

ENVIRONMENTAL ASSESSMENT

IMPLEMENTATION OF BASE REALIGNMENT AND CLOSURE (BRAC) RECOMMENDATIONS AND OTHER ARMY TRANSFORMATION ACTIONS AT FORT JACKSON, SOUTH CAROLINA

Prepared for:

**U.S. Army Corps of Engineers
Mobile District**

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EXECUTIVE SUMMARY

ES.1 INTRODUCTION

On September 8, 2005, the Defense Base Closure and Realignment (BRAC) Commission recommended that certain BRAC actions occur at Fort Jackson, South Carolina. These recommendations were approved by the President and forwarded to Congress. Congress did not alter any of the BRAC Commission's recommendations and on November 9, 2005, the recommendations became law.

The BRAC Commission recommendations must now be implemented as provided for in the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510), as amended.

ES.2 PROPOSED ACTION

The BRAC Commission directed actions at Fort Jackson are:

- **Establish New Army Reserve Southeast Regional Readiness Command.** The Commission recommended realignment of the Birmingham Armed Forces Reserve Center (AFRC) Alabama by disestablishing the 81st Regional Readiness Command and establishing the Army Reserve Southeast Regional Readiness Command in a new Reserve Center (RC) on Fort Jackson;
- **Establish New Consolidated Drill Sergeant School.** The Commission recommended realignment of Fort Benning, Georgia and Fort Leonard Wood, Missouri by relocating the Drill Sergeant School (DSS) from each location to Fort Jackson;
- **Establish a Joint Center of Excellence for Religious Training and Education.** The Commission recommended the realignment of Maxwell Air Force Base (AFB), Alabama; Naval Air Station (NAS) Meridian, Mississippi; and Naval Station (NS) Newport, Rhode Island by relocating religious training and education to Fort Jackson, establishing a Joint Center of Excellence for Religious Training and Education (JCERTE); and
- **Relocation of Mobilization Processing Functions.** The Commission recommended the realignment of Fort Eustis, Virginia, Fort Jackson, South Carolina, and Fort Lee, Virginia by relocating all mobilization processing functions to Fort Bragg, North Carolina, and designating it as Joint Pre-Deployment/Mobilization Site Bragg/Pope.

ES.2.1 Force Structure and Population Changes at Fort Jackson

As a result of the force structure changes described in ES.2, there would be an addition of approximately 141 active duty personnel, 233 civilians, and 474 full time equivalent students at Fort Jackson.

Table ES.1 shows the change in installation personnel associated with the proposed actions.

Table ES.1 Population Changes to Occur at Fort Jackson as a Result of BRAC Actions				
Proposed Action	Permanent Party Personnel Military	Permanent Party Personnel Civilian Mission	Student Annual Input	Average Student Load (Full Time Equivalent)
Army Reserve Southeast Regional Readiness Command	40	217	0	0
Consolidated Drill Sergeant School	53	0	1,830	366
Joint Center of Excellence for Religious Training and Education	49	16	1,130 ¹	108 ¹
Relocation of Mobilization Processing Functions	-1	0	0	0
Net change (Increase) to Fort Jackson	141	233	2,960	474
Family Members increase = approximately 225				
1 as per U.S. Air Force and U.S. Navy Chaplain Joint Transition Team Action Officers.				
<i>Source: Fort Jackson, 2006</i>				

ES.2.2 Construction

Implementation of the proposed action would require construction of new facilities and expansion of existing facilities to accommodate the increase in personnel assigned to Fort Jackson. Implementing the proposed action at Fort Jackson would consist of the projects shown in Table ES.2.

Table ES.2 lists proposed facilities projects that have been identified as required to support the proposed action. For each construction project, the table shows the facility, facility's estimated size in square feet, and general site location.

Table ES.2 Proposed BRAC Construction Projects at Fort Jackson			
Project No.	Project Title	Square Feet	Location
64519	Reserve Center for Army Reserve Southeast Regional Readiness Command	79,935	Old Coal Yard next to Gate 1 Traffic Circle
31354	Consolidated Drill Sergeant School	288,350	New Construction at Morgan Street off Kemper Street
65074	Joint Center of Excellence for Religious Training and Education	122,430	New Construction adjacent to Building #10100
Total		490,715	
<i>Source: Fort Jackson, 2006</i>			

ES.3 ALTERNATIVES

ES.3.1 No Action Alternative

Under the No Action Alternative, Fort Jackson would not implement the proposed action. Under the No Action Alternative, none of the activities listed in ES.2 would be implemented.

For realignment actions directed by the BRAC Commission, it will be noted that for the No Action Alternative, maintenance of current conditions is not feasible, since the BRAC actions are required to be implemented by the BRAC legislation.

The No Action Alternative is included as required by the CEQ regulations to identify the existing baseline conditions against which potential impacts will be evaluated. The No Action Alternative must be described because it is the baseline condition or the current status of the environment if the proposed action was not implemented.

ES.3.2 **Alternative 1 – Establishment of New Army Reserve Southeast Regional Readiness Command, Consolidated DSS, and JCERTE; Relocation of Mobilization Processing Functions; Relocation of 5th Brigade Cadet Command, CDC Expansion; Stationing of two Basic Training Battalions** *(Preferred Alternative)*

Under Alternative 1, Fort Jackson would implement the proposed action by:

- Constructing, operating, and maintaining an RC and an organizational storage building to provide adequate space for the new Regional Readiness Command. The RC would be located across Marion Avenue from the Military Entrance Processing Station and adjacent to the traffic circle at the Gate 1 Access Control Point.
- Consolidating the DSSs from Fort Benning and Fort Leonard Wood to this one location, thereby fostering consistency, standardization and training proficiency. The new Consolidated DSS complex would be

located adjacent to DSS statue on a 12-acre tract bounded by Kemper Street, Pickens Avenue, Pender Street, and Marion Avenue.

- Constructing a JCERTE, which would be established to include all religious training and education from Maxwell AFB; NAS Meridian; and the NS Newport. The additional facilities for the new JCERTE would be constructed adjacent to the existing Chaplain Center and School.
- Relocating the Mobilization Processing Functions from Fort Jackson to Fort Bragg.

Other Army Actions at Fort Jackson

In addition, other Army actions that are sufficiently well defined for analysis at this time are forecast to be implemented at Fort Jackson during the FY06-11 timeframe and are included as part of Alternative 1.

- Constructing a 6,190-SF expansion of the existing CDC, located on Chesnut Road in the Enlisted Family Housing Area, to provide adequate space to meet childcare needs. The current main front entrance to the center would be modified to take advantage of the existing Sports Complex parking lot that is located immediately adjacent to the CDC.
- Relocate the 5th Brigade Cadet Command from Fort Bragg to Fort Jackson and construct a 3,000-SF facility adjacent to Building 1436 on the east side of Hardee Street.
- Stationing two Basic Combat Training battalions. These units would occupy and utilize existing facilities, training areas, and ranges at Fort Jackson.

Table ES.3 shows the change in installation personnel associated with these other Army actions.

Table ES.3 Population Changes to Occur at Fort Jackson as a Result of Other Army Actions				
Proposed Action	Permanent Party Personnel Military	Permanent Party Personnel Civilian Mission	Student Annual Input	Average Student Load (Full Time Equivalent)¹
Station Two Basic Combat Training Battalions	100	0	6,800	2,400
Relocate 5th Brigade Cadet Command	5	3	0	0
Expand Child Development Center	0	0	0	0
Net change (Increase) to Fort Jackson	105	3	6,800	2,400

Family Members increase = approximately 168
 1 Number of students annually ÷ number of training periods per year.
 Source: Fort Jackson, 2006

Table ES.4 identifies facilities projects that have been identified as required to support the other Army actions. It is anticipated that no new training facilities would be required for the two Basic Combat Training Battalions. The two additional Basic Combat Training Battalions (a total of approximately 6,800 soldiers) would train with weapons systems and vehicles consistent with existing activities at Fort Jackson.

Table ES.4 Proposed Construction Projects at Fort Jackson			
Project No.	Project Title	Square Feet	Location
NA	5 th Brigade Cadet Command	3,000	New Construction adjacent to Building #1436 on the east side of Hardee Street
65641	Child Development Center expansion	6,190	New Construction expanding Child Development Center (Building #5975 on Chesnut Road)
Total		9,190	

Source: Fort Jackson, 2006

Alternative 1 is the preferred alternative.

ES.3.3 Alternative 2 – Establishment of New Army Reserve Southeast Regional Readiness Command RC, Consolidated DSS, and JCERTE; Relocation of Mobilization Processing Functions

Under Alternative 2, the BRAC-directed actions at Fort Jackson would remain the same as Alternative 1. With implementation of Alternative 2, only those actions recommended by the Commission would be implemented. The construction of the CDC expansion, the relocation of the 5th Brigade Cadet Command, and the stationing of the two BCT battalions would not occur.

ES.4 ENVIRONMENTAL CONSEQUENCES

ES.4.1 No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented, and Fort Jackson would continue to use its current inventory of facilities. The No Action Alternative would not result in any significant impacts on land use; aesthetics and visual resources; air quality; noise; geology and soils; water resources; biological resources; cultural resources; socioeconomics; transportation; utilities; or hazardous and toxic substances in the project areas.

ES.4.2 Alternative 1

Alternative 1 has been identified as the Army's preferred alternative.

Land Use

Direct impacts to land use would be associated with the construction of major new facilities, and expansion or adaptive reuse of existing facilities. The proposed project areas are located within the already built-up cantonment area and, therefore, would not result in significant impacts on land use in the areas.

Aesthetics and Visual Resources

Under Alternative 1, there would be minor adverse impacts to the aesthetics of the surrounding areas. The proposed construction sites are located either on parcels with sparse tree cover or already-cleared industrial sites. Some tree clearing would be required.

Air Quality

Alternative 1 would have minor adverse direct impacts to air quality. Short-term air quality impacts would occur as particulate matter is emitted as a result of construction activities. Both the dust emissions and exhaust emissions associated with construction would be minor, temporary, and confined primarily to the immediate project areas. This alternative would not have any significant impacts on long-term air quality. Increased traffic emissions and energy use in buildings would have a negligible impact to air quality. Direct impacts would be generated from dust and engine emissions during construction activity.

Noise

Alternative 1 would have minor adverse direct noise impacts. During construction there would be short-term, localized noise impacts associated with the operation of construction equipment and machinery, power tools, and the delivery of construction materials. These noise impacts would be minor, temporary, and confined primarily to the immediate project areas. The operation of the RC, DSS, JCERTE, and expanded CDC facilities also would result in minor adverse direct noise impacts. Current noise levels at these project sites are very low. Although the anticipated noise levels of the daily operations at these facilities (e.g., vehicular activity, HVAC operations) are expected to be low, there would be a slight noise increase relative to the existing levels.

Geology and Topography

No direct effects on geology or topography are expected from implementation of Alternative 1. Alternative 1 would have minor adverse direct impacts to soils. Soils would be disturbed by construction activities such as grading, vegetative clearing, and excavating during construction of the new facilities. Soil disturbance has potential to result in erosion and increases in total sediment loads in storm water runoff. Faster rates of runoff would be an indirect impact.

Water Resources

Under Alternative 1, moderate adverse direct impacts to surface water would occur as a result of cut and fill activities, grading, and construction activities at the proposed construction sites. Faster rates of runoff would be an indirect impact.

Biological Resources

Under Alternative 1 there would be moderate direct adverse impacts to biological resources within the cantonment area of Fort Jackson. Removal of existing vegetation would cause minor adverse impacts at potential project sites on the cantonment area. After construction is complete, cleared areas would be landscaped and replanted with grasses, as well as native and non-native (ornamental) plant species.

There would be moderate short- and long-term direct adverse impacts to wildlife under Alternative 1 due to displacement and habitat removal. A variety of mammal and upland bird species may be affected. However, since most of the species inhabiting these disturbed cantonment areas are transient and adaptable, they would move to other similar habitat available in the cantonment area.

No federally-listed threatened or endangered species are known to be present in the cantonment area of Fort Jackson. Training activities associated with the proposed action would occur at existing ranges and training areas in a manner

consistent with existing training activities. Therefore, no impacts to these species are anticipated.

There would be no direct effects on wetlands under Alternative 1, since there are no jurisdictional wetlands occurring within the sites. New activities associated with the alternative would be required to comply with the Clean Water Act's and U.S. Army Corps of Engineers' wetland permitting requirements. Indirect impacts on wetlands would occur through vegetation removal and the increase in water runoff from this activity.

Cultural Resources

Cultural resource surveys have not been completed for this area; however most of these sites have been disturbed. All areas within the main cantonment area at Fort Jackson that are not wooded are thought to be areas that have been previously disturbed. These disturbed areas do not require cultural resources surveys.

There are no known cultural resources located at the proposed Alternative 1 construction sites. Therefore direct impacts to cultural resources are not anticipated with implementation of Alternative 1. However, during construction if any cultural materials are found, all construction would cease, the materials would not be moved, the Fort Jackson Cultural Resources Manager would be contacted immediately, and Fort Jackson would then consult with the Federally Recognized Native American Indian Tribes (FRNAIT) and State Historic Preservation Office (SHPO).

Socioeconomics

Direct short-term beneficial economic impacts would be realized by the regional and local economy during the construction phase of this alternative. In addition, direct long-term economic impacts would be realized from the increase in operations associated with this alternative. These impacts would be in the form of increased business volume, income, and employment associated with the increased on-post operations.

There are no anticipated adverse socioeconomic impacts of the Proposed Action related to environmental justice. Some potential short-term minor adverse effects on the protection of children could be expected due to access to construction sites.

Indirect beneficial impacts would be associated with an increased number of jobs and material purchases during construction activities.

Transportation

Short-term minor adverse impacts to transportation can be expected from traffic congestion due to construction equipment entering and leaving the RC site. More short term traffic congestion would be experienced in the northeastern

section of the cantonment area due to construction vehicles and equipment entering and leaving the DSS, JCERTE, and CDC construction sites.

Utilities

No impacts on utilities are anticipated as a result of the proposed action.

Hazardous and Toxic Substances

During construction, there would be short-term minor adverse impacts from hazardous and/or toxic materials due to the potential for construction equipment to have spills or leaks of antifreeze, hydraulic fluid, oil, and fuel. During operation of the developed sites, there will be long-term minor potential for accidental spills of hazardous and toxic materials such as antifreeze, grease, hydraulic fluid, oil, and fuel from vehicles parked on or traveling on paved parking lots surrounding the building. Indirect impacts would be associated with the increased amount of lead and other heavy metal contamination from range activities.

Cumulative Impacts

Cumulative impacts are the incremental effects of implementing any of the alternatives when added to past, present, and reasonably foreseeable future actions at Fort Jackson and the actions of other parties in the surrounding area. There would be a slight increase in the potential for short-term adverse cumulative impacts to air quality associated with construction, repair, maintenance and operation of additional facilities. Under this alternative there is the potential for cumulative adverse impacts to soils due to soil erosion, removal, and compaction through the implementation of construction, maintenance, and repair projects and ongoing activities on- and off-base. Run-off from soil disturbance may have cumulative adverse affects on downstream water resources. Any cumulative impact to cultural resources would be mitigated as discovered. Beneficial cumulative impacts, in the form of increased business volume, income, and employment associated with construction, repair, renovation and on-going mission and off-post activities. Short-term minor cumulative adverse impacts to transportation can be expected from traffic congestion due to increased traffic. When combined with the potential spills from other construction projects that may be occurring on the installation or in the watersheds that include areas adjacent to the installation, short-term cumulative impacts from hazardous and toxic substances may occur. Cumulative impacts are not expected to be significant.

ES.4.3 Alternative 2

Land Use

Direct impacts to land use would be associated with the construction of major new facilities, and expansion or adaptive reuse of existing facilities. The proposed project areas are located within the cantonment land use designation and therefore would not result in significant impacts on land use in the areas.

Aesthetics and Visual Resources

Under Alternative 2, there would be impacts to aesthetics similar to Alternative 1.

Air Quality

The potential air quality impacts under Alternative 2 would be the same as those of Alternative 1.

Noise

The potential noise impacts under Alternative 2 would be the same as those of Alternative 1.

Direct and indirect impacts associated with Alternative 2 would be similar to those associated with Alternative 1.

Water Resources

Implementation of Alternative 2 would have moderate adverse direct impacts to water resources similar to Alternative 1.

Direct and indirect impacts associated with Alternative 2 would be similar to those associated with Alternative 1.

Biological Resources

Under Alternative 2, construction would have minor direct and indirect impacts on similar vegetation (pine plantation and pine/hardwood forest) and wildlife habitats as for Alternative 1.

Cultural Resources

There are no known cultural resources located at the proposed construction site. Therefore direct impacts to cultural resources are not anticipated with implementation of this Alternative. However, during construction if any cultural materials are found, all construction would cease, the materials would not be moved, the Fort Jackson Cultural Resources Manager would be contacted immediately, and Fort Jackson would then consult with the FRNAIT and SHPO.

Geology and Topography

Alternative 2 would have minor adverse direct impacts to soils similar to those discussed under Alternative 1.

Socioeconomics

The direct socioeconomic impacts under Alternative 2 would be anticipated to be similar to those impacts described under Alternative 1.

Transportation

Impacts to transportation would be the same as in Alternative 1.

Utilities

Alternative 2 would have similar impacts on utilities as Alternative 1.

Hazardous and Toxic Materials

Under this Alternative, impacts from hazardous and/or toxic materials would be similar to those described in Alternative 1.

During construction, there would be short-term minor adverse impacts from hazardous and/or toxic materials due to the potential for construction equipment to have spills or leaks of antifreeze, hydraulic fluid, oil, and fuel. During operation of the developed sites, there will be long-term minor potential for accidental spills of hazardous and toxic materials such as antifreeze, grease, hydraulic fluid, oil, and fuel from vehicles parked on or traveling on paved parking lots surrounding the building.

ES.5 MITIGATION AND BEST MANAGEMENT PRACTICES

No significant adverse or significant beneficial impacts are anticipated as a result of implementing any of the proposed action alternatives or the No Action Alternative. As part of the proposed action, Fort Jackson has identified a number of Best Management Practices (BMP) that would be implemented in association with the proposed construction activities, regardless of the Proposed Action Alternative selected. These measures are designed to avoid, reduce, or eliminate the impact of adverse impacts. For those adverse impacts that cannot be avoided, reduced or eliminated, the BMPs include features designed to protect, maintain, restore, or enhance environmental conditions.

Best Management Practices: Although the examples of standard best management practices described below would reduce any potential adverse impacts of implementing either of the action alternatives, they are not required to reduce the potential impacts below significance levels.

- **Geology and Soils:** Construction activities for the action alternatives would follow a Memorandum of Agreement with the South Carolina Department of Health and Environmental Control to ensure erosion control plans are in effect. Actions occurring on the installation are required to meet existing management plans, standard operating procedures (SOPs), permit requirements, as well as local, State, and federal standards. Programs are in-place to ensure proper soil management and are adequately funded to repair or rehabilitate areas disturbed by military activities.
- **Air Quality:** Techniques will be employed to minimize fugitive dust emissions and open-burning activities would be minimized by regulating the types of materials burned as well as tracking weather conditions.

- **Water Resources:** Best Management Practices (BMPs) will be implemented in accordance with applicable National Pollutant Discharge Elimination System (NPDES) permits and State and local requirements. All construction activities will be conducted in accordance with State, local, and federal guidelines, regulations, and permits, and all identified and available BMPs will be used to minimize potential effects. Appropriate features such as wellhead protection measures, stabilization of disturbed soils, drainage swales, and retention ponds during construction phases to minimize erosion and off-site sedimentation will be implemented in accordance with the State of South Carolina Clean Water regulation requirements for construction activities.
- **Biological Resources:** All soil disturbing activities are reviewed to ensure that impacts to wetlands are avoided or minimized. Trees and vegetation would be maintained and structural erosion control measures would be employed according to standards and specifications of the State of South Carolina and/or the U.S. Environmental Protection Agency document *Stormwater Management for Construction Activities*. Management of prescribed pine tree habitat for red-cockaded woodpeckers would be maintained as outlined in the Endangered Species Management Plan in accordance with the provisions of the Endangered Species Act.
- **Cultural Resources:** Fort Jackson has previously coordinated with the State Historic Preservation Officer (SHPO) and the Federally Recognized Native American Indian Tribes (FRNAIT) concerning proposed project lands within the cantonment area. The FRNAIT and SHPO have agreed that the cantonment area does not have to be surveyed prior to disturbance. Proposed project areas outside the cantonment area have been surveyed for cultural resources and none are known to exist. If artifacts are found during construction within the cantonment area or beyond, work will cease and the FRNAIT and SHPO will be consulted. Integrated Cultural Resources Management Plan procedures will be followed

ES.6 CONCLUSIONS

As analyzed and discussed in the Environmental Assessment, direct, indirect, and cumulative impacts of the each of the Proposed Action Alternatives and the No Action Alternative have been considered and no significant impacts (either beneficial or adverse) have been identified. Therefore, either of the action alternatives considered could be implemented. This conclusion is based on the results of this EA, which has been completed in a manner consistent with stated

requirements. Therefore, issuance of a FNSI is warranted, and preparation of an Environmental Impact Statement is not required.

Therefore, any of the alternatives considered, including the No Action Alternative, could be implemented. However, the No Action Alternative would not support Congressional requirements under the BRAC law (Public Laws 101-510 and 107-107).

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SECTION 1

PURPOSE, NEED, AND SCOPE

1.1 INTRODUCTION

On September 8, 2005, the Defense Base Closure and Realignment (commonly referred to as BRAC) Commission recommended that certain BRAC actions occur at Fort Jackson, South Carolina. These recommendations were approved by the President on September 15, 2005 and forwarded to Congress. Congress did not alter any of the BRAC Commission's recommendations and on November 9, 2005, the recommendations became law. The BRAC Commission recommendations must now be implemented as provided for in the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510), as amended.

The BRAC Commission directed actions at Fort Jackson:

- **Establish New Army Reserve Southeast Regional Readiness Command.** The Commission recommended realignment of the Birmingham Armed Forces Reserve Center (AFRC) Alabama by disestablishing the 81st Regional Readiness Command and establishing the Army Reserve Southeast Regional Readiness Command in a new Reserve Center (RC) on Fort Jackson;
- **Establish New Consolidated Drill Sergeant School.** The Commission recommended realignment of Fort Benning, Georgia and Fort Leonard Wood, Missouri by relocating the Drill Sergeant School (DSS) from each location to Fort Jackson;
- **Establish a Joint Center of Excellence for Religious Training and Education.** The Commission recommended the realignment of Maxwell Air Force Base (AFB), Alabama; Naval Air Station (NAS) Meridian, Mississippi; and Naval Station (NS) Newport, Rhode Island by relocating religious training and education to Fort Jackson, establishing a Joint Center of Excellence for Religious Training and Education (JCERTE); and
- **Relocation of Mobilization Processing Functions.** The Commission recommended the realignment of Fort Eustis, Virginia, Fort Jackson, South Carolina, and Fort Lee, Virginia by relocating all mobilization processing functions to Fort Bragg, North Carolina, and designating it as Joint Pre-Deployment/Mobilization Site Bragg/Pope.

To enable implementation of these recommendations, the Army proposes to provide necessary facilities to support the changes in force structure. This Environmental Assessment (EA) analyzes and documents potential environmental effects associated with the Army's proposed action at Fort Jackson. Details on the proposed action are set forth in Section 2.

1.2 PURPOSE AND NEED FOR PROPOSED ACTION

The purpose of the proposed action is to implement the BRAC Commission's recommendations at Fort Jackson.

The need for the proposed action is to improve the ability of the Nation to respond rapidly to challenges of the 21st century. The Army's mission is to defend the United States and its territories, support national policies and objectives, and defeat nations responsible for aggression that endangers the peace and security of the United States. To carry out these tasks, the Army must adapt to changing world conditions and must improve its capabilities to respond to a variety of circumstances across the full spectrum of military operations.

In previous rounds of BRAC, the explicit goal was to save money and downsize the military to reap a "peace dividend." In the 2005 BRAC round, the Department of Defense (DoD) sought to reorganize its installation infrastructure to most efficiently support its forces, increase operational readiness and facilitate new ways of doing business. Thus, BRAC represents more than cost savings. It supports advancing the goals of transformation, improving military capabilities, and enhancing military value. The Army needs to carry out the BRAC recommendations at Fort Jackson to achieve the objectives for which Congress established the BRAC process.

1.3 SCOPE

This EA has been developed in accordance with the National Environmental Policy Act of 1969 (NEPA) and implementing regulations issued by the President's Council on Environmental Quality (CEQ) and the Army.¹ Its purpose is to inform decision makers and the public of the likely environmental consequences of the proposed action and alternatives.

An interdisciplinary team of environmental scientists, biologists, planners, economists, engineers, archaeologists, historians, and military technicians has analyzed the proposed action and alternatives in light of existing conditions and has identified relevant beneficial and adverse effects associated with the action. The proposed action is described in Section 2, and alternatives, including the No Action Alternative, are described in Section 3. Conditions existing as of 2005, considered to be the environmental "baseline" conditions, are described in Section 4, Affected Environment and Environmental Consequences. The expected effects of the proposed action, also described in Section 4, are presented immediately following the description of baseline conditions for each environmental resource addressed in the EA. Section 4 also addresses the potential for cumulative effects, and mitigation measures are identified where appropriate.

The Defense Base Closure and Realignment Act of 1990 specifies that NEPA does not apply to actions of the President, the Commission, or the Department of Defense,

¹ Council on Environmental Quality *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*, 40 *Code of Federal Regulations* (CFR) Parts 1500–1508, and *Environmental Analysis of Army Actions*, 32 CFR Part 651.

except “(i) during the process of property disposal, and (ii) during the process of relocating functions from a military installation being closed or realigned to another military installation after the receiving installation has been selected but before the functions are relocated” (Sec. 2905(c)(2)(A), Public Law 101-510, as amended). The law further specifies that in applying the provisions of NEPA to the process, the Secretary of Defense and the secretaries of the military departments concerned do not have to consider “(i) the need for closing or realigning the military installation which has been recommended for closure or realignment by the Commission, (ii) the need for transferring functions to any military installation which has been selected as the receiving installation, or (iii) military installations alternative to those recommended or selected” (Sec. 2905(c)(2)(B)). The Commission’s deliberation and decision, as well as the need for closing or realigning a military installation, are exempt from NEPA. Accordingly, this EA does not address the need for realignment.

This EA identifies, documents, and evaluates environmental effects of BRAC and other Army actions at Fort Jackson. The effects at Fort Bragg of the realignment of Fort Jackson by the relocation of all mobilization processing functions to Fort Bragg will be evaluated by that installation.

1.4 PUBLIC INVOLVEMENT

The Army invites public participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision-making. All agencies, organizations, and members of the public having a potential interest in the proposed action, including Native American, minority, low-income, and disadvantaged groups, are urged to participate in the decision making process.

Public participation opportunities with respect to this EA and decision making on the proposed action are guided by 32 Code of Federal Regulations (CFR) Part 651.14. Upon completion, the final EA will be made available to the public for 30 days, along with a draft Finding of No Significant Impact (FNSI). At the end of the 30-day public review period, the Army will consider any comments submitted by individuals, agencies, and organizations on the proposed action, the EA, or draft FNSI. As appropriate, the Army may then execute the FNSI and proceed with implementation of the proposed action. If it is determined prior to issuance of a final FNSI that implementation of the proposed action would result in significant impacts, the Army will publish in the Federal Register a notice of intent to prepare an environmental impact statement, commit to mitigation actions sufficient to reduce impacts below significance levels, or not take the action.

With the review of the draft FNSI, the public may obtain information and/or submit comments through Jim McCracken, NEPA Coordinator. Mr. McCracken’s mailing address is:

HQ, U.S. Army Garrison, Fort Jackson
DLE, Environmental and Natural Resources Division
2563 Essayons Way, IMSE-JAC-LGE (McCracken)
Fort Jackson, SC 29207-5670.

1.5 REGULATORY FRAMEWORK

A decision on whether to proceed with the proposed action rests on numerous factors such as mission requirements, schedule, availability of funding, and environmental considerations. In addressing environmental considerations, Fort Jackson is guided by relevant statutes (and their implementing regulations) and Executive Orders (EOs) that establish standards and provide guidance on environmental and natural resources management and planning. These include the Clean Air Act, Clean Water Act, Noise Control Act, Endangered Species Act, National Historic Preservation Act, Archaeological Resources Protection Act, Resource Conservation and Recovery Act, and Toxic Substances Control Act. Executive Orders bearing on the proposed action include EO 11988 (Floodplain Management), EO 11990 (Protection of Wetlands), EO 12088 (Federal Compliance with Pollution Control Standards), EO 12580 (Superfund Implementation), EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), EO 13045 (Protection of Children from Environmental Health Risks and Safety Risks), EO 13101 (Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition), EO 13123 (Greening the Government Through Efficient Energy Management), EO 13148 (Greening the Government Through Leadership in Environmental Management), EO 13175 (Consultation and Coordination with Indian Tribal Governments), and EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds). These authorities are addressed in various sections throughout this EA when relevant to particular environmental resources and conditions. The full text of the laws, regulations, and EOs is available on the Defense Environmental Network & Information Exchange Web site at <http://www.denix.osd.mil>.

SECTION 2 PROPOSED ACTION

2.1 INTRODUCTION

The proposed action is the implementation of the Commission's recommendations as required by the BRAC legislation, Public Laws 101-510 and 107-107.

BRAC-directed actions:

- **Establish New Army Reserve Southeast Regional Readiness Command at Fort Jackson.** Realignment of the Birmingham AFRC Alabama by disestablishing the 81st Regional Readiness Command and establishing the Army Reserve Southeast Regional Readiness Command in a new RC on Fort Jackson, South Carolina.
- **Establish New Consolidated DSS at Fort Jackson.** Realign Fort Benning, Georgia, and Fort Leonard Wood, Missouri, by relocating the DSS from each location into a Consolidated DSS at Fort Jackson.
- **Establish New JCERTE at Fort Jackson.** Realign Maxwell AFB, Alabama; NAS Meridian, Mississippi; and NS Newport, Rhode Island, by relocating religious training and education to Fort Jackson, establishing a JCERTE.
- **Relocation of Mobilization Processing Functions from Fort Jackson.** Realignment of Fort Eustis, Virginia, Fort Jackson, and Fort Lee, Virginia, by relocating all mobilization processing functions to Fort Bragg, North Carolina, designating it as Joint Pre-Deployment/Mobilization Site Bragg/Pope.

The proposed action analyzed in this document involves force structure and installation population changes, garrison facility requirements, cantonment area training facility requirements, and changes to the number of weapons and vehicles stored and used on-post. The proposed action would be implemented over time. Each of these components is discussed separately below.

2.2 FORCE STRUCTURE AND FORT JACKSON POPULATION CHANGES

Force structure refers to the numbers, size, and composition of units comprising Army forces. BRAC recommendations eliminate force structure through inactivation of units assigned to the installation and add force structure through creation of new units, realignment of existing units, or reassignment of units from overseas.

2.2.1 Existing Fort Jackson Structure and Population

Fort Jackson (Figure 2-1) is the largest and most active Initial Entry Training Center in the U.S. Army, training 34 percent of all new soldiers and 69 percent of the women entering the Army each year. Providing the Army with trained, disciplined, motivated and physically fit soldiers is the installation's primary mission. Accomplishing the

training mission means training more than 45,000 basic training and advanced individual training soldiers every year.

The installation has other missions as well. Fort Jackson has added several new schools and training institutions since 1995 including the U.S. Army Soldier Support Institute, the U.S. Army Chaplain Center and School, and the Department of Defense Polygraph Institute.

The installation encompasses more than 52,000 acres of land including over 53 ranges and field training sites and 1,000 buildings.

An additional 14,000 soldiers attend courses at the Soldier Support Institute, Chaplain Center and School, and Drill Sergeant School annually. More than 3,600 active duty soldiers stationed at Fort Jackson and their 10,000 family members make the installation and the surrounding area their home. Fort Jackson employs almost 5,200 civilians and provides services for more than 115,000 retirees and their family members.

2.2.2 BRAC-directed Population Changes at Fort Jackson

Fort Jackson would remain the home to the US Army Training Center. BRAC-directed changes at Fort Jackson include:

- Establish new Army Reserve Southeast Regional Readiness Command;
- Establish new Consolidated DSS; -
- Establish new JCERTE;
- Relocation of Mobilization Processing Functions;

As a result of these force structure changes, there would be an addition of approximately 141 active duty personnel, 233 civilians, and 474 full time equivalent students at Fort Jackson.

Table 2.1 shows the change in installation personnel associated with the proposed BRAC actions.

Table 2.1 Population Changes to Occur at Fort Jackson as a Result of BRAC Actions				
Proposed Action	Permanent Party Personnel Military	Permanent Party Personnel Civilian Mission	Student Annual Input	Average Student Load (Full Time Equivalent)
Army Reserve Southeast Regional Readiness Command	40	217	0	0
Consolidated Drill Sergeant School	53	0	1,830	366
Joint Center of Excellence for Religious Training and Education	49	16	1,130 ¹	108 ¹
Relocation of Mobilization Processing Functions	-1	0	0	0
Net change (Increase) to Fort Jackson	141	233	2,960	474
Family Members increase = approximately 225 1 as per U.S. Air Force and U.S. Navy Chaplain Joint Transition Team Action Officers. Source: Fort Jackson, 2006				

2.3 GARRISON FACILITIES

Implementation of the proposed action would require construction of new facilities and expansion of existing facilities to accommodate the increase in personnel assigned to Fort Jackson. Table 2.2 identifies proposed facilities projects that have been identified as required to support the proposed action. For each construction project, the table shows project number, project title, facility's estimated size in square feet (SF), and general site location.

Project No.	Project Title	Square Feet	Location
64519	Reserve Center for Army Reserve Southeast Regional Readiness Command	79,935	Old Coal Yard next to Gate 1 Traffic Circle
31354	Consolidated Drill Sergeant School	288,350	New Construction at Morgan Street off Kemper Street
65074	Joint Center of Excellence for Religious Training and Education	122,430	New Construction adjacent to Building #10100
Total		490,715	
<i>Source: Fort Jackson, 2006</i>			

2.4 TRAINING FACILITIES

Implementation of the proposed BRAC actions would not require improvements to the maneuver and firing ranges at Fort Jackson. The available existing facilities would allow the troops to train to the requirements of the U.S. Army Training and Doctrine Command (TRADOC).

2.5 WEAPON SYSTEMS AND VEHICLES

Implementation of the proposed action would not result in changes in the types and varieties of equipment used by units assigned to Fort Jackson. The RC would be a Garrison Unit (administrative functions only) and does not have authorization for equipment. There would be 257 additional personnel who would use privately owned vehicles (POVs). The RC would provide parking for approximately 95 percent of the anticipated personnel. The JCERTE would entail an approximately 65 additional full time personnel who would use privately owned vehicles POVs.

2.6 SCHEDULE

Under the BRAC law, the Army must initiate all realignments not later than September 15, 2007, and complete all realignments not later than September 15, 2011².

² Section 2904(a), Public Law 101-510, as amended, provides that the Army must "... initiate all closures and realignments no later than 2 years after the date on which the President transmits a report [by the BRAC Commission] to the Congress ... containing the recommendations for such closures or realignments; and ...

Implementation of the proposed action would occur over approximately 5 years. Facilities construction would be synchronized to meet the needs, on a priority basis, of units being relocated. Establishment of new units would occur as facilities for their operations and support become available.

The schedule for implementation of the proposed action must balance facilities construction timeframes and planned arrival dates of inbound units and stand-up dates of newly established units, all within the 6-year limitation of the BRAC law.

complete all such closures and realignments no later than the end of the 6-year period beginning on the date on which the President transmits the report ... ” The President took the specified action on September 15, 2005.

SECTION 3 ALTERNATIVES

3.1 INTRODUCTION

A basic principle of NEPA is that an agency should consider reasonable alternatives to a proposed action. Considering alternatives helps to avoid unnecessary impacts and allows analysis of reasonable ways to achieve the stated purpose. To warrant detailed evaluation, an alternative must be reasonable. To be considered reasonable, an alternative must be ready for decision-making (any necessary preceding events having taken place), affordable, capable of implementation, and satisfactory with respect to meeting the purpose of and need for the action. The following discussion, and that in Section 3.3, identifies alternatives considered by the Army and identifies whether they are feasible and, hence, subject to detailed evaluation in this EA.

Alternatives for implementation of the proposed action have been examined according to three variables: means to physically accommodate realigned units, siting of new construction, and schedule. This section presents the Army's development of alternatives and addresses alternatives available for the proposed action. The section also describes the No Action Alternative.

3.2 DEVELOPMENT OF ALTERNATIVES

3.2.1 Means to Accommodate Realigned or Relocated Units

Realignment or relocation of units and the establishment of new units involve ensuring that the installation has adequate support facilities for personnel and their operational requirements. The Army considers four means of meeting increased space requirements, as follows:

- Use of existing facilities;
- Modernization or renovation of existing facilities;
- Leasing of off-post facilities; and
- Construction of new facilities.

Army Regulation 210-20, Master Planning for Army Installations, establishes Army policy to maximize use of existing facilities. The regulation directs that new construction will not be authorized to meet a mission that can be supported by existing underutilized adequate facilities, provided that the use of such facilities does not degrade operational efficiency. Under this policy, selection and use of facilities to support mission requirements adheres to the foregoing four choices in the order in which they are listed. That is, if there are adequate existing facilities to accommodate requirements, and absent other overriding considerations, further examination of renovation, leasing, or construction alternatives is not required.

Similarly, if a combination of use of existing facilities and renovation satisfies the Army's needs, leasing or new construction need not be addressed. New construction may proceed only when use of existing facilities, renovation, leasing, or a combination of such measures are inadequate to meet mission requirements.

3.2.2 Siting of New Construction

The Army considers both general and specific siting criteria for construction of new facilities.

General siting criteria include:

- consideration of compatibility between the functions to be performed and the installation land use designation for the site;
- adequacy of the site for the function required, proximity to related activities;
- distance from incompatible activities, availability and capacity of roads;
- efficient use of property;
- development density;
- potential future mission requirements; and
- special site characteristics, including environmental incompatibilities.

Specific siting criteria include consideration of location of the workforce and efficient, streamlined management of functions. Collocation of similar types of functions, as opposed to dispersion, permits more efficient use of equipment, vehicle, and other assets.

3.2.3 Schedule

Alternatives for scheduling of proposed relocation actions are principally affected by three factors: the availability of facilities to house relocated personnel and functions, efforts to minimize potential disruption of mission activities based on the number of personnel involved in the relocation or the amount of work to be performed, and early realization of benefits to be gained by completion of the realignments. In most cases, minor shifts in schedule would not produce different environmental results.

3.3 PROPOSED ACTION IMPLEMENTATION ALTERNATIVES

The following alternatives will be included in this NEPA document.

3.3.1 No Action Alternative

The No Action Alternative will be included as required by the CEQ regulations to identify the existing baseline conditions against which potential impacts will be evaluated. The No Action Alternative must be described because it is the baseline condition or the current status of the environment if the proposed action was not implemented. For actions directed by the BRAC Commission, it will be noted that for

the No Action Alternative, maintenance of current conditions is not feasible, since the BRAC actions are required to be implemented by the BRAC legislation..

Under the No Action Alternative, Fort Jackson would not implement the proposed action.

3.3.2 Implementation Alternatives for BRAC-directed Realignment and Relocation Actions

Although BRAC legislation eliminates the need to decide whether to realign an installation or transfer a function to another installation, it does not eliminate the requirement for an environmental analysis of how the relocation of units or activities is conducted at the designated installation. Alternatives of how the units or activities could be transferred might include: phasing the move, relocating to interim facilities at the gaining installation, use of renovated facilities versus new construction, or alternative siting of construction at the gaining installation.

Discretionary actions are not exempted from consideration of all alternatives that would be considered for any typical NEPA analysis. Discretionary realignment alternatives might also include: phasing the move, relocating to interim facilities at the gaining installation, use of renovated facilities versus new construction, or alternative siting of construction at the installation.

The Proposed Action

1. The Commission recommended realignment of the Birmingham AFRC to Fort Jackson by constructing, operating, and maintaining an RC and an organizational storage building to provide adequate space for the new Army Reserve Southeast Regional Readiness Command.

To support this action, Fort Jackson proposes to construct project (PN) 64519 Reserve Center. The new approximately 79,935-SF facility would alleviate the overcrowded and substandard space located at the Birmingham AFRC by providing space for administrative, educational, assembly, library, learning center and physical fitness areas for the Army Reserve unit.

2. The Commission recommended realignment of Fort Benning and Fort Leonard Wood by relocating the DSS from each location to Fort Jackson.

To support this action, Fort Jackson proposes to construct PN 31354 Consolidated DSS.

The realignment at Fort Jackson would include consolidating the DSSs from Fort Benning and Fort Leonard Wood to this one location, which would foster consistency, standardization, and training proficiency. The approximately 288,350-SF training complex would include constructing, operating and maintaining school administration and operations offices and areas, classrooms, instructor preparation areas, dining hall, auditorium, student billeting with dayrooms, lounges, common and vending areas, laundry rooms, arms storage and distribution rooms, latrines, supply and bulk

storage areas, utilities monitoring and control system connection (UMCS), fire alarms, communication, information systems and intrusion detection systems (IDS).

3. The Commission recommended establishing the JCERTE at Fort Jackson.

To support this requirement, Fort Jackson proposes to construct PN 65074 Religious Education and Training Center.

The approximately 122,430-SF JCERTE would be established at Fort Jackson to include all religious training and education from Maxwell AFB, NAS Meridian, and the NS Newport.

4. The Commission recommended realignment of Fort Eustis, Fort Jackson, and Fort Lee by relocating all mobilization processing functions to Fort Bragg, designating it as Joint Pre-Deployment/Mobilization Site Bragg/Pope.

No construction would occur at Fort Jackson as a result of the relocation of Mobilization Processing Functions from Fort Jackson.

3.4 DEVELOPMENT OF IMPLEMENTATION ALTERNATIVES

Alternative methods of supporting the BRAC action were identified by a diverse team of military planners and environmental specialists. This team of personnel identified a range of implementation components and then reviewed, screened, and grouped them into alternatives. The implementation components were grouped into two categories:

- means to physically accommodate the relocated units, and
- siting of proposed construction.

3.4.1 Means to Physically Accommodate Realigned Units

Implementation of the recommendations at Fort Jackson would add approximately 141 active duty personnel, 233 civilians, and 474 full time equivalent students at Fort Jackson.

Evaluation of all facilities at Fort Jackson shows a shortfall in built space to accommodate the additional personnel. Overall, the installation requires approximately 490,715 SF of additional space to meet the needs of the proposed action.

Use of off-post leased space to meet Fort Jackson's requirements would involve several major drawbacks. Force protection policies specify certain facilities characteristics, such as physical security features, setback distances from roadways, and "hardened" construction. Use of leased space in the private sector – having personnel and equipment both on- and off-post – would adversely affect command and control functions, result in higher operational costs, and impair efficient use of resources. For these reasons, use of leased space is not feasible and is not further evaluated in this EA.

Construction of new facilities is driven by the need to ensure adequate space is available for mission requirements. Fort Jackson's existing 10,509,201 SF of space is, with very minor exception, fully utilized for current mission requirements. Accordingly, new construction is required.

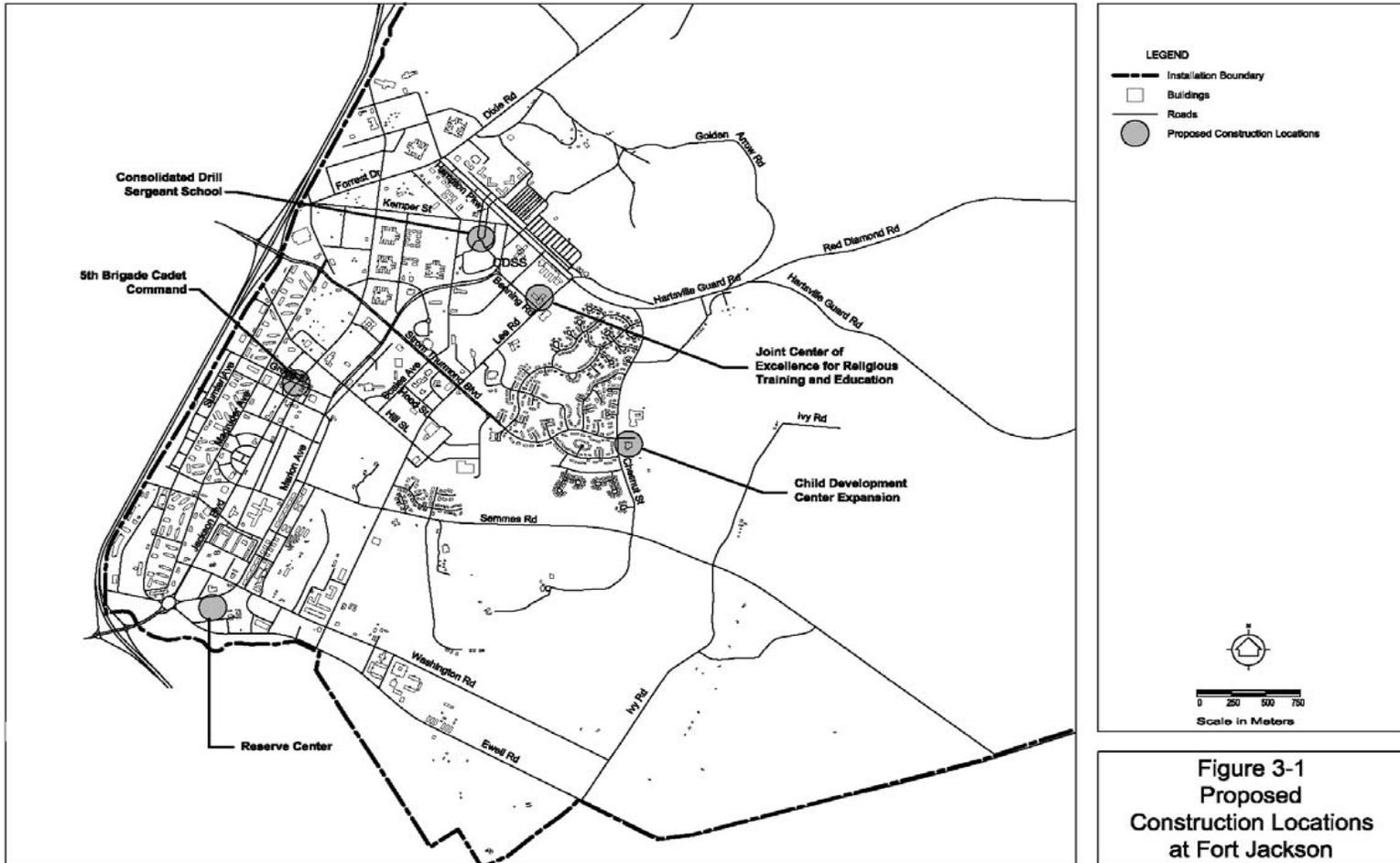
3.4.2 Siting of New Construction

Fort Jackson has identified three facilities projects required to support the proposed action. These projects involve stand-alone new construction that would provide approximately 288,350 SF for the Consolidated DSS, 122,430 SF for the JCERTE, and 79,935 SF for the RC.

Siting of these new facilities is based principally on the precept that the Fort Jackson Real Property Master Plan seeks generally to collocate like uses and to separate incompatible uses. The Army's 12 general land use categories aid in this effort³.

Potential locations for new construction, shown in Figure 3-1, conform to the Fort Jackson Real Property Master Plan. The locations adhere to the general and specific siting criteria set forth in Section 3.2.2. While numerous variations of the present proposal for siting of facilities could be developed, the locations presented in Section 3.4.3 reflect the results of the Army's Master Planning process for Fort Jackson.

³ Army land use planning recognizes the following 12 land use categories: Airfields, Maintenance, Industrial, Supply/Storage, Administration, Training/ranges, Unaccompanied Personnel Housing, Family Housing, Community Facilities, Medical, Outdoor Recreation, and Open Space.



3.4.3 Alternatives for Implementing the Proposed Action

The actions at Fort Jackson consist of 1) constructing an RC, 2) constructing a consolidated DSS, 3) constructing a JCERTE facility, 4) relocation of mobilization processing functions from Fort Jackson.

- **Reserve Center for Army Reserve Southeast Regional Readiness Command.** The location for constructing the RC has been identified and is shown on Table 3.1.
- **Consolidated Drill Sergeant School.** Potential alternative locations for establishing the Consolidated DSS were considered within the Fort Jackson cantonment area. The existing DSS at Fort Jackson is currently sub-letting space in the 120th Adjutant General (AG) Reception Station which the 120th AG Reception Battalion needs returned for its own use to alleviate overcrowded conditions in the reception station complex. It was determined that the only viable location for construction of the new Consolidated DSS was behind the Drill Sergeant Statue and adjacent to Morgan Street. The site is bounded by Kemper Street, Pickens Avenue, Pender Street, and Marion Avenue.
- **Joint Center of Excellence for Religious Training and Education.** Potential alternative locations for establishing the JCERTE were considered. However, since there is an existing Army Chaplain Center and School at Fort Jackson, and available adequate cantonment area land immediately adjacent to the existing Army Chaplain Center and School facilities, it was determined that the most reasonable location for construction of the new JCERTE was on the site adjacent to the existing Army Chaplain Center and School.
- **Relocation of Mobilization Processing Functions.** This action is limited to the relocation of these functions from Fort Jackson and the transfer of these functions to another installation.

3.4.3.1 **Alternative 1 – Establishment of New Army Reserve Southeast Regional Readiness Command RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two Basic Combat Training Battalions (*Preferred Alternative*)**

Under Alternative 1, Fort Jackson would implement the proposed action by implementing the following:

- Fort Jackson would construct, operate, and maintain an RC and an organizational storage building to provide adequate space for the new Regional Readiness Command. The RC would be located across Marion Avenue from the Military Entrance

Processing Station and adjacent to the traffic circle at the Gate 1 Access Control Point.

- Fort Jackson would consolidate the DSSs from Fort Benning and Fort Leonard Wood to this one location, thereby fostering consistency, standardization and training proficiency. The new Consolidated DSS complex would be located adjacent to DSS statue on a 12-acre tract bounded by Kemper Street, Pickens Avenue, Pender Street, and Marion Avenue.
- The JCERTE would be established at Fort Jackson to include all religious training and education from Maxwell AFB; NAS Meridian; and the NS Newport. The additional facilities for the new JCERTE would be constructed adjacent to the existing Chaplain Center and School.
- Relocation of Mobilization Processing Functions from Fort Jackson and the realignment of these functions to another installation.

In addition, other Army actions that are sufficiently well defined for analysis at this time are forecast to be implemented at Fort Jackson during the FY06-11 timeframe and are included as part of Alternative 1.

- A 6,190-SF expansion would be constructed on the existing Child Development Center (CDC), located on Chesnut Road in the Enlisted Family Housing Area, to provide adequate space to meet childcare needs. The CDC action is an expansion of an existing facility at Fort Jackson. Consequently, no viable alternative site locations exist.

The current main front entrance to the center would be modified to take advantage of the existing Sports Complex parking lot that is located immediately adjacent to the CDC.

- Relocate the 5th Brigade Cadet Command (approximately 5 military and 3 civilian personnel) from Fort Bragg to Fort Jackson and construct a 3,000-SF facility. Based on the Fort Jackson master planning criteria, the most reasonable location for construction of the new building is on a site adjacent to Building 1436.
- Two Basic Combat Training Battalions (approximately 3,400 soldiers each annually) would be stationed at Fort Jackson. No construction would occur at Fort Jackson as a result of establishing these training battalions at Fort Jackson as it is anticipated that these units would use existing facilities, training areas, and ranges.

Table 3.1 shows the change in installation personnel associated with other Army actions.

Table 3.1 Potential Population Changes to Occur at Fort Jackson as a Result of Other Army Actions				
Proposed Action	Permanent Party Personnel Military	Permanent Party Personnel Civilian Mission	Student Annual Input	Average Student Load (Full Time Equivalent)¹
Station Two Basic Combat Training Battalions	100	0	6,800	2,400
Relocate 5th Brigade Cadet Command	5	3	0	0
Expand Child Development Center	0	0	0	0
Net change (Increase) to Fort Jackson	105	3	6,800	2,400

Family Members increase = approximately 168
 1 Number of students annually ÷ number of training periods per year.
 Source: Fort Jackson, 2006

Table 3.2 identifies facilities projects that have been identified as required to support the other Army actions. For each construction project, the table shows project number, project title, facility's estimated size in square feet (SF), and general site location. It is anticipated that no new training facilities would be required for the two Basic Combat Training Battalions. The two additional Basic Combat Training Battalions (a total of approximately 6,800 soldiers annually) would train with weapons systems and vehicles consistent with existing activities at Fort Jackson.

Table 3.2 Proposed Construction Projects at Fort Jackson as a Result of Other Army Actions			
Project No.	Project Title	Square Feet	Location
NA	5 th Brigade Cadet Command	3,000	New Construction adjacent to Building #1436 on the east side of Hardee Street
65641	Child Development Center expansion	6,190	New Construction expanding Child Development Center (Building #5975 on Chesnut Road)
Total		9,190	

Source: Fort Jackson, 2006

3.4.3.2 Alternative 2 – Establishment of New Army Reserve Southeast Regional Readiness Command RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

Under Alternative 2, the BRAC-directed actions at Fort Jackson would remain the same as Alternative 1. With implementation of Alternative 2, only those actions directed by Congress would be implemented.

- Fort Jackson would construct, operate, and maintain an RC and an organizational storage building to provide adequate space for the new Regional Readiness Command. The RC would be located across Marion Avenue from the Military Entrance Processing Station and adjacent to the traffic circle at the Gate 1 Access Control Point.
- Fort Jackson would consolidate the DSSs from Fort Benning and Fort Leonard Wood to this one location, thereby fostering consistency, standardization and training proficiency. The new Consolidated DSS complex would be located adjacent to DSS statue on a 12-acre tract bounded by Kemper Street, Pickens Avenue, Pender Street, and Marion Avenue.
- The JCERTE would be established at Fort Jackson to include all religious training and education from Maxwell AFB; NAS Meridian; and the NS Newport. The additional facilities for the new JCERTE would be constructed adjacent to the existing Chaplain Center and School.
- Relocation of Mobilization Processing Functions from Fort Jackson and the realignment of these functions to another installation.

The construction of the CDC expansion, the relocation of the 5th Brigade Cadet Command, and the stationing of two BCT battalions would not occur.

Table 3.3 Summary of Alternatives for Actions at Fort Jackson			
	No Action Alternative	Alternative 1 (BRAC-directed plus other Army actions)	Alternative 2 (BRAC-directed actions)
Establish Army Reserve Southeast Regional Readiness Command	Do not construct Reserve Center	Construct a Reserve Center, across Marion Avenue from the Military Entrance Processing Station and adjacent to the traffic circle at the Gate 1 Access Control Point	Same action as Alt. 1
Establish Consolidated Drill Sergeant School	Do not construct Consolidated Drill Sergeant School facility	Construct the Consolidated Drill Sergeant School Complex on a 12-acre tract bounded by Kemper Street, Pickens Avenue, Pender Street, and Marion Avenue	Same action as Alt. 1
Establish Joint Center of Excellence for Religious Training and Education	Do not construct Joint Center of Excellence for Religious Training and Education facility	Construct a Joint Center of Excellence for Religious Training and Education at Fort Jackson at selected location	Same action as Alt. 1
Relocate Mobilization Processing Functions	Do not realign mobilization processing functions from Fort Jackson	Realign Mobilization processing functions, these functions depart Fort Jackson	Same action as Alt. 1
Child Development Center Expansion	Do not construct a Child Development Center expansion	Construct a 6,190-square-foot expansion adjoining the Child Development Center, located on Chesnut Road in the Enlisted Family Housing Area	Do not construct a Child Development Center expansion
Relocate 5th Brigade Cadet Command	Do not relocate the Cadet Command and do not construct a building at Fort Jackson	Relocate the Cadet command and construct a 3,000-SF facility adjacent to Building 1436	Do not relocate the Cadet Command and do not construct a building at Fort Jackson
Station Two Basic Combat Training Battalions	Do not station two Basic Combat Training Battalions at Fort Jackson	Station two Basic Combat Training Battalions at Fort Jackson	Do not station two Basic Combat Training Battalions at Fort Jackson
<i>Source: Fort Jackson, Master Planning Office and Parsons</i>			

SECTION 4

AFFECTED ENVIRONMENT AND CONSEQUENCES

4.1 INTRODUCTION

The following discussion describes the affected environment within all of the Fort Jackson locales that are being considered in this analysis. Following a description of the affected environment, the discussion addresses the potential environmental consequences or impacts of each of the implementation alternatives evaluated. The discussion focuses on aspects of the environment that could be impacted by the proposed construction projects, maintenance and operation of the proposed facilities and support elements, and implementation of new activities associated with the presence of the new activities at Fort Jackson.

The discussion is structured using the following general environmental resource categories:

- Land Use;
- Aesthetics and Visual Resources;
- Air Quality;
- Noise;
- Geology and Soils;
- Water Resources;
- Biological Resources;
- Cultural Resources;
- Socioeconomics;
- Transportation;
- Utilities; and
- Hazardous and Toxic Substances.

As discussed in Section 3, the alternatives being considered in the environmental consequences section of this EA are:

- No Action Alternative;
- Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of the 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*); and

- Alternative 2 – Establishment of New RC, Consolidated DSS, JCERTE, and Relocation of Mobilization Processing Functions (The RC, DSS, and JCERTE would be constructed at same locations as those considered under Alternative 1).

4.1.1 Definition of Key Terms

4.1.1.1 Environmental Baseline

The environmental baseline is defined as the environmental conditions at the installation as of November 2005.

4.1.1.2 Impact

An environmental consequence or impact (referred to in this document as an impact) is defined as a noticeable change in a resource from the existing environmental baseline conditions caused by or resulting from the proposed action. The terms “impact” and “effect” are synonymous as used in this EA. Impacts may be determined to be beneficial or adverse and may apply to the full range of natural, aesthetic, cultural, and economic resources of the installation and its surrounding environment.

4.1.1.3 Direct Versus Indirect Impacts

Where applicable, the analysis of impacts associated with each course of action has been further divided into direct and indirect impacts. Definitions and examples of direct and indirect impacts as used in this document are as follows:

- **Direct Impacts.** A direct impact is caused by the proposed action and occurs at the same time and place. Both short-term and long-term direct impacts can be applicable.
- **Indirect Impacts.** An indirect impact is caused by the proposed action and occurs later in time or is farther removed in distance, but is still reasonably foreseeable.
- **Application of Direct Versus Indirect Impacts.** For direct impacts to occur, a resource must be present in a particular area. For example, if highly erodible soils were disturbed due to construction, there would be a direct impact to soils from erosion at the development site. Sediment-laden runoff might indirectly affect surface water quality in adjacent areas downstream from the development site.

4.1.1.4 Impact Characterization

Impacts are characterized by their relative magnitude. Adverse or beneficial impacts that are significant are the highest level of impacts. Conversely, negligible adverse or beneficial impacts are the lowest level of impacts. In this document, five descriptors are used to characterize the level of impacts. In order of degree of impact, the descriptors are as follows:

- No Impact;
- Negligible Impact;
- Minor Impact;
- Moderate Impact; and
- Significant Impact.

The following figure graphically represents this hierarchy of impacts.



4.1.1.5 Significance

The term “significant,” as defined in Section 1508.27 of the CEQ regulations for implementing NEPA (40 CFR 1500), requires consideration of both the context and intensity of the impact evaluated. Significance can vary in relation to the context of the proposed action. Thus, the significance of an action must be evaluated in several contexts that vary with the setting of the proposed action. For example, context may include consideration of effects on a national, regional, and/or local basis depending upon the action proposed. Both short-term and long-term effects may be relevant.

In accordance with the CEQ implementing guidance, impacts are also evaluated in terms of their intensity or severity. Factors contributing to the evaluation of the intensity of an impact include, but are not limited to, the following:

- Because an impact may be both beneficial and adverse, a significant impact may exist even if, on balance, the impact is considered beneficial.
- The degree to which the action affects public health or safety.
- Unique characteristics of the geographic area where the action is proposed such as proximity to parklands, historic or cultural resources, wetlands, prime farmlands, wild and scenic rivers or ecologically critical areas, and rare flora and fauna species.
- The degree to which the effects on the quality of the human environment are likely to be controversial.

- The degree to which the effects of the action on the quality of the human environment are likely to be highly uncertain or involve unique or unknown risks.
- The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
- The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP or may cause loss or destruction of significant scientific, cultural, or historical resources.
- The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the ESA.
- Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment (i.e., CWA, ESA, etc.).

4.2 LAND USE

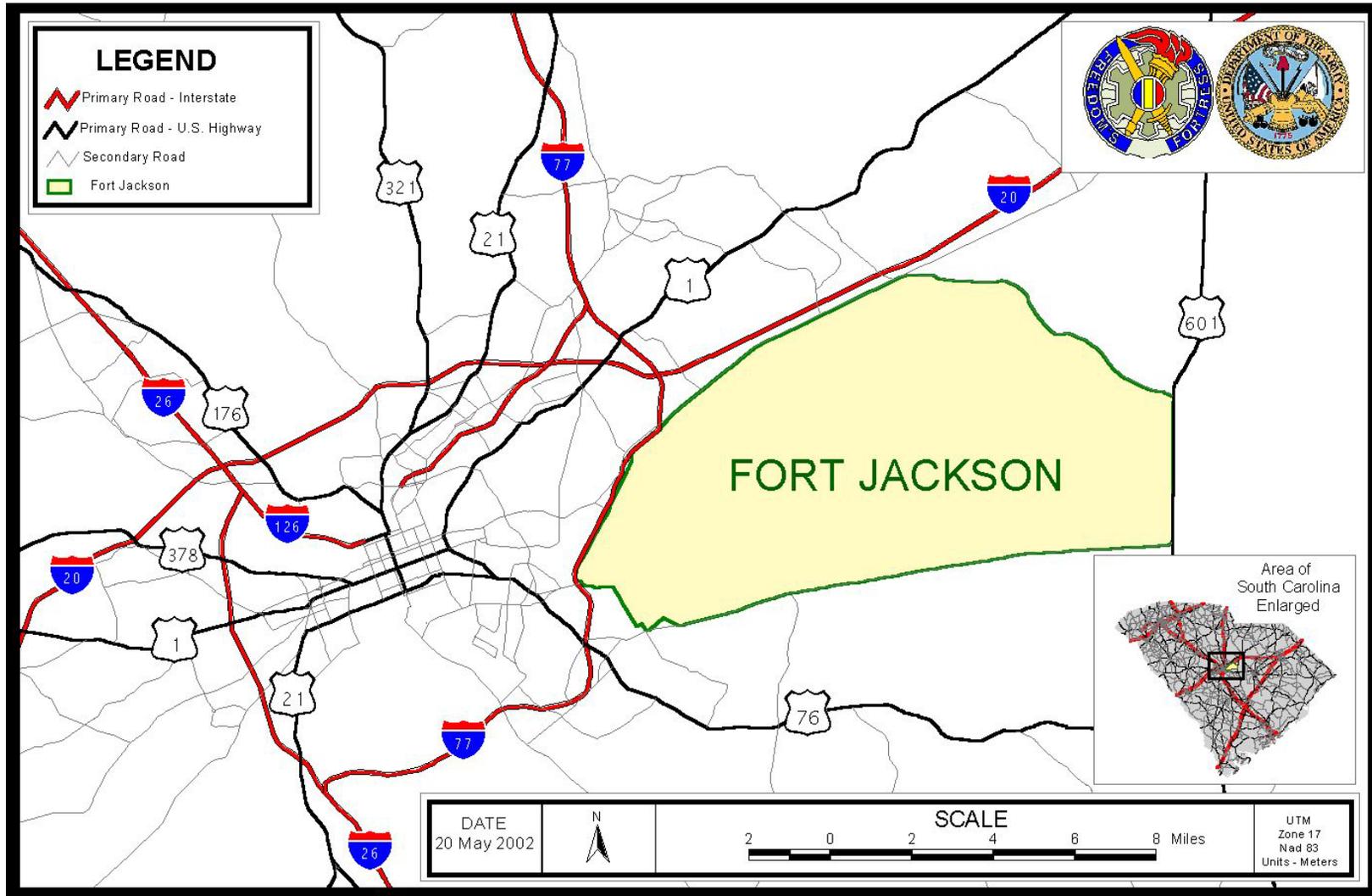
4.2.1 Affected Environment

Training activities and exercises, such as general use training, range/impact area, and noise buffers, are the predominant land uses on Fort Jackson. Of the 52,001 acres at Fort Jackson, slightly more than 5,800 acres are classified as improved grounds, with the remaining 46,500 acres comprised of training areas.

4.2.1.1 Regional Geographic Setting and Location

Fort Jackson is a 52,001-acre military installation located in central South Carolina in Richland County, within the city limits of Columbia as shown on Figure 4-1. It is bounded by Leesburg Road on the south, U.S. Highway 601 on the east, Screaming Eagle Road on the northeast, as shown on Figure 2-1, Percival Road on the northwest, and the Southeastern Beltway (Interstate Highway 77) on the west. Fort Jackson is within the sandhills region of the Upper Coastal Plain.

Figure 4-1 Location of Fort Jackson



Source: U.S. Army Training Center and Fort Jackson, South Carolina Integrated Natural Resources Management Plan and EA 2004-08

4.2.1.2 Installation Land/Airspace Use

Training activities and exercises, such as training, range/impact area, and noise buffers, are the predominant land uses on Fort Jackson. Major land use areas of Fort Jackson are shown on Figure 4-2. Table 4.1 summarizes the installation's existing land use by type and acreage. Of the 52,300 acres at Fort Jackson, slightly more than 5,500 acres are classified as improved grounds, with approximately 46,500 acres comprised of Army-owned training areas.

The Real Property Master Plan for the U.S. Army Infantry Center and Fort Jackson is authorized by AR 210-20, *Master Planning for Army Installations*, and is intended to govern and guide the future physical development of the installation.

During preparation of the master plan, three conceptual land use plans were prepared to illustrate different scenarios for the future development of the installation. These concept plans, the Basic Combat Training (BCT) Expansion Plan, the Advanced Individual Training (AIT)/Campus Expansion Plan, and the Balanced Expansion Plan, were developed with the guidance and direction of Fort Jackson's master planning personnel.

The BCT Expansion Plan outlined the growth necessary to accommodate 15 battalions of basic trainees. The AIT/Campus Expansion Plan addressed the expansion of the installation to provide facilities for an increased number of AIT students. The Balanced Expansion Plan allowed for the expansion of Fort Jackson to accommodate increased numbers of AIT students and permanent party personnel assigned to the installation from Fort Benjamin Harrison as a result of a 1991 BRAC action.

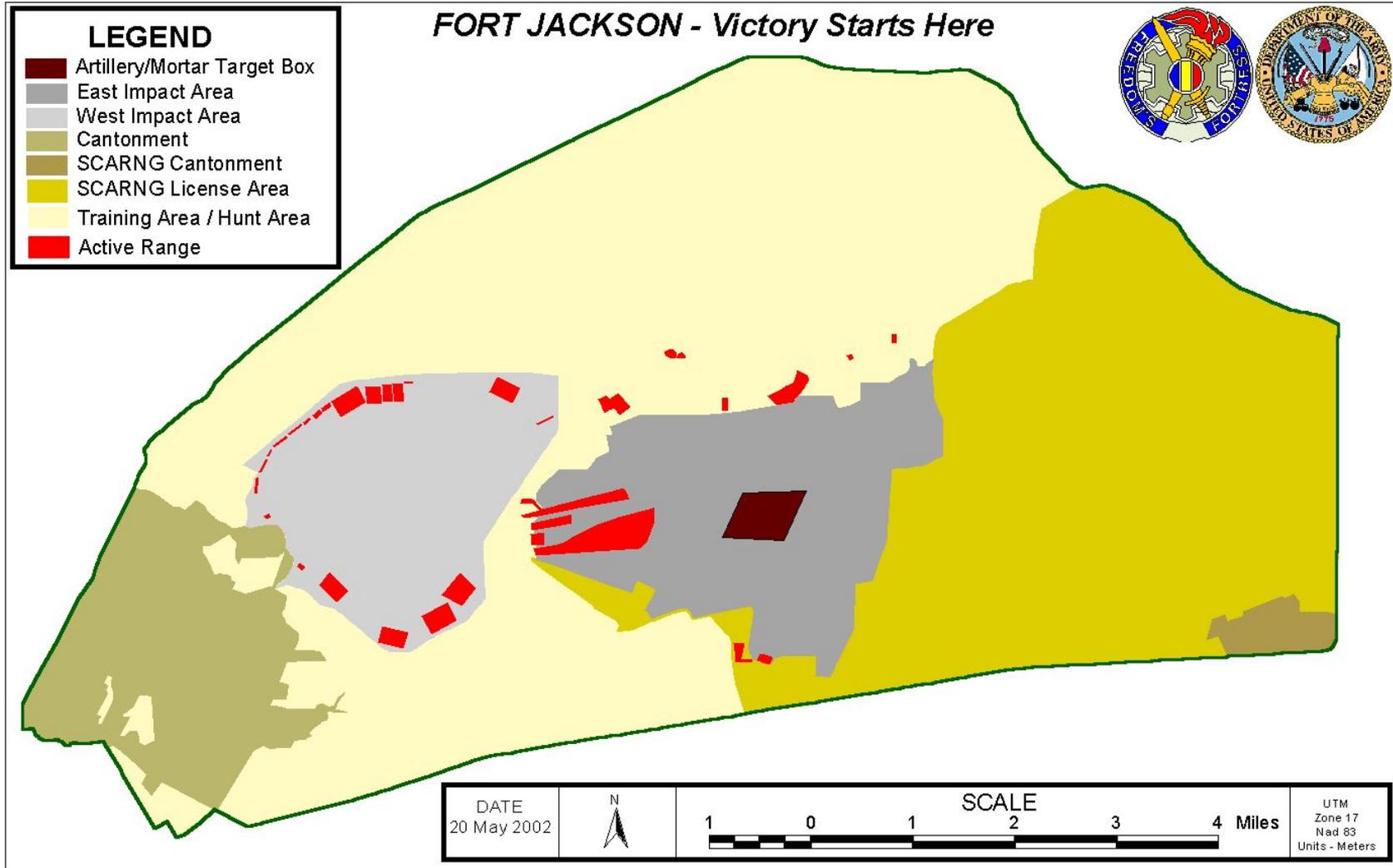
From the three initially identified concept plans, a cantonment area land use plan was developed. The preferred concept plan reflected the land use goals and objectives of Fort Jackson, consolidated compatible land uses into functional areas that improved the efficiency of installation operations, and improved upon the installation's functional land use relationships. Since the cantonment area land use plan was prepared, new facilities have been constructed, and aging, inadequate facilities have been demolished. As a result, the cantonment land use plan was modified slightly to reflect these actions and to ensure the accuracy of assigned land use categories

Cantonment Area. Located in the southwestern portion of the installation, Fort Jackson's cantonment is flanked on the north, west and south by the city of Columbia or unincorporated Richland County and on the east by the training land comprising the balance of the installation.

The cantonment includes a wide variety of land uses that comprise the elements necessary for a complete community. Family housing, with supportive elementary schools, is located in separate adjacent areas on the

eastern perimeter of the cantonment, while troop housing flanks the northern and western sides. Community and commercial services are concentrated southwest of the family housing area. Included in the above are the Post Exchange, Commissary, bank and credit union, Class VI stores, Officers Club and various indoor recreational facilities. The Moncrief Army Community Hospital is located west of the community center and north of Semmes Lake. The Headquarters building, US Army Training Center, and Fort Jackson are centrally located on Jackson Boulevard. Industrial activities (public works, logistics and maintenance) are concentrated in the south central portion of the installation east of Marion Avenue. The cantonment is surrounded on the north and east by reserved land and buffer areas that provide a transition to the installation's range and training areas..

Figure 4-2 Major Land Use Areas of Fort Jackson



Source: U.S. Army Training Center and Fort Jackson, South Carolina Integrated Natural Resources Management Plan and EA 2004-08

Land Use Category	Approximate Acreage	Percent of Total Area
Cantonment	5,536	10.6
Administration	82	0.2
Buffer/Reserved Land	3,054	5.9
Community Facilities	248	0.5
Family Housing	343	0.7
Industrial	31	0.1
Maintenance	130	0.2
Medical	50	0.1
Outdoor Recreation	490	0.9
Supply/Storage	148	0.3
Troop Housing	434	0.8
Training	103	0.2
SCARNG Cantonment	423	0.8
Non-Cantonment	46,465	89.4
Training - General	32,342	62.2
Training - Range/Impact Area	10,355	19.9
Training - Noise Buffer	2,193	4.2
Supply/Storage	208	0.4
Recreation	917	1.8
Water	450	0.9
Total Installation	52,001	100.0
<i>Source: Real Property Master Plan</i>		

The cantonment of the South Carolina Army National Guard (SCARNG) McCrady Training Center (Leesburg) is located in the southeastern corner of the installation and consists of approximately 423 acres. The cantonment consists of billeting, operational, maintenance and administrative facilities for units using the more than 15,000-acre training area adjacent to the cantonment which is licensed to the National Guard by the Army. The Unit Training and Equipment Site (UTES), a tenant of the center, provides tracked equipment for mechanized infantry, armor, artillery, and combat support units to conduct individual and collective training. There is also a Marine Corps Reserve center located adjacent to the SCARNG cantonment area.

Training and Maneuver Areas. Fort Jackson has 147 alphanumeric training areas, which encompass approximately 44,900 acres. This includes a 13,836-acre area licensed to the SCARNG in the southeastern portion of the installation.

Fort Jackson has established eight training areas, all or portions of which also serve as noise buffers. These buffer areas are located adjacent to the installation's southern and eastern boundary, flanking the SCARNG's cantonment. Artillery and mortar fire does not occur within these areas to help reduce the exposure of off-post residents to unwanted sound.

Range/Impact Areas. The West Impact Area includes about 4,739 acres and is surrounded by 19 permanent small arms ranges. The West Impact Area contains safety fans associated with each of the 19 small arms ranges. These safety fans are developed based on potential down-range impacts of projectiles fired.

The East Impact Area (also known as the Artillery Impact Area) includes about 5,250 acres near the center of the installation. The East Impact Area is the established impact area for mortar and artillery weaponry training and contains the Artillery and Mortar Target Zone, the "target box" targeted during artillery and mortar firing. The East Impact Area also contains range safety fans for the following ranges: Bastogne, Main Tank, Casablanca, Cowpens, Anzio I and II, Omaha Beach, Rifle Squad Training 3 (RST-3), RST-4, Kasserine Pass, and the Combat Pistol Qualification Range. An Engineer Demolition Site is also located within the East Impact Area.

Supply/Storage. The most notable supply/storage land use on Fort Jackson is the ammunition supply point. The Reservation Land Use Plan delineates the area used by the ammo storage facility by including the storage bunkers and administrative facilities, as well as the land constrained by the associated inhabited building clearance line.

Recreation. Recreational areas on Fort Jackson are primarily hunting areas and fishing ponds and lakes (*i.e.*, Heise Pond, Twin Lakes, Weston Lake). Fort Jackson is divided into 35 hunting areas that correspond to 35 training areas subdivided into 132 subareas. In total, approximately 917 acres on the installation are reserved for recreational use.

The Weston Lake Recreation Area, Fort Jackson's largest recreation site, is located south of the artillery impact area and can be accessed by State Route 262. The lake has a surface area of approximately 173 acres and is surrounded by scenic woodlands. The recreation area is approximately 853 acres in size and includes cabins and facilities for camping, boating and swimming. The Jackson Flyers Association, Inc. has a dedicated site for the use of radio-controlled model aircraft. The site, which is located east of Wildcat Road adjacent to TA 12A, is 64 acres in size. A segment of the Palmetto trail, a 425-mile recreational trail that eventually traverse the state of South Carolina, passes through Fort Jackson's cantonment area before proceeding eastward along the southern boundary of the installation.

Within and adjacent to the installation boundaries, there are no recreational lands that are components of the National Wild and Scenic Rivers System, the National Trails System, or recreational areas identified as parks, parklands, ecologically critical areas, or other areas of ecological, recreational, scenic or aesthetic importance. Therefore Fort Jackson operations and activities are not involved with the regulatory management constraints for such recreational areas.

Water Bodies. Water bodies on Fort Jackson consist of lakes and ponds used for irrigation, recreation, wildlife management and aesthetic purposes. Approximately 450 acres of surface water bodies are located on the installation.

4.2.1.3 Surrounding Land/Airspace Use

The City of Columbia borders Fort Jackson to the northwest, west and southwest; the balance of the installation is adjacent to unincorporated portions of Richland County. Urbanized development is located to the southwest between Leesburg and Garners Ferry roads; to the west along Jackson Boulevard; and to the northwest within the Forest Acres and Arcadia Lakes communities and in the vicinity of Interstate highways I-20 and I-77. Dense commercial development, such as the Columbia Mall, occurs in the vicinity of Two Notch Road (US Highway 1) and I-20, and strip commercial characterizes development on Decker Boulevard, Two Notch Road, the intersection of Percival Road and I-77, and the intersection of Forest Drive and I-77 outside Gate 2. Sesquicentennial State Park, a day-use facility with lake, hiking and biking trails, and picnic and camping facilities, is located northeast of the junction of I-20 and I-77 and is the largest public land use adjacent to Fort Jackson. Most of the unincorporated areas adjacent to Fort Jackson are low density or rural residential, agricultural or open space land uses.

4.2.1.4 Current and Future Development in the Region of Influence

Fort Jackson's Region of Influence (ROI) consists of the following six counties: Calhoun, Fairfield, Kershaw, Lexington, Richland and Saluda. Richland County is home to Fort Jackson and the center of the ROI, and would realize the greatest effects due to the actions at Fort Jackson.

The City of Columbia Comprehensive Plan (CCPD, 1998), adopted on November 18, 1998, establishes a pattern of proposed land uses for each of the city's planning districts. The land use classification system is comprised of *nodal classes* (community commercial, major mixed use, and major institutional facilities) and *area classes* (employment, residential and major open space).

Columbia's East Planning District, which is separated from the installation by Interstate 77, is predominantly residential and would remain according to the

comprehensive plan. The nearest commercial nodes are located at Garners Ferry Road and Fort Jackson Boulevard and Forest Drive and I-77. As noted in the plan, the latter commercial area is poorly defined and has great potential to devolve into a “typical cluttered, ugly suburban highway commercial strip.” The South Planning District borders Fort Jackson to the west of the cantonment and to the south along a portion of Leesburg Road. The comprehensive plan calls for continued residential development to occur adjacent to the installation’s boundary.

Land use plans for the Columbia region are prepared by the Central Midlands Regional Planning Council. In addition, the Council serves the region as the coordinator for programs on aging, economic development, transportation planning, air quality and water quality planning.

The completion of Interstate 77 in October 1994 improved access between north Richland County and the City of Columbia. The roadway has facilitated development in northeast and southeastern Richland County, both areas immediately adjacent to Fort Jackson.

Land adjacent to the western quarter of Fort Jackson has experienced medium to high density urban development from Columbia eastward. Projections call for most of the remaining undeveloped land west of the installation to be developed as single family residential. Interstate 77 serves to separate Fort Jackson from residential and commercial land uses adjacent to its western boundary.

The Richland Northeast area, which is adjacent to the northern boundary of Fort Jackson, has been and is forecasted to remain one of the fastest growing residential areas of the Columbia MSA. The area consists primarily of low-density, single family homes and a corridor of general commercial land uses along U.S. Highway 1, which bisects the area. Increased residential development along Percival Road is forecasted, with existing low and medium residential subdivisions expected to expand. Industrial land use is projected for the area between Percival Road (adjacent to Fort Jackson) and Interstate 20.

The area east of the installation between South Carolina Highway 268 and the Richland County line and the area east of U.S. Highway 601 are mostly undeveloped. Future development is not expected in this area due to the proximity of the Richland County landfill and the absence of urban-level services. If utility service is extended to these areas, additional development could conflict with the training activities of the South Carolina National Guard, whose training areas are located in the southeastern corner of the installation.

South of Fort Jackson, gradually increasing residential growth is projected east along Leesburg Road (South Carolina Highway 262), particularly from Weston Lake west to Semmes Road. The area east of Weston Lake along

Leesburg Road is unlikely to be developed in the near future due to the unavailability of utilities and an inadequate transportation system.

4.2.2 Consequences

4.2.2.1 No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented, and Fort Jackson would continue to use its current inventory of facilities with no new construction occurring. The No Action Alternative would not result in any substantive impacts on land use in the project areas.

4.2.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (Preferred Alternative)

- **Direct Impacts** – Negligible adverse direct impacts to land use from this Alternative would be associated with the construction of major new facilities, and expansion or adaptive reuse of existing facilities. The new facilities would be compatible with existing land uses since they would be within appropriate land use designations in the cantonment area. The proposed projects would not result in substantive impacts on land use in the areas.
- **Indirect Impacts** – The proposed construction projects are all located within the cantonment area and would be compatible with existing land uses. No indirect impacts to land use would be expected from implementing this alternative.

4.2.2.3 Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

- **Direct Impacts** – Negligible adverse direct impacts to land use from Alternative 2 would be associated with the construction of major new facilities, and expansion or adaptive reuse of existing facilities. However, these new facilities would be compatible with existing uses since they would represent expansion of existing functional land use areas through infill development. The proposed project areas are located within the cantonment land use designation and therefore would not result in substantial impacts on land use in the areas.
- **Indirect Impacts** – No indirect impacts to land use would be expected from implementing this alternative.

4.3 AESTHETICS AND VISUAL RESOURCES

4.3.1 Affected Environment

Fort Jackson encompasses more than 52,000 acres of land located in the sand hills of the Coastal Plain Province. Fort Jackson is comprised of gently rolling plains with stands of pine and oak trees. These areas are dissected by gently flowing creeks and flat alluvial plains. Landscape plants such as crepe myrtle line major thoroughfares. Selected parcels that have been cleared by demolition are being allowed to grow back to their natural states, increasing the volume of flora present within the cantonment and providing buffer space between structures.

Architecturally, the installation has mostly transitioned from the temporary World War II-era buildings of the original Camp Jackson to a modern day training campus with varied contemporary permanent structures.

Many of the more recently constructed buildings on the installation are aesthetically pleasing and complement the surrounding natural and man-made environment. In addition, landscaped areas are well-maintained and create attractive settings. Two ongoing actions have improved the visual image of Fort Jackson. These include the demolition of the majority of the WW II temporary wooden buildings and the development of the new landmark buildings, such as the Soldier Support Institute, that have added additional focal points to the installation's inventory of facilities.

4.3.2 Consequences

4.3.2.1 No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented, and Fort Jackson would continue to use its current inventory of facilities. The No Action Alternative would not result in any substantive impacts on aesthetics or visual resources in the project areas.

4.3.2.2 **Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)**

- **Direct Impacts** – Under Alternative 1, there would be negligible impacts to the aesthetics of the surrounding areas. The RC proposed site is on a currently unused parcel of land that is interspersed with trees. Siting the RC here would require some tree clearing, but could be off-set by providing aesthetic and recreational outdoor settings for the close to 250 occupants of the proposed building. Also, this building site is just inside Gate 1 and the new construction would be one of the first structures that people would see upon entering the installation. Extra care should be taken to ensure a naturally pleasing landscape around this facility. The DSS is proposed for an already-cleared industrial site with less than 20 trees. The proposed JCERTE site is zoned as an industrial area and only

has eight trees. It is surrounded on three sides by parking lots and buildings, but has thick wooded areas directly to its south and southwest. The views of the personnel working north of JCERTE building site may experience an obstructed view of the wooded area and associated wildlife. Expanding the CDC on Chesnut Road and building the 5th Brigade Cadet Command adjacent to Building 1436 would have a negligible impact on the aesthetic environment.

- **Indirect Impacts** - The proposed construction projects are all located within the cantonment area and would be compatible with existing land uses. No indirect impacts to aesthetics or visual resources would be expected from implementing this alternative.

4.3.2.3 Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

- **Direct Impacts** – Under Alternative 2, there would be impacts similar to Alternative 1.
- **Indirect Impacts** – No indirect impacts to aesthetics or visual resources would be expected from implementing this alternative.

4.4 AIR QUALITY

4.4.1 Affected Environment

Air quality is regulated at the national level through regulations promulgated under the Clean Air Act of 1970 and its subsequent amendments. The Clean Air Act requires state or local governments to monitor ambient levels of pollutants that have federal standards set by the U.S. Environmental Protection Agency (USEPA). Areas that meet Federal and State air quality standards are classified as areas in attainment, while areas that do not meet these standards are classified as nonattainment areas.

Fort Jackson is in the South Carolina Air Quality Control Region (AQCR) 200, which includes Newberry, Fairfield, Lexington, and Richland counties. Boundaries of air quality control regions conform to the district boundaries established by the South Carolina Department of Health & Environmental Control (SCDHEC), Bureau of Air Quality. Air quality is monitored by SCDHEC at eight monitoring stations in the Columbia region. Stations measure lead (Pb), sulfur dioxide (SO₂), total suspended particulates (TSP-PM₁₀ and PM_{2.5}), carbon monoxide (CO), photochemical oxidants (ozone), nitrogen dioxides (NO₂), and volatile organic compounds (VOC).

4.4.1.1 Ambient Air Quality Conditions

Ambient air is air that is found close to ground level and is external to buildings or other structures. Measuring pollutant levels in ambient air is generally how outdoor air quality is evaluated. National Ambient Air Quality Standards (NAAQS) are established by the CAA and are established for two levels of air quality protection. Primary standards are established to protect

public health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation and buildings (SCDHEC, 2006).

On July 18, 1997, USEPA revised the NAAQS for ozone. The previous standard was referred to as the 1-hour standard. A violation of the 1-hour standard occurs when the 1-hour daily maximum concentration exceeds 0.12 ppm more than once in 3 consecutive years. The new standard is more stringent and is referred to as the 8-hour standard. Under the 8-hour standard a violation occurs when the 3-year average of the fourth highest daily maximum 8-hour average exceeds 0.08 ppm.

In recent years, all areas of South Carolina have been in attainment with the 1-hour ozone standard. However, several areas of the state now have violations of the more stringent 8-hour level.

4.4.1.2 Air Pollutant Emissions at Installation

Fort Jackson is currently working to identify sources that may contribute to the level of ozone in the area and implement a plan of action to reduce emissions to help attain the 8-hour ozone standard by December 31, 2007. Prior to any construction activities, all construction projects are reviewed by Fort Jackson's Environmental Division to ensure that construction and operating permits are applied for prior to construction activities. This review covers sources of criteria air pollutants, hazardous air pollutants, and stratospheric ozone depleting substances (regulated air contaminants). It includes point and fugitive sources of regulated air contaminants directly and indirectly associated with construction activities.

Fort Jackson operates in compliance with State Permit No. 1900-0016, issued by SCDHEC. Although this permit expired in 2005, there is a permit shield in place, which means that a new permit has been applied for, and that Fort Jackson is considered to be permitted during this time. The largest sources of allowable emissions on the installation are the central energy plants, which burn natural gas and fuel oil.

4.4.1.3 Regional Air Pollutant Emissions Summary

Upon review of the ozone nonattainment area boundary recommendations submitted by the SCDHEC on July 14, 2003, and later amended on November 14, 2003, the USEPA, in a letter dated December 3, 2003, notified the SCDHEC of its intent to promulgate designations of nonattainment areas in South Carolina with modifications to the State's recommendations. Specifically, USEPA's response indicated that the entire Columbia Metropolitan Statistical Area, which includes Fort Jackson, would be designated as the nonattainment area (there are two other nonattainment areas in South Carolina). Such a recommendation would include a

nonattainment status for the full counties of Lexington and Richland (in which Fort Jackson is located). The SCDHEC, however, has requested that only combined portions of the two counties be designated as a nonattainment area.

Upon the effective date of nonattainment, areas are immediately faced with a more comprehensive permitting process under nonattainment New Source Review (NSR). Within 1 year of the effective date, areas would begin a conformity analysis that ensure that projects utilizing federal funds do not have an adverse impact on an area's air quality.

States may also have to implement emission reduction strategies to improve air quality. Those strategies are included in the revised State Implementation Plan (SIP) that is due to USEPA within 3 years after the effective date of the nonattainment designation.

The USEPA has provided an option for areas currently meeting the 1-hour ozone standard to attain the 8-hour ozone standard by December 31, 2007 and obtain cleaner air sooner than federally mandated. This option requires an expeditious time line for achieving emissions reductions sooner than expected under the 8-hour ozone implementation rulemaking, while providing "fail-safe" provisions for the area to revert to the historic SIP process if specific milestones are not met.

By signing the Early Action Compact (EAC), USEPA agreed to defer the effective date of the nonattainment designation for participating areas. However, areas participating in the EAC that do not meet all of the terms of the EAC, including established milestones, would forfeit participation and be designated according to requirements within USEPA's 8-hour ozone implementation rule, i.e., Transportation Conformity and nonattainment New Source Review.

Through their participation with the EAC, Lexington and Richland counties are both exploring countywide local control strategies. Of South Carolina's 46 counties, 45 have entered into EACs. Many of the counties entering into the EACs do not have problems meeting the air quality standard but would plan and work with other areas to implement controls to ensure early attainment of the standards.

Strategies under consideration by Richland County include strengthening land-use planning, alternative vehicles, ozone awareness and education, alternative work schedules, participation in Clean Cities plans, and open burning restrictions. Interested stakeholders (i.e., local, State, and federal government, citizens, public interest groups, and the business community) have been and continue to be involved in the planning. By way of its involvement with the EAC, Fort Jackson would not be required to conduct a Conformity Determination for the actions analyzed in this document.

4.4.2 Consequences

4.4.2.1 No Action Alternative

Under the No Action Alternative no new construction would occur at Fort Jackson. There would be no increase in emissions and no additional impacts to air quality.

4.4.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)

- **Direct Impacts** - Alternative 1 would have minor adverse direct impacts to air quality. Minor, short-term air quality impacts would occur as particulate matter is emitted as a result of construction activities. Both the dust emissions and exhaust emissions associated with construction are minor, temporary, and confined primarily to the immediate project areas. BMPs would be employed to minimize fugitive dust emissions. For example, dust suppression would be applied at construction sites to reduce emissions.

The potential effects of the proposed action on air quality would be considered adverse if construction or operation-related emissions or increases in vehicle density exceeded any threshold levels set by federal, state, or local regulations. All construction work would be completed using mobile sources such as bulldozers or backhoes, and no major impacts should occur during the construction phase.

Mobile air emission sources are not subject to any federal or state restrictions and are not being considered by the USEPA or the State of South Carolina regarding nonattainment areas. Only fixed sources are subject to federal and state regulations. Since the proposed action does not involve the construction of fixed sources, Alternative 1 would not have any long-term air quality impacts or adversely contribute to the area's ozone air quality status. Increased traffic emissions and energy use in buildings would have a negligible adverse impact to air quality.

- **Indirect Impacts** - Implementation of Alternative 1 would have minor indirect impacts to air quality. Minor, short-term air quality impacts would occur when dust and engine emissions created by construction activity are blown off of the construction sites into nearby areas.

4.4.2.3 Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

The potential air quality impacts under Alternative 2 would be similar to those of Alternative 1.

4.5 NOISE

4.5.1 Affected Environment

A study of noise generators and noise impacts conducted in May 1991 by the U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM) at Fort Jackson noted that the primary noise generators were small arms, demolition, and artillery. To protect the general public from noise impacts, the U.S. Army has established an Environmental Noise Management Program to replace the Installation Compatible Use Zone (ICUZ) program. By examining the effects of noise on an installation's adjacent communities the program establishes a background for relating land use noise levels. The program then assesses noise levels from Army-generated operations to identify noise impacted areas and describe each area's land use compatibility.

Fort Jackson's ICUZ Study (Fort Jackson, 1991) was updated in 1991 using the noise zones developed by USACHPPM to aid in the process of identifying areas that experience high levels of noise. The study resulted in the mapping of areas on the installation that are within the contour lines of Noise Zones II and III. Zone II is the area where the sound level is between 65 and 75 decibels, A-weighted (dBA) day-night sound level (DNL). This area is considered to have a substantive noise exposure and is, therefore, "normally unacceptable" for noise-sensitive land uses. Zone III is the area where the DNL is greater than 75 dBA. This zone is considered an area of severe noise exposure and is unacceptable for noise-sensitive activities.

Zone II boundaries generated by range operations extend over training areas adjacent to the firing ranges and impact areas. Fort Jackson has established sound buffer areas adjacent to portions of the installation perimeter to mitigate any potential for disturbance of noise-sensitive uses located off-post. These buffers, which are approximately 3,000 feet wide, are located adjacent to Leesburg Road and Highway 601, along the southern and eastern borders of the installation, respectively.

All Noise Zone III areas are generated by the small arms ranges, demolition, and artillery fire and are contained within the installation. The areas primarily affected by this level of noise include the following sites: the small arms ranges adjacent to Dixie Road and Hartsville Guard Road; Training Area 7A; the South Impact Area; 1 LT Joe V. Abernathy and LTC Terry D. Allen Jr. ranges; and the South Carolina National Guard artillery firing points.

When changes occur in the type, frequency, or size of range operations, new noise zone models are prepared and the results are appended to a present ICUZ study or a new Environmental Noise Management Program study is prepared.

4.5.2 Consequences

4.5.2.1 No Action Alternative

Under the No Action Alternative no new construction or operations would occur at Fort Jackson. Therefore, it is anticipated that this alternative would

not result in any additional impacts on noise in the project areas above the baseline conditions.

4.5.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)

- **Direct Impacts** – Alternative 1 would have minor adverse direct noise impacts. During construction there would be minor, short-term, localized noise impacts associated with the operation of construction equipment and machinery, power tools, and the delivery of construction materials. These noise impacts would be minor, temporary, and confined primarily to the immediate project areas. BMPs would be employed to minimize the potential noise impacts. For example, construction activities near sensitive noise areas, such as housing, would be limited to daylight hours to have less effect on sensitive areas.

Because construction noise would be temporary and because Fort Jackson noise ordinances would be complied with, short-term noise effects would be considered minor.

The operation of the RC, DSS, JCERTE, expanded CDC, and 5th Brigade Cadet Command facilities also would result in minor adverse direct impacts. Current noise levels at these project sites are very low. Although the anticipated noise levels of these operations (e.g., vehicular activity, HVAC operations) are expected to be low, there would be a slight noise increase relative to the existing levels.

Because additional soldiers would train with weapons systems and vehicles consistent with existing activities at Fort Jackson and since this training load has been accommodated at Fort Jackson in the past, analysis indicates that the additional training would cause a negligible increase in noise.

- **Indirect Impacts** – There are no anticipated indirect noise impacts as a result of the construction or operation of the proposed facilities.

4.5.2.3 Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

The potential noise quality impacts under Alternative 2 would be similar to those of Alternative 1.

4.6 GEOLOGY AND SOILS

4.6.1 Affected Environment

4.6.1.1 Geologic and Topographic Conditions

Fort Jackson is located on the northwestern edge of the Coastal Plain Province, a region of low to moderate relief and gently rolling plains. The Fall Line, a zone which marks the boundary between the younger, softer sediments of the Coastal Plain Province and the ancient, crystalline rocks of the Piedmont Province, lies approximately 4 miles west of the cantonment area.

Flat to gently rolling low plains characterize the extreme western portion of the installation, including a major portion of the cantonment area and the alluvial plains occupied by Gills and Mill Creeks. Colonels Creek, which is located in the eastern part of the installation, flows in a broad alluvial plain which consists partially of a swamp. The majority of the installation is gently rolling, moderately-dissected high plains.

The nearly flat alluvial plains of southwesterly-flowing Gills and Wildcat Creeks and the adjacent gently rolling low relief of the cantonment area occupy the extreme western portion of Fort Jackson. The valley of Gills Creek and its tributaries is covered partially by a swamp. Local relief is generally less than 60 feet. Slopes are predominately between 0 and 3 percent on the alluvial plains; while slopes in the cantonment area are predominately between 3 and 8 percent. The upper valleys of Mill and Cedar Creeks occupy low plains along the southern boundary of the installation. Local relief is generally less than 40 feet and slopes are usually less than 3 percent.

See Figure 4-3 for a topographic map of Fort Jackson.

4.6.1.2 Soils

Based on a soil map compiled by the United States Department of Agriculture (USDA), the majority of soils located on Fort Jackson are Lakeland, Vaucluse, Pelion, and Johnston.

Most of the cantonment area at Fort Jackson is classified as Pelion-urban land complex. About 60 percent of this complex contains Pelion soils. Pelion soils occur on side slopes of ridges, with typical slopes of 2 to 15 percent. Pelion soils are loamy sands, very strongly acidic with moderately slow permeability. About 40 percent of the complex is urban and is largely covered by impervious surfaces. Areas of this complex that have not been urbanized have a high potential for urban development.

Johnston soils occur on floodplains and usually have slopes of less than 1 percent. These hydric soils tend to be associated with wetlands and are

strongly acidic, with moderately rapid permeability. Johnson loam has low potential for erosion because of its cohesion and lack of slope.

Vaucluse soils are loamy sands that occur at high elevations near ridge tops. These soils have slopes of 6 to 10 percent and are strongly acidic and slowly permeable. Potential for erosion is low; however, if the soil is disturbed or cultivated, the erosion hazard is severe.

The removal of vegetation and the length and percent of slope are concerns related to the soil erosion potential at Fort Jackson. Thus, soils that are denuded of vegetation or are located on long, steep slopes can be highly erodible. These conditions are widespread at Fort Jackson, outside of the cantonment area.

A soil map of Fort Jackson is shown on Figure 4-4.

4.6.1.3 Prime Farmland

Congress enacted the Farmland Protection Policy Act (FPPA) as a subtitle of the 1981 Farm Bill. The purpose of the law is to "minimize the extent to which Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses" (P.L. 97-98, Sec. 1539-1549; 7 U.S.C. 4201, et seq.). The cantonment area of Fort Jackson qualifies as urban development and is exempt from the FPPA.

Figure 4-3 Topographic Map of Fort Jackson

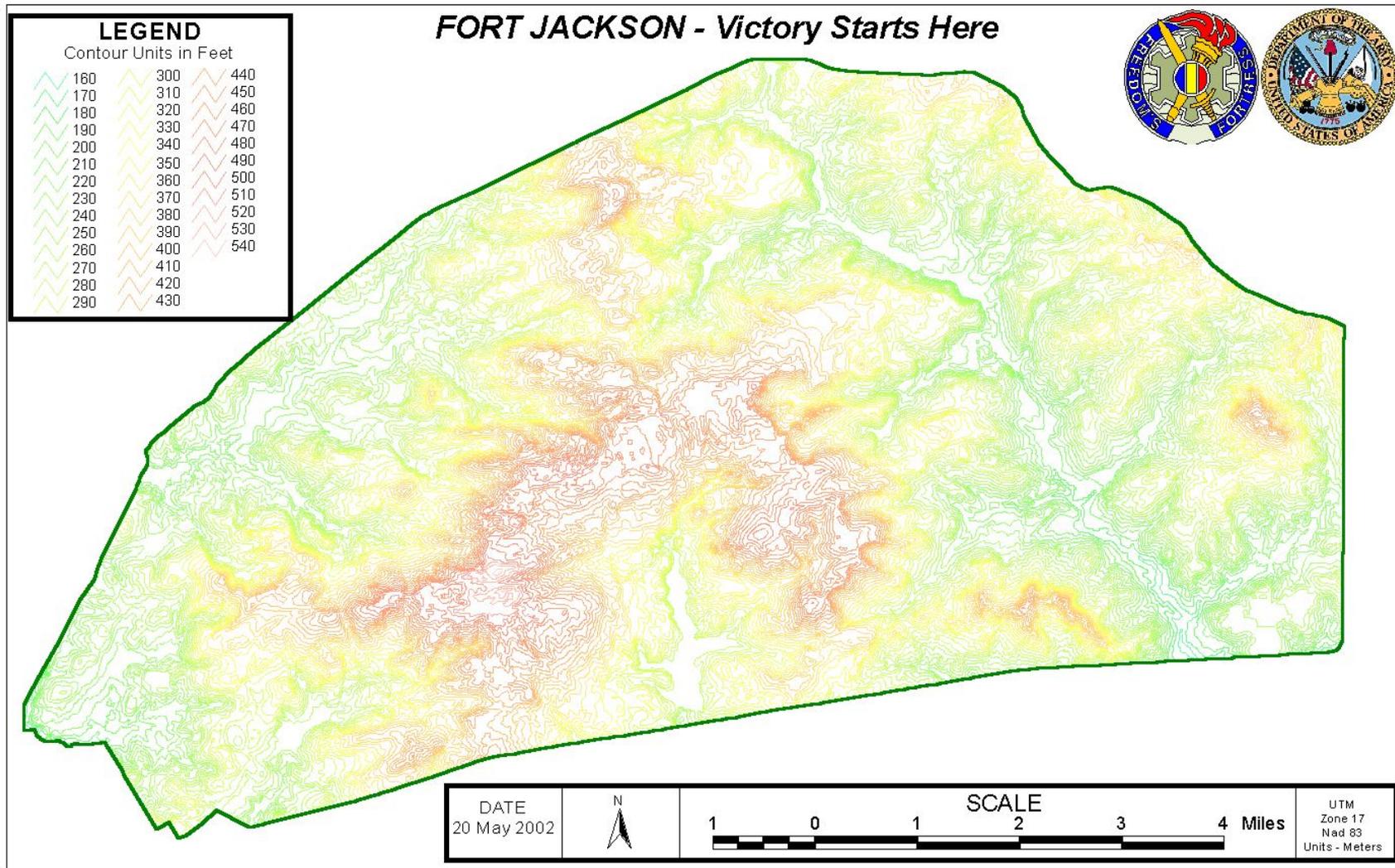
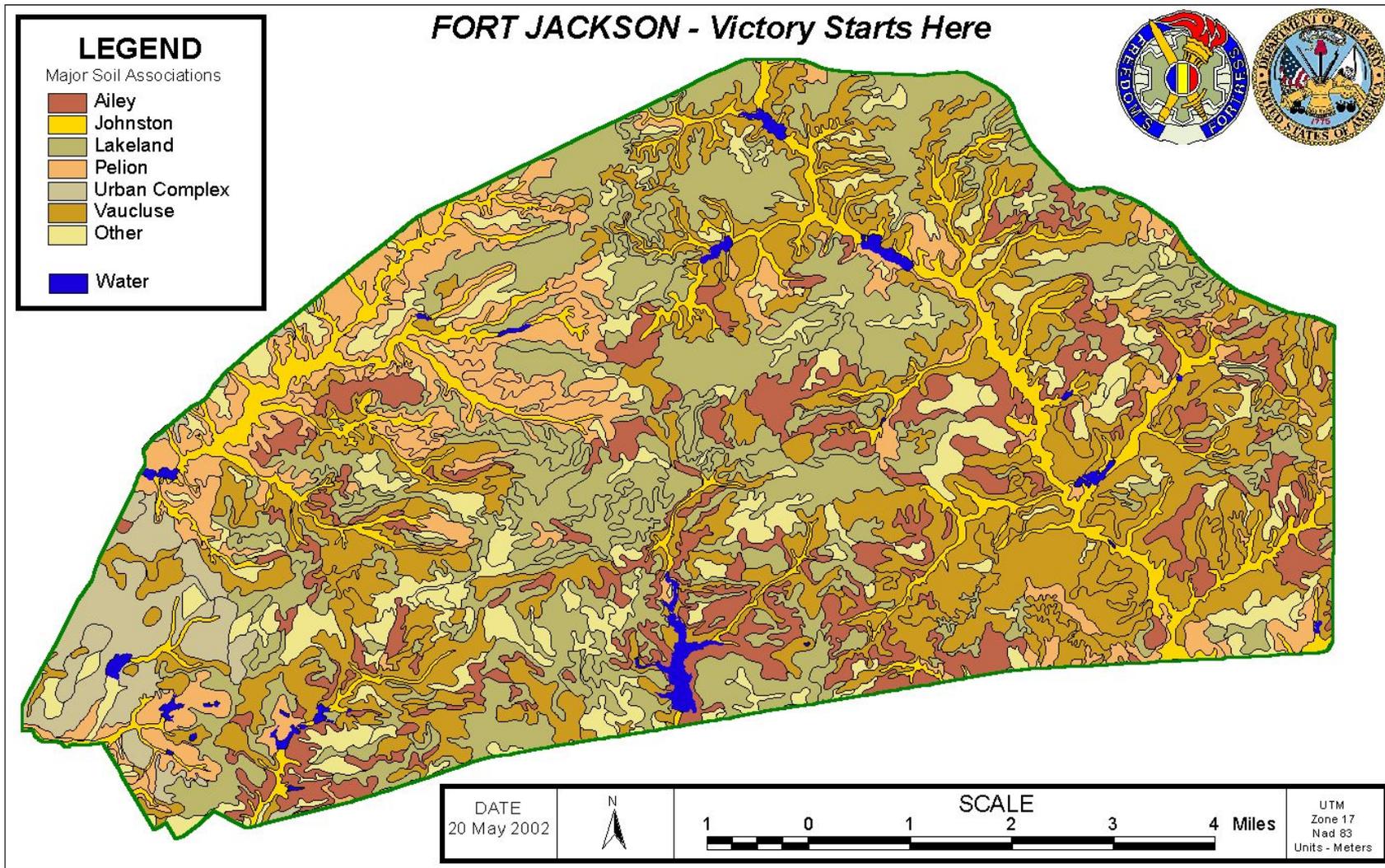


Figure 4-4 Soils of Fort Jackson



4.6.2 Consequences

4.6.2.1 No Action Alternative

Under the No Action Alternative no new construction would occur at Fort Jackson. Thus, there would be no impacts to geology and soils differing from the baseline condition.

4.6.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)

- **Direct Impacts** - The potential effects of Alternative 1 on topography and geology were considered adverse if they would result in: 1) a substantial decrease in permeability, 2) a substantial increase in runoff, 3) substantial water-induced erosion, or 4) an increase in landscape instability or landslides through topographic or slope alterations.

No direct effects on geology or topography are expected from implementation of Alternative 1. The cantonment area, where all construction would occur, consists primarily of Pelion soils that have slight erosion potential. Areas disturbed during construction would be cleared, replanted, and maintained as described in Section 4.15, the Mitigation Summary, included in this EA. Actions occurring on the installation are required to meet existing management plans, standard operating procedures (SOPs), as well as local, State, and federal standards.

Alternative 1 would have minor adverse direct impacts to soils. Soils would be disturbed by construction activities such as grading, vegetative clearing, and excavating during construction of the new facilities. Soil disturbance has potential to result in erosion and increases in total sediment loads in storm water runoff.

If over 1 acre of land is disturbed, National Pollution Discharge Elimination System (NPDES) permits and a SWPPP would be required for Alternative 1.

Soil disturbance during construction under Alternative 1 would be slightly more than that under Alternative 2 due to 2,000-3,000 foot trenching required for heating and cooling ducting as described in section 4.12.2. This difference would be negligible because Pelion soils have only slight erosion potential and BMPs would reduce soil erosion at construction sites.

Additional minor, direct impacts to soils may be caused by an increase in erosion and soil compaction on the training areas due to increased personnel assigned to the DSS, JCERTE, and other proposed activities that could include up to 6,800 additional people undergoing training. This

adverse impact would be minor since this training load has been accommodated at Fort Jackson in the past; and Fort Jackson range analysis indicates that the extra troops would be within the range training capacity.

- **Indirect Impacts** - The implementation of Alternative 1 would have minor indirect impacts to local watersheds. The increase in impermeable surfaces following construction would create faster rates of runoff that could lead to increased erosion and sediment loads in storm water runoff. However, the use of erosion controls detailed in NRCS Critical Area standards and those required by State of South Carolina storm water discharge permits for construction sites as well as other BMPs would decrease the minor, indirect impacts to soils located in the vicinity of the area of proposed development.

4.6.2.3 Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

- **Direct Impacts** - Direct impacts associated with Alternative 2 would be similar to those associated with Alternative 1, but less in the training areas due to fewer troops training.

Indirect Impacts - Indirect impacts associated with Alternative 2 would be similar to those associated with Alternative 1, but less in the training areas due to fewer troops training.

4.7 WATER RESOURCES

4.7.1 Affected Environment

4.7.1.1 Surface Water

Fort Jackson has four surface water watersheds located on the installation, Colonels Creek watershed, Gills Creek watershed, Congaree River watershed, and Cedar Creek watershed. Any surface water that occurs on the eastern portion of Fort Jackson flows into a major tributary of the Wateree River, called Colonels Creek. This creek flows southeastward across the installation. Gills Creek, the other major surface watershed, flows slightly southwest across the northwestern quarter of the installation and continues off of the installation, flowing south through a series of lakes. Gills Creek is then joined by Wildcat Creek before it eventually flows into the Congaree River. The majority of the cantonment is drained by Wildcat Creek. The southern portion of Fort Jackson is drained by the upper reaches of Mill Creek and Cedar Creek. Figure 4.5 provides a map of these surface water features.

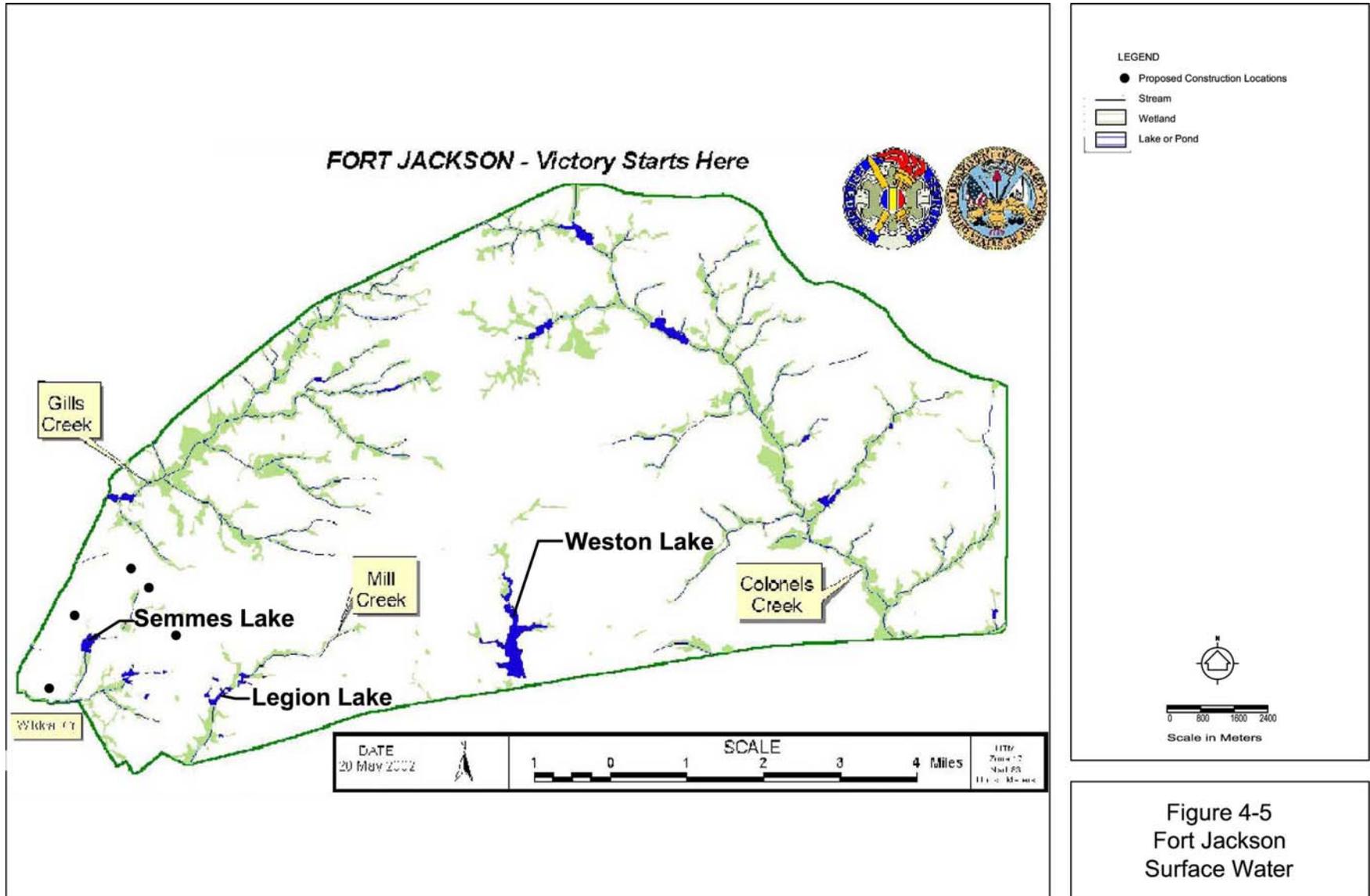
Streams located at Fort Jackson are similar to those found elsewhere in the Coastal Plain Province. These streams have linear branching surface patterns and occupy broad valleys with gentle gradients found to the south and southeast. All of Fort Jackson's creeks and streams eventually flow into

either the Wateree River or the Congaree River, which in turn eventually join to form the Santee River approximately 16 miles southeast of the installation. The Santee River is the principal river in the region, and it flows southeast until it empties into the Atlantic Ocean near Georgetown, South Carolina (Fort Jackson 2005b).

A total of 26 lakes, ponds, and impoundments are located at Fort Jackson. These water bodies range in size from 0.5 to 173 acres, however, most are less than 35 acres in size (Fort Jackson 2005b). Combined these water bodies cover approximately 427 acres of the installation. Seven ponds are adequate for fisheries, and the remaining lakes and ponds are maintained for waterfowl habitat, recreation, aesthetics, and irrigation water for the golf courses.

None of the proposed Alternative locations are located near water bodies. Two lakes are located within the cantonment area, Semmes Lake and Legion Lake. Table 4.2 provides the approximate distances from each of these lakes to the proposed Alternative locations.

	DSS site	JCERTE site	CDC Expansion	RC site
Semmes Lake	1 mile	1 mile	1.10 miles	0.7 mile
Legion Lake	1.4 miles	1.2 miles	0.8 mile	1 mile
<i>Source: Parsons, 2006</i>				



4.7.1.2 Hydrogeology/Groundwater

The primary source of groundwater in the Fort Jackson area is the Tuscaloosa Formation of the Upper Cretaceous age (Fort Jackson, 2005b). This formation underlies all of the installation and is at the surface over a large portion of the installation. The formation lies as an unconformity on a peneplain surface of older, crystalline rocks and consists of interbedded, generally unconsolidated, fine to coarse sand and clay. The make-up of the formation causes groundwater to occur under both unconfined and artesian conditions.

The groundwater at Fort Jackson is suitable for human consumption and is generally plentiful. The water quality at the installation is considered excellent in general, although occasionally water quality standards are exceeded with slight concentrations of manganese and iron being detected. Total dissolved solids are usually less than 50 milligrams per liter. Fort Jackson is not located within a recharge area for a sole-source aquifer (Fort Jackson, 2005b).

4.7.1.3 Floodplains

Fort Jackson has 100-year regulatory floodplain areas designated along all of the major waterways flowing through the installation, including Gills Creek, Mill Creek, Cedar Creek, Wildcat Creek, and Colonels Creek. According to the 1981 Flood Insurance Rate Maps for Richland County, these floodplain areas are designated "Zone A" (FEMA, 1981). Executive Order 11988 limits development activities in regulatory floodplains areas. None of the proposed Alternative locations are located within the 100-year floodplain (Fort Jackson 2005b).

4.7.2 Consequences

4.7.2.1 No Action Alternative

Under the No Action Alternative no new construction would occur at Fort Jackson. Thus, there would be no impacts to water resources with implementation of the No Action Alternative differing from the baseline condition.

4.7.2.2 **Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)**

- **Direct Impacts** -- In Alternative 1, minor adverse direct impacts to surface water would occur as a result of cut and fill activities, grading, and construction activities at the five proposed sites. The majority of these sites would require minimal to no grading or cut and fill activities. Most of the proposed RC at the traffic circle site has been previously disturbed. The traffic circle site is relatively flat and has few trees.

- **Indirect Impacts** -- Implementation of Alternative 1 would have minor indirect impacts to local water resources. The increase in impermeable surfaces following construction would create faster rates of runoff that could lead to increased erosion.

4.7.2.3 **Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions**

- **Direct Impacts** -- Implementation of Alternative 2 would have moderate adverse direct impacts to water resources similar to Alternative 1.
- **Indirect Impacts** -- Indirect impacts under Alternative 2 would be similar to Alternative 1.

4.8 **BIOLOGICAL RESOURCES**

4.8.1 **Affected Environment**

Fort Jackson supports a diversity of habitats within its 52,001 acres and provides resources for a variety of plants, fish, and other wildlife species. Through systematic surveys, some rare, threatened, and endangered species have been identified on the installation. Common terrestrial and aquatic wildlife species include representatives of mammals, fishes, amphibians, reptiles, birds, and invertebrates typically found in association with the sandhills physiographic region of the Southeast.

4.8.1.1 **Vegetation**

Fort Jackson encompasses a wide variety of vegetative site conditions ranging from bottomland hardwood communities to xeric longleaf pine communities. In general, Fort Jackson can be classified into five primary terrestrial vegetative types: pine, pine/upland hardwood, upland hardwood, bottomland hardwood, and open field. There are no grassland areas on Fort Jackson, except for a small amount in the cantonment area and alongside roads.

Field investigations and surveys have identified over 750 species of flora on the installation. Forest cover is the principal vegetative type and may be grouped into eight major forest types: Natural Pine, Pine Plantation, Pine-Scrub Oak, Pine-Hardwood, Scrub Oak, Upland Hardwood, Bottomland Hardwood, and Hardwood-Pine. Appendix B lists flora known to occur on Fort Jackson, as well as a description of each forest type.

Fort Jackson has implemented reduced grounds maintenance practices primarily by designating several areas as no-mow areas. About 170 acres (includes some road shoulder and other areas outside of the cantonment area) of no-mow area has been designated and left to "go wild" since about the mid-1990s. These areas currently have mature vegetation and the fire potential has increased in these areas.

4.8.1.2 Wildlife

Invertebrates. Fort Jackson supports many species about which very little is known, particularly with regard to those species in the lower phyla. The installation was included in a range-wide status survey for specific endangered butterfly species. The SCARNG conducted a survey for butterflies during 1995 and 1996 that resulted in the collection and identification of 45 species throughout the installation. Invertebrate species occurring on Fort Jackson are listed in Appendix B.

Mammals. Fort Jackson is inhabited by mammals typical of similar South Carolina habitats. The white-tailed deer (*Odocoileus virginianus*) is the only big-game mammal species on the installation. Common small mammals include five mouse species, three shrew species, seven bat species, two rabbit species, fox squirrel (*Sciurus niger*), Eastern gray squirrel (*S. carolinensis*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and opossum (*Didelphis virginianus*).

An endangered bird and mammal survey was conducted on Fort Jackson from 1990 to 1992. This survey concentrated on endangered, threatened, and special status species; however, common species were also encountered. This survey substantially contributed to development of the list of mammals known to occur on Fort Jackson (see Appendix B). The South Carolina Department of Natural Resources (SCDNR) performed a bat survey on the SCARNG-licensed area of Fort Jackson. This survey contributed to general knowledge regarding bat occurrence and usage of the installation.

Birds. Land Condition Trend Analysis (LCTA) surveys of breeding birds were performed on Fort Jackson from 1992 to 1993. The endangered bird and mammal survey contributed considerably to bird species data on Fort Jackson. The SCDNR performed a raptor survey on the SCARNG-licensed area of Fort Jackson during 1996 and 1997 and a neotropical migratory bird survey of the SCARNG-licensed area in 1999 and 2000. In addition, surveys concentrating on specific species, such as for Swainson's warblers (*Limnothlypis swainsonii*) by the National Museum of Natural History, Smithsonian Institute, have been conducted on the installation. Appendix B lists bird species known to occur in the cantonment and range areas of Fort Jackson.

Fish. The cantonment and range areas of Fort Jackson contain primarily a small pond and lake fisheries resource; however, several major streams and their tributaries are present. A fish inventory performed in the 1970s provided baseline data for fisheries management on the installation. A fisheries inventory and analysis of managed lakes and ponds was completed in 1987.

Fish species commonly found on Fort Jackson include largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redear sunfish

(*L. microlophus*), chain pickerel (*Esox niger*), and channel catfish (*Ictalurus punctatus*). Appendix B lists fish species known to occur on Fort Jackson.

Reptiles and Amphibians. The 1992 to 1993 LCTA surveys on Fort Jackson included surveys of reptiles and amphibians. The SCARNG performs an annual reptile and amphibian survey that collects data from five sites in differing habitat types. Data collected include location, genus and species (sexed, if possible), method of trapping, temperature high and low, relative humidity, amount of precipitation (if applicable), and number of re-traps. These data are then entered into the LCTA database for future trend analysis. Presently, there are 68 reptile and amphibian species known to occur on the installation. Appendix B includes a list of the species that can be found in the cantonment and range areas.

4.8.1.3 Sensitive Species

Vegetation. To date, two federally-listed endangered plant species have been located on Fort Jackson. These species are the rough-leaved loosestrife (*Lysimachia asperulaefolia*) and the smooth coneflower (*Echinacea laevigata*). These two species were identified during a threatened and endangered plant survey of the installation conducted in 1992.

In addition, the federally-listed species Canby's dropwort (*Oxypolis canbyi*) and the federally-listed candidate species Georgia's aster (*Aster georgianus*) are listed for Richland County. They have not been found on the installation, and SCDNR botanist Dr. Bert Pittman has indicated that Fort Jackson does not have suitable habitat for either of these species.

Wildlife. Fort Jackson provides habitat for one federally-listed endangered species, the red-cockaded woodpecker (*Picoides borealis*). The bald eagle (*Haliaeetus leucocephalus*), which is currently listed as threatened by the U.S. Fish and Wildlife Service (USFWS), is a transient visitor on the installation. According to the INRMP (Fort Jackson, 1997a), no bald eagle nests or permanent roost sites are known to occur on the installation, and it is unlikely that the species nest at Fort Jackson because of unsuitable habitat.

Although not currently listed as threatened or endangered, Fort Jackson provides habitat for four rare animal species: the southeastern myotis (*Myotis austroriparius*), the Rafinesque's big-eared bat (*Plecotus rafinesquii*), the loggerhead shrike (*Lanius ludovicianus*), and the Bachman's sparrow (*Aimphila aestivalis*). These species may be listed in the future if their numbers continue to decline.

Unique and Critical Habitats. No land within Fort Jackson has been identified as critical habitat for any federally-listed threatened or endangered species. Given the presence of three federally-listed endangered species, Fort Jackson has prepared Endangered Species Management Plans (ESMPs) for each species. The objective of the *Endangered Species*

Management Plan for Smooth Coneflower (Echinacea laevigata) and Rough-leaved Loosestrife (Lysimachia asperulaefolia) (Fort Jackson, 1997b) and the *Endangered Species Management Plan for the Red-Cockaded Woodpecker (Picoides borealis)* (Fort Jackson, 2000) is to conserve these endangered plant and animal species as required by the ESA, while providing for training readiness and other mission requirements of Fort Jackson.

4.8.1.4 Wetlands

According to the INRMP (Fort Jackson, 1997a), there are approximately 5,250 acres of wetlands on Fort Jackson. Aquatic and wetland vegetative communities occurring on Fort Jackson include Ponds and Lakes, Depressions, Wetland Hardwood, and Pine-Wetland Hardwood. The wetland hardwood vegetative community is the most prominent contiguous wetland community on the installation.

Vegetation within the ponds and lakes biotic community is primarily fringe and submerged vegetation. A few lakes are crowded by floating vegetation, while others have small islands that support additional vegetation. Because the water bodies were once natural stream courses, the fringe canopy vegetation consists primarily of tulip poplar (*Liriodendron tulipifera.*), red maple, and blackgum. Shrub layers are frequently composed of wax myrtle (*Myrica* sp.), fetterbrush (*Leucothoe racemosa*), and hardwood saplings. Emergent vegetation is comprised of pickerel-weed (*Pontederia cordata*), golden-club (*Orontium aquaticum*), arrowhead (*Sagittaria* sp.), duck potato (*Ipomoea pandurata*), spikerushes (*Eleocharis* sp.), rushes (*Juncus* sp.), and sedges (*Carex* sp.). The small islands generally support a variety of wetland hardwoods, such as red maple, sweetgum, water oak, black willow (*Salix nigra*), and blackgum.

Due to changes in topography and man-made features, depressional wetlands and ditches are scattered throughout the installation. Depressions are generally less than 1 acre and are vegetated with sedges, grasses, and rushes. These areas may be seasonally wet and over time may lose their wetland characteristics. Ditches consist of both roadside swales and channeled drainage ditches and are generally not considered to be wetlands. Over time some ditches collect silt and water to the point of supporting wetland plant species. These areas may have an adequate water supply, develop appropriate soils and support wetland vegetation to the point of being classified as a wetland. These ditches are vegetated primarily with herbaceous plant species and may occasionally provide substrate for hardwood seedlings to sprout. Dominant plant species that characterize this community include rushes, iris, ferns, hat pins, panic grasses, and violets.

The Wetland Hardwood vegetative community is typically located adjacent to a stream or creek and extends to the limits of the floodplain. Canopy species usually consist of tulip poplar, blackgum, red maple, and sweetgum. The sub-

canopy is dominated by hardwood saplings, stiff cornel dogwood (*Cornus* sp.), swamp red bay, ironwood, and river birch. This community supports a shrub and ground cover dominated by giant cane (*Arundinaria gigantea*), fetterbush, gallberry, swamp cyrilla (*Cyrilla racmiflora*), wax myrtle, iris, sedges, rushes, and violets. This community is frequently inundated, and wetland identifiers are prominent.

Adjacent to many Wetland Hardwood communities on Fort Jackson are Pine-Wetland Hardwood communities. The Pine-Wetland Hardwood is often a transition from a Wetland Hardwood community to an upland community and may be naturally occurring or planted. The Pine-Hardwood community consists primarily of loblolly pine, red maple, and sweetgum in the canopy. Sub-canopy species may include pine and hardwood saplings, red bay, flowering dogwood, and wax myrtle. The shrub layer is frequently thick and is dominated by sweet gallberry and cyrilla covered with *Smilax* vines and grape vines. Due to the dense canopy and shrub layers, Pine-Hardwood communities frequently do not have ground cover vegetation.

4.8.2 Consequences

Biological impacts on the terrestrial ecology of the installation were considered important if the proposed action would result in: 1) adverse direct or indirect impacts on sensitive biological communities such as managed areas, 2) direct mortality, permanent habitat loss, or lower reproductive success for individuals of plants that are state- or federally-listed or proposed for listing as threatened, endangered, or rare, 3) reduction of a wildlife population to less than self-sustaining levels, 4) substantial interference with the movement of any resident wildlife species, 5) direct or indirect impacts on individuals or populations of wildlife species that are state- or federally-listed or proposed for listing as threatened, endangered, or rare, 6) a substantial increase of invasive species or animals or 7) a jurisdictional wetland is affected.

4.8.2.1 No Action Alternative

Under the No Action Alternative no new construction would occur on Fort Jackson. Therefore, there would be no impacts to biological resources since the health and condition of plant and animal communities in the project areas would not be affected.

4.8.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)

- **Direct Impacts** -- Under Alternative 1 there would be moderate direct adverse impacts to biological resources within the cantonment area of Fort Jackson. Existing vegetation would be removed from the five potential project sites on the cantonment area. Vegetation removed would include turf, pine plantation, and pine/hardwood forest. After construction is

complete, cleared areas would be landscaped and replanted with grasses, as well as native and non-native (ornamental) plant species.

There would be moderate short- and long-term direct adverse impacts to wildlife under Alternative 1 due to displacement and habitat removal. A variety of mammal and upland bird species may be affected. However, since most of the species inhabiting these disturbed cantonment areas are transient and adaptable, they would move to other similar habitat available in the cantonment area.

Currently, federally-listed threatened and endangered plant species are not known to be present in the cantonment area of Fort Jackson. No threatened or endangered species habitat has been found in the vicinity of the potential construction sites for Alternative 1.

It is unlikely that red-cockaded woodpeckers would use habitat in the potential project areas. Urban areas, the cantonment areas, impact areas, or areas free of vegetation (e.g., drop-zones, field landing strips, and gun positions) are not considered suitable or potentially suitable acreage for red-cockaded woodpeckers due to their type of land-use or mission requirements (Fort Jackson, 2000).

There may be minor direct impacts to portions of isolated or jurisdictional wetlands associated with Alternative 1. Presently, a jurisdictional determination has not been conducted at the site. If jurisdictional wetlands are present, these areas should be avoided. If these areas can not be avoided the appropriate permits would be obtained in accordance with Section 404 of the CWA. If jurisdictional wetlands are to be affected, appropriate mitigation would be conducted. No water crossing would be necessary under this alternative.

Minor, direct impacts to biological resources in the cantonment area and training areas may be caused by an increase in vegetation trampling and soil impaction due to increased personnel assigned to the DSS, JCERTE, and other proposed activities that could include up to 6,800 additional people undergoing training. This adverse impact would be minor since more people than this have trained at Fort Jackson in the past; and Fort Jackson range analysis indicates that the extra troops would be well within the range training capacity.

Operational activities associated with the proposed action would not deviate from the existing training impacts assessed in the current INRMP. Programs are in place to ensure proper biological management and are adequately funded to manage areas disturbed by military activities.

- **Indirect Impacts** -- Construction proposed as part of Alternative 1 may cause minor adverse indirect impacts to fish and wildlife species. The removal of vegetation and increased impermeable surfaces would lead to

increased water runoff and soil erosion. This increased runoff may contain sediment, contaminants, and other construction-related debris. Sediment loading in streams may increase turbidity and affect other water quality parameters such as dissolved oxygen, pH, conductivity, and heavy metal concentrations, which in turn could affect fish and wildlife. Construction sites are often exposed to vehicle and equipment contaminants that have the potential to stress or cause mortality in species.

4.8.2.3 Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

- **Direct Impacts** – Direct impacts associated with Alternative 2 would be similar to those associated with Alternative 1.
- **Indirect Impacts** – Indirect impacts associated with Alternative 2 would be similar to those associated with Alternative 1.

4.9 CULTURAL RESOURCES

Cultural resources can be defined as objects, structures, buildings, or sites that may have important archeological and historic values. In addition, cultural resources include properties that may play a crucial role in a community's historically rooted customs, practices, and beliefs. Therefore, cultural resources encompass a wide range of sites and buildings from prehistoric Native American campsites to Army buildings constructed in the recent past.

To ensure that cultural resources are considered during federal project planning, Sections 106 and 110 of the National Historic Preservation Act (NHPA, P.L. 89-655) provide a framework for federal review and protection of cultural resources. The Advisory Council on Historic Preservation (ACHP) developed the implementing regulations for the Section 106 (36 CFR Part 800) process. The National Register of Historic Places (NRHP) is maintained by the Secretary of Interior who also sets forth significance criteria (36 CFR Part 60) for inclusion in the register. For the purpose of consideration by a federal undertaking, cultural resources may be considered "historic properties" if they meet NRHP criteria. Historic properties are those that meet one or more of the following criteria:

- those that are formally placed in the NRHP by the Secretary of the Interior;
- those that meet the criteria and are determined eligible for inclusion; and
- historic properties that are yet undiscovered but may meet eligibility criteria.

Section 110(f) of the NHPA states that "... the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark (NHL), and shall afford the ACHP a reasonable opportunity to comment on the undertaking."

If an undertaking is determined to have an adverse effect on properties included in, or eligible for, the NRHP, the lead federal agency, and the SHPO enter into consultation to

identify ways to avoid or reduce the adverse effects. The ACHP and other interested parties also can participate in the consultation process. Consultation typically results in a Memorandum of Agreement (MOA) that stipulates the measures required to mitigate the adverse effects and identifies the responsible parties and implementation schedule.

The Archeological Resources Protection Act (ARPA, P.L. 96-95) protects archeological resources present on federal lands. Section 3(c) of the Native American Graves Protection and Repatriation Act (NAGPRA, P.L. 101-601) and its implementing regulations (43 CFR Part 10) protects Native American human remains, burials, and associated burial goods. Army Regulation, AR 200-4: Cultural Resources Management describes the appropriate process that should be followed if historic properties are found on Fort Jackson.

4.9.1 Affected Environment

Established in 1917, Camp Jackson was created with land donated to the federal government from the city of Columbia that had purchased the Hampton estate and from Columbia residents that donated 1,192 acres of farm land located in the South Carolina Sandhills (Fort Jackson, 2005a). Additional land was purchased to bring the total area to 22,000 acres. More land was gradually added to the camp and the population quickly expanded. There were 44,000 troops training at Camp Jackson by July 1918, and during this time the base served as a remount and recovery station for military horses. However, by 1921, the base was de-activated, and some 2,000 temporary buildings and facilities were razed and salvaged. The South Carolina National Guard used portions of the base and rebuilt some facilities for their use from 1925 through 1939 (Fort Jackson, 2005a).

Camp Jackson was reactivated in 1939 and was designated Fort Jackson in 1940. In 1940, Fort Jackson had 569 buildings but quickly added about 3,000 additional buildings to provide training and housing for 43,000 troops being mobilized for World War II (WWII). Additional acreage was purchased to bring the total post area to approximately 52,000 acres (Fort Jackson, 2005a).

Many divisions have trained at Fort Jackson including the following:

- the original “Old Hickory” Division;
- the 5th, 8th and 31st Infantry;
- the “Dixie Division;” and
- the 101st Airborne “Screaming Eagle” Division.

Some of the first women’s units were trained at Fort Jackson. The first group was the Army Nurse Corps. In 1973, Fort Jackson trained the Women’s Army Corps (WAC) soldiers in the 17th WAC Basic Training Battalion. The women’s basic training was then later combined with the men’s training in 1977. Medical corps evacuation specialists and transportation groups of the Reserve and National Guard trained at Fort Jackson (Fort Jackson, 2005a).

4.9.1.1 Prehistoric and Historic Background

Prehistoric Background

The prehistoric past of Fort Jackson has been divided into the following periods based on current scientific understanding:

- Paleoindian/Ogweoweh (11500-9900 B.C.);
- Early Archaic (9900-6000 B.C.);
- Middle Archaic (6000-2000 B.C.);
- Late Archaic (2000-500 B.C.);
- Early Woodland (500 B.C.-A.D. 200);
- Middle Woodland (A.D. 200-500);
- Late Woodland (A.D. 500-1000); and
- Mississippian (A.D. 1000-1543).

The settlements of the Paleoindian/Ogweoweh period were focused along major river drainages. Paleoindian/Ogweoweh occupations would be expected to be sparse at Fort Jackson due to its location on a major inter-riverine upland. Definite Paleoindian/Ogweoweh artifacts have been recovered from five sites at Fort Jackson; however, later excavations did not recover any additional cultural remains leading some experts to believe these sites were “planted” (Fort Jackson, 2005a).

To the west of Fort Jackson, several Early Archaic sites have been partially excavated along the Broad-Saluda-Congaree drainages, including the Taylor Site and the Nipper Creek Site.

Fort Jackson contains 35 Late Archaic components that appear to relate to the resource extraction sites noted by Anderson (1979), possibly representing groups of families utilizing upland sandhills resources during the late fall or winter (after Sassaman et al. 1990).

Fort Jackson contains some 275 sites categorized in the archaeological database as “Woodland.” According to the Integrated Cultural Resources Management Plan (ICRMP) future site recordings would, whenever possible, classify sites as being from the Early, Middle, or Late Woodland period. Fort Jackson may contain many smaller sites, likely associated with limited occupation and resource acquisition in the inter-riverine sandhills (Fort Jackson, 2005a).

Throughout most of the Southeast, the Mississippian Period is represented by a highly stratified society that has an agricultural emphasis and contains complex public works and ceremonial centers. Due to its limited agricultural potential, Fort Jackson contains only a few examples of Mississippian occupations presumably representing resource procurement locales.

Historic Background

The historic past of Fort Jackson has been divided into the following periods that represent distinct phases of the region's history:

- Protohistoric and Colonial (1543-1782 A.D.);
- Early Statehood and Antebellum (1783-1860 A.D.);
- The Civil War (1861-1865 A.D.);
- Postbellum (1866-1900 A.D.); and
- Twentieth Century (1900-2000 A.D.).

In 1670, the South Carolina coast was permanently settled by Europeans with the establishment of Charles Towne. Agriculture, trade with Native Americans, and the harvesting of forest products were the focus of the colonial economy. Columbia was a major trading center due to its location half way between coastal towns and the western frontier.

Much of Richland County was destroyed during the Civil War. The land had deteriorated from the intensive cotton agriculture, and there were difficult times that continued until the industrial revolution at the end of the nineteenth century (Petty 1943). Gradually Richland County evolved from a farming region to an area of industrial importance. The textile industry became important to Richland County during the nineteenth and early twentieth centuries.

4.9.1.2 Status of Cultural Resource Inventories and Section 106 Consultations

The *U.S. Army Training Center and Fort Jackson, South Carolina, Draft Integrated Cultural Resources Management Plan and Environmental Assessment 2005-2010* contains descriptions of the cultural resource surveys conducted at Fort Jackson and provides a summary of their findings (Fort Jackson, 2005a). The Draft ICRMP was written in coordination with Native American tribal organizations and includes a summary of the periods of human habitation in the Fort Jackson region and a summary of Fort Jackson's history.

One of the missions of the Environmental and Natural Resources Division (ENRD) is to manage the cultural resources of Fort Jackson. To properly manage Fort Jackson's cultural resources, the Cultural Resources Manager coordinates with the South Carolina SHPO, the Advisory Council of Historic Preservation, the Tribal Historic Preservation Officers, and the public as appropriate (Fort Jackson, 2005b).

Approximately 81 percent of the installation has been surveyed for archaeological resources (Fort Jackson, 2005b). The known archaeological sites that are eligible or potentially eligible for the NRHP have been located in fairly discrete clusters. Portions of the main cantonment and portions of outlying impact areas are the only areas at Fort Jackson that have not been

surveyed. The unsurveyed portion of the main cantonment area is expected to contain archaeological resource sites, some of which may be eligible for the NRHP (Fort Jackson, 2005b). According to a letter from the South Carolina SHPO dated December 15, 1993, (see Appendix A) previously disturbed portions of the main cantonment area do not require an archaeological survey (Fort Jackson, 2005a).

Of the 668 archaeological sites that have been located within Fort Jackson, 575 sites have been preliminarily determined to be ineligible for the NRHP. These ineligible sites, except for 26 cemeteries, require no further management consideration. The 24 sites that are considered eligible for the NRHP are required to be preserved in-place or the appropriate data recovery investigations must be conducted in order to prevent the loss of the cultural resource information that is present. All of the remaining sites have been determined to be potentially eligible for the NRHP. These 69 potentially eligible sites contain components of every cultural period identified at Fort Jackson and they must be preserved in-place until their eligibility for listing has been officially determined (Fort Jackson, 2005a).

There are no properties listed on the NRHP, no properties listed as NHLs, no properties listed on the World Heritage List, and no identified access routes to sites of religious or ceremonial rites of Native Americans at Fort Jackson (Fort Jackson, 2005a).

4.9.1.3 Native American Resources

A Traditional Cultural Property (TCP) can be defined as a site eligible for listing in the NRHP due to its association with a living community's cultural practices or beliefs that are rooted in the community's history and are important in maintaining the cultural identity of the community. TCPs are usually eligible for the NRHP because of their associations with major events or patterns of events in a community's culture and history. Certain kinds of TCPs are specifically provided for under the NHPA. Native American Sacred Sites can be eligible for the NRHP and federal agencies are required to consult with Native American groups that may value such sites [16 U.S.C. 470a(d)(6)(B)] (Fort Jackson, 2005a).

The FRNAIT have not identified any TCPs to the installation. If a TCP is identified the site would be managed in consultation with the community or Tribe/Nation that has identified the TCP and in a manner so as to preserve those qualities of the TCP that make it eligible for the NRHP (Fort Jackson, 2005a).

Executive Order 13084, Consultation and Coordination with Indian Tribal Governments.

On May 14, 1998, President Clinton issued EO 13084, Consultation and Coordination with Indian Tribal Governments. This EO recognizes the unique

legal relationship the US government has with Indian tribal governments as set forth in the Constitution of the United States, treaties, statutes, EOs, and court decisions. In treaties, our Nation has guaranteed the right of Indian tribes to self-government. As domestic dependent nations, Indian tribes exercise inherent sovereign powers over their members and territory. The United States continues to work with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, trust resources, and Indian tribal treaty and other rights.

The order also notes that government agencies should establish regular and meaningful consultation and collaboration with Indian tribal governments in the development of regulatory practices on Federal matters that substantially or uniquely affect their communities to reduce the imposition of unfunded mandates upon Indian tribal governments, and to streamline the application process for and increase the availability of waivers to Indian tribal governments. Specifically, the order requires that government agencies, to the extent possible, be guided by the principles of respect for Indian tribal self-government and sovereignty, for tribal treaty and other rights, and have an effective process to permit elected officials and other representatives of Indian tribal governments to provide meaningful and timely input in the development of regulatory policies on matters that substantially or uniquely affect their communities.

It is to be the Army's policy to fully comply with EO 13084 by incorporating Indian tribal concerns in decision-making processes supporting Army policies, programs, projects and activities. In this regard, the Army ensures that it would identify, disclose, and respond to potential adverse social and environmental impacts on tribal populations within the area affected by a proposed Army action.

4.9.2 Consequences

4.9.2.1 No Action Alternative

Under the No Action Alternative no new construction would occur at Fort Jackson. Therefore, there would be no impacts to cultural resources with implementation of this alternative.

4.9.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)

- **Direct Impacts** - The proposed sites for the construction projects are located in the cantonment area in cleared (non-forested) areas that have been previously disturbed. The previously disturbed and cleared areas do not require cultural resource surveys as noted in earlier correspondence with the SHPO (Appendix A).

There are currently no known cultural resources located at the proposed Alternative 1 construction sites. Therefore direct impacts to cultural resources are not anticipated with implementation of Alternative 1. However, during construction if any cultural materials are found, all construction would cease, the materials would not be moved, the Fort Jackson Cultural Resources Manager would be contacted immediately, and Fort Jackson would then consult with the FRNAIT and SHPO.

- **Indirect Impacts** - Indirect impacts to cultural resources are not anticipated with implementation of Alternative 1. However, if any indirect impacts to cultural resources are discovered as part of the construction, these impacts would be mitigated through consultation with the FRNAIT and the SHPO.

4.9.2.3 Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

- **Direct Impacts** - Direct impacts to cultural resources are not anticipated with implementation of Alternative 2. However, during construction if any cultural materials are found, all construction would cease, the materials would not be moved, the Fort Jackson Cultural Resources Manager would be contacted immediately, and Fort Jackson would then consult with the FRNAIT and SHPO.
- **Indirect Impacts** - Indirect impacts to cultural resources are not anticipated with implementation of Alternative 2.

4.10 SOCIOECONOMICS

Fort Jackson's ROI is the Columbia, South Carolina, Metropolitan Statistical Area (MSA) which consists of the following six counties: Calhoun, Fairfield, Kershaw, Lexington, Richland and Saluda. Included within the MSA is Columbia, the capital of South Carolina. Richland County is home to Fort Jackson and the center of the ROI, and realizes the greatest social and economic effects from Fort Jackson. These effects include off-post purchase and rental of housing, purchase of goods and services, and employment generation as directly and indirectly related to DOD civilian and military employment associated with Fort Jackson.

4.10.1 Affected Environment

The following section discusses the existing economic and social conditions of the Fort Jackson ROI in respect to labor force, employment, population, housing and quality of life. Existing social and economic characteristics of Fort Jackson are also discussed.

4.10.1.1 Economic Development

Regional Economic Activity

The annual civilian labor force within the ROI was approximately 350,000 in 2004 (BLS, 2004) with total employment estimated at 420,000 (BEA, 2003).

The average annual unemployment rate in the ROI in 2004 was 5.7 percent, lower than the statewide average of 6.8 percent for South Carolina. The current labor force represents an approximate 4 percent increase since 2000, slightly greater than the statewide increase during the same period. The majority of the labor force increase occurred in Lexington and Richland counties which represent the primary sources of labor and employment within the region. These figures are shown in Table 4.3.

County	% Increase, 2000-2004	2004 Labor Force	Unemployment Rate (%)
Calhoun	2.5	7,252	6.6
Fairfield	3.3	11,382	8.0
Kershaw	4.4	28,200	6.2
Lexington	5.3	124,321	4.9
Richland	4.9	169,131	6.0
Saluda	2.2	9,566	7.5
ROI TOTAL	4.3	349,852	5.7
South Carolina	3.3	2,039,031	6.8

Source: U.S. Department of Labor, Bureau of Labor Statistics, 2004.

Employment by the major industry sectors by “place of work” for 2003 is shown in Table 4.4. Employment by “place of work” reflects workers commuting to work outside their county of residence and, thus, results in the recipient county’s employment exceeding the county labor force. Total employment within the ROI was approximately 420,000 in 2003, a 1 percent decrease from 2000. Local and regional employment trends reflect national trends as the services, government, and retail trade sectors account for two-thirds of the regional employment. Services and government account for a greater relative portion of employment in Richland County in which Fort Jackson is located.

The ROI has experienced a slowdown in employment and population growth since 2000 as compared to the 1990-2000 period. Modest growth is forecast for the short-term, with annual employment gains slightly exceeding the rate of growth during the 1990s. Marginal gains in employment are forecast for the construction, education and health services, and leisure and hospitality sectors. Fort Jackson, the University of South Carolina, and state and local government employment should continue to be the stabilizing factors in the local and regional economy (HUD, 2002).

Table 4.4 Total Full Time and Part-Time Employment by Industry by Place of Work, Fort Jackson Region of Influence, 2003 (North American Industrial Classification System).				
Industry	Region of Influence		Richland County	
	Total	Percent	Total	Percent
Farm Employment	3,978	1.0	456	0.1
Forestry, Fisheries	1,863	0.4	606	0.2
Mining	342	Neg.	170	Neg.
Construction	26,491	6.2	11,463	4.5
Manufacturing	33,333	7.9	12,377	4.8
Transportation, Warehousing, Utilities	11,641	2.8	4,451	1.7
Wholesale Trade	14,227	3.4	7,502	2.9
Retail Trade	47,266	11.2	26,057	10.2
Finance, Insurance, Real Estate	38,991	9.2	27,117	10.6
Services	148,422	35.2	98,359	38.5
Government	89,701	21.3	66,908	26.2
TOTAL EMPLOYMENT	420,682	100	255,466	100
<i>Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, 2004.</i>				

The largest employers within the ROI include a mixture of private companies and public agencies. State and local government agencies employ approximately 67,000 employees, while Fort Jackson's civilian and military employment is approximately 20,000. Major private sector employers include Palmetto Health (7,500 employees); Blue Cross & Blue Shield (5,100 employees); South Carolina Electric & Gas (4,000 employees); United Parcel Service (3,500 employees); and the University of South Carolina.

Fort Jackson Contribution to Regional Economic Activity

Fort Jackson is a major contributor to the local and regional economy. Table 4.5 reflects the annual expenditures of Fort Jackson in respect to direct outputs for payrolls and other expenditures. In FY05 the combined military and civilian payrolls exceeded \$520 million, with an additional \$202 million expended for services, supplies, utilities, and travel/transportation. In addition, during FY05 almost \$41 million was approved for various construction projects on the installation.

Table 4.5 Major Expenditures, Fort Jackson, FY 2005	
Expenditure	Dollars (million)
Military Payroll	\$402.3
Civilian Payroll	\$118.2
<i>Total Payroll</i>	\$520.5
Services (Including contractors)	\$108.7
Supplies/Equipment	\$74.7
Utilities	\$10.8
Travel/Transportation	\$7.9
<i>Total Non-Payroll Expenditure</i>	\$202.1
Total Expenditures	\$722.6
<i>Source: Directorate of Resource Management, Fort Jackson S.C., 2005 Annual Statistical Report.</i>	

The University of South Carolina's Moore School of Business estimates that Fort Jackson contributes almost \$1.2 billion annually to the regional economy in the form of business sales, with a total annual economic impact of \$2.14 billion. As portrayed in Table 4.6, the economic impact of the installation is responsible for supporting more than 33,000 direct and indirect jobs, and \$911 million of personal income annually in the form of wages and salaries. In addition, visitor-related generated impacts in the form of business sales and personal income approximate almost \$39 million annually. Currently, there are over 18,000 military retirees and their families residing within the ROI because of the services offered at Fort Jackson.

Table 4.6 Annual Estimated Economic Impacts of Fort Jackson, 2005 (\$million)			
Economic Variable	Direct Impacts	Indirect Impacts	Total Impacts
Business Sales	\$580.40	\$587.40	\$1,167.80
Employment	19,000	14,251	33,251
Labor Income	\$510.50	\$400.90	\$911.30
Visitors-Related Business Sales/Income	-	-	\$38.70
<i>Source: The Economic Impact of the Military in South Carolina: A Focus on the Industry Distribution of Economic Activity, University of South Carolina, Moore School of Business, 2004.</i>			

4.10.1.2 Demographics

Regional Population

Table 4.7 depicts the population distribution and trends within the ROI. The population of this ROI increased from 548,335 in 1990 to 647,158 in 2000.

This represented an 18 percent increase compared to a statewide increase of 15 percent during the same time period. The greatest absolute and relative increase in population occurred in Lexington County, with Fairfield County having the smallest relative increase.

The current population estimate of approximately 690,000 for the ROI represents a 1 percent annual increase since 2000. This relative annual growth rate is similar to the State of South Carolina during the same period. Population projections for 2015 for the Columbia, South Carolina/MSA indicate a continuation of this annual growth rate.

County	2015 Projected Population ¹	2005 Population Estimates ²	Percent Change 1990-2000	2000 Population	1990 Population
Calhoun	17,070	15,100	19.1	15,185	12,753
Fairfield	25,660	24,047	5.2	23,454	22,295
Kershaw	62,740	56,486	20.7	52,647	43,599
Lexington	272,440	235,272	28.9	216,014	167,611
Richland	364,730	340,078	12.2	320,677	285,720
Saluda	20,550	18,895	17.3	19,181	16,357
ROI Total	763,190	689,878	18.0	647,158	548,335
Columbia, South Carolina	NA	NA	18.6	116,278	98,052
South Carolina	4,687,920	4,255,083	15.1	4,012,012	3,486,703

Source: U.S. Department of Commerce, U.S. Census Bureau, 1990 and 2000 U.S. Census.
¹ Office of Research and Statistics, Health and Demographics Division, South Carolina. Based on 2003 population estimates.
² U.S. Census Bureau, Population Division.

The dynamics of population change responsible for population growth or decline are natural increase (births minus deaths) and net migration. Net migration is the difference between in-migration (moving in) and out-migration (moving out) of population. Table 4.8 portrays the relative importance of these two components of population growth for the project area during the 2000-2003 period.

Strong in-migration was the major reason for population growth during the 1990s, averaging 5,400 people annually. Retirees, especially retired military personnel, relocating to the area have sustained the population growth of the region. Since 2000 the rate of in-migration has slowed, partially due to a weaker economy. However, net migration was still responsible for almost 60 percent of the population growth within the ROI from 2000 through 2005 (Table 4.8). This relative importance of net migration approximated that of the State of South Carolina during the same time period. However, internal migration accounted for 100 percent of the net population loss in Calhoun and

Saluda counties, while comprising over 75 percent of the population growth in Kershaw County.

Table 4.8 Estimated Components of Population Change, Fort Jackson Region of Influence, 2000-2005				
County	Population Change ¹	Natural Increase	Net Migration ²	Percent Increase Due to Migration
Calhoun	(84)	122	(171)	100
Fairfield	593	222	410	69
Kershaw	3,839	1,020	2,902	76
Lexington	19,258	6,844	12,806	66
Richland	19,297	10,294	9,399	49
Saluda	(286)	133	(386)	100
ROI Total	42,617	18,635	24,960	59
South Carolina	243,267	97,715	151,485	62

Source: U.S. Department of Commerce, U.S. Census Bureau, Population Division.
¹ Total population includes residual population.
² Includes both domestic and international migration.
 () Denotes decrease.

Fort Jackson Population

Table 4.9 portrays the most current (2005) status of the military and civilian population associated with Ft. Jackson. The Ft. Jackson on-base population approximates 24,000, and is comprised of 16,746 military personnel, 5,253 civilians, and an estimated 2,200 military family members. The military population consists of 597 officers; 2,989 enlisted personnel; 10,488 trainees; 1,957 students; and transients. During Fiscal Year (FY) 2005 over 48,000 soldiers were trained at Fort Jackson, including 29,542 graduates of Basic Combat Training (BCT). The on-post civilian population consists of 2,065 DoD employees; 1,629 civilian employees (including Non-appropriated funded employees, and employees of the installation Exchange and Commissary); and 1,559 contract employees.

Additional population directly associated with Fort Jackson includes 18,760 family members of military personnel, and over 34,000 military retirees and their family members living within the surrounding area of Fort Jackson. Approximately 30 percent of the permanent party military personnel reside on the installation with the remaining 70 percent living in the surrounding communities, primarily in Richland County.

Table 4.9 Fort Jackson On-Post Population, 2005	
Personnel	Number
Military	
Permanent Party Military (TRADOC)	
Officers	597
Enlisted Personnel	2,989
Trainees (BCT/AIT)	10,488
Students	1,957
Transients	715
On-Post Military Family Members	2,200
<i>Total Military Related Personnel</i>	18,946
Civilian	
DOD Civilian	2,065
Federal, non-DoD, Civilian Employees	1,629
Contract Employees	1,559
<i>Total Civilian Personnel</i>	5,253
TOTAL	24,199
<i>Source: Directorate of Resource Management, Ft. Jackson, S.C., 2005 Annual Statistical Report.</i>	

4.10.1.3 Housing

Regional Housing and Household Characteristics

In 1999 there were a total of 269,244 housing units within the ROI according to the 2000 U.S. Census (Table 4.10). The number of housing units increased by 25 percent from 1990-2000. Approximately 80 percent of the total housing units within the region are in Richland County and Lexington County.

According to the 2000 U.S. Census, single-family residential is the dominant housing type, comprising approximately 65 percent of the total housing units within the area (Table 4.11). Multi-family housing is of greatest frequency and importance in Richland County, primarily within the City of Columbia, with single-family units predominating in the outlying suburban counties. Residential building permits issued within the ROI since 2000 reflect a continuation of this pattern of housing types within the individual counties.

Selected housing characteristics related to occupancy status, median value, vacancy rate and median household income are shown in Table 4.10. As indicated, the owner-occupancy rate ranges from 61 percent in Richland County to 84 percent in Calhoun County. The lower owner-occupancy rate in Richland County is reflective of a more urbanized population and multi-family rental housing in the City of Columbia. The median value of owner-occupied

housing in 2000 ranged from \$60,600 in Calhoun County to \$95,900 in Richland County (Table 4.10). Approximately 9 percent of the housing units within the ROI were vacant in 2000. Over 7,000 of the vacant units were for rent while 2,700 were for sale.

County	Total Housing Units 2000	Percent Vacant 2000	Percent Owner Occupied 2000	Median Value Owner Occupied 2000	Median Rent Renter Occupied 2000	Median Household Income 2000
Calhoun	6,864	13.7	84.3	\$60,600	\$237	\$32,736
Fairfield	10,383	15.4	77.4	\$63,100	\$272	\$30,376
Kershaw	22,683	11.0	82.0	\$77,000	\$329	\$38,804
Lexington	90,978	8.5	77.2	\$92,700	\$442	\$44,659
Richland	129,793	7.5	61.3	\$95,000	\$476	\$39,961
Saluda	8,543	16.6	80.6	\$68,600	\$274	\$35,774
ROI Total	269,244	8.8	70.1	\$89,250	\$425	\$40,815
Columbia, South Carolina	46,142	8.4	45.6	\$96,800	\$438	\$31,141
South Carolina	1,753,670	12.5	72.2	\$83,100	\$397	\$37,082

Source: U.S. Department of Commerce, Bureau of the Census, Population and Housing Characteristics, 2000

As shown in Table 4.10, the median household income in 2000 within the ROI ranged from approximately \$30,000 in Fairfield County to over \$44,000 in Lexington County according to the 2000 U.S. Census. The overall median household income for the ROI exceeded that of the State of South Carolina by approximately 10 percent. However, the median household incomes for Calhoun, Fairfield and Saluda counties were less than the statewide median income.

In 2000 there were a total of 269,244 households in the ROI, which represented an increase of 25 percent from 1990. Approximately 50 percent of the households are in Richland County (Table 4.10). The median age of the population ranged from 32.6 years in Richland County to 38.9 years in Calhoun County according to the 2000 U.S. Census. The lower median age of the population in Richland County is partially reflective of the military personnel associated with Fort Jackson.

The April 26, 2006, Columbia, South Carolina Consolidated Multiple Listing Service (CMLS), contained 1,777 single-family homes for sale in the Columbia, South Carolina area, primarily in Richland County and Lexington

County. The median listed price approximated \$160,000. Table 4.11 portrays the distribution of these current for-sale properties by listed price range. In addition, there were 350 multi-family, condominiums and townhouses listed for sale in the Columbia, South Carolina area. In addition to rental apartments, there were 44 single-family rental properties listed for rent, with rents ranging from \$575-\$750 for a two-bedroom/two bath home to \$775-\$1,100 for a three-bedroom/two-three bath home.

Table 4.11 Single-Family Homes Listed For Sale, Columbia, South Carolina Area	
Listed Price Range	Number of Homes Listed
\$50,000 - \$75,000	99
\$75,000 - \$100,000	159
\$100,000 - \$125,000	214
\$125,000 - \$150,000	273
\$150,000 - \$175,000	259
\$175,000 - \$200,000	199
\$200,000 - \$225,000	106
> \$225,000	468
TOTAL	1,777
<i>Source: Columbia, South Carolina Consolidated Multiple Listing Service, April 26, 2006.</i>	

Table 4.12 Ft. Jackson, On-Post Housing	
Housing Type	Number of Housing Units
Family Housing	1,182
Barracks	1,525
BOQ	473
Transient Lodging	822
Recreational Lodging	68
DVQ	15
Total	4,085
<i>Source: Directorate of Resource Management, Ft. Jackson, S.C., 2005 Annual Statistical Report.</i>	

The current inventory of on-post housing includes 1,182 family housing units for officers and enlisted personnel on the installation. However, approximately 40 percent of these units are currently vacant. Currently, 252 of these units are being renovated under a \$20 million housing renovation program that is planned for completion by mid-2007. Some of the smaller units are being combined and converted into larger units. The remaining vacant units consist of units available for occupancy, or in maintenance/cleaning status. Fort Jackson plans on implementing a Residential Communities Initiative program in 2008.

Because of the lack of quality on-post housing, the permanent party military personnel are provided the option of on-post or off-post residency. Currently,

2,877 permanent party military personnel live off-post (80 percent) and 734 live on-post (20 percent). Off-post military personnel and family members comprise a total population of approximately 8,800. It is estimated that about one-half of the off-post military personnel own their home with the other half renting a single-family home, apartment, or mobile home.

4.10.1.4 Quality of Life

Education

On-Post

The Secondary School District (DoD, DDESS), under the direction of Fort Jackson, is supported with three elementary schools. The schools are administered by the South Carolina Department of Domestic Dependent Elementary and Secondary Schools and the Department of Defense Education Activity. These schools support children of military personnel living on Fort Jackson. The current average daily attendance at the three elementary schools combined is 649 students. The total enrollment capacity of these three schools is approximately 1,200. Middle and high school students attend off-post schools.

There are two child development centers on Fort Jackson. The Scales Avenue Center has an operating capacity of 343 children and provides primary full-day care. In addition, the center offers part time options, and a part day toddler and pre-school program. The Hood Street Center has an operating capacity of 60 children and offers care on an hourly basis. Both of these centers currently provide care for both pre-school and school-age children. However, there is a need for a separate care facility for only school-age children.

Off-Post

There are seven public school districts serving the Columbia metropolitan area and the surrounding counties. Fort Jackson is supported primarily by Richland County School District 2 for on-post students in grades seven through twelve. The District received \$386,813 in Federal Impact Aid funds for the 2004/2005 school year to help off-set the cost of educating the dependent children of military personnel assigned to Fort Jackson. .

A majority of Fort Jackson military children attend Richland County School District 2, with a total enrollment of approximately 20,000 students. A sizable number of military children also attend Richland County District 1 schools, with a total enrollment of approximately 25,000 students.

Health

On-Post

Moncrief Army Community Hospital is Fort Jackson's primary medical service facility. The acute care facility has 90 inpatient beds, 58 infirmary beds, and 30 ambulatory clinics, and offers a wide range of medical and dental services to active duty personnel, dependents and military retirees. The hospital's average daily loads include 15 inpatients, 1,304 clinic patients, 478 laboratory procedures, and 292 radiological procedures. McWethy Clinic, located adjacent to the hospital, provides health care for soldiers-in-training, soldiers on temporary duty and reserve component personnel on drill or annual training status. The installation has three dental clinics within easy access of family and troop housing areas.

Off-Post

Off-post medical facilities provide a comprehensive range of primary and secondary health care within the area. In addition to the Moncrief Army Community Hospital, there are several other hospitals within the ROI. The largest of these include the 649-bed Palmetto Richland Memorial Hospital in Columbia, and the 502-bed Palmetto Baptist Medical Center Columbia (UE, 1993). Also within the city of Columbia are 13 additional hospitals with 1,754 beds.

Law Enforcement

On-Post

General law enforcement on Fort Jackson is the responsibility of the Fort Jackson Law Enforcement Activity (FJLEA). FJLEA also performs fish and wildlife law enforcement by means of the Game Warden Section. The military law enforcement authorities coordinate their off-post activities with local law enforcement authorities on a case-by-case basis.

Off-Post

The City of Columbia Police Office, the Richland County Sheriff's Department and the Lexington County Sheriff's Department provide law enforcement for their respective jurisdictions in the areas surrounding Fort Jackson. Off-post police have no jurisdiction on the installation and the military police have no jurisdiction off-post, with the exception of offenses committed by military personnel.

Fire Protection

On-Post

Fort Jackson's Directorate of Logistics and Engineering (DLE) Fire Department provides all fire protection services on-post with one fire station currently in use. Building 5499, located at the intersection of Jackson

Boulevard and Hill Street, serves as the installation's primary fire station. Fort Jackson also has a Hazardous Material Response Team in the event of an accidental hazardous material spill. DLE also performs wildfire (wildland fire) suppression.

The installation has mutual aid agreements with the majority of the rural volunteer and municipal fire departments in Lexington County and the City of Columbia. The agreements provide critical back-up fire fighting support. A mutual aid agreement with the South Carolina Forestry Commission provides for wilderness fire control assistance

Off-Post

Off-post fire protection services in the immediate vicinity of Fort Jackson are handled by the Columbia Fire Department. The Columbia Fire Department exists to protect lives, property and the environment through the enforcement of fire codes, the investigation of incidents of arson, and responses to fires, rescue incidents, hazardous material leaks and natural disasters. The Department's Fire Suppression Division operates from 25 fire stations throughout Columbia and Richland County. The Department employees approximately 310 firefighters and has an additional 190 volunteers. The Lexington County Fire Department employees few full time firefighters, relying instead on volunteers.

Recreation

On-Post

A wide variety of on-post recreational facilities are available to military personnel and their dependents, and to civilian employees on a space-available basis. The installation has a four-field softball complex, two eighteen-hole golf courses, a driving range, and numerous running tracks. In addition, there are numerous playgrounds and multiple-use courts associated with the schools and family housing areas within the cantonment. Other outdoor recreational facilities include: multi-court facilities; basketball courts; baseball/softball fields; youth soccer fields; handball courts; outdoor swimming pools; miniature golf course; water park; and fishing and hunting areas. Indoor recreational facilities include: a physical fitness center; gymnasiums; bowling alleys; swimming pool; movie theater; arts and crafts center; and a community center.

Off-Post

Fort Jackson is situated in a region that is nationally recognized for its outdoor recreational opportunities. The City of Columbia has 125 public parks and two State Parks, Dreher Island State Park on Lake Murray and Sesquicentennial State Park on US Highway 1 northeast of Columbia. Lake Murray, located 15 miles west of Columbia, has facilities for swimming, boating, and water sports. Also within the vicinity of Fort Jackson are Lake

Monticello and Lake Wateree in Fairfield County. Congaree Swamp National Monument is south of Columbia.

4.10.1.5 Environmental Justice

The following discussion of environmental justice issues addresses two Presidential Executive Orders (EOs).

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.

On February 11, 1994, President Clinton issued EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. The purpose of this EO is to avoid the disproportionate placement of adverse environmental, economic, social, or health impacts from Federal actions and policies on minority and low-income populations or communities. An element emanating from this order was the creation of an Interagency Federal Working Group on Environmental Justice comprised of the heads of seventeen Federal departments and agencies, including the US Army. Each department or agency is to develop a strategy and implementation plan for addressing environmental justice.

It is the Army's policy to fully comply with EO 12898 by incorporating environmental justice concerns in decision-making processes supporting Army policies, programs, projects, and activities. In this regard, the Army ensures that it would identify, disclose, and respond to potential adverse social and environmental impacts on minority and/or low-income populations within the area affected by a proposed Army action.

The initial step in the environmental justice analysis process is the identification of minority populations and low income populations that might be affected by implementation of the proposed action or alternatives. For environmental justice considerations, these populations are defined as individuals or groups of individuals, which are subject to an actual or potential health, economic, or environmental threat arising from existing or proposed Federal actions and policies. *Low income*, or the poverty threshold, is defined as the aggregate annual mean income for a family of four in 2003 correlating to \$18,600.

Low income and minority population data was compared for the Fort Jackson ROI, the City of Columbia, and the State of South Carolina. This comparative analysis is summarized in Table 4.13. Based on 2003 U.S. Census estimates, the percentage of low-income persons is slightly lower for the Fort Jackson ROI (12.5 percent) than for the State of South Carolina (13.8 percent).

Table 4.13					
Minority and Low-Income Populations, Fort Jackson Region of Influence.					
County	Total Population (2000)	Percent Minority Population (2000)	Median Household Income in Dollars (2003)	Persons Below Poverty (2003)	Percent Persons Below Poverty (2003)
Calhoun	15,185	50.0	\$33,712	2,178	14.3
Fairfield	23,454	60.5	\$30,857	3,814	15.9
Kershaw	52,647	29.4	\$40,288	6,669	12.0
Lexington	216,014	15.8	\$45,677	24,309	10.5
Richland	320,677	50.2	\$39,737	43,073	13.9
Saluda	19,181	34.2	\$31,614	2,830	15.1
ROI, Total/Average	647,158	36.6	\$41,350	82,873	12.5
Columbia, South Carolina	116,278	50.8	NA	NA	22.1
South Carolina	4,012,012	32.8	\$38,003	565,953	13.8

Source: U.S. Department of Commerce, U.S. Census Bureau, 2000 U.S. Census; Small Area Income and Poverty Estimates, 2003.
NA= Information not available at this geographic level.

However, the percent minority population is higher for the ROI (36.6 percent) than for South Carolina (32.8 percent). Fairfield County has the highest percentage of both minority population (60.5 percent) and population below the poverty level (15.9 percent). Lexington County has the lowest percentage of both minority population (15.8 percent) and population below the poverty level (10.5 percent). The percentage of minority population in Richland County, which includes the City of Columbia and Fort Jackson, exceeds that of the state (44 percent compared to 31 percent). Richland County's percentage of persons below the poverty level (13.9 percent) is approximately that of the state-wide average. The City of Columbia's poverty rate is almost twice that of the Fort Jackson ROI and the State of South Carolina.

4.10.1.6 Protection of Children

On April 21, 1997, President Clinton issued EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. This EO recognizes that a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because children's bodily systems are not fully developed; because they eat, drink, and breathe more in proportion to their body weight; because their size and weight can diminish protection from standard safety features; and because their behavior patterns can make them more susceptible to accidents. Based on these factors, President Clinton directed each Federal agency to make it a high priority to identify and assess environmental health risks and safety risks that might disproportionately affect children. President Clinton also directed each Federal agency to ensure that

its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

It is the Army's policy to fully comply with EO 13045 by incorporating these concerns in decision-making processes supporting Army policies, programs, projects, and activities. In this regard, the Army ensures that it would identify, disclose, and respond to potential adverse social and environmental impacts on children within the area affected by a proposed Army action.

4.10.2 Consequences

4.10.2.1 No Action Alternative

- **Direct Impacts** - Under the No Action Alternative there would be no additional economic impacts since the proposed facilities and operations would not occur. However, minor adverse social impacts are anticipated on the child development functions at Fort Jackson. The existing Child Development Center (CDC) is currently beyond capacity and cannot accommodate the combined child care needs of school age children from ages 6-12 years old, the middle school, and the teenage population of the installation. School age child care is currently provided by the CDC, through spaces in individual homes providing family child care, and through partnerships with other installation Morale, Welfare and Recreation (MWR) activities. The minor, short- and long-term impact would be a diminished quality of life for the Fort Jackson community due to inadequate child care for school age children and supervised programs for older youths.
- **Indirect Impacts** – There are no indirect impacts associated with the No Action Alternative.

4.10.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (Preferred Alternative)

- **Direct Impacts** – Moderate direct short-term beneficial economic impacts would be realized by the regional and local economy during the construction phase of this alternative. Employment generated by construction activities would result in wages paid, an increase in business sales volume, and expenditures for local and regional services, materials and supplies. In addition, direct long-term economic impacts would be realized from the increase in operations associated with this alternative. These impacts would be in the form of increased business volume, income, and employment associated with the increased on-post operations.

The Economic Impact Forecast (EIFS) model developed by the USACE, Construction Engineering and Research Laboratory, was used to assess the impacts of this alternative on the economy. The EIFS model was used to project both the short-term temporary regional economic impacts of project construction and long-term economic impacts of the increase in installation operations. The EIFS model provides a systematic method for evaluating the regional socioeconomic effects of government actions, particularly military actions.

Using employment and income multipliers developed with a comprehensive regional/local database combined with economic export base techniques, the EIFS model estimates the regional economic impacts with respect to changes in employment generated, and expenditures directly and indirectly resulting from project construction. The EIFS model evaluates economic impacts in terms of regional change in sales (business) volume, employment and personal income.

The estimated total "hard" construction cost of \$89.2 million (2005 dollars) for the construction of the new facilities was used as the EIFS input for change in capital costs. The estimated construction period for the new facilities is 3.5 years. The ROI was considered to be the ROI surrounding Fort Jackson. The EIFS employment and income multiplier for this ROI is 3.64. Appendix C contains the EIFS report including the model forecast inputs and outputs for both construction and operations resulting from the implementation of the BRAC Commission recommendations.

Table 4.14 portrays the estimated direct, indirect and total annual economic impacts of construction activities on sales (business) volume, income and employment. As a result of construction expenditures for materials, supplies and services, in addition to construction labor wages, the EIFS model estimates there would be a \$18.2 million increase in direct annual business volume (sales); \$6.4 million increase in direct annual personal income; and an increase of 205 direct jobs created in the construction, retail trade, service and industrial sectors. These impacts would be realized annually over the length of the construction period. However, the majority of the impacts would occur during the second and third years of the construction period with the construction of the DSS and the JCERTE facilities. The increase in sales volume, income and employment includes capital expenditures, income and labor directly associated with the construction activity. Table 4.14 also portrays the indirect impacts on business volume, income and employment as a result of the initial direct impacts of the construction activities.

Table 4.14				
Estimated Annual Economic Impacts, Alternative 1, Fort Jackson				
Variable	Direct Impacts	Indirect Impacts	Total	RTV ¹ (percent)
Annual Construction Impacts ²				
Sales (Business Volume)	\$18,215,000	\$48,087,600	\$66,302,600	0.22
Income	\$6,370,786	\$8,291,270	\$14,662,060	0.10
Employment	205	211	415	0.10
Annual Operations Impacts ²				
Sales (Business Volume)	\$28,324,580	\$74,776,890	\$103,601,470	0.35
Income	\$62,471,600	\$12,893,040	\$75,364,640	0.52
Employment	3,482	327	3,809	0.96
<i>Source: Economic Impact Forecast System, U.S. Army Corps of Engineers, Construction Engineering Research Laboratory.</i>				
1 Rational Threshold Value.				
2 2005 Dollars.				

The EIFS model also includes a Rational Threshold Value (RTV) profile that is used in conjunction with the forecast models to assess the importance of impacts of an activity for a specific geographic area. For each variable (sales volume, employment, income and population), the current time-series data available from the United States Department of Congress Bureau of Economic Analysis are calculated along with the annual change, deviation from the average annual change, and the percent deviation for each of these variables, which then defines a threshold for important annual regional economic impacts for a variable. Within the EIFS model the RTV is calculated for each of these variables when assessing the regional economic impacts of a specific project. If the RTV for a particular variable associated with the impacts of a specific project exceeds the maximum annual historic deviation for that variable, then the economic impacts are considered to be substantive. If the RTV for a variable is less than the maximum annual historic deviation for that variable, then the regional economic impacts are not considered of great consequence.

Table 4.14 portrays the RTV associated with each of the economic impacts resulting from the construction activity. The regional positive RTVs for each economic variable as indicated in Appendix C are as follows: sales volume (10.07 percent); income (9.66 percent); employment (2.11 percent); and population (1.93 percent). Thus, the RTV for each of the variables was found to be considerably less than the respective regional RTV. For this reason, impacts on regional employment, business sales, and income directly associated with construction activity under this alternative would be negligible on a regional basis.

As indicated in Table 4.14, minor direct annual regional economic impacts would occur as a result of the increased operations under Alternative 1. Separate EIFS model runs were completed for the students/trainees and permanent party military/civilian to determine the total annual impacts. There would be an increase of 3,482 employees in the government, retail trade, services and industrial sectors, which would increase the regional economy by \$28.3 million in business volume (sales), and result in \$62.5 million in direct personal income. Employment and income of the students/trainees and permanent party military/civilian personnel are included in the direct employment and direct income. The direct income represents the earnings of employees in the government, retail, wholesale and service establishments that would be initially or directly affected by the net gain of military and civilian employees. The increase in business volume reflects increases in the sales of goods, services, and supplies to the military and civilian personnel, and other employment directly associated with project operations.

As indicated in Table 4.14, the RTV for each of the economic variables is considerably less than the respective regional RTV. For example, employment within the Fort Jackson ROI would increase by less than 1 percent as a result of the increase in on-post operations. For this reason, operations associated with this alternative would have negligible to minor beneficial economic impacts on the Fort Jackson ROI.

Direct long-term impacts would occur in respect to both on-post and off-post population in the Fort Jackson region. On-post military population would increase with the addition of an estimated 2,874 unaccompanied military personnel who would occupy barracks spaces. The unaccompanied personnel represent the additional students/trainees (2,874 Full Time Equivalents) anticipated under Alternative 1. This represents an approximate 15 percent increase in total on-post population, and over a 20 percent increase in students/trainee population.

Off-post population would increase as a result of the relocation of permanent party military and accompanying civilians to the Fort Jackson region under Alternative 1. In addition to the estimated 233 civilians who would relocate, it is assumed that the anticipated 242 unaccompanied and accompanied permanent party military personnel would reside off-post. This assumption is based on the current lack of suitable on-post housing. Assuming an average of three persons per household, the off-post population would increase by approximately 1,450 with the addition of these new households. This increase in off-post population would represent a negligible impact on the regional population and Richland County population.

It is anticipated that there could be a need for approximately 475 off-post housing units assuming all of the permanent party military personnel, in addition to the civilians, live off-post. According to the 2000 U.S. Census, there were 7,000 vacant housing units advertised for rent within the Fort Jackson ROI that were not for seasonal, recreational or occasional use. Over 60 percent of these vacant units were in Richland County. Currently, there are more than 700 existing homes listed for sale for under \$150,000 in the Fort Jackson ROI. Thus, the existing housing supply is anticipated to be sufficient to accommodate the new long-term demands associated with Alternative 1. Consequently, impacts of the local and regional off-post housing resources would be negligible.

Off-post school enrollment would increase as a result of the potential increase under Alternative 1. It is assumed that all school-age dependents of military personnel would attend off-post schools because of their anticipated off-post residency. Richland County School Districts 1 and 2 would support the majority of the military dependent children. It is estimated that there could be an additional 680 school-age children of military and civilian personnel associated with Alternative 1. This estimate is based on the factor of 2.3 children per family, and assuming 50-75 percent of the permanent party military and civilian personnel are accompanied by family members. The current enrollment of these two school districts is approximately 45,000 students. Thus, the projected anticipated enrollment increase represents less than 2 percent of the current enrollment. Consequently, impacts of Alternative 1 on local school enrollment would be negligible. On-post DDESS schools are currently operating at approximately only one-half of their capacity of 1,200 students. This low enrollment is primarily due to the lack of suitable on-post family housing resources and military families instead opting for off-post housing.

There are no anticipated adverse socioeconomic impacts of Alternative 1 related to environmental justice. Some potential short-term minor adverse effects on the protection of children could be expected. Because construction sites can be enticing to children, construction activity could be an increased safety risk. Therefore, during construction, safety measures as stated in 29 CFR 1926.13, *Safety and Health Regulations for Construction*, and Army Regulation 385-10, *Army Safety Program*, would be followed to protect the health and safety of all residents on Fort Jackson as well as construction workers. Safety measures, barriers, and "no trespassing" signs would be placed around the perimeter of construction sites to deter children from playing in these areas, and construction vehicles and equipment would be secured when not in use. These measures would reduce the potential for injuries to children.

- **Indirect Impacts** - The anticipated increase in construction activity, on-post operations, and permanent population under Alternative 1 would have negligible to minor indirect socioeconomic impacts on the Fort Jackson region. These impacts would be in respect to employment, income, business volume, housing, educational and community facilities, public services, and government revenues and expenditures.

Negligible to minor indirect short-term beneficial economic impacts would be realized by the regional and local economy during both the construction and operations phases of this alternative. Employment generated by construction activities would result in additional indirect wages paid, an increase in indirect business sales volume, and indirect expenditures for local and regional services, materials and supplies as indicated in Table 14. Subsequently, annual on-going operations associated with Alternative 1 would also result in the above economic impacts to the local and regional economy.

Table 4.14 portrays the indirect economic impacts of the proposed construction activities on sales (business) volume, income and employment. As a result of construction expenditures for materials, supplies and services, in addition to construction labor wages, the EIFS Model estimates there would be approximately \$48.1 million increase in indirect business volume (sales); \$8.3 million increase in indirect or induced personal income; and an increase of 211 indirect jobs created in the construction, retail trade, service and industrial sectors. These impacts would be realized on an annual basis during the length of the construction period, but would have negligible to minor impacts on the regional economy.

Also portrayed in Table 4.14 are the annual indirect impacts of the proposed operations on sales (business) volume, income and employment. As a result of direct expenditures for materials, supplies and services, in addition to direct labor wages, the EIFS Model estimates there would be approximately \$74.8 million increase in indirect business volume (sales); \$12.9 million increase in indirect or induced personal income; and an increase of 327 indirect jobs created in the construction, retail trade, service and industrial sectors. However, the local and regional impacts on the regional economy would be negligible to minor.

It is anticipated that the current housing supply should be sufficient to accommodate the additional housing demand associated with Alternative 1. However, some new housing construction could be encouraged by this new demand, albeit modest. Any new development would be added to the tax rolls which would result in increased property tax revenues. In addition, there would be increases in sales tax, utility tax and other revenues resulting from the additional population. Some supportive

infrastructure and public services may be subject to additional demand from the new population directly associated with Alternative 1.

There would be minor indirect impacts on the off-base school facilities as a result of the influx of the military and civilian personnel associated with Alternative 1. The estimated increase of 680 off-base students could indirectly result in the possibility of a potential need for expansion of certain existing school facilities (e.g. classrooms); a demand for additional staff and classroom teachers; and possibly an increase in the current student/teacher ratio in some schools. In addition, the impacted school district(s) would receive additional Federal Impact Aid (FIA) associated with military-affiliated students. However, the additional FIA would be minor assuming that all of the new student enrollees would live off-post. It is assumed that the majority of these impacts would occur in Richland County School Districts 1 and 2 based on the current enrollment distribution of military-affiliated students in the Fort Jackson region.

4.10.2.3 Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

- **Direct Impacts** - The direct socioeconomic impacts under Alternative 2 would be anticipated to be similar to, but marginally less than, those impacts described under Alternative 1. The somewhat lower impact would be due to less construction taking place and fewer troops training.
- **Indirect Impacts** - The indirect socioeconomic impacts would be similar to, but marginally less than, those impacts as described under Alternative 1. The somewhat lower impact would be due to less construction taking place and fewer troops training.

4.11 TRANSPORTATION

4.11.1 Affected Environment

The following sections discuss the transportation infrastructure in the Fort Jackson cantonment area.

4.11.1.1 Roadways and Traffic

Primary access to the installation is provided by Forest Drive, Jackson Boulevard, and Interstate 77 (I-77). Fort Jackson Boulevard and Gate 1 connect the southern portion of the cantonment area to I-77, while Strom Thurmond Boulevard and Gate 2 provide access to the western and northern portion of the cantonment area. Since the completion of I-77, most personnel residing off-post use Gate 2 for access to the installation.

Fort Jackson has over 207 miles of roads, of which approximately 133 miles are paved and 74 miles are unpaved. Traffic flow within the cantonment area is predominantly north-to-south along the primary roadways of Jackson Boulevard, Lee Road, and Marion Avenue. Major east-to-west roadways

include Strom Thurmond Boulevard, Washington Road/Anderson Street, Hill Street, Hampton Parkway, and Semmes Road.

4.11.1.2 Installation Transportation

Fort Jackson provides a shuttle bus that transports people within and around the cantonment area.

4.11.1.3 Public Transportation

Fort Jackson is supported by the Central Midlands Regional Transit Authority which has two buses per day dropping off passengers at the installation and returning them to various locations in and around Columbia, South Carolina. Taxi cab service is also available and allowed access to Fort Jackson and to its employees.

4.11.2 Consequences

4.11.2.1 No Action Alternative

Under the No Action Alternative no new construction would occur at Fort Jackson. No new transportation infrastructure would be constructed, nor would any existing infrastructure be upgraded.

4.11.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)

- **Direct Impacts** - Short term minor adverse impacts can be expected from traffic congested due to construction equipment entering and leaving the RC site.

More short term traffic congestion would be experienced in the northeastern section of the cantonment area due to construction vehicles and equipment entering and leaving the DSS, JCERTE, and CDC construction sites. This would be a minor adverse impact.

Long term traffic inside Gate 1 during the morning and evening rush hours would be somewhat heavier due to the Gate's use by RC personnel commuting to the new RC just outside the traffic circle.

Long-term increased traffic congestion would result due to increased personnel assigned to DSS, JCERTE, the CDC, and other proposed activities that could include up to 6,800 additional people undergoing training. This impact would be moderately adverse. Traffic could be especially congested on Hampton Parkway and Hartsville Guard Road.

Indirect Impacts – No indirect impacts to transportation associated with Alternative 1 have been identified.

4.11.2.3 Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

- **Direct Impacts** - Impacts would be similar to, but marginally less than, those impacts described under Alternative 1. The somewhat lower impact would be due to less construction taking place and fewer troops training.
- **Indirect Impacts** – No indirect impacts to transportation associated with Alternative 2 have been identified.

4.12 UTILITIES

4.12.1 Affected Environment

The following sections discuss the utility service lines, such as telephone, fiber optic, sanitary sewer, storm water sewer, water, and electrical, in the area of Fort Jackson's cantonment area. There are utility lines along many of the cantonment roads.

4.12.1.1 Potable Water Supply

The primary sources of water for the City of Columbia and Fort Jackson are Lake Murray and the Broad River, which intersects the Saluda River west of downtown Columbia to form the Congaree River. Raw surface water from the Broad River is treated at the City of Columbia Canal Water Treatment Plant, which has a capacity of 70 million gallons per day (MGD). Raw water from Lake Murray is treated at the Lake Murray Water Treatment Plant, which has a total system capacity of 55 MGD. Currently, the combined system is operating at less than half of its total capacity of 125 MGD. The maximum daily volume available to Fort Jackson from the City of Columbia is approximately 6.5 million gallons per day. Based on data provided by City of Columbia, Fort Jackson currently consumes approximately 1.88 MGD of water on average.

Potable water is stored in a 2 million gallon elevated tank on one of the highest elevations on the installation. The distribution system serves the main cantonment area. The existing potable water distribution has approximately 384,500 linear feet of mains and laterals. Six well systems designed with hydro pneumatic pressurization and sodium hypochlorite disinfection systems serve the training ranges and the Weston Lake Recreation Area east of the cantonment area.

4.12.1.2 Wastewater System

Fort Jackson has limited treatment facilities and relies on the City of Columbia and its Metropolitan Wastewater Treatment Plant to treat almost of its wastewater. The average daily flow is approximately 3.2 MGD. A small wastewater treatment plant serves the Weston Lake Recreation Area near Leesburg Road. Three major drainage basins make up the collection system that serves Fort Jackson. The wastewater collection system presently

consists of approximately 324,270 linear feet. Septic tanks with tile drainage fields serve isolated facilities not connected to the main collection system.

Fort Jackson maintains seven sewage lift stations used for transferring wastewater from lower elevations to locations within the collection system where gravity flow conditions prevail. Fort Jackson is permitted under the NPDES by the South Carolina Department of Health and Environmental Control. The Permit Number is SC0003786.

Training ranges have no sanitary sewers; chemical toilets are commonly used and are serviced on a regular basis by service contract with the removed contents discharged into a convenient manhole.

4.12.1.3 Storm Water System

The Fort Jackson Storm Water Management Plan describes Fort Jackson's program to comply with the NPDES Phase II regulations covered under the South Carolina General Permit for Discharges from Small Municipal Separate Storm Sewer Systems. The program consists of public education/outreach, illicit discharge detection and elimination, construction site storm water runoff, post-construction storm water runoff, and pollution prevention.

4.12.1.4 Energy Sources

Electricity is supplied to Fort Jackson by South Carolina Electric & Gas Company (SCE&G). SCE&G serves Columbia, South Carolina, and areas to the north, south, and west. Existing electrical lines are a combination of above and below ground lines.

Natural gas is also supplied to the installation by the SCE&G. In the event of a service interruption, the installation switches to low sulfur Number 6 fuel oil at the central energy plants. A number of other facilities on the installation have individual natural-gas-powered boilers.

4.12.1.5 Communications

Fort Jackson is in the process of installing an installation-wide fiber optic "backbone." The fiber is of the 24 strand variety that offers excess capacity estimated to meet all present and future communication needs. Existing communication lines are a combination of above and below ground lines.

4.12.1.6 Solid Waste

The Fort Jackson solid waste program is comprised of several components. It employs contractors for the regular collection of trash. It has a turn-in program (to DRMO) for excess government property. There is a mulch facility, a thrift store, a green procurement strategy, and a Qualified Recycling Program. Fort Jackson provides facilities for recycling numerous types of materials. The central recycling center and four recycling "igloos" are located

throughout the cantonment area. Construction contractors are required to dispose of construction and demolition debris off-post.

4.12.2 Consequences

4.12.2.1 No Action Alternative

Under the No Action Alternative no new construction would occur at Fort Jackson. No new utilities would be constructed, nor would any new connections be made to existing utilities.

4.12.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)

- **Direct Impacts** – The proposed location of the RC is equidistant between two heating and cooling plants, and a decision would have to be made as to which distribution system the RC would connect to. In either case, the distance of utility runs required for heating and cooling ducting ranging from 2,000-3,000 feet in length. Both heating and cooling plants have existing capacity to provide heat and chill water to the proposed RC.

The DSS is immediately adjacent to Power Plant 4, and would connect to its existing heating and cooling distribution system with little use of existing capacity.

The existing JCERTE building has its own internal boiler and chiller. The new building would connect to existing distribution lines coming from one of the installation's four existing power plants, with little use of existing capacity.

Constructing a 6,190 SF expansion onto the existing Child Development Center (Building 5975) would require minor upgrades and extensions to that building's electrical, communications, plumbing, and heating and cooling. Its effect on Fort Jackson's overall utilities would be negligible.

A new fiber optic communications distribution system is currently being constructed throughout the installation. All new proposed construction would connect to this new fiber optic backbone.

No other utilities (i.e. storm sewers, sanitary sewers, etc.) would require expansion or upgrade. Connections would be made to these systems that would use only a slight amount of the overall capacity of the installation's utilities. A long-term slight increase in utilities utilization would result due to increased personnel assigned to DSS, JCERTE, the CDC, and other proposed activities that could include up to 6,800 additional people undergoing training.

- **Indirect Impacts** – There would be no indirect impacts associated with Alternative 1.

4.12.2.3 Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions

- **Direct Impacts** – Alternative 2 would have similar impacts as Alternative 1.
- **Indirect Impacts** – There would be no indirect impacts associated with Alternative 2.

4.13 HAZARDOUS AND TOXIC SUBSTANCES

4.13.1 Affected Environment

The following sections discuss the historic procurement, storage, handling, use, disposal and recycling of hazardous and toxic substances on Fort Jackson.

4.13.1.1 Uses of Hazardous Materials

Fort Jackson is required to track the amount of hazardous materials stored and used on the installation and report to the regulatory agencies annually. Commonly used hazardous materials at Fort Jackson include paints, adhesives, sealants, fuels, antifreeze, oil, greases, other lubricants, and solvents. (Fort Jackson, 2000).

4.13.1.2 Storage and Handling Areas

Hazardous waste (HW) at Fort Jackson is stored at Satellite Accumulation Areas (SAA) or Container Storage Areas (CSA) prior to turn-in to DRMO or permitted disposal off-post. Site-specific spill response plans, spill response kits, and Material Safety Data Sheet (MSDS) files are displayed prominently near all HW storage areas.

4.13.1.3 Hazardous Wastes

Common types of wastes at Fort Jackson include lamp crusher filters, PreservCyt solution, weapons cleaning solids, pesticide vat rinsate, paint chips, photography chemicals, dental amalgams, chemotherapy drugs, aqueous brake solution, vehicle maintenance Petroleum, Oils, and Lubricants (POLs), contaminated soil, batteries, lamps (light bulbs), Meals Ready to Eat (MRE) heaters, and oil filters.

4.13.1.4 Site Contamination and Cleanup

In October 1991, Fort Jackson was issued a Resource Conservation and Recovery Act (RCRA) Part B permit. Under the corrective action portion of the permit, investigation of inactive or closed sites redesignated as solid waste management units (SWMUs) and other areas of concern (AOCs) were initiated. Fort Jackson has a total of 39 IRP sites listed in the Defense Sites Environmental Restoration Tracking System (AEDB-R). Twenty of these

have no further action planned. The sites include landfills, weapons cleaning/solvent sites, storage areas, acid neutralization drainage sites, and explosive ordnance disposal (EOD) sites. No off-post contamination exists or has been documented.

The proposed action was considered to have an impact if hazardous materials in the project areas were encountered during project activities.

4.13.1.5 Special Hazards

No special hazards are in proximity to the projects discussed in the Alternatives.

4.13.2 Consequences

4.13.2.1 No Action Alternative

Under the No Action Alternative, no new construction would occur at Fort Jackson. Therefore, there would be no adverse or beneficial environmental impacts differing from the baseline conditions due to hazardous materials.

4.13.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)

Under this alternative, an RC building would be constructed. The Consolidated DSS would be a new training complex at the Morgan Loop (off Kemper Street). The JCERTE building would be adjacent to Building #10100, and the Child Development Center's expansion would be at Building #5975 on Chesnut Road.

- **Direct Impacts** - During construction, there would be short-term minor adverse impacts due to the potential for construction equipment to have spills or leaks of antifreeze, hydraulic fluid, oil, and fuel. During operation of the developed sites, there would be long-term minor potential for accidental spills of hazardous and toxic materials such as antifreeze, grease, hydraulic fluid, oil, and fuel from vehicles parked on or traveling on paved parking lots surrounding the building.

During training rotations of the additional soldiers, there would be a minor adverse impact from hazardous and toxic materials, due to additional lead and metal contamination at range berms.

- **Indirect Impacts** – Any subsequent migration of toxic materials from contamination would be a potential long term indirect impact.

4.13.2.3 **Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions**

Under this Alternative, impacts would be similar to those described in Alternative 1.

4.14 **CUMULATIVE EFFECTS SUMMARY**

4.14.1 **Introduction**

The cumulative impact analysis evaluates the incremental effects of implementing any of the alternatives when added to past, present, and reasonably foreseeable future U.S. Army actions at Fort Jackson and the actions of other parties in the surrounding area, where applicable. The cumulative impact analysis has been prepared at a level of detail that is reasonable and appropriate to support an informed decision by the U.S. Army in selecting an alternative. The cumulative impact discussion is presented according to each of the implementation alternatives listed.

The key components of the cumulative impact analysis include the following:

Cumulative Impact Analysis Area. The cumulative impact analysis area includes the area that has the potential to be affected by implementation of the proposed action at Fort Jackson. This includes the installation and the area immediately proximate to the installation boundary and varies by resource category being considered:

- **Land Use.** The cumulative impact analysis area for land use is Fort Jackson and its surrounding community.
- **Aesthetics and Visual Resources.** The cumulative impact analysis area for aesthetic and visual resources is Fort Jackson and the surrounding community that has Fort Jackson within its viewshed.
- **Air Quality.** The cumulative impact analysis area for air quality is the AQCR that includes Fort Jackson.
- **Noise.** The cumulative impact analysis area for noise includes all areas adjacent to the Zone 2 or Zone 3 noise zones that could be impacted by an expansion of one or more of those zones.
- **Geology and Soils.** The cumulative impact analysis area for geology and soils, including topography, is defined by the installation boundary.
- **Water Resources.** The cumulative impact analysis area for water resources, including physiography and surface drainage, surface water, surface water quality, groundwater, floodplains, and storm water is defined as the installation boundary and the watersheds of Colonels Creek, Gills Creek, Congaree River, and Cedar Creek..

- **Biological Resources.** The cumulative impact analysis area for biological resources is the installation and the watersheds of Colonels Creek, Gills Creek, Congaree River, and Cedar Creek.
- **Cultural Resources.** The cumulative impact analysis area for cultural resources is Fort Jackson and Richland County.
- **Socioeconomic Environment.** The cumulative impact analysis area for the socioeconomic environment includes the ROI discussed earlier in this document. The analysis includes consideration of the regional economy and demographics; Fort Jackson's population and economic impact; Native American and other ethnic concerns; environmental justice; impacts to children; and community services (i.e., education, police protection, fire protection, and emergency services).
- **Transportation.** The cumulative impact analysis area for transportation is Fort Jackson and roadways within the surrounding community that serve Fort Jackson.
- **Utilities.** The cumulative impact analysis area for utilities is defined by the installation boundary and the service areas of the public utilities that serve Fort Jackson.
- **Hazardous and Toxic Substances.** The cumulative impact analysis area for hazardous and toxic materials includes all areas within the installation boundaries and the watersheds that include the installation.

Past and Present Actions. Past actions are defined as actions within the cumulative analysis area under consideration that occurred before November 2005. These include past actions at Fort Jackson and past demographic, land use, and development trends in the areas that surround the installation.

In most cases, the characteristics and results of these past and present actions are described in the Affected Environment sections under each of the resource categories covered in this EA. Past and present actions that have been identified and considered in the analysis of cumulative impacts are listed below. These actions are grouped to indicate those that are anticipated on-post and those that are anticipated off-post.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions are mainly limited to those that have been approved and that can be identified and defined with respect to timeframe and location. Reasonably foreseeable future actions that have been identified and considered in the analysis of cumulative impacts, both on-post and off-post are listed below.

Reasonably Foreseeable On-post Actions:

- Range and Training Area construction and improvements. Two range improvement projects have been funded at Fort Jackson. Both have

undergone NEPA analysis. Several other range improvement projects are listed in the FY07–FY13 Range Development Plan (RDP) including four new zero ranges, and four new automated qualification ranges.

- Continuation of past and present actions as discussed above. One exception is the relocation of the 3rd Army Headquarters to Shaw Air Force Base. This would consist of approximately 2,000 people. Army-specific training for this organization might be conducted at Fort Jackson.
- Continuation of present management actions, and the modification of these management actions, as necessary, to ensure compliance with regulations.
- Building or system renewals or replacements, construction of new buildings or systems, expansions and improvements in existing buildings, and street and road improvements would continue as needed to fulfill mission requirements at Fort Jackson that are not included in the proposed action or alternatives. These include:
 - A new power plant proposed for FY 09;
 - Advanced Individual Training (AIT) Barracks and a classroom facility proposed for FY 10;
 - A 4th Brigade Headquarters Building proposed for FY 11;
 - Two additional trainee barracks complexes proposed for FY 8-FY 10 to support existing BCT stationed at Fort Jackson; and
 - Modernization of the reception station proposed for FY 11.
- Proposal for a 500-acre National Veterans Cemetery on the northern boundary of Fort Jackson near Percival Road and Clemson Spears Creek. This site is approximately 9 miles from the closest construction site considered in this EA.

Reasonably Foreseeable Off–post Actions include the following:

- Potential expansion of a National Guard facility near Highway 601 and Leesburg Road. This site is approximately 16 miles from the closest construction site under the proposed action.; and
- Continuation of present management actions within the surrounding civilian community and the continuation of existing civilian development trends; and
- Continued civilian encroachment around the Fort Jackson installation, mainly from the metro Columbia area including:

- Future phases of development of residential subdivisions between Percival Road and I-20 (400-500 more houses). This development would occur no closer than approximately 2 miles from the closest construction site under the proposed action.; and
- Proposed 145-acre annex into the city of Columbia off of Screaming Eagle Road.

4.14.2 Potential Cumulative Impacts

4.14.2.1 No Action Alternative

Under the No Action Alternative there would be minimal cumulative impacts differing from the baseline condition. Aesthetics and visual resources could be impacted by the deterioration of existing buildings. Cumulative impacts occurring as a result of activities in the region would continue.

4.14.2.2 Alternative 1 - Establishment of New RC, Consolidated DSS, JCERTE; Relocation of Mobilization Processing Functions; CDC Expansion; Relocation of 5th Brigade Cadet Command; and Stationing of two BCT Battalions (*Preferred Alternative*)

Cumulative impacts under Alternative 1 by resource category are as follows:

- **Aesthetics and Visual Resources.** There would be no substantial cumulative impacts to aesthetics under Alternative 1. All projects on Fort Jackson would be developed in compliance with the Installation Design Guide. Additionally, all of these projects are located within the cantonment area.
- **Land Use.** There would be no cumulative impacts to land use under Alternative 1 since all projects constructed on the installation would be compatible with existing uses. They would represent expansion of existing functional land use areas through infill development.
- **Air Quality.** There would be a slight increase in the potential for negligible short-term adverse cumulative impacts to air quality associated with the proposed and reasonably foreseeable construction projects. The potential increases in short-term fugitive dust from on- and off-post construction activities may combine with dust and particulate matter generated through training activities and other previously approved construction projects on the installation. These emissions would accumulate with other pollutants from adjacent and regional activities. This would likely only be an issue when atmospheric conditions are stagnant such as on hot humid days in late summer. Techniques to minimize fugitive dust would be employed. Increased traffic emissions from the additional traffic associated with the proposed action, as well as travel of the 3rd Army Headquarters personnel (approximately 2,000

people) from Shaw AFB for training at Fort Jackson would have a cumulative adverse impact to air quality. The additional impact would be negligible.

- **Noise.** The construction and operation of the RC, DSS, JCERTE, and renovated CDC facilities would not result in any substantial cumulative noise impacts. An increase in on-post training from an additional 6,800 people from the BCT and an additional 2,000 people under the 3rd Army Headquarters may result in expansion of noise contours that may result from changes in training and weapons firing. For areas that are already at the upper limits of a Zone I or Zone II noise zone area, any additional noise resulting from changes associated with this alternative would cause an adverse cumulative impact if it causes the noise zone to increase to the next level. Efforts would be made to minimize noise level changes outside the installation, especially in noise sensitive areas.
- **Geology and Soils.** Under this alternative there is the potential for cumulative adverse impacts to soils due to soil erosion, removal, and compaction. The proposed action and reasonably foreseeable development projects in the surrounding communities have the potential to result in cumulative adverse impacts to soils. These impacts would be short-term and because most of the development would take place on previously disturbed or developed areas, the impacts would be minor.
- **Water Resources.** Run-off from soil disturbance from BRAC and non BRAC related construction projects and training activities on Fort Jackson combined with soil disturbance from construction projects being implemented in surrounding community would have cumulative adverse affects on downstream water resources. Use of BMPs would minimize adverse impacts to water resources.
- **Biological Resources.** Because most of the construction activities that would be implemented under Alternative 1 are located within or adjacent to the existing cantonment area or previously disturbed areas, it is not anticipated that any major cumulative impacts to biological resources would occur due to on-post activities. However, development within the surrounding community would continue. Consequently, there would be a potential for adverse cumulative impacts to biological resources due to loss or degradation of habitat. This loss of habitat could cause displacement of some individuals of certain species that use that habitat.
- **Cultural Resources.** There would be no cumulative impacts to cultural resources under Alternative 1. There are no known cultural resources located at the proposed Alternative 1 construction sites.
- **Socioeconomics.** Negligible to minor beneficial cumulative impacts would be in the form of increased business volume, income, and

employment associated with construction activities and increased on-post operations in combination with other non-BRAC proposed on-post actions and construction projects. Negligible to minor beneficial cumulative economic impacts would be realized by the regional and local economy during both the construction and operations phases of this alternative. Employment generated by construction activities would result in additional indirect wages paid, an increase in indirect business sales volume, and indirect expenditures for local and regional services, materials and supplies. Housing and other development in the surrounding communities when combined with on-installation development would result in Negligible to minor long-term cumulative economic impacts. These impacts would be beneficial because most of the development would take place on previously disturbed or developed areas, and the development would improve housing and other support facilities within the surrounding communities. Other cumulative socioeconomic impacts include potential negligible short-term adverse impacts due to an increase in school enrollment and increased demand on public services. In the long-term, however, FIA and an enhanced tax base and tax revenues would be expected to off-set these impacts.

- **Transportation.** Minor long-term traffic congestion would result from increased personnel assigned to the RC, Consolidated DSS, JCERTE, CDC, and BCT battalions. This when combined with traffic due to increased traffic from travel of the 3rd Army Headquarters (approximately 2,000 personnel) from Shaw AFB for training at Fort Jackson would have a cumulative adverse impact on traffic congestion.
- **Utilities.** Implementation of the proposed action would have no short- or long-term cumulative adverse or beneficial impact on the utilities.
- **Hazardous and Toxic Substances.** With the BRAC-related and other construction projects considered under this alternative, the possibility for spills from construction equipment is increased. This would result in the potential for negligible to minor short-term adverse cumulative impacts when combined with the potential spills from other construction projects that may be occurring on the installation and/or in adjacent areas.

4.14.2.3 **Alternative 2 - Establishment of New RC, Consolidated DSS, JCERTE; and Relocation of Mobilization Processing Functions**

Cumulative impacts under Alternative 2 by resource category are as follows:

- **Aesthetics.** The potential cumulative impacts to aesthetics under Alternative 2 would be the same as those of Alternative 1.
- **Land Use.** There would be no cumulative impacts to land use under Alternative 1 since all projects constructed on the installation would be

compatible with existing uses. They would represent expansion of existing functional land use areas through infill development.

- **Air Quality.** The potential cumulative impacts to air quality under Alternative 2 would be the same as those of Alternative 1.
- **Noise.** The potential cumulative impacts to noise under Alternative 2 would be the same as those of Alternative 1.
- **Geology and Soils.** The potential cumulative impacts to geology and soils under Alternative 2 would be the same as those of Alternative 1.
- **Water Resources.** The potential cumulative impacts to water resources under Alternative 2 would be the same as those of Alternative 1.
- **Biological Resources.** The potential cumulative impacts to biological resources under Alternative 2 would be the same as those of Alternative 1.
- **Cultural Resources.** The potential cumulative impacts to cultural resources under Alternative 2 would be the same as those of Alternative 1.
- **Socioeconomics.** The potential cumulative impacts to socioeconomics under Alternative 2 would be the same as those of Alternative 1.
- **Transportation.** Cumulative impacts under Alternative 2 would be the same as under Alternative 1.
- **Utilities.** Utility impacts under Alternative 2 would be similar to those under Alternative 1.
- **Hazardous and Toxic Substances.** The potential cumulative impacts to hazardous and toxic substances under Alternative 2 would be the same as those of Alternative 1.

4.15 BEST MANAGEMENT PRACTICES AND MITIGATION

As part of the proposed action, Fort Jackson has identified a number of BMPs that would be implemented in association with the proposed construction activities, regardless of the alternative selected. These measures are designed to avoid, reduce, or eliminate the impact of adverse impacts. For those adverse impacts that cannot be avoided or reduced, the BMPs include features designed to: protect, maintain, restore, or enhance environmental conditions. These BMPs are summarized below:

Best Management Practices: Although the standard best management practices described below would reduce any potential adverse impacts of implementing either of the action alternatives, they are not required to reduce the potential impacts below significance levels.

- **Geology and Soils:** Construction activities for the action alternatives would follow a Memorandum of Agreement with the South Carolina Department of Health and Environmental Control to ensure erosion control plans are in effect. Actions occurring on the installation are required to meet existing management plans, standard operating procedures (SOPs), permit requirements, as well as local, State, and federal standards. Programs are in-place to ensure proper soil management and are adequately funded to repair or rehabilitate areas disturbed by military activities.
- **Air Quality:** Techniques will be employed to minimize fugitive dust emissions and open-burning activities would be minimized by regulating the types of materials burned as well as tracking weather conditions.
- **Water Resources:** Best Management Practices (BMPs) will be implemented in accordance with applicable National Pollutant Discharge Elimination System (NPDES) permits and State and local requirements. All construction activities will be conducted in accordance with State, local, and federal guidelines, regulations, and permits, and all identified and available BMPs will be used to minimize potential effects. Appropriate mitigation features such as wellhead protection measures, stabilization of disturbed soils, drainage swales, and retention ponds during construction phases to minimize erosion and off-site sedimentation will be implemented in accordance with the State of South Carolina Clean Water regulation requirements for construction activities.
- **Biological Resources:** All soil disturbing activities are reviewed to ensure that impacts to wetlands are avoided or minimized. Trees and vegetation would be maintained and structural erosion control measures would be employed according to standards and specifications of the State of South Carolina and/or the U.S. Environmental Protection Agency document *Stormwater Management for Construction Activities*. Management of prescribed pine tree habitat for red-cockaded woodpeckers would be maintained as outlined in the Endangered Species Management Plan in accordance with the provisions of the Endangered Species Act.
- **Cultural Resources:** Fort Jackson has previously coordinated with the State Historic Preservation Officer (SHPO) and the Federally Recognized Native American Indian Tribes (FRNAIT) concerning proposed project lands within the cantonment area. The FRNAIT and SHPO have agreed that previously disturbed areas within the cantonment does not have to be surveyed. If artifacts are found during construction within the cantonment area, work will cease and the FRNAIT and SHPO will be consulted. Integrated Cultural Resources Management Plan procedures will be followed.

4.16 CONCLUSIONS, FINDINGS, AND RECOMMENDATIONS

As noted in this analysis, direct, indirect, and cumulative impacts of the each of the Proposed Action Alternatives and the No Action Alternative have been considered. No significant adverse or significant beneficial impacts were identified. Therefore, either of the action alternatives considered could be implemented. This conclusion is based on the results of this EA, which has been completed in a manner consistent with stated requirements. Therefore, issuance of a FNSI is warranted, and preparation of an Environmental Impact Statement is not required. Implementation of the No Action Alternative would result in the continuation of conditions that cannot support the training mission and appropriate living conditions at Fort Jackson. For actions directed by the BRAC Commission, it is noted that for the No Action Alternative, maintenance of current conditions is not feasible, since the BRAC actions are required to be implemented by the BRAC legislation..

SECTION 5

ACRONYMS

A

ACHP	Advisory Council on Historic Preservation
AEDB-R	Army Environmental Database-Restoration
AFB	Air Force Base
AFRC	Armed Forces Reserve Center
AIT	Advanced Individual Training
AOC	Area of Concern
AQCR	Air Quality Control Region
ARC	Army Reserves Center
ATFP	Anti-Terrorism/Force Protection

B

BCT	Basic Combat Training
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BMPs	Best Management Practices
BOQ	Bachelor Officer Quarters
BRAC	Base Closure and Realignment

C

CAA	Clean Air Act
CBT	Combating Terrorism
CDC	Child Development Center
CEQ	Council on Environmental Quality

CFR	Code of Federal Regulations
CLFC	Convoy Live-Fire Course
CO	Carbon Monoxide
CSA	Container Storage Area
CWA	Clean Water Act

D

dBA	A-weighted decibels
DDESS	Domestic Dependent Elementary and Secondary Schools
DLE	Directorate of Logistics and Engineering
DNL	Day-night Sound Level
DoD	Department of Defense
DSS	Drill Sergeant School
DVQ	Distinguished Visitor Quarters

E

EA	Environmental Assessment
EAC	Early Action Compact
EIFS	Economic Impact Forecast System
ENRD	Environmental and Natural Resources Division
EO	Executive Order
EOD	Explosive Ordnance Disposal
ESA	Endangered Species Act
ESMP	Endangered Species Management Plan

F

FIA	Federal Impact Aid
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FJLEA	Fort Jackson Law Enforcement Activity	ITAM	Integrated Training Area Management
FPPA	Farmland Protection Policy Act		
FRNAIT	Federally Recognized Native American Indian Tribes	J	
FTE	Full Time Equivalent	JCERTE	Joint Center of Excellence for Religious Training and Education
FY	Fiscal Year		
		K	
G		L	
GIS	Geospatial Information System	LCTA	Land Condition Trend Analysis
		LRAM	Land Rehabilitation and Maintenance Program
H			
HMMWV	High-Mobility Multipurpose Wheeled Vehicles	M	
HMTF	Hazardous Material Tracking Form	MGD	Million gallons per day
HUD	U.S. Department of Housing and Urban Development	MSA	Metropolitan Statistical Area
HVAC	Heating, Ventilation, and Air Conditioning	MWR	Morale, Welfare and Recreation
HW	Hazardous Waste		
		N	
I		NAAQS	National Ambient Air Quality Standards
ICUZ	Installation Compatible Use Zone	NAF	Non-Appropriated Fund
IDS	Intrusion Detection System	NAGPRA	Native American Graves Protection and Repatriation Act
IGPBS	Integrated Global Presence and Basing Strategy	NEPA	National Environmental Policy Act
INCRMP	Integrated Cultural Resources Management Plan	NHL	National Historic Landmark
INRMP	Integrated Natural Resources Management Plan	NHPA	National Historic Preservation Act
		NO2	Nitrogen Oxides

NPDES	National Pollutant Discharge Elimination System	SCDNR	South Carolina Department of Natural Resources
NRCS	Natural Resources Conservation Service	SCDSS	South Carolina Department of Social Services
NRHP	National Register of Historic Places	SCE&G	South Carolina Electric and Gas Company
NSR	New Source Review	SCKCR	South Carolina Kids Count Report
O		SF	Square Foot or Square Feet
P		SHPO	State Historic Preservation Officer
PM10	Particulate Matter less than 10 microns in size	SIP	State Implementation Plan
POL	Petroleum, Oils, and Lubricants	SOPs	Standard Operating Procedures
ppm	Parts per Million	SUA	Support Unit of Action
PS	Physical Security	SWMU	Solid Waste Management Unit
psi	Pounds per square inch	SWPPP	Stormwater Pollution Prevention Plan
POV	Privately Owned Vehicles		
Q		T	
R		TCP	Traditional Cultural Property
RC	Reserve Center	TRADOC	U.S. Army Training and Doctrine Command
RDP	Range Development Plan	TSP	Total Suspended Particulates
ROI	Region of Influence		
RTV	Regional Threshold Value		
S		U	
SAA	Satellite Accumulation Area	UA	Unit of Action
SCARNG	South Carolina Army National Guard	UAC	Urban Assault Course
SCDHEC	South Carolina Department of Health & Environmental Control	UE	Unit of Employment
		UEPH	Unaccompanied Enlisted Personnel Housing

UMCS	Utilities Monitoring and Control System Connection	V	
		VOC	Volatile Organic Compounds
USACHPPM	U.S. Army Center for Health Promotion and Preventative Medicine	W	
USDA	U.S. Department of Agriculture	WAC	Women's Advisory Council
		WWII	World War II
USEPA	U.S. Environmental Protection Agency	X	
USFWS	U.S. Fish and Wildlife Service	Y	
		Z	

SECTION 6

REFERENCES

References that were used during the development of this EA include the following:

Reference	Description
BEA, 2004	United States Department of Commerce, Bureau of Economic Analysis, <i>Employment by Industry by Place of Work</i> , 2004.
BLS, 2004	United States Department of Labor, Bureau of Labor Statistics, <i>Civilian Labor Force and Unemployment Rates</i> , 2004.
CMLS, 2006	Columbia, South Carolina, Consolidated Multiple Listing Service, <i>Single-Family Home Listings</i> , April, 2006.
Fort Jackson, 1991	Fort Jackson, 1991. <i>Installation Compatible Use Zone (ICUZ) Study for Fort Jackson</i> . Fort Jackson, South Carolina.
Fort Jackson, 1997a	<i>Fort Jackson Integrated Natural Resources Management Plan FY 97 - 2001</i> . Directorate of Public Works, Environmental and Natural Resources Division, Fort Jackson, SC.
Fort Jackson, 1997b	<i>Endangered Species Management Plan for Smooth Coneflower (<u>Echinacea laevigata</u>) and Rough-leaved Loosestrife (<u>Lysimachia asperulaefolia</u>)</i> , Fort Jackson, South Carolina. Directorate of Public Works, Environmental and Natural Resources Division, Fort Jackson, SC. 38 pp.
Fort Jackson, 2000	Fort Jackson, <i>Environmental Assessment of the Master Plan and Ongoing Mission, 2000</i>
Fort Jackson, 2000	<i>Endangered Species Management Plan for the Red-cockaded Woodpecker (<u>Picoides borealis</u>)</i> Fort Jackson, South Carolina. Directorate of Logistics and Engineering, Wildlife Office, Fort Jackson, SC.
Fort Jackson, 2002	Fort Jackson, <i>Storm Water Pollution Prevention Plan</i> , January 2000
Fort Jackson, 2005a	<i>Fort Jackson Integrated Cultural Resource Management Plan, FY 2005-2010</i> . Environmental and Natural Resources Division, Directorate of Logistics and Engineering, Fort Jackson, South Carolina.
Fort Jackson, 2005b	<i>Prefinal Environmental Assessment Range Improvements in the Vicinity of the Former Camden Firing Range Facilities: the Implementation of an Urban Assault Course and a Convoy Live Fire Course</i> , Fort Jackson, South Carolina, 2005.

Reference	Description
Fort Jackson, 2005c	Fort Jackson, Directorate of Resource Management, <i>2005 Annual Statistical Report</i> .
HUD, 2004	United States Department of Housing and Urban Development, <i>Analysis of the Columbia-Lexington, South Carolina Housing Market</i> , August 1, 2004.
Laubmann, 1991	Laubmann-Reed & Associates, Inc., May 1991. <i>Installation Design Guide for Headquarters, US Army Training Center and Fort Jackson, South Carolina</i> . Fort Jackson, South Carolina.
SCDE, 2005	South Carolina Department of Education, <i>School and District Report Cards</i> , 2005.
SCDHEC, 2006	South Carolina Department of Health & Environmental Control, Bureau of Air Quality. <i>South Carolina Air Program: A Decade and Beyond, 1990-2005</i> .
SCDSS, 2005	South Carolina Department of Social Services, <i>South Carolina Kids Count Report</i> , 2005.
SCORS, 2005	South Carolina Office of Research and Statistics, Health and Demographics Division, <i>Population Projections</i> , 2005.
USACE	United States Army Corps of Engineers, Construction Engineering Research Laboratory, <i>Economic Impact Forecast System (EIFS)</i> .
USC, 2004	University of South Carolina, Moore School of Business, <i>The Economic Impact of the Military in South Carolina: A Focus on the Industry Distribution of Economic Activity</i> , 2004.
USCB, 1990, 2000, 2005	United States Department of Commerce, U.S. Census Bureau, Population Division, <i>1990 and 2000 U.S. Census; Population and Housing Characteristics; Population Estimates and Projections; Components of Population Change</i> .
USCB, 2003	United States Department of Commerce, U.S. Census Bureau, <i>Small Area Income and Poverty Estimates</i> , 2003.

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Darrel B. Sisk, Jr.	B.E.D. Environmental Design; M.S. Architectural Engineering; 17 years experience in base civil engineering, military planning and environmental planning and impact assessment.	Project Manager/Senior Project Planner; data collection and key participant in description of proposed action, alternatives formulation, and related environmental analyses.
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Karen Boulware	M.S. Resource Planning; B.S. Geology; 10 years experience in environmental assessment impact studies and planning.	Environmental Scientist; data collection, analysis and key participant in preparation of PEA text and supporting sections.
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Richard Hall	B.S. Environmental Biology, M.S. Zoology, 24 years of experience in environmental assessment and impact studies, biological community investigations and ecosystem restoration.	Principal Environmental Scientist, technical review, editing, and quality assurance of PEA.

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Randy Norris	B.S. Plant and Soil Science; Master of Urban Planning/Environmental Planning; 14 years experience in environmental impact assessment, environmental management and planning.	Environmental Planner; data collection, assisted in land use, noise, hazardous/toxic materials, and alternatives analysis.
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SECTION 9 PERSONS CONSULTED

All information solicited and collected in preparation of this document was done so with Army installation personnel. No information from outside sources was utilized in preparation of this document.

APPENDIX A

PUBLIC INVOLVEMENT

A.1 INTRODUCTION

As noted in Section 1.4, Fort Jackson's public participation program included two major elements:

- Public Agency and Private Organization Coordination as part of the scoping process, and
- Public Comment on the Draft Environmental Assessment.

As part of the initial scoping effort, letters were mailed to the following public agencies, private organizations, and individuals:

Federal and State agencies that were contacted included the following:

- U.S. Fish and Wildlife Service;
- Charleston District, U.S. Army Corps of Engineers;
- South Carolina Department of Health and Environmental Control, Division of Environment;
- State Historic Preservation Office, South Carolina Department of Archives and History;
- South Carolina Department of Natural Resources.

In addition to those Federal and State agencies, letters were also sent to the following agencies, organizations, and individuals:

- Columbia City Manager's Office;
- Richland County Administrator;
- Absentee-Shawnee Tribe of Oklahoma;
- Alabama-Quassarte Tribal Town;
- Catawba Indian Nation;
- Chickasaw Nation;
- Coushatta Tribe of Louisiana;
- The Eastern Band of Cherokee Indians;
- Kialegee Tribal Town;
- Muscogee (Creek) Nation of Oklahoma;
- Poarch Creek Indians;

- Seminole Tribe of Florida;
- The Shawnee Tribe;
- Thlopthlocco Tribal Town;
- Tuscarora Nation;
- Mohawk Nation;
- United Keetoowah Band;
- Cherokee Nation of Oklahoma;
- Eastern Shawnee Tribe of Oklahoma;
- Miccosukee Indian Tribe;
- Seminole Indian Tribe;
- Seminole Nation of Oklahoma; and
- United South and Eastern Federation of Tribes.

Copies of the scoping letter that was sent out and the letters that were received during the initial scoping effort are provided on the following pages.

A.2 SCOPING COMMENTS

Comments received from agencies and other interested parties based on the scoping letters include:

- U.S. Department of the Interior, U.S. Fish and Wildlife Service;
- South Carolina Department of Health and Environmental Control;
- South Carolina Department of Natural Resources;
- Catawba Indian Nation;
- Miccosukee Tribe of Indians of Florida; and
- Richland County Government.

Copies of the comment letters are included on the following pages:

In addition to scoping letters received, a copy of a 1993 letter from the South Carolina State Historic Preservation Officer (SHPO) pertaining to archeological sites within the cantonment area is also included in this Appendix. The letter documents the SHPO concluding that “the Cantonment Area is unlikely to contain significant intact archeological deposits. Consequently, we do not recommend that this area receive an archeological survey.”

May 4, 2006

«Title» «FirstName» «LastName»
«JobTitle»
«Company»
«Address1»
«Address2»
«City», «State» «PostalCode»

Re: Request for Information and Notification of the Preparation of an *Environmental Assessment for Base Realignment and Closure 2005 Activities at Fort Jackson, South Carolina*
Parsons Project No. 745060

Dear «Title»«LastName»:

Parsons Infrastructure and Technology, Inc. (Parsons) is currently under contract with the Mobile District, U.S. Army Corps of Engineers to assist in preparing an Environmental Assessment (EA) associated with Base Realignment and Closure (BRAC) actions. As currently identified The proposed action includes: implementation of the Commission's recommendations as mandated by the BRAC legislation, Public Law 101-510 and 107-107, and implementation of other Army transformation actions proposed to occur at Fort Jackson during the FY05-11 timeframe that were sufficiently well defined for analysis at this time:

BRAC-directed Actions:

- **Establish New Army Reserve Southeast Regional Readiness Support Command at Fort Jackson.** Realignment of the Birmingham AFRC Alabama by disestablishing the 81st Regional Readiness Command and establishing the Army Reserve Southeast Regional Readiness Support Command in a new RC on Fort Jackson, South Carolina.
- **Establish New Consolidated Drill Sergeant School (DSS) at Fort Jackson.** Realign Fort Benning, Georgia, and Fort Leonard Wood, Missouri, by relocating the DSS from each location into a Consolidated DSS at Fort Jackson.
- **Establish New Joint Center of Excellence for Religious training and Education (JCERTE) at Fort Jackson.** Realign Maxwell AFB, Alabama, Naval Air Station Meridian, Mississippi, and Naval Station Newport, Rhode Island, by relocating religious training and education to Fort Jackson, establishing a Joint Center of Excellence for Religious Training and Education.
- **Departure of Mobilization Processing Functions from Fort Jackson.** Realignment of Fort Eustis, Virginia, Fort Jackson, and Fort Lee, Virginia, by relocating all mobilization processing functions to Fort Bragg, North Carolina, designating it as Joint Pre-Deployment/Mobilization Site Bragg/Pope.

Other Army Transformation Related Action:

- **Relocate Two Basic Combat Training Battalions at Fort Jackson.** Relocate two Basic Combat Training Battalions (approximately 1,200 soldiers each) to Fort Jackson.

We are informing you of this study effort and requesting:

- any information your agency may have on file that might be pertinent to our analysis,
- areas of interest that you feel should be considered in the EA process, and
- additional persons, organizations, or agencies that we should consider contacting.

A list of the other persons and organizations that are being contacted as part of this initial coordination effort is attached to this letter.

The purpose of this EA update is to identify and evaluate the environmental impacts (including physical and biological, historical and archaeological, and socioeconomic) associated with the proposed activities at Fort Jackson. As part of the EA, we will identify and describe the proposed action, alternatives to these actions, and related environmental effects as required by the President's Council on Environmental Quality (CEQ), the National Environmental Policy Act of 1969, and 32 Code of Federal Regulations, Part 651.

The EA will review the potential impacts of a No Action Alternative and several implementation alternatives. The alternatives identified to date include:

No Action Alternative. The No Action Alternative will be included as required by the CEQ regulations to identify the existing environmental baseline conditions against which potential impacts will be evaluated. For realignment actions directed by the BRAC Commission, note that for the No Action Alternative, continuance of the current operational condition is not feasible.

Under the No Action Alternative, Fort Jackson would not implement the proposed action. Organizations presently assigned to Fort Jackson would continue to train at and operate from the post. Fort Jackson would use its current inventory of facilities, though routine replacement or renovations actions could occur through normal military maintenance and construction procedures, as circumstances independently warrant.

Alternative 1 – Establishment of New Army Reserve Southeast Regional Readiness Command RC at Traffic Circle Site and Establishment of Consolidated DSS; JCERTE; CDC Addition; Relocation of two Basic Training Battalions, and Departure of Mobilization Processing Functions (*Preferred Alternative*)

Under Alternative 1, Fort Jackson would implement the proposed action by implementing the following:

- Fort Jackson would construct, operate, and maintain an RC and an organizational storage building to provide adequate space for the new Regional Readiness Support Command. The RC would be located across Marion Avenue from the Military Entrance Processing Station and adjacent to the traffic circle at the Gate 1 Access Control Point.
- Fort Jackson would consolidate the DSSs from Fort Benning and Fort Leonard Wood to this one location, thereby fostering consistency, standardization and training proficiency. The new Consolidated DSS complex would be located adjacent to DSS statue on a 12-acre tract bounded by Kemper Street, Pickens Avenue, Pender Street, and Marion Avenue.

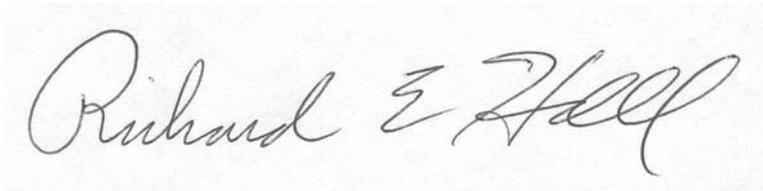
- The JCERTE would be established at Fort Jackson to include all religious training and education from Maxwell AFB; Naval Air Station Meridian; and the Naval Station Newport. The additional facilities for the new JCERTE would be constructed adjacent to the existing Chaplain Center and School.
- A 6,190-SF expansion would be constructed on the existing CDC, located on Chestnut Road in the Enlisted Family Housing Area, to provide adequate space to meet childcare needs. The current main front entrance to the center would be modified to take advantage of the existing Sports Complex parking lot that is located immediately adjacent to the CDC.
- Two Basic Combat Training Battalions would be relocated to Fort Jackson. These units would occupy and utilize existing facilities, training areas, and ranges at Fort Jackson.
- Departure of Mobilization Processing Functions from Fort Jackson and the realignment of these functions to another installation.

Alternative 2 – Establishment of New Army Reserve Southeast Regional Readiness Command RC at Golden Arrow Road Site and Establishment of Consolidated DSS; JCERTE; CDC Addition; Relocation of two Basic Training Battalions, and Departure of Mobilization Processing Functions

Under Alternative 2, the BRAC-related actions at Fort Jackson would remain the same as Alternative 1. With implementation of Alternative 2, the new RC would be constructed at an alternate location from that considered in Alternative 1. Instead of locating the new RC adjacent to the traffic circle at the Gate 1 Access Control Point, the new RC would be located near the intersection of Hartsville Guard Road and Golden Arrow Road in the vicinity of Hilton Field. If you, or someone on your staff, have any questions concerning this request, please contact us for clarification or discussion. Your assistance and effort in this matter are greatly appreciated.

Respectfully,

PARSONS



Richard E. Hall
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Enclosure

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Mr. Charles Locust
Assistant Chief
United Keetoowah Band
Post Office Box 746
Tahlequah, Oklahoma 74465

CC:
Ms. Lisa Stopp
NAGPRA Officer
United Keetoowah Band
Post Office Box 746
Tahlequah, Oklahoma 74465

CC:
Mr. Sequoyah Guess
United Keetoowah Band
Post Office Box 746
Tahlequah, Oklahoma 74465

Mary Tidwell
Cherokee Nation of Oklahoma
P.O. Box 948
Tahlequah, OK 74465

Glen Brock, Director
Environmental Department
Eastern Shawnee Tribe of Oklahoma
P.O. Box 350
Seneca, MO 64804

Billy Cypress, Chairman
Miccosukee Indian Tribe
Tamiami Station
P.O. Box 440021
Miami, FL 33144

James Billie, Chairman
Seminole Indian Tribe
6300 Stirling Road
Hollywood, FL 33024

Gary White Deer, HPO
Seminole Nation of Oklahoma
P.O. Box 1768
Seminole, OK 74868-1768

James T. Martin, Executive Director
United South and Eastern Federation
of Tribes
711 Stewarts Ferry Pike, Suite 100
Nashville, TN 37214

Mr. Richard Sidebottom
Review and Compliance Coordinator
State Historic Preservation Office
South Carolina Department of Archives
and History
8301 Parklane Road
Columbia, South Carolina 29223

Ms. Tina Hadden
Charleston District
U.S. Army Corps of Engineers
69-A Hagood Avenue
Charleston, South Carolina 29403

Mr. Quinton Epps
Water Quality Division
South Carolina Department of Health
and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201



United States Department of the Interior

FISH AND WILDLIFE SERVICE
 176 Croghan Spur Road, Suite 200
 Charleston, South Carolina 29407

June 8, 2006

Mr. Richard E. Hall
 Parsons
 400 Woods Mill Road South, Suite 330
 St. Louis, Missouri 63017-3427

Re: BRAC Actions
 Fort Jackson, Richland County, South Carolina
 FWS Log No. 2006-I-0591

Dear Mr. Hall:

The U.S. Fish and Wildlife Service (Service) has reviewed your May 04, 2006, letter regarding the above-referenced projects and offers the following comments.

We are providing a list of federally protected species and species of concern which have the potential to occur in Richland County to aid you in determining the impacts your project may have on protected species. This list includes known occurrences and areas where the species has a high possibility of occurring. Records are updated continually and may be different from the following. This list should be used only as a guideline, not as the final authority.

Richland

Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	E	Known
Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
Carolina heelsplitter	<i>Lasmigona decorate</i>	E	Possible
Georgia aster	<i>Aster georgianus</i>	C	Known
Southern Dusky Salamander	<i>Desmognathus auriculatus</i>	SC	Possible
Sandhills milk-vetch	<i>Astragalus michauxii</i>	SC	Known
Purple balduina	<i>Balduina atropurpurea</i>	SC	Known
Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known

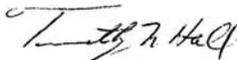
Richland cont.	Creeping St. John's wort	Hypericum adpressum	SC	Known
	Bog spicebush	Lindera subcoriacea	SC	Known
	Prairie birdsfoot-trefoil	Lotus purshianus var. helleri	SC	Possible
	Carolina bogmint	Macbridea caroliniana	SC	Known
	Algae-like pondweed	Potamogeton confervoides	SC	known
	False coco	Pteroglossaspis ecristata	SC	Known
	Awned meadowbeauty	Rhexia aristosa	SC	Known
	Reclined meadow-rue	Thalictrum subrotundum	SC	Known
	White false-asphodel	Tofieldia glabra	SC	Known
	Rayner's blueberry	Vaccinium crassifolium ssp. Empervirens	SC	Known
	Bachman's sparrow	Aimophia aestivalis	SC	Known
	Henslow's sparrow	Ammodramus henslowii	SC	Known
	American kestrel	Falco sparverius	SC	Known
	Loggerhead shrike	Lanius ludovicianus	SC	Known
	Painted bunting	Passerina ciris ciris	SC	Possible
	Carolina darter	Etheostoma collis	SC	Known
	Rafinesque's big-eared bat	Corynorhinus rafinesquii	SC	Known
	Southern hognose snake	Heterodon simus	SC	Known

T- Federally Threatened, E- Federally Endangered, SC- Species of Concern

Please use the Fort Jackson's Integrated Natural Resources Management Plan and Red-cockaded Woodpecker Endangered Species Management Plan to assist you in preparing an Environmental Assessment. Measures to avoid or minimize impacts to sensitive resources, including wetlands, should be taken when determining new construction locations and all associated BRAC directed actions.

Thank you for the opportunity to provide comments in the early planning phase of this project. If you require additional assistance, please contact Tera Baird at (843) 727-4707 ext. 225. In future correspondence concerning the project, please reference FWS Log No. 2006-I-0591.

Sincerely,



Timothy N. Hall
Field Supervisor

TNH/TKB

BOARD:
Elizabeth M. Hagood
Chairman
Edwin H. Cooper, III
Vice Chairman
Steven G. Kisner
Secretary

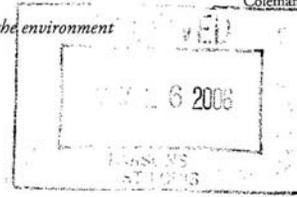


C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment

May 16, 2006

BOARD:
Henry C. Scott
Paul C. Aughtry, III
Glenn A. McCall
Coleman F. Buckhouse, MD



Mr. Richard E. Hall
Parsons
400 Woods Mill Road South
Suite 330
St. Louis, MO 63017-3427

RE: Parsons Project No. 745060 Notification of Preparation of an Environmental Assessment for Base Realignment and Closure 2005 Activities at Fort Jackson, South Carolina

Dear Mr. Hall:

The South Carolina Department of Health and Environmental Control Bureau of Water administers applicable regulations pertaining to water quality standards and classifications, including wetlands protection, in accordance with the South Carolina Pollution Control Act, the Federal Clean Water Act, the State Stormwater Management and Sediment Reduction Act, and associated regulations for all of these statutes.

To ensure protection and maintenance of water quality standards and classified uses, including wetlands functions, the Department recommends the following issues be addressed when planning and constructing this project:

1. Any placement of fill material in waters of the state, including jurisdictional wetlands, will require a Department administered Section 401 Certification and an Army Corps of Engineers administered Section 404 Permit. When evaluating applications for fill in wetlands, demonstration of avoidance of wetland impacts, minimization of wetland impacts and mitigation of unavoidable wetland impacts provides assurances that impacts have been reduced to the extent possible and that water quality standards will be maintained. Documentation of these measures will be required.
2. If a state land disturbance permit from the Sediment, Erosion and Stormwater program is required, the placement of fill material into non-jurisdictional wetlands will require compensation for the impacts to these wetlands.
3. A Navigable Waters Permit will also be required for all construction within navigable waters of South Carolina.

Other regulations not administered by this Bureau may apply to your project. Thank you for the opportunity to comment on this project. Please contact Vivianne Vejdani by phone at (803) 898-4243 or by email at vejdanhv@dhec.sc.gov if you have any questions.

Sincerely,

Gina L. Kirkland, Section Manager
Water Quality Certification and Wetlands Programs Section

GLK: VV

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
2600 Bull Street • Columbia, SC 29201 • Phone: (803) 898-3432 • www.scdhec.gov

South Carolina Department of Natural Resources



June 6, 2006

Mr. Richard E. Hall
PARSONS
400 Woods Mill Road South; Suite 330
St. Louis, Missouri 63017-3427



John E. Frampton
Director

REF: Request for Information and Notification of the Preparation of an Environmental Assessment for Base Realignment and Closure 2005 Activities at Fort Jackson, South Carolina

Dear Mr. Hall:

Personnel with the South Carolina Department of Natural Resources have reviewed the proposed project, evaluated its impact on natural resources and offer the following comments.

We believe that the proposed work can be accomplished with minimal impacts to natural resources and we do not offer any objections provided that the following recommendations are incorporated into project plans.

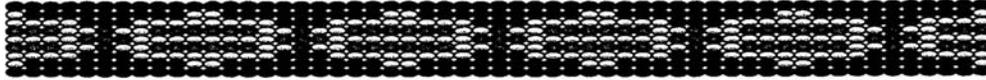
- 1) Prior to beginning any land disturbing activity, appropriate erosion control measures, such as silt fences, silt barriers or other devices, should be placed between the disturbed area and the affected waterway or wetland; and maintained in a functioning capacity until the area is permanently stabilized.
- 2) During construction all necessary measures should be taken to prevent oil, tar, trash and other pollutants from entering the adjacent offsite areas.
- 3) Once the project is initiated, it should be carried to completion in an expeditious manner in order to minimize the period of disturbance to the environment. Upon project completion, all disturbed areas should be permanently stabilized with vegetative cover, riprap or other erosion control methods as appropriate.
- 4) Land disturbing activities should avoid encroachment into any wetland areas unless specifically authorized for impact by permit. Wetlands that are unavoidably impacted should be appropriately mitigated.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert E. Duncan".

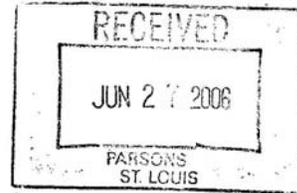
Robert E. Duncan
Environmental Programs Director

Catawba Indian Nation
Tribal Historic Preservation Office
P. O. Box 750
Rock Hill, South Carolina 29731
803-328-2427 Fax 803-328-5791



26 May 2006

Attention: Richard E. Hall
Parsons
400 Woods Mill Road South
Suite 330
St. Louis, Missouri 63017-3427



Re. THPO #	Project #	Project description and location
2006-208-1	745060	Letter re. Preparation of an EA for Base Realignment and Closure 2005 Activities at Fort Jackson, SC

Dear Sir:

The Catawba have no immediate objections to the procedures for base realignment as long as the MOA / MOU we have previously developed with Fort Jackson is strictly adhered to and we are kept fully informed of any ground disturbance activities that would occur before action is taken.

If you have questions, please contact Sandra Reinhardt at 803-328-2427 ext. 233, or e-mail sandrar@ccppcrafts.com.

Sincerely,

Wenonah G. Haire
Tribal Historic Preservation Officer



Miccosukee Tribe of Indians of Florida

Business Council Members

Billy Cypress, Chairman

Jasper Nelson, Ass't. Chairman
Max Billie, Treasurer

Andrew Bert Sr., Secretary
William M. Osceola, Lawmaker

May 30, 2006

Mr. Richard Hall, Project Manager
Parsons
400 Woods Mill Road South, Suite 330
St. Louis, MO 63017-3427

RE: Environmental Assessment for Base Realignment and Closure 2005 Activities at Fort
Jackson, SC

Dear Mr. Hall:

The Miccosukee Tribe received your letters concerning the above. The Tribal Chairman referred your letter to me as I am the Tribal Representative for Native American Graves Protection and Repatriation and Section 106 consultation. Mr. Fred Dayhoff is a Tribal Consultant on these matters. Please direct all future correspondence to me.

The Miccosukee Tribal Elders have decided that the Tribe will limit itself to those matters within the State of Florida. Therefore, the Tribe will defer to the wishes of the other Tribes which have a more direct cultural affiliation with this site.

Thank you for consulting with the Miccosukee Tribe. Please call me at 305.223.8380, Ext. 2243, if you require additional information.

Sincerely,

A handwritten signature in black ink that reads "Steve Terry". The signature is written in a cursive, flowing style.

Steve Terry
NAGPRA & Section 106 Representative

P.O. Box 440021, Tamiami Station, Miami, Florida 33144, (305) 223-8380, fax (305) 559-6653
Constitution Approved by the Secretary of the Interior, January 11, 1962

Richland County Government

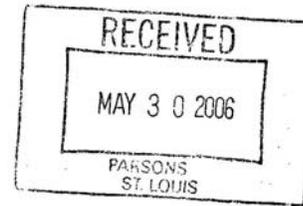
County Administration Building
2020 Hampton Street
P.O. Box 192
Columbia, SC 29202



Phone: (803) 576-2050
Fax: (803) 576-2137
TDD: (803) 748-4999

Office of the County Administrator

May 24, 2006



Parsons Infrastructure and Technology, Inc.
Attn: Richard E. Hall, Project Manager
400 Woods Mill Road South
Suite 330
St. Louis, MO 63017-3427

Dear Mr. Hall:

Richland County Government is in receipt of correspondence received on May 18, 2006 from Parsons Infrastructure and Technology, Inc. regarding the Environmental Assessment for Base Realignment and Closure 2005 Activities at Fort Jackson. The document requests information pertinent to the environmental assessment at Fort Jackson. Parsons wishes to ascertain any areas of interest that Richland County Government feels should be considered in the Environmental Assessment process, and additional persons, organizations, or agencies that the County feels should be contacted by Parsons as part of the initial coordination effort.

The purpose of the Environmental Assessment update is to identify and evaluate the environmental impacts (including physical and biological, historical and archaeological, and socioeconomic) associated with the proposed forthcoming expansion at Fort Jackson as a result of the BRAC proposal.

The Richland County Conservation Commission responded on behalf of Richland County Government to this request for information. Their response is attached.

Based upon the recommendations of the Richland County Conservation Commission, Richland County Government has no environmental concerns of the proposed BRAC actions at Fort Jackson.

Please let me know if you have any questions, or require additional information.

Regards,

A handwritten signature in black ink, appearing to read "J. Milton Pope".

J. Milton Pope
Interim County Administrator

cc: Jim Wilson

Richland County Government



Office of the County Administrator

To: Jim Wilson
From: Roxanne Matthews *RM*
Date: May 22, 2006
Subject: Environmental Assessment for Base Realignment and Closure 2005 Activities at Fort Jackson, SC

J. Milton Pope, Interim County Administrator, has asked me to follow up with regards to the request for information received on May 18, 2006 from Parsons Infrastructure and Technology, Inc. regarding the Environmental Assessment for Base Realignment and Closure 2005 Activities at Fort Jackson.

Richland County Government was a recipient of the Parsons correspondence (attached), along with various state and local agencies. The document requests information pertinent to the environmental assessment at Fort Jackson. Parsons wishes to ascertain any areas of interest that Richland County feels should be considered in the Environmental Assessment process, and additional persons, organizations, or agencies that the County feels should be contacted by Parsons as part of the initial coordination effort.

The purpose of the Environmental Assessment update is to **identify and evaluate the environmental impacts (including physical and biological, historical and archaeological, and socioeconomic)** associated with the proposed forthcoming expansion at Fort Jackson as a result of the BRAC proposal. The Conservation Commission is a natural fit to respond to this request for information. Therefore, please share this information with the Commission members at your next meeting.

Please forward any information regarding possible environmental impacts as a result of the Fort Jackson expansion to me no later than **June 16, 2006**.



South Carolina Department of Archives and History

1430 Senate Street, P.O. Box 11,669, Columbia, South Carolina 29211 (803) 734-8577
 State Records (803) 734-7914; Local Records (803) 734-7917
 December 15, 1993

Mr. Tre' Wharton
 Gulf Engineers and Consultants
 P.O. Box 84010
 Baton Rouge, LA 70884-4010

Re: Cantonment Area, Fort Jackson, Richland County, South Carolina

Dear Mr. Wharton:

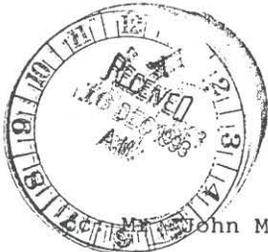
This letter is in response to our telephone conversation of December 13, 1993 regarding the Fort Jackson Cantonment area. Based on visits to this part of the base and a review of existing maps, we have concluded that the Cantonment Area is unlikely to contain significant intact archaeological deposits. Consequently, we do not recommend that this area receive an archaeological survey.

However, our office should be immediately notified if archaeological materials are discovered within the Cantonment Area. Archaeological materials include, but are not limited to, the following items: pieces of pottery, fragments of metal, wooden objects, chipped stone tools and tool making debris, concentrations of animal bone, building foundations, human burials, historic docks, engineering structures, or non-recent watercraft remains.

These comments are provided to assist you with your responsibilities under Section 106 of the National Historic Preservation Act of 1966, as amended, and the regulations codified at 36 CFR Part 800. If you have questions, please call me at 803\734-8478.

Sincerely,

Lee Tippet
 Staff Archaeologist
 State Historic Preservation Office



John Maitland, Fort Jackson

Post-it® Fax Note	7671	Date	7-31-2000	# of pages	▶
To	Valerie Marcell	From			
Co./Dept.		Co.			
Phone #		Phone #			
Fax #		Fax #			

Post-it® Fax Note	7671	Date	8/20/1993	# of pages	▶
To	Renee Flinchum-Bu/A	From			
Co./Dept.	SCARNG	Co.			
Phone #	Sent to Karen	Phone #	751-4103		
Fax #	K. Maitland / July 19th 2000	Fax #	751-7927		

Sent Valerie Marcell email about SCARNG cantonment area 7-15-19-2000

APPENDIX B

SPECIES LISTS

B.1 LIST OF FLORA KNOWN TO OCCUR AT FORT JACKSON, SOUTH CAROLINA

FAMILY NAME	ACCEPTED NAME	COMMON NAME
EUPHORBIACEAE	<i>Acalypha gracilens</i>	slender threeseed mercury
ASTERACEAE	<i>Acanthospermum australe</i>	paraguayan starburr
ACERACEAE	<i>Acer rubrum</i>	red maple
ASTERACEAE	<i>Achillea millefolium</i>	common yarrow
SCROPHULARIACEAE	<i>Agalinis fasciculata</i>	beach false foxglove
SCROPHULARIACEAE	<i>Agalinis purpurea</i>	purple false foxglove
SCROPHULARIACEAE	<i>Agalinis setacea</i>	threadleaf false foxglove
POACEAE	<i>Agrostis hyemalis</i>	winter bentgrass
SIMAROUBACEAE	<i>Ailanthus altissima</i>	tree of heaven
FABACEAE	<i>Albizia julibrissin</i>	silk tree
LILIACEAE	<i>Aletris farinosa</i>	white colicroot
LILIACEAE	<i>Allium canadense</i>	meadow garlic
LILIACEAE	<i>Allium cuthbertii</i>	striped garlic
BETULACEAE	<i>Alnus serrulata</i>	hazel alder
ASTERACEAE	<i>Ambrosia artemisiifolia</i>	annual ragweed
ROSACEAE	<i>Amelanchier arborea</i> var. <i>arborea</i>	common serviceberry
ROSACEAE	<i>Amelanchier canadensis</i>	canadian serviceberry
LILIACEAE	<i>Amianthium muscitoxicum</i>	flypoison
FABACEAE	<i>Amorpha herbacea</i> var. <i>herbacea</i>	clusterspike indigobush
VITACEAE	<i>Ampelopsis arborea</i>	peppervine
APOCYNACEAE	<i>Amsonia ciliata</i>	fringed bluestar
POACEAE	<i>Andropogon gerardii</i>	big bluestem
POACEAE	<i>Andropogon ternarius</i>	splitbeard bluestem
POACEAE	<i>Andropogon virginicus</i>	broomsedge bluestem
APIACEAE	<i>Angelica venenosa</i>	hairy angelica
ASTERACEAE	<i>Antennaria plantaginifolia</i>	woman's tobacco
POACEAE	<i>Anthaenantia villosa</i>	green silkyscale
POACEAE	<i>Anthoxanthum aristatum</i>	annual vernalgrass
POACEAE	<i>Anthoxanthum odoratum</i>	sweet vernalgrass
ROSACEAE	<i>Aphanes microcarpa</i>	slender parsley piert
FABACEAE	<i>Apios americana</i>	groundnut
APOCYNACEAE	<i>Apocynum cannabinum</i>	indianhemp
BRASSICACEAE	<i>Arabidopsis thaliana</i>	mouseear cress
ARALIACEAE	<i>Aralia spinosa</i>	devil's walkingstick
CARYOPHYLLACEAE	<i>Arenaria serpyllifolia</i>	thymeleaf sandwort
POACEAE	<i>Aristida lanosa</i>	woollysheath threeawn
POACEAE	<i>Aristida oligantha</i>	prairie threeawn
POACEAE	<i>Aristida purpurascens</i>	arrowfeather threeawn
POACEAE	<i>Aristida purpurascens</i> var. <i>virgata</i>	arrowfeather threeawn
POACEAE	<i>Aristida tuberculosa</i>	seaside threeawn
ARISTOLOCHIACEAE	<i>Aristolochia serpentaria</i>	virginia snakeroot
ASTERACEAE	<i>Arnica acaulis</i>	common leopardbane
ROSACEAE	<i>Aronia arbutifolia</i>	red chokeberry

FAMILY NAME	ACCEPTED NAME	COMMON NAME
POACEAE	<i>Arundinaria gigantea</i>	giant cane
POACEAE	<i>Arundo donax</i>	giantreed
ASCLEPIADACEAE	<i>Asclepias amplexicaulis</i>	clasping milkweed
ASCLEPIADACEAE	<i>Asclepias tomentosa</i>	tuba milkweed
ASCLEPIADACEAE	<i>Asclepias tuberosa</i>	butterfly milkweed
ASCLEPIADACEAE	<i>Asclepias verticillata</i>	whorled milkweed
ASPLENIACEAE	<i>Asplenium platyneuron</i>	ebony spleenwort
ASTERACEAE	<i>Aster concolor</i>	eastern silver aster
ASTERACEAE	<i>Aster dumosus</i>	rice button aster
ASTERACEAE	<i>Aster ericoides</i>	heath aster
ASTERACEAE	<i>Aster lateriflorus</i>	calico aster
ASTERACEAE	<i>Aster paludosus</i>	southern swamp aster
ASTERACEAE	<i>Aster patens</i>	late purple aster
ASTERACEAE	<i>Aster paternus</i>	toothed whitetop aster
ASTERACEAE	<i>Aster pilosus</i> var. <i>pilosus</i>	white oldfield aster
ASTERACEAE	<i>Aster solidagineus</i>	narrowleaf aster
ASTERACEAE	<i>Aster tortifolius</i>	dixie aster
DRYOPTERIDACEAE	<i>Athyrium filix-femina</i> ssp. <i>asplenioides</i>	ladyfern
SCROPHULARIACEAE	<i>Aureolaria pectinata</i>	combleaf
POACEAE	<i>Axonopus fissifolius</i>	common carpetgrass
ASTERACEAE	<i>Baccharis halimifolia</i>	eastern baccharis
FABACEAE	<i>Baptisia alba</i> var. <i>alba</i>	white wild indigo
FABACEAE	<i>Baptisia albescens</i>	spiked wild indigo
FABACEAE	<i>Baptisia bracteata</i>	longbract wild indigo
FABACEAE	<i>Baptisia cinerea</i>	grayhairy wild indigo
FABACEAE	<i>Baptisia tinctoria</i>	horseflyweed
GENTIANACEAE	<i>Bartonia paniculata</i>	twining screwstem
GENTIANACEAE	<i>Bartonia virginica</i>	yellow screwstem
RHAMNACEAE	<i>Berchemia scandens</i>	alabama supplejack
ASTERACEAE	<i>Berlandiera pumila</i>	soft greeneyes
BIGNONIACEAE	<i>Bignonia capreolata</i>	crossvine
POACEAE	<i>Brachiaria ramosa</i>	dixie signalgrass
CABOMBACEAE	<i>Brasenia schreberi</i>	watershield
ASTERACEAE	<i>Brickellia eupatorioides</i> var. <i>eupatorioides</i>	false boneset
POACEAE	<i>Briza minor</i>	little quakinggrass
POACEAE	<i>Bromus catharticus</i>	rescuegrass
POACEAE	<i>Bromus japonicus</i>	japanese brome
CYPERACEAE	<i>Bulbostylis capillaris</i>	threadleaf beakseed
CYPERACEAE	<i>Bulbostylis stenophylla</i>	sandy field hairsedge
BURMANNIACEAE	<i>Burmannia biflora</i>	northern bluethead
POACEAE	<i>Calamagrostis coarctata</i>	
LAMIACEAE	<i>Calamintha georgiana</i>	georgia calamint
VERBENACEAE	<i>Callicarpa americana</i>	american beautyberry
COMMELINACEAE	<i>Callisia rosea</i>	piedmont roseling
ORCHIDACEAE	<i>Calopogon barbatus</i>	bearded grasspink
ORCHIDACEAE	<i>Calopogon tuberosus</i>	tuberous grasspink
CALYCANTHACEAE	<i>Calycanthus floridus</i>	eastern sweetshrub
CONVOLVULACEAE	<i>Calystegia sepium</i>	hedge false bindweed
BIGNONIACEAE	<i>Campsis radicans</i>	trumpet creeper
BRASSICACEAE	<i>Capsella bursa-pastoris</i>	shepherd's purse
BRASSICACEAE	<i>Cardamine hirsuta</i>	hairy bittercress

FAMILY NAME	ACCEPTED NAME	COMMON NAME
CYPERACEAE	<i>Carex alata</i>	broadwing sedge
CYPERACEAE	<i>Carex albolutescens</i>	greenwhite sedge
CYPERACEAE	<i>Carex atlantica</i>	prickly bog sedge
CYPERACEAE	<i>Carex atlantica</i> ssp. <i>capillacea</i>	prickly bog sedge
CYPERACEAE	<i>Carex crinita</i>	fringed sedge
CYPERACEAE	<i>Carex debilis</i> var. <i>debilis</i>	white-edge sedge
CYPERACEAE	<i>Carex festucacea</i>	fescue sedge
CYPERACEAE	<i>Carex folliculata</i>	northern long sedge
CYPERACEAE	<i>Carex glaucescens</i>	southern waxy sedge
CYPERACEAE	<i>Carex leptalea</i>	bristlystalk sedge
CYPERACEAE	<i>Carex lonchocarpa</i>	southern long sedge
CYPERACEAE	<i>Carex lurida</i>	shallow sedge
CYPERACEAE	<i>Carex tenax</i>	wire sedge
CYPERACEAE	<i>Carex venusta</i>	darkgreen sedge
CYPERACEAE	<i>Carex vulpinoidea</i>	common fox sedge
ASTERACEAE	<i>Carphephorus bellidifolius</i>	sandywoods chaffhead
JUGLANDACEAE	<i>Carya alba</i>	mockernut hickory
JUGLANDACEAE	<i>Carya glabra</i>	pignut hickory
JUGLANDACEAE	<i>Carya illinoensis</i>	pecan
JUGLANDACEAE	<i>Carya ovata</i>	shagbark hickory
JUGLANDACEAE	<i>Carya pallida</i>	sand hickory
BIGNONIACEAE	<i>Catalpa bignonioides</i>	southern catalpa
RHAMNACEAE	<i>Ceanothus americanus</i>	new jersey tea
ULMACEAE	<i>Celtis laevigata</i>	sugarberry
ULMACEAE	<i>Celtis occidentalis</i>	common hackberry
POACEAE	<i>Cenchrus longispinus</i>	innocent-weed
APIACEAE	<i>Centella asiatica</i>	spadeleaf
FABACEAE	<i>Centrosema virginianum</i>	spurred butterfly pea
CARYOPHYLLACEAE	<i>Cerastium glomeratum</i>	sticky chickweed
CARYOPHYLLACEAE	<i>Cerastium semidecandrum</i>	five-stamen chickweed
EMPETRACEAE	<i>Ceratiola ericoides</i>	sand heath
APIACEAE	<i>Chaerophyllum tainturieri</i>	hairyfruit chervil
FABACEAE	<i>Chamaecrista fasciculata</i>	sleepingplant
FABACEAE	<i>Chamaecrista nictitans</i>	partridge pea
CUPRESSACEAE	<i>Chamaecyparis thyoides</i>	atlantic white cedar
ERICACEAE	<i>Chamaedaphne calyculata</i> var. <i>angustifolia</i>	leatherleaf
EUPHORBIACEAE	<i>Chamaesyce maculata</i>	spotted sandmat
POACEAE	<i>Chasmanthium laxum</i>	slender woodoats
POACEAE	<i>Chasmanthium laxum</i> var. <i>sessiliflorum</i>	slender woodoats
CHENOPODIACEAE	<i>Chenopodium album</i>	lamb's quarters
PYROLACEAE	<i>Chimaphila maculata</i>	striped prince's pine
OLEACEAE	<i>Chionanthus virginicus</i>	white fringetree
ASTERACEAE	<i>Chrysopsis gossypina</i>	cottony goldenaster
ASTERACEAE	<i>Chrysopsis graminifolia</i> var. <i>aspera</i>	goldenaster
ASTERACEAE	<i>Chrysopsis graminifolia</i> var. <i>microcephala</i>	goldenaster
ASTERACEAE	<i>Chrysopsis mariana</i>	maryland goldenaster
ASTERACEAE	<i>Cirsium horridulum</i>	yellow thistle
ASTERACEAE	<i>Cirsium lecontei</i>	le conte's thistle
ASTERACEAE	<i>Cirsium nuttallii</i>	nuttall's thistle
ASTERACEAE	<i>Cirsium repandum</i>	sandhill thistle
ASTERACEAE	<i>Cirsium virginianum</i>	virginia thistle

FAMILY NAME	ACCEPTED NAME	COMMON NAME
ORCHIDACEAE	<i>Cleistes divaricata</i>	rosebud orchid
CLETHRACEAE	<i>Clethra alnifolia</i>	coastal sweetpepperbush
FABACEAE	<i>Clitoria mariana</i>	atlantic pigeonwings
EUPHORBIACEAE	<i>Cnidioscolus stimulosus</i>	finger rot
COMMELINACEAE	<i>Commelina erecta</i>	whitemouth dayflower
COMMELINACEAE	<i>Commelina virginica</i>	virginia dayflower
ASTERACEAE	<i>Conyza bonariensis</i>	asthmaweed
ASTERACEAE	<i>Conyza canadensis</i>	canadian horseweed
ASTERACEAE	<i>Coreopsis gladiata</i>	coastalplain tickseed
ASTERACEAE	<i>Coreopsis lanceolata</i>	lanceleaf tickseed
ASTERACEAE	<i>Coreopsis major</i>	greater tickseed
ASTERACEAE	<i>Coreopsis X delphiniifolia</i>	
CORNACEAE	<i>Cornus florida</i>	flowering dogwood
ROSACEAE	<i>Crataegus flava</i>	yellowleaf hawthorn
ROSACEAE	<i>Crataegus uniflora</i>	dwarf hawthorn
ASTERACEAE	<i>Croptilon divaricatum</i>	slender scratchdaisy
FABACEAE	<i>Crotalaria pallida</i>	smooth rattlebox
FABACEAE	<i>Crotalaria purshii</i>	pursh's rattlebox
FABACEAE	<i>Crotalaria rotundifolia</i>	rabbitbells
FABACEAE	<i>Crotalaria spectabilis</i>	showy rattlebox
EUPHORBIACEAE	<i>Croton capitatus</i>	hogwort
EUPHORBIACEAE	<i>Croton glandulosus</i>	vente conmigo
CUPRESSACEAE	<i>Cupressus arizonica</i>	arizona cypress
CUSCUTACEAE	<i>Cuscuta compacta</i>	compact dodder
POACEAE	<i>Cynodon dactylon</i>	bermudagrass
CYPERACEAE	<i>Cyperus compressus</i>	poorland flatsedge
CYPERACEAE	<i>Cyperus croceus</i>	baldwin's flatsedge
CYPERACEAE	<i>Cyperus erythrorhizos</i>	redroot flatsedge
CYPERACEAE	<i>Cyperus iria</i>	ricefield flatsedge
CYPERACEAE	<i>Cyperus plukenetii</i>	plukenet's flatsedge
CYPERACEAE	<i>Cyperus polystachyos</i>	manyspike flatsedge
CYPERACEAE	<i>Cyperus retrofractus</i>	rough flatsedge
CYPERACEAE	<i>Cyperus retrorsus</i>	pine barren flatsedge
CYPERACEAE	<i>Cyperus strigosus</i>	strawcolored flatsedge
CYRILLACEAE	<i>Cyrilla racemiflora</i>	swamp titi
POACEAE	<i>Dactyloctenium aegyptium</i>	durban crowfoot grass
POACEAE	<i>Danthonia sericea</i>	downy danthonia
POACEAE	<i>Danthonia spicata</i>	poverty oatgrass
SOLANACEAE	<i>Datura stramonium</i>	jimsonweed
HYDRANGEACEAE	<i>Decumaria barbara</i>	woodvamp
FABACEAE	<i>Desmodium ciliare</i>	hairy smallleaf ticktrefoil
FABACEAE	<i>Desmodium floridanum</i>	florida ticktrefoil
FABACEAE	<i>Desmodium laevigatum</i>	smooth ticktrefoil
FABACEAE	<i>Desmodium lineatum</i>	sand ticktrefoil
FABACEAE	<i>Desmodium paniculatum</i>	panickedleaf ticktrefoil
POACEAE	<i>Dichanthelium acuminatum</i> var. <i>fasciculatum</i>	western panicgrass
POACEAE	<i>Dichanthelium commutatum</i>	variable panicgrass
POACEAE	<i>Dichanthelium dichotomum</i> var. <i>dichotomum</i>	cypress panicgrass
POACEAE	<i>Dichanthelium dichotomum</i> var. <i>ensifolium</i>	cypress panicgrass
POACEAE	<i>Dichanthelium dichotomum</i> var. <i>ensifolium</i>	cypress panicgrass
POACEAE	<i>Dichanthelium dichotomum</i> var. <i>tenue</i>	cypress panicgrass

FAMILY NAME	ACCEPTED NAME	COMMON NAME
POACEAE	Dichanthelium erectifolium	erectleaf panicgrass
POACEAE	Dichanthelium oligosanthes var. scribner	scribner's rosette grass
POACEAE	Dichanthelium sabulorum var. patulum	hemlock rosette grass
POACEAE	Dichanthelium scabriusculum	woolly rosette grass
POACEAE	Dichanthelium scoparium	velvet panicum
POACEAE	Dichanthelium strigosum var. leucoblepharis	roughhair rosette grass
POACEAE	Dichanthelium strigosum var. strigosum	roughhair rosette grass
CONVOLVULACEAE	Dichondra carolinensis	carolina ponysfoot
POACEAE	Digitaria ischaemum	smooth crabgrass
RUBIACEAE	Diodia teres	poorjoe
RUBIACEAE	Diodia virginiana	virginia buttonweed
DIOSCOREACEAE	Dioscorea villosa	wild yam
EBENACEAE	Diospyros virginiana	common persimmon
BRASSICACEAE	Draba brachycarpa	shortpod whitlowgrass
DROSERACEAE	Drosera brevifolia	dwarf sundew
DROSERACEAE	Drosera intermedia	spoonleaf sundew
ROSACEAE	Duchesnea indica	indian strawberry
CYPERACEAE	Dulichium arundinaceum	threeway sedge
ASTERACEAE	Echinacea laevigata	smooth purple coneflower
POACEAE	Echinochloa crus-galli	barnyardgrass
CYPERACEAE	Eleocharis baldwinii	baldwin's spikerush
CYPERACEAE	Eleocharis compressa	flat-stem spikerush
CYPERACEAE	Eleocharis equisetoides	jointed spikesedge
CYPERACEAE	Eleocharis melanocarpa	black-fruit spikerush
CYPERACEAE	Eleocharis microcarpa	small-fruit spikerush
CYPERACEAE	Eleocharis obtusa	blunt spikesedge
CYPERACEAE	Eleocharis olivacea	bright green spikerush
CYPERACEAE	Eleocharis tenuis	slender spikerush
CYPERACEAE	Eleocharis tortilis	twisted spikerush
CYPERACEAE	Eleocharis tricostata	three-angle spikerush
CYPERACEAE	Eleocharis tuberculosa	cone-cup spikerush
ASTERACEAE	Elephantopus nudatus	smooth elephantsfoot
ASTERACEAE	Elephantopus tomentosus	devil's grandmother
POACEAE	Elymus virginicus	virginia wildrye
ERICACEAE	Epigaea repens	trailing arbutus
POACEAE	Eragrostis curvula	weeping lovegrass
POACEAE	Eragrostis refracta	coastal lovegrass
POACEAE	Eragrostis spectabilis	purple lovegrass
ASTERACEAE	Erechtites hieraciifolia	american burnweed
POACEAE	Eremochloa ophiuroides	centipede grass
ASTERACEAE	Erigeron strigosus	prairie fleabane
ASTERACEAE	Erigeron strigosus var. beyrichii	beyrich's fleabane
ERIOCAULACEAE	Eriocaulon compressum	flattened pipewort
ERIOCAULACEAE	Eriocaulon decangulare	tenangle pipewort
POLYGONACEAE	Eriogonum tomentosum	dog-tongue wild buckwheat
APIACEAE	Eryngium prostratum	creeping eryngo
APIACEAE	Eryngium yuccifolium	button eryngo
ASTERACEAE	Eupatorium album	white thoroughwort
ASTERACEAE	Eupatorium capillifolium	dog-fennel
ASTERACEAE	Eupatorium coelestinum	blue mistflower
ASTERACEAE	Eupatorium compositifolium	yankeeweed

FAMILY NAME	ACCEPTED NAME	COMMON NAME
ASTERACEAE	<i>Eupatorium hyssopifolium</i>	hyssop-leaf thoroughwort
ASTERACEAE	<i>Eupatorium mohrii</i>	mohr's thoroughwort
ASTERACEAE	<i>Eupatorium perfoliatum</i>	common boneset
ASTERACEAE	<i>Eupatorium pilosum</i>	rough boneset
ASTERACEAE	<i>Eupatorium purpureum</i>	sweet-scented joe-pye-weed
ASTERACEAE	<i>Eupatorium rotundifolium</i>	round-leaf thoroughwort
ASTERACEAE	<i>Eupatorium X pinnatifidum</i>	
EUPHORBIACEAE	<i>Euphorbia corollata</i>	flowering spurge
EUPHORBIACEAE	<i>Euphorbia curtisii</i>	curtis' spurge
EUPHORBIACEAE	<i>Euphorbia ipecacuanhae</i>	american-ipecac
POACEAE	<i>Eustachys retusa</i>	argentine finger grass
ASTERACEAE	<i>Euthamia tenuifolia</i> var. <i>tenuifolia</i>	slender goldentop
ASTERACEAE	<i>Facelis retusa</i>	annual trampweed
POACEAE	<i>Festuca pratensis</i>	meadow fescue
POACEAE	<i>Festuca subverticillata</i>	nodding fescue
CYPERACEAE	<i>Fimbristylis annua</i>	annual fimbry
CYPERACEAE	<i>Fimbristylis autumnalis</i>	slender fimbry
HAMAMELIDACEAE	<i>Fothergilla gardenii</i>	dwarf witch-alder
AMARANTHACEAE	<i>Froelichia floridana</i>	plains snake-cotton
CYPERACEAE	<i>Fuirena squarrosa</i>	hairy umbrella sedge
FABACEAE	<i>Galactia erecta</i>	erect milk-pea
FABACEAE	<i>Galactia regularis</i>	eastern milk-pea
FABACEAE	<i>Galactia volubilis</i>	downy milk-pea
RUBIACEAE	<i>Galium aparine</i>	sticky-willy
RUBIACEAE	<i>Galium pilosum</i>	hairy bedstraw
RUBIACEAE	<i>Galium tinctorium</i>	stiff marsh bedstraw
ASTERACEAE	<i>Gamochaeta purpurea</i>	spoon-leaf purple everlasting
ONAGRACEAE	<i>Gaura filipes</i>	slender-stalk beeblossom
ERICACEAE	<i>Gaylussacia baccata</i>	black huckleberry
ERICACEAE	<i>Gaylussacia dumosa</i>	dwarf huckleberry
ERICACEAE	<i>Gaylussacia frondosa</i>	blue huckleberry
LOGANIACEAE	<i>Gelsemium sempervirens</i>	evening trumpet-flower
GENTIANACEAE	<i>Gentiana catesbaei</i>	elliott's gentian
GERANIACEAE	<i>Geranium carolinianum</i>	carolina geranium
VERBENACEAE	<i>Glandularia pulchella</i>	South American mock vervain
ASTERACEAE	<i>Gnaphalium helleri</i>	heller's cudweed
ASTERACEAE	<i>Gnaphalium obtusifolium</i>	rabbit-tobacco
ORCHIDACEAE	<i>Goodyera pubescens</i>	downy rattlesnake plantain
SCROPHULARIACEAE	<i>Gratiola aurea</i>	golden hedge-hyssop
SCROPHULARIACEAE	<i>Gratiola pilosa</i>	shaggy hedge-hyssop
SCROPHULARIACEAE	<i>Gratiola virginiana</i>	round-fruit hedge-hyssop
POACEAE	<i>Gymnopogon brevifolius</i>	short-leaf skeleton grass
ORCHIDACEAE	<i>Habenaria repens</i>	water-spider false rein orchid
ASTERACEAE	<i>Helenium amarum</i>	yellowdicks
CISTACEAE	<i>Helianthemum canadense</i>	long-branch frostweed
ASTERACEAE	<i>Helianthus angustifolius</i>	swamp sunflower
ASTERACEAE	<i>Helianthus atrorubens</i>	purpledisk sunflower
BORAGINACEAE	<i>Heliotropium amplexicaule</i>	clasping heliotrope
ARISTOLOCHIACEAE	<i>Hexastylis arifolia</i>	little-brown-jug
ASTERACEAE	<i>Hieracium gronovii</i>	queendevil
CARYOPHYLLACEAE	<i>Holosteum umbellatum</i>	jagged-chickweed

FAMILY NAME	ACCEPTED NAME	COMMON NAME
POACEAE	<i>Hordeum pusillum</i>	little barley
RUBIACEAE	<i>Houstonia longifolia</i>	long-leaf summer bluet
RUBIACEAE	<i>Houstonia pusilla</i>	tiny bluet
APIACEAE	<i>Hydrocotyle umbellata</i>	many-flower marsh-pennywort
CLUSIACEAE	<i>Hypericum canadense</i>	lesser canadian st. john's-wort
CLUSIACEAE	<i>Hypericum crux-andreae</i>	st. peter's-wort
CLUSIACEAE	<i>Hypericum denticulatum</i>	coppery st. john's-wort
CLUSIACEAE	<i>Hypericum drummondii</i>	nits-and-lice
CLUSIACEAE	<i>Hypericum galioides</i>	bedstraw st. john's-wort
CLUSIACEAE	<i>Hypericum gentianoides</i>	orange-grass
CLUSIACEAE	<i>Hypericum hypericoides</i>	st. andrew's-cross
CLUSIACEAE	<i>Hypericum lloydii</i>	sandhill st. john's-wort
CLUSIACEAE	<i>Hypericum mutilum</i>	dwarf st. john's-wort
CLUSIACEAE	<i>Hypericum setosum</i>	hairy st. john's-wort
ASTERACEAE	<i>Hypochoeris glabra</i>	smooth cat's-ear
ASTERACEAE	<i>Hypochoeris radicata</i>	spotted cat's-ear
LILIACEAE	<i>Hypoxis hirsuta</i>	eastern yellow star-grass
LILIACEAE	<i>Hypoxis sessilis</i>	glossy-seed yellow star-grass
AQUIFOLIACEAE	<i>Ilex amelanchar</i>	sarvis holly
AQUIFOLIACEAE	<i>Ilex coriacea</i>	large gallberry
AQUIFOLIACEAE	<i>Ilex glabra</i>	inkberry
AQUIFOLIACEAE	<i>Ilex laevigata</i>	smooth winterberry
AQUIFOLIACEAE	<i>Ilex opaca</i>	american holly
FABACEAE	<i>Indigofera caroliniana</i>	carolina indigo
CONVOLVULACEAE	<i>Ipomoea lacunosa</i>	whitestar
CONVOLVULACEAE	<i>Ipomoea pandurata</i>	man-of-the-earth
IRIDACEAE	<i>Iris verna</i> var. <i>verna</i>	dwarf violet iris
IRIDACEAE	<i>Iris virginica</i>	virginia iris
GROSSULARIACEAE	<i>Itea virginica</i>	virginia sweetspire
JUGLANDACEAE	<i>Juglans nigra</i>	black walnut
JUNCACEAE	<i>Juncus acuminatus</i>	knotty-leaf rush
JUNCACEAE	<i>Juncus biflorus</i>	bog rush
JUNCACEAE	<i>Juncus bufonius</i>	toad rush
JUNCACEAE	<i>Juncus canadensis</i>	canadian rush
JUNCACEAE	<i>Juncus debilis</i>	weak rush
JUNCACEAE	<i>Juncus dichotomus</i>	forked rush
JUNCACEAE	<i>Juncus diffusissimus</i>	slim-pod rush
JUNCACEAE	<i>Juncus effusus</i>	lamp rush
JUNCACEAE	<i>Juncus marginatus</i>	grass-leaf rush
JUNCACEAE	<i>Juncus polycephalus</i>	many-head rush
JUNCACEAE	<i>Juncus repens</i>	lesser creeping rush
JUNCACEAE	<i>Juncus scirpoides</i>	needle-pod rush
JUNCACEAE	<i>Juncus trigonocarpus</i>	red-pod rush
CUPRESSACEAE	<i>Juniperus virginiana</i>	eastern redcedar
ERICACEAE	<i>Kalmia latifolia</i>	mountain-laurel
ASTERACEAE	<i>Krigia cespitosa</i>	weedy dwarf-dandelion
ASTERACEAE	<i>Krigia virginica</i>	virginia dwarf-dandelion
CYPERACEAE	<i>Kyllinga odorata</i>	fragrant spike sedge
CYPERACEAE	<i>Kyllinga pumila</i>	low spike sedge
ERIOCAULACEAE	<i>Lachnocaulon anceps</i>	white-head bogbutton
ERIOCAULACEAE	<i>Lachnocaulon minus</i>	small's bogbutton

FAMILY NAME	ACCEPTED NAME	COMMON NAME
ASTERACEAE	<i>Lactuca floridana</i>	woodland lettuce
ASTERACEAE	<i>Lactuca graminifolia</i>	grass-leaf lettuce
LAMIACEAE	<i>Lamium amplexicaule</i>	giraffehead
CISTACEAE	<i>Lechea minor</i>	thyme-leaf pinweed
CISTACEAE	<i>Lechea mucronata</i>	hairy pinweed
POACEAE	<i>Leersia hexandra</i>	southern cutgrass
POACEAE	<i>Leersia virginica</i>	whitegrass
ERICACEAE	<i>Leiophyllum buxifolium</i>	sand-myrtle
BRASSICACEAE	<i>Lepidium virginicum</i>	poorman's-pepperwort
FABACEAE	<i>Lespedeza angustifolia</i>	narrow-leaf bush-clover
FABACEAE	<i>Lespedeza bicolor</i>	shrubby bush-clover
FABACEAE	<i>Lespedeza cuneata</i>	chinese bush-clover
FABACEAE	<i>Lespedeza hirta</i>	hairy bush-clover
FABACEAE	<i>Lespedeza repens</i>	creeping bush-clover
FABACEAE	<i>Lespedeza stuevei</i>	tall bush-clover
ERICACEAE	<i>Leucothoe axillaris</i>	coastal doghobble
ERICACEAE	<i>Leucothoe racemosa</i>	swamp doghobble
ASTERACEAE	<i>Liatris secunda</i>	piedmont gayfeather
ASTERACEAE	<i>Liatris squarrosa</i>	scaly gayfeather
ASTERACEAE	<i>Liatris tenuifolia</i>	short-leaf gayfeather
OLEACEAE	<i>Ligustrum lucidum</i>	glossy privet
OLEACEAE	<i>Ligustrum sinense</i>	chinese privet
SCROPHULARIACEAE	<i>Lindernia dubia</i> var. <i>anagallidea</i>	yellow-seed false pimpernel
LINACEAE	<i>Linum medium</i>	stiff yellow flax
LINACEAE	<i>Linum striatum</i>	ridged yellow flax
LINACEAE	<i>Linum virginianum</i>	woodland flax
HAMAMELIDACEAE	<i>Liquidambar styraciflua</i>	sweet-gum
MAGNOLIACEAE	<i>Liriodendron tulipifera</i>	tuliptree
BORAGINACEAE	<i>Lithospermum carolinense</i>	hairy puccoon
CAMPANULACEAE	<i>Lobelia elongata</i>	long-leaf lobelia
CAMPANULACEAE	<i>Lobelia glandulosa</i>	glade lobelia
CAMPANULACEAE	<i>Lobelia nuttallii</i>	nuttall's lobelia
CAMPANULACEAE	<i>Lobelia puberula</i>	downy lobelia
CAPRIFOLIACEAE	<i>Lonicera japonica</i>	japanese honeysuckle
ONAGRACEAE	<i>Ludwigia alternifolia</i>	seedbox
ONAGRACEAE	<i>Ludwigia decurrens</i>	wing-leaf primrose-willow
ONAGRACEAE	<i>Ludwigia leptocarpa</i>	angle-stem primrose-willow
ONAGRACEAE	<i>Ludwigia linearis</i>	narrow-leaf primrose-willow
ONAGRACEAE	<i>Ludwigia palustris</i>	marsh primrose-willow
ONAGRACEAE	<i>Ludwigia uruguayensis</i>	uruguayan primrose-willow
FABACEAE	<i>Lupinus diffusus</i>	oak ridge lupine
LYCOPODIACEAE	<i>Lycopodiella alopecuroides</i>	fox-tail club-moss
LYCOPODIACEAE	<i>Lycopodiella appressa</i>	southern bog club-moss
LYCOPODIACEAE	<i>Lycopodium digitatum</i>	fan ground-pine
LAMIACEAE	<i>Lycopus rubellus</i>	taper-leaf water-horehound
LAMIACEAE	<i>Lycopus uniflorus</i>	northern water-horehound
LAMIACEAE	<i>Lycopus virginicus</i>	virginia water-horehound
ERICACEAE	<i>Lyonia ligustrina</i>	maleberry
ERICACEAE	<i>Lyonia lucida</i>	shinyleaf
ERICACEAE	<i>Lyonia mariana</i>	piedmont staggerbush
PRIMULACEAE	<i>Lysimachia asperulifolia</i>	rough-leaf yellow-loosestrife

FAMILY NAME	ACCEPTED NAME	COMMON NAME
PRIMULACEAE	<i>Lysimachia quadrifolia</i>	whorled yellow-loosestrife
MAGNOLIACEAE	<i>Magnolia grandiflora</i>	southern magnolia
MAGNOLIACEAE	<i>Magnolia virginiana</i>	sweet-bay
ROSACEAE	<i>Malus angustifolia</i>	southern crabapple
ASTERACEAE	<i>Marshallia graminifolia</i>	grass-leaf barbara's-buttons
ASTERACEAE	<i>Marshallia obovata</i>	spoon-shape barbara's-buttons
MAYACACEAE	<i>Mayaca fluviatilis</i>	stream bog-moss
SCROPHULARIACEAE	<i>Mecardonia acuminata</i>	axil-flower
LILIACEAE	<i>Melanthium latifolium</i>	slender bunchflower
MELIACEAE	<i>Melia azedarach</i>	chinaberry tree
FABACEAE	<i>Melilotus officinalis</i>	yellow sweetclover
POACEAE	<i>Microstegium vimineum</i>	nepalese browntop
ASTERACEAE	<i>Mikania scandens</i>	climbing hempvine
CARYOPHYLLACEAE	<i>Minuartia caroliniana</i>	pine-barren stitchwort
LOGANIACEAE	<i>Mitreola sessilifolia</i>	swamp hornpod
MALVACEAE	<i>Modiola caroliniana</i>	carolina bristle-mallow
MOLLUGINACEAE	<i>Mollugo verticillata</i>	green carpetweed
LAMIACEAE	<i>Monarda punctata</i>	spotted beebalm
MONOTROPACEAE	<i>Monotropa hypopithys</i>	many-flower indian-pipe
MORACEAE	<i>Morus rubra</i>	red mulberry
POACEAE	<i>Muhlenbergia capillaris</i>	hairawn muhly
COMMELINACEAE	<i>Murdannia keisak</i>	wart-removing-herb
MYRICACEAE	<i>Myrica cerifera</i>	southern bayberry
MYRICACEAE	<i>Myrica heterophylla</i>	evergreen bayberry
HALORAGACEAE	<i>Myriophyllum laxum</i>	loose water-milfoil
HALORAGACEAE	<i>Myriophyllum pinnatum</i>	cut-leaf water-milfoil
SANTALACEAE	<i>Nestronia umbellula</i>	leechbrush
NYMPHAEACEAE	<i>Nuphar lutea</i>	yellow pondlily
SCROPHULARIACEAE	<i>Nuttallanthus canadensis</i>	oldfield-toadflax
NYMPHAEACEAE	<i>Nymphaea odorata</i>	american white waterlily
MENYANTHACEAE	<i>Nymphoides cordata</i>	little floatingheart
NYSSACEAE	<i>Nyssa sylvatica</i>	black tupelo
ONAGRACEAE	<i>Oenothera fruticosa</i>	narrow-leaf evening-primrose
ONAGRACEAE	<i>Oenothera fruticosa</i> ssp. <i>Glauca</i>	narrow-leaf evening-primrose
ONAGRACEAE	<i>Oenothera laciniata</i>	cut-leaf evening-primrose
ONAGRACEAE	<i>Oenothera speciosa</i>	pinkladies
RUBIACEAE	<i>Oldenlandia uniflora</i>	clustered mille-graines
BORAGINACEAE	<i>Onosmodium virginianum</i>	wild job's-tears
POACEAE	<i>Oplismenus hirtellus</i>	long-leaf basket grass
CACTACEAE	<i>Opuntia humifusa</i> var. <i>humifusa</i>	
FABACEAE	<i>Orbexilum pedunculatum</i> var. <i>psoralioides</i>	sampson's-snakeroot
ARACEAE	<i>Orontium aquaticum</i>	goldenclub
OSMUNDACEAE	<i>Osmunda cinnamomea</i>	cinnamon fern
OSMUNDACEAE	<i>Osmunda regalis</i> var. <i>spectabilis</i>	royal fern
OXALIDACEAE	<i>Oxalis articulata</i> ssp. <i>rubra</i>	jointed wood-sorrel
OXALIDACEAE	<i>Oxalis corniculata</i>	creeping yellow wood-sorrel
OXALIDACEAE	<i>Oxalis dillenii</i>	slender yellow wood-sorrel
ERICACEAE	<i>Oxydendrum arboreum</i>	sourwood
APIACEAE	<i>Oxypolis rigidior</i>	stiff cowbane
APIACEAE	<i>Oxypolis ternata</i>	pedmont cowbane
POACEAE	<i>Panicum anceps</i>	beaked panicum

FAMILY NAME	ACCEPTED NAME	COMMON NAME
POACEAE	<i>Panicum dichotomiflorum</i>	fall panicgrass
POACEAE	<i>Panicum hemitomon</i>	maidencane
POACEAE	<i>Panicum verrucosum</i>	warty panicgrass
POACEAE	<i>Panicum virgatum</i>	switchgrass
VITACEAE	<i>Parthenocissus quinquefolia</i>	virginia-creeper
POACEAE	<i>Paspalum boscianum</i>	bull crowngrass
POACEAE	<i>Paspalum dilatatum</i>	dallasgrass
POACEAE	<i>Paspalum floridanum</i>	florida paspalum
POACEAE	<i>Paspalum laeve</i>	field paspalum
POACEAE	<i>Paspalum notatum</i> var. <i>saurae</i>	bahiagrass
POACEAE	<i>Paspalum setaceum</i>	thin paspalum
POACEAE	<i>Paspalum urvillei</i>	vasey's grass
PASSIFLORACEAE	<i>Passiflora incarnata</i>	purple passion-flower
ARACEAE	<i>Peltandra virginica</i>	green arrow-arum
POACEAE	<i>Pennisetum glaucum</i>	pearl millet
SCROPHULARIACEAE	<i>Penstemon australis</i>	eustis lake beardtongue
LAURACEAE	<i>Persea palustris</i>	swamp bay
SOLANACEAE	<i>Petunia axillaris</i>	
POACEAE	<i>Phalaris caroliniana</i>	carolina canarygrass
POLEMONIACEAE	<i>Phlox nivalis</i>	trailing phlox
VISCACEAE	<i>Phoradendron leucarpum</i>	oak mistletoe
VISCACEAE	<i>Phoradendron leucarpum</i>	oak mistletoe
POACEAE	<i>Phyllostachys aurea</i>	golden bamboo
SOLANACEAE	<i>Physalis virginiana</i>	virginia ground-cherry
PHYTOLACCACEAE	<i>Phytolacca americana</i>	american pokeweed
PINACEAE	<i>Pinus echinata</i>	shortleaf pine
PINACEAE	<i>Pinus elliottii</i>	slash pine
PINACEAE	<i>Pinus serotina</i>	pond pine
PINACEAE	<i>Pinus strobus</i>	eastern white pine
PINACEAE	<i>Pinus taeda</i>	loblolly pine
PINACEAE	<i>Pinus virginiana</i>	virginia pine
POACEAE	<i>Piptochaetium avenaceum</i>	black-seed spear grass
TURNERACEAE	<i>Piriqueta cistoides</i> ssp. <i>caroliniana</i>	pitted stripeeed
ASTERACEAE	<i>Pityopsis graminifolia</i> var. <i>graminifolia</i>	narrow-leaf silk-grass
PLANTAGINACEAE	<i>Plantago aristata</i>	large-bract plantain
PLANTAGINACEAE	<i>Plantago lanceolata</i>	english plantain
PLANTAGINACEAE	<i>Plantago wrightiana</i>	wright's plantain
ORCHIDACEAE	<i>Platanthera ciliaris</i>	yellow fringed orchid
ORCHIDACEAE	<i>Platanthera clavellata</i>	green woodland orchid
ORCHIDACEAE	<i>Platanthera cristata</i>	crested yellow orchid
PLATANACEAE	<i>Platanus occidentalis</i>	american sycamore
POLYPODIACEAE	<i>Pleopeltis polypodioides</i> ssp. <i>polypodioides</i>	resurrection fern
ASTERACEAE	<i>Pluchea camphorata</i>	plowman's-wort
POACEAE	<i>Poa annua</i>	annual bluegrass
POACEAE	<i>Poa chapmaniana</i>	chapman's bluegrass
ORCHIDACEAE	<i>Pogonia ophioglossoides</i>	snake-mouth orchid
POLYGALACEAE	<i>Polygala cruciata</i>	drumheads
POLYGALACEAE	<i>Polygala grandiflora</i>	showy milkwort
POLYGALACEAE	<i>Polygala lutea</i>	orange milkwort
POLYGALACEAE	<i>Polygala mariana</i>	maryland milkwort
POLYGALACEAE	<i>Polygala polygama</i>	racemed milkwort

FAMILY NAME	ACCEPTED NAME	COMMON NAME
POLYGALACEAE	<i>Polygala verticillata</i>	whorled milkwort
POLYGONACEAE	<i>Polygonella americana</i>	southern jointweed
POLYGONACEAE	<i>Polygonella polygama</i>	october-flower
POLYGONACEAE	<i>Polygonum hydropiperoides</i>	swamp smartweed
POLYGONACEAE	<i>Polygonum hydropiperoides</i>	swamp smartweed
POLYGONACEAE	<i>Polygonum pensylvanicum</i>	pinkweed
POLYGONACEAE	<i>Polygonum sagittatum</i>	arrow-leaf tearthumb
BUDDLEJACEAE	<i>Polypremum procumbens</i>	juniper-leaf
DRYOPTERIDACEAE	<i>Polystichum acrostichoides</i>	christmas fern
POTAMOGETONACEAE	<i>Potamogeton diversifolius</i>	waterthread
ROSACEAE	<i>Potentilla canadensis</i>	dwarf cinquefoil
ASTERACEAE	<i>Prenanthes autumnalis</i>	slender rattlesnake-root
HALORAGACEAE	<i>Proserpinaca pectinata</i>	comb-leaf mermaidweed
LAMIACEAE	<i>Prunella vulgaris</i>	common selfheal
ROSACEAE	<i>Prunus angustifolia</i>	chickasaw plum
ROSACEAE	<i>Prunus caroliniana</i>	carolina laurel cherry
ROSACEAE	<i>Prunus serotina</i>	black cherry
ROSACEAE	<i>Prunus umbellata</i>	hog plum
RUTACEAE	<i>Ptelea trifoliata</i>	common hoptree
DENNSTAEDTIACEAE	<i>Pteridium aquilinum</i>	western brackenfern
ADIANTACEAE	<i>Pteris multifida</i>	spider brake
APIACEAE	<i>Ptilimnium capillaceum</i>	herbwilliam
FABACEAE	<i>Pueraria montana</i> var. <i>lobata</i>	kudzu
LAMIACEAE	<i>Pycnanthemum flexuosum</i>	appalachian mountain-mint
LAMIACEAE	<i>Pycnanthemum flexuosum</i>	appalachian mountain-mint
LAMIACEAE	<i>Pycnanthemum incanum</i>	hoary mountain-mint
LAMIACEAE	<i>Pycnanthemum setosum</i>	awned mountain-mint
LAMIACEAE	<i>Pycnanthemum tenuifolium</i>	narrow-leaf mountain-mint
ASTERACEAE	<i>Pyrrhopappus carolinianus</i>	carolina desert-chicory
FAGACEAE	<i>Quercus alba</i>	white oak
FAGACEAE	<i>Quercus falcata</i>	southern red oak
FAGACEAE	<i>Quercus incana</i>	bluejack oak
FAGACEAE	<i>Quercus laevis</i>	turkey oak
FAGACEAE	<i>Quercus margarettiae</i>	runner oak
FAGACEAE	<i>Quercus marilandica</i>	blackjack oak
FAGACEAE	<i>Quercus nigra</i>	water oak
FAGACEAE	<i>Quercus phellos</i>	willow oak
FAGACEAE	<i>Quercus shumardii</i>	shumard's oak
FAGACEAE	<i>Quercus stellata</i>	post oak
FAGACEAE	<i>Quercus virginiana</i>	live oak
RANUNCULACEAE	<i>Ranunculus abortivus</i>	littleleaf buttercup
MELASTOMATAACEAE	<i>Rhexia alifanus</i>	savannah meadow-beauty
MELASTOMATAACEAE	<i>Rhexia mariana</i>	maryland meadow-beauty
MELASTOMATAACEAE	<i>Rhexia nashii</i>	maid marian
MELASTOMATAACEAE	<i>Rhexia petiolata</i>	fringed meadow-beauty
MELASTOMATAACEAE	<i>Rhexia virginica</i>	handsome-harry
ERICACEAE	<i>Rhododendron atlanticum</i>	dwarf azalea
ERICACEAE	<i>Rhododendron canescens</i>	mountain azalea
ERICACEAE	<i>Rhododendron minus</i>	carolina rhododendron
ERICACEAE	<i>Rhododendron viscosum</i>	clammy azalea
ANACARDIACEAE	<i>Rhus copallina</i>	dwarf sumac

FAMILY NAME	ACCEPTED NAME	COMMON NAME
ANACARDIACEAE	<i>Rhus glabra</i>	smooth sumac
FABACEAE	<i>Rhynchosia reniformis</i>	dollarleaf
FABACEAE	<i>Rhynchosia tomentosa</i>	twining snout-bean
CYPERACEAE	<i>Rhynchospora cephalantha</i>	bunched beak sedge
CYPERACEAE	<i>Rhynchospora cephalantha</i> var. <i>microcephala</i>	bunched beak sedge
CYPERACEAE	<i>Rhynchospora chalarocephala</i>	loose-head beak sedge
CYPERACEAE	<i>Rhynchospora fascicularis</i>	fascicled beak sedge
CYPERACEAE	<i>Rhynchospora globularis</i>	globe beak sedge
CYPERACEAE	<i>Rhynchospora glomerata</i>	clustered beak sedge
CYPERACEAE	<i>Rhynchospora gracilentia</i>	slender beak sedge
CYPERACEAE	<i>Rhynchospora grayi</i>	gray's beak sedge
CYPERACEAE	<i>Rhynchospora inexpansa</i>	nodding beak sedge
CYPERACEAE	<i>Rhynchospora nitens</i>	short-beak beak sedge
CYPERACEAE	<i>Rhynchospora oligantha</i>	feather-bristle beak sedge
CYPERACEAE	<i>Rhynchospora pallida</i>	pale beak sedge
CYPERACEAE	<i>Rhynchospora plumosa</i>	plumed beak sedge
CYPERACEAE	<i>Rhynchospora rariflora</i>	few-flower beak sedge
CYPERACEAE	<i>Rhynchospora stenophylla</i>	coastal-plain beak sedge
RUBIACEAE	<i>Richardia brasiliensis</i>	tropical mexican-clover
FABACEAE	<i>Robinia hispida</i>	bristly locust
FABACEAE	<i>Robinia pseudoacacia</i>	black locust
FABACEAE	<i>Robinia viscosa</i>	clammy locust
ROSACEAE	<i>Rosa wichuraiana</i>	memorial rose
LYTHRACEAE	<i>Rotala ramosior</i>	lowland toothcup
ROSACEAE	<i>Rubus argutus</i>	saw-tooth blackberry
ROSACEAE	<i>Rubus argutus</i>	saw-tooth blackberry
ROSACEAE	<i>Rubus trivialis</i>	southern dewberry
ASTERACEAE	<i>Rudbeckia hirta</i> var. <i>pulcherrima</i>	black-eyed-susan
ACANTHACEAE	<i>Ruellia caroliniensis</i>	carolina wild petunia
POLYGONACEAE	<i>Rumex acetosella</i>	common sheep sorrel
POLYGONACEAE	<i>Rumex hastatulus</i>	heartwing sorrel
GENTIANACEAE	<i>Sabatia brachiata</i>	narrow-leaf rose-gentian
GENTIANACEAE	<i>Sabatia difformis</i>	lance-leaf rose-gentian
GENTIANACEAE	<i>Sabatia quadrangula</i>	four-angle rose-gentian
POACEAE	<i>Saccharum alopecuroides</i>	silver plumegrass
POACEAE	<i>Saccharum giganteum</i>	sugarcane plumegrass
POACEAE	<i>Sacciolepis striata</i>	american cupscale
CARYOPHYLLACEAE	<i>Sagina decumbens</i>	trailing pearlwort
ALISMATACEAE	<i>Sagittaria latifolia</i>	duck-potato
SALICACEAE	<i>Salix nigra</i>	black willow
LAMIACEAE	<i>Salvia azurea</i>	azure-blue sage
LAMIACEAE	<i>Salvia lyrata</i>	lyre-leaf sage
CAPRIFOLIACEAE	<i>Sambucus canadensis</i>	american elder
APIACEAE	<i>Sanicula canadensis</i>	canadian black-snakeroot
SARRACENIACEAE	<i>Sarracenia flava</i>	yellow pitcherplant
SARRACENIACEAE	<i>Sarracenia purpurea</i>	purple pitcherplant
SARRACENIACEAE	<i>Sarracenia rubra</i>	sweet pitcherplant
LAURACEAE	<i>Sassafras albidum</i>	sassafras
SAURURACEAE	<i>Saururus cernuus</i>	lizard's-tail
POACEAE	<i>Schizachyrium scoparium</i>	little bluestem
POACEAE	<i>Schizachyrium tenerum</i>	slender bluestem

FAMILY NAME	ACCEPTED NAME	COMMON NAME
FABACEAE	Schrankia microphylla var. microphylla	little-leaf sensitive-briar
CYPERACEAE	Scirpus cyperinus	woolgrass
CARYOPHYLLACEAE	Scleranthus annuus	annual knawel
CYPERACEAE	Scleria ciliata	fringed nut-rush
CYPERACEAE	Scleria pauciflora	few-flower nut-rush
CYPERACEAE	Scleria reticularis	netted nut-rush
CYPERACEAE	Scleria triglomerata	whip nut-rush
LAMIACEAE	Scutellaria elliptica	hairy skullcap
LAMIACEAE	Scutellaria integrifolia	helmet-flower
SELAGINELLACEAE	Selaginella arenicola	sand spike-moss
ASTERACEAE	Senecio anonymus	small's ragwort
POACEAE	Setaria glauca	
POACEAE	Setaria pumila	yellow bristlegrass
POACEAE	Setaria viridis	green bristlegrass
SCROPHULARIACEAE	Seymeria cassioides	yaupon black-senna
BRASSICACEAE	Sibara virginica	virginia winged-rockcress
CARYOPHYLLACEAE	Silene caroliniana	sticky catchfly
IRIDACEAE	Sisyrinchium angustifolium	narrow-leaf blue-eyed-grass
IRIDACEAE	Sisyrinchium atlanticum	eastern blue-eyed-grass
IRIDACEAE	Sisyrinchium rosulatum	annual blue-eyed-grass
SMILACACEAE	Smilax glauca	
SMILACACEAE	Smilax herbacea	
SMILACACEAE	Smilax laurifolia	
SMILACACEAE	Smilax rotundifolia	
SMILACACEAE	Smilax smallii	
SMILACACEAE	Smilax walteri	
SOLANACEAE	Solanum americanum	american black nightshade
SOLANACEAE	Solanum carolinense	carolina horse-nettle
SOLANACEAE	Solanum ptychanthum	
ASTERACEAE	Solidago arguta	atlantic goldenrod
ASTERACEAE	Solidago latissimifolia	elliott's goldenrod
ASTERACEAE	Solidago nemoralis var. nemoralis	gray goldenrod
ASTERACEAE	Solidago odora	anise-scented goldenrod
ASTERACEAE	Solidago rugosa	wrinkle-leaf goldenrod
ASTERACEAE	Solidago stricta	wand goldenrod
ASTERACEAE	Solidago tortifolia	twist-leaf goldenrod
ASTERACEAE	Soliva sessilis	lawn burrweed
ASTERACEAE	Sonchus oleraceus	common sow-thistle
POACEAE	Sorghastrum elliottii	slender indiagrass
POACEAE	Sorghastrum nutans	yellow indiagrass
POACEAE	Sorghum halepense	johnson grass
APIACEAE	Spermolepis divaricata	rough-fruit scaleseed
POACEAE	Sphenopholis obtusata	prairie wedgescale
ORCHIDACEAE	Spiranthes vernalis	spring ladies'-tresses
POACEAE	Sporobolus junceus	pineywoods dropseed
CARYOPHYLLACEAE	Stellaria media	common chickweed
EUPHORBIACEAE	Stillingia sylvatica	queen's-delight
CARYOPHYLLACEAE	Stipulicida setacea	pineland scaly-pink
FABACEAE	Strophostyles umbellata	pink fuzzy-bean
CONVOLVULACEAE	Stylisma patens	coastal-plain dawnflower
VERBENACEAE	Stylodon carneus	carolina false vervain

FAMILY NAME	ACCEPTED NAME	COMMON NAME
FABACEAE	<i>Stylosanthes biflora</i>	side-beak pencil-flower
STYRACACEAE	<i>Styrax americanus</i>	american snowbell
ASTERACEAE	<i>Taraxacum officinale</i>	common dandelion
FABACEAE	<i>Tephrosia spicata</i>	spiked hoary-pea
FABACEAE	<i>Tephrosia virginiana</i>	goat's-rue
ASTERACEAE	<i>Tetragonotheca helianthoides</i>	pineland nerve-ray
APIACEAE	<i>Thaspium trifoliatum</i>	purple meadow-parsnip
BROMELIACEAE	<i>Tillandsia usneoides</i>	spanish-moss
LILIACEAE	<i>Tofieldia racemosa</i>	coastal false asphodel
ANACARDIACEAE	<i>Toxicodendron pubescens</i>	atlantic poison-oak
ANACARDIACEAE	<i>Toxicodendron radicans</i>	eastern poison-ivy
ANACARDIACEAE	<i>Toxicodendron vernix</i>	poison-sumac
COMMELINACEAE	<i>Tradescantia ohiensis</i>	bluejacket
COMMELINACEAE	<i>Tradescantia virginiana</i>	virginia spiderwort
EUPHORBIACEAE	<i>Tragia urens</i>	wavy-leaf noseburn
EUPHORBIACEAE	<i>Tragia urticifolia</i>	nettle-leaf noseburn
CLUSIACEAE	<i>Triadenum virginicum</i>	virginia marsh-st. john's-wort
LAMIACEAE	<i>Trichostema dichotomum</i>	forked bluecurls
LAMIACEAE	<i>Trichostema setaceum</i>	narrow-leaf bluecurls
POACEAE	<i>Tridens flavus</i>	purpletop tridens
FABACEAE	<i>Trifolium arvense</i>	rabbit-foot clover
FABACEAE	<i>Trifolium campestre</i>	lesser hop clover
FABACEAE	<i>Trifolium dubium</i>	suckling clover
FABACEAE	<i>Trifolium incarnatum</i>	crimson clover
FABACEAE	<i>Trifolium repens</i>	white clover
CAMPANULACEAE	<i>Triodanis perfoliata</i> var. <i>biflora</i>	clasping-leaf venus'-looking-glass
POACEAE	<i>Triplasis americana</i>	perennial sand grass
POACEAE	<i>Triplasis purpurea</i>	purple sand grass
TYPHACEAE	<i>Typha latifolia</i>	broadleaf cattail
ULMACEAE	<i>Ulmus alata</i>	winged elm
ULMACEAE	<i>Ulmus americana</i>	american elm
LENTIBULARIACEAE	<i>Utricularia gibba</i>	humped bladderwort
LENTIBULARIACEAE	<i>Utricularia juncea</i>	southern bladderwort
LENTIBULARIACEAE	<i>Utricularia purpurea</i>	eastern purple bladderwort
LENTIBULARIACEAE	<i>Utricularia subulata</i>	zigzag bladderwort
LILIACEAE	<i>Uvularia puberula</i>	mountain bellwort
ERICACEAE	<i>Vaccinium corymbosum</i>	highbush blueberry
ERICACEAE	<i>Vaccinium elliotii</i>	elliott's blueberry
ERICACEAE	<i>Vaccinium fuscum</i>	black blueberry
ERICACEAE	<i>Vaccinium stamineum</i>	deerberry
ERICACEAE	<i>Vaccinium tenellum</i>	small black blueberry
ERICACEAE	<i>Vaccinium virgatum</i>	small-flower blueberry
VALERIANACEAE	<i>Valerianella radiata</i>	beaked cornsalad
VERBENACEAE	<i>Verbena brasiliensis</i>	brazilian vervain
ASTERACEAE	<i>Verbesina occidentalis</i>	yellow crownbeard
ASTERACEAE	<i>Vernonia acaulis</i>	stemless ironweed
ASTERACEAE	<i>Vernonia angustifolia</i>	tall ironweed
SCROPHULARIACEAE	<i>Veronica arvensis</i>	corn speedwell
CAPRIFOLIACEAE	<i>Viburnum nudum</i>	possumhaw
FABACEAE	<i>Vicia lathyroides</i>	spring vetch
FABACEAE	<i>Vicia sativa</i> ssp. <i>sativa</i>	garden vetch

FAMILY NAME	ACCEPTED NAME	COMMON NAME
FABACEAE	Vicia villosa ssp. varia	winter vetch
VIOLACEAE	Viola bicolor	field pansy
VIOLACEAE	Viola pedata	bird-foot violet
VIOLACEAE	Viola walteri	prostrate blue violet
VIOLACEAE	Viola X primulifolia	
VITACEAE	Vitis labrusca	fox grape
VITACEAE	Vitis rotundifolia	muscadine
POACEAE	Vulpia myuros	rattail fescue
POACEAE	Vulpia octoflora	sixweeks fescue
CAMPANULACEAE	Wahlenbergia marginata	southern rockbell
BRASSICACEAE	Warea cuneifolia	carolina pinelandcress
FABACEAE	Wisteria frutescens	american wisteria
FABACEAE	Wisteria sinensis	chinese wisteria
BLECHNACEAE	Woodwardia areolata	netted chain fern
BLECHNACEAE	Woodwardia virginica	virginia chain fern
RANUNCULACEAE	Xanthorhiza simplicissima	shrub yellowroot
ASTERACEAE	Xylorhiza tortifolia var. tortifolia	mojave woody-aster
XYRIDACEAE	Xyris ambigua	coastal-plain yellow-eyed-grass
XYRIDACEAE	Xyris baldwiniana	baldwin's yellow-eyed-grass
XYRIDACEAE	Xyris caroliniana	carolina yellow-eyed-grass
XYRIDACEAE	Xyris elliotii	elliott's yellow-eyed-grass
XYRIDACEAE	Xyris fimbriata	fringed yellow-eyed-grass
XYRIDACEAE	Xyris jupicai	richard's yellow-eyed-grass
XYRIDACEAE	Xyris stricta	pineland yellow-eyed-grass
ASTERACEAE	Youngia japonica	oriental false hawk's-beard
AGAVACEAE	Yucca aloifolia	aloe yucca
LILIACEAE	Zigadenus densus	osceola's-plume
LILIACEAE	Zigadenus glaberrimus	sandbog deathcamas
FABACEAE	Zornia Bracteata	viperina

Source: Fort Jackson, Integrated Natural Resources Management Plan, 2004

B.2 LIST OF FAUNA KNOWN TO OCCUR AT FORT JACKSON, SOUTH CAROLINA

Birds

GENUS	SPECIES	COMMON NAME
<i>Accipiter</i>	<i>striatus</i>	Sharp-shinned Hawk
<i>Accipiter</i>	<i>cooperii</i>	Cooper's Hawk
<i>Aimophila</i>	<i>aestivalis</i>	Bachman's sparrow
<i>Aix</i>	<i>sponsa</i>	Wood duck
<i>Anas</i>	<i>acuta</i>	Northern Pintail
<i>Anas</i>	<i>crecca</i>	Green-winged Teal
<i>Anas</i>	<i>platyrhynchos</i>	Mallard
<i>Agelaius</i>	<i>phoeniceus</i>	Red-winged Blackbird
<i>Archilochus</i>	<i>colubris</i>	Ruby-throated hummingbird
<i>Ardea</i>	<i>herodias</i>	Great Blue Heron
<i>Aythya</i>	<i>collaris</i>	Ring-necked duck
<i>Aythya</i>	<i>valisineria</i>	Canvasback
<i>Bombycilla</i>	<i>cedrorum</i>	Cedar waxwing
<i>Branta</i>	<i>canadensis</i>	Canada Goose
<i>Bubo</i>	<i>virginianus</i>	Great Horned Owl
<i>Buteo</i>	<i>platypterus</i>	Broad-winged hawk
<i>Buteo</i>	<i>lineatus</i>	Red-shouldered hawk
<i>Buteo</i>	<i>jamaicensis</i>	Red-tailed hawk
<i>Butorides</i>	<i>striatus</i>	Green-backed heron
<i>Caprimulgus</i>	<i>carolinensis</i>	Chuck-will's-widow
<i>Caprimulgus</i>	<i>vociferus</i>	Whip-poor-will
<i>Cardinalis</i>	<i>cardinalis</i>	Northern cardinal
<i>Carduelis</i>	<i>tristis</i>	American goldfinch
<i>Carpodacus</i>	<i>mexicanus</i>	House Finch
<i>Cathartes</i>	<i>aura</i>	Turkey Vulture
<i>Catharus</i>	<i>ustulatus</i>	Swainson's thrush
<i>Ceryle</i>	<i>alcyon</i>	Belted Kingfisher
<i>Chaetura</i>	<i>pelagica</i>	Chimney swift
<i>Charadrius</i>	<i>vociferus</i>	Killdeer
<i>Chen</i>	<i>caerulescens</i>	Snow goose
<i>Chordeiles</i>	<i>minor</i>	Common nighthawk
<i>Coccyzus</i>	<i>americanus</i>	Yellow-billed cuckoo
<i>Colaptes</i>	<i>auratus</i>	Northern flicker
<i>Colinus</i>	<i>virginianus</i>	Northern bobwhite
<i>Columba</i>	<i>livia</i>	Rock Dove
<i>Contopus</i>	<i>virens</i>	Eastern wood-pewee
<i>Coragyps</i>	<i>atratus</i>	Black vulture
<i>Corvus</i>	<i>brachyrhynchos</i>	American crow
<i>Corvus</i>	<i>ossifragus</i>	Fish crow
<i>Cyanocitta</i>	<i>cristata</i>	Blue jay
<i>Dendroica</i>	<i>caerulscens</i>	Black-throated Blue Warbler

GENUS	SPECIES	COMMON NAME
<i>Dendroica</i>	<i>dominica</i>	Yellow-throated warbler
<i>Dendroica</i>	<i>discolor</i>	Prairie warbler
<i>Dendroica</i>	<i>pinus</i>	Pine warbler
<i>Dryocopus</i>	<i>pileatus</i>	Pileated woodpecker
<i>Dumetella</i>	<i>carolinensis</i>	Gray Catbird
<i>Egretta</i>	<i>thula</i>	Snowy Egret
<i>Elanoides</i>	<i>forficatus</i>	Swallow-tailed Kite
<i>Empidonax</i>	<i>virescens</i>	Acadian flycatcher
<i>Falco</i>	<i>sparverius</i>	American kestrel
<i>Geothlypis</i>	<i>trichas</i>	Common yellowthroat
<i>Guiraca</i>	<i>caerulea</i>	Blue grosbeak
<i>Haliaeetus</i>	<i>leucocephalus</i>	Bald Eagle
<i>Hirundo</i>	<i>rustica</i>	Barn swallow
<i>Hylocichla</i>	<i>mustelina</i>	Wood thrush
<i>Icteria</i>	<i>virens</i>	Yellow-breasted chat
<i>Icterus</i>	<i>spurius</i>	Orchard oriole
<i>Lanius</i>	<i>ludovicianus</i>	Loggerhead Shrike
<i>Limnothlypis</i>	<i>swainsonii</i>	Swainson's warbler
<i>Melanerpes</i>	<i>carolinus</i>	Red-bellied woodpecker
<i>Melanerpes</i>	<i>erythrocephalus</i>	Red-headed woodpecker
<i>Meleagris</i>	<i>gallopavo</i>	Wild turkey
<i>Mimus</i>	<i>polyglottos</i>	Northern mockingbird
<i>Mniotilta</i>	<i>varia</i>	Black-and-white warbler
<i>Molothrus</i>	<i>ater</i>	Brown-headed cowbird
<i>Myiarchus</i>	<i>crinitus</i>	Great crested flycatcher
<i>Oporornis</i>	<i>formosus</i>	Kentucky warbler
<i>Otus</i>	<i>asio</i>	Eastern screech-owl
<i>Oxyura</i>	<i>jamaicensis</i>	Ruddy duck
<i>Pandion</i>	<i>haliaetus</i>	Osprey
<i>Parus</i>	<i>bicolor</i>	Tufted titmouse
<i>Parus</i>	<i>carolinensis</i>	Carolina chickadee
<i>Passer</i>	<i>domesticus</i>	House Sparrow
<i>Passerina</i>	<i>cyanea</i>	Indigo bunting
<i>Phalacrocorax</i>	<i>auritus</i>	Double-crested Cormorant
<i>Picoides</i>	<i>borealis</i>	Red-cockaded woodpecker
<i>Picoides</i>	<i>pubescens</i>	Downy woodpecker
<i>Picoides</i>	<i>villosus</i>	Hairy Woodpecker
<i>Pipilo</i>	<i>erythrophthalmus</i>	Rufous-sided towhee
<i>Piranga</i>	<i>olivacea</i>	Scarlet Tanager
<i>Piranga</i>	<i>rubra</i>	Summer tanager
<i>Polioptila</i>	<i>caerulea</i>	Blue-gray gnatcatcher
<i>Progne</i>	<i>subis</i>	Purple martin
<i>Protonotaria</i>	<i>citrea</i>	Prothonotary warbler
<i>Quiscalus</i>	<i>quiscula</i>	Common grackle

GENUS	SPECIES	COMMON NAME
<i>Seiurus</i>	<i>motacilla</i>	Louisiana waterthrush
<i>Seiurus</i>	<i>aurocapillus</i>	Ovenbird
<i>Setophaga</i>	<i>ruticilla</i>	American redstart
<i>Sialia</i>	<i>sialis</i>	Eastern bluebird
<i>Sitta</i>	<i>carolinensis</i>	White-breasted nuthatch
<i>Sitta</i>	<i>pusilla</i>	Brown-headed nuthatch
<i>Sphyrapicus</i>	<i>varius</i>	Yellow-bellied Sapsucker
<i>Spizella</i>	<i>passerina</i>	Chipping sparrow
<i>Spizella</i>	<i>pusilla</i>	Field Sparrow
<i>Stelgidopteryx</i>	<i>serripennis</i>	Northern rough-winged swallow
<i>Strix</i>	<i>varia</i>	Barred owl
<i>Sturnella</i>	<i>magna</i>	Eastern Meadowlark
<i>Sturnus</i>	<i>vulgaris</i>	European Starling
<i>Telespyza</i>	<i>cantans</i>	Laysan finch
<i>Thryothorus</i>	<i>ludovicianus</i>	Carolina wren
<i>Toxostoma</i>	<i>rufum</i>	Brown thrasher
<i>Turdus</i>	<i>migratorius</i>	American robin
<i>Tyrannus</i>	<i>tyrannus</i>	Eastern kingbird
<i>Vireo</i>	<i>olivaceus</i>	Red-eyed vireo
<i>Vireo</i>	<i>solitarius</i>	Solitary vireo
<i>Vireo</i>	<i>griseus</i>	White-eyed vireo
<i>Vireo</i>	<i>flavifrons</i>	Yellow-throated vireo
<i>Wilsonia</i>	<i>citrina</i>	Hooded warbler
<i>Zenaida</i>	<i>macroura</i>	Mourning dove
Source: Fort Jackson, Integrated Natural Resources Management Plan, 2004		

Amphibians and Reptiles

GENUS	SPECIES	COMMON NAME
<i>Acris</i>	<i>c. crepitans</i>	Northern Cricket frog
<i>Acris</i>	<i>gryllus</i>	Southern Cricket frog
<i>Agkistrodon</i>	<i>p. piscivorus</i>	Cottonmouth
<i>Agkistrodon</i>	<i>c. contortrix</i>	Copperhead
<i>Alligator</i>	<i>mississippiensis</i>	American Alligator
<i>Ambystoma</i>	<i>opacum</i>	Marbled salamander
<i>Ambystoma</i>	<i>talpoideum</i>	Mole salamander
<i>Anolis</i>	<i>carolinensis</i>	Green anole
<i>Bufo</i>	<i>terrestris</i>	Southern toad
<i>Bufo</i>	<i>woodhousi fowlerii</i>	Fowler's Toad
<i>Cemophora</i>	<i>coccinea</i>	Scarlet snake
<i>Chelydra</i>	<i>serpentina</i>	Common Snapping Turtle
<i>Cnemidophorus</i>	<i>s. sexlineatus</i>	Six-lined Racerunner
<i>Crotalus</i>	<i>horridus</i>	Timber/Canebrake Rattlesnake
<i>Coluber</i>	<i>constrictor</i>	Southern Black Racer

GENUS	SPECIES	COMMON NAME
<i>Coluber</i>	<i>c. constrictor</i>	Northen Black Racer
<i>Diadophis</i>	<i>punctatus</i>	Ring-necked snake
<i>Elaphe</i>	<i>g. guttata</i>	Corn/red snake
<i>Elaphe</i>	<i>o. obsoleta</i>	Black Rat Snake
<i>Eumeces</i>	<i>laticeps</i>	Broad-headed skink
<i>Eumeces</i>	<i>fasciatus</i>	Five-lined skink
<i>Eumeces</i>	<i>inexpectatus</i>	Southeastern Five-lined Skink
<i>Eurycea</i>	<i>cirrigera</i>	Southern Two-lined Salamander
<i>Eurycea</i>	<i>quadridigitata</i>	Dwarf salamander
<i>Farancia</i>	<i>a. abacura</i>	Eastern Mud Snake
<i>Gastrophryne</i>	<i>carolinensis</i>	Eastern narrow-mouthed toad
<i>Heterodon</i>	<i>platirhinos</i>	Eastern Hognose Snake
<i>Heterodon</i>	<i>simus</i>	Southern Hognose Snake
<i>Hyla</i>	<i>cinerea</i>	Green Treefrog
<i>Hyla</i>	<i>chrysoscelis</i>	Cope's gray treefrog
<i>Hyla</i>	<i>femorialis</i>	Pinewoods Treefrog
<i>Hyla</i>	<i>sp.</i>	Gray Treefrog
<i>Kinosternon</i>	<i>subrubrum</i>	Eastern Mud Turtle
<i>Lampropeltis</i>	<i>g. getula</i>	Eastern King Snake
<i>Masticophis</i>	<i>f. flagellum</i>	Eastern Coachwhip
<i>Necturus</i>	<i>punctatus</i>	Dwarf Waterdog
<i>Nerodia</i>	<i>e. erythrogaster</i>	Redbelly Water Snake
<i>Nerodia</i>	<i>f. fasciata</i>	Banded Water Snake
<i>Nerodia</i>	<i>taxispilota</i>	Brown water snake
<i>Notophthalmus</i>	<i>viridescens</i>	Eastern Newt
<i>Opheodrys</i>	<i>aestivus</i>	Rough Green Snake
<i>Ophisaurus</i>	<i>ventralis</i>	Eastern Glass lizard
<i>Pituophis</i>	<i>m. melanoleucus</i>	Northern Pine Snake
<i>Plethodon</i>	<i>glutinosus</i>	Slimy salamander
<i>Pseudacris</i>	<i>c. crucifer</i>	Northern Spring Peeper
<i>Pseudacris</i>	<i>triseriata</i>	Upland Chorus Frog
<i>Pseudemys</i>	<i>f. floridana</i>	Florida Cooter
<i>Pseudotriton</i>	<i>m. montanus</i>	Eastern Mud Salamander
<i>Rana</i>	<i>catesbeiana</i>	Bullfrog
<i>Rana</i>	<i>c. clamitans</i>	Bronze frog
<i>Rana</i>	<i>utricularia</i>	Southern leopard frog
<i>Rana</i>	<i>virgatipes</i>	Carpenter frog
<i>Regina</i>	<i>rigida</i>	Glossy Water Snake
<i>Scaphiopus</i>	<i>h. holbrookii</i>	Eastern spadefoot toad
<i>Sceloporus</i>	<i>undulatus</i>	Eastern fence lizard
<i>Sceloporus</i>	<i>u. undulatus</i>	Southern fence lizard
<i>Sceloporus</i>	<i>u. hyacinthinus</i>	Northern fence lizard
<i>Scincella</i>	<i>lateralis</i>	Ground skink
<i>Siren</i>	<i>intermedia</i>	Lesser Siren

GENUS	SPECIES	COMMON NAME
<i>Sistrurus</i>	<i>miliaris</i>	Carolina Pigmy Rattlesnake
<i>Sternotherus</i>	<i>odoratus</i>	Stinkpot
<i>Storeria</i>	<i>occipitomaculata</i>	Redbelly Snake
<i>Tantilla</i>	<i>coronata</i>	Southeastern crowned snake
<i>Terrapene</i>	<i>c. carolina</i>	Eastern box turtle
<i>Thamnophis</i>	<i>s. sirtalis</i>	Eastern Garter Snake
<i>Trachemys</i>	<i>s. scripta</i>	Yellow Bellied Turtle
<i>Virginia</i>	<i>striatula</i>	Rough Earth Snake
<i>Virginia</i>	<i>valeriae</i>	Smooth earth snake
Source: Fort Jackson, Integrated Natural Resources Management Plan, 2004		

Mammals

GENUS	SPECIES	COMMON NAME
<i>Blarina</i>	<i>carolinensis</i>	Southern short-tailed shrew
<i>Glaucomys</i>	<i>volans</i>	flying squirrel
<i>Canis</i>	<i>latrans</i>	Coyote
<i>Castor</i>	<i>canadensis</i>	Beaver
<i>Cryptotis</i>	<i>parva</i>	least shrew
<i>Didelphis</i>	<i>marsupialis</i>	opposum
<i>Lutra</i>	<i>canadensis</i>	River Otter
<i>Lynx</i>	<i>rufus</i>	Bobcat
<i>Mephitis</i>	<i>mephitis</i>	Skunk
<i>Mustela</i>	<i>vison</i>	Mink
<i>Myotis</i>	<i>austroriparius</i>	Southeastern Myotis
<i>Neotoma</i>	<i>floridana</i>	Eastern Woodrat
<i>Ochrotomys</i>	<i>nuttalli</i>	Golden mouse
<i>Odocoileus</i>	<i>virginianus</i>	White-tailed Deer
<i>Ondatra</i>	<i>zibethica</i>	Muskrat
<i>Peromyscus</i>	<i>leucopus</i>	White-footed mouse
<i>Peromyscus</i>	<i>polionotus</i>	Oldfield mouse
<i>Peromyscus</i>	<i>gossypinus</i>	Cotton mouse
<i>Plecotus</i>	<i>rafinesquii</i>	Rafinesque's Big-eared Bat
<i>Procyon</i>	<i>lotor</i>	Raccoon
<i>Reithrodontomys</i>	<i>humulis</i>	Eastern harvest mouse
<i>Scapanus</i>	<i>latimanus</i>	Broad-footed mole
<i>Sigmodon</i>	<i>hispidus</i>	Hispid cotton rat
<i>Sorex</i>	<i>longirostris</i>	Southeastern shrew
<i>Sylvilagus</i>	<i>floridanus</i>	Eastern Cottontail
<i>Sylvilagus</i>	<i>aquaticus</i>	Swamp Rabbit
<i>Sciurus</i>	<i>carolinensis</i>	Eastern Gray Squirrel
<i>Sciurus</i>	<i>niger</i>	Fox Squirrel
<i>Urocyon</i>	<i>cinereoargenteus</i>	Gray Fox
<i>Vulpes</i>	<i>fulva</i>	Red Fox

GENUS	SPECIES	COMMON NAME
<i>Source: Fort Jackson, Integrated Natural Resources Management Plan, 2004</i>		

Fish

GENUS	SPECIES	COMMON NAME
<i>Chaenobryttus</i>	<i>gulosus</i>	Warmouth
<i>Ctenopharyngodon</i>	<i>idellus</i>	Grass Carp
<i>Enneacanthus</i>	<i>chaetodon</i>	Black-banded Sunfish
<i>Erimyzon</i>	<i>sucetta</i>	Lake Chubsucker
<i>Esox</i>	<i>a. americanus</i>	Redfin Pickerel
<i>Esox</i>	<i>niger</i>	Chain Pickerel
<i>Etheostoma</i>	<i>fusiforme</i>	Swamp Darter
<i>Fundulus</i>	<i>lineolatus</i>	Lined Topminnow
<i>Fundulus</i>	<i>nottii</i>	Starhead Topminnow
<i>Gambusia</i>	<i>affinis</i>	Gambusia (mosquito fish)
<i>Ictalurus</i>	<i>catus</i>	White Catfish
<i>Ictalurus</i>	<i>melas</i>	Black Bullhead
<i>Ictalurus</i>	<i>natalis</i>	Yellow Bullhead
<i>Ictalurus</i>	<i>punctatus</i>	Channel Catfish
<i>Lepomis</i>	<i>auritus</i>	Redbreast Sunfish
<i>Lepomis</i>	<i>gibbosus</i>	Pumpkinseed
<i>Lepomis</i>	<i>gulosus</i>	Warmouth
<i>Lepomis</i>	<i>macrochirus</i>	Bluegill
<i>Lepomis</i>	<i>megalotis</i>	Longear Sunfish
<i>Lepomis</i>	<i>microlophus</i>	Redear Sunfish
<i>Micropterus</i>	<i>salmoides</i>	Largemouth Bass
<i>Notemigonus</i>	<i>crysoleucas</i>	Golden Shiner
<i>Pomoxis</i>	<i>annularis</i>	White Crappie
<i>Pomoxis</i>	<i>nigromaculatus</i>	Black Crappie
<i>Source: Fort Jackson, Integrated Natural Resources Management Plan, 2004</i>		

Invertebrates

GENUS	SPECIES	COMMON NAME
<i>Achalarus</i>	<i>lyciades</i>	Hoary Edge
<i>Agraulis</i>	<i>vanillae</i>	Gulf Fritillary
<i>Amblyscirtes</i>	<i>alternata</i>	Least Florida Skipper
<i>Ancylopha</i>	<i>numitor</i>	Least Skipper
<i>Anthocharis</i>	<i>midea</i>	Falcate Orange Tip
<i>Asterocampa</i>	<i>celtis</i>	Hackberry
<i>Atlides</i>	<i>halesus</i>	Great Purple Hairstreak
<i>Atrytone</i>	<i>arogos</i>	Arogos Skipper
<i>Battus</i>	<i>philenor</i>	Pipevine Swallowtail
<i>Calycopis</i>	<i>cecrops</i>	Red-banded Hairstreak
<i>Celastrina</i>	<i>argiolus</i>	Spring Azure
<i>Colias</i>	<i>cesonia</i>	Dog Face

GENUS	SPECIES	COMMON NAME
<i>Cyllopsis</i>	<i>gemma</i>	Gemmed Satyr
<i>Enodia</i>	<i>creole</i>	Creole Pearly Eye
<i>Enodia</i>	<i>portlandia</i>	Pearly Eye
<i>Epargyreus</i>	<i>clarus</i>	Silver-spotted Skipper
<i>Erynnis</i>	<i>horatius</i>	Horace's Dusky Wing
<i>Erynnis</i>	<i>juvenalis</i>	Juvenal's Dusky Wing
<i>Erynnis</i>	<i>zarucco</i>	Zarucco Dusky Wing
<i>Euptoieta</i>	<i>claudia</i>	Variegated Fritillary
<i>Eurema</i>	<i>lisa</i>	Little Sulphur
<i>Eurema</i>	<i>nicippe</i>	Sleepy Orange
<i>Everes</i>	<i>comyntas</i>	Eastern Tailed Blue
<i>Hermeuptychia</i>	<i>sosybius</i>	Carolina Satyr
<i>Hesperia</i>	<i>meskei</i>	Meske's Skipper
<i>Hylephila</i>	<i>phyleus</i>	Fiery Skipper
<i>Junonia</i>	<i>coenia</i>	Buckeye
<i>Lerema</i>	<i>accius</i>	Clouded Skipper
<i>Libytheana</i>	<i>carinenta</i>	American Snout
<i>Limenitis</i>	<i>a. astyanax</i>	Red-spotted Purple
<i>Megisto</i>	<i>cymela</i>	Little Wood Satyr
<i>Nastra</i>	<i>lherminier</i>	Swarthy Skipper
<i>Neonympha</i>	<i>areolata</i>	Georgia Satyr
<i>Papilio</i>	<i>palamedes</i>	Palamedes Swallowtail
<i>Papilio</i>	<i>troilus</i>	Spicebush Swallowtail
<i>Papilio</i>	<i>glaucus</i>	Tiger Swallowtail
<i>Phoebus</i>	<i>sennae</i>	Cloudless Sulphur
<i>Phyciodes</i>	<i>tharos</i>	Pearl Crescent
<i>Poanes</i>	<i>yehl</i>	Yehl Skipper
<i>Poanes</i>	<i>Zabulon</i>	Zabulon Skipper
<i>Polites</i>	<i>vibex</i>	Whirlabout
<i>Pyrgus</i>	<i>communis</i>	Checkered Skipper
<i>Strymon</i>	<i>melinus</i>	Gray Hairstreak
<i>Thorybes</i>	<i>bathyllus</i>	Southern Cloudy Wing
<i>Vanessa</i>	<i>virginiensis</i>	American Painted Lady
Source: Fort Jackson, Integrated Natural Resources Management Plan, 2004		

B.3 DESCRIPTION OF FOREST TYPES AT FORT JACKSON, SOUTH CAROLINA

Natural Pine, the most important forest type on the installation, includes all natural pine stands, regardless of species, in which less than 20% of the basal area of overstory trees are hardwoods or less than 20% of the basal area is dominated by scrub oak. Longleaf pine (*Pinus palustris*) is the predominate species, occurring in pure stands on sand ridges and upper slopes, becoming mixed with loblolly pine (*P. taeda*) and pond pine (*P. serotina*) on lower slopes and bottomland. Scattered mixed stands of shortleaf (*P. echinata*), loblolly, and longleaf pine are not uncommon on upper and lower slopes where clay subsoil is near the surface. In the southeastern section of Fort Jackson, Virginia pine (*P. virginiana*) is occasionally mixed with the above species on upper slopes and ridges.

The **Pine Plantation** forest type is made up mostly of planted longleaf pine and slash pine (*Pinus elliotii*), which is not native to Fort Jackson. Some planted loblolly pine and direct-seeded longleaf pine are scattered throughout the installation.

Pine-Scrub Oak are those pine stands, usually longleaf, with scrub oak understory. The area must have pine basal areas 30-80%. This type is usually found on sand ridges and upper slopes where sandy soil is relatively deep.

In **Pine Hardwood** stands, hardwoods must constitute 21-49% of the overstory basal area, while the remainder is pine of any species. This type can be divided into two sub-types according to site. Longleaf, loblolly, and/or shortleaf pine are commonly found mixed with upland hardwoods on upper and lower slopes and loblolly and/or pond pine with bottomland hardwoods on lower slopes and bottomland sites.

Hardwood-Pine stands are comprised of hardwoods ranging 51-79% of the basal area; the remainder being pine of any species. This vegetative type can be differentiated from Upland Hardwood by the presence of seed-producing pine trees adequate in number to re-seed the area if all other stems are removed.

In **Scrub Oak** stands, at least 51% of the basal area must be dominated by scrub oak species, while the remaining basal area is usually composed of scattered longleaf pine of less than 30% basal area. Scrub oak species include turkey oak (*Quercus laevis*), blackjack oak (*Q. marilandica*), dwarf post oak (*Q. stellata*), and bluejack oak (*Q. cinerea*). Small black gum (*Nyssa sylvatica*), persimmon (*Diospyros virginiana*), pignut hickory (*Carya glabra*), and mockernut hickory (*C. tomentosa*) are often mixed with above species on sand ridges and upper slopes.

Upland Hardwood stands are composed of at least 80% upland hardwoods in the overstory. Remaining trees are pine of any species. Upland hardwood species are southern red oak (*Quercus falcata*), water oak (*Q. nigra*) scarlet oak (*Q. coccinea*), willow oak (*Q. phellos*), white oak (*Q. alba*), sweet gum (*Liquidambar styraciflua*), post oak, persimmon, pignut, and mockernut hickories attaining greater size than in scrub oak type. Upland hardwoods are usually found on lower slopes.

Bottomland Hardwoods require a minimum of 80% of the basal area of overstory trees to be bottomland hardwoods; the remainder can be pine of any species. Bottomland

hardwoods consist primarily of black gum and red maple (*Acer rubrum*) with scattered sweet gum, water oak, sycamore (*Platanus occidentalis*), and yellow poplar (*Liriodendron tulipifera*) found in heads of drainage branches, swamps, and poorly drained soils bordering streams.

Minor species found in mixture with the above forest types include swamp bay (*Persea pubescens*), flowering dogwood (*Cornus florida*), black cherry (*Prunus serotina*), American holly (*Ilex opaca*), river birch (*Betula nigra*), black willow (*Salix nigra*), hackberry (*Celtis laevigata*), beech (*Eagus grandifolia*), blue beech (*Carpinus caroliniana*), and ironwood (*Ostrya virginiana*) (Fort Jackson 1997a).

APPENDIX C ECONOMIC IMPACT FORECASTING SYSTEM MODEL OUTPUT

EIFS REPORT

PROJECT NAME

Fort Jackson, BRAC EA – Construction

STUDY AREA

45017 Calhoun, SC
 45039 Fairfield, SC
 45055 Kershaw, SC
 45063 Lexington, SC
 45079 Richland, SC
 45081 Saluda, SC

FORECAST INPUT

Change In Local Expenditures	\$15,100,000
Change In Civilian Employment	125
Average Income of Affected Civilian	\$30,000
Percent Expected to Relocate	0
Change In Military Employment	0
Average Income of Affected Military	\$0
Percent of Military Living On-post	0

FORECAST OUTPUT

Employment Multiplier	3.64	
Income Multiplier	3.64	
Sales Volume – Direct	\$18,115,000	
Sales Volume – Induced	\$47,823,600	
Sales Volume – Total	\$65,938,600	0.22%
Income – Direct	\$6,353,544	
Income – Induced)	\$8,245,752	
Income - Total(place of work)	\$14,599,300	0.1%
Employment – Direct	204	
Employment - Induced	209	
Employment – Total	414	0.1%
Local Population	0	
Local Off-base Population	0	0%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	10.07 %	9.66 %	2.11 %	1.93 %
Negative RTV	-5.35 %	-5.07 %	-2.55 %	-0.56 %

EIFS REPORT

PROJECT NAME

Ft. Jackson, BRAC EA - Operations (Students)

STUDY AREA

- 45017 Calhoun, SC
- 45039 Fairfield, SC
- 45055 Kershaw, SC
- 45063 Lexington, SC
- 45079 Richland, SC
- 45081 Saluda, SC

FORECAST INPUT

Change In Local Expenditures	\$2,000,000
Change In Civilian Employment	0
Average Income of Affected Civilian	\$0
Percent Expected to Relocate	0
Change In Military Employment	2875
Average Income of Affected Military	\$15,600
Percent of Military Living On-post	100

FORECAST OUTPUT

Employment Multiplier	3.64
Income Multiplier	3.64
Sales Volume - Direct	\$14,378,600
Sales Volume - Induced	\$37,959,510
Sales Volume – Total	\$52,338,100 0.18%
Income – Direct	\$45,194,840
Income – Induced)	\$6,544,984
Income - Total(place of work)	\$51,739,820 0.36%
Employment - Direct	2938
Employment - Induced	166
Employment - Total	3104 0.78%
Local Population	
Local Off-base Population	0 1.16%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	10.07 %	9.66 %	2.11 %	1.93 %
Negative RTV	-5.35 %	-5.07 %	-2.55 %	-0.56 %

EIFS REPORT

PROJECT NAME

Fort Jackson BRAC EA- Operations (Non-Student)

STUDY AREA

45017 Calhoun, SC
 45039 Fairfield, SC
 45055 Kershaw, SC
 45063 Lexington, SC
 45079 Richland, SC
 45081 Saluda, SC

FORECAST INPUT

Change In Local Expenditures	\$3,000,000
Change In Civilian Employment	233
Average Income of Affected Civilian	\$37,000
Percent Expected to Relocate	0 (default)
Change In Military Employment	242
Average Income of Affected Military	\$32,500
Percent of Military Living On-post	0

FORECAST OUTPUT

Employment Multiplier	3.64
Income Multiplier	3.64
Sales Volume - Direct	\$13,777,270
Sales Volume - Induced	\$36,371,990
Sales Volume - Total	\$50,149,260 0.17%
Income - Direct	\$17,003,260
Income - Induced)	\$6,271,264
Income - Total(place of work)	\$23,274,520 0.16%
Employment - Direct	535
Employment - Induced	159
Employment - Total	695 0.17%
Local Population	1183
Local Off-base Population	1183 0.19%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	10.07 %	9.66 %	2.11 %	1.93 %
Negative RTV	-5.35 %	-5.07 %	-2.55 %	-0.56 %