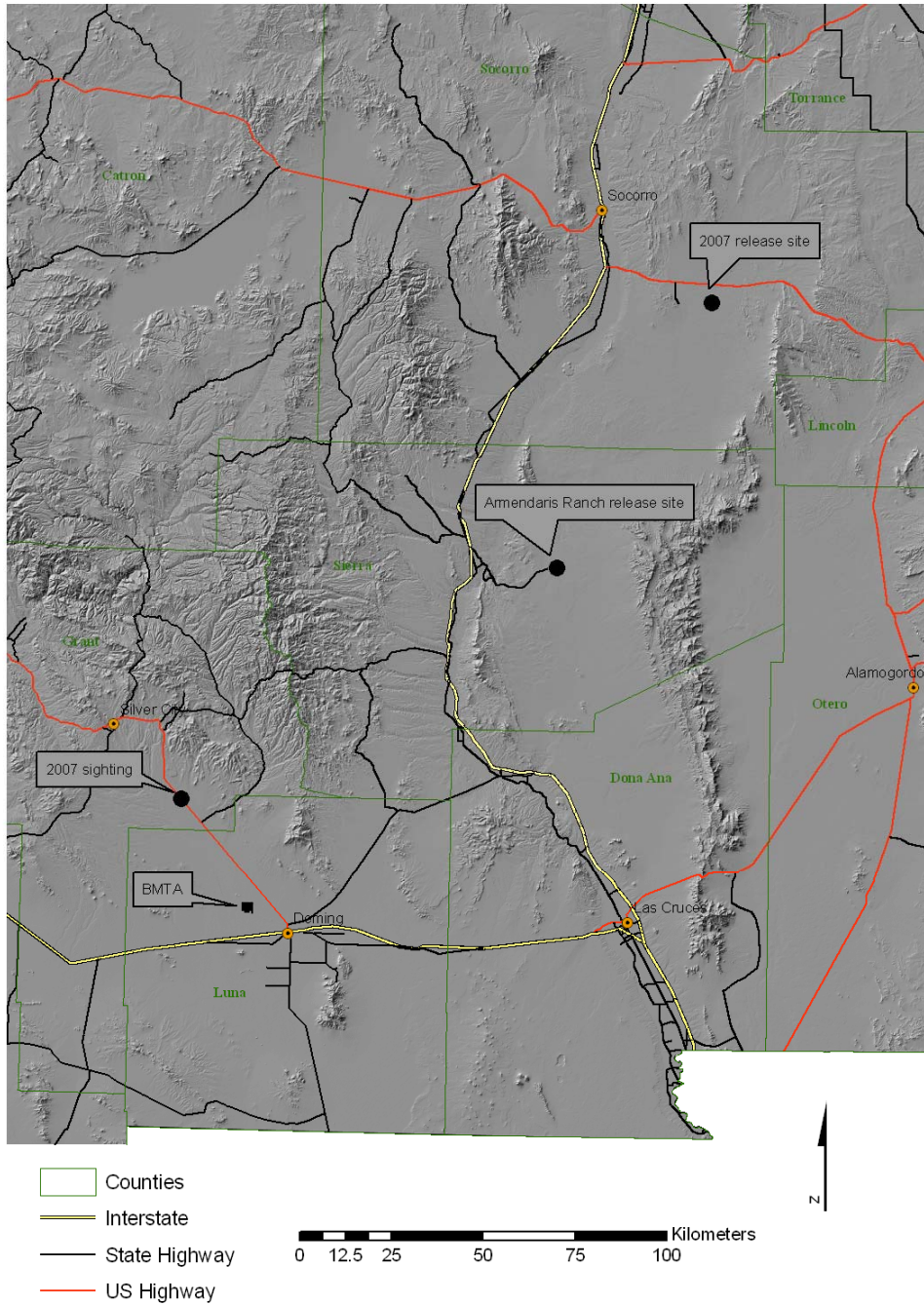


Figure 1. Map showing BMTA and nearest locations of APFAs to BMTA: a 2007 sighting of an individual APFA, the 2006 release site on the Armendaris Ranch, and the 2007 release site southeast of Socorro.

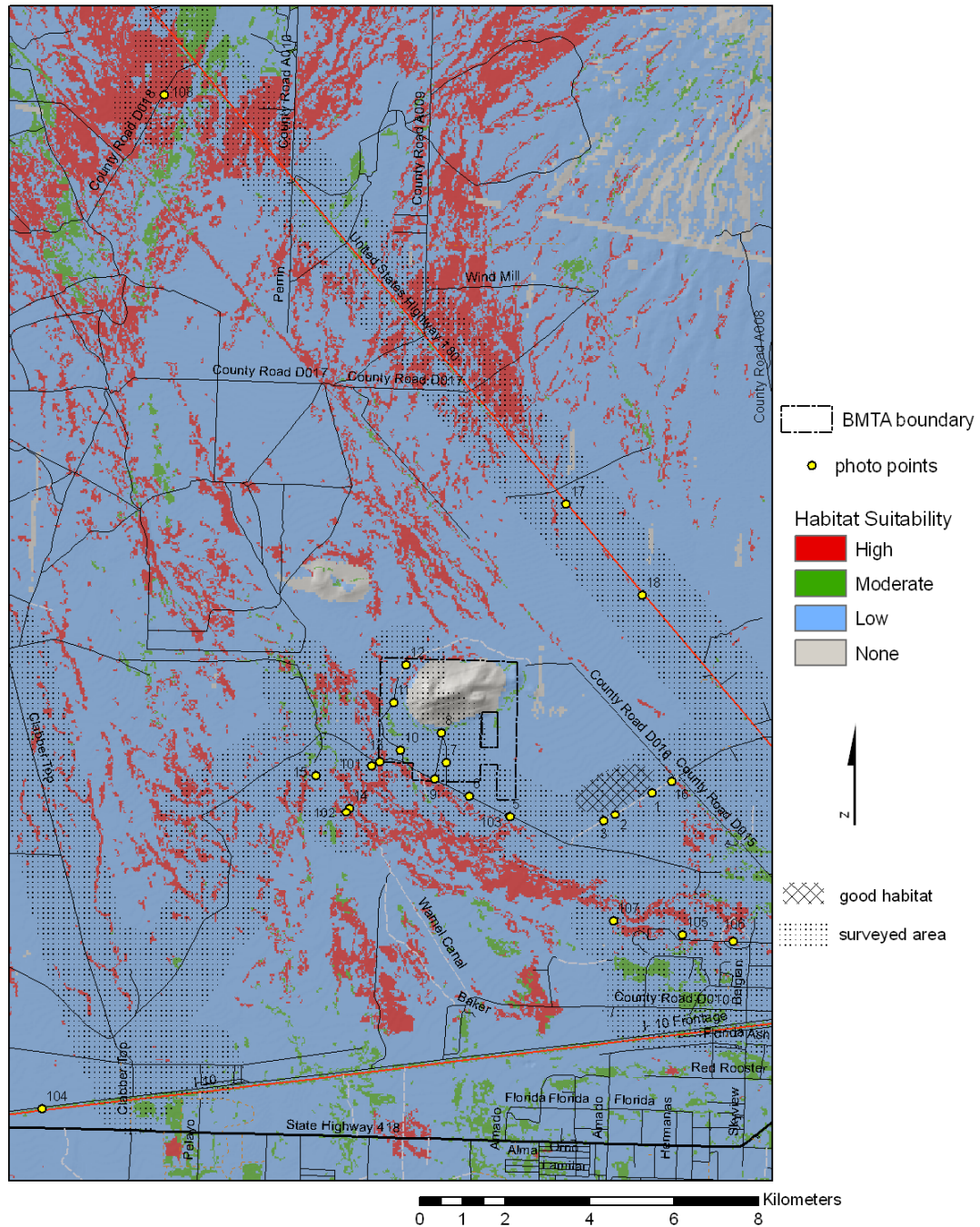


Figure 2. Map of BMTA showing photo points and habitat suitability model (red, green, blue) from Young et al. (2005), area surveyed, and good habitat indicated by Angel Montoya (pers. comm. 2007).

Results and Discussion

Surveys

We did not observe northern APFAs on or near BMTA. Listed in Table 1 below are the birds that we detected on and around BMTA.

Genus	species	common name
<i>Buteo</i>	<i>swainsoni</i>	Swainson's Hawk
<i>Falco</i>	<i>sparverius</i>	American Kestrel
<i>Callipepla</i>	<i>gambelii</i>	Gambel's Quail
<i>Zenaida</i>	<i>macroura</i>	Mourning Dove
<i>Athene</i>	<i>cunicularia</i>	Burrowing Owl
<i>Tyrannus</i>	<i>verticalis</i>	Western Kingbird
<i>Lanius</i>	<i>ludovicianus</i>	Loggerhead Shrike
<i>Corvus</i>	<i>corax</i>	Common Raven
<i>Mimus</i>	<i>polyglottos</i>	Northern Mockingbird
<i>Amphispiza</i>	<i>bilineata</i>	Black-throated Sparrow
<i>Calamospiza</i>	<i>melanocorys</i>	Lark Bunting
<i>Icterus</i>	<i>parisorum</i>	Scott's Oriole

Table 1. Birds observed on and around BMTA.

Habitat evaluation

Most of the area on and around BMTA appears to be low quality habitat for northern APFAs. The habitat model from Young et al. (2005) indicates that some of these areas (red on Figure 2) contain highly suitable habitat. We surveyed as many of these areas as we could access. They can be seen in photos from points 5, 9, 13, and 108 (Figures 4-7, respectively). These areas do not conform well to known habitat requirements for APFAs, reviewed above in the Introduction. Disregarding the oak woodland and riparian gallery forest habitats that do not occur on or near BMTA, APFAs near BMTA would use grassland habitat with scattered, but not dense, woody plants (about 2.6-3.6 woody plants per hectare). The classic aplomado habitat in southern New Mexico is yucca grassland. Areas marked as high habitat suitability (Figures 4-7) by the Young et al. (2005) model show limited patches of grass and dense brushy areas with creosotebush (*Larrea tridentata*) and mesquite, but very few yuccas.

The areas marked by this model as highly suitable also do not include the area that Angel Montoya (pers. comm. 2007), an expert APFA biologist, indicated was the best aplomado habitat in the area of BMTA (northwest of photo points 1, 2, 3, and 16; Figure 2). The habitat in this area is grassland with scattered yuccas and mesquite. Because the areas marked by the habitat model (Young et al. 2005) do not appear suitable, and because suitable areas are classified by the model as having low suitability (Figure 2), we concluded that this model does not accurately indicate habitat suitability on BMTA and environs. Young et al. (2005) field validated the model with randomly placed model assessment points in southern New Mexico, west Texas, and northern Chihuahua,

Mexico. They placed no model assessment points on or near BMTA (Young et al. 2005, p. 32), which may account for the inaccuracy of the model in that area.

Alternatively, we can use the SWReGAP vegetation classifications (USGS National GAP Analysis 2005; Figure 3) to locate potential APFA habitat. The Wildlife Habitat Relationship created for the APFA (USGS Southwest Regional Gap Analysis 2005) indicates that suitable habitat includes the following four ecological systems: 1) Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe, 2) Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub, 3) Chihuahuan Mixed Salt Desert Scrub, and 4) Chihuahuan Sandy Plains Semi-Desert Grassland.

The apparently suitable habitat northwest of points 1-3 (Figure 2) contains Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe and Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub. Unsuitable habitat also occurs in these two ecological systems. Points 5, 9, 12, 14, 106 (Figures 4-5, and 12-14, respectively) are good examples. They are in roughly the same ecological systems as points 1, 2, 3, and 16, but they contain only small, scattered patches of grass, and the woody vegetation is for the most part too dense to be suitable for APFAs. The inaccuracies of the ReGAP map are likely problems of scale. While the vegetation types may be generally accurate, patches of unsuitable habitat within them are not resolved, making the ReGAP map of questionable use at the scale of BMTA.

Conclusions

Given the recent releases in New Mexico and breeding successes of APFAs in New Mexico and west Texas, potential exists for APFAs to occur or breed on or near BMTA. Suitable, even good, aplomado falcon habitat occurs within 5 km of BMTA. APFAs have been released/sighted within 22, 78, and 130 miles of BMTA. These birds or their offspring could easily travel to BMTA. Finally, habitat at BMTA could be improved to provide suitable habitat for APFAs.

To create more suitable APFA habitat at BMTA, we recommend that NMARNG consider options to end unmanaged grazing at BMTA, such as reinforcing boundary fences and installing signage indicating NMARGN rules for public use. Training activities at the small arms firing range do not currently impact grass cover enough to degrade habitat. Increases in soil-disturbing activities would likely reduce grass quality and impact the grassland birds that APFAs depend on for food and should therefore be avoided. NMARNG should continue to survey for APFAs on and in the vicinity of BMTA and monitor condition of grass/shrub habitat at BMTA. An accurate and detailed habitat map would make surveys and management for APFAs at BMTA more effective and efficient.



Figure 4. Habitat southwest of photo point 5.



Figure 5. Habitat south of photo point 9.



Figure 6. Habitat south of photo point 13.



Figure 7. Habitat northwest of photo point 108.



Figure 8. Habitat northwest of photo point 1.



Figure 9. Habitat northwest of photo point 2.



Figure 10. Habitat northwest of photo point 3.



Figure 11. Habitat north of photo point 16.



Figure 12. Habitat south of photo point 12.



Figure 13. Habitat north of photo point 14.



Figure 14. Habitat north of photo point 106.

Literature Cited

Hector, D.P. 1985. The diet of the aplomado falcon (*Falco femoralis*) in eastern Mexico. Condor, 87:336-342.

Keddy-Hector, Dean P. 2000. Aplomado Falcon (*Falco femoralis*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/549>

Montoya, A. 2007. Senior field biologist with the Peregrine Fund.

New Mexico Army National Guard. 2007. (Preliminary final) Integrated Natural Resources Management Plan (INRMP) and Environmental Assessment (EA) of the implementation of the INRMP. Prepared for New Mexico Army National Guard, NMARNG-FMO-EV, 47 Bataan Boulevard, Santa Fe, New Mexico 87505.

New Mexico Dept. of Game and Fish. 1991. Handbook of species endangered in New Mexico. NM Department of Game and Fish, Santa Fe, NM.

Perez, C.J., P.J. Zwank, and D.W. Smith. 1996. Survival, movements, and habitat use of aplomado falcons released in southern Texas. Journal of Raptor Research 30:175-182.

- Peregrine Fund. 2007a. Aplomado falcon restoration—conservation projects. Web newsletter 10 May 2007. Accessed 1/18/2008 online at http://www.peregrinefund.org/conserves_category.asp?category=Aplomado%20Falcon%20Restoration.
- Peregrine Fund. 2007b. Aplomado falcon updates—notes from the field. Ants put a hitch in falcon placement. Accessed 2/5/2008 online at http://www.peregrinefund.org/notes_category.asp?category=Aplomado%20Falcon%20Updates.
- Truett, J.C. 2002. Aplomado falcons and grazing: Invoking history to plan restoration. *Southwestern Naturalist* 47(3):379-400.
- U.S. Fish and Wildlife Service. 1986. Determination of the northern aplomado falcon to be an endangered species. *Federal Register* 51(37):6686-6690.
- U.S. Fish and Wildlife Service. 2005. Establishment of a nonessential experimental population of northern aplomado falcons in New Mexico and Arizona and availability of draft environmental assessment. *Federal Register* 70(26):6819-6828.
- U.S. Fish and Wildlife Service. 2006. Endangered northern aplomado falcons return to New Mexico's skies. News release August 3, 2006. Accessed online 1/18/08 at <http://www.fws.gov/news/NewsReleases/showNews.cfm?newsId=D616DDE0-96A0-1A28-A1EB9868814A62D7>.
- USGS National Gap Analysis. 2005. Southwest regional gap analysis project. New Mexico Cooperative Fish and Wildlife Research Unit. <http://fws-nmcfwru.nmsu.edu/swregap/Stewardship/stewardshipmetadata.htm>.
- USGS Southwest Regional Gap Analysis. 2005. Wildlife habitat relationship for the aplomado falcon. Accessed 1/30/08 online at <http://fws-nmcfwru.nmsu.edu/swregap/habitatreview/TextModels/175610.pdf>.
- Young, K.E., B.C. Thompson, D.M. Browning, Q.H. Hodgson, J.L. Lanser, A. Lafón Terrazas, W.R. Gould, and R. Valdez. 2002. Characterizing and predicting suitable aplomado falcon habitat for conservation planning in the northern Chihuahuan Desert. New Mexico Cooperative Fish and Wildlife Research Unit. Las Cruces, New Mexico. 171 pp. + appendices.
- Young, K.E., B.C. Thompson, R. Valdez, W.R. Gould, and A. Lafón Terrazas. 2005. Assessment of predictive values from the aplomado falcon habitat suitability model: validation information for conservation planning in the northern Chihuahuan Desert. New Mexico Cooperative Fish and Wildlife Research Unit. Las Cruces, New Mexico, 63pp. + appendices. Report and GIS data accessed May 2007 at <http://fws-nmcfwru.nmsu.edu/aplomado/aplomado.htm>.