

ENVIRONMENTAL ASSESSMENT
FOR
PROPOSED REMOVAL OF AIRFIELD OBSTRUCTION
AT
CHARLESTON AIR FORCE BASE,
SOUTH CAROLINA



July 2002

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ACRONYMNS AND ABBREVIATIONS

A/DS	Approach/Departure Zone
AF	Air Force
AFMAN	Air Force Manual
AFPAM	Air Force Pamphlet
AICUZ	Air Installation Compatible Use Zone
BASH	Bird Aircraft Strike Hazard
CAA	Clean Air Act
CAFB	Charleston Air Force Base
CCAA	Charleston County Aviation Authority
CEQ	Council on Environmental Quality
CEV	Civil Engineer, Environmental Office
COE	Corp of Engineers
CZ	Clear Zone
DBH	Diameter at Breast Height
DEEV	Military Airlift Command Civil Engineer Directorate, Environmental Office
DHEC	Department of Health and Environmental Control
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPC	Environmental Planning Committee
EJ	Environmental Justice
EPA	Environmental Protection Agency
FAR	Federal Aviation Regulations
FAA	Federal Aviation Administration
GA	Graded Area
HQ	Headquarters
LF	Linear Feet
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
OG/CC	Operations Group Commander
ROI	Region of Influence
SC	South Carolina
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
SIP	State Implementation Plan
TS	Transition Zone
T & E	Threatened and Endangered
USAF	United States Air Force
USFWS	United States Fish and Wildlife Service

1.0 PURPOSE AND NEED FOR PROPOSED ACTION

1.1 Introduction.

Charleston Air Force Base (CAFB) is located in Charleston County in southeast South Carolina, approximately 15 miles inland from the Atlantic Ocean (see Figure 1.1a). CAFB lies within the coastal zone of South Carolina between the Ashley and the Cooper Rivers. CAFB property consists of 3,772 acres. Figure 1.1b shows CAFB and the surrounding area.

Charleston AFB is within the corporate boundaries of the city of North Charleston on property formerly owned and operated by the Charleston Municipal Airport. The Charleston Municipal Airport became operational in 1931, but was activated as an Army Air Base during World War II. CAFB has a joint-use agreement with the Charleston County Aviation Authority for shared use of the runways and navigational aids by civilian, commercial and military aircraft.

CAFB has two runway surfaces in a cross-wind orientation: a northeast - to southwest-oriented runway of approximately 7,050 linear feet (LF), and a northwest- to southeast-oriented runway of approximately 9,000 LF. Each end of each runway is identified by the whole number nearest one-tenth the magnetic azimuth of the runway centerline when viewed from the direction of approach. For example, a runway end with an approach azimuth of 332 degrees would be designated Runway 33. For CAFB, the southwest end of the shorter runway is designated 03 with the other end designated 21. The southeast end of the long runway is designated 33 and the other end is 15. For the purposes of this Environmental Assessment, each runway area will be denoted by its orientation.

Currently, trees intrude into the controlled airspace at CAFB as defined by the Unified Facility Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design* for Class B Air Force runways. An airfield survey in 2001 revealed that trees penetrate into the clear zone graded areas, approach-departure surfaces, and transitional surfaces (as defined in UFC 3-260-01) for Runways 03, 33, and 15.

The direct elimination of threats to air navigation at CAFB is an AF and Federal Aviation Administration (FAA) requirement. Charleston Air Force Base proposes to attain applicable airfield operations criteria by removing intruding trees, either by clear-cut or selective cutting, on 394 acres of forest land near the ends of the runways. Wetland forests and painted bunting habitat (a state species of special concern) will be affected by the proposed action. Charleston Air Force Base, 437th OG/CC is the proponent of this project.

1.2 Airfield Design Criteria for Charleston AFB.

Airfield design and layout must comply with the Unified Facility Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design*, and the Federal Aviation Regulations (FAR), Part 139, which regulate and ensure safe aircraft operations. UFC 3-260-01 provides criteria for unobstructed airspace as well as safe and efficient ground movements. Airspace surfaces are defined as follows:

1.2.1 Primary Surface (PS). This surface defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area. The primary surface comprises

runway surfaces, runway shoulders, and lateral safety zones. Length of the primary surface includes the runway length and extends 200 feet beyond the end of the runway. For Class B runways, the width of the primary surface is 2,000 feet (1,000 feet each side of centerline).

1.2.2 Clear Zone (CZ). This surface defines the limits of the obstruction clearance requirements in the vicinity contiguous to the primary surface. The clear zone is a 3,000 by 3,000 foot area centered on centerline at the end of a runway.

1.2.3 Graded Area (GA). The graded area denotes an area within the clear zone, measuring 1,000 feet in length beyond the primary surface and by the established width of the primary surface (2,000 feet wide for Class B). The graded area must be clear of any obstructions such as above-ground structures (except essential navigational aids), trees, stumps, roadways, and ditches. The GA provides aircraft a clear and relatively smooth area if problems are encountered during landing or take-off. The only structures allowed in the GA are navigational aids such as approach lights, runway and taxiways lighting systems, and other such structures directly related to essential operational requirements.

1.2.4 Approach-Departure Clearance Surface (A/DS). This surface is a symmetrical imaginary trapezoid plane that begins 200 feet past the end of the runway, and represents the approach-departure 'glide angle' for an airfield. The width of this surface at the end of runway is 2,000 feet, and it flares uniformly to a width of 16,000 at a distance of 50,000 feet. This plane rises 1 foot vertically for every 50 feet horizontally (50:1 glide angle).

1.2.5 Transitional Surfaces (TS). These surfaces connect the primary surfaces, clear zone, and approach-departure clearance surfaces to other outer horizontal flight surfaces (not within the scope of this document). The transitional surface begins at the lateral boundary of the primary surface, and then slopes upward 1 foot vertically for every 7 feet horizontally (7:1) at right angles to the runway centerline. The elevation of the runway centerline is the elevation for the beginning of the 7:1 slope.

1.2.6 Accident Potential Zones (APZ). UFC 3-260-01 establishes three successive accident potential zones: the clear zone (3,000' x 3,000'), the APZI (5,000' x 3,000'), and APZII (7,000' x 3,000'). These zones were established from mishap probabilities based on past Air Force crash patterns, with the CZ having the highest accident potential of the three zones.

1.2.7 Airfield Surface Overlaps. Note that the A/DS and the TS are three-dimensional surfaces and there is overlap between the two of them and the clear zone. Refer to UFC 3-260-01 for illustrations depicting the different types of controlled air spaces.
(http://www.efdlant.navy.mil/lantops_15/documents/p_publications.htm).

1.3 Airfield Operations at CAFB.

The runways at CAFB are utilized by both the Air Force and the Charleston County Aviation Authority under a joint use agreement. The type of aircraft utilizing the airfield requires Class B runway criteria. Class B runways are primarily intended for high performance and large heavy lift aircraft like the C-5 Galaxy, C-17 Globemaster, C-141 Starlifter, and C-130 Hercules. CAFB uses Visual Air Navigation Facilities located on the approach ends of the runway, which requires that trees or other obstructions be removed for flight safety [UFC 3-260-01].



Figure 1.1a Location Map



Figure 1.1b Charleston AFB and the Surrounding Area

1.4 Airfield Waivers

Waivers represent a deviation from normal airfield standards. The Wing Commander may approve temporary waivers required for construction activity. Only the Major Command (MAJCOM) has the ability to authorize permanent waivers for obstructions including natural geographic features or obstructions whose removal is impractical. Trees are a permissible deviation within the CZ outside of the graded area if their maximum height is 10 ft below the 50:1 approach-departure or 7:1 transitional surfaces.

1.5 Need for the Action

Removal of airfield obstacles is necessary to maintain the CAFB critical airlift mission and to bring CAFB into compliance with applicable AF and FAA airfield criteria as set forth in UFC 3-260-01 and the FAR, Part 139.

1.6 Objectives for the Action

The objective of the proposed activity is to protect lives and AF property; maximize the safety and efficiency of runway operations; meet constant availability standard of an unrestricted approach during landing procedures; and maintain precision landing capability for all aircraft operations at CAFB.

1.7 Scope of the EA.

This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality Regulations, and Air Force Instruction (AFI) 32-7061. The scope of this EA includes an evaluation of four alternatives:

Alternative 1, the proposed action, implements land clearing within the graded areas on Runways 03 and 33. Non-wetland areas within the GA will be cleared of trees by commercial timber sale, followed by grubbing (removing) stumps, grading soil to level, seeding grass, and periodic mowing for grass height control. Real property easements will be sought where required clearing would extend beyond Air Force property. Jurisdictional wetlands within the GA will be also be subject to tree removal using South Carolina Best Management Practices (BMP) for logging in wetland areas, followed up by periodic and selective herbicide treatment for undesirable species. Wetland areas will not be grubbed and graded. A previously strip-mined area west of the end of Runway 03 will receive only a “cut and leave” treatment. Additionally, this alternative will selectively remove trees beneath the approach/departure and transitional surfaces for Runways 03 and 33 that now intrude are exhibit the potential to intrude into airspaces in the foreseeable future. Follow-up maintenance treatments beneath the approach/departure and transitional surfaces would include selectively cutting and selective herbicide treatments to eliminate the regeneration and re-sprouting of undesirable species (tall-growing/fast-growing).

Alternative 2 differs from Alternative 1 by completely draining, leveling, and establishing turf throughout all runway graded areas, to include wetland areas.

Alternative 3 would re-locate CAFB operations to another Air Force base such as Shaw AFB near Sumter, South Carolina.

Alternative 4 is the “do-nothing alternative” in which no action is undertaken.

1.8 Decisions That Must Be Made

The decision to be made is whether or not to remove trees penetrating the airspace at CAFB, and the treatment of wetland areas within a CAFB clear zone. This document evaluates the potential effect of implementing the proposed action; the alternative action; and finally, the no action alternative as described in the above paragraph at CAFB.

1.9 Applicable Regulatory Requirements and Required Coordination

1.9.1 Executive Order 11990 and the Clean Water Act (CWA). Executive Order 11990, *Protection of Wetlands* requires federal agencies to take action to minimize the destruction, loss, or degradation of wetlands. Under Section 404 of the Clean Water Act, “jurisdictional waters of the United States, including wetlands” are protected. A delineation of jurisdictional wetlands pursuant to the requirements of the Clean Water Act was completed in 1997 by Rust Environment and Infrastructure, and submitted to the US Army Corps of Engineers (COE), Charleston District in 1998. The COE concurred with the delineation. Correspondence with the COE indicates that tree cutting activities proposed in Alternative 1 would not require a permit consistent with Section 404 of the CWA, since no earth-moving would take place. Alternative 2 would most likely require a permit action through the COE for the proposed conversion of wetlands to airfield turf near the end of Runway 33. Issuance of permits is generally contingent upon submission of a satisfactory mitigation plan to offset potential impacts. Mitigation requirements vary greatly, depending upon the quality and acreage of wetlands to be affected, the type of mitigation proposed, and the location of the mitigation site relative to the impacted wetland.

The Charleston COE conducted a site visit on 24 November 2001 to determine whether wetlands at the ends of the runways at CAFB were ‘jurisdictional wetlands’ or ‘isolated wetlands’ as defined by the 9 January 2001 Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army COE Supreme Court ruling. The COE determined that wetlands at the ends of Runways 3 and 15 are isolated, but the wetland at the end of Runway 33 is a jurisdictional wetland and would require a permit before any earth-moving activities occur, to include grading, filling, or grubbing stumps associated with land clearing.

1.9.2 Coastal Zone Management Act. Congress passed the Coastal Zone Management Act (CZMA) to assist coastal states, Great Lakes States, and United States territories to develop state coastal management programs to comprehensively manage and balance competing uses of and affects on coastal resources. Federal Consistency is the CZMA requirement that federal actions which are reasonably likely to affect any land or water use or natural resource of the coastal zone be consistent with the enforceable policies of a coastal state’s federally approved coastal management program (CMP). CAFB is located in a coastal zone, and impact to wetlands will require coordination with the South Carolina Department of Health and Environmental Control (SCDHEC) Office of Ocean and Coastal Resource Management. State coastal zone personnel review the federal action to determine if the proposed action will be consistent with the their

state's CMP. Federal Consistency is intended not only to protect the resource, but also to be beneficial to both state and federal agencies by maximizing communication and coordination between the two levels of government. Under this requirement, national interests are taken into account by coastal states and in return for this concession, the states are allowed a greater say in the future of their own state.

2.0 DESCRIPTION OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Introduction

Charleston AFB is the home of the 437 Air Wing (AW), which provides airlift services for all branches of the Department of Defense, and other governmental agencies. The 437 AW utilizes C-17 aircraft to carry people and equipment to combat locations, re-supply military installations and diplomatic operations, and to carry humanitarian aid around the world. In 1990-1991, during Operation Desert Shield/Desert Storm, CAFB was a major staging base. As stated previously, trees are penetrating the controlled air spaces at CAFB and need to be removed to meet FAA and AF airfield requirement, and to maintain critical mission continuity.

2.2 Selection Criteria for Alternatives

Selection criteria are the factors used to evaluate the alternatives. CAFB identified the following criteria for evaluating alternatives:

1. Alternative eliminates hazards to air navigation due to obstructions.
2. Alternative meets applicable airfield criteria for Class B Air Force runways as established in UFC 3-260-01, *Airfield and Heliport Planning and Design*.
3. Alternative provides for the constant availability of an unrestricted approach during landing procedures.
4. Alternative does not interfere with critical airlift missions.
5. Alternative does not diminish the efficiency of runway operations.
6. Alternative minimizes disturbance to wetlands and wildlife habitat.
7. Alternative complies with applicable state and federal laws to protect the environment.
8. Alternative is economically feasible.

2.3 Alternatives Considered but Eliminated from Detailed Study

After comparing the alternatives to the criteria, two alternatives were eliminated from further study. Alternative 2 was eliminated because of the high mitigation costs associated with completely draining and leveling wetland areas throughout the GA. Alternative 3 was also eliminated from further study due to a lack of economic feasibility. While implementation of this alternative would eliminate problems with CAFB runways, it would be very costly.

2.4 Description of the Proposed Action

2.4.1 Treatments. Table 2.4 presents a summary of the activities and the acreage involved in implementing the proposed action. The proposed alternative (Alternative 1) would implement the following actions:

Clear-Zone – Within Graded Area. All trees within the graded areas of Runway 03, 33 and 15 clear zones will be removed. In non-wetland areas, stumps will be grubbed and all slash removed or burned on-site. The soil surface would be graded to near level conditions. A cover of turf grass will be established by seeding and fertilization, and then maintained by periodic mowing to Bird/Aircraft Strike Hazard (BASH) reduction standards as specified in Air Force Pamphlet (AFPAM) 91-212 - *BASH Management Techniques*. The current vegetation within these treatment areas consists mostly of young sapling-sized trees and shrubs (primarily wax myrtle), with very few merchantable sized trees that could be removed by commercial timber sale. Following land clearing, drainage ditches within the clear zone treatment areas may require additional engineering design features to sustain a low-maintenance drainage network (e.g. rip-rap, etc.). Jurisdictional wetland areas within the graded areas of Runway 03 and 33 clear zones will be logged using South Carolina Best Management Practices (BMP) for logging in wetland areas. No stump removal or grading will take place in jurisdictional wetlands. Wetland areas will be periodically treated to remove fast-growing and tall growing species by either cutting or selective application of a herbicide following the U.S. Environmental Protection Agency (EPA) approved label instructions. See Figures 2.4b and 2.4c for the prescribed treatments.

Clear Zone - Outside Graded Area. All trees that now intrude, or have the potential to intrude in the foreseeable future, into the approach-departure or transitional surfaces for Runways 03, 33 and 15 will be removed. Selected trees will be marked for removal based on height and species criteria. The prescribed treatment would be aimed at manipulating the vegetation to promote slow-growing and low-stature tree or shrub species. Follow-up maintenance treatments beneath the approach/departure and transitional surfaces would include selective cutting and selective herbicide treatments to eliminate the regeneration and re-sprouting of undesirable species (tall-growing/fast-growing). Fast-growing/tall-growing species would be periodically removed, while more compatible low-growing and slow-growing species would be left. The intended result would be to establish a low-maintenance and self-sustaining vegetation cover under the A/D and transitional surfaces that remains low in stature, is compatible with airfield safety requirements, and remains aesthetically acceptable. If necessary, low stature native shrubs will be planted in areas where overstory removal has removed most vegetative cover. See Figures 2.4b and 2.4c for the prescribed treatments.

2.4.2 Logging Methods. Trees of merchantable size will be removed by commercial timber sale. Proceeds from the sale of timber would be collected and distributed in accordance with Title 10, United States Code, Section 2665. Outside of strip-mined areas, the areas to be logged are flat with 0-6% slopes. The strip-mined areas contain steeper topography with undulating ridges and ravines. To prevent or reduce soil erosion during logging, South Carolina Best Management Practices for logging operations will be stipulated in the timber sale contract. In general, the BMPs include proper planning (including the use of topographic maps and field reconnaissance), road construction and maintenance, harvesting, use of prescribed fire,

silvicultural chemicals, and protection of riparian areas (streamside management zones). Logging unit boundaries, road systems, and log landings will be designed so that stream and other water bodies are avoided. Tree felling, skidding, and loading will be conducted such that the forest floor is disturbed to the least amount possible. Landings should be placed on firm and high ground away from streams and low-lying soggy areas. Stream crossings by log skidders will be kept to a minimum. Where large trees cannot be removed by conventional logging practices, as may be found in previously strip-mined areas, the trees would be felled and left to decay in place. Riparian and wetland areas not involved in the proposed action will be avoided. Contractual requirements will shut down logging operations during wet periods to avoid creating ruts. Harvesting will also be timed to avoid the breeding season of the painted bunting between April 15 and September 30.

2.4.3. Vegetation Management Techniques. Treatments described above that do not involve clearing stumps and establishing turf will result in extensive stump sprouting and root suckering of previously cut hardwood trees within the project area. Stump sprouting from species such as sweetgum and red maple is prolific. These pioneer species are fast-growing and acquire a tall stature in a relatively short period of time. In the Southeast, stems of fast-growing sweetgum from stump sprouts, root suckers and seed stored in the soil typically become abundant after a land-clearing operation. During field reconnaissance of the proposed project area in October–November 2001, many sweetgum and red maples were observed with good-sized multiple branches on cut stumps. Sprouts from sweetgum and other cut hardwood stumps have the advantage of utilizing the root resources of what once was a much larger tree. Consequently, stump sprouts of these less desirable and less marketable hardwood species will quickly reoccupy a clear-cut site. For this reason, herbicides and other vegetation control treatments will be used to control fast-growing species. Herbicide mixing, application, storage, and disposal will be within the specifications of the EPA approved product label.

2.5 Description of Past and Reasonably Foreseeable Future Actions Relevant to Cumulative Impacts

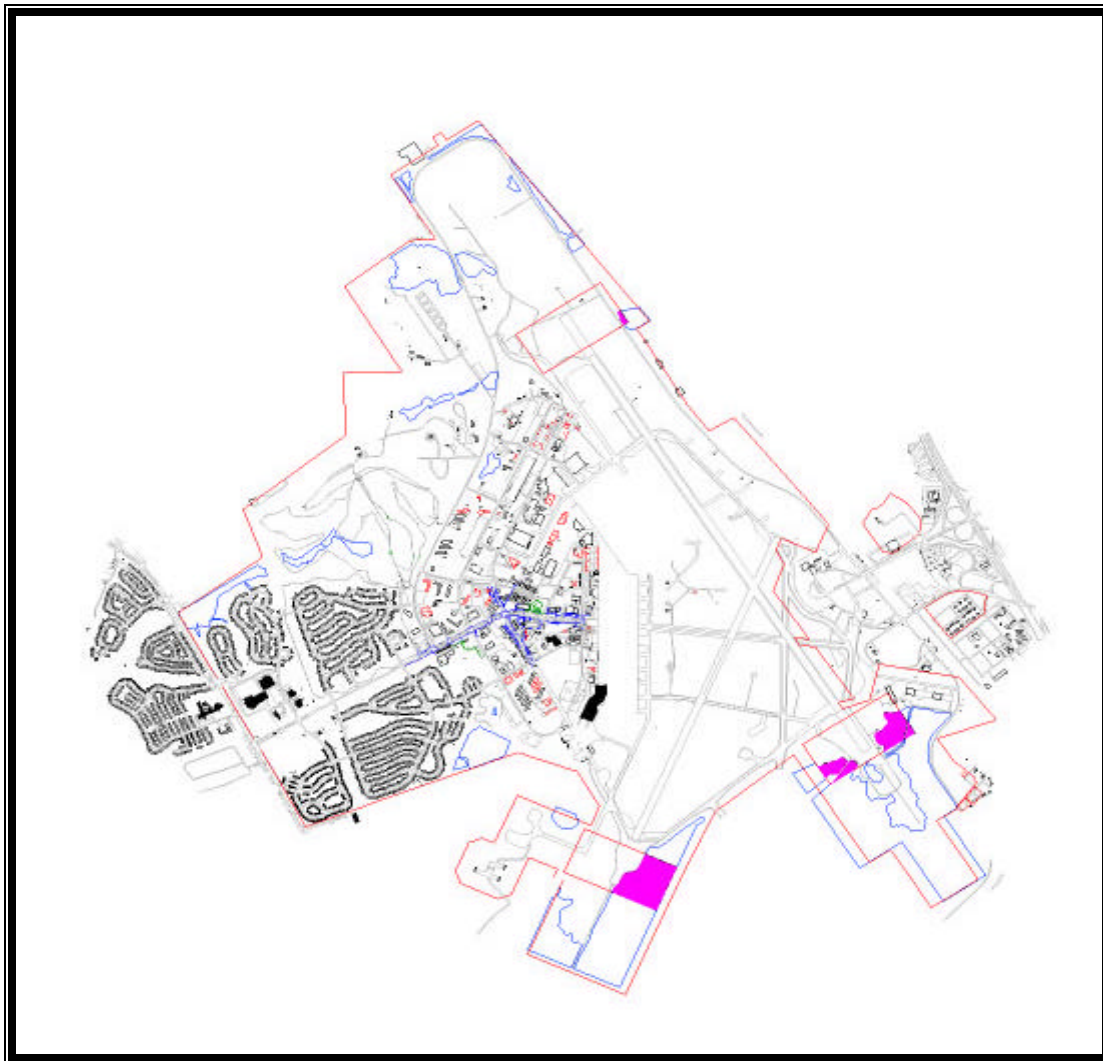
The same areas that presently require land clearing, grubbing and grading, or selective cutting, etc., as outlined by the proposed action, have been periodically cleared in the past when trees became too tall for airfield safety requirements. Many old stumps from previous episodes of cutting were observed during the October–November 2001 site visit. In the future, non-wetland areas within the GA will be maintained as turf; and vegetation in wetland areas will be managed for low-stature species by periodic and selective herbicides treatment to remove undesirable fast-growing and tall-growing species.

Table 2.4. Summary of the Proposed Action to Eliminate Airspace Obstructions at CAFB

Type of Controlled Area	Approximate Acres Involved	Treatment Recommended
Runway 03		
CZ-GA, non-wetland	49	Clear, grub, grade and establish turf. Following clearing, drainage ditch areas may require additional engineering design to sustain a low-maintenance drainage network.
CZ-GA wetland, isolated, non-jurisdictional	2	Tree removal/commercial timber sale using BMPs for harvest in wetland area. Selective and periodic herbicide treatment for undesirable tall and fast growing species.
CZ outside GA, including the A/DS, and TS	124	Selective tree removal by commercial timber sale followed by vegetative management techniques, by cutting or use of herbicides, to promote low-growing, slow-growing native species.
CZ outside GA, A/DS and TS (strip-mined)	14	Cut and leave (phosphate-mined area).
Runway 33		
CZ-GA, non-wetland	46	Clear, grub, grade and establish turf. Following clearing, drainage ditch areas may require additional engineering design to sustain a low-maintenance drainage network.
CZ-GA wetland, non-isolated, jurisdictional	12	Tree removal/commercial timber sale using BMPs for harvest in wetland area. Selective and periodic herbicide treatment for undesirable tall and fast growing species.
CZ outside GA, A/DS, TS	138	Selective tree removal/commercial timber sale, manage vegetative cover by planting low-growing slow-growing native species, followed by periodic selective herbicide treatment to suppress undesirable species.
Runway 15		
CZ-GA, non-wetland	8	Clear, grub, grade and establish turf.
CZ-GA wetland Isolated, non-jurisdictional	1	Tree removal/commercial timber sale using BMP for harvest in wetland area. Selective and periodic herbicide treatment for undesirable tall and fast growing species.

CZ- Clear Zone
 TS- Transitional Zone

A/DS- Approach/Departure Zone
 GA - Graded Area



Note: Red lines at the ends of runways denote clear zones and graded areas. Magenta indicates wetlands.

Figure 2.4a. Wetlands (magenta), graded areas, and clear zones at the ends of Runways 03, 33 and 15 at Charleston Air Force Base. The CZs are depicted as red-outlined squares at the ends of runways, and the graded areas are shown as red-outlined rectangles within those squares.

Figure 2.4b. Clear Zone and Graded Area Treatments at Runway 03

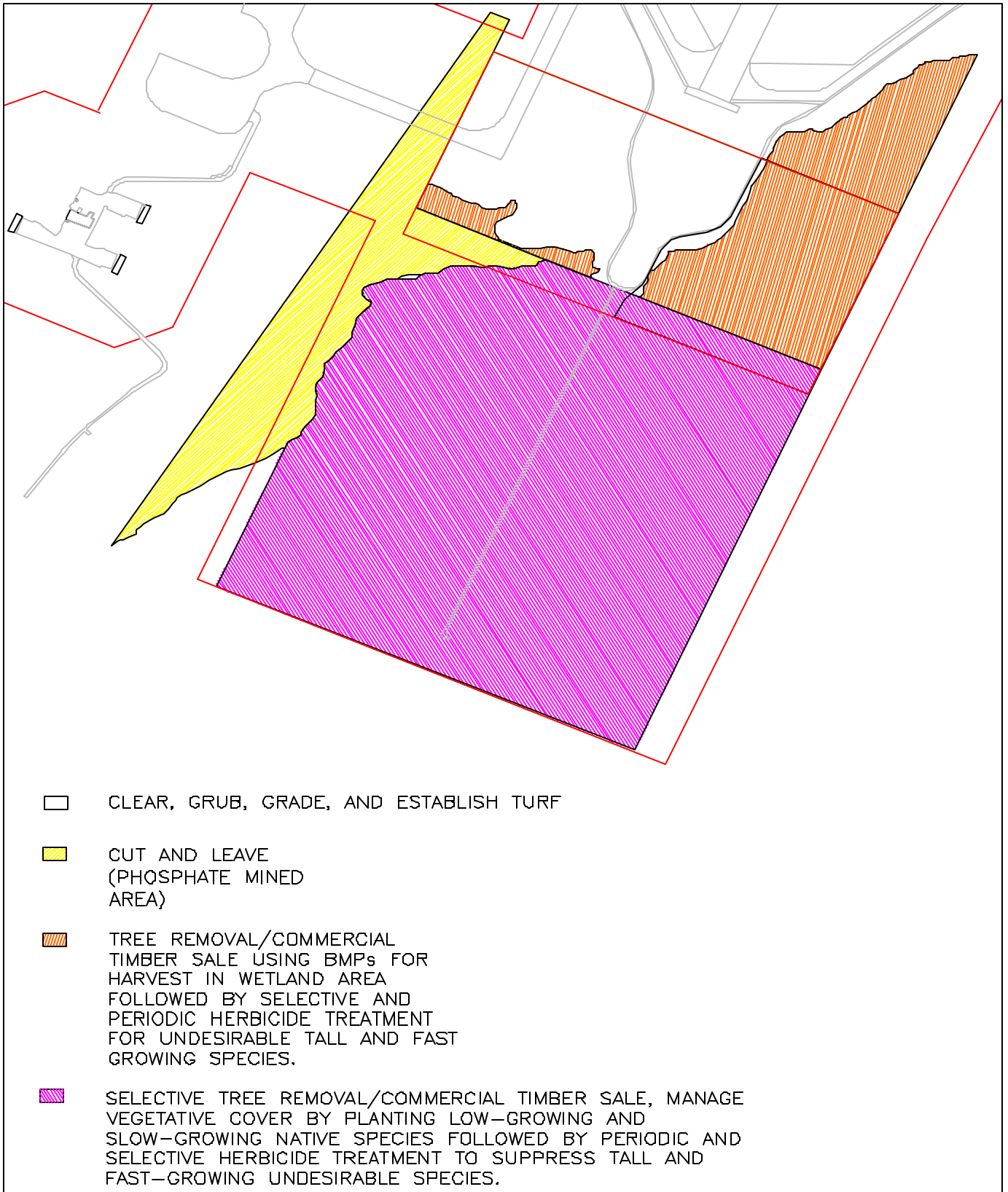
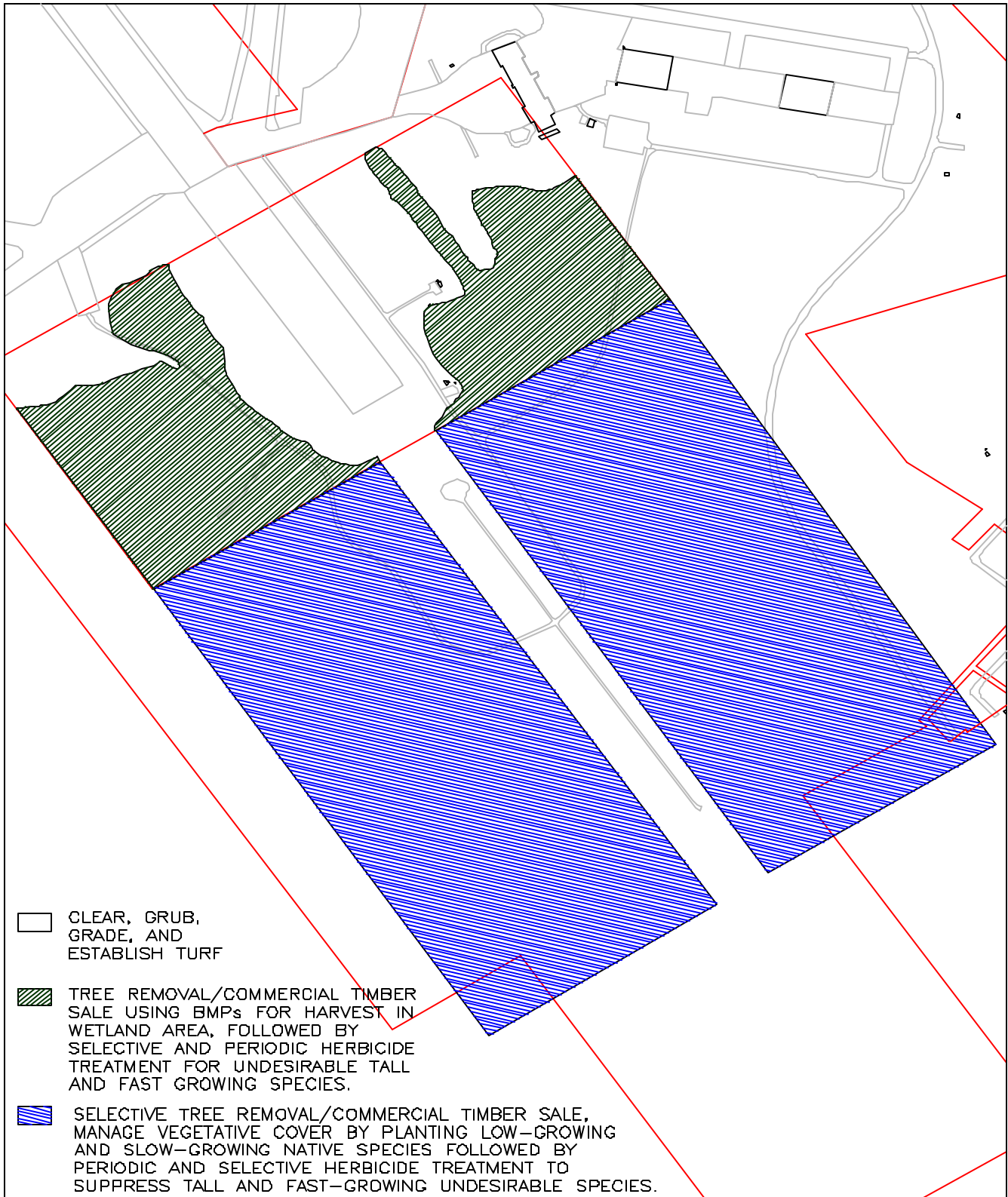


Figure 2.4c. Clear Zone and Graded Area Treatments at Runway 33



3.0 THE AFFECTED ENVIRONMENT

3.1 Introduction

This section describes the existing environmental conditions found at CAFB that may be potentially affected by the proposed action. The region of influence (ROI) determines the geographical area to be addressed as the affected environment. Although the base boundary may constitute the ROI limit for most or all resources, potential impacts associated with certain resources (e.g. water and air quality) may transcend these boundaries.

Located approximately 15 miles inland from the Atlantic Ocean, CAFB consists of 3,772 acres in the town of North Charleston, South Carolina in Charleston County. North Charleston is about 7 miles inland from Charleston, which lies right on the coast between the mouths of the Ashley and Cooper Rivers. Land around CAFB is a mixture of commercial, industrial, residential and open space. The population of Charleston is approximately 80,414. The population of North Charleston is approximately 70,218. The population of Charleston County is approximately 319,921. Charleston County is the largest, and the second most populated county in South Carolina. Average annual daily temperatures range between 75 and 54 degrees Fahrenheit. Average rainfall measures 52 inches per year.

3.2 Air Quality

The federal Clean Air Act (CAA), 42 U.S.C. 7401-7671(q) amended in November 1990, provides that emission sources must comply with air quality standards and regulations that have been established by federal, state, and county regulatory agencies. These standards focus on (1) the maximum allowable ambient pollutant concentrations, and (2) the maximum allowable emissions from individual sources.

The U.S. Environmental Protection Agency (EPA) established the federal standards for the permissible levels of certain pollutants in the atmosphere. The National Ambient Air Quality Standards (NAAQS) have been established for six criteria pollutants: ozone, nitrogen dioxide, particulate matter equal to or less than 10 microns in diameter, carbon monoxide, sulfur dioxide and lead. Table 3.2 provides the ambient air quality standards for the state of South Carolina. Charleston and the vicinity are in attainment with South Carolina air quality standards.

3.3 Noise

In the context of this EA, noise is defined as any undesirable or unwanted sound or audible disturbance, which interferes with normal activity. Intrusive noise interferes with daily activities, as stated above, but is considered especially bad when it makes normal conversation impossible. At times people are willing to endure noise as a tradeoff for the accomplishment of certain tasks such as using loud power tools to save time and energy. Those who identify with the noise and realize it may be important to national defense or humanitarian airlifts may tolerate some level of noise. The C-17 Globemaster produces a tremendous amount of noise but is recognized by most adults as essential to defense of the United States, essential to the war on terrorism, and to humanitarian efforts worldwide.

Table 3.2. South Carolina Department of Health and Environmental Control Air Pollution Control Regulations and Standards

Pollutant	Measuring Interval	Micrograms Per Cubic Meter Unless Noted Otherwise ^{(1) (2)}
Sulfur Dioxide	3 hours	1300 ⁽⁴⁾
	24 hours	365 ⁽⁴⁾
	Annual	80
Total Suspended Particulates	Annual Geometric Mean	75
PM ₁₀	24 hours	150 ⁽³⁾
	Annual	50 ⁽³⁾
Carbon Monoxide	1 hour	40 mg per cubic meter
	8 hour	10 mg per cubic meter
Ozone	1 hour	0.12 ppm ⁽³⁾
Gaseous Fluorides (as HF)	12 hr. avg.	3.7
	24 hr. avg.	2.9
	1 wk. avg.	1.6
	1 mo. avg.	0.8
Nitrogen Dioxide	Annual	100
Lead	Calendar Quarterly Mean	1.5

⁽¹⁾ Arithmetic Average except in case of total suspended particulate matter

⁽²⁾ At 25⁰ C and 760 mm Hg.

⁽³⁾ Attainment determinations will be made based on the criteria contained in Appendices H and K, 40 CFR 50, July 1, 1987.

⁽⁴⁾ Not to be exceeded more than once a year.

3.4 Wastes, Hazardous Materials, and Stored Fuels

Hazardous wastes and materials have been generated and used at CAFB since it became operational. Operations involving hazardous material and wastes include aircraft and ground vehicle maintenance, fuel storage and dispensing, operation of utility systems, general base maintenance activities and fire training. Currently wastes are managed through the Defense Reutilization and Marketing Office (DRMO). Fuels used and stored at CAFB include JP-4, diesel fuel, AVGAS (aircraft fuel) and MOGAS (automobile fuel).

There are three inactive Solid Waste Management Units (SWMUs) in the vicinity of Runway 03. SWMU 53 consisted of an earthen berm with a limestone base used for the controlled burning of flammable substances during fire training exercises. SWMU 60 was a hardfill area that was used for disposal of concrete, used furniture and other non-hazardous debris. SWMU 71 was an ash disposal area that received coal ash from the CAFB heating plant. None of these sites were located in the field. A determination of no further action was recommended for the soil medium, but annual monitoring for the groundwater medium is being performed for these sites.

There are two SWMUs in the vicinity of Runway 33. SWMU 58 is an inactive hardfill area, similar to SWMU 60 above. SWMU 70 was another ash disposal unit like 71 above. A

determination of no further action was also recommended for these sites. However, long term monitoring will be conducted.

3.5 Water Resources

The state of South Carolina is divided into eight major drainage basins. There are two major river basins in the area. The city of Charleston and the surrounding area are within the Ashley and Cooper River Basins, and are bounded by the Ashley River to the south-southwest and the Cooper River to the north-northeast.

The Cooper River Basin encompasses 8 watersheds and 843 square miles. The Cooper River Basin incorporates the Lower Coastal Plain and Coastal Zone regions. Of the half million acres in the basin, 8.3 % is urban, 2.6 % is agricultural, 4.1 % is scrub/shrub, 0.4 % is barren land, 52.7 % is forested, 14.5 % is forested wetland, 1.6 % is non-forested wetland, and 15.8 % is open water. The city of Charleston makes up most of the urban portion. There are a total of 471.2 stream miles in the Basin, together with 60,188.5 acres of lake waters and 13,059.3 acres of estuarine areas. The diverted Santee River flows through Lake Moultrie's Pinopolis Dam and joins Wadboo Creek to form the Cooper River. The Cooper River merges with Mepkin Creek to form the West Branch Cooper River, which then converges with the East Branch Cooper River to reform the Cooper River. The Cooper River then accepts drainage from the Back River, Goose Creek and the Wando River before flowing into Charleston Harbor and the Atlantic Ocean.

The Ashley River Basin encompasses 7 watersheds and 894 square miles. The Ashley River Basin also incorporates the Lower Coastal Plain and Coastal Zone regions of the State. Of the half million acres in this basin, 9.8 % is urban, 4.1 % is agricultural, 7.2 % is scrub/shrub, 0.2 % is barren land, 47.6 % is forested, 7.8 % is forested wetland, 15.1 % is non-forested wetland, and 9.0 % is open water. Again the city of Charleston makes up most of the urban portion. There are a total of 239.6 stream miles in the Basin, together with 4,232 acres of lake waters and 32,701.9 acres of estuarine areas. The Cypress Swamp drains into the Great Cypress Swamp, which joins the Hurricane Branch to form the Ashley River. The Ashley then accepts drainage from several streams, including Dorchester Creek, and communicates with the Stono River by way of Elliot's Cut before flowing into Charleston Harbor and the Atlantic Ocean. The Charleston Harbor also accepts drainage from a portion of the Atlantic Intra-coastal Waterway. There is a small flowing creek approximately 2000 feet south and southeast of Runway 33. Numerous ditches and trenches containing water during the wet season are present at the ends of both runways. See Appendix C for location of water resources.

The wetlands at CAFB serve many important functions that benefit the base. These functions include attenuating floodwater, recharging groundwater, and providing wildlife habitat, among others. The floodwater attenuation function is of greatest direct benefit at those wetlands nearest buildings, roads, and runways. The two largest wetlands at the ends of Runways 03 and 33 provide habitat for large mammals like white-tailed deer. They are also inhabited by a variety of other wildlife including birds of prey. Red-shouldered hawks are heard vocalizing within the forested wetland east of Runway 03. Another ephemerally inundated wetland near the northwestern boundary of the base, and in the general vicinity of the golf course, provides excellent amphibian breeding habitat.

In 1997, a total of 29 wetlands were identified and delineated within the boundaries of CAFB (for a total of 332.9 acres). All but two of the 34 wetlands occurring on CAFB are forested. All of the wetlands have been at least moderately disturbed in the historical past by either logging, or filling at the wetland/upland boundary, or ditching. Some CAFB wetlands have been catastrophically disturbed by phosphate strip-mining (1867-1937), especially the two large wetlands at the ends of Runways 03 and 33. For more information on wetlands at CAFB, see the October 1997 Natural Resource Surveys.

Water quality on base is tested by the CAFB bioengineering office. Water quality meets SCDHEC standards and is reported quarterly to the Vice Commander at Environmental Planning Committee (EPC) meetings.

3.6 Biological Resources

The wooded wetland and upland forested areas at CAFB support a great deal of common species of wildlife, probably due in part to the rich food supply provided by a diverse array of understory species producing fruit and seeds, and mast-bearing trees like oak and beech. The open and scrubby areas also have a lot of bird activity evidenced by multiple sightings of the kinds of birds of prey and songbirds that prefer open habitat like the American kestrel, Northern harrier, meadowlarks and certain types of sparrows. Table 3.6a presents a list of bird species found near the ends of runways at CAFB.

Currently, there are no threatened or endangered species on CAFB. The scrubby open areas near the ends of Runways 03 and 33 also contain habitat for the painted bunting, a South Carolina species of concern. The bird prefers this type of open and brushy habitat with woodlands nearby. The bunting was not observed during the October-November 2001 field survey. Presumably they had already migrated south for the winter. There were a colony (20 pairs) of threatened least terns (*Sterna antillarum*) nesting on the roof of the hospital at CAFB in 1993. They were the objects of surveys during 1994, 1995, and 1996, but they were not observed in any of those years and haven't been documented on the base since 1993. See Appendix A for a list of threatened or endangered species of plants and animals in South Carolina.

Table 3.6a. Bird Species Observed Near the Ends of the Runways at CAFB

Common Name	Scientific Name
Turkey Vulture	Cathartes aura
Northern Flicker	Colaptes auratus
Red-bellied Woodpecker	Melanerpes carolinus
Downy Woodpecker	Picoides pubescens
Yellow-bellied Sapsucker	Sphyrapicus varius
Yellow Rumped Warbler	Dendroica coronata
Barred Owl	Strix varia
American Kestrel	Falco sparverius
Northern Harrier	Circus cyaneus
Red-Shouldered Hawk	Buteo lineatus
Red-tailed Hawk	Buteo jamaicensis
Morning Dove	Zenaida macroura
American Crow	Corvus brachyrhynchos
Fish Crow	Corvus ossifragus
Blue Jay	Cyanocitta cristata
Carolina Chickadee	Parus carolinensis
Tufted Titmouse	Parus bicolor
Carolina Wren	Thryothorus ludovicianus
Brown Creeper	Certhia Americana
Ruby-crowned Kinglet	Regulus calendula
Common Grackle	Quiscalis quiscula
Red-winged Blackbird	Agelaius phoeniceus
Eastern Phoebe	Sayornis phoebe
Great-crested Flycatcher	Myiarchus crinitus
Northern Cardinal	Cardinalis cardinalis
Red-eyed Vireo	Vireo olivaceus
Northern Mockingbird	Mimus polyglottis
American Robin	Turdus migratorius

A ground skink, *Scincella lateralis*, and a box turtle, *Terrepenne Carolina* species, were also observed in the mature forested wetlands and uplands near Runway 33. Small fish and frogs were seen in a drainage off the end of Runway 33. Other wildlife with a high potential to be present in these wooded areas include white-tailed deer (*Odocoileus virginianus*), raccoons (*Procyon lotor*), skunks (*Mephites mephitis*) and cottontail rabbits (*Sylvilagus floridanus*).

Tables 3.6b and 3.6c present lists of tree, shrub, and groundcover species observed in the wetland areas around the ends of runways and surrounding uplands at Charleston Air Force Base. See Appendix B for photos of the forested areas at the ends of runways at CAFB. Only certain wetlands, like the ones at the ends of Runways 03 and 33 (listed as CH11, CH12, CH13 in the CAFB Natural Resource Survey October 1997) contained all of these species. Predominant species were red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), several species of oak, and Loblolly Pine (*Pinus taeda*). A tremendous diversity of small trees and other types of understory species are present in most areas. In the darker and wetter areas, several species of ferns form the ground cover.

Wetland indicator status for plants found at CAFB (Table 3.6b) is obtained from the 1996 National List of Plant Species that Occur in Wetlands. Obligate wetland plants (OBL) describes plants that occur in wetlands 99% of the time. Facultative wetland plants (FACW) occur in wetlands 67-99% of the time. Facultative (FAC) plants are just as likely to occur in wetlands as

not (50/50). Facultative upland (FACU) plants occur in wetlands from 1-33% of the time. Upland (UPL) plants are plants that only occur in upland areas.

Table 3.6b. Trees and Shrubs of Wetlands and Surrounding Uplands at CAFB

Common Name	Scientific Name	Wetland Indicator Status (if known)
Arrow-wood	<i>Viburnum dentatum</i>	FAC
Bay, Red	<i>Persea borbonia</i>	FACW
Beech	<i>Fagus grandifolia</i>	FACU
Birch, River	<i>Betula nigra</i>	FACW
Button-bush, Common	<i>Cephalanthus occidentalis</i>	OBL
Catalpa, Southern	<i>Catalpa bignonioides</i>	FAC-
Cedar, Eastern Red	<i>Juniperus virginiana</i>	FACU-
Cherry	<i>Prunus serotina</i>	FACU
Chinese Tallow-Tree	<i>Sapium sebiferum</i>	FAC
Devil's Walkingstick	<i>Aralia spinosa</i>	FAC
Dogwood, Flowering	<i>Cornus florida</i>	FACU
Elm, Cedar	<i>Ulmus crassifolia</i>	FAC
Sweetgum	<i>Liquidambar styraciflua</i>	FAC+
Hackberry	<i>Celtis occidentalis</i>	FAC
Hawthorne	<i>Crataegus species</i>	OBL-FAC-
Hickory, Mockernut	<i>Carya tomentosa</i>	?
Holly, American	<i>Ilex opaca</i>	FAC-
Holly, Yaupon	<i>Ilex vomitoria</i>	FAC
Hornbeam, American /Blue-beech	<i>Carpinus caroliniana</i>	FAC
Ligustrum	<i>Ligustrum sinense</i>	FAC
Magnolia, Southern	<i>Magnolia grandiflora</i>	FAC+
Maple, Box Elder	<i>Acer negundo</i>	FACW
Maple, Red	<i>Acer rubrum</i>	FACW
Mulberry, Red	<i>Morus rubra</i>	FAC
Oak, Laurel	<i>Quercus laurifolia</i>	FACW
Oak, Live	<i>Quercus virginiana</i>	FACU-
Oak, Red (varieties), Q. pagoda=FAC+	<i>Quercus falcata</i>	FAC+ - FACU
Oak, Swamp Chestnut	<i>Quercus prinus</i>	UPL
Oak, Water	<i>Quercus nigra</i>	FAC
Palmetto, Dwarf	<i>Sabal minor</i>	FACW
Pecan	<i>Carya illinoensis</i>	FAC+
Persimmon, Common	<i>Diospyros virginiana</i>	FAC
Pine, Loblolly	<i>Pinus taeda</i>	FAC
Pine, Longleaf	<i>Pinus palustris</i>	FACU+
Plum	<i>Prunus species</i>	FAC - UPL
Poplar, Yellow	<i>Liriodendron tulipifera</i>	FACW
Sassafras, Common	<i>Sassafras albidum</i>	FAC-
Spanish Dagger	<i>Yucca species</i>	FAC
Spice-bush, Common	<i>Lindera benzoin</i>	FAC+
Sumac, Smooth	<i>Rhus glabra</i>	?
Sycamore	<i>Plantanus occidentalis</i>	FAC-
Tupelo, Black/Blackgum	<i>Nyssa sylvatica</i>	FAC
Wax Myrtle	<i>Myrica cerifera</i>	FAC+
Willow	<i>Salix nigra</i>	OBL

Table 3.6c. Smaller Shrubs and Ground Cover of Wetlands and Surrounding Uplands at Charleston Air Force Base

Common Name	Scientific Name	Wetland Indicator Status (if known)
Pepper Vine	<i>Ampelopsis arborea</i>	FAC+
Muscadine Grape	<i>Vitis rotundifolia</i>	FAC
Carolina Jessamine	<i>Gelsemium sempervirens</i>	FAC
Sourwood	<i>Oxydendrum arboreum</i>	?
Common Deerberry	<i>Vaccinium stamineum</i>	FACU
Honeysuckle	<i>Lonicera japonica</i>	FAC-
Cat Greenbriar	<i>Smilax glauca</i>	FAC
Saw Greenbriar	<i>Smilax bona-nox</i>	FAC
Southern Dewberry	<i>Rubus trivialis</i>	FAC
Poison Ivy	<i>Toxicodendron radicans</i>	FAC
Summersweet Clethra	<i>Clethra alnifolia</i>	FACW
Fern, Cinnamon	<i>Osmunda cinnamomea</i>	FACW+
Fern	<i>Osmunda regalis</i>	OBL
Fern, Chain	<i>Woodwardia virginica</i>	OBL
Fern	<i>Woodwardia areolata</i>	OBL
Lizard's tail	<i>Saururus cernuus</i>	OBL

3.7 Socioeconomic Resources

3.7.1 Regional Economic Development. Within the Ashley River Basin, on the west side of the Ashley River in the Charleston and North Charleston areas, are numerous historic properties including Middleton Place, Drayton hall, Magnolia Gardens, Runnymede Plantation and Charles Towne Landing State Park. These are important scenic, cultural and tourism resources. In this basin, residential developments with a high potential for growth include Amberwood, Jerico on the Ashley, Summerfield, River Oaks, and Shadowmoss in Charleston County. With regard to the Cooper River Basin, the Union Terminal (Sea Port Facility) within the City of Charleston is projected to be an area of population growth. However, areas west of the Cooper River have declined in population and are not expected to grow in the near future. The Navy closed the US Navy Base/Shipyard in 1996. Office, manufacturing, and industrial reuse of this property will occur well into the future. The Bushy Industrial park, which includes several very large industries is also located in this watershed, and should continue to encourage industrial growth.

3.7.2 Local Demographic Information. Demographic information presented below for Charleston County was provided by the Charleston County website. It was compiled from the 1990 Census, South Carolina Department of Commerce, the Berkley-Charleston-Dorchester Council of Governments, the Charleston Metro Chamber of Commerce, and the Charleston County Park and Recreation Department. See Section 3.14 for more detailed information on demographics of the areas nearest to the base and location of the proposed action.

Population

1990	295,039	
2000	309,969	
Percent Change		5%

Distribution of County Residents by Gender

Male	48.3%
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Female 51.7%

Age Distribution

0-17 23.7%
18-64 64.4%
65 and over 11.9%

Income

Median Household Income \$35,150
Persons below poverty level 16.8%

Households (2000 Census)

123,326 total households
2.42 people per household (average)
123,326 year round occupied housing units
Homeownership Rate 61%

Employment by Sector

Total Countywide Employment	169,180 persons
Management, Professional and Related Occupations	35.9%
Service Occupations	17.9%
Sales and Office Occupations	26.2%
Farming, Fishing and Forestry Occupations	0.5%
Construction Occupations	9.5%
Production, Transportation Occupations	9.9%

3.8 Cultural Resources

The Cultural Resource Program at CAFB was started in 1984, when the National Park Service (NPS) conducted a preliminary survey of the relatively undisturbed portions of the Base. The NPS concluded that there was essentially no chance for the discovery of significant archeological resources. The Base and the area around the base have seen a tremendous of human activity and disturbance particularly from phosphate mining and ditching of water around the runways. At the present time, the only way that archeological remains would be encountered would be accidentally during new construction. If that should occur, construction would cease until the proper federal, state and tribal entities are contacted. None of the Cold War properties surveyed are eligible for potential inclusion in the National Register of Historic Places (NRHP).

3.9 Land Use

3.9.1 Regional Land Use. CAFB lies within Charleston County and is part of the Cooper and Ashley River Basin (Watershed numbers 03050201-050 and 03050202-040, respectively). Regional land uses are residential, commercial, industrial and recreational. Industrial uses include manufacturing, mining and landfills.

3.9.2 Land Use at CAFB. CAFB lies in a developed area within the corporate boundaries of North Charleston. Dorchester Road forms the boundary of the base to the west and Interstate Highway (IH) 26 lies to the northeast. The eastern boundary is formed by the Southern Railroad

tracks. Approximately 85% of the land at CAFB is characterized as “improved grounds” and requires maintenance of some type such as mowing and landscaping. The dominant land use of improved grounds includes airfield, aircraft operations and maintenance, and industrial, administrative, and housing. The remaining 15% of land at CAFB includes upland forests, and forested and un-forested wetland areas. Portions of these areas are classified as “semi-improved” which require periodic maintenance. Remaining forests and wetlands are classified unimproved and are not maintained by the Air Force.

3.10 Traffic and Transportation

There are many freeways in the vicinity of Charleston and North Charleston. IH 26 runs northwest to southeast from Charleston to North Charleston and on to Columbia and Spartanburg, South Carolina. IH 526 loops around the city of Charleston and cuts through North Charleston and continues to the southwest where it joins US Highway 17, the Savannah highway. US Highway 78/52 parallels IH 26 towards Columbia. State highway 61 also parallels IH 26 to the west of the two cities. State highway 171 runs south to the coast. Traffic on these roads is fairly heavy in this urban and industrialized area. Some traffic is also attributable to tourism, which is very important in this area. Traffic on the base is fairly light except at the gate during rush hours. See Appendix C for roads and freeways in the area.

3.11 Airfield and Airfield Operations

As stated previously, Charleston AFB is the home of the 437 AW, which provides airlift services for all branches of the Department of Defense, and other governmental agencies. CAFB serves as a crucial link in force protection. CAFB’s mission is to command assigned airlift and supporting units; provide for the airlift of troops and passengers, military equipment, mail and aeromedical airlift; and to participate in operations involving the air-land or airdrop of troops, equipment and supplies.

Formerly, C-141s were the prime transport for air-land and airdrop operations. In 1988, CAFB was selected as the site for the C-17 “beddown.” The transition from C-141s to C-17s began in 1993, but they still fly the C-141 at CAFB. Like the C-141, the C-17 is a transport craft that carries people and equipment to combat locations, re-supplies military installations and diplomatic operations, and carries humanitarian aid around the world. In 1990-1991, during Operation Desert Shield/Desert Storm, CAFB was a major staging base. C-17s have also served critical roles in other Persian Gulf efforts like Desert Fox, and Phoenix Scorpion. They are currently involved with Operation Enduring Freedom in Afghanistan delivering bombs, supporting troops, and providing humanitarian aid.

The 437 AW has four flying squadrons (14th, 15th, 16th, and 17th AS). The 14th and 17th AS are the two active duty squadrons equipped with the C-17 Globemaster III, and the 15th and 16th fly the C-141B. The 315th AW (Reserve) also has four flying squadrons, the 300th, 317th, 701st and 707th AS. The 300th and 317th are equipped with the C-17, and the 701st and 707th fly the C-141.

The City of Charleston also uses the airfield. In 1952, an agreement was drawn up between the AF and the city of Charleston that allowed the establishment of a troop carrier base and joint use

of the runways. A new joint use agreement was signed in 1981 and a new civilian terminal was constructed in 1985.

3.12 Safety and Occupational Health

The public and the AF's primary safety concern are in regard to aircraft crashes. Mishaps include mid-air collisions with other aircraft, collisions with objects, weather-related accidents, and bird-aircraft collisions.

The AF has defined four classifications for mishaps with its aircraft, Class A, B, C, and High Accident Potential. Class A and B are considered most important as they (1) involve losses exceeding \$1,000,000 for injury, occupational illness and property damage, (2) a fatality or permanent total disability, or (3) the destruction or damage beyond economical repair to an AF aircraft. Class B mishaps involve losses exceeding \$200,000 but less than \$1,000,000 for injury, occupational illness and property damage, permanent partial disability, or hospitalization for five or more personnel.

Bird/Wildlife Aircraft Strike Hazard (BASH) is another important concern at flying bases. Many bases have greatly reduced the occurrence of bird strikes by a number of different means. In general, the means to reduce BASH is by awareness, bird control, bird avoidance, and aircraft design. Measures most frequently employed are those that make the flight paths much less welcome to birds and other animals. Precautions to reduce bird strikes include maintaining height of grass on the airfield between 4 and 7 inches, frequently emptying garbage dumpsters near the flightline, and possibly limited application of herbicides to control vegetation near the airfield. Other methods include the use of falconers flying birds of prey, and propane cannons shot at intervals to scare birds away from airfields. At MacDill AFB, a database has been created correlating information including tides, time of day, weather, vegetational cover, calendar date, and various species of birds. The database can then be queried to predict the behavior and occurrence of certain birds. Efforts to reduce BASH are coordinated through the MAJCOM by contacting BASH team personnel at Headquarters AF Safety Agency, Flight Safety Wildlife (AFSA/SEFW) 9700 Avenue G SE, Suite 279A, Building 24499, Kirtland AFB, NM 87117-5671.

At CAFB, the BASH program is conducted in two phases. Phase 1 is everyday bird activity, and CAFB falls into this category most of the time. Phase 2 is declared during bird migration periods. Most guidance for BASH comes from AFPAM 91-212. The following measures are used at CAFB.

- 1.) Vegetation height is maintained at 7-14 inches
- 2.) Reducing "pooling areas" and making the airfield unattractive to birds
- 3.) Use of bird distress calls
- 4.) Mobile and permanent propane cannons
- 5.) Pyrotechnics (screamer sirens, etc.)
- 6.) Last resort taking of individual birds that will not leave the airfield

3.13 Environmental Management-Pollution Prevention and Geology and Soils

Pollution Prevention is very important at CAFB. The DoD has established a Measure of Merit for diversion of non-hazardous solid waste. This measure is supported by AF policy established by HQ USAF/ILEV. The 437th CES/CEV tracks CAFB's performance and reports progress quarterly to Air Mobility Command (AMC) and AFCEE. CAFB is working towards a 40% reduction rate of its waste stream by 2005 and is determined to achieve this goal through cooperation of the entire Charleston AFB team and tenants.

AFI 32-7080 outlines requirements for Pollution Prevention Program at AF Bases. This program is coordinated between the different entities at CAFB including the Services Squadron, Army Air Force Exchange Service, and the Defense Commissary Agency. CAFB recycles paper, plastic, metal, glass, used oil, lead-acid batteries, and tires. Material to be composted includes yard wastes. In addition, AFI 32-7042 outlines requirements for affirmative procurement program for materials with recycled content like paper, retread tires, building insulation, cement/concrete containing fly ash and re-refined oils.

Fifteen soil types have been mapped at CAFB (NRCS, 1993). Most have a large sand constituent. These soil types include:

Albany fine sand, 0-2% slopes;	Meggett fine sandy loam;
Chipley fine sand, 0-2% slopes;	Ogeechee fine sandy loam;
Chisolm fine sand, 0-6% slopes;	Udorthents sandy and loamy;
Coosaw fine sand;	Williman loamy fine sand;
Echaw fine Sand;	Yauhannah loamy fine sand, 0-2% slopes;
Hobcaw fine sandy loam;	Yemassee loamy fine sand; and
Leon fine sand;	Yonges fine sandy loam.
Lynn Haven loamy fine sand;	

The hydrology of CAFB is driven in large part by a combination of low elevation and runoff from paved areas. Much of the natural hydrology has been altered by development including road berms and large impervious surfaces, historic phosphate strip mining, and ditching of water away from the runway. Most of the land disturbance within the wetlands at CAFB occurred prior to government ownership. Phosphate strip mining (which occurred between 1867 and 1937) has left large pits and furrows throughout the undeveloped lands. All of the wetlands near the perimeter of CAFB have been affected by the strip mining. The ditches occurring throughout CAFB, were likely constructed during or shortly after initial base construction.

Udorthents sandy and loamy is the soil found in wetlands at the end of Runways 03 and 33. Lynn Haven loamy fine sand, and Chipley fine sand, 0-2% slopes, are found at the end of Runway 15.

3.14 Environmental Justice

Environmental justice (EJ) is a concept involving race, ethnicity data, and the poverty status of populations within the region of influence (ROI). On February 11, 1994, President Clinton issued Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. The purpose of this order is to avoid the disproportionate placement of any adverse environmental or economic impacts from federal policies and actions on minority and low-income populations. Environmental justice analysis is

performed to identify potential disproportionately high and adverse impacts from a proposed action and to identify alternatives that might mitigate these impacts.

Table 3.14 below compares household income for the city of North Charleston and two zip codes near the location where the proposed action would take place. As can be seen, there does not seem to be an inordinate number of poor people in the areas bounded by these two zip codes. Unfortunately the US Census has not yet released similar income information for specific zip codes.

Table 3.14

	City of North Charleston 2000 Census	Zip Code 29418 1990 Census	Zip Code 29404 (includes CAFB) 1990 Census
No. Of Households	29,783	14,041	1,347
Income < \$10,000	4,656 (15.6%)	1,759 (12.5%)	45 (12%)
Income \$10,000-\$14,999	2,473 (8.3%)	1,397 (9.9%)	146 (10.8%)
Income \$15,000-\$24,999	5,436 (18.2%)	3,494 (24.8%)	473 (35.1%)
Median Household Income	\$29,307	\$26,198	\$25,242
Per Capita Income	\$14,361	\$11,625	\$7,730

U.S. Bureau of the Census
2000 and 1990 Census of Population and Housing

The effect of the proposed action on the potentially affected community should be taken into consideration during EA analysis, particularly with regard to the following:

- Both beneficial and adverse effects on aspects of the environment important to EJ communities
- The degree to which the proposed action may affect the safety and health of such communities, and whether such effects are disproportional compared to the rest of the population
- The degree to which the action may affect unique environmental characteristics valued by the affected communities, such as farm lands, recreation areas, historic places, and culturally valued neighborhoods or businesses
- The potential for impacts to be controversial in the eyes of the affected community
- The potential for uncertain or unknown risks to the community, for example, from the release of chemicals that may or may not have human health implications
- The degree to which the action may set precedents for carrying out other similar actions in the potentially affected community, or in other similar communities
- The contribution the proposed action could make to cumulative impacts on the affected community, including exposure to one or more chemical, biological, physical, or radiological agents across air, water, soil, or other environmental media over time, from single or multiple sources
- The extent to which the action could affect historic properties or other cultural resources important to the potentially affected communities, and
- Whether the proposed action could result in violation of a Federal, State, Indian tribal, or local law designed to protect the potentially affected communities, or communities in general

3.15 Indirect and Cumulative Effects

CEQ regulations state that cumulative impacts result from the “incremental impact of actions when added to other past, present, and reasonably foreseeable future actions regardless of what agency undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”

Cumulative environmental impacts are most likely to arise when a relationship exists between a proposed action and other actions in a similar location, time period, and/or involving similar actions. As an example of cumulative impacts, the Charleston County Aviation Authority (CCAA) recently removed trees on its property adjacent to CAFB Runways 03 and 33. This makes the affect on natural resources in the vicinity greater than those activities undertaken by a single entity, such as CAFB. The proposed action includes the intention of the Air Force to seek and execute easements to remove trees on adjacent private lands that intrude into airfield approach-departure surfaces. Easements executed on private lands would remove offending trees only.

3.16 Coastal Zone Management

Since CAFB is located in the coastal zone of South Carolina, the AF will seek a Finding of Consistency from the South Carolina Office of Ocean and Coastal Resources Management before proceeding with the proposed action.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction.

The purpose of this section is to analyze the environmental consequences of the proposed action and the other alternatives for those resources (natural or human environment) that may be potentially affected by the proposed action.

4.2 Air Quality

Under the proposed action, a minor increase in emissions would be expected during construction, and due to the temporary nature of the project (approximately four to six weeks), the proposed action is not expected to appreciably impact air quality within the ROI. Potential impacts to air quality include fugitive dust and equipment exhaust from logging operations and personal vehicles. Sources of fugitive particulate emissions include site preparation activities such as clearing, grading, and hauling. These types of emissions would be considerably reduced through control measures such as wetting and covering adjacent soil. Vehicles would include logging equipment, trucks to haul away the trees, and personally owned vehicles. Because of the size and duration of the project, and the limited number of vehicles involved in the proposed action, emissions generated as a result of implementing the proposed action would have no appreciable impact on the air quality in the ROI (i.e. *de minimis*).

The proposed activity would not violate the General Conformity Rule because the area around Charleston is in attainment. The General Conformity Rule implements the CAA conformity provision, and mandates that the federal government not engage, support, or provide financial assistance for licensing or permitting, or approve any activity not conforming to an approved State Implemented Plan (SIP) in non-attainment areas. Therefore, the Federal action is exempt from further conformity analyses pursuant to 40 CFR 93.153.

Under the no-action alternative, no significant impact on air quality is anticipated since trees would not be cut and no fugitive dust or emissions from logging vehicles would be produced.

4.3 Noise

Under the proposed action, a minor and temporary increase in noise from logging activities in the immediate proximity of the project would be expected. However, due to heavy civilian and military aircraft landing and taking off, the temporary increase in noise from logging and logging vehicles is expected to be fairly insignificant compared to the noise that local residents and workers are already experiencing.

Under the no-action alternative, no significant impact on current noise levels is anticipated since trees would not be cut and no noise from logging and logging vehicles would be produced.

4.4 Wastes, Hazardous Materials, and Stored Fuels

Construction activities occurring under the proposed action would not have any impact on hazardous materials or stored fuels. Construction vehicles and equipment are a potential source of wastes, hazardous materials, and fuels. Air Force construction contracts do not allow on-site fuel storage or non-routine equipment maintenance. Follow-up vegetation management practices associated with the proposed action would create the potential for herbicide spillage. Air Force pesticide application contract specifications reduce this risk by stipulating that pesticide cannot be stored or mixed on-site. Applicators are only allowed to transport to the work site an amount that is intended to be used in that work day.

The no action alternative would have no effect on wastes, hazardous materials, or stored fuels.

4.5 Water Resources

Under the proposed action, water resources in the immediate vicinity including wetlands will be affected. Erosion of soil and its subsequent transport to nearby bodies of water, together with damage and compaction of the forest floor are the primary impacts involved with logging. BMPs will be employed, as discussed in Section 2, to reduce soil erosion, compaction and siltation of water. Great care will be taken not to disturb streams and wetlands outside the 3000 by 3000 foot CZ. Major water bodies like the Cooper and Ashley River will not be affected due to their distance from the ends of the runways. The Ashley River is over 7000 feet to the southwest of the end of Runway 03, and the Cooper River is over 2 miles to the southeast of the end of Runway 33. See Appendix C for location of water resources in the vicinity of the Base.

The proposed action would affect 12 acres of jurisdictional wetlands and 3 acres of isolated, non-jurisdictional forested wetlands within the clear zone graded areas (CZ/GA) of Runways 03, 33 and 15. Large trees would be removed and the area will be maintained as low-stature trees and shrubs. Other potential affects to water resources may result from the conversion of 103 acres of upland forest to turf within the graded areas, and the selective cutting of 262 acres of forest area in the vicinity of the ends of the runways.

The proposed action may change the type and function of wetlands, but these areas will remain wetlands. The potential exists for the water table to rise after logging, but its rise may be offset to some extent by an increase in the rate of evaporation once the trees and the shade they provide are removed. Flood duration (length of time inundated) during the wet season may also increase. Increased runoff and wider fluctuations in water level may also occur without the dampening effect provided by natural forested wetlands (Mitsch and Gosselink, 1986). The exact relationship between evaporation and vegetated and non-vegetated wetlands is not known, it seems to depend more on the type of wetland and the season than whether the wetland is vegetated or not (Mitsch and Gosselink, 1986). Depressional wetlands in the Northeast have standing water in the winter after trees have lost their leaves, but the standing water soon disappears when trees begin to leaf-out (Bill Sipple, pers. com.). If more standing water is created temporarily or permanently, the proposed action has the potential to create habitat for water birds including the great blue heron (*Ardea herodias*), white ibis (*Eudocimus albus*), and several egret species (*Egretta* sp.), thus increasing BASH problems.

Under the proposed alternative, the disturbance within clear zone wetland areas will be limited to silvicultural activities associated with the removal of large trees and the promotion of low stature trees and shrubs. As a silvicultural activity, the proposed action will not require a Section 404

permit action. Alternative 2 (See 1.7) would require a permit action and thus would require mitigation. Potential mitigation sites on CAFB are available, and include wetlands and riparian areas nearby Hunley Park (former Navy housing area west of the main gate) that are candidates for restoration and enhancement. Enhancement of the wetland near the Family Campground (wetland number 27 in the natural resource survey), with its mature gum pond and amphibian-breeding habitat, is another potential mitigation site.

The no action alternative would have no effect on water resources because no trees would be cut and there would be no effect on local hydrology, water resources, or BASH problems in the area.

4.6 Biological Resources

There are no threatened or endangered species on CAFB according to the South Carolina Department of Natural Resources. Therefore, no threatened or endangered species will be affected by the proposed action.

The proposed action will convert graded areas from a partially forested condition to “openings” dominated by grass. Common species of forest-dwelling wildlife like deer, raccoon, opossum, barred owls, woodpeckers, and red-shouldered hawks will be displaced from the graded areas by land clearing activities. On the other hand, wildlife preferring open areas such the meadowlark, horned lark (*Eremophila alpestris*), Northern Harrier, and others may actually increase. Some BASH potential may be created as well, but probably no more than currently exists due to the large open expanses of turf that are already present around CAFB airfields.

The proposed action will remove much of the overstory forest trees beneath the A/DS and TS. Areas containing mature hardwood overstory will be converted to a younger and more open forest condition. The painted bunting, mentioned earlier in this report, requires early and mixed-successional stages of vegetation for breeding, (Catlin, D., Species Management Abstract, The Painted Bunting, The Nature Conservancy, 2000). It is possible that this bird (and others requiring open habitat) may actually benefit from the proposed action because vegetation in the CZ outside of the GA will be maintained in an early successional stage. Adjacent forest areas outside the project area will remain unaltered, and the combination of open (early successional) and forested areas (later successional) that the bunting requires will be provided. This action has the potential for benefiting the bunting whose numbers have declined at a rate of three percent a year every year between 1966 and 1998 (Catlin, D., Species Management Abstract, The Painted Bunting, The Nature Conservancy, 2000).

Under the no action alternative, no impacts to biological resources are anticipated since the tree cutting would not take place.

4.7 Socioeconomic Resources

The ROI for the proposed activity is CAFB and the immediate vicinity. There are industrial and residential areas all along the eastern and southeastern side of the base. The proposed action should not have a significant impact on local socio-economics in this area because primary activities involved with the proposed action are temporary, would occupy a fairly short time

frame, and would take place within the boundaries of the Base. The proposed action should have no more than a negligible and temporary effect on the community resulting from a slight increase in traffic and noise in the immediate vicinity of the runways. Residents and workers in this area are accustomed to the high noise levels already occurring at the airport. Also, it is possible the proposed action might result in a short-term increase in jobs and income in the local area. Although there are a good number of people living below the poverty level in the County as a whole (18.9%), the temporary nature of the proposed action should not affect their lives.

Under the no action alternative, there would be no effect on socio-economics resources because no clearing would occur.

4.8 Cultural Resources

The National Park Service surveyed CAFB in 1984 for cultural resources and determined that there was very little chance of encountering cultural resources there. It is therefore doubtful that any cultural resources would be discovered during the implementation of the proposed action. Should archaeological or historical resources be found, all work would stop and the proper federal, state and tribal entities would be notified.

Under the no action alternative, there would be no effect on cultural resources because no ground disturbance would occur.

4.9 Land Use

The proposed action will not affect current land uses since land use within and outside of the Base will remain the same. The forest area to be cleared within the graded areas is re-growth resulting from a lack of maintenance in the past. The proposed action will return the graded areas to their previous condition. Airfield operations, residential, and industrial uses would continue as before. A temporary and short-term increase in noise and traffic should be the only effect observed during implementation of the proposed action. New roads or facilities will not be needed to accomplish the proposed action.

Under the no action alternative, nothing would happen and there would be no effect upon land uses in the area.

4.10 Transportation Systems

The proposed action would have a temporary and minor impact on local traffic and transportation because of the relatively small area it encompasses and the short time frame involved with removal of the trees. The proposed action would involve a short-term increase in traffic in the immediate area of the Base most likely on Interstate Highway 26, and possibly Interstate Highway 526 as well, due to the increase in logging and personal vehicles needed during implementation of the proposed action. Traffic on United States Highway 52/78 has the potential to temporarily increase as well on roads like Aviation Drive, Dorchester, Ashley-Phosphate and others that directly or indirectly connect to the interstates.

Under the no action alternative, there would be no effect on transportation systems.

4.11 Airspace and Airfield Operations

Under the proposed action, airfield safety would increase because the potential for an aircraft to hit an obstruction would be greatly decreased after the trees are removed. CAFB would be in compliance with UFC 3-260-01 and the FAR Part 139. Critical airlift operations at CAFB would continue uninterrupted should the proposed action be implemented.

Under the no action alternative, no trees would be cut and airfield operations would continue to be jeopardized.

4.12 Safety and Occupational Health

As stated above, under the proposed action, airfield safety would increase because the potential for an aircraft to hit an obstruction would be greatly decreased after the trees are removed. The potential for life and property-threatening mishaps would be reduced. Removing the trees also reduces the BASH potential because most birds and other types of wildlife are not as attracted to vast areas of turf and short stature shrubs as they are to diverse forests with food and shelter provided by trees and understory shrubs.

Under the no action alternative, no trees would be cut and threats to crew safety and AF property would continue to be a problem.

4.13 Environmental Management – Pollution Prevention and Geology and Soils

The proposed action would have no affect upon the Pollution Prevention Program at CAFB. No wastes would enter the waste stream at CAFB from activities implemented under the proposed action.

The proposed action will result in the grubbing and grading of soils in the upland areas of the GA (see Table 2.4). The proposed action would contribute only very minimally to soil erosion in the immediate vicinity. Runoff, with the potential to create soil erosion, occurs whenever the rate of rainfall exceeds the surface storage capacity and infiltration rate of the soil. Soil is particularly vulnerable when a protective vegetative layer that absorbs the impact of raindrops does not cover it. This is most likely during intense rainfall (greater than two inches per hour). Sandy soil like that at CAFB has a low water-holding capacity and a high infiltration rate, but has large grain size which tends to slow particles down to some degree. Due to the gently rolling to flat topography, soil carried away by rain would probably not travel very far. In all likelihood, water and soil will be carried to the nearest shallow depression (Winegardner, 1996). Mulching and/or seeding greatly reduce or eliminate loss of soil and this is part of the treatment for the sites after clear-cutting. In addition, BMPs specifically designed to reduce soil erosion and compaction during logging and grading will be employed.

Under the no action alternative, no logging or grading would occur and there would be no effect on the Pollution Prevention Program or soils at CAFB.

4.14 Environmental Justice

The proposed action involves a combination of land clearing and grading, and selective tree removal around the ends of the runways at CAFB. This activity would take place near the edge of AF property east and north east of CAFB. The land use just across the boundary of AF property is commercial, industrial, and residential. The only potential effect of the proposed action on property owners or residents outside the Base would be the easements sought to remove or trim trees obstructing airspace outside of CAFB, and the potential slight increase in noise and particulates resulting from the implementation of the proposed action. There are not a disproportionate number of poor people near the boundaries of the base near where the logging and grading would occur. Income is similar across the board (see Table 3.14). In addition, the action will not have an adverse effect on the local community, individual health and safety, unique historic and cultural resources, or local businesses.

Under the no action alternative, no trees would be cut, and no environmental justice issues would arise.

4.15 Indirect and Cumulative Effects

CEQ regulations stipulate that the cumulative effects analysis within the EA consider the potential environmental impacts resulting from the “incremental impacts of the action when added to other past, present, and reasonably foreseeable future action regardless of what agency or person undertakes such other actions.” As stated in Section 3, cumulative effects occur when similar actions take place in approximately the same time frame or location. Other projects with the potential to add to the proposed action are the land clearing around the ends of the runways being conducted by the CCAA, resulting in further loss of forest (or wetlands) to the detriment of forest (and wetland) living wildlife.

One cumulative effect will be the temporary increase in noise, and possibly air emissions, during the proposed logging and land-clearing activities. Due to the short-term nature of the project and the size of the area affected, the incremental contribution of the proposed action should be minor.

Other construction activities are planned at CAFB according to the base General Plan. Most planned construction is associated with the expansion of the Aerial Port Complex (see General Plan). Most construction will take place on existing industrial sites. A new Pallet Storage Building (Building 183) will be located in a forest area along Davis Drive. Land clearing of forest would accommodate a new 13,000 square feet with parking area.

Under the no action alternative, no trees would be cut, and no problems arising from indirect and cumulative effects of additional tree cutting would occur.

4.16 Unavoidable Adverse Effects

Unavoidable adverse affects include the permanent conversion of forest and shrub land to turf or low-stature early-successional trees and shrubs at CAFB. Overstory trees would be removed from wetland areas. Some wildlife would be displaced from the graded areas into neighboring areas of forest and wetland.

Under the no action alternative, no trees would be cut, and no problems arising from unavoidable adverse effects would occur.

4.17 Relationship Between Short-term Uses and Enhancement of Long-term Productivity

Implementation of the proposed action would have a positive effect on long-term productivity by greatly reducing the hazards currently faced by Air Force personnel and aircraft while carrying out their mission of airlifting people and equipment around the world. By removing obstructions to airspace, the critical airlift mission at CAFB is perpetuated.

Under the no action alternative, airfield obstructions remain in place and still present a hazard to personnel and aircraft at CAFB.

4.18 Irreversible and Irrecoverable Commitment of Resources

Logging and grading activities would result in the consumption of fuel by logging equipment and other heavy machinery in addition to the fuel consumed by personally owned vehicles of workers driving to the site. A very small amount of energy to conduct activities under the proposed action would be expended and irreversibly lost.

Implementation of the proposed action will result in the permanent loss of 103 acres of forest and shrubby areas by conversion to turf. Another 291 acres of forest, to include approximately 15 acres of forested wetlands, would be converted from mid-to-late successional forest to a permanent early-successional state. Wetland areas affected represent approximately five percent of the 332.9 acres of delineated wetlands on CAFB according to the 1997 Natural Resources Survey. Fortunately, the amount of forest and wetland that will be lost is small compared to the amounts that exist in the state and the region. In the Cooper River Basin alone, there are one half million acres, of which 52.7% is forested, and 14.5% is forested wetland. This accounts for approximately 336,000 acres. This amount is a small fraction of the total in the Basin. In addition, according to the CAFB Natural Resource Survey conducted in 1997, many of the wetland areas involved in the proposed action are of low quality primarily due to 1) tree species domination by red maple and sweet gum, instead of the original baldcypress (*Taxodium distichum*), tupelo (*Nyssa aquatica*), and mixed oak (*Quercus* species) stands, 2) previous disturbance by phosphate mining, 3) ditching of water around the airfield before and during WWII. The majority of the tree removals in wetlands will occur at the ends of Runways 03 and 33. These wetlands have been heavily disturbed by historical phosphate strip-mining.

Under the no action alternative, trees remain in place and there is no irreversible and irretrievable commitment of resources.

4.19 Coastal Zone Management

Under the proposed action, activities to remove obstructions from airspace around CAFB will occur in the coastal zone. Any federal actions undertaken in the coastal zone must be consistent with South Carolina's Coastal Management Plan. Coordination and/or a Finding of Consistency will be required from the South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Zone Management. CAFB will submit detailed maps, technical information, its wetland delineation, and a detailed description of the project. The state will review the project, provide comments and perhaps request more information. If sufficient information is received and the project is consistent with the state's coastal management plan,

the project then undergoes a 10-day public waiting period, and after that it is either approved or the state will request more information.

Under the no action alternative, no federal action would take place in the coastal zone, and no Finding of Consistency would have to be sought from the Office of Ocean and Coastal Zone Management.

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APPENDIX A

Threatened and Endangered Plant and Animal Species in South Carolina

South Carolina -- 41 listings	
Animals – 22	
<u>Status</u>	<u>Listing</u>
T(S/A)	Alligator, American (<i>Alligator mississippiensis</i>)
E	Bat, Indiana (<i>Myotis sodalis</i>)
T	Eagle, bald (lower 48 States) (<i>Haliaeetus leucocephalus</i>)
E	Heelsplitter, Carolina (<i>Lasmigona decorata</i>)
E	Manatee, West Indian (<i>Trichechus manatus</i>)
T	Plover, piping (except Great Lakes watershed) (<i>Charadrius melodus</i>)
E	Puma, eastern (<i>Puma concolor cougar</i>)
T	Salamander, flatwoods (<i>Ambystoma cingulatum</i>)
T	Sea turtle, green (except where endangered) (<i>Chelonia mydas</i>)
E	Sea turtle, hawksbill (<i>Eretmochelys imbricata</i>)
E	Sea turtle, Kemp's ridley (<i>Lepidochelys kempii</i>)
E	Sea turtle, leatherback (<i>Dermochelys coriacea</i>)
T	Sea turtle, loggerhead (<i>Caretta caretta</i>)
T	Snake, eastern indigo (<i>Drymarchon corais couperi</i>)
E	Stork, wood (AL, FL, GA, SC) (<i>Mycteria americana</i>)
E	Sturgeon, shortnose (<i>Acipenser brevirostrum</i>)
T	Tern, roseate (Western Hemisphere except NE U.S.) (<i>Sterna dougallii dougallii</i>)
T(S/A)	Turtle, bog (southern) (<i>Clemmys muhlenbergii</i>)
E	Whale, finback (<i>Balaenoptera physalus</i>)
E	Whale, humpback (<i>Megaptera novaeangliae</i>)
E	Whale, right (<i>Balaena glacialis</i>)
E	Woodpecker, red-cockaded (<i>Picoides borealis</i>)

Plants – 19	
<u>Status</u>	<u>Listing</u>
T	Amaranth, seabeach (<i>Amaranthus pumilus</i>)
T	Amphianthus, little (<i>Amphianthus pusillus</i>)
E	Coneflower, smooth (<i>Echinacea laevigata</i>)
E	Sunflower, SchweiniTS's (<i>Helianthus schweiniTSii</i>)
T	Pink, swamp (<i>Helonias bullata</i>)
T	Heartleaf, dwarf-flowered (<i>Hexastylis naniflora</i>)
E	Quillwort, black spored (<i>Isoetes melanospora</i>)
T	Pogonia, small whorled (<i>Isotria medeoloides</i>)
E	Pondberry (<i>Lindera melissifolia</i>)
E	Loosestrife, rough-leaved (<i>Lysimachia asperulaefolia</i>)
E	Dropwort, Canby's (<i>Oxypolis canbyi</i>)
E	Harperella (<i>Ptilimnium nodosum</i>)
E	Sumac, Michaux's (<i>Rhus michauxii</i>)
T	Gooseberry, Mic cosukee (<i>Ribes echinellum</i>)
E	Arrowhead, bunched (<i>Sagittaria fasciculata</i>)
E	Pitcher-plant, mountain sweet (<i>Sarracenia rubra jonesii</i>)
E	Chaffseed, American (<i>Schwalbea americana</i>)
E	Trillium, persistent (<i>Trillium persistens</i>)
E	Trillium, relict (<i>Trillium reliquum</i>)

APPENDIX B

Photos of Areas near ends of Runways to be affected by the Proposed Action at CAFB

Runway 03



Photo 1. Inside woods near Runway 03, looking E-SE, approaching creek near Porsche Plant on the other side of Air Force property boundary. Photo shows typical amount of canopy and heavy leaf litter in the interior of the woods E and SE of the ends of Runway 03.



Photo 2. On the other side of the creek looking SW back toward runway 03



Photo 3. Utility cut NE of Runway 03. Note utility wires overhead. This area is near the end of the runway lights.

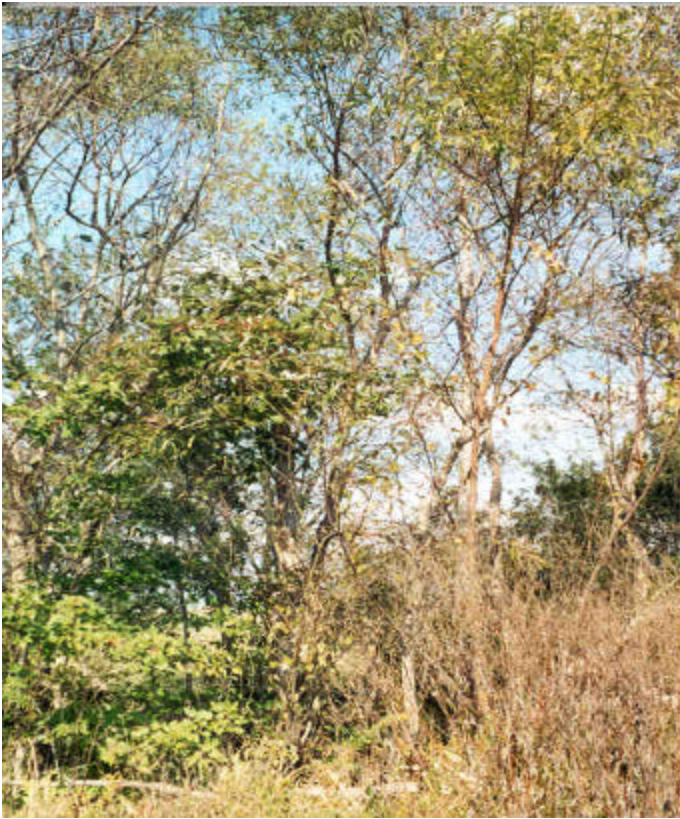


Photo 4. Looking E toward the Porsche Plant (Runway 03)



Photo 5. Edge of the woods NE of the road near Runway 03

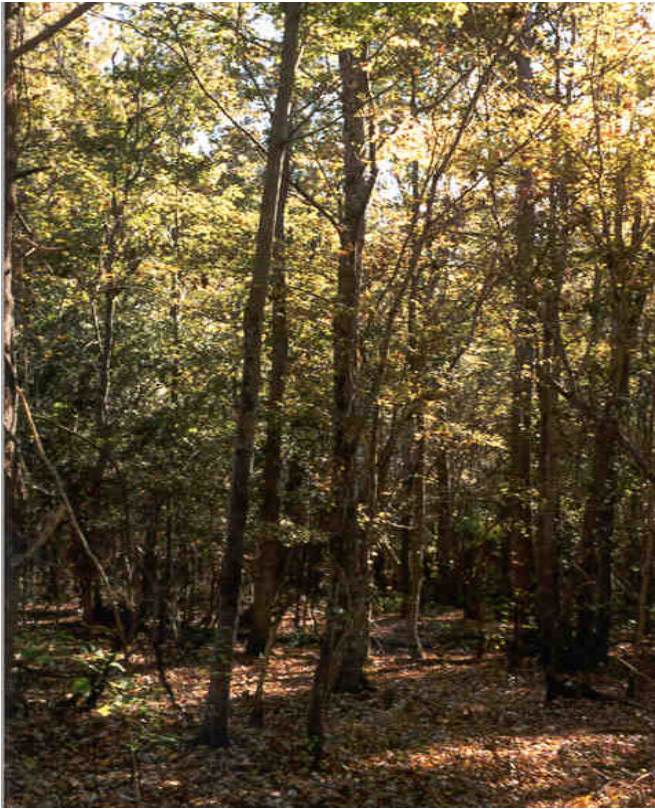


Photo 6. Inside woods heading E towards Porsche Plant (Runway 03)



Photo 7. Inside woods heading E towards Porsche Plant near runway 03. Note vines.



Photo 8. Standing at the little creek looking across at the Porsche Plant



Photo 9. Fungus at base of dead tree about half way between paved road shown in Photo 10 and the creek near the Porsche Plant (Runway 03). Note heavy leaf litter.

Runway 33



Photo 10. Trees near road that leads into the clear zone at the end of Runway 33



Photo 11. Looking E-SE towards the woods at the end of Runway 33



Photo 12. Looking NW towards scrubby area with tall Catalpa Trees near end of Runway 33. Catalpas are the tall trees with large leaves near the top only.



Photo 13. Looking SW across the clear zone at Runway 33



Photo 14. Looking NW down towards Runway 33 lights



Photo 15. Looking at the mature woods at the end of Runway 33



Photo 16. Looking NE not far from road that goes down to the end of the clear zone of Runway 33



Photo 17. Area NE of Runway 33 near runway lights. The trees are lining a small flowing creek NE of the end of the Runway



Photo 18. Looking back down the road towards the locked gate near Runway 33



Photo 19. Looking W-SW toward scrubby areas with catalpa trees near Runway 33



Photo 20. Looking N-NW toward scrubby areas with catalpa trees near Runway 33



Photo 21. Closer look at edge of woods and scrubby area west of the end of Runway 33



Photo 22. Another close look at edge of woods and scrubby area west of the end of Runway 33. Species shown are wax myrtle (far left and far right), cherry (*Prunus* species off center to the left), and tall young pines on the right.

Runway 21



Photo 23. Narrow strip of nice woodland near the end of Runway 21. Some very large oaks and pines are present. Ferns made up the ground cover in the areas along the road.



Photo 24. Looking SE at woods near 21 near the end of Runway 21. Note large trees.



Photo 25. Looking N-NW up Perimeter Road. Note Large pines.



Photo 26. Large pecan tree across from the end of Runway 21

Appendix C



CHARLESTON, NORTH CHARLESTON, AND WATER RESOURCES IN THE VICINITY

APPENDIX D

Mitigation

To mitigate for the impact of the proposed action on wooded wetlands and upland areas at the ends of Runways 03, 33, and 21 at CAFB, the Air Force proposes the following actions.

Both Air Force and Federal Aviation Administration requirements restrict wetland restoration and enhancement in areas adjacent to the runway ends. Attracting birds and other wildlife to enhanced wetland sites near the ends of the runway presents a wildlife strike hazard and puts Air Force personnel and property at risk. Since this where the proposed action will take place, mitigation will occur in nearby areas at distances meeting airfield requirements from the runway approach and departure zones.

Hunley Park is a housing area that was formerly owned by the Navy. It is located west of the main gate of CAFB on the other side of Dorchester Road. It is bounded on the west by the Ashley River and lies about 500 feet east of Popperdam Creek. It now belongs to CAFB. There is a small creek that originates near the center of the Base and flows to the west-southwest across the golf course, under Dorchester Road and across most of Hunley Park via a culvert. Most of this creek on Hunley Park flows via a culvert for approximately 500 feet. This culverted creek is about one mile southwest of the end of Runway 15 at CAFB. The creek then joins with coastal marshes, and ultimately the Ashley River adjacent to Hunley Park. For purposes of this discussion, the creek will be referred to as Golf Course Creek.

The Air Force proposes to excavate, remove the culvert, recreate the channel (complete with natural meanders), perform site preparation, and establish vegetative buffers along Golf Course Creek at Hunley Park. Although restoration and enhancement of this riparian area benefits a different type of water resource than the wooded wetlands to be impacted by the proposed action, it is in the vicinity and will provide benefits to the same watershed by improving the quality of water that reaches the Ashley River and perhaps the local groundwater as well. According to the Army Corps of Engineers (ACOE) and the Natural Resources Conservation Service (NRCS) the benefits of vegetative buffers include the following.

- Improvement of aquatic habitat by shading
- Moderation of water temperature changes
- Enhancement/creation of food chain by addition of detritus
- Reduction in the amount of mowing required due to planting of trees and mulching of the area rather than mowing
- Reduction in sediment load to watershed, reduction in non-point source pollution
- Increase in species diversity
- Attenuation of flooding
- Improvement in Local Air Quality by carbon sequestration and increased oxygen production
- Shore stabilization

And in addition, according to the Natural Resource Survey for Charleston Air Force Base dated October 1997, Golf Course Creek on Hunley Park presents an excellent opportunity to help offset the effects that the proposed action will have on natural resources in the vicinity of the ends of Runways 03, 33 and 21. According to the Natural Resource Survey, Golf Course Creek is culverted for 500 feet on the Hunley Park Property. Beginning at the point where it enters

Hunley Park, the culvert will be removed and the creek channel restored including the natural meanders. Excavation will not be conducted any deeper than it takes to reach buried hydric soils. The intention of this action is to mimic the hydrology and hydraulic variability of the site prior to modification by placement of a culvert.

This area has plant species composition similar, but a little less diverse, than that around the ends of the runways at CAFB. See Chapter 3 of this Environmental Assessment for plant species observed at the ends of runways at CAFB. In addition, the Hunley Park Creek area is dominated by exotic species, like privet (*Ligustrum* species), control of which is mandated by Air Force Instructions. Despite the exotic species, the presence of animal tracks around the unculverted end of the creek, and the many species of migratory and resident birds observed on site, indicates this area has excellent potential for restoration. During the site visit in March 2002, the creek was followed across the golf course beginning at Authur Road to its junction with another creek or tributary. The portion of the creek observed contained sunfish (Family *Centrarchidae*), mosquito fish (*Gambusia affinis*), red-eared sliders (*Trachemys scripta elegans*), and aquatic insects. The empty shells of fresh water mussels (Family *Mitilidae*) were observed and many animal tracks were also observed along the banks of the creek. Burrows of crayfish (Family *Astacidae*) were present in addition. This wide variety of common wildlife indicates that their colonization of the portion of Golf Course Creek on Hunley Park after the culvert is removed and the creek bed restored would occur rapidly.

In the process of restoring the creek bed, exotic species like privet and honeysuckle (*Lonicera japonica*) will be removed. Hay bales, mulch, and biodegradable geotextile material will be applied to the site to greatly reduce or prevent erosion.

According to the NRCS, oaks are an integral part of the wetland and riparian forest ecosystem. However, oaks are a heavy-seeded species, whose seeds do not disperse easily on their own. While planting oaks is the appropriate method to restore native vegetation or create vegetative buffers, oak plantings should be interspersed with shrubs and light-seeded species such as bald cypress (*Taxodium distichum*). To re-create the array of naturally occurring vegetation, bald cypress, tupelo (*Nyssa aquatica*), swamp chestnut oak (*Quercus michauxii*), and laurel oak (*Q. laurifolia*) saplings will be planted along the edge of the creek bed at regular intervals. Above the creek bed, in areas with less frequent or shorter duration inundation, the following native trees will be planted: water oak (*Q. nigra*), cherrybark oak (*Q. pagoda*), and Pecan (*Carya illinoensis*). Plantings of persimmon (*Diospyros virginiana*) will be interspersed among the trees. Extra plants of the above species will be planted to ensure sufficient numbers of trees and shrubs survive. During planting, open spaces will be mulched and left to open to allow for the slower establishment of shade intolerant species so that canopy closure happens gradually. Mulch will not be allowed to touch the sensitive bark of young trees. Required widths of buffer are usually between 25 and 50 feet. Also, brush piles consisting of trimmings from base maintenance activities will be placed among the plantings. Brush piles reduce erosion and create habitat for birds and small wildlife.

Plants listed above are recommended by the NRCS for wetlands. Because plants have different tolerances for hydric conditions, a wetland indicator status is assigned to plants for each region of the United States. This indicator status is obtained from the 1996 National List of Plant Species that Occur in Wetlands. Obligate wetland plants (OBL) describes plants that occur in wetlands 99% of the time. Facultative wetland plants (FACW) occur in wetlands 67-99% of the

time. Facultative (FAC) plants are just as likely to occur in wetlands as not (50/50). Facultative upland (FACU) plants occur in wetlands from 1-33% of the time. Upland (UPL) plants are plants that only occur in upland areas. Wetland indicator status for each recommended plant is as follows.

Plant Species	Wetland Indicator Status
Bald Cypress	OBL
Tupelo	OBL
Swamp Chestnut Oak	FAC
Laurel Oak	FACW
Water Oak	FAC+
Cherrybark Oak	FAC+
Pecan	FAC+
Persimmon	FAC
Dogwood	FACU

Naturally occurring understory species should establish themselves on their own due to their presence in the seed bank (soil), availability of nearby seed sources (less than 200 feet away), and mobile seed dispersers such as birds and mammals, which do not chew up or digest the seeds. Flowering Dogwood (*Cornus florida*) can be added to this mix for aesthetic reasons, and also as food for wildlife. Many species of wildlife eat its red berries, which follow the beautiful blooms. Cherry (*Prunus* species) is already present at the site and should be identified and retained. Although the above-mentioned species recommended for planting are native, they currently are not present at this site. Once or twice weekly inspections to ensure planted native species are surviving, and exotic species are not dominating the freshly cleared site will be required. Under drought conditions they may need additional watering. Trees will need to be watered once or twice a week until plants are established and growing. Watering schedules will depend on the frequency of precipitation. Selective herbicide application will be used to control exotic species. Biological control of pest insects etc. and exotic plants be also be implemented whenever possible. Monitoring and maintenance will be the responsibility of the 437th OG/CC.

The goal of this action is to achieve, over time, climax vegetation, or the natural diversity of mature stands, that originally existed at this site, and at sites all over coastal South Carolina. In restoring the natural creek bed and providing additional species of native vegetation, the Air Force will be creating a much higher quality habitat (i.e. food, nesting sites, and shelter) for migratory and resident birds and other wildlife than that which currently exists at the site. In addition, this will improve water quality in Golf Course Creek and ultimately the quality of water entering the Ashley River and the watershed. Approximate area of Hunley Park restoration is 2.29 acres based on a 50-foot wide buffer with one meander. The meander will approximately double the 500 feet of creek bed to 1000 feet.

The area that contains the culvert is in a large swale approximately 25-30 feet below government housing. The width of the swale containing the creek is approximately 375 feet. Restoration of the creek bed and hydrology should not affect the housing area except for the temporary noise and traffic produced by heavy earth-moving equipment.

As a contingency and if deemed necessary by the Charleston Army Corps of Engineers, other parts of Golf Course Creek could be given vegetated buffers prior to it entering the Golf Course or along its banks at the eastern end of the Golf Course. Again, additional wildlife habitat would

be created, and water quality improved prior to its entering coastal marshes and the Ashley River to the west. At the present time, much of the creek is ditched and surrounded by turf. Its aesthetic value could be greatly improved with native trees and shrubs along its bank. This action would also have the potential of improving the quality of life for military personnel, as the presence of a tree-lined stream would only add to the beauty of the Base.

The Air Force also proposes as additional mitigation for impacts to natural resources near runways at CAFB, the re-connection of wetlands CH16, CH17, and CH27. These wetlands are located approximately 3000 feet southwest of the end of runway 15. These names are derived from the 1997 Natural Resource Survey. Based on professional judgment, local topography, and their alignment, it appears that these individual wetlands were originally connected and may have flowed generally to the southwest toward Popperdam Creek and/or the Ashley River. By re-connecting these wetlands, and by clearing the existing channel of debris (including concrete rip-rap, old 55-gallon drums, and auto parts), habitat for wildlife, and local water quality will be greatly improved. Exotic species like chinaberry trees (*Sapium sebiferum*) and honeysuckle will be removed. In accordance with elevation and soil conditions, exotics existing in upland sites they will be replaced with facultative or upland species. If exotics exist in wetland sites they will be replaced with facultative wetland and obligate wetland species. Exotics existing in intermediate sites will be replaced with facultative wetland or facultative species. Repair of the silt fence along the side adjacent to the baseball diamond would also be performed. As individual wetlands, CH16, CH17 and CH27 occupy approximately 10.34 acres. Their connection would increase the size of wetland acreage to some extent.

Land use around this area includes a baseball diamond to the north, a camping area to the south and a military training area.

The 1997 Natural Resource survey describes CH27 as a medium to high quality wetland that is often flooded but with a depth of only 3 inches. Due to its depth and *Nyssa* canopy cover, it should not be as attractive to birds like herons and egrets (Family *Ardeidae*) that are attracted to open water areas producing a potential Bird Aircraft Strike Hazard (BASH). The Survey further describes CH27 as excellent amphibian breeding habitat. It is probably one of the better wetlands on the base because CH27 is a gum (*Nyssa biflora*) pond. The buttressed trunks of tall and mature *Nyssa* species were observed only at this site on CAFB, indicating that with improvements, it has a very high potential for restoration to high quality. This is primarily due to the fact that the site is not dominated by red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*). Sites that are dominated by these two species are typical of lower quality, early successional, or disturbed and degraded wetland types, and are very abundant on undeveloped areas on CAFB. In addition, some of the more open areas between or within these three wetlands could be further enhanced with vegetated buffers or spot planting of natives, as described above for the Golf Course Creek. If available, ferns, like the cinnamon fern (*Osmunda cinnamomea*) would be good shade-tolerant candidates for groundcover at this site since they are already present in some areas of CH27. CH17 contains *Nyssa* species as well and this is probably another indication that CH27 and CH17 were originally part of a much larger wetland.

Diverse bird life is indicative of environmental quality. Birds were particularly abundant at CH27 and species noted during the March 2002 site visit are listed in the following table.

COMMON NAME	Scientific Name
American Robin	<i>Turdus migratorius</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Blue Jay	<i>Cyanocitta cristata</i>
Yellow-Rump Warbler	<i>Dendroica coronata</i>
Ruby-crowned Kinglet	<i>Regulus calendula</i>
Carolina Wren	<i>Thryothorus ludovicianus</i>
Tufted Titmouse	<i>Parus bicolor</i>
Great-Crested flycatcher	<i>Myiarchus crinitus</i>
Black and White Warbler	<i>Mniotilta varia</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Red-Shouldered Hawk	<i>Buteo Lineatus</i>
Brown Thrasher	<i>Toxostoma rufum</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Red-Tailed Hawk	<i>Buteo jamicensis</i>
Common Grackle	<i>Quiscalis quiscula</i>
Red-Bellied Woodpecker	<i>Melanerpes carolinus</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>
Ring-Billed Gull	<i>Larus delawarensis</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Song Sparrow	<i>Melospiza melodia</i>
Chuck-Will's Widow	<i>Caprimulgus carolinensis</i>
Thrush species (Hermit or Wood)	<i>Catharus guttatus or Hylocichla mustelina</i>

Many of these birds are migratory and their presence at CH27 indicated that this is good habitat for uncommon as well as common species of birds. The Common yellowthroat, a warbler, exhibited nesting behavior and it is probably true that many species utilize CH27 for foraging, nesting, and shelter. Undoubtedly many other species were present but not detected during the single four-hour site visit.

The success of the mitigation activities at Hunley Park and CH16, CH17 and CH27 can be determined by whether the planted trees and shrubs are thriving and by the presence of wildlife utilizing the site. Trees and shrubs at the sites should be checked at least once a week for watering, and to ensure that pest insect or animal species are not damaging them. Once trees and shrubs are established (i.e. beginning to grow after original planting). Baseline measurements can be taken on a random selection of individual tree and shrub species. Then their growth can be periodically measured, recorded, and compared to baseline height and diameter. Care and maintenance of restored areas should be included in the Base Comprehensive Management Plan. For information on tree planting, see <http://www.nrcs.usda.gov/feature/backyard/plantree.html>.

In summary the amount of area to be enhanced and restored on CAFB is approximately 12.63 acres. Under requirements for a 2000 by 1000-foot clear zone, 12.1 acres of jurisdictional wetlands will be affected by the proposed action. The remaining 2.34 acres will be addressed during the permit process as secondary impacts. The amount of acres restored and enhanced could be increased if vegetative buffers were placed on other parts of Golf Course Creek, or on other tributaries on CAFB.

References

4.13.1 Publications

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Natural Resource Survey conducted by Rust Environmental and Infrastructure, Inc. in 1997.

Regulatory Guidance Letter, October 31 2001, No 01-1, Department of the Army, Corps of Engineers.

Vines, R. A., 1976, Trees, Shrubs, and Woody Vines of the Southwest, University of Texas Press, Austin and London.

1.1.1 Websites

Wetland Restoration and Enhancement:

<http://www.pwrc.usgs.gov/wli/wrts1.htm>

<http://www.pwrc.usgs.gov/wli/wris3.htm>

National Resource Conservation Service, Conservation Practice Standard, Wetland Enhancement, Code 659, August 1998.

National Resource Conservation Service, Conservation Practice Standard, Wetland Restoration, Code 657, August 1998.

**FINDING OF NO SIGNIFICANT IMPACT
AND
FINDING OF NO PRACTICABLE ALTERNATIVE**

**Removal of Airfield Obstructions
Charleston Air Force Base**

1. Pursuant to the Council on Environmental Quality regulations, the provisions of the National Environmental Policy Act (40 CFR Parts 1500-1508), and the Air Force Environmental Impact Analysis Process (32 CFR Part 989), the Air Force conducted an assessment of the potential environmental consequences of removing trees from the graded areas and clear zone at Charleston Air Force Base (CAFB), South Carolina. The environmental assessment (incorporated as an attachment to this finding) considered all potential impacts of the proposed action and alternatives, both as a solitary action and potentially in conjunction with other similar projects. This report summarizes the results of the evaluations of the proposed action and alternatives. It analyzes activities that have the potential to affect both the natural and human environment. This analysis summarizes the options evaluated and provides information explaining the need for the proposed action and its effect on human and natural resources. The finding of no practical alternative (FONPA) summarizes the options considered and states why there is no practical alternative to removing obstructions to air navigation at the end of the CAFB runway.

2. Proposed Action:

- a.** The proposed action is the removal of trees in the Graded Area (GA), by land clearing 1000 feet out from the centerline and 1000 feet from the ends of runways in the GA for Runways 03, 33 and 15; the overstory removal of trees intruding in the Approach/Departure (A/DS) and Transitional Surface (TS) of the Clear Zones (CZs) at Runways 03, 33 and 15; and a “cut and leave” treatment west of the end of runway 03 at CAFB. Under this alternative, non-wetland areas within the GA will be grubbed, graded, seeded with grass (converted to turf) and grass height controlled by mowing. Jurisdictional wetlands within the GA will be subject to tree cutting and commercial harvest using Best Management Practices (BMPs) for logging in wetland areas, and followed up by periodic and selective herbicide treatment to remove undesirable fast-growing and tall-growing species.
- b.** Alternatives: Two possible alternatives are as follows. The first alternative involves completely draining, leveling, establishing turf throughout the graded areas of Runways 03, 33, and 15, and then selectively cutting trees intruding in the approach/departure and transitional surfaces of the clear zone by overstory removal and selective herbicide treatment. The second alternative action would be to move Air Force flying missions to other installations, the closest of which is Shaw AFB near Sumter, South Carolina. Neither of these alternatives adequately met selection criteria as put forth in Section 2 of the attached Environmental Assessment.

- c. No Action Alternative. The no action alternative would not remove trees that now obstruct air navigation. Safety hazards for personnel, aircraft, and equipment would continue. Without removal of airfield obstructions in the graded areas, approach/departure and transitional surfaces of the clear zone, CAFB would be unable to continue its airlift mission, and the effectiveness of its mission and the training of its personnel would be seriously degraded. In addition, CAFB will not be in compliance with the Unified Facility Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design* and Federal Aviation Administration Regulations (FAR), part 139.

3. Summary of Findings

a. Biological Resources:

- (1) *Upland Habitat in the Graded Areas of Runways 03, 33 and 15.* The proposed action will directly affect by conversion to turf 103 acres of upland habitat covered with brush, young woodlands and open areas. Permanent impacts to the vegetation outside the graded area will be kept to a minimum. Any adverse impact on wildlife is expected to be short term as species relocate to new habitats. Existing habitat in the graded area will be irreversibly committed to this airfield obstruction removal project.
- (2) *Wetland Habitat in the Graded Areas of Runways 03, 33 and 15.* The proposed action will directly affect approximately 15 acres of wetland by tree cutting and log removal using Best Management Practices for logging in South Carolina wetlands; followed up by selective herbicide for fast-growing and tall-growing tree species.
- (3) *Habitat in the Clear Zone outside Graded Areas of Runways 03 and 33.* The proposed action will directly affect approximately 276 acres in the CZ outside of the GA. A selective tree removal will be performed utilizing a forestry contractor. Selected trees will be marked for removal based on height and species criteria. The prescribed treatment would be aimed at manipulating the vegetation to promote slow-growing and low-stature tree or shrub species. Fast-growing/tall-growing species would be selectively removed, while more compatible low-growing and slow-growing species would be left. The intended result would be to establish a low-maintenance and self-sustaining vegetation cover under the A/DS and transitional surfaces that remains low in stature, is compatible with airfield safety requirements, and remains aesthetically acceptable. Commercial timber harvest contracts will be used to remove trees where feasible. Other trees designated for removal will be cut and left in place.
- (4) *Endangered Species.* No state or federally listed, or candidate species were observed or anticipated to be found at the location of the proposed action, or CAFB as a whole. Consultation with the United States Fish and Wildlife Service confirmed that there are no known threatened or endangered species or species habitat at the proposed site.

- b. Cultural Resources: There are no documented historic or archaeological resources associated with the site chosen for the proposed action or CAFB as a whole.
- c. Solid/Hazardous Waste: The proposed action will not result in the generation of hazardous waste. The expected waste stream will consist of logging debris, which would be recycled at CAFB as mulch for landscaping.
- d. Air Emissions: The region is currently in attainment status. Logging activities and the use of logging equipment will cause a temporary increase in air emissions. The emissions that will be generated during the course of the project will not exceed the *de minimus* threshold triggering the requirement for an air conformity analysis under 40 Code of Federal Regulation Part 93, Subpart B.
- e. Noise: Noise levels in immediate proximity to the project would temporarily increase during the logging phase of the project. There are no sensitive receptors in the immediate proximity of the project area.
- f. Environmental Justice: All environmental impacts will be limited to Charleston AFB. There are no minority or low-income populations in the area of the proposed action, and thus, there will be no disproportionately high or adverse impacts on such populations.
- g. Cumulative Impacts: The General Plan for Charleston AFB identifies one construction project that would result in the permanent removal of forest habitat. As part of the planned expansion of the Aerial Port Complex, a new 13,000 square foot Pallet Storage Building, with parking facilities, will be sited in a forested area along Davis Drive. This project and the proposed action represent a cumulative impact on the forest resources at CAFB.
- h. Relationship Between Short-term Uses and Enhancement of Long-term Productivity: Removing airfield obstructions at CAFB will ensure the installation is capable of meeting current and long-term training requirements and be in compliance with the requirements of UFC 3-260-01 and the FAR, part 39.
- i. Irreversible and Irrecoverable Commitment of Resources: Implementation of the proposed action would irreversibly commit fuels, manpower and costs to the airfield obstruction removal project.

4. Practicable Alternatives: There is no practicable alternative to the proposed action. All other possible alternatives would fail to meet selection criteria as described in Section 2 of the attached EA.

5. Finding of No Significant Impact: Based upon my review of the facts and analyses contained in the attached environmental assessment conducted in accordance with the requirements of the National Environmental Policy Act, the Council on Environmental Quality regulations, and Air Force Environmental Impact Analysis Process regulation 32 CFR 989, I conclude that the Proposed Action will not have a significant environmental impact, either by itself, or cumulatively with other ongoing projects at Charleston AFB. Accordingly, the requirements of NEPA, the regulations promulgated by the CEQ and 32 CFR 989 are fulfilled

and an Environmental Impact Statement is not required. The signing of this combined Finding of No Significant Impact and Finding of No Practicable Alternative (FONSI/FONPA) completes the environmental impact process under Air Force regulations.

6. Finding of No Practicable Alternative: Pursuant to Executive Order 11988, the authority delegated in SAFO 791.1 and taking the information contained in the attached environmental assessment into consideration, I find that there is no practicable alternative to constructing the proposed action in a wetland. The Proposed Action, as designed, includes all practicable measures to minimize harm.

7. The project will be implemented upon approval and after a public review period.

All interested agencies, groups, and persons disagreeing with this decision are invited to submit written comments within 30 days of this notice for consideration by the Charleston Air Force Base Environmental Office. A copy of the EA is available at the Environmental Office, building 247 at Charleston AFB and at the Dorchester County Library on Dorchester road. For questions regarding the EA, contact Mr. Harold Deese, Environmental Engineer, (843) 963-2701, e-mail: harold.deese@charleston.af.mil.

JOHN R. BAKER, Lieutenant General, USAF
Vice Commander, Air Mobility Command

Date

