

**APPENDIX B**

**ECOLOGICAL SURVEY AND HABITAT CHARACTERIZATION**

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## APPENDIX B

### ECOLOGICAL SURVEY AND HABITAT CHARACTERIZATION

#### ***B.1.0 Introduction***

This report presents generic ecological characterization of sites and parcels associated with Main Post, Pelham Range, and Choccolocco Corridor, Ft. McClellan (FTMC), Calhoun County, Alabama. This information is used primarily as the basis for habitat delineation at FTMC for use in the assessment of potential risk to ecological receptors from exposure to stressors (i.e., chemical contaminants) within environmental media associated with the sites or parcels at FTMC. This report also serves to summarize and reference the large body of available information regarding the ecological characterization of FTMC. This information was obtained from a number of sources, including:

- Previous studies published in existing historical documents;
- Historical data and information gathered by interview process; and
- Direct field observation recorded during ecological site reconnaissance visits of Main Post, Pelham Range, and Choccolocco Corridor performed during 2-6 March 1998 and 27-31 July 1998.

#### ***B.1.1 Site History***

Fort McClellan is presently under the jurisdiction of the U.S. Army Training and Doctrine Command (TRADOC). The installation houses three major organizations, including the U.S. Army Military Police School (AMPS), U.S. Army Chemical School (AMCLS), and Training Center (under the direction of the Training Brigade), in addition to other support units and tenants (Integrated Natural Resources Management Plan [INRMP], 1998).

The Federal Government purchased 18,946 acres of land near Anniston in 1917 for use as an artillery range. With the outbreak of World War I, the property (Camp McClellan) was used to train troops for participation in the War and served in that capacity until the armistice. It was then designated as a demobilization center until 1919 when Camp McClellan served as a training area for active Army units and other civilian elements. Camp McClellan was redesignated as FTMC in 1929 and continued to serve as a training area (INRMP, 1998).

1 The Federal Government acquired an additional 22,245 acres (Pelham Range) west of Fort  
2 McClellan in 1940. In 1941, the Alabama Legislature leased approximately 4,488 acres to the  
3 Federal Government to provide an access corridor from the Main Post to Talladega National  
4 Forest. This corridor provided access to additional woodlands for training and maneuvers.  
5 Between 1945 and 1946, FTMC served as a personnel separation point. After a 3-month closing  
6 period, it was activated as a Recruit Training Center until May 1947 when it ceased operation  
7 and was placed in an inactive status until 1951 (INRMP, 1998).

8  
9 The U.S. Army reactivated FTMC in January 1951 for operation of the Chemical Corps School  
10 and as a replacement center for the Chemical Corps. The Chemical Corps School offered  
11 advance training in all phases of chemical, biological, and radiological warfare to students from  
12 all branches of the military service until the school was deactivated in 1973. The Army Combat  
13 Development Command Chemical/Biological Radiological Agency moved to FTMC in 1962 and  
14 performed its mission until is also was deactivated in 1973 (INRMP, 1998).

15  
16 The mission of the installation was changed in 1966 and FTMC was renamed the U.S. Army  
17 School/Training Center and FTMC. The 3rd Army non-Commissioned Officers Academy also  
18 was stationed at FTMC from 1967 to 1972. Ongoing activities can be divided into support  
19 activities, academic training, and practical training. Support activities include housing, feeding,  
20 and moving individuals during training. Academic training includes classroom, laboratory, and  
21 field instruction. Practical training encompasses weapons, artillery and explosives, vehicle  
22 operation and maintenance, and physical and tactical training activities (INRMP, 1998).

## 23 24 ***B.2.0 Review of Existing Documentation and Data***

25 This section cites, describes, and briefly summarizes the sources of information used to develop  
26 this report. In addition, information used to develop this ecological survey may have been  
27 obtained by either personal interview or from direct observation during site reconnaissance visits  
28 performed on 2-6 March 1998 and 27-31 July 1998.

## 29 30 ***B.2.1 Literature Review***

31 The history of environmental investigations at FTMC indicate that most of studies have focused  
32 on delineating the nature and extent of potential contamination within very specific areas at  
33 FTMC with the direct or indirect goal of mitigating the contaminant source. Studies of

1 ecological components of FTMC may or may not have been included in these environmental  
2 investigations. An entirely separate literature base, however, exists that focuses on ecological  
3 issues related to FTMC. The objective of several of these ecological studies is primarily  
4 surveying, identifying, and inventorying ecological and biological resources within the  
5 boundaries of FTMC. Other studies have evaluated ecological effects caused by releases of  
6 specific chemicals on site.

7  
8 All pertinent sources used in preparing this report are listed in Table B-1. If a primary source  
9 document was not obtained, the citation of the primary document is followed by the citation of  
10 the secondary source document in which it was referenced. Many valuable ecological surveys  
11 have been completed within the last five years. These provide an excellent survey of the current  
12 ecological inventory at FTMC.

### 14 ***B.2.2 Ecological Site Reconnaissance***

15 The ecological site reconnaissance is a critical component of ecological assessments at FTMC.  
16 The specific goals of the ecological site reconnaissance are:

- 18 • To develop familiarity with sites and landscape at FTMC;
- 19 • To generally confirm or refute the results of previous ecological site surveys (but  
20 not to perform confirmatory biological/ecological surveying tasks); and
- 21 • To locate, identify, and document ecological features within FTMC.

22  
23 Field observations at FTMC were recorded during two separate ecological site reconnaissance  
24 visits performed by two field biologists, one during the week of 2-6 March 1998 and another  
25 during the week of 27-31 July 1998. The first reconnaissance resulted in the observation of  
26 approximately 45 individual sites, primarily within Main Post, and to a lesser extent, within  
27 Pelham Range. At each site, the physical/environmental condition was documented photographi-  
28 cally using a Minolta X-370, 35-mm camera containing conventional 35-mm color film (either  
29 200 or 400 exposure speed). A total of 145 photographs were exposed during the site visit  
30 (Attachment B-1), and a brief descriptive caption associated with each photograph was written  
31 based on the information recorded for each photograph in the Photo Log Sheets (Attachment B-  
32 2). Along with photo-documenting each site, observations and other pertinent information  
33 relevant to the site photographed was recorded in the Field Activity Daily Log (FADL) sheets  
34 (Attachment B-3).

**Table B-1**

**Summary of Previous Investigations Related to Ecology at Fort McClellan  
Fort McClellan, Calhoun County, Alabama  
(Page 1 of 3)**

<b>Document</b>	<b>Date</b>	<b>Author(s)</b>	<b>Affiliation</b>	<b>Summary</b>
A study of the Endangered and Threatened Plants and Animals on Fort McClellan Military Installation and Pelham Range, Calhoun County, Alabama	1979	Mattee & Haynes	Geological Survey of Alabama	Biological inventories of fish and vascular plants. No federally listed endangered or threatened species were identified.
Fort McClellan, Alabama Forest Type Map and Stand Descriptions	1984		Resource Management Service, Inc.	An inventory and mapping of forest areas on Fort McClellan
Guide to the Wetland Communities of Fort McClellan, Alabama	1984	Gaddy	US Fish and Wildlife Service	Summary of the wetland communities of Fort McClellan containing a draft National Wetland Inventory map for Pelham range
Results of Red-cockaded Woodpecker Survey on Fort McClellan, Alabama (Unpublished)	1992	Summerour	Jacksonville State University	This survey was intended to determine if the red cockaded woodpecker was present in the pine dominated forests on Fort McClellan. Although suitable habitat was present, no red cockaded woodpeckers were located.
Preliminary Wetland Survey, Fort McClellan and Pelham Range, Anniston, Alabama	Sep-92	USACE	US Army Corps of Engineers	Formal identification and delineation of wetland areas. This study mapped and summarized wetland attributes, sensitivity to impacts and management potential.
Natural Areas Management Plan for Ft. McClellan, Alabama	1993	Law	Law Environmental	This study reviews the significant or highly impacted lands that contain unique or unusual biological values. Management goals, preliminary plans and cost estimates are included.
Effects of Habitat Fragmentation on Avian Neotropical Migrants at Fort McClellan, Alabama (Unpublished)	1995	Webb	Net Work Associates	Surveys were conducted of the breeding bird populations within the forested sections of Main Post.
Natural Heritage Inventory of Fort McClellan, Main Post: Federal Endangered, Threatened, Candidate Species and State Listed Species	Sep-94	Alabama Dept. of Conservation of Natural Resources (ADCNR)	Alabama Natural Heritage Program	A biological inventory of the Main Post identified 13 SINAs that contain 5 candidate species. No federally endangered or threatened species were identified

**Table B-1**

**Summary of Previous Investigations Related to Ecology at Fort McClellan  
Fort McClellan, Calhoun County, Alabama  
(Page 2 of 3)**

<b>Document</b>	<b>Date</b>	<b>Author(s)</b>	<b>Affiliation</b>	<b>Summary</b>
Natural Heritage Inventory of Fort McClellan, Pelham Range: Federal Endangered, Threatened, Candidate Species and State Listed Species	Sep-94	Alabama Dept. of Conservation of Natural Resources (ADCNR)	Alabama Natural Heritage Program	A biological inventory of Pelham Range identified 6 SINAs that contain 1 endangered plant, 1 threatened plant, and 2 candidate species.
Endangered Species Management Plan for Fort McClellan, Alabama	Jan-96	Garland, B.W.	Directorate of Environment	Conservation goals, actions needed and estimated costs of the conservation actions to manage the 16 SINAs and the endangered, threatened, candidate species located there.
Vascular Plants of Fort McClellan, Calhoun County, Alabama	Jun-96	Whetstone et al.	Whetstone Consulting Inc.	This study summarizes seasonal field surveys to document occurrences of environmentally sensitive species and characterizes distribution of native plants relative to community structure.
Environmental Baseline Survey	1998	ESE	Environmental Science and Engineering Inc.	
Ecological Risk Assessment: Effect of Fog Oil Obscurant on Selected Amphibians, Reptiles, and Birds at Fort Leonard Wood, Missouri	Jul-96	3DII	3D/International Inc. Harland Bartholomew and Associates, Inc.	
Environmental Fate of Fog Oil at Ft. McClellan, Alabama	Aug-96	3DII	3D/International Inc. Harland Bartholomew and Associates, Inc.	
Site Investigation Work Plan, Ft. McClellan, Alabama (Draft)	May-97	ESE	Environmental Science and Engineering Inc.	
Biologic Assessment: Disposal and Reuse of Ft. McClellan, AL (Draft)	Sep-97	3DII	3D/International Inc. Harland Bartholomew and Associates, Inc.	

Table B-1

Summary of Previous Investigations Related to Ecology at Fort McClellan  
 Fort McClellan, Calhoun County, Alabama  
 (Page 3 of 3)

Document	Date	Author(s)	Affiliation	Summary
Feasibility Study Report Ft. McClellan, Alabama RI/FS	Oct-95	SAIC	Scientific Applications International Corporation	
Ft. McClellan Comprehensive Reuse Plan (Implementation Strategy)	Nov-97	EDAW	EDAW, Inc.	
Integrated National Resources Management Plan 1998-2002 (Draft)	Jan-98	Reisz Engineering Gene Stout and Associates	Directorate of Environment	
Botanic Study of Upland Seeps on Ft. McClellan, Alabama with special attention to <i>Platanthera integrilabia</i> (Orchidaceae)	1997	Whetstone et al.	Whetstone Consulting Inc.	
Amphibians and reptiles of Ft. McClellan, Calhoun County, Alabama	Aug-97	Cline and Adams	Jacksonville State University	
Survey of the Appalachian Cottontail ( <i>Sylvilagus obscurus</i> ) on Main Post, Ft. McClellan	Dec-96	Webb	Net Work Associates	
Longleaf Pine Restoration Plan for Ft. McClellan, Alabama (Final Report)	Aug-97	Maceina, Meldahl, and Kush	Auburn University	
Freshwater Mollusk Survey Ft. McClellan, Alabama (Final Report)	Jul-97	C2ES	C <sup>2</sup> Environmental Services, Inc.	

1  
2 A second site reconnaissance was intended primarily to visit and observe areas of FTMC that  
3 were missed during the first visit, and to a lesser extent to compare spring and summer  
4 conditions at selected sites. General areas not visited during the initial field reconnaissance  
5 included all of Choccolocco Corridor, regions within Pelham Range along the northern and  
6 southern boundaries, and higher elevation areas of Main Post. In addition, several specific sites  
7 or parcels were visited and observed during the second site visit in July 1998. Similar to the first  
8 visit, the physical and environmental condition of the site or area was documented photographi-  
9 cally, this time using a Hewlett-Packard PhotoSmart C20 digital camera with 1 megapixel  
10 resolution and a capacity for 40 exposures per memory card. Each set of daily exposures were  
11 transferred electronically to a laptop computer each evening using supplied photo-manipulation  
12 software. A total of 127 exposures were made during this four-day site visit (Attachment B-4),  
13 and a brief descriptive caption was written for each photograph based on site-specific informa-  
14 tion recorded in Photo Log Sheets (Attachment B-5). Observations and other pertinent informa-  
15 tion relevant to the site photographed were recorded in the FADL sheets (Attachment B-6).

16  
17 Each site visit represents only a single time-point-observation for each site, specific to the late  
18 winter/early spring and mid-summer seasonal cycles, respectively, for the eastern Alabama  
19 region. Performing two reconnaissances, however, provided risk assessors with a valuable  
20 opportunity to observe temporal variations in habitat conditions or species presence under  
21 different seasonal conditions. Temporal variation in habitat condition and species presence at  
22 each site can be a potential source of uncertainty when inferring (a) the existence of potential  
23 (unknown) ecological receptor species, and (b) potential (unknown) exposure pathways. Perfor-  
24 ming two separate reconnaissances provided a limited opportunity to address this source of  
25 uncertainty. Additional site reconnaissance visits would reduce further the uncertainty associated  
26 with temporal variation in habitat conditions. Additional visits would also improve the  
27 identification and characterization of assessment endpoints and valued ecological entities at  
28 FTMC. Additional visits to FTMC will include documentation methods similar to those  
29 described for previous site reconnaissance visits.

30

1 **B.3.0 Installation-wide Ecological Setting**

2  
3 **B.3.1 Site Description**

4 Fort McClellan is located in northeastern Alabama in Calhoun County, is approximately 65 miles  
5 east of Birmingham, Alabama, and is contiguous to the city of Anniston (Figure B-1). The  
6 Installation includes three tracts of government-owned land. The first area, designated as Main  
7 Post, consists of approximately 18,929 acres, which adjoins Anniston, Alabama, and stretches six  
8 miles to the northeast towards Jacksonville, Alabama, in the valley west of the Choccolocco  
9 Mountains. Approximately 12,000 acres of the Main Post are characterized by underdeveloped  
10 mountains (3D/International, Inc. [3DII], 1997).

11  
12 The second area, designated as the Choccolocco Corridor, consists of approximately 4,388 acres  
13 of land leased from the State of Alabama. This area is east of Main Post and connects FTMC  
14 with the Talladega National Forest. Associated with the Choccolocco Corridor is another  
15 approximately 100,000 acres of woodlands that are accessible for training in the event of national  
16 emergency or with the approval of the U.S. Forest Service (USFS). The Choccolocco Corridor  
17 lease to the Army will not be renewed, and ownership of the land will remain with the State of  
18 Alabama (3DII, 1997).

19  
20 The third tract is Pelham Range which consists of approximately 22,277 acres of land located  
21 approximately eight miles west of FTMC's Main Post cantonment area. Pelham Range, which  
22 adjoins Anniston Army Depot one-half mile west of US Highway 431, has been used for firing  
23 ranges, maneuvers, and field training. The entire Pelham Range will remain as Army property,  
24 but will be licensed from the U.S. Army Training and Doctrine Command to the Army National  
25 Guard (3DII, 1997).

26  
27 As expected for a region as large as FTMC, significant ecological and environmental resources  
28 are located within its boundaries. Vegetative resources such as pine and hardwood forest and  
29 threatened and endangered plant species have been identified within the Main Post and Pelham  
30 Range property. Important and valued wildlife species, such as the Grey bat (*Myotis grisescens*),  
31 the blue shiner (*Cyprinella caerulea*), and the Red-cockaded woodpecker (*Picoides borealis*),  
32 have been, or are currently, associated with FTMC habitat. These may be candidates for focused  
33 assessment and special protection measures. Similarly, watershed resources, such as the Cane

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 ENGR. CHCK. BY: A. MAYLA  
 INITIATOR: A. GONZALEZ DWG. NO.: ...77319res.041  
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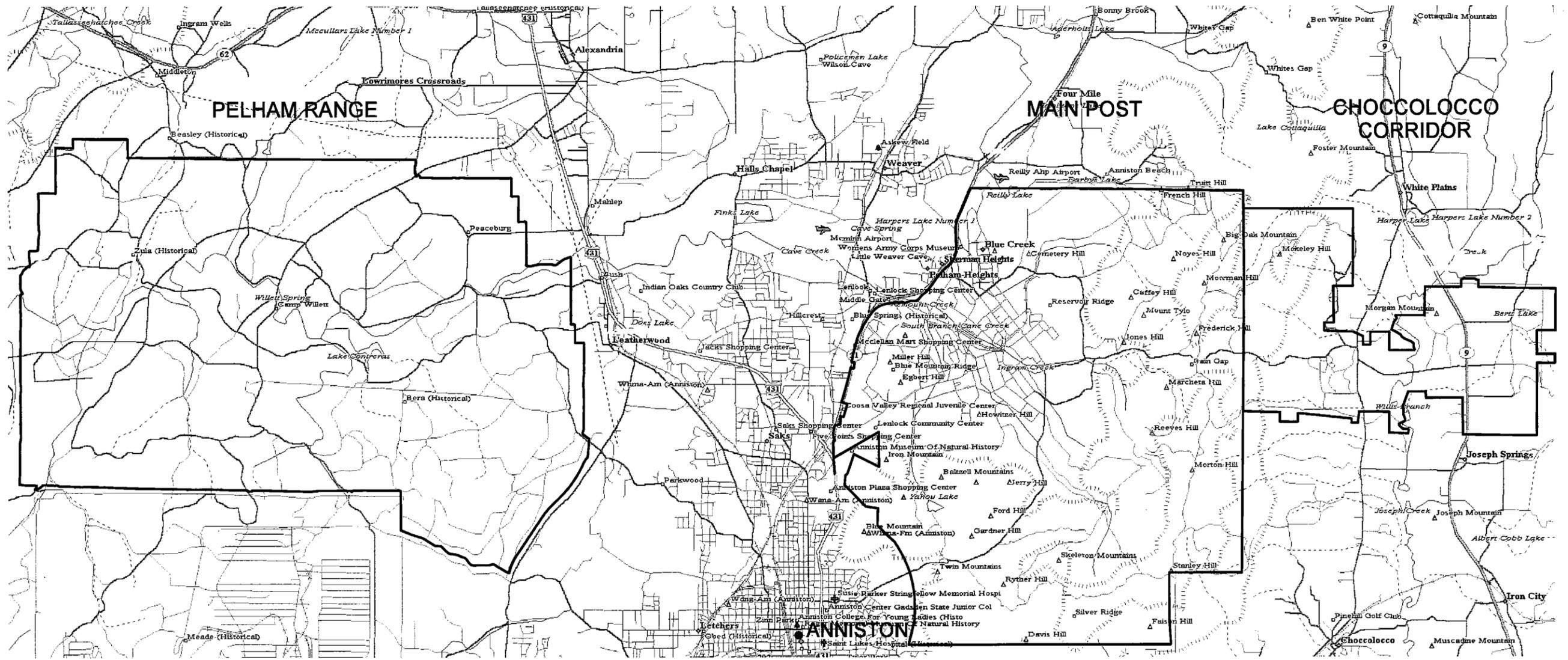
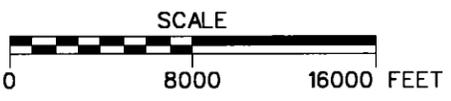


FIGURE B-1  
 FORT McCLELLAN  
 REGIONAL LOCATION MAP

U. S. ARMY CORPS OF ENGINEERS  
 MOBILE DISTRICT  
 FORT McCLELLAN  
 CALHOUN COUNTY, ALABAMA  
 Contract No. DACA21-96-D-0018



1 Creek/Cave Creek corridor that drains the majority of Main Post and Pelham Range, as well as  
2 Choccolocco Creek that passes through the Choccolocco Corridor, are important and valued  
3 environmental resources. Associated with these watershed resources are several valuable  
4 wetland communities located throughout Main Post and Pelham Range.

5  
6 Future land use at FTMC is the primary focus of environmental assessment and mitigation. The  
7 Installation is preparing a phased approach to disposal of land currently within the boundaries of  
8 FTMC (EDAW, Inc. [EDAW], 1997). To this end, environmental issues related to military land  
9 use must be addressed. A portion of the Cantonment Area of Main Post will remain primarily a  
10 developed and industrial sector. The sparse ecological resources located within this area of Main  
11 Post are not expected to be of significant value. Other areas of Main Post, Pelham Range, and  
12 the Choccolocco Corridor, however, are intended to be used for purposes such as wildlife  
13 refuges, nature trails, residential development, and open habitat. These areas will be assessed  
14 within this context.

### 16 ***B.3.2 Abiotic Characterization***

#### 18 ***B.3.2.1 Topography***

19 Fort McClellan lies almost entirely in the Valley and Ridge physiographic province of the  
20 Appalachian Highlands. A narrow strip along the eastern, boundary, locally known as the  
21 Talladega Mountains, lies in the Piedmont Upland Province.

22  
23 Main Post is characterized by a series of mountainous ridges on the south and east which are  
24 known as Choccolocco Mountain. Lateral ridges extend from the main range in a westerly  
25 direction. Elevations range from 700 to 2,063 feet above sea level. Eastern and southern parts of  
26 the installation, which comprise approximately one-half of the Main Post, are primarily steep  
27 slopes with thin, rocky soils. The remainder of Main Post is gently rolling and contains the  
28 cantonment area. In contrast, Pelham Range is characterized by moderately rolling hills with  
29 numerous valleys. Elevations vary from 480 feet to 945 feet above sea level. The Choccolocco  
30 Corridor is bordered by Choccolocco Mountain on the west and the Talladega Mountains on the  
31 east. The valley between these two mountain ranges consists of flat to gently rolling lands  
32 (Foster Wheeler Environmental Corporation, 1996 as cited in INRMP, 1998).

1 **B.3.2.2 Geology**

2 Geology in the investigated areas consists of variably weathered claystone and shale (with minor  
3 sandstone) on the Main Post and interlayered limestone, dolomite, and sandstone on Pelham  
4 Range. Soil derived from the weathered bedrock consists predominantly of clayey silt and silty  
5 clay with localized sand lenses. Ledges, seams, and boulders of moderately to slightly weathered  
6 bedrock were encountered at many of the investigated sites (SAIC, 1995).

7  
8 The Jacksonville fault is a major, but not regional, thrust fault within the fold and thrust belt of  
9 the Appalachian Highlands in Alabama. Changes in structural style of the fault along the strike  
10 suggest a complex history of deformation (INRMP, 1998). Considerable stratigraphic separation  
11 on the fault decreases toward Bynum, Alabama, where the fault dies out at Coldwater Mountain  
12 and the southwestern end of the Choccolocco Mountain. Mapping indicates that the Jacksonville  
13 fault bounds a large thrust slice within the more regional Pell City thrust sheet (INRMP, 1998).  
14 Stratigraphic and structural relationships at FTMC and Whites Gap windows suggest that the  
15 Jacksonville fault-Pell City fault splay is preserved at the windows and that subsequent folding  
16 of the splay may be related to the Anniston cross-strike structural discontinuity (Foster Wheeler  
17 Environmental Corporation, 1996 as cited in INRMP, 1998).

18  
19 The U.S. Geological Survey (USGS) has identified eight geologic types on Main Post (Tucker et  
20 al., 1995).

- 21
- |                      |                          |                            |
|----------------------|--------------------------|----------------------------|
| 22 • Chilhowee Group | 26 • Conasauga Formation | 29 • Newala and Little Oak |
| 23 • Shady Dolomite  | 27 • Knox Group          | 30 Limestones              |
| 24 • Rome Formation  | 28 • Athens Shale        | 31 • Quaternary Alluvium   |
- 25

32 Geotechnical properties (United Soil Classification System [USCS] classification, grain size,  
33 Atterberg limits, density, soil pH, cation exchange capacity, and laboratory permeability) of soils  
34 on the Main Post have been previously investigated by landfill siting studies east of Landfill 3  
35 and during earlier investigations of Landfills 3 and 4 (USAEHA ,1976, SAIC, 1993). The  
36 majority of the analyses indicate that the site soils consist of acidic, predominantly silt and clay  
37 with variable plasticity. The measured laboratory hydraulic conductivity ranges from between  
38  $2.2 \times 10^{-3}$  and  $7.15 \times 10^{-8}$  cm/sec.

39

1 **B.3.2.3 Hydrology (Surface Water Features)**

2 Fort McClellan's watershed is served by two major drainages, Cane Creek and Cave Creek.  
3 These two streams combine to create one of six major Calhoun County watersheds. Cane Creek  
4 bisects Main Post, flowing east to west between such facilities as the Directorate of Operations  
5 and Logistics and Directorate of Engineering and Housing, through the golf course, and even-  
6 tually through the entire length of Pelham Range (INRMP, 1998). Major tributaries to Cane  
7 Creek include Ingram Creek, the south branch of Cane Creek, and Remount Creek. Cave Creek  
8 drains the northern third of Main Post, flowing southwest to north from the ammunition storage  
9 bunkers (1400 Area), past the Reception Center and National Guard facilities, and exiting the  
10 post north of the Woman's Army Corps (WAC) Museum (INRMP, 1998).

11  
12 Dothard Creek, located in the northwestern corner of Main Post, is another primary stream. Its  
13 head waters are both on and off-post, serving the area around Reilly Lake. Another major  
14 watershed, Choccolocco Creek, occurs to the east of the Choccolocco Mountains, passing in a  
15 northerly to southerly direction through the Choccolocco Corridor. All of these stream systems  
16 originate in the Choccolocco Mountains on the eastern boundary of the installation and are fed  
17 by springs originating from underlying limestone strata (INRMP, 1998). The predominate  
18 drainage pattern on Pelham Range is to Cane Creek in the center of the range. Cane Creek then  
19 flows westerly, where it leaves the range on the western boundary, joining the Coosa River  
20 offpost.

21  
22 Fort McClellan contains over 23 acres of managed impoundments and numerous areas where  
23 beaver dams create temporary ponds. Managed impoundments are listed below (Pittman et al.,  
24 1991 as cited in INRMP, 1998).

25

<u>Impoundment</u>	<u>Location</u>	<u>Size</u>
Reilly Lake	Main Post	8.5 acres
Yahou Lake	Main Post	13.5 acres
Duck Pond	Main Post	0.45 acres
Willett Springs	Pelham Range	0.75 acres

<u>Impoundment</u>	<u>Location</u>	<u>Size</u>
Contreras Lake	Pelham Range	ca. 10 acres

1  
2 The Installation also contains numerous wetlands and associated ecological communities. These  
3 are discussed in Section B.3.3.2 of this report.  
4

5 **B.3.2.4 Geohydrology (Groundwater Features)**

6 Groundwater elevation measurements were obtained on a monthly basis between April 1994 and  
7 June 1995 by manual measurement in constructed wells at the Remedial Investigation (RI) sites.

8 The measured depth to groundwater ranged from 0.0 to 139.87 feet below ground surface (bgs)  
9 on the Main Post, and from 0.38 to 72.93 feet bgs on Pelham Range with average depths of 24.2  
10 and 34.1 feet, respectively. Because the residual soil comprising the aquifers beneath the site  
11 areas is predominantly silt and clay, groundwater at the sites occurs under confined conditions.

12 Artesian conditions were observed on the Main Post at a well location on former Landfill 1 (LF1-  
13 G02) and on Pelham Range at well location RL-G02 (Range L). Perched groundwater may  
14 occur along less weathered bedrock zones, including rock ledges and siliceous, boulder horizons  
15 (SAIC, 1995).  
16

17 Groundwater flow across the Main Post generally occurs in a northwesterly direction under an  
18 average hydraulic gradient of 0.02 ft/ft based on average groundwater elevation measurements  
19 from spatially clustered and widely spaced monitoring wells. Variability in the groundwater  
20 flow direction is likely to occur in localized areas of the Main Post dependent on local  
21 topography, proximity to surface water bodies, and subsurface geology and structure.

22 Groundwater flow on Pelham Range is known only in the vicinity of the RI sites with monitoring  
23 wells because of the large areal extent of Pelham Range and the sparsity of groundwater  
24 monitoring points. The measured groundwater elevations ranged between 667.1 and 1,043.2 feet  
25 above mean sea level (msl) on the Main Post and between 546.0 and 668.6 feet above msl at the  
26 RI sites on Pelham Range. Using measured and estimated aquifer parameters for the Main Post,  
27 groundwater flow velocity across the Post area is estimated to be approximately 0.026 ft/day  
28 (SAIC, 1995).  
29

1 Field hydraulic conductivity values were estimated by slug testing at 16 wells on the RI sites  
2 from the Main Post and Pelham Range. The hydraulic conductivity values ranged between  $1.05$   
3  $\times 10^{-5}$  and  $3.27 \times 10^{-4}$  cm/sec with an average error of less than  $\pm 10$  percent (SAIC, 1995).

4  
5 The installed monitoring wells generally produced less than 1 gallon per minute (gpm) to 6 gpm  
6 during well development; however, shallow well productivity was highly variable and typically  
7 produced less than 1 gpm. Groundwater pH ranged from 4.9 to 9.4 pH units on the Main Post  
8 and between 6.3 and 9.6 units on Pelham Range. The average groundwater pH on the Main Post  
9 (6.9) was nearly neutral, whereas the average pH on Pelham Range (8.1) was basic, consistent  
10 with the carbonate geology within Pelham Range. Conductivity of groundwater associated with  
11 Main Post ranged between 19 and 14,100  $\mu\text{mhos/cm}$  (mean: 1,037  $\mu\text{mhos/cm}$ ). Conductivity of  
12 groundwater associated with Pelham Range ranged between 22 and 409  $\mu\text{mhos/cm}$  (mean: 231  
13  $\mu\text{mhos/cm}$ ). The conductivity values measured on Pelham Range are consistent with regional  
14 averages. The average groundwater temperature in the FTMC area was 62.4 degrees Fahrenheit  
15 ( $^{\circ}\text{F}$ ) (16.9 degrees Celsius [ $^{\circ}\text{C}$ ]), which is consistent with previously reported regional average  
16 of 59.7 $^{\circ}\text{F}$  (15.4 $^{\circ}\text{C}$ ) (SAIC, 1995).

### 17 18 **B.3.2.5 Climate**

19 Fort McClellan has a temperate, humid climate characterized by hot, long summers and short,  
20 mild to moderately cold winters. The average annual temperature is 63  $^{\circ}\text{F}$ . Temperatures in the  
21 summer reach 90 $^{\circ}\text{F}$  or higher about 70 days per year; however, temperatures of 100 $^{\circ}\text{F}$  or higher  
22 are rare. Freezing temperatures are common but of short duration. The first frost usually occurs  
23 in late October which provides a growing season of 221 days. Snow is rare and averages one-  
24 half to one inch. The annual rainfall average is 53 inches and is fairly well distributed (INRMP,  
25 1998).

### 26 27 **B.3.2.6 Generic Land Usage (Current)**

28 Presently, roughly 80-85% of the Main Post is assumed to be forested (Alabama Department of  
29 Conservation of Natural Resources [ADCNR], 1994). This estimate is based on aerial photo-  
30 graphs made in March 1982 and provided to the Alabama Natural Heritage Program (ALNHP)  
31 by Fort McClellan natural resources management personnel. Since no major clearcuts have  
32 taken place since that time, and since ground observations made from 1990 through 1993 during  
33 the natural heritage survey/inventory appear to correspond with the 1982 aerial photographs, it is

1 assumed that the cover conditions within Main Post remain essentially unchanged. The forest is  
2 predominantly naturally occurring second-growth woodlands, but some is also the result of  
3 natural succession on former open areas such as old agricultural fields (ADCNR, 1994). The  
4 remainder of the Main Post is non-forested and comprises a mixture of paved and non-paved  
5 roads and parking areas, urbanized areas containing buildings for offices, training, storage and  
6 housing, open fields, manmade reservoirs, firebreaks, recreation areas and other disturbed areas  
7 (ADCNR, 1994).

8  
9 The approximately 15-20% that constitutes the developed (urbanized) and semi-developed  
10 portions of the Installation receives the greatest amount of human activity. Administration,  
11 operations, and training functions occur here. This area also supports virtually all supply,  
12 storage, public works, housing and recreation facilities and activities (ADCNR, 1994).

13  
14 Most of the activities on the greater portion of the Installation typically fall into either troop  
15 training or natural resource management and consumption. The former activity includes both on-  
16 site use of various training by Army and National Guard personnel at the various training areas  
17 and ranges, or else on some of the natural forested areas, as well as use of foothills of Chocco-  
18 loco Mountain as a backdrop for safe receipt of practice fire from rifles, artillery and other  
19 weaponry (ADCNR, 1994). Activities directly targeting natural resources include active timber  
20 and game management. Timber is actively harvested in a limited number of areas (i.e., in those  
21 areas not presently excluded from commercial timbering due to steep slopes and poor soils as  
22 identified by Pittman, et al. [1991 as cited in INRMP, 1998]), and hunting is permitted as well.  
23 Each of these latter activities is accessible to the public within certain limitations (ADCNR,  
24 1994).

25  
26 A third significant use of the forested part of Fort McClellan could be termed as a storage use.  
27 Sizable areas of the base contain unexploded dud ammunition, while smaller areas contain  
28 storage for toxic chemicals (ADCNR, 1994).

### 29 30 ***B.3.2.7 Generic Land Usage (Proposed - Future)***

31 Future land-use objectives will be considered in ecological assessments at FTMC. The ultimate  
32 disposition of land parcels will dictate the use of the land. This will impact directly what  
33 ecological value(s) will be associated with the land at that time. This, in turn, will impact the

1 assessment goals for each region or site; assessment methods and assumptions will be adjusted  
2 accordingly.

3  
4 Future land-use objectives are currently under development. Several draft documents record  
5 potential land-use objectives ranging from industrial, training facilities, residential, open land,  
6 wildlife refuge, and transportation infrastructure. These will be finalized as the project  
7 progresses and will be incorporated into the assessment of particular ecological sites or regions,  
8 as appropriate.

### 9 10 **B.3.3 Biotic Characterization**

#### 11 12 **B.3.3.1 Landscape Ecology (Large-scale Features)**

13 Forest and grassland habitats dominate the vegetative communities. Forests cover approximately  
14 14,000 acres on the Main Post and approximately 17,140 acres on Pelham Range. The most  
15 common tree species found on the installation are pine, oak, hickory, sweet gum, yellow poplar,  
16 maple, elm, and black walnut. Grasslands, both natural and manmade, cover approximately  
17 4,732 acres on the Main Post and 4,864 acres on Pelham Range. Manmade grasslands are used  
18 for a wide range of activities such as parade grounds, golf course, tank battle drill areas, and  
19 firing ranges (ESE, 1998). Vegetation type and quality is strongly influenced by the wide  
20 variation in elevation and soil type within the boundaries of Main Post, Choccolocco Corridor,  
21 and Pelham Range.

22  
23 The natural fauna present at any time on the installation depends on seasonal variations and the  
24 type of vegetation present. Approximately 35 species of mammals and 240 species of birds have  
25 been reported to be residing within the installation's habitat. The predominant mammals found  
26 are the white-tailed deer, cottontail and swamp rabbits, gray squirrel, raccoon, opossum, fox, and  
27 beaver (Roy F. Weston, 1990). The bird species population includes wood duck, quail, and  
28 turkey. As reported by Fort McClellan Directorate of Environment personnel, no endangered  
29 bird species are currently nesting within the Installation's habitat (Garland, 1996). The creeks,  
30 springs, and ponds located on the installation also support fish populations that include bluegill,  
31 crappie, bream, bass, catfish, and trout (ESE, 1998).

1 **B.3.3.2 Flora**

2 Calhoun County, of the Valley and Ridge Province, is within the Oak-Pine Forest Region. The  
3 region is transitional between the north central deciduous forest and the southern evergreen  
4 forest. The Oak-Pine Forest Region is characterized by the absence of virgin forest and by the  
5 abundance of oaks and hickories. Pines persist in areas less suitable for deciduous species.

6  
7 Loblolly pine is abundant, and longleaf pine is localized. Mountainous areas are forested with  
8 longleaf pine, chestnut oak, mountain oak, and chestnut and pignut hickory up to 1,800 feet in  
9 elevation. Typically, upland slopes and hills are covered by pines (loblolly, longleaf, shortleaf),  
10 oaks (southern red, post, black, blackjack), pignut hickory, and dogwood. In ravines, beech,  
11 tuliptree, white ash, maple, white oak, holly, and redbud are present. The lowland forest includes  
12 oaks (white, post, chestnut, black, red, and sugar maple, elm, holy, hornbean, river birch, yellow  
13 poplar, and a few pines (Pittman et al., 1991 as cited in INRMP, 1998).

14  
15 **Floral Inventory.** A floral inventory of Fort McClellan was completed in 1996 (Whetstone et  
16 al. 1996). The inventory focused on vascular flora and identified vegetation communities and  
17 sensitive species. Communities are described are as follows:

18  
19 **Rare, Threatened, Endangered, or Special Concern Flora.** Two federally-listed plant  
20 species are located on Pelham Range, Tennessee yellow-eyed-grass (endangered) and Mohr's  
21 Barbara's buttons (threatened). Other plant species of concern include Fraser's loosestrife and  
22 the white fringeless orchid, former C2 candidate species, and the southern rein orchid, a former  
23 C3 candidate species (INRMP, 1998). A comprehensive list of threatened, endangered, or  
24 special concern plant species associated with FTMC is presented in Table B-2.

25  
26 **Vegetation Communities.** Vegetation communities occur under three broad forest systems:

- 27  
28 • **Wetland Broadleaf:** Sweetgum Bottomland Forests, Hardwood Seep Forests, Hardwood  
29 Bottomland Forests;  
30  
31 • **Terrestrial Broadleaf:** Mixed Mesophytic Forests, Hardwood-Pine Terraces, Oak and  
32 Hickory Dominated Communities; and  
33  
34 • **Terrestrial Needleleaf:** Pine Dominated Communities and Mountain Longleaf Community  
35

Table B-2

**Rare, Threatened, and Endangered, or Special Concern Species Associated with FTMC<sup>a</sup>  
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 3)

Common Name	Scientific Name	Location <sup>b</sup>	Listing or Ranking <sup>c</sup>		
			Federal	State	Global
<b>VEGETATION</b>					
sky blue	<i>Aster azureus</i>			S1	G5
three-flowered hawthorn	<i>Crataegus triflora</i>			S2	G2
pine lady's-slipper	<i>Cypridium acaule</i>		Thr	S3	G5
pale coneflower	<i>Echinacea pallida</i>		Thr	S2	G4,G5
eastern purple coneflower	<i>Echinacea purpurea</i>		SpC	S2	G4,G5
horsetail	<i>Equisetum arvense</i>			S2	G5
soapwort gentian	<i>Gentiana saponaria</i>		E	S3	G5
ground juniper	<i>Juniperus communis</i>			S1	G5
yellow honeysuckle	<i>Lonicera flava</i>		SpC	S3	G5
Frasher's loosestrife	<i>Lysimachia fraseri</i>		FmrC2; E	S1	G3
pinemap	<i>Monotropa hypopithys</i>			S2	G5
single flowered cancer-root	<i>Orobanche uniflora</i>			S2	G5
Mohr's Barbara's button	<i>Marchillia mohrii</i>		Thr	S3	G3
southern rein orchid	<i>Plantanthera flava</i>		FmrC3; E	S3	G4
white fringeless orchid	<i>Plantanthera integrilabia</i>		FmrC2	S1	G2
rose-pink	<i>Sabatia capitata</i>			S2	G2
Alabama skullcap	<i>Scutellaria alabamensis</i>			S2	
narrow-leafed trillium	<i>Trillium lancifolium</i>			S3	G3
Tennessee yellow-eyed-grass	<i>Xyris tennesseensis</i>		E	S1	G1
crow-poison	<i>Zigadenus leimanthoides</i>			S1	G4
<b>MAMMALS</b>					
Appalachian Cottontail	<i>Sylvilagus obscurus</i>	MP		C2	
Gray bat (Gray Myotis)	<i>Myotis grisescens</i>	MP?		E	

Table B-2

Rare, Threatened, and Endangered, or Special Concern Species Associated with FTMC<sup>a</sup>  
Fort McClellan, Calhoun County, Alabama

(Page 2 of 3)

Common Name	Scientific Name	Location <sup>b</sup>	Listing or Ranking <sup>c</sup>		
			Federal	State	Global
<b>FISHES</b>					
Coldwater Darter	<i>Etheostama ditrema</i>	PR	FmrC2		
blue shiner	<i>Cyprinella caerulea</i>	CC	Thr		
<b>MOLLUSKS</b>					
Coldwater Elimia	<i>Elimia gerhardti</i>	MP	SpC/C3		
<b>BIRDS</b>					
Red-cockaded woodpecker	<i>Picoides borealis</i>	UNK	E	S2	G2
<b>INSECTS</b>					
Diana butterfly	<i>Speyeria diana</i>	MP	C2	S3?	G3?
Caddisfly	<i>Cheumatopsyche harwoodi</i>	MP			
	<i>Heteroplectron americanum</i>	MP			
	<i>Hydroptila consimilis</i>	MP			
	<i>H. setigera</i>	MP			
	<i>H. talledage</i>	MP			
	<i>Ironoquia punctatissima</i>	MP			
	<i>Molanna blenda</i>	MP			
	<i>Ochrotrichia confusa</i>	PR			
	<i>Polycentropus carlsoni</i>	MP	C2		
	<i>Protophila maculata</i>	PR			
	<i>Psiloptreta frontalis</i>	MP			
	<i>Pycnopsyche gentilis</i>	MP			
	<i>P. lepida</i>	MP			
	<i>P. luculenta</i>	MP			
	<i>Rhyacophila glaberrima</i>	MP			
<i>R. nigrita</i>	MP				
<i>R. torva</i>	MP				

**Table B-2**

**Rare, Threatened, and Endangered, or Special Concern Species Associated with FTMC<sup>a</sup>  
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 3)

Common Name	Scientific Name	Location <sup>b</sup>	Listing or Ranking <sup>c</sup>		
			Federal	State	Global
	<i>Trienodes taenia</i>	MP			

<sup>a</sup> Sources:

- *Vascular Flora of Fort McClellan, Calhoun County, Alabama (Whetstone et al., 1996),*
- *Integrated Natural Resources Management Plan (INRMP, 1998);*
- *Natural Heritage Inventory of Fort McClellan, Main Post: Federal Endangered, Threatened, Candidate Species and State-listed Species (Alabama Department of Conservation of Natural Resources (ADCNR), 1994)*

<sup>b</sup> Location of Species on Fort McClellan: MP = Main Post; PR = Pelham Range; CC = Choccolocco Corridor; UNK = currently unknown, historically present.

<sup>c</sup> Listing or Ranking codes: C = Candidate species; S = State; G = Global; Thr = Threatened; E = Endangered; SpC = Special concern species. No code indicates listing status is not applicable or uncertain.

1  
2 **Forest Inventory.** A forest cover map of Main Post and Pelham Range was completed in 1984  
3 (Resource Management Service, Inc., 1984). Forest stands were typed and mapped on parcels as  
4 small as three acres. Non-timbered land was not included within the mapping program.

5 Although changes, such as expansion of the Small Arms Impact Area and range construction,  
6 have eliminated some stands, this map still provides a good overview of forest types on FTMC  
7 (INRMP, 1998). The forest survey results were summarized graphically in that report, and are  
8 reproduced in this report as Figure B-2 (Main Post and Choccolocco Corridor) and Figure B-3  
9 (Pelham Range).

10  
11 Pine, pine-hardwoods, and upland hardwoods predominate within Calhoun County. While these  
12 cover types constitute the majority of forests on Fort McClellan, a variety of other forest types  
13 can also be found on the Installation (Table B-3). Forest types on Fort McClellan are closely  
14 associated with successional stage, topography, and soils.

15  
16 Fort McClellan contains the finest remaining example of a naturally maintained, mountain  
17 longleaf pine ecosystem (Garland, 1997; Maceina et al., 1997; Garland, 1996) (Figure B-4). Any  
18 activities or land-use scenarios should include as one of its goals the preservation of this valuable  
19 forest community.

20  
21 **Wetlands.** Fort McClellan has an estimated 3,424 acres of delineated wetlands. Major wetland  
22 communities were originally characterized and mapped in 1984. However, regulatory criteria for  
23 identifying wetlands have significantly changed since this original study was performed. Thus,  
24 the USACE performed a supplementary mapping and evaluation study in 1992 to identify larger  
25 wetland complexes (INRMP, 1998). The following are recognized wetland communities located  
26 within FTMC (Foster Wheeler Environmental Corporation, 1996 as cited in INRMP, 1998):

27  
28 • **Bottomland Hardwoods**

29 Floodplain hardwood communities occurring on first and second floodplain levels  
30 and wetland transitional terraces (palustrine, forested-deciduous seasonally and  
31 temporarily flooded).  
32

**Table B-3**

**Forest-type Structure and Breakdown by Percent Acreage within  
Main Post, Pelham Range, and Choccolocco Corridor  
Fort McClellan, Calhoun County, Alabama**

<b>Forest Type</b>	<b>Location and Acreage (Percent of Total Area)</b>						
	<b>Main Post</b>		<b>Pelham Range</b>		<b>Choccolocco Corridor</b>	<b>Totals</b>	
Pine	2,402	(13%)	9,453	(51%)	?	11,495	(34%)
Pine-Hardwood	3,289	(21%)	2,100	(11%)	?	5,389	(16%)
Hardwood-Pine	706	(5%)	2,774	(15%)	?	3,480	(10%)
Hardwood	9,457	(61%)	2,172	(11%)	?	11,629	(34%)
Reproduction	35	(<1%)	2,207	(12%)	?	2,242	(6%)
<b>Total</b>	<b>15,259</b>	<b>(100%)</b>	<b>18,706</b>	<b>(100%)</b>	<b>?</b>	<b>34,235</b>	<b>(100%)</b>

Source: Integrated Natural Resources Management Plan (INRMP), 1998

# Fort McClellan Main Post

## Special Interest Natural Areas (SINA)

 Watershed Boundaries  
 Mountain Longleaf Pine  
(High and Medium  
Probability Areas)

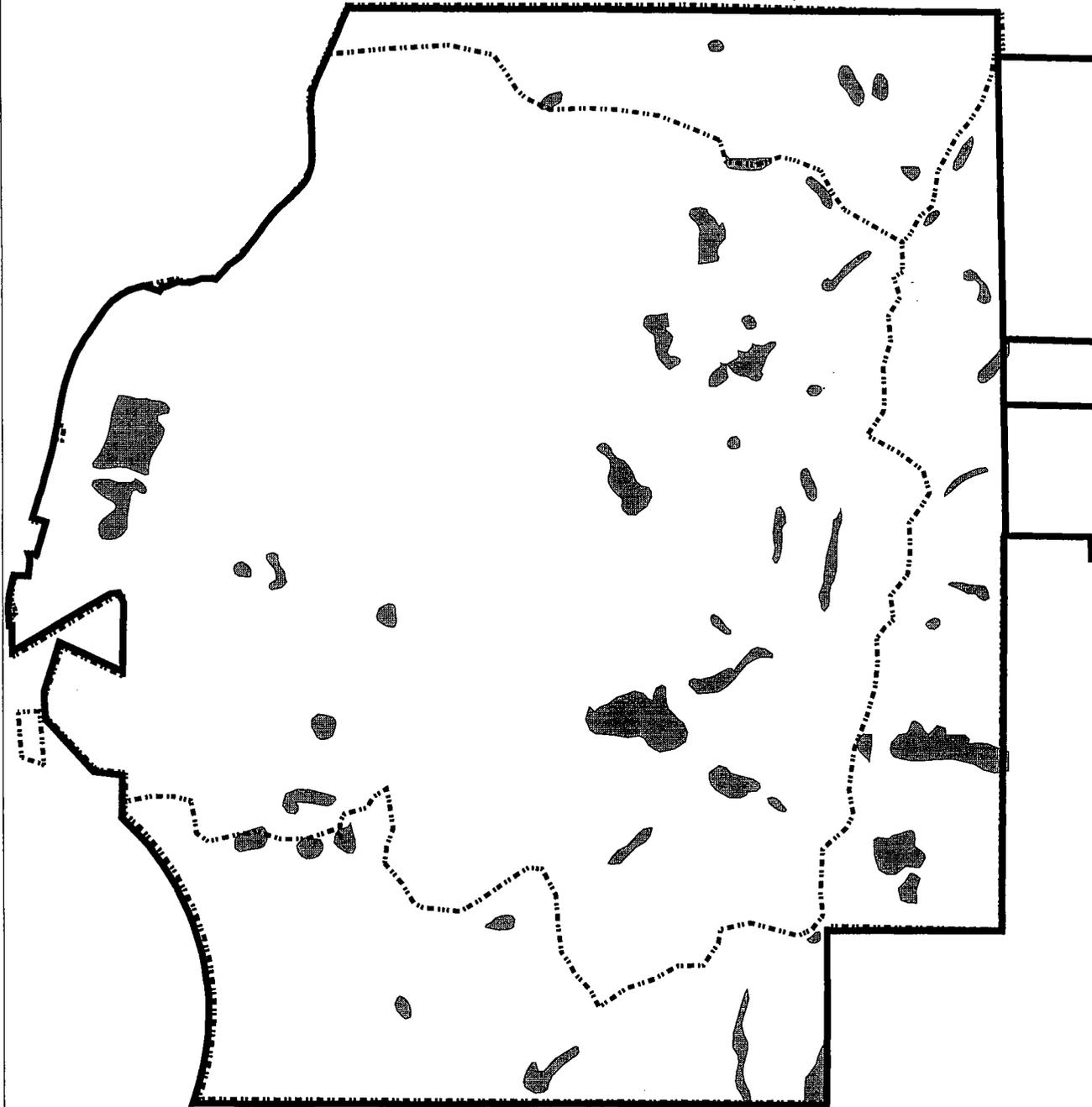


Figure B-4

Mountain Longleaf Pine Forest  
Stands within Mainpost

1           • **Depressions**

2           Hardwood depressions in upland communities (palustrine, forested-deciduous,  
3           temporarily flooded).

4  
5           • **Mixed Shrub Communities**

6           Shrub-dominated wetlands along stream flood plains, impoundment shorelines, and  
7           stream heads (palustrine, scrub/shrub-deciduous, temporarily and seasonally  
8           flooded).

9  
10          • **Shrub Depression**

11          Depressions in upland communities (palustrine, scrub/shrub-deciduous, temporarily  
12          and seasonally flooded).

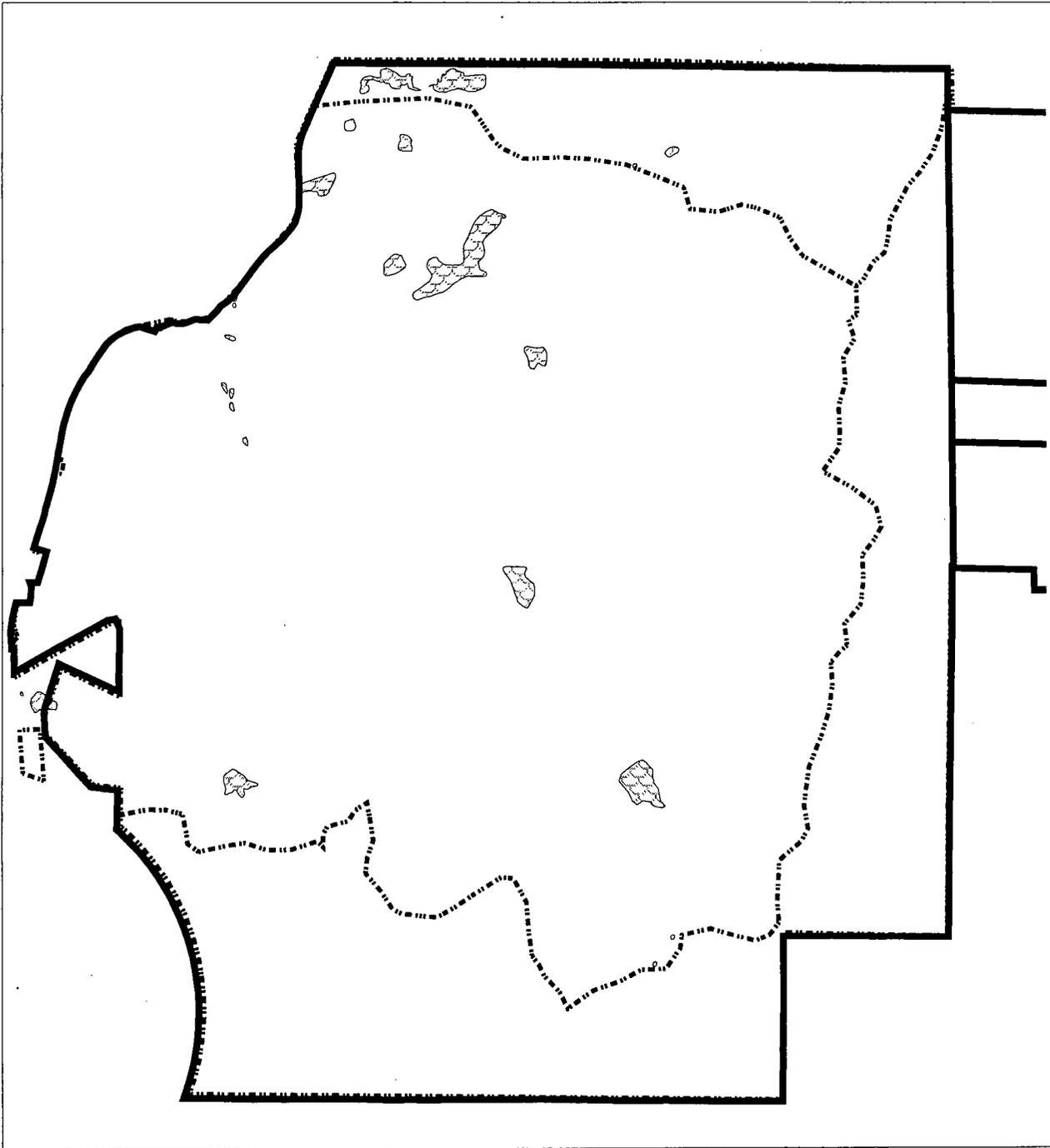
13  
14          • **Herbaceous Wetlands**

15          Herbaceous vegetation-dominated wetland communities along flood plains and in  
16          impoundments either man-made or created by beavers (palustrine, emergent  
17          persistent, temporarily and seasonally flooded.)  
18

19   The wetland habitats found within the Installation's boundaries are generally located in various  
20   topographical depressions, near stream seepages, and in valleys along creek flood plains (Roy F.  
21   Weston, 1990; SAIC, 1993). The indicator plant species that assist in defining a wetland include  
22   water oaks, sweet gum, bulrush, needlerush, and cattail. The Main Post, Pelham Range, and the  
23   Choccolocco Corridor have an abundance of wetlands representing important habitats for a wide  
24   variety of plants and animals. Wetland communities found on the Main Post (Figure B-5) are the  
25   Marcheta Hill Orchard Seep, Cane Creek Seep, South Branch Cane Creek, and 200 acres west of  
26   the airstrip that comprise the tributary to Victoria Creek (Garland, 1996). Pelham Range wetland  
27   communities occur along the banks of Cane Creek, Willett Spring, and Cabin Creek Spring.  
28   Additionally, wetland habitat potentially exists at or around the Installation's lakes, namely Lake  
29   Reilly, Lake Conteras, Lake Yahou, and Lake Willett, and along the nearly 10 miles of creeks,  
30   namely Cane and Cave Creeks (Roy F. Weston, 1990).

31  
32   **B.3.3.3 Fauna**

33   Fort McClellan ecosystems support a diversity of natural fauna. The Alabama Natural Heritage  
34   Program identified 12 ecosystem community types on Main Post and seven community types on  
35   Pelham Range.  
36



# Fort McClellan Main Post

## Special Interest Natural Areas (APEC)

 Watershed Boundaries  
 Wetlands

Figure B-5

Major Wetland Features  
within Mainpost



1 **Game Fish and Wildlife Species.** Species designated as game within the State of Alabama  
2 occur on FTMC (Table B-4). However, not all are actively managed as game as part of the  
3 FTMC-hunting or fishing program.

4  
5 **Nongame Birds and Mammals.** Thirty-five mammal species and 240 avian species have  
6 been identified on Fort McClellan. Species are listed in Attachment B-7.

7  
8 **Fish.** Lakes and streams of FTMC support numerous species of fish. Game species (Table B-4)  
9 include largemouth bass, bluegill, and catfish. Nongame fish species include the blacknose dace  
10 (*Rhinichthys atratulus*), creek chub (*Semotilus atromaculatus*), and stoneroller (*Campostoma*  
11 *anomalum*). A comprehensive list of confirmed species is provided in Attachment B-8.

12  
13 **Reptiles and Amphibians.** Fort McClellan supports a moderate diversity of amphibians. In  
14 addition, numerous species of reptile occur on the Installation. A list of reptiles and amphibians  
15 confirmed to be present on FTMC is provided in Attachment B-9.

16  
17 **Special Interest Natural Areas.** The Endangered Species Management Plan for FTMC  
18 identifies 16 Special Interest Natural Areas (SINAs) at FTMC (Garland, 1996). SINAs are  
19 locations where the habitat fosters one or more rare, threatened, or endangered species. Because  
20 these species are sensitive to environmental degradation, SINAs require management practices  
21 that promote the continued well being of these ecosystems (ESE, 1998) According to the ESMP,  
22 16 SINAs are located on the Main Post (MP) and Pelham Range (PR):

- 23  
24
- Mountain Longleaf Community Complex (MP)
  - Cane Creek Seep (MP)
  - Moorman Hill Mountain Juniper (MP)
  - Frederick Hill Aster Site (MP)
  - Bains Gap Seep (MP)
  - Marcheta Hill Crow Poison Seep (MP)
  - Marcheta Hill Orchid Seep (MP)
  - South Branch Cane Seep (MP)
  - Stanley Hill Chestnut Oak Forest (MP)
  - Reynolds Hill Turkey Oak (MP)
  - Davis Hill Honeysuckle (MP)
  - Willett Springs (PR)
- 25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35

Table B-4

Game Fish and Wildlife Species  
Fort McClellan, Calhoun County, Alabama

Common Name	Scientific Name
<b>Birds</b>	
wood duck	<i>Aix sponsa</i>
eastern wild turkey	<i>Meleagris gallopava</i>
bobwhite quail	<i>Colinus virginianus</i>
mourning dove	<i>Zenaida macroura</i>
<b>Mammals</b>	
white-tailed deer	<i>Odocoileus virginianus</i>
eastern gray squirrel	<i>Sciurus carolinensis</i>
eastern fox squirrel	<i>Sciurus niger</i>
eastern cottontail rabbit	<i>Sylvilagus floridanus</i>
swamp rabbit	<i>Sylvilagus aquaticus</i>
raccoon	<i>Procyon lotor</i>
<b>Fish</b>	
largemouth bass	<i>Micropterus salmoides</i>
bluegill	<i>Lepomis macrochirus</i>
sunfish (red-ear, longear, dollar, spotted)	
channel catfish	<i>Ictalurus punctatus</i>

Source: Integrated Natural Resources Management Plan (INRMP, 1998)