

### **3.8 BIOLOGICAL RESOURCES**

Existing biological resources are discussed in this section. The ROI for biological resources encompasses McGregor Range on Fort Bliss, including the Sacramento Mountains foothills, the Hueco Mountains in New Mexico, Otero Mesa, and Tularosa Basin. For the purposes of analyzing cumulative impacts, the ROI also includes the remainder of Fort Bliss, including the South Training Areas and the Doña Ana Range–North Training Areas. It also includes the Lincoln National Forest and BLM land north and east of McGregor Range.

Due to its large size (about 698,500 acres) and varied topography, McGregor Range exhibits a high degree of biodiversity. The vegetation mirrors this diversity in that plant communities range from the Chihuahuan Desert plant communities in the Tularosa Basin to pinyon pine/juniper woods in the Sacramento Mountains foothills (U.S. Army, 1996d, 1997c).

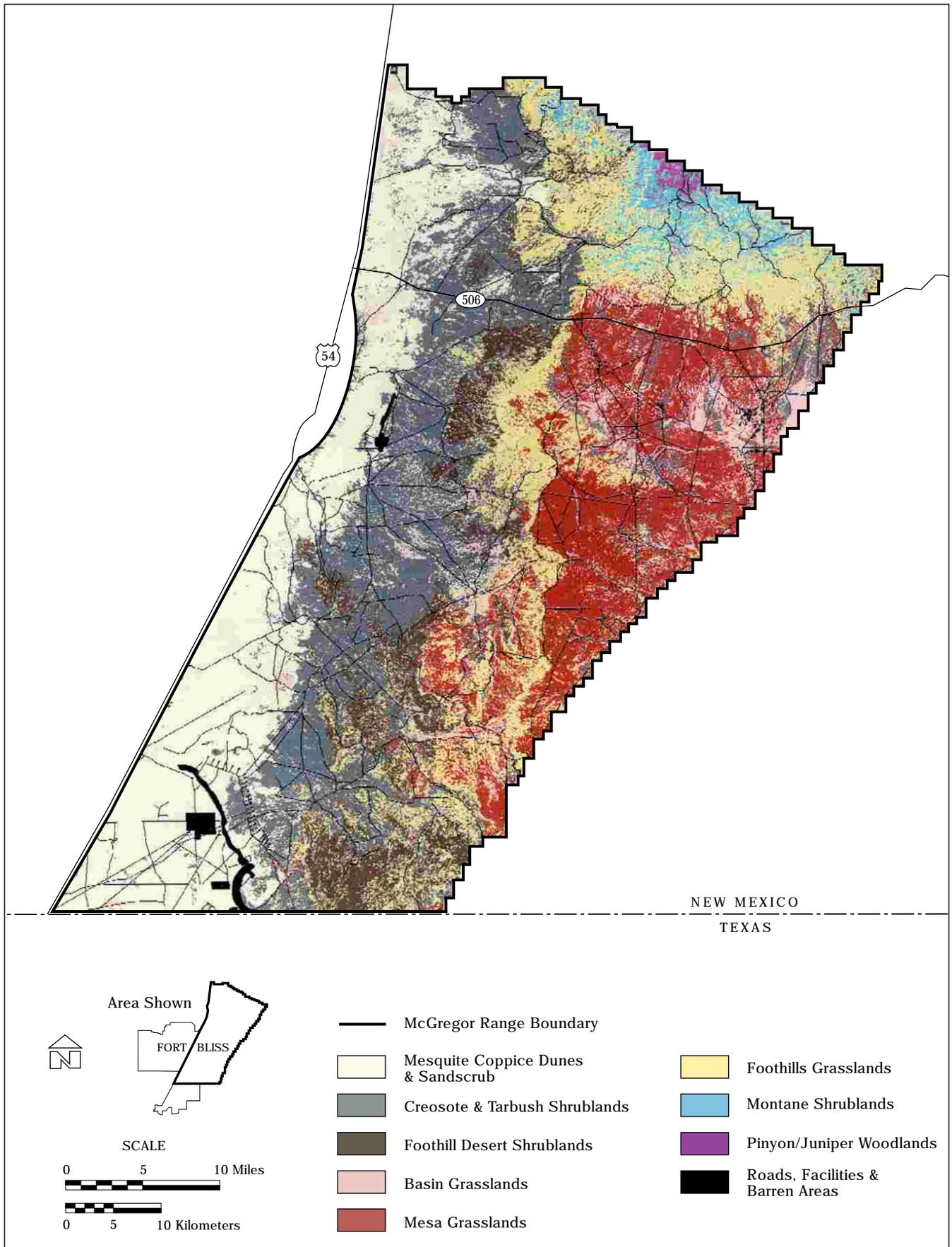
Wildlife species diversity is also high; for example, of the State of New Mexico's 123 species of amphibians and reptiles, 47 species occur and 19 species have the potential to occur on Fort Bliss (U.S. Army, 1997c; Degenhardt et al., 1996). Most of these species are found on McGregor Range. Recent breeding bird studies have shown that the number of species (species richness) in the Chihuahuan Desert on McGregor Range (Kozma and Mathews, 1997) is higher than reported in Chihuahuan Desert habitat off the range (Raitt and Maze, 1968; Naranjo and Raitt, 1993). These and other studies on Fort Bliss have demonstrated that arroyo-riparian drainage areas are used more extensively by wildlife than adjacent upland areas. Almost 2,500 miles of these arroyos have been mapped on McGregor Range. Many of these arroyos, as well as upland areas, are likely in good to excellent condition in terms of providing wildlife habitat as shown by Kozma and Mathews (1997). The following sections summarize the biological resources on McGregor Range; additional detailed information is in Appendix D, *Biology*.

#### **3.8.1 Vegetation**

The major plant community types in the area of McGregor Range are desert grasslands, Chihuahuan Desert scrub, and plains mesa sandscrub. Types that occur in the mountains in the area are juniper savanna, conifer and mixed woodlands, and montane conifer forests (Dick-Peddie, 1993). The vegetation on McGregor Range and the rest of Fort Bliss was characterized and mapped (U.S. Army, 1996d, 1997c), and this section is based on those reports. Within the Tularosa Basin, alluvial fans and piedmonts support desert shrub and grassland plant communities. Desert shrub plant communities dominate the Tularosa Basin floor, and Otero Mesa generally supports desert grassland plant communities. The upper Sacramento Mountains foothills generally support a wooded plant community dominated by open and closed stands of pinyon pine (*Pinus edulis*) and juniper (*Juniperus monosperma*, and *J. deppeana*) (Figure 3.8-1).

The plant communities and other areas on Fort Bliss were mapped using satellite imagery and 34 mapping units, totaling 1,113,403 acres, were identified. Of this total, 698,482 acres (almost 63 percent) constitutes McGregor Range. Approximately 35,900 acres, or 5.2 percent, of McGregor Range consists of rock, barren soil, military facilities, and roads (mapping units 24, 25, and 26). Of the remaining 31 vegetation mapping units identified (U.S. Army, 1996d, 1997c), 23 occur on McGregor Range (Table 3.8-1). These 23 mapping units were grouped into eight categories (Table 3.8-2) and mapped (Figure 3.8-1).

Coppice dunes and sandscrub are the dominate vegetation types in the western one-fifth of McGregor Range and honey mesquite is the dominate plant in some areas while sandsage is dominate in others. These types give way to creosotebush dominated plant communities where tarbush and lowland



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**Figure 3.8-1. McGregor Range Vegetation.**

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**Table 3.8-1. Descriptions of 27 Mapping Units on McGregor Range**

<i>Plant Community (mapping units)</i>	<i>Description</i>
<i>Shrublands</i>	
Basin desert shrubland coppice dunes (1)	Consists of the large coppice dunes in the Tularosa Basin. Honey mesquite ( <i>Prosopis glandulosa</i> ) is the dominant shrub with four-winged saltbush ( <i>Atriplex canescens</i> ) common in some areas. Sparse undergrowth; mesa dropseed ( <i>Sporobolus flexuosus</i> ) common in some areas.
Plains/coppice dunes sandscrub (2)	Sandsage ( <i>Artemisia filifolia</i> ) common with some mesquite and Mesa dropseed. Occurs at north and south end of coppice dune fields.
Plains sandscrub (3)	Sandsage/mesa dropseed common plants. Located on sandy areas mostly in Tularosa Basin with small amounts on Otero Mesa.
Basin desert shrubland (4)	Dominated by honey mesquite and alkali sacaton ( <i>Sporobolus airoides</i> ) in broad clay depressions at northern edge of coppice dunes.
Basin/lowland desert shrub (5)	Bottomland tarbush ( <i>Flourensia cernua</i> ) dominate with tobosagrass ( <i>Hilaria mutica</i> ) and burrograss ( <i>Scleropogon brevifolius</i> ) also common. Occurs on silty alluvial fan toe slopes and bottomlands on northern Otero Mesa and in the basin below mesa.
Lower piedmont desert shrubland – creosotebush and tarbush (6)	Dominated by creosotebush ( <i>Larrea tridentata</i> ) and bush muhly ( <i>Muhlenbergia porteri</i> ); tarbush is common in some areas. Occurs in heavy depositional soils of the lower toe slopes and the basin bottom.
Upper piedmont desert shrubland – creosotebush/bush muhly (7)	Dominated by creosotebush and bush muhly. Occurs on gravelly soil of the upper piedmont and foothills of the Sacramento Mountains.
Foothill desert shrubland – white thorn acacia (8)	Dominated by viscid acacia ( <i>Acacia noevernicosa</i> ); other species are sideoats grama ( <i>Bouteloua curtipendula</i> ), black grama ( <i>B. eriopoda</i> ), and ocotillo ( <i>Fouquieria splendens</i> ). Occurs on shallow gravelly soils of foothills, mesa escarpments, and upper piedmont.
Foothill desert shrubland – ocotillo - mariola (9)	Ocotillo and mariola ( <i>Parthenium incanum</i> ) are common plant species. Occurs on the rocky Sacramento Mountains foothills.
Foothill desert shrubland – Lechugilla/sideoats grama (10)	Dominated by lechugilla ( <i>Agave lechuguilla</i> ) and sideoats grama. Occurs on all aspects of the Hueco Mountains and unnamed hills.
Montane shrubland – mountain mahogany (11)	Mountain mahogany ( <i>Cercocarpus montanus</i> ), curlyleaf muhly, and New Mexico needlegrass are dominant. Occurs predominantly on rocky south-facing slopes at mid-elevation in the Sacramento Mountains foothills.
<i>Grasslands</i>	
Sandy plains desert grassland (12)	Dominated by mesa dropseed and soaptree yucca ( <i>Yucca elata</i> ). Occurs mostly south of McGregor Range Camp on sandy sites.
Basin/lowland desert grassland – tobosa grass and alkali sacaton (13)	Dominated by tobosagrass and alkali sacaton and occurs in heavy depositional soils on flats, bottomlands, and swales. Usually associated with drainages on Otero Mesa and Sacramento Mountains foothills.
Basin/lowland desert grassland – burrograss (14)	Monotypic growth of burrograss. Occurs in drainage's on Otero Mesa and broad alluvial depressions in the basin.
Foothills piedmont desert grassland (15)	Black and sideoats grama dominant with soaptree yucca and creosotebush. Occurs on gravelly footslopes and piedmont of the Sacramento and Hueco mountains.
Foothill grasslands (16)	Dominated by sideoats grama, sacahuista ( <i>Nolina microcarpa</i> ), and curlyleaf muhly ( <i>Muhlenbergia setifolia</i> ). Occurs on gravelly or rocky slopes near Otero Mesa escarpment and canyon walls of the escarpment.
Mesa grassland – blue grama/alkali sacaton (17)	Blue grama ( <i>Bouteloua gracilis</i> ) and alkali sacaton common along with soaptree yucca and purple threeawn ( <i>Aristida purpurea</i> ). Occurs on silty-clay soils near the Sacramento Mountains foothills.
Mesa grassland – black and blue grama/soaptree yucca (18)	Dominated by blue and black grama plus soaptree yucca and banana yucca ( <i>Yucca baccata</i> ). Covers extensive areas on fine silty soil on Otero Mesa and low tablelands beneath the mesa.

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**Table 3.8-1. Descriptions of 27 Mapping Units on McGregor Range (Continued)**

<i>Plant Community (mapping units)</i>	<i>Description</i>
Mesa grassland – black and blue grama/banana yucca (19)	Black and blue grama plus banana yucca are dominant. Occurs on shallow soils on southern Otero Mesa.
Mesa/foothill grasslands (20)	New Mexico needlegrass ( <i>Stipa neomexicana</i> ), sideoats grama, black grama, banana yucca common. Occurs on rocky ridges of slopes of the southern Otero Mesa.
Foothill grasslands – sideoats grama, curlyleaf muhly (21)	Sideoats grama, curlyleaf muhly, skeletonleaf goldeneye ( <i>Viguiera stenoloba</i> ), ocotillo, and common sotol ( <i>Dasyilirion wheeleri</i> ) are common. Occurs on Otero Mesa escarpment and rocky slopes of the Sacramento and Hueco mountains.
<i>Woodlands</i>	
Woodland – oneseed juniper (22)	Oneseed juniper, curlyleaf muhly, and hairy grama are dominant. Occurs on rocky, gravely slopes at moderately high elevation in the Sacramento Mountains foothills.
Woodland – pinyon pine (23)	Pinyon pine, alligator juniper, sideoats grama, sandpaper oak ( <i>Quercus pungens</i> ), and gray oak ( <i>Quercus grisea</i> ) are dominant. Occurs on rocky, well developed soils on high elevation slopes of the Sacramento Mountains foothills.
<i>Military Lands and Roads</i>	
Barren military land (24)	Rock, barren soil, and impact areas.
Military facilities (25)	Military facilities.
Roads (26)	Roads.

Note: Mapping units renumbered from the presentation in the source document.  
Source: U.S. Army, 1996d.

**Table 3.8-2. Summary of Desert Shrubland, Grassland, and Woodland Plant Communities and Disturbed Ground on McGregor Range**

<i>General Plant Community Type</i>	<i>Mapping Units<sup>a</sup></i>	<i>Acres</i>	
		<i>Number</i>	<i>Percent</i>
<i>Shrublands</i>			
Mesquite coppice dunes and sandscrub	1, 2, 3, 4	136,730	19.8
Creosotebush and tarbush shrublands	5, 6, 7	157,506	22.9
Foothill desert shrublands	8, 9, 10	55,511	8.1
Montane shrublands	11	18,115	2.6
<i>Total Shrublands</i>		<i>367,862</i>	<i>53.3</i>
<i>Grasslands</i>			
Basin grasslands	12, 13, 14	37,467	5.5
Mesa grasslands	17, 18, 19, 20	113,825	16.5
Foothill grasslands	15, 16, 21	129,495	18.8
<i>Total Grasslands</i>		<i>280,787</i>	<i>40.8</i>
<i>Woodlands</i>			
Pinyon/juniper woodlands	22, 23	4,360	0.6
<i>Total Woodlands</i>		<i>4,360</i>	<i>0.6</i>
<i>Disturbed Ground</i>			
Facilities and barren areas	24, 25, 26	35,896	5.2
<i>Total Disturbed Ground</i>		<i>35,896</i>	<i>5.2</i>
<i>Grand Total</i>		<i>688,905<sup>b</sup></i>	<i>99.9</i>

<sup>a</sup> From Table 3.8-1.

<sup>b</sup> Area mapped on McGregor Range.

Source: U.S. Army, 1996d.

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grasslands are associated with loamy soils in the drainages. The Hueco Mountains are in the southeast portion of McGregor Range and lechugilla, creosotebush, and mariola communities dominate the shallow soils on the steep slopes while desert grasslands dominated by sideoats grama and black grama occupy the gentler slopes. The Otero Mesa occurs on eastern part of McGregor Range and the vegetation is predominately black and blue grama with tobosa grass and burrograss in the broad drainages. New Mexico needlegrass, as well as various shrubs, can be found on rocky ridges. The Sacramento Mountains piedmont is west of the Sacramento Mountains and east of the Tularosa Basin, and includes part of the Otero Mesa escarpment. Soils are shallow and rocky on the escarpment where vegetation is a mixture of shrublands and grasslands (mostly sideoats grama and curlyleaf muhly). Creosotebush and mariola plant communities occur on the coarse rocky soil of the upper piedmont giving way to almost pure stands of creosotebush further down on the piedmont. The Sacramento Mountains foothills are at the north end of McGregor Range and vegetation is predominately pinyon pine/juniper woodlands and montane shrublands (mountain mahogany) in the upper slopes of the foothills; these types give way to Chihuahuan Desert shrublands at lower elevations (U.S. Army, 1996d).

At lower elevations in the area, the native plant communities are adapted to arid conditions. The communities generally produce limited amounts of desirable forage and are very susceptible to deterioration if disturbed. At higher elevations, the greater availability of moisture tends to result in higher forage yields, and a greater stability. Since moisture conditions also relate to soil type and topographic position, many variations in vegetation correlate with soil and slope characteristics. For example, on Otero Mesa, feathergrass and sideoats grama tend to be found on gravelly ridges while tobosa is found in the moister swale areas. In the Canyonlands (BLM natural unit, see Section 3.1.2.2), the moister sites contrast with drier sites by having more curlyleaf muhly and skeleton leaf goldeneye and less mariola and sideoats grama.

The long-term effects of variations in climate can be deduced from studies of the Jornada Experimental Range (23 miles northeast of Las Cruces) and from research on other rangelands. Differing opinions are held by researchers regarding grasslands on the Jornada Experimental Station. On the Jornada, severe droughts have caused reductions in the basal cover of black grama to about the same amount, regardless of grazing intensity. During wet periods, the basal cover has recovered to a similar degree on all but heavily grazed pastures. Increases in vigor, basal area, and stored foods in black grama occurred whenever there was substantial, well-timed precipitation throughout a 15-month period (two growing seasons), regardless of grazing intensity. In years of little or no rainfall there is little significant growth of the forage grasses. The relationships also are affected by many other factors (BLM, 1980).

Of the approximately 689,000 acres of land mapped on McGregor Range, about 53 percent, or 367,900 acres, are desert shrublands, mostly in the Tularosa Basin (Table 3.8-2). About 136,700 acres of the shrublands (about 20 percent of McGregor Range) are covered with mesquite-dominated plant communities, most of which are coppice dunes. Creosote-dominated plant communities cover over 157,500 acres, or 23 percent, of the total land on McGregor Range. Shrub-dominated plant communities have replaced grassland plant communities, including black grama grasslands, over large areas in southern New Mexico in the last century (Buffington and Herbel, 1965). For example, over 86,000 acres of a 144,500-acre study area on the Jornada Experimental Range was grasslands with no shrubs in 1858; no such habitat existed by 1963 although black grama grasslands still occur elsewhere on the Jornada Experimental Range as indicated above. During the same time period, mesquite dominated habitat increased from 6,266 acres in 1858 to 66,151 acres in 1963 and creosote-dominated areas increased from 640 acres to about 12,000 acres during the same period (Buffington and Herbel, 1965). Mesquite-dominated areas have continued to expand even after livestock have been removed from the range for many years. Long-term studies in permanent exclosures at the Jornada Experimental Range from 1935 to 1980 showed that black grama grass totally disappeared by 1980, even in areas where it was the dominant species in 1935; the greatest decline in black grama took place between 1950 and 1955 during a severe

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drought. These former black grama grasslands are now mesquite-dominated areas (Hennessy et al., 1983). It is believed that the formation of mesquite coppice dunes is related to drought and livestock grazing. Under heavy livestock grazing and/or drought, grass cover was reduced. In addition, cattle feed on mesquite seeds and the dispersal of these seeds is of “great importance in the spread of mesquite to adjacent areas” (Buffington and Herbel, 1965). Openings created by the reduction in grass cover were occupied by mesquite. The establishment of this species altered the site and extensive soil movement occurred, forming coppice dunes. In addition, soil moisture conditions and competition were such that black grama could not become reestablished (Hennessy et al., 1983).

It is likely that much of the mesquite- and creosote-dominated areas on Fort Bliss were once grasslands and this conversion from grassland to shrublands is considered a step in the decertification process (Schlesinger et al., 1990). Long-term studies carried out at the Jornada Experimental Range have shown that the conversion to shrublands has resulted in a reduction in plant species diversity (Huenneke, 1995). Grasslands had 2.5 times more plant species than mesquite and 1.7 times more plant species than the creosote type. Net primary productivity did not differ significantly between the grassland and shrubland types (Huenneke, 1995).

Once established, coppice dunes persist and the return to grasslands, even in areas where livestock have been excluded for many years, is highly unlikely (Gardner, 1951; Buffington and Herbel, 1965; Hennessy et al., 1983). Chemical treatment has proven successful in reducing mesquite growth over the short term (about 3 years on the Jornada Experimental Range). Satellite imagery data over a several-year period was used to track photosynthetic activity of the mesquite canopy. No ground transects were sampled. The satellite data indicated that during the first 3 years after treatment, an increase in grass growth was noted. After 3 years, mesquite began to recover and a reduction in grass growth resulted (Eve and Peters, 1995).

Grassland plant communities cover about 281,000 acres, which accounts for 41 percent of the land on McGregor Range. Within McGregor Range, Otero Mesa covers about 161,400 acres or 54 percent of the grasslands on McGregor Range (U.S. Army, 1996d). Otero Mesa extends southeast away from McGregor Range and covers about 1,202,000 acres (USAF, 1998). The remainder of the grassland plant communities occur in the Tularosa Basin. The largest contiguous blocks of grasslands are found on Otero Mesa and below the escarpment.

Montane shrublands and pinyon pine/juniper woodlands cover about 22,500 acres, or almost 3 percent of McGregor Range; these plant community types are in the Sacramento Mountains foothills (U.S. Army, 1996d).

Since 1966, when the BLM grazing system was instituted on McGregor Range, modern grazing management practices have been followed. Grazing has been excluded over much of McGregor Range for decades. Some of the plant communities are approaching presettlement conditions such as the black grama/blue grama grassland, sand sagebrush, and mesa drop seed communities described below (U.S. Army, 1997c). One such area is a 123,500-acre black grama/blue grama grassland tract on and below southern Otero Mesa, which have not been grazed for many years. The area is characterized by high grass cover with a low incidence of shrubs and weedy species, and a general absence of exposed and eroded soil. Similarly, grazing units on Otero Mesa contain grasslands in excellent conditions. The black grama grasslands in this area are particularly important because they have been much reduced starting in the 19<sup>th</sup> century as indicated above. Three high-quality sand sagebrush communities are also found on McGregor Range east of Oro Grande in the Tularosa Basin, on the Sacramento Mountains foothills, and on northern Otero Mesa. The nearest known sand sagebrush plant community of the type found on the northern Otero Mesa of similar high quality is 150 miles north on WSMR. Mesa dropseed grassland occur on isolated patches within the mesquite coppice dune fields. One of the largest grasslands of this type (1,230 acres) is along the New Mexico-Texas border near Newman and another area of Mesa

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dropseed is northeast of Oro Grande in the Tularosa Basin. These areas may be remnants of much larger grasslands that covered the Tularosa Basin before intensive livestock grazing and the encroachment of mesquite (U.S. Army, 1997c).

Exotic plant species have become established on some areas on McGregor Range. African rue (*Peganum harmala*) has become established on Otero Mesa. It invades disturbed sites, and once successfully established, it can spread and out compete the native grasses. Russian thistle (*Salsola iberica*) is another species that becomes established on disturbed ground and this species can be found throughout McGregor Range. Salt cedar (*Tamarix ramosissima*) has become established at some stock tanks and at other widely scattered locations on McGregor Range. Another potential problem plant is malta starthistle (*Centaurea melitensis*, that is currently known to grow along U.S. Highway 54 and may occur along other roadways on McGregor Range. Another species of concern is Johnson grass (*Sorghum halepense*), which occurs in some drainages on Fort Bliss. Fort Bliss has initiated a 2-year study to map the distribution and abundance of some of the exotic plant species on Fort Bliss. From this information, a strategy will be developed to control any exotic plants that Fort Bliss deemed necessary to maintain the biological diversity on post or for other appropriate reasons.

### **3.8.2 Wetlands and Arroyo-riparian Drainages**

Wetlands and arroyo-riparian drainages have been studied on McGregor Range (for more details see Appendix D). The USACE Waterways Experiment Station is currently mapping and characterizing all Waters of the U.S., including wetlands on Fort Bliss (U.S. Army, 1998h; 1997d). To qualify as a USACE jurisdictional wetland, it must have hydric soil, have evidence of saturation to the surface sometime during the growing season, and contain wetland plant species. Waters of the U.S. includes “water such as intrastate lakes, rivers, streams (including intermittent streams)” (33 CFR 328.3[a][3]).

Probable Waters of the U.S. have been mapped on McGregor Range (Figure 3.7-1). A total of 1,291 dry washes with distinct streambeds and sides, comprising 2,475 miles, were mapped on McGregor Range and the South Training Areas. In addition, 13 intermittently flooded lakes with distinct ordinary high water marks, totaling 132 acres, and 110 artificial water resources (691 acres) including sewage lagoons, storm-water retention basins, and cattle tanks were mapped (U.S. Army, 1998h).

The vast majority of arroyo-riparian drainages on McGregor Range do not qualify as USACE jurisdictional wetlands but, as indicated above, thousands of miles of these water ways are probable Waters of the U.S. Perennial riparian corridors of the western U.S. have been studied extensively and the density and diversity of flora and fauna in many of these areas determined. However, the flora and fauna of arroyo-riparian drainages on McGregor Range and elsewhere have not been fully studied (Cockman, 1996; Kozma, 1995).

Cockman (1996) studied arroyo-riparian ephemeral drainages on McGregor Range and determined that drainages had the following characteristics in relation to upland areas:

- Shrub, tree, and forb cover are higher on the main channel than the surrounding area.
- Species richness of shrubs, trees, grasses, and forbs are higher in the main channel than all other locations.
- Heights of shrubs along the main channel are nearly twice that of shrubs in the uplands.
- Obligate species such as desert willow tended to be taller than nondrainage species.

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- Obligate species at one elevation may occur outside of the drainage at another elevation. For example, Apache plume (*Fallugia paradoxa*) is obligate in the submesa drainages but occurs outside the drainages in the foothills. Species such as little-leaf and big-leaf sumac (*Rhus microphylla* and *R. trilobata*) occur at many locations in the foothill and submesa drainages (Cockman et al., 1996). Little-leaf sumac occurs frequently in drainages in the Tularosa Basin, and less frequently, in deep, sandy areas not associated with drainages.

### **3.8.3 Wildlife**

Information regarding amphibians and reptiles, avifauna, and mammals is presented in this section. More detailed information is presented in Appendix D.

#### **3.8.3.2 Amphibians and Reptiles**

Surveys for amphibians and reptiles were conducted on Otero Mesa and in the Tularosa Basin on McGregor Range in 1996 and 1997. Based on these surveys and other information, a total of 8 species of amphibians and 39 species of reptiles have been observed on Fort Bliss; an additional 19 species and subspecies of amphibians and reptiles have the potential to occur (U.S. Army, 1997d, e, 1996e) (Appendix D). Seven of the amphibian species are toads, and the eighth species is the barred tiger salamander (*Ambystoma tigrinum mavortium*), which is found in stock tanks on the Otero Mesa and in the Tularosa Basin. The box turtle (*Terrapene ornata*) is the only species of turtle observed on Fort Bliss and is most common in the grassland plant communities on the Otero Mesa, although it has been regularly observed in the desert shrubland communities in the Tularosa Basin (U.S. Army, 1997d, e, 1996d, e).

The most diverse group of reptiles are the lizards; 20 species have been recorded from Fort Bliss, including 6 species of whiptails (Appendix D) (U.S. Army, 1997e). The largest number of lizard species occur in the grassland habitat (17 species) followed by the desert shrublands (13), and Sacramento Mountains foothills (10) (U.S. Army, 1997e). Some species, such as the western marbled whiptail (*Cnemidophorus marmoratus*) and Texas horned lizard (*Phrynosoma cornutum*) are found in essentially all areas on McGregor Range; while others, such as the leopard lizard (*Gambelia wislizenii*), have been reported only from the desert shrubland habitat, and the lined tree lizard (*Urosaurus ornatus*), only in the wooded habitat of the Sacramento Mountains foothills (U.S. Army, 1997e).

Eighteen species of snakes have been recorded from Fort Bliss (U.S. Army, 1997e, 1996e) (Appendix D). On McGregor Range, the largest number of species occur in the grassland habitat on Otero Mesa (13 species), followed by the desert shrubland and the Sacramento Mountain foothills (11). Species such as the western diamondback rattlesnake (*Crotalus atrox*) and gopher snake (*Pituophis catenifer*) are common and widespread throughout McGregor Range. Other species, such as the Mojave (*C. scutulatus*) and prairie (*C. viridis*) rattlesnakes, have been reported only from the grassland habitat on Otero Mesa and the Texas long-nosed snake (*Rhinocheilus lecontei*) was observed only in the Sacramento Mountains foothills (U.S. Army, 1997e) and the desert shrubland habitat of the Tularosa Basin (U.S. Army, 1996e).

#### **3.8.3.3 Avifauna**

A total of 334 species of birds have been recorded from Fort Bliss (U.S. Army, 1996f) and 223 of these have been recorded from McGregor Range (Table D.3-3 in Appendix D). Sixty-three of the species not recorded from McGregor Range were diving birds, wading birds, waterfowl, shorebirds, gulls, and terns that use aquatic habitats; appropriate aquatic habitat for these species either does not exist or is rare on McGregor Range. Many of these aquatic and wetlands species have been observed at the sewage lagoons and oxidation ponds near the Fort Bliss cantonment area in Texas. Another 16 species not recorded on McGregor Range were warblers that are rare to very rare migrants on Fort Bliss. These species may

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occur on McGregor Range, but have been observed elsewhere on Fort Bliss due to more observers in the cantonment area and at the sewage lagoons and oxidation ponds.

In recent years, detailed studies of the bird life in various habitats on McGregor Range were conducted and some of these studies are still in progress. These studies have centered on determining existing conditions and have concentrated on documenting breeding bird communities in various habitats, the occurrence of neotropical migrants, and the status of sensitive species. This section summarizes the results of the breeding bird, neotropical migrant, and raptor studies, while sensitive species are addressed in Section 3.8.4. Breeding bird surveys have been conducted in numerous locations scattered throughout McGregor Range (see Figure D.3-2 in Appendix D) and the results of these studies are summarized below. More detailed information regarding these studies appears in Appendix D.

#### Tularosa Basin

**Breeding birds.** In 1996 and 1997, 24 sites were sampled for breeding birds in the Tularosa Basin in desert shrubland habitats dominated by sandsage, mesquite, creosote, and viscid acacia (U.S. Army, 1996g, 1997f) (see Table D.3-4 in Appendix D). The black-throated sparrow (*Amphispiza bilineata*) was by far the most common species recorded in all four habitats in 1996 and in 1997. The western kingbird (*Tyrannus verticalis*), Scott's oriole (*Icterus parisorum*), mourning dove (*Zenaida macroura*), and ash-throated flycatcher (*Myiarchus cinerascens*) were other common species. In 1997, 718 nests of 42 species were observed, compared to 453 nests of 34 species in 1996 (U.S. Army, 1996g, 1997f). During both years, the largest number of nests belonged to the black-throated sparrow and the largest number of nests were found in the mesquite habitat.

Breeding bird studies at eight sample locations in arroyo and upland habitats in the Chihuahuan Desert showed the black-throated sparrow, northern mockingbird (*Mimus polyglottos*), verdin (*Auriparus flaviceps*), brown-headed cowbird (*Molothrus ater*), mourning dove, and ash-throated flycatcher were the most common species (U.S. Army, 1995c, 1996g, 1997g; Kozma, 1995;). A total of 1,214 nests of 32 species were detected from 1993 through 1997 and nests of the black-throated sparrow, northern mockingbird, Scott's oriole, mourning dove, and house finch (*Carpodacus mexicanus*) were the most commonly observed. Nest density was about twice as high in arroyo habitat, and Torrey yucca (*Yucca torreyi*), javelina bush (*Microrhamnus ericoides*), and little-leaf sumac were most frequently used for nesting, even though these shrubs were among the lowest in density (Kozma and Mathews, 1997).

Breeding bird surveys conducted along eight transects at four arroyo/upland sites in the Chihuahuan Desert below the Otero Mesa escarpment, in 1997, resulted in 40 species of birds comprising 689 individuals being recorded (USAF, 1997a, b) (Table D.3-5 in Appendix D). Seventeen percent more species and 29 percent more individuals were recorded in the arroyos than the uplands, and the black-throated sparrow accounted for 25 percent of the birds recorded, followed by the northern mockingbird (8 percent), and ash-throated flycatcher (7 percent).

**Neotropical migrants.** Many bird species breed in North America and winter in Central and South America (called neotropical migrants), and many of these species started to decline in the early 1980s (Robbins et al., 1993). Forest fragmentation on the breeding grounds, the elimination of wintering habitat in the tropics, and the loss of important stop-over habitat are likely major reasons for these declines (Flather and Sauer, 1996; Sheery and Holmes, 1996; Moore et al., 1993).

In the west, over 60 percent of the neotropical migrants use riparian areas for stop-over habitat during migration or for breeding (Krueper, 1993), and most of the riparian areas that have been studied are mesic sites dominated by species such as willow and cottonwoods. McGregor Range contains few such mesic riparian areas, but arroyo-riparian drainages on the range attract more neotropical migrants in comparison

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to adjacent uplands (Kozma, 1995; U.S. Army, 1995c; 1996h; 1997g). During 5 years of mist netting along arroyo-riparian drainages and in adjacent uplands, 27 species of neotropical migrants were captured 342 times and all species captured more than once, were more common in the arroyos than uplands (Table D.3-6 in Appendix D).

These studies of nesting and migratory birds on McGregor Range demonstrate that arroyo-riparian areas are used by more species more consistently than upland sites. As indicated in Section 3.8.2, approximately 2,475 miles of arroyos with well-developed channels and sides occur on McGregor Range and the South Training Areas. Many of these arroyos, as well as similar areas on other parts of Fort Bliss, likely provide habitat that is used to a greater degree than adjacent upland habitat by nesting birds and neotropical migrants moving through the Chihuahuan Desert.

**Raptors.** Data collected at 24 breeding bird sample locations showed that the Swainson's hawk (*Buteo swainsoni*) and turkey vulture (*Cathartes aura*) were the most common raptors observed in the desert shrublands during spring and summer of 1996 and 1997 (Table D.3-7 in Appendix D) (U.S. Army, 1996g, 1997f). Surveys along the Otero Mesa escarpment revealed that a breeding pair of falcons, consisting of a prairie falcon (*Falco mexicanus*) and a possible prairie/peregrine falcon (*Falco peregrinus*) hybrid, were nesting near Rough Canyon (USAF, 1997c, d). Numerous stick nests and a number of golden eagles (*Aquila chrysaetos*) were also observed but nesting was not confirmed in 1997. An active golden eagle nest was observed along the escarpment in 1998 (U.S. Army, 1998i). Data from wintering bald eagle (*Haliaeetus leucocephalus*) surveys in the desert shrubland habitat showed that the golden eagle and red-tailed hawk were the most common wintering species (U.S. Army, 1995d, 1996i) (Table D.3-8 in Appendix D).

#### Otero Mesa

**Breeding birds.** In 1996 and 1997, 8 sites were sampled for breeding birds in the black grama grasslands and the mesa grasslands (dominated by blue grama grass), an additional four sites were sampled in the black grama grasslands of the Tularosa Basin (U.S. Army, 1996g, 1997f). As in the desert shrublands habitats, there was a substantial increase in the number of birds recorded in the grassland habitats in 1997; approximately twice as many birds were detected in 1997 than 1996 (Table D.3-9 in Appendix D). In 1996, the horned lark (*Eremophila alpestris*) was the most common species recorded in the mesa grasslands; the eastern meadowlark (*Sturnella magna*) was most abundant in the mesa grasslands in 1997, and the black-grama grasslands both years. Other common breeding bird species were the black-throated sparrow, mourning dove, northern mockingbird, common nighthawk (*Chordeiles minor*), Scott's oriole, and ash-throated flycatcher.

Breeding bird surveys along eight transects in the grassland habitat of Otero Mesa in 1997 resulted in the observation of 45 species comprising 720 individuals (USAF, 1997a, b) (Appendix D). For the combined transects, 45 percent more species and 34 percent more birds were observed in the grassland swales than in the adjacent uplands. The eastern meadowlark was the most abundant species, followed by the northern mockingbird, mourning dove, and black-throated sparrow.

**Raptors.** The turkey vulture and red-tailed hawk were the most common species of raptor observed at 12 breeding bird sampling sites in 1996 and 1997, respectively (Appendix D) (U.S. Army, 1996h; 1997f). Additional species observed on Otero Mesa during the spring and summer were the golden eagle, merlin (*Falco columbarius*), burrowing owl (*Athene cunicularia*), and great horned owl (*Bubo virginianus*). During surveys for wintering bald eagles, the red-tailed hawk was the most common raptor observed (U.S. Army, 1995d; 1996i) (Appendix D). The golden eagle and American kestrel were also fairly common wintering species.

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Hueco Mountains

**Breeding birds.** Reconnaissance surveys for breeding birds were conducted in the Hueco Mountains on McGregor Range in June 1997 (U. S. Army, 1997h). Six routes totaling about 28 miles, were traversed along arroyos and in uplands within an area of approximately 6,700 acres. A total of 40 species comprising 737 individuals were recorded during six surveys on June 10 and 12, 1997 (Table D.3-11 in Appendix D). The black-throated sparrows were the most common species encountered. Other common species were the northern mockingbird, cactus wren, canyon towhee (*Pipilo fuscus*), house finch, and mourning dove. Scaled (*Callipepla squamata*) and Gambel's (*Callipepla gambelii*) quail were fairly common and were most frequently associated with the larger arroyo-riparian drainages (U. S. Army, 1997h).

**Raptors.** The turkey vulture and red-tailed hawk were the most frequently observed raptors in the Hueco Mountains in June 1997, while the Swainson's hawk and American kestrel were infrequently detected. Raptor surveys were conducted along the east facing Hueco Mountain escarpment, as well as in the interior of these mountains. The red-tailed hawk, American kestrel, and golden eagle were observed along the escarpment. However, the surveys indicated that the golden eagle probably does not nest along the escarpment, although the red-tailed hawk and American kestrel may. Observations in the interior of the Hueco Mountains on McGregor Range showed that there were few cliffs that would support cliff-nesting raptors such as the golden eagle or prairie falcon, and these two species were not observed in this area. The turkey vulture, red-tailed hawk, and American kestrel were observed and these species likely nest in the Hueco Mountains (U.S. Army, 1999). There is no data regarding wintering raptors in the Hueco Mountains, but the same species that winter elsewhere in the desert shrubland and grassland habitats on the McGregor Range likely occur in these mountains.

Sacramento Mountains

**Breeding birds.** The Sacramento Mountains foothills occur within McGregor Range, and breeding birds were sampled at six sites in the pinyon pine/juniper woods. The most common breeding birds recorded were the northern mockingbird, common bushtit (*Psaltriparus minimus*), spotted towhee (*Pipilo maculatus*), and black-chinned sparrow (*Spizella atrogularis*) (U.S. Army, 1996g; 1997f) (see Table D.3-12 in Appendix D).

**Raptors.** The turkey vulture was the most common species of raptor observed at breeding bird sampling locations in the pinyon pine-juniper habitat. The red-tailed hawk was observed occasionally, while the golden eagle and sharp-shinned hawk (*Accipiter striatus*) were seen once in 1996 (Table D.3-7 in Appendix D) (U.S. Army, 1996g; 1997f). During wintering bald eagle surveys, the golden eagle was the most common raptor observed. The red-tailed hawk, bald eagle, and American kestrel were also fairly common wintering species (Table D.3-8 in Appendix D) (U.S. Army, 1995d, 1996i). The great horned owl and western screech owl (*Otus kennicotti*) were detected during spotted owl (*Strix occidentalis*) surveys of the Sacramento Mountains foothills during the winter of 1995 to 1996; however, no spotted owls were observed (U.S. Army, 1996j).

3.8.3.4 Mammals

A total of 58 species of mammals are known to occur, and an additional 19 species have the potential to occur on McGregor Range, including 17 species of bats. Two maternity colonies of the fringed myotis (*Myotis thysanodes*) were observed in abandoned cabins in the Sacramento Mountains foothills (Smartt, 1980); a maternity colony was observed in one of these cabins in 1998 and based on behavioral traits, it is likely a fringed myotis colony (U.S. Army, 1998j). Surveys for bats along the Otero Mesa escarpment and nearby stock tanks (See Appendix D) indicated that bats roost in small scattered groups; no large

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roost sites were observed. Western pipistrelles (*Pipistrellus hesperus*), *Myotis* sp. and free-tailed bats (*Tadarida*) were observed emerging from the escarpment and at some stock tanks (USAF, 1997e, f).

Fort Bliss conducted rodent surveys at 24 sampling sites in 12 habitat types on McGregor Range in 1997 and 1998 (U.S. Army, 1997i) (see Figure D.3-1 in Appendix D). The largest number of rodents were captured in the swale and the acacia scrub habitat and the lowest number was in the mesquite dunes (Table D.3-14 in Appendix D). In 1997, the most abundant species were the silky pocket mouse (*Perognathus flavus*) and Merriam's kangaroo rat (*Dipodomys merriami*). Other common species were the deer mouse (*Peromyscus maniculatus*), hispid cotton rat (*Sigmodon hispidus*), white-footed mouse (*Peromyscus leucopus*), cactus mouse (*Peromyscus eremicus*), western harvest mouse (*Reithrodontomys megalotis*), and Ord's kangaroo rat (*Dipodomys ordii*). The largest number of species was in the sandy arroyo scrub (14) and *Chilopsis* arroyo (14) and the smallest number (7) was in the mesquite coppice dunes (U.S. Army, 1997i).

A study of rodents in arroyos and adjacent upland habitats in the Chihuahuan Desert for 2 years on McGregor Range, found the relative abundance was over six times greater in the arroyos than adjacent habitats. The white-footed mouse, deer mouse, western harvest mouse, and white-throated woodrat (*Neotoma albigula*) were more common in the arroyos, and Merriam's kangaroo rat, and the desert plains pocket mouse (*Perognathus flavescens*) was more abundant in adjacent upland habitats (U.S. Army, 1996h).

The desert cottontail (*Sylvilagus audubonii*) and black-tailed jackrabbit (*Lepus californicus*) are common on McGregor Range. The coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), badger (*Taxidea taxus*), and bobcat (*Lynx rufus*) are predators in the desert shrubland and grassland habitats. The mountain lion (*Puma concolor*) was observed in the Sacramento Mountains foothills along the Otero Mesa escarpment in 1979 (Smartt, 1980), and in Rough Canyon along the Otero Mesa escarpment in 1996 (U.S. Army, 1997j).

The mule deer (*Odocoileus hemionus*) occurs throughout Fort Bliss, and on McGregor Range is most common in the mountainous portions including the Sacramento Mountains foothills. The number of mule deer in the Sacramento Mountains foothills on McGregor Range ranged from 587 in 1984 to 206 in 1995 (Table D.3-15 in Appendix D) (NMDGF, 1997). In addition, the number of deer observed north of New Mexico Highway 506 was substantially greater than the number observed south of this highway (Table D.3-15 in Appendix D).

The pronghorn antelope (*Antilocapra americana*) occurs mostly in the grassland communities of Otero Mesa and below the Mesa, with occasional use of the desert shrubland habitat in the Tularosa Basin. An estimated 500 to 700 pronghorn inhabit the Otero Mesa of Fort Bliss. The oryx (*Oryx gazella*) is common in the desert-shrubland communities and has become common in the Tularosa Basin portion of McGregor Range. The javelina (*Dicotyles tajacu*) are widely dispersed in the Tularosa Basin and have been observed infrequently in many locations. Recent observations in the Sacramento Mountains foothills and on Otero Mesa indicate that this species may be expanding its extent on McGregor Range.

### **3.8.4 Sensitive Species**

Various species of flora and fauna occur on McGregor Range that are listed as threatened, endangered, or species of concern by the USFWS and the State of New Mexico (sensitive species) (See Table D.4-1 in Appendix D). In addition, the diverse habitats on McGregor Range have the potential to support species that have not been confirmed. The following sections present brief summaries of selected sensitive species known to occur or have the potential to occur on McGregor Range. More detailed descriptions of these species appear in Appendix D. In addition, federally listed species will be addressed in greater detail in a biological assessment that will be prepared separately. The draft biological assessment is tentatively

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scheduled to be completed during the spring of 1999. Refer to Table D.4-1 for the scientific names of sensitive species discussed in this section.

#### 3.8.4.1 Plants

One federally endangered and five plant species of special concern occur or have the potential to occur on McGregor Range. The federally and state endangered Sneed pincushion cactus is known to occur on the Doña Ana Range–North Training Areas on Fort Bliss (U. S. Army, 1991a, 1998i) and this species was not observed in the Hueco Mountains in Texas (U. S. Army, 1991a). The Alamo beardtongue and Hueco Mountain rockdaisy are federal species of special concern and the Alamo beard tongue is a state rare and sensitive species. These species have been recorded in the Hueco Mountains in Texas (U. S. Army, 1991a, 1998i). Surveys for these two species in potential habitat in the Hueco Mountains of McGregor Range, in 1998, did not detect these plants (Corral, 1998). These species are very unlikely elsewhere on McGregor Range.

The night blooming cereus is a federal species of concern and a state rare and sensitive species, and is known to occur in the alluvial gravelly sands portions of the desert shrubland habitat on the Doña Ana Range–North Training Areas (U. S. Army 1990, 1998i). A survey for this species took place in a 5,000-acre segment of the Chihuahuan Desert on McGregor Range in 1997 and it was not observed (USAF, 1997g). Potential habitat for this species occurs in the Tularosa Basin on McGregor Range.

The sand prickly pear is a federal species of concern and a state endangered species, and occurs in the sandy soils of mesquite coppice dunes; it has been recorded from BLM land about 0.8 mile from the Doña Ana Range–North Training Areas boundary. It was not observed during surveys on Doña Ana Range–North Training Areas in 1996 (U. S. Army, 1998i), and there is a very low potential that this species would occur in the alluvial gravelly sand portions of the mesquite coppice dune plant community on McGregor Range. Prior to 1992, there were only two records of the grama grass cactus (federal species of concern) on Otero Mesa on McGregor Range. Surveys in 1993 and 1994 showed that this species was much more abundant and this species is now considered common on Otero Mesa (Corral, 1997).

#### 3.8.4.2 Invertebrates

The Los Olmas tiger beetle is a federal species of concern and has not been observed on McGregor Range but has the potential to occur in areas of limestone soil. The population trends for this species are not known and it is listed as possibly occurring in New Mexico (BISON-M, 1997).

#### 3.8.4.3 Reptiles

One federal reptile species of concern and a state threatened species may occur on McGregor Range. The Texas horned lizard is a federal species of special concern and is common and widespread on McGregor Range (U. S. Army 1997e). The mottled rock rattlesnake is not a federal species of concern but is a State of New Mexico threatened species. This species is typically found in rocky canyons and hillsides and has been reported from the Organ Mountains near Fort Bliss. It is possible in the Hueco Mountains and Otero Mesa escarpment on McGregor Range.

#### 3.8.4.4 Birds

Nineteen federal and/or state listed or sensitive bird species occur or have the potential to occur on McGregor Range (Table D.4-1 in Appendix D). The interior least tern, willow flycatcher, and piping plover and federally listed species that have not been reported (least tern) or occur only sporadically (willow flycatcher and piping plover) on McGregor Range. The subspecies of willow flycatchers

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observed on McGregor Range was not determined so it is not known if the endangered southwestern willow flycatcher has occurred on McGregor Range. These three species occur only as migrants because appropriate nesting habitat is lacking on post. The remaining federally listed bird species either occur as wintering species, or as breeding species if suitable nesting habitat occurs on post.

Peregrine Falcon. The peregrine falcon is a federal and state endangered species and has not been recorded as a breeding species at Fort Bliss, although an unconfirmed peregrine/prairie falcon and a prairie falcon made a nesting attempt on the Otero Mesa escarpment in 1997 (USAF, 1997c, d). A survey for potential peregrine falcon nesting habitat was conducted during the fall of 1979 in the Organ Mountains and the Sacramento Mountains foothills on McGregor Range (U.S. Army, 1980a). No peregrine falcons were observed during this study although four prairie falcon and three golden eagle nest sites were found in the Organ Mountains and one prairie falcon nest site was found in the Sacramento Mountains foothills just north of the McGregor Range boundary (U.S. Army, 1980a). The peregrine falcon is occasionally observed on McGregor Range (U.S. Army, 1996g, 1997f, k) indicating that it is an occasional winter resident and migrant.

Northern Aplomado Falcon. The northern aplomado falcon is a federal and state endangered species that once inhabited the grasslands of southern Texas, New Mexico, and Arizona; historic records show that it was common until about 1940 (Hector, 1987). The reasons for this species' decline are unclear. Habitat loss and pesticide contamination likely contributed to this decline (Hector, 1987).

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Sporadic observations of the northern aplomado falcon have been reported since 1991 in areas near Fort Bliss and an unconfirmed sighting occurred on McGregor Range in May 1997 when an immature bird was observed in the desert shrubland-grassland habitat in the Tularosa Basin (USAF, 1997d). In 1992, breeding populations were discovered south of the border in grassland habitat in the State of Chihuahua, Mexico (Montoya et al., 1997). Given the recent sighting of this species near Fort Bliss and the existence of potential grassland habitat on Otero Mesa, surveys for this species were conducted in 1994 and 1996 on Fort Bliss (U.S. Army, 1994b, 1997k). In 1994, 495 miles of survey routes were traversed over 23 days from February 2 through April 21. No northern aplomado falcons were observed, although 13 other species of raptors were noted and the location of 30 nest structures were mapped (U.S. Army, 1994b).

In 1996, the northern aplomado falcon survey was expanded to include habitat evaluation and avian prey-base studies on Fort Bliss (U.S. Army, 1997k). Results of this study were compared to similar habitat and prey-base assessments conducted at occupied aplomado falcon territories in Chihuahua, Mexico (Montoya et al., 1997). No northern aplomado falcons were observed during these surveys (U.S. Army, 1997k). Habitat and prey-base study results for Fort Bliss showed some similarities and differences when compared to equivalent studies in Chihuahua, Mexico. Based on this analysis, it appears that the number of woody species and potential nest sites would be adequate to support northern aplomado falcons on Otero Mesa (U.S. Army, 1997k). The comparison of vegetation and prey-base data from Otero Mesa and occupied territories in Mexico showed that the percent grass cover and biomass of potential prey species were much less on Otero Mesa (U.S. Army, 1997k; Montoya et al., 1997). Precipitation patterns and soil type may contribute to the observed differences between Otero Mesa and Mexico. Some believe that livestock grazing has had a greater impact on the grasslands on Otero Mesa than in Mexico. These preliminary results indicate that the grassland habitat on Otero Mesa may have a reduced capacity to support northern aplomado falcons compared to occupied territories in Mexico and that the principal reason for this may be livestock grazing. However, further study is necessary before a more definitive determination of northern aplomado falcon habitat and food requirements can be made (U. S. Army 1997k). The Army, along with the BLM and WSMR, will conduct further studies of the potential aplomado falcon habitat on Otero Mesa. Ongoing studies include a 5-year study initiated by the BLM, WSMR, and New Mexico State University. In addition, the USAF is sponsoring a 10-year effort for the monitoring of aplomado falcon habitat on Otero Mesa.

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Bald Eagle. The bald eagle is a federal and state threatened species that winters in southern New Mexico including a small population (5 to 30 individuals) in the Sacramento Mountains; one of the known roost sites is about 4 miles from the northern border of McGregor Range (U.S. Army, 1995d). Surveys for wintering bald eagles in the Sacramento Mountains foothills on McGregor Range were conducted during the winters of 1994 to 1995 and 1995 to 1996, and bald eagles were observed 28 and 16 times respectively (U.S. Army, 1995d, 1996i). During both winters, most bald eagles were observed at the extreme northern boundary of McGregor Range where high ridges and hills provide favorable perch sites and updrafts. Vegetation in this area is mainly grassland with varying amounts of shrubs (mountain mahogany and oak) and two trees (pinyon pine and juniper) providing favorable foraging conditions (U.S. Army, 1995d). Only one bald eagle was observed over the grasslands of Otero Mesa. There were no observations of eagles feeding or hunting. Food sources on Fort Bliss may include deer carrion and rabbits.

Mexican Spotted Owl. The Mexican spotted owl is a federal threatened species and its range includes southern New Mexico where it occurs in suitable habitat in isolated mountain ranges (U.S. Army, 1996j). The Sacramento Mountains contain a breeding population of Mexican spotted owls and the closest known breeding pair is 10 miles from the McGregor Range boundary (U.S. Army, 1996j). This species was observed on McGregor Range during the winter of 1989 to 1990 and surveys for this species were conducted in the Sacramento Mountains foothills on McGregor Range from December 12, 1995, to February 21, 1996. No spotted owls were heard or observed during these surveys (U.S. Army, 1996j). No mixed conifer habitat and only a few isolated ponderosa pine occur in the Sacramento Mountains foothills on McGregor Range. Based on the habitat in the foothills on Fort Bliss and the ecology of the spotted owl, it seems likely that the southern Sacramento Mountains foothills on McGregor Range are only used by spotted owls on an occasional basis during the winter or dispersal (U.S. Army, 1996j).

Black Tern, White-faced Ibis, and Northern Goshawk. Of the eight federal candidate or species of special concern, the black tern, white-faced ibis, and northern goshawk occur only sporadically on McGregor Range, and appropriate nesting habitat is lacking. The remaining species (mountain plover, ferruginous hawk, western burrowing owl, loggerhead shrike, and Baird's sparrow) occur as nesting or wintering species or potential nesting habitat is present.

Mountain Plover. The mountain plover is a proposed threatened species and has declined by 63 percent since 1966 (Knopf, 1994) and is considered an associate of the short grass prairie dominated by blue grama and buffalo grass (*Buchloe dactyloides*) (Knopf and Miller, 1994). Various observers have noted that the mountain plover nests and forages in areas of disturbed ground such as occur at prairie-dog towns and areas heavily grazed by livestock (Knopf and Miller, 1994; Miller and Knopf, 1993; Sager, 1996).

In a recent statewide survey, the mountain plover was observed at 35 sites in 11 counties during the breeding season in New Mexico. This species was observed in a variety of habitats, but bare ground was a common feature at all the sites and livestock grazing had created most of the bare ground (Sager, 1996). The mountain plover has not been observed on Fort Bliss; based on its habitat requirements, Otero Mesa on McGregor Range provides the best potential habitat for this species especially in the denuded areas around stock tanks and troughs. The mountain plover was not recorded during field surveys for this species in a 5,000-acre proposed tactical target complex site in the grassland habitat on Otero Mesa and in grassland habitat in a second proposed tactical target complex site in the Tularosa Basin (USAF, 1997h, i). This species was also not recorded during surveys of other potential habitat in a 13,000-acre section of Otero Mesa such as along roads at heavily grazed stock tanks or prairie-dog (*Cynomys ludovicianus arizonensis*) towns (USAF, 1997h, i; U.S. Army, 1998k).

Ferruginous Hawk. The ferruginous hawk is a federal species of concern and it breeds from the Canadian provinces south to Arizona and Oklahoma and nests on trees, bushes, large rocks, and hillsides. It is a

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grassland species and typically feeds on prairie dogs and ground squirrels (Finch, 1992). Observations on McGregor Range confirm this because all but one ferruginous hawk observed during wintering bald eagle surveys were associated with the grassland habitat of Otero Mesa (U.S. Army, 1995d, 1996i). The ferruginous hawk has been observed on McGregor Range during the fall, winter, and spring including three observations at prairie-dog towns on Otero Mesa in March 1996 (U. S. Army, 1996i) and 21 observations during the winter of 1994 to 1995 and two observations during the winter of 1995 to 1996 (U.S. Army, 1995d, 1996i). Surveys during February and April 1997 resulted in seven observations of the ferruginous hawk in February and zero observations in April (U.S. Army, 1998i). These observations indicate that the ferruginous winters at and migrates through Fort Bliss. This species is not known to nest on Fort Bliss and was not observed during intensive breeding bird surveys during 1996 and 1997 (U.S. Army, 1996g, 1997f) or during the April 1997 ferruginous hawk surveys (U. S. Army 1998k).

Western Burrowing Owl. The western burrowing owl is a federal species of concern and it nests in desert grasslands on Otero Mesa and in desert shrublands in the Tularosa Basin. It was observed at 20 of the active and inactive prairie-dog towns observed on Otero Mesa in 1996 (U.S. Army, 1996l). Field studies in 1997 showed that there were 18 to 22 pairs at 11 of 16 prairie-dog towns inspected on Otero Mesa on McGregor Range (U.S. Army, 1997l). All military facilities on McGregor Range were inspected in 1997, and 11 pairs of burrowing owls were observed nesting in concrete conduit boxes at radar tracking sites just east of McGregor Range Camp (U.S. Army, 1997l). Elsewhere in the Tularosa Basin, burrowing owls may occur occasionally in mesquite dunes habitat and along eroded arroyos. The extent of use of these habitat types in the desert shrublands habitat in the Tularosa Basin has not been determined (U.S. Army, 1997l). In 1997, one burrowing owl was repeatedly observed along a road in the Tularosa Basin between Shorad and Mack Tanks; it was living in some kangaroo rat holes (USAF, 1997h).

Loggerhead Shrike. The loggerhead shrike is a federal species of concern and its presence on McGregor Range consists of wintering and resident birds. This species is fairly common in the desert habitat on McGregor Range during the breeding season; 53 were recorded from 12 breeding bird sampling locations in the grasslands on Otero Mesa and 50 from 24 sampling locations in four desert shrubland habitats in the Tularosa Basin (U.S. Army, 1996h). The loggerhead shrike has also been recorded during breeding bird surveys in 1993 and 1994 in arroyo-riparian and upland habitats (Kozma, 1995). These results indicate that the loggerhead shrike is fairly common on Fort Bliss although there is no historic data to determine long-term trends. The long-term trend for the period 1968 through 1996 for the breeding bird survey in New Mexico shows a decline throughout the period similar to that observed on a national scale (Sauer et al., 1997).

Baird's Sparrow. Baird's sparrow is a federal species of concern and a state threatened species. It was once one of the most abundant nesting species in the northern prairie states and Canada and has declined in abundance by about 90 percent with cultivation and conversion of much of its mixed-grass prairie nesting habitat (DeSmet and Conrad, 1989). This species winters and migrates through New Mexico and the declines on the nesting grounds are evident in New Mexico. It was once relatively numerous and wide-spread in New Mexico but in recent years is very rarely reported (NMDGF, 1996). Baird's sparrow was observed on McGregor Range during migration and is believed to winter on the post (Smartt, 1980; U.S. Army, 1997m). Surveys for this species were conducted at 28 sites on McGregor Range from late February to early April 1997 and it was observed 27 times. Preferred habitat on McGregor Range were swales on Otero Mesa with dense tall growth of tobosagrass along with black and blue grama grassland and low shrub density. Baird's sparrows were not observed along swales that had been heavily grazed or had dense growth of tall grass such as dropseed (*Sporobolus* sp.) (U.S. Army, 1997m).

Costa's Hummingbird, Varied Bunting, Bell's Vireo, and Gray Vireo. The Costa's hummingbird, varied bunting, bell's vireo, and gray vireo are state threatened species that occur or have the potential to occur on McGregor Range. The varied bunting and Bell's vireo have been observed as occasional migrants

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through McGregor Range and it is unlikely that these species nest on McGregor Range due to the lack of appropriate habitat. The gray vireo was recorded from McGregor Range in 1980 (Smartt, 1980) and potential breeding habitat exists in the Sacramento Mountains foothills. However, intensive breeding bird surveys in the pinyon pine-juniper habitat in the Sacramento Mountains foothills in 1996 and 1997 have failed to detect this species (U. S Army 1996i, 1997f). Surveys for the gray vireo took place in the pinyon-juniper and montane shrublands habitat in the Sacramento Mountains foothills on McGregor Range in June 1998 and no confirmed sightings took place (U.S. Army, 1998l).

#### 3.8.4.5 Mammals

Bats. Seventeen species of bats may occur on McGregor Range and nine are federal species of concern, including the small-footed myotis, occult little brown bat, fringed myotis, cave myotis, long-legged myotis, Yuma myotis bat, spotted bat, pale Townsend's bat, and big free-tailed bat. In addition, the spotted bat is a state threatened species. There have been few surveys for bats on Fort Bliss so the status of these species of special concern is not known. Two maternity colonies of several hundred fringed myotis were observed in abandoned buildings in the Sacramento Mountains foothills in 1979 by Smartt (1980); follow-up surveys in 1998 indicated that a *Myotis* sp. maternity colony (likely fringed myotis) still inhabited one of these abandoned buildings (U.S. Army, 1998j). Surveys for bats along the Otero Mesa took place during the late spring and summer of 1997 and 1998 (see Section 3.8.3). No large roost sites were observed along the Otero Mesa escarpment and sensitive species that can be heard such as the spotted bat were not recorded. *Myotis* sp. were recorded and could have represented sensitive species but species determinations were not made (USAF, 1997e, f; U.S. Army, 1998j).

Gray-footed Chipmunk. The gray-footed chipmunk is a federal species of concern and a state threatened species that occurs in the woodland and forested habitats in the Sacramento Mountains foothills on McGregor Range. It has also been collected from the Otero Mesa and may be a resident of the canyons in the Otero Mesa escarpment (U.S. Army, 1997j).

Black-tailed Prairie Dog. The black-tailed prairie dog is a federal species of concern and occurs in the grassland habitat on Otero Mesa on McGregor Range. A total of 10 active and 12 inactive prairie-dog towns were observed on Otero Mesa in 1996. Prairie-dog density was low (less than 4 per acre); there was an estimated 399 black-tailed prairie dogs in 10 towns (U. S. Army 1996k). In 1997, black-tailed prairie-dog surveys were conducted on Otero Mesa and 16 towns were observed; 12 were active. The number of prairie dogs recorded in 1997 was 482, which is a 17 percent increase over 1996. However, prairie-dog densities on Otero Mesa are an order of magnitude less than densities reported elsewhere. The reasons for the low populations on the Otero Mesa are not clear (U.S. Army, 1998k). Sensitive species observed at the prairie-dog towns on Otero Mesa were the burrowing owl and ferruginous hawk.

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