

**APPENDIX D:**

**LETTERS OF CONSULTATION AND REVISED BIOLOGICAL  
ASSESSMENT FOR ANNISTON ARMY DEPOT**





**ARGONNE NATIONAL LABORATORY**

9700 SOUTH CASS AVENUE, BUILDING 900, ARGONNE, ILLINOIS 60439

TELEPHONE: 630/252-8849

May 4, 2000

Mr. Larry Goldman, Field Supervisor  
U.S. Fish and Wildlife Service  
Daphne Field Office  
1208-B Main Street  
P.O. Drawer 1190  
Daphne, AL 36526

Dear Mr. Goldman:

The Department of Army, Assembled Chemical Weapons Assessment Program and the Chemical Demilitarization Program are preparing an environmental impact statement concerning its plans to destroy chemical agent and munitions stored at Anniston Army Depot (AAD) located in south western corner of Calhoun County, Alabama. This EIS will evaluate two different technologies and the no action for destruction of chemical agent and munitions stored at AAD. I've included a map showing the location of the AAD and copies of the Federal Register notices for your use.

We would appreciate receiving information on any federally-protected species that may inhabit or visit the AAD and could possibly be affected by construction of demonstration facilities or an incinerator. As part of the analysis of ecological impacts we will assess potential impacts to federally endangered, threatened, and candidate species. A list of these species and their residency status at AAD or in the vicinity would be useful for the analysis.

Thank you in advance for your assistance.

Sincerely,



Edwin D. Pentecost, PhD  
Environmental Assessment Division

Encl.



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
P. O. Drawer 1190  
Daphne, Alabama 36526

IN REPLY REFER TO:  
00-1408a

May 25, 2000

Dr. Edwin D. Pentecost  
Argonne National Laboratory  
9700 South Cass Avenue, Building 900  
Argonne, IL 60439

Dear Dr. Pentecost:

This is in response to your letter, dated May 4, 2000, requesting endangered species information for inclusion in an Environmental Impact Statement pursuant to the Army's plans to destroy chemical agent and munitions at Anniston Army Depot, Calhoun County, Alabama.

The Service has determined that the following endangered or threatened species need to be considered in an Environmental Impact Statement for Anniston Army Depot:

Tennessee yellow-eyed grass	<i>Xyris tennesseensis</i>
Red-cockaded woodpecker	<i>Picooides borealis</i>
Gray bat	<i>Myotis grisescens</i>
Mohr's Barbara's buttons	<i>Marshallia mohrii</i>

If aquatic habitats will be affected either on the Depot or in adjacent areas then the list should be expanded to include the following:

Pygmy sculpin	<i>Cottus pygmaeus</i>
Blue shiner	<i>Cyprinella caerulea</i>
Fine-lined pocketbook mussel	<i>Lampsilis altilis</i>
Tulotoma snail	<i>Tulotoma magnifica</i>
Painted rocksnail	<i>Leptoxis taeniata</i>
Southern pigtoe mussel	<i>Pleurobema georgianum</i>

If you have questions or need additional information, please call Mr. Bruce Porter at (334) 441-5181, ext 37.

Sincerely,

Larry E. Goldman  
Field Supervisor

PHONE: 334-441-5181

[www.fws.gov](http://www.fws.gov)

FAX: 334-441-6222

SHIPPING ADDRESS: 1208-B Main Street, Daphne, AL 36526



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
PROGRAM MANAGER FOR ASSEMBLED CHEMICAL WEAPON ASSESSMENT  
ABERDEEN PROVING GROUND, MD 21010-5423

AMSSB-PM-ACWA

4 October 2001

MEMORANDUM FOR Mr. Larry E. Goldman, US Department of the Interior, Fish and Wildlife Service, P.O. Drawer 1190, Daphne, AL 36526

SUBJECT: Completed Biological Assessment

1. We have completed a Biological Assessment for the proposed Assembled Chemical Weapons pilot test project at the Anniston Army Depot (ANAD) in Calhoun County, Alabama, pursuant to the Endangered Species Act requirements. The biological assessment was prepared based on your response to our letter requesting information on federally listed endangered species that occur on ANAD (see your response to Dr. Edwin D. Pentecost, Argonne National Laboratory, dated 25 May 2000). I am enclosing a copy of the biological assessment for your review and concurrence.

2. If you have questions on the biological assessment do not hesitate to contact me or Dr. Pentecost at (630) 252-8849.

A handwritten signature in cursive script that reads "Jon Ware".

JON WARE  
Environmental Team Leader

Encl

CF:  
E. Pentecost, ANL  
W. Burns, ANAD



**BIOLOGICAL ASSESSMENT FOR THE  
ASSEMBLED CHEMICAL WEAPONS ASSESSMENT PROGRAM  
AT ANNISTON ARMY DEPOT, ANNISTON, ALABAMA**

**Prepared for**

**PM Assembled Chemical Weapons Assessment  
Aberdeen Proving Ground, MD 21010-5424**

**December 2001**



## **Biological Assessment for the Assembled Chemical Weapons Assessment Program at Anniston Army Depot, Anniston, Alabama**

### **Background**

The U.S. Department of Defense (DOD) was directed by Congress as part of the Omnibus Consolidated Appropriations Act of 1997 (Public Law 104-208) to “demonstrate not less than two alternatives to the baseline incineration process for demilitarization of assembled chemical munitions.” The DOD also was directed by Congress in this legislation to establish an Assembled Chemical Weapons Assessment (ACWA) Program. The Program Manager for ACWA announced the DOD’s intent to prepare an environmental impact statement (EIS) on plans to design, construct, and operate one or more pilot test facilities for assembled chemical weapon destruction technologies at one or more chemical weapons stockpile sites (Fed. Register, Vol. 65, No. 73, pp. 20139–20140, August 14, 2000). Potential locations for pilot testing include Blue Grass Army Depot in Kentucky, Pine Bluff Arsenal in Arkansas, Pueblo Chemical Depot in Colorado, and the Anniston Army Depot (ANAD) in Alabama.

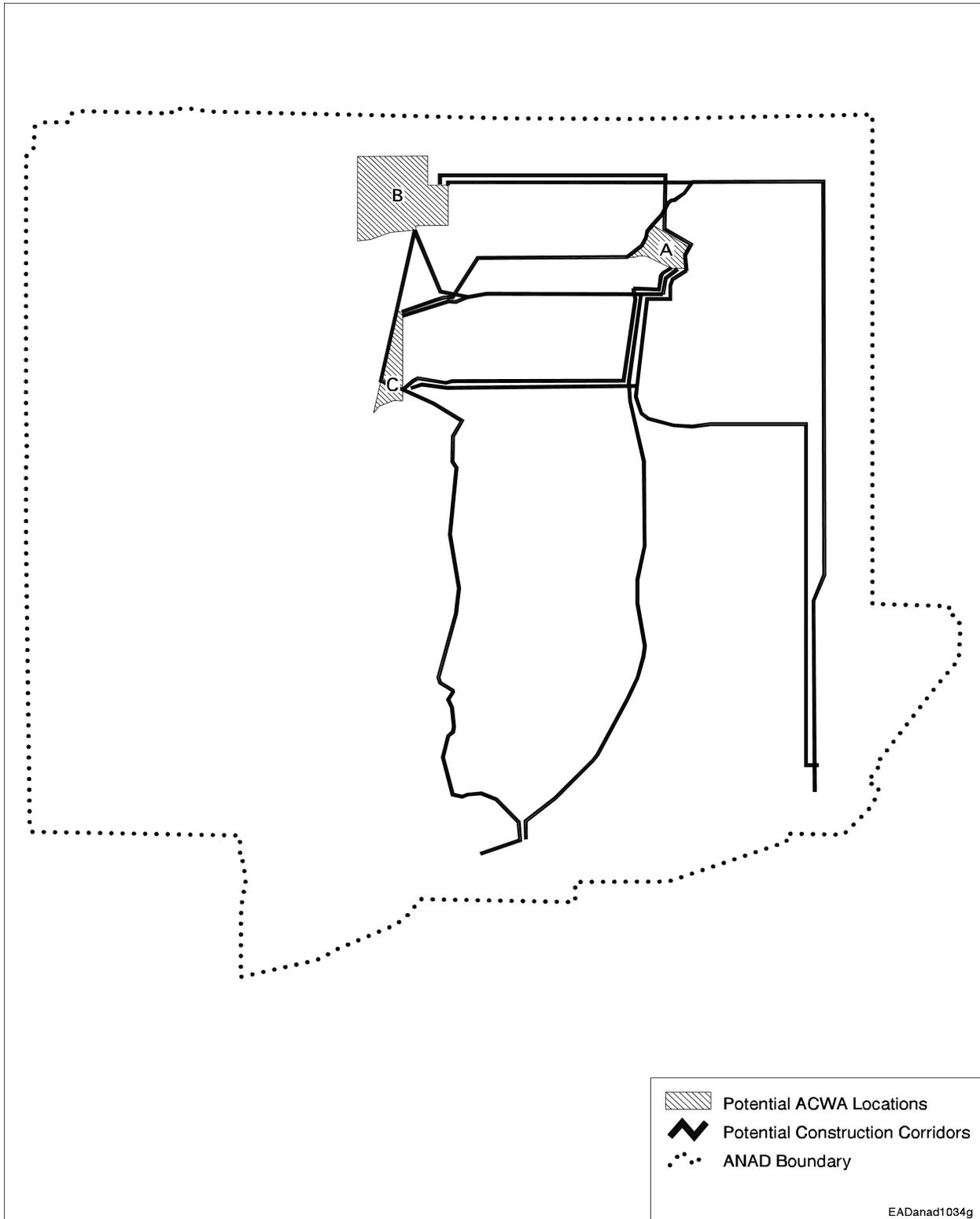
In fulfilling its responsibilities under the National Environmental Policy Act of 1969 and the Endangered Species Act of 1974, the DOD has prepared this biological assessment of potential impacts to federally listed species from constructing and operating ACWA pilot test facilities at the ANAD. The ANAD is an active DOD installation in Calhoun County, Alabama, occupying 15,279 acres (6,185 ha) located about 56 miles (90 km) east of Birmingham, Alabama. The installation facilities consist of earth-covered igloos, warehouses, aboveground magazines, maintenance buildings, and facilities used for administration, operations, medical care, and housing.

### **Project Description**

Pilot testing of the ACWA technologies is intended to provide DOD with valuable information regarding the suitability of alternative technologies for the destruction of nerve agent and mustard agent, currently contained in munitions stored at ANAD and the other installations. The ACWA technologies consist of the use of electrochemical oxidation or chemical neutralization followed by either supercritical water oxidation or a process using microorganisms known as biological treatment. The ACWA facilities are assumed to operate for about 36 months as a bounding case for the EIS analysis.

The ACWA pilot test facilities would occupy an area of about 25 acres (10 ha). Three alternative locations for the test facilities are being evaluated in the environmental impact statement (Figure 1). Site A covers about 32.6 acres (13.2 ha), Site B occupies 149 acres (60.3 ha), and Site C is approximately 36.4 acres (14.7 ha) in size. Construction of the pilot facility may require substantial site preparation in highly sloped areas of the sites.

In addition to the structures associated with the ACWA pilot test facilities, construction of the site infrastructure would require disturbance within existing rights-of-way for gas, water, sewer, and electrical power lines and the creation of several new corridors for these utilities. Although the locations of all areas disturbed during construction cannot be identified at this time, for the



**FIGURE 1 Potential Areas of Disturbance for Construction of ACWA Pilot Facilities at Anniston Army Depot**

purpose of this biological assessment, probable locations were assumed, to allow for an evaluation of the impacts of construction activities on known locations of listed species.

No liquid wastes produced by the treatment processes would be released to the environment. During pilot testing of the technologies, minor amounts of trace metals (up to  $8.3 \times 10^{-4}$  lb/day [0.38 g/day]) and organic compounds (up to 0.58 lb/day [260 g/day]) would be emitted to the atmosphere.

### **Affected Environment**

Located near the southern edge of the Appalachian mountain range, the ANAD is surrounded by a mosaic of forest communities and agricultural lands, in a temperate climate. The predominant forest type in the vicinity of ANAD is mixed broadleaf deciduous/pine forest. Common associates include oak, hickory, longleaf pine, and loblolly pine. Most of the land on ANAD has been cleared and now supports second growth forest managed for timber production and other uses. There is little undisturbed area remaining on the installation except for an approximate 1,000 to 1,200 acres (405 to 486 ha) of old-growth oak-hickory forest in the restricted area that occupies the northwest corner of ANAD (Godwin et al. 1994).

The eastern half of Site A is forested with an immature broadleaf deciduous forest community composed primarily of red oak, white oak, and hickory (USGS 1998). The western half of the site is wooded but is not under forest management. The adjacent area to the northeast is an immature pine-hardwood forest community composed primarily of loblolly pine and broadleaf deciduous species. Site A is situated at the confluence of a perennial stream flowing from the southwest and an intermittent stream flowing from the south. Both of these streams are located within excavated channels. The perennial stream exits the ANAD near its northeast corner. Approximately 12 acres (4.9 ha) of the stream's 100-year floodplain occur within Site A.

Site B is representative of an upland hardwood forest and is managed for wildlife habitat and timber production. The western half of Site B lies within a broadleaf deciduous forest community composed primarily of red oak, white oak, and hickory (USGS 1998). Forest management in this area includes selective cutting. The eastern half of the site is wooded but is not under forest management. Tree species of the closed forest canopy include chestnut oak (*Quercus prinus*), swamp chestnut oak (*Quercus michauxii*), and southern red oak (*Quercus falcata*). Pines are present in the far western portion of the site, which is lower in elevation. Flowering dogwood (*Cornus florida*) and immature oaks make up the shrub layer, with numerous oak seedlings present. No intermittent streams occur on Site B. The northern portion of the site lies within the watershed of an intermittent stream that flows north, while the southern portion of Site B lies within the watershed of an intermittent stream that flows to the northwest.

Site C slopes away fairly rapidly from Ammo Workshop Road. At the southern end of the site, the elevation is considerably lower. The entire site is included within an immature loblolly pine forest community (USGS 1998). Longleaf pine (*Pinus palustris*) and shortleaf pine (*Pinus echinata*) occur on this site together with hardwoods, such as black jack oak (*Quercus marilandica*), mockernut hickory (*Carya tomentosa*), butternut hickory (*Carya cordiformis*), and sweet gum (*Liquidambar styraciflua*). The vegetation density at Site C is greater than that of the

other two sites, and much of the site is overgrown with kudzu (*Pueraria montana*). Site C is located within the watershed of the perennial stream that intersects Site A.

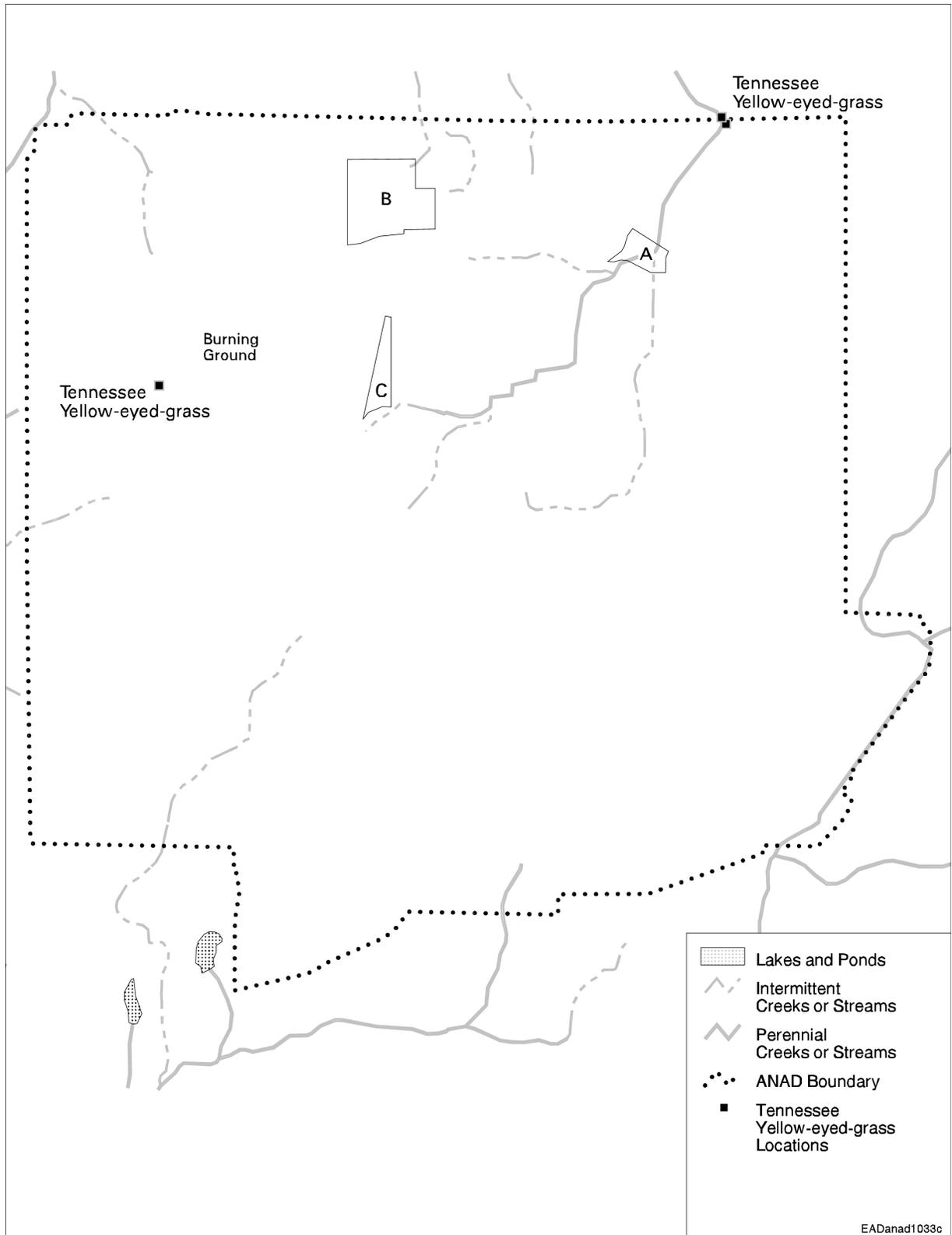
### Protected Species at Anniston Army Depot

An installationwide survey was conducted in 1994 by the Alabama Natural Heritage Program for endangered, threatened, and candidate flora and fauna (Godwin et al. 1994). The only federally listed species that was found on the ANAD installation was *Xyris tennesseensis* (Tennessee yellow-eyed grass), listed as endangered. One population of *X. tennesseensis* was located within a seep, along a spring run, in the vicinity of the toxic burning ground in the west-central portion of the installation (Figure 2). A second population of *X. tennesseensis* has since been discovered along the banks of a perennial stream in the northeast corner of ANAD, near the boundary between ANAD and the Pelham Range (Burns 2000). Two populations of *X. tennesseensis* also occur on the Pelham Range, an installation adjacent to ANAD, to the north (U.S. Army 1998).

Although *Picoides borealis* (the red-cockaded woodpecker), listed as endangered, is a resident species in northern Alabama, this species does not occur on the ANAD site. The floral and faunal survey, conducted in 1994 by the Alabama Natural Heritage Program, and a subsequent breeding bird survey completed in 1997 (Bailey et al. 1997) have not been able to locate this species on the installation. *Picoides borealis* has historically resided on the Pelham Range of Fort McClellan, adjacent to ANAD, but a 1998 survey concluded that this species no longer occurs there (Reisz Engineers 1998). However, *Picoides borealis* does occur at two locations within the Talladega National Forest, one approximately 25 mi (40 km) east of ANAD and the other about 30 mi (50 km) to the south. This species requires open mature pine woodland and savannah habitat, and nests in groups with a home range of 100 to 400 acres (40.5 to 161.9 ha) (FWS 2000). This open habitat is typically maintained by periodic fire. Roosting and nesting cavities are excavated in live pine trees with heartwood at least 5.5 to 6 in. (14.0 to 15.2 cm) in diameter (FWS 2000). Longleaf, loblolly, and shortleaf pines are the most common trees used, with longleaf pine being preferred. Cavity trees average between 80 and 150 years in age, with 60 to 80 years generally being the minimum (FWS 2000). Trees that are selected are usually infected with the heart rot fungus, which is found primarily in old trees. Currently, no suitable habitat exists for this species at ANAD. The stands of mature forest currently present on the installation consist of oak and hickory canopy species. If future monitoring documents the presence of *Picoides borealis*, the U.S. Fish and Wildlife Service would be contacted to determine appropriate protection measures.

As the largest member of the genus *Myotis* in the eastern United States, *Myotis grisescens* (the gray bat), listed as endangered, can be distinguished from other bats by its unicolored dorsal fur. This monotypic species is found mostly in Alabama, northern Arkansas, Kentucky, Missouri, and Tennessee. Some *M. grisescens* also appear in parts of other states, including Georgia, Indiana, Illinois, and Kansas.

*M. grisescens* are restricted almost entirely to caves or cavelike habitats. They are highly selective of caves that provide specific temperature and roosting conditions. In winter, *M. grisescens* roost only in deep vertical caves with a temperature range of 6 to 11°C (42 to 51°F). As a result, only a small number of caves can be used throughout the year. Blowing Wind



**FIGURE 2** Locations of Existing Tennessee Yellow-Eyed Grass at Anniston Army Depot

Cave and Fern Cave National Wildlife Refuges, both of which are located in Decatur, Alabama, are known to be the most important summer and winter caves, respectively, for *M. grisescens*. The two caves are about 85 mi (136 km) northwest of ANAD in northern Alabama.

*M. grisescens* has been captured on the Pelham Range next to ANAD, although no roosts have been identified (U.S. Army 1998). The other closest known occurrence is located southwest of ANAD, approximately 43 mi (69 km) from Area A, 42 mi (67 km) from Area B, and 41 mi (66 km) from Area C.

Although *Myotis grisescens* is known to occur on the Pelham Range north of ANAD, it does not occur on ANAD. The small unnamed stream that passes through Area A is unlikely to provide foraging habitat for *M. grisescens* because of its narrow excavated channel. Facility construction would not affect caves used for hibernating, maternity, or roosting since suitable caves do not exist on ANAD or in the immediate vicinity. Foraging habitat, such as large stream corridors, lakes, or adjacent forests, also would not be affected by facility or infrastructure construction. Consequently, construction of an ACWA pilot test facility would not result in impacts on the *M. grisescens*.

*Marshallia mohrii* (Mohr's Barbara's buttons), listed as threatened, is a perennial herb with stems 1 to 2.5 ft (0.3 to 0.8 m) in height. The tubular-shaped flower is white, pale pink, and lavender and blooms from mid-May through June. Fruit is produced in July and August. This herb prefers moist prairielike openings in woodlands and is also found along shale-bedded streams. Associations with soils of the Conasauga-Firestone Association are known to occur. These are sandy clays with high organic content. *M. mohrii* can be found in either full sun or partial shade.

Once known to span three different physiographic regions (Cahaba Valley, Warrior Basin, and Coosa Valley) in Alabama and Georgia, *M. mohrii* is now found only in Alabama in Calhoun, Etowah, Bibb, and central Cherokee Counties. The location of *M. mohrii* closest to ANAD is in Calhoun County, approximately 4 mi (6 km) from Area A, 2 mi (3 km) from Area B, and 3 mi (5 km) from Area C.

*Marshallia mohrii* is not known to occur on ANAD, although it is present just to the west of ANAD and on Pelham Range to the north. Habitat associated with *M. mohrii* on the Pelham range consists of ephemeral streams with an open canopy maintained by frequent wildfires. Habitat for *M. mohrii* is not present at or near the proposed facility or infrastructure construction sites. Therefore, facility construction would not result in impacts on *M. mohrii*.

### **Species Description and Biology**

The following description and habitat requirements of *Xyris tennesseensis* (Tennessee yellow-eyed grass) were obtained primarily from the U.S. Fish and Wildlife Service final rule for the determination of endangered species status (FWS 1991) and the recovery plan (FWS 1994), except where noted. *Xyris tennesseensis* is a perennial plant of the Xyridaceae family. It was listed by the U.S. Fish and Wildlife Service as an endangered species on July 26, 1991, and is known from only 14 extant populations. Eight of these occur in Alabama, with six others in

Georgia and Tennessee. These isolated populations typically occur on sites of less than 1 acre (0.4 ha) and range in size from a few dozen to thousands of individuals.

This species occurs in clumps from few to many bulbous-based individuals, with stems 2.3 to 3.3 ft (7 to 10 dm) in height. The leaves are basal, linear, and mostly 5.5 to 17.7 in. (14 to 45 cm) in length, the larger ones appearing slightly twisted. They are typically pink, red, or purplish in color at the base, while the blade is deep green. Leaves overlap each other one-eighth to one-third of their length. The inflorescence is a dense spike 0.4 to 0.6 in. (1.0 to 1.5 cm) long, solitary at the tip of a 1 to 2 ft- (3 to 7 dm-) long scape. The pale yellow flowers open in late morning and wither by mid-afternoon, with only one or a few flowers open at any time. Flowering takes place from August through September.

Habitat requirements for *X. tennesseensis* include open or thinly wooded areas, with soil that is moist to wet year round. This species typically occurs on seep-slopes, the banks or gravelly shallows of small streams, and in springy meadows. Water quality is critical to habitat suitability, as *X. tennesseensis* requires clean, spring-fed headwater streams or associated seeps. Unlike other species of *Xyris*, *X. tennesseensis* is found to grow in soils associated with calcareous rocks, and, as a result, soils near *X. tennesseensis* are generally neutral to alkaline. They can be found either in full sun or under partial shade. However, successful seed germination requires open, wet areas with high light levels. The principal pollinators of *X. tennesseensis* in a population north of ANAD are two species of solitary bees (Reisz Engineers 1998).

Threats to *X. tennesseensis* populations include habitat loss or degradation due to drainage or diversion of seeps or groundwater, agriculture or silvicultural uses and practices, gravel quarrying, and road construction and maintenance. Erosion due to timber operations upslope of *X. tennesseensis* populations may result in sedimentation into seeps and water quality degradation of the watershed, thus reducing habitat quality. In addition to such anthropogenic effects, natural succession in areas occupied by *X. tennesseensis* may result in overcrowding and decreased light levels due to woody plant encroachment. The invasion of kudzu into areas occupied by *X. tennesseensis* may threaten the viability of some populations (U.S. Army 1998). A recovery plan was prepared in 1994 that addresses the potential threats to *X. tennesseensis* and the actions needed for recovery (FWS 1994).

### **Impacts of ACWA Pilot Test Facilities on *Xyris tennesseensis* (Tennessee Yellow-eyed Grass)**

Currently, two populations of *X. tennesseensis* are known to occur on ANAD (Figure 2). One is located within a seep near the burning ground in the west-central portion of the installation, approximately 1.3 mi (2.0 km) from the nearest proposed pilot test facility site. The other population is located on the banks of a perennial stream, near the northeast corner of the installation and approximately 4,600 ft (1,400 m) downstream from Site A. The closest population to Sites A, B, and C are located about 0.9 mi (1.4 km), 1.9 mi (3.6 km), and 1.4 mi (2.2 km) away, respectively.

Construction of the ACWA pilot test facilities would disturb 25 acres (10 ha) at the site selected. Neither Site A, B, nor C is situated on or near the two populations of *X. tennesseensis*. Site A is

situated at the confluence of a small perennial and intermittent stream and includes approximately 12 acres (4.9 ha) of the 100-year floodplain. Consequently, construction activities at Site A may require the placement of culverts or the re-routing of stream channels.

Surface disturbance for electric, gas, sewer, and water lines is expected to occur during construction of new corridors as well as along previously disturbed rights-of-way. Construction activities for these utilities is estimated to disturb corridors of up to 30 ft (9.1 m) each in width (up to 120 ft [36.6 m] for electricity). Installation of utility lines within the new and existing utility corridors may result in disturbance to a number of streams crossing the corridors.

Sedimentation may occur within surface waters downstream of the facility construction site due to site grading and stream channel impacts. Construction in close proximity to the stream channels may also result in accidental releases of contaminants into the streams. Construction of the new utility corridors, north of Site A (adjacent to the perennial stream), and southwest of Site A (crossing the stream), may result in similar impacts. Biota within or along streams downgradient of Site A or the utility corridors could be adversely affected by uncontrolled runoff from the facility construction site or utility corridors. Consequently, the population of *X. tennesseensis* located along the perennial stream, downstream of Site A, could be indirectly affected by construction activities. However, the implementation of best management practices for erosion and sediment control would be expected to greatly reduce the potential for any adverse effects.

Although the locations of other areas disturbed during construction cannot be identified at this time, the following locations will be identified in the final engineering design: (1) the sanitary waste treatment facility, (2) electrical substation, (3) parking lots, (4) a construction sedimentation pond, and (5) routes for buried communication cables. However, for the purposes of this biological assessment, probable locations were assumed, to allow for an evaluation of impacts of construction activities on known locations of *X. tennesseensis* populations.

### **Conservation Measures (Protective Measures to Minimize Effects of the ACWA Project)**

The FWS has developed a recovery plan in order to protect and manage the existing populations of *X. tennesseensis* and promote research on the species' ecological requirements and life history. Specific objectives and management actions at ANAD to protect *X. tennesseensis* populations should include these:

- Develop a management plan to maintain and enhance *X. tennesseensis* populations at ANAD. Development of the plan should be coordinated with the U.S. Fish and Wildlife Service. The plan would identify actions needed to maintain necessary conditions for viable *X. tennesseensis* habitat. Goals of the plan should include the attainment of self-sustaining populations. Once the plan is finalized, it should be incorporated into the current natural resource management plan.
- In consultation with the U.S. Fish and Wildlife Service, ANAD should develop *X. tennesseensis* population goals that are compatible with the military mission. The

goals will rely on the 1994 survey results and the *X. tennesseensis* Recovery Plan for the US FWS Southeast Region.

- Establish study areas encompassing *X. tennesseensis* populations. The boundaries of primary and secondary habitat should be determined. Monitoring of populations should be conducted, at least annually, to determine if the populations are reproducing successfully and maintaining stable numbers or increasing. Monitoring should also identify potential threats to population viability. Establishment of the study areas will allow ANAD land management personnel to monitor the effectiveness of intermediate management actions.
- Specific intermediate management actions should be implemented at locations where *X. tennesseensis* is known to exist. Suitable light and moisture conditions should be maintained at the locations of known populations. Management actions could include elimination of invasive weeds, prevention of erosion and siltation, and prevention of damage from trampling or vehicles. Corrective action should be taken for imminent threats to populations.

If the U.S. Army decides to build an ACWA pilot test facility at ANAD, a project-specific mitigation plan would be developed for *X. tennesseensis*. The following measures would be taken to further protect *X. tennesseensis* populations and habitat once draft facility and infrastructure designs were developed and decisions were made on placement of structures and infrastructure requirements.

- Determine the precise locations of areas needed for construction of the ACWA site and support facilities, including fabrication and lay down areas.
- Conduct surveys for *X. tennesseensis* on the proposed facility sites and in areas likely to be impacted by construction of the proposed utility corridors, particularly in locations where construction may impact streams and ponds.
- Implement storm water runoff control measures and avoid construction activities or equipment within buffer areas along streams where practicable, to minimize impacts to water quality. The success of mitigation to prevent soil erosion and control storm water runoff in areas of steep terrain should be monitored regularly.
- Instruct construction managers on what types of habitat to avoid and who to notify if questions arise about possible impact to *X. tennesseensis* populations during the construction process.

### **Conclusion (Effect Determination)**

Impacts to *X. tennesseensis* from construction associated with the ACWA pilot test facility and infrastructure cannot be accurately determined until all facility structure and infrastructure locations are identified. Figure 1 shows potential locations for access roads, the electrical power line, water lines, and gas lines that would be needed for construction at Sites A, B, or C. By

superimposing known locations of *X. tennesseensis* populations over the infrastructure and site facility locations, potential areas of impact can be identified.

Although no populations of *X. tennesseensis* occur at proposed locations of the pilot test facility or infrastructure corridors, indirect impacts to *X. tennesseensis* may occur. Site A is located on a 100-year floodplain, and facility construction may require the placement of culverts or re-routing of the streams at Site A. Adverse impacts to the population downstream, along the perennial stream, may occur if re-routing of the stream is necessary. However, the implementation of best management practices to prevent soil erosion and control storm water runoff would be expected to greatly reduce or eliminate the potential for downstream effects. Potential indirect impacts to *X. tennesseensis* could be avoided by locating the ACWA facilities at Sites B or C.

Operation of the ACWA facilities is not expected to impact the *X. tennesseensis*. Trace elements released to the atmosphere by the destruction methodologies being tested would be less than  $1.2 \times 10^{-10}$  lb/day [ $5.4 \times 10^{-8}$  g/day] and would be dispersed over a relatively large geographic area. Process water is either recycled or disposed of in a manner to meet existing regulations. No chemical agent (i.e., mustard or nerve agent) or degradation products would be released during normal facility operations. Sanitary effluent from the wastewater treatment facility would meet National Pollutant Discharge Elimination System standards set for the facility by the State of Alabama.

It is concluded that the construction of ACWA pilot test facilities and associated infrastructure “may affect, but is not likely to adversely affect” a population of *X. tennesseensis* if an ACWA facility were to be constructed at Site A. However, construction of ACWA facilities and associated infrastructure would have “no effect” on *X. tennesseensis* if the facility were to be built at Sites B or C. This conclusion is based on the proximity of project activities to known populations documented during surveys of the ANAD site (Godwin et al. 1994) and personal communications with on-site staff (Burns 2000).

### Literature Cited

Bailey, M.A. 1997, *Survey of the Breeding Birds of Anniston Army Depot, Alabama*, final report, prepared by the Nature Conservancy/Alabama Natural Heritage Program, Montgomery, Ala., for the U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Ga.

Burns, W., 2000, personal communication from Burns (Anniston Army Depot, Anniston, Ala.) to C.L. Tsao (Argonne National Laboratory, Argonne, Ill.), Aug. 10.

Godwin, J.C., J.L. Hilton, and M.A. Bailey, 1994, *Faunal and Floral Survey of Anniston Army Depot and Coosa River Annex: Federal Endangered, Threatened, and Candidate Species*, prepared by Alabama Natural Heritage Program, Alabama Department of Conservation and Natural Resources, State Lands Division, Montgomery, Ala., for Anniston Army Depot, Anniston, Ala.



