3 Affected Environment and Environmental Consequences

This section describes the natural and human environment that would be affected by the Proposed Action occurring at TBR. The environmental consequences that would occur on that affected environment from the implementation of each action alternative and the no action alternative also are described.

3.1 Land Use

This section describes existing land use and management activities within, and near TBR, including those areas proposed for acquisition, and evaluates potential land use impacts under each alternative, including the No Action Alternative.

3.1.1 Definition of Resource

Land use classifications refer to the type of a current land use or to the intended future use of land, more commonly referred to as zoning. Land jurisdiction refers to the administrative authority held by local, state, regional, and federal planning agencies and organizations. Public and private sector land uses are subject to regulations in the form of enforceable plans and policies that determine the size, type, and location of development or lack thereof.

The analysis of potential land use impacts associated with the Proposed Action focuses on the coastal region in southeastern Georgia, with particular consideration for McIntosh and Long Counties.

3.1.2 Regulatory Framework

The federal regulatory framework for land use is summarized in Table 3-1. The local, regional, and state regulatory framework for the land use resource is summarized in Table 3-2.

Table 3-1
Federal Planning Requirements

Regulatory Driver	Description	Responsible Agency/Department	Applicable Program/Plan
Sikes Act Improvement Act (SAIA)	Directs each military department to prepare, implement, and maintain a natural resources management plan for each military installation in the United States.	United States Department of Defense (DOD); United States Fish and Wildlife Service (USFWS); Georgia Department of Natural Resources (GA DNR)	Integrated Natural Resources Management Plan (INRMP)
Coastal Zone Management Act (CZMA)	Provides that federal actions with a reasonably foreseeable effect on any land or water use or natural resource of the coastal zone are, to the maximum extent practicable, consistent with the enforceable policies of federally approved coastal management programs.	National Oceanic and Atmospheric Administration (NOAA) Office of Ocean and Coastal Resource Management (OCRM); GA DNR Coastal Resources Division	Georgia Coastal Zone Management Plan (1997)
Farmland Protection Policy Act (FPPA)	Ensures that federal programs are administered in a manner that, to the extent practicable, would be compatible with private, state, and local government programs and policies to protect farmland.	U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS); Georgia USDA-NRCS	Farm and Ranch Land Protection Program

Source: MCAS Beaufort 2007.

Table 3-2
Local, Regional, and State Planning Requirements

Law / Regulation / Guidance	Description	Responsible Agency/Department	Applicable Program/Plan
Georgia Planning Act	The foundation for community and regional planning requiring each local government to prepare, adopt and maintain a comprehensive plan.	Georgia Department of Community Affairs (GA DCA)	• Planning and Environmental Management Program
Zoning Procedures Law	Provides local governments the authority to use zoning to manage development activities.	McIntosh County; Long County; City of Darien; City of Ludowici	• Joint County/City Comprehensive Plan for McIntosh County and the City of Darien (CGRDC 1991); • McIntosh County Partial Comprehensive Plan Update (Grant Services and Consulting, Inc. 2008); • City of Darien Comprehensive Plan Partial Update (Ecological Planning Group 2008); • Long County Comprehensive Plan (Grant Services and Consulting, Inc. 2005); and • City of Ludowici Comprehensive Plan (CGRDC 2005)
Local Planning Requirements	Formal regulations that guide the community planning process.		
Regional Planning Rules	Define the process for the creation and adoption of regional plans	Coastal Regional Commission of Georgia	• The Regional Plan of Coastal Georgia (Coastal Regional Commission 2012)
State Planning Recommendations	Provides a set of best practices for local comprehensive planning that support compliance with the Local Planning Requirements.	GA DCA	• Planning and Environmental Management Program

Note: Following the enactment of the Local Planning Requirements in 2005, local government comprehensive plans that did not meet the new standards were required to complete partial plan updates.

Key: CGRDC = Coastal Georgia Regional Development Center.

Source: GA DCA 2011a.

3.1.3 Affected Environment

3.1.3.1 Regional Setting

As defined by the Coastal Regional Commission of Georgia, southeastern Georgia consists of a 10-county region that includes Bulloch, Screven, Effingham, Bryan, Chatham, McIntosh, Long, Liberty, Glynn, and Camden Counties. The counties of Bryan and Effingham have experienced significant population growth and development over the last decade, and the region as a whole is viewed as an emerging growth area relative to other more developed areas of the state. The region is bordered by Florida to the south, the Atlantic Ocean to the east, and by other state-defined regions to the north and further inland to the west and southwest. The coastal region of southeastern Georgia is relatively undeveloped other than in the urban areas of Savannah, Hinesville, Jesup, Brunswick, and St. Mary's. The majority of land in the region is forested. Numerous swamps or marshlands also are present in the region, which tend to serve as natural constraints to development. Limited, low-density residential, commercial, and industrial development is dispersed throughout the region. (Coastal Georgia Regional Development Center [CGRDC] 2009)

With respect to TBR (i.e., McIntosh and Long Counties), commercial forestry is the most prevalent land use (Lusk 2009). Conservation lands adjacent to TBR also are a prominent land use; for example, the 21,000-acre Altamaha Waterfowl Management Area is located approximately 15 miles west of TBR (Georgia Department of Community Affairs [GA DCA] 2011b). The communities of Townsend and Cox in McIntosh County and Ludowici in Long County are smaller growth areas with close proximity to TBR.

The majority of lands adjacent to TBR are privately owned and managed for commercial forestry operations with certain parcels leased for secondary activities such as hunting. Goodwood Georgia, Limited Liability Company (LLC) (Goodwood), a subsidiary of FIATP SSF Timber, LLC, owns property to the northwest and southeast of TBR, and Rayonier Forest Resource Limited Partnership and Rayonier Timberlands Operating Company (RTOC) Limited Partnership own property northeast of TBR (Figure 3-1). The State of Georgia owns lands and holds conservation easements on a majority of the land west of TBR. Approximately 24,000 acres of land generally located north, south, and west of TBR are held as a conservation easement (Figure 3-2). The easements cover both public and private sector lands in the vicinity of TBR and govern development to prevent land use conflicts with the military mission. State lands are in proximity to TBR in McIntosh and Long Counties (Figure 3-2); however, no residential or commercial properties directly adjoin TBR (MCAS Beaufort 2008).

3.1.3.2 Townsend Bombing Range

TBR is located in McIntosh County approximately 60 miles south-southwest of Savannah, Georgia, and 20 miles inland from the Atlantic Ocean (Figure 1-3). TBR is approximately 15 miles north of the City of Darien and 2 miles west of the unincorporated community of Townsend. Long County borders TBR to the west-northwest and east, while Wayne County, Georgia, is directly west of TBR and to the south and east of Long County.

TBR is within one of 11 Georgia county jurisdictions defined as the Coastal Management Program Service Area or areas that receive direct or indirect economic benefits from the Eastern Seaboard. These counties are therefore subject to the Georgia Coastal Zone Management Plan and include Effingham, Bryan, Chatham, Liberty, Long, McIntosh, Wayne, Glynn, Brantley, Camden, and Charlton. (Georgia Department of Natural Resources [GA DNR] n.d.)

State Hwy. 57 traverses the northeastern boundary of TBR, providing access to the range via Tram Road. A navigable portion of the Altamaha River basin is southwest of TBR. Surface water features on the range include the Snuffbox Canal and various freshwater marshes and streams. In addition, a

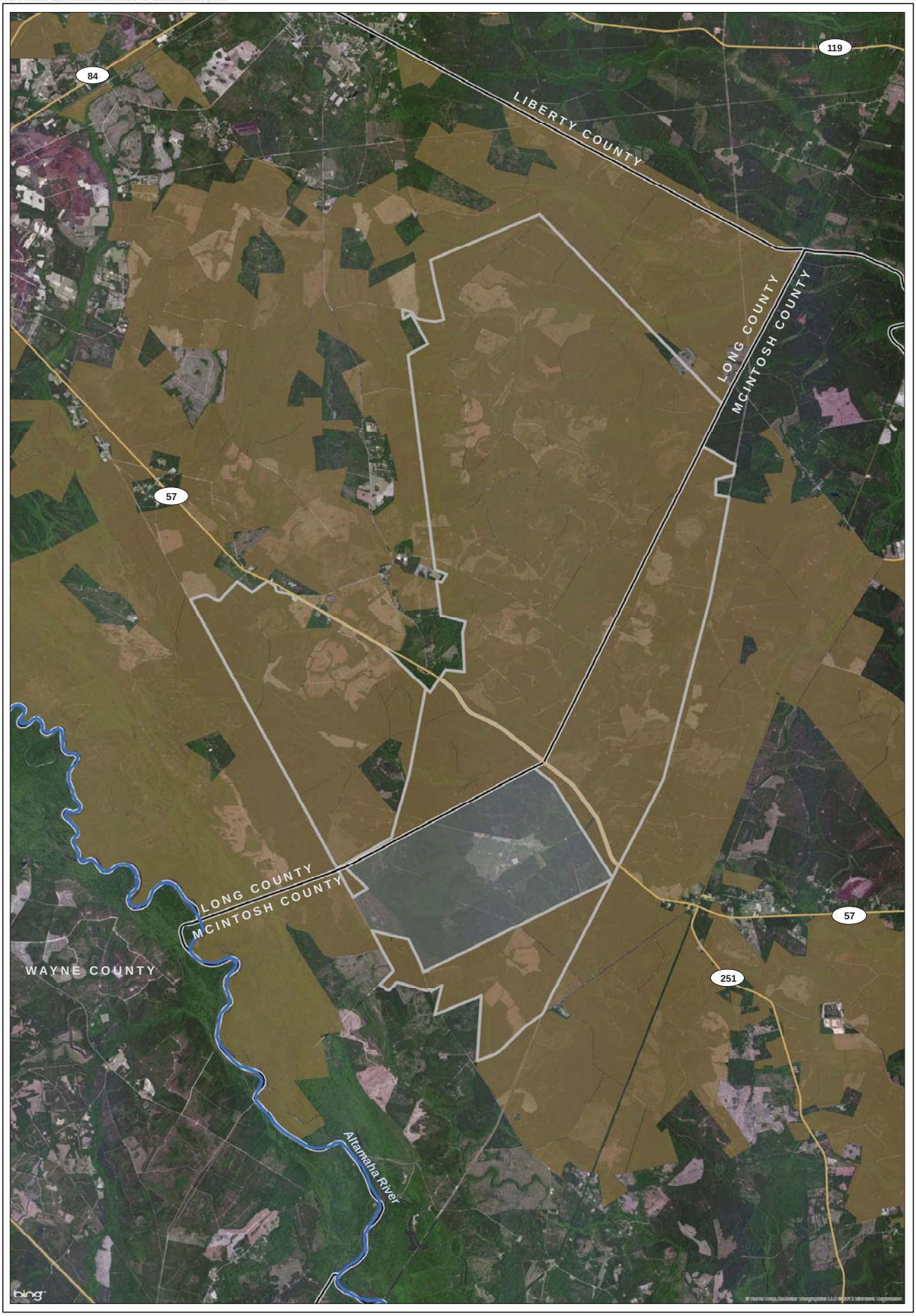
Georgia Power Company transmission line and a Southern Natural Gas pipeline are located just outside the TBR boundaries to the west and southeast (MCAS Beaufort 2008; see Figure 2-18).

The Air National Guard Range Master Plan (ANG 2005) and the Townsend Bombing and Gunnery Range Master Plan and Business Strategy (GA ANG 2005) guide planning for the management and modernization of TBR. Currently, TBR consists of approximately 5,183 acres of relatively flat terrain with a maximum elevation of 49 feet above MSL. Land cover can be characterized generally as maintained open space. The developed area of TBR, which includes the target area, administrative facilities, and maintenance areas, comprises approximately 410 acres surrounded by woodlands in varying stages of growth or succession. Approximately 350 acres of TBR's developed area have been cleared for the placement of targets and instrumentation that support training activities. The cantonment area comprises approximately 60 acres northwest of the target area, where personnel support buildings and range administrative facilities are located (MCAS Beaufort 2008).

Land Management

MCAS Beaufort is responsible for all land management activities on TBR, including natural and cultural resources management and EOD, among others. Through a host-tenant real-estate agreement with MCAS Beaufort, the GA ANG CRTC provides operational control for TBR air and land assets, and oversees the construction, renovation, and maintenance of range facilities, roadways, utilities, and other physical infrastructure. Non-military land management objectives include forestry and limited, controlled hunting programs. EOD operations, which occur on a bimonthly basis for approximately one-week intervals, provide range personnel access for road repairs, timber harvesting, species surveys, and similar management activities (MCAS Beaufort 2008).

The forested areas on and around TBR serve as important noise and safety buffers for the training activities conducted on the range's interior locations. The original land purchase agreement included a timber easement for McIntosh County, covering approximately 3,007 acres of land on the eastern, northern, and southern portions of the current range area. McIntosh County is responsible for the management of these lands in accordance with a Memorandum of Agreement (MOA) with MCAS Beaufort. The federal government retains rights for the remaining timberlands on TBR, an area of approximately 2,192 acres. The federal timber resources, located in the central portion of the range (adjacent to the air-to-ground target area), are managed in accordance with the "Integrated Natural Resources Management Plan for Townsend Bombing Range, McIntosh County, Georgia, 2006-2011" (MCAS Beaufort 2007; referred to herein as the TBR INRMP). In support of forestry operations on TBR, NAVFAC SE and Fort Stewart provide forestry and prescribed burning support on an as-needed basis.



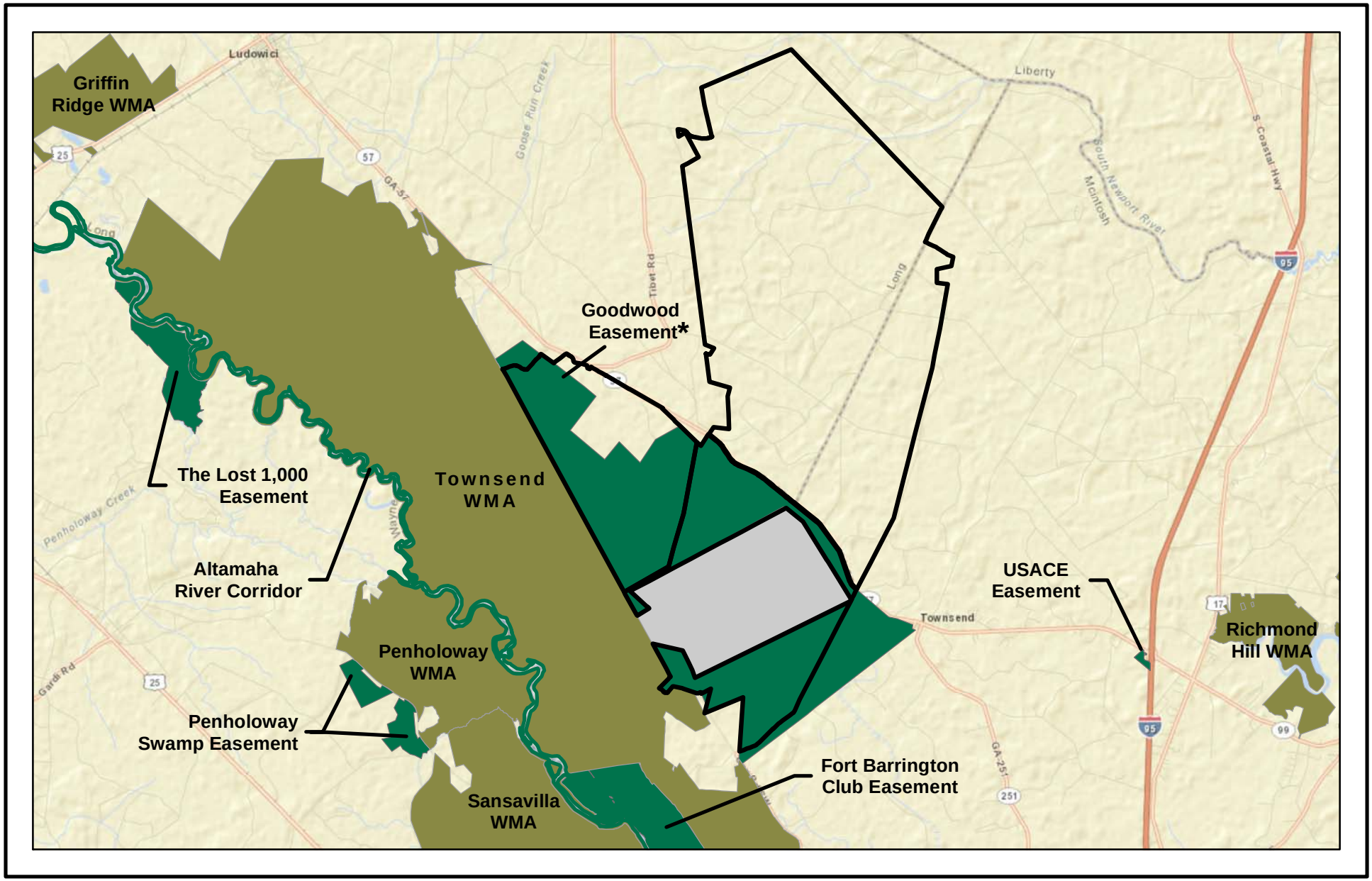
Commercial Timber Lands
Acquisition Areas
Existing Range
Counties
Major Roads
Altamaha River

Figure 3-1
Commercial Timber Lands Adjacent to TBR
Townsend Bombing Range
McIntosh and Long Counties, Georgia

0 1 2 Miles

Sources: Bing 2012, Based on Lusk 2009

Path: C:\GIS\Moore_Support\Townsend\Townsend\Townsend_PNS_Version\maps\mxd\ALL\Fig3-2_ProtectedLandsTBR.mxd



State Lands
Conservation Easements
Altamaha River Corridor
Acquisition Areas
Existing Range

USACE = United States Army Corps of Engineers

WMA = Wildlife Management Area

*Goodwood Easement land is owned by Goodwood Georgia, LLC whereas the restrictive easement is owned by the United States Marine Corps

N

0 1.5 3 Miles

Figure 3-2
Protected Lands Adjacent to TBR
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Based on Lusk 2009, Esri 2010

3.1.3.3 McIntosh County

In Georgia, county-level adoption of a regional comprehensive plan is voluntary. McIntosh County has adopted the provisions of the Coastal Georgia Comprehensive Plan (CGRDC 2008) and works in coordination with the CGRDC to administer land use controls throughout the county. In accordance with the McIntosh County and City of Darien Joint Comprehensive Plan Community Assessment (CGRDC 2007), all planning activities should be consistent with the Coastal Georgia Comprehensive Plan (CGRDC 2008). Additionally, McIntosh County works in close coordination with the Georgia Department of Transportation (GDOT), the GA DNR, and the GA DCA to administer land use decisions.

TBR is located in the far northwest portion of McIntosh County and accounts for about 2% of the 574.5 square miles (367,680 acres) of total land area within the county (Table 3-3). Current land use in McIntosh County is characterized by undeveloped, forested lands (approximately 42% or 117,335 acres) and areas designated as open space, such as parks and conservation lands (approximately 40% or 109,777 acres; Table 3-3). Approximately 12% of McIntosh County consists of developed lands for residential and commercial use. Prime farmland in McIntosh County, as defined by the Farmland Protection Policy Act (FPPA), makes up approximately 7% or 22,905 acres of the total land area (Natural Resources Conservation Service [NRCS] 2007a).

Table 3-3
Land Use for McIntosh County

Land Use Category	Acres	Percentage
Residential	31,589	11.4
Commercial/Institutional/Industrial	642	0.2
Infrastructure	3,817	1.4
Agriculture (Farms)	9,110	3.3
Federal (Townsend Bombing Range)	5,183	1.9
Parks/Recreation/Conservation	109,700	39.5
Other Undeveloped Lands (Forested)	117,335	42.3
Total Land Area	**277,376**	**100**
Total Water Area	**90,304**	
Total Acres	**367,680**	

Sources: CGRDC 2007; University of Georgia 2010.

Approximately 33% of the total land area in the county is in proximity to major rivers and marshes and is within the 100-year floodplain (U.S. Census Bureau 2010). Historically, a lack of suitable land for development and, in general, the rural nature of McIntosh County precluded the need for growth management plans/programs/policies. Thus, local land use controls to manage growth over the long-term have been put in place only recently.

Residential areas in McIntosh County are largely concentrated within the City of Darien, with a few sparsely populated to the east and west of TBR in the communities of Townsend, Cox, and Jones. Overall, commercial areas are located along major thoroughfares throughout the county. The McIntosh County Industrial Park is located in the southern portion of the county (CGRDC 2007).With respect to the Proposed Action, the community of Townsend and areas along State Hwy. 57 and State Road (SR) 251 support the majority of residential development in the county.

The population in McIntosh County is estimated to grow by 72% by 2030. The growth is expected to occur along SR 251 to the west of Interstate 95 (I-95) and, over the long-term, along SR 99 in the northern part of the county. McIntosh County has enacted a zoning law to manage land use required to support this projected growth trend. New development in the county is expected to occur in and around Darien, and the city and surrounding areas are the focus of county zoning ordinances. TBR and the

majority of land area surrounding the range are not currently zoned. With respect to the Proposed Action, the area along the Altamaha River (southwest of TBR) is zoned as "Conservation-Preservation." The area directly east of TBR (north of Darien) is also part of this zoning district, which comprises roughly 112,352 acres or 41% of the total zoned areas in the county. The remaining zones are mainly focused on land parcels with a direct connection to the City of Darien (Grant Services and Consulting, Inc. 2008).

3.1.3.4 Long County

The Ludowici City Council and the Board of County Commissioners of Long County, Georgia, are provided authority under the Georgia State Constitution to enforce Article IX, Section II, Paragraph IV, "Planning and Zoning." These two entities collectively appoint a five-member Planning and Zoning Board to evaluate proposed land use changes and administer the land development code in Long County and the City of Ludowici. The Planning and Zoning Board provides recommendations to the City Council and Board of Commissioners who render final decisions with respect to land use approvals, conditional approvals, or denials (Long County and City of Ludowici 2008).

Long County has a total land area of 404 square miles (258,240 acres; Table 3-4) of which approximately 89% is classified as "undeveloped" (U.S. Census Bureau 2010). Approximately 5% of Long County is developed as residential or commercial and the remainder is generally undeveloped (forested, agriculture, conservation, military reservation). The northeastern corner of Long County is occupied by a U.S. Army military installation, Fort Stewart, which accounts for approximately 11% of Long County's total land area. Approximately 4% or 2,634 acres of land in Long County is considered prime farmland as defined by the FPPA (NRCS 2007a).

Table 3-4
Land Use for Long County

Land Use Category	Acres	Percentage
Residential	11,219	4.4
Commercial/Industrial	91	< 0.1
Agriculture (Farms)	13,141	5.1
Infrastructure	3,925	1.5
Federal (Fort Stewart)	28,156	11.0
Other Undeveloped Lands (Forested)	200,044	78.0
Total Land Area	**256,576**	**100**
Total Water Area	**1,664**	
Total	**258,240**	

Sources: Grant Services and Consulting, Inc. 2005; University of Georgia 2010.

Most of the residential communities in Long County are concentrated within the county seat (the City of Ludowici) and are located in the central portion of the county. Other residential communities are located in the north and northeastern portions of the county near Fort Stewart. Sparse residences exist along unpaved roads throughout the county's unincorporated areas. Presently, there are no true industrial land uses in Long County with the exception of resource-based companies for clay and sand surface mining, and lumber and pulpwood processing. There are few commercial land uses in the unincorporated areas of the county (Grant Services and Consulting, Inc. 2005). As with McIntosh County, over the past several decades, a general lack of suitable lands for development within Long County has delayed the establishment of land use controls able to manage growth effectively over the long term.

Future growth and development in Long County is expected to occur in the north-central part of Long County from Ludowici to Walthourville. Additional growth also is occurring (and expected to continue) north of the Long-Liberty County line along U.S. 84 and is largely the result of expanded potable water service to the area (CGRDC 2009). To control and direct future growth, Long County and

the City of Ludowici define the following zoning districts that are administered through the local land development regulations (Long County and City of Ludowici, Georgia 2008) and enforced by a Planning and Zoning Board:

- Conservation (CON);
- Agriculture and Forestry (AF);
- Single-Family Residential (R-1 and R-2);
- Multi-Family Residential (MFR);
- Manufactured Home Park (MHP);
- Neighborhood and General Commercial (C-1 and C-2); and
- Light and General Industrial (I-1 and I-2).

The boundaries defined by the zoning districts are designated as the official zoning map for Long County and the City of Ludowici.

3.1.3.5 Forestland

This section discusses forestland as it pertains to marketable forest resources. Forestland as a vegetative community and habitat is discussed in Section 3.8, Biological Resources.

The 5,183 acres comprising the existing TBR historically belonged to the Union Camp Corporation, who managed the forestland for fiber and timber products. In 1981 the USMC leased the land from Union Camp until 1992 when the USMC purchased the land in fee. At that time, a timber easement for approximately 3,007 acres of forestland not located adjacent to the aerial gunnery range and range facilities was granted to McIntosh County (Figure 2-4). The remaining 2,192 acres are managed by the USMC and are divided among forested and non-forested areas. Approximately 1,782 acres of the USMC-managed land are forested areas and are managed in accordance with the principles of ecosystem management as outlined in the TBR INRMP (MCAS Beaufort 2007); non-forested areas (approximately 410 acres) are comprised of target areas, roads, and facility infrastructure.

Purchase in Fee / Fee Simple

The highest form of real estate ownership where the owner has absolute title to the land, limited only by basic government rights (i.e., taxation) and deed restrictions (i.e., zoning laws, neighborhood restrictions), with no limit on the duration of ownership and the ability to pass to another by will or inheritance.

The TBR INRMP provides for integrated land management, fish and wildlife management, forest management, and outdoor recreation management by implementing an ecosystem approach to natural resources management. Natural resources are to be managed without interfering with the military readiness or mission of the Installation. The TBR INRMP covers a five-year period, but has a ten-year planning horizon and has the flexibility to accommodate changes in the ecosystem and military mission (MCAS Beaufort 2007).

The TBR INRMP incorporates the Ten-Year Forest Management Plan (1996-2006) for TBR (MCAS Beaufort 2007 [Appendix VI]). The Ten-Year Forest Management Plan is intended for use by TBR's natural resource managers and other responsible parties as a planning tool and guidance for conducting sound forest management practices at TBR. Its goal is to "assure sustained flow of quality forest products and other benefits related to the maintenance of a viable and healthy forest; protect real estate value and improvements; enhance and protect other natural resources associated with the forest environment; and finally to facilitate military missions." The Ten-Year Forest Management Plan states that, at the time of its preparation, approximately 67% of TBR's entire forested area was composed of

planted pine. An additional approximately 5% was made up of natural pine including a small area of natural longleaf pine (*Pinus palustris*). Mixed hardwoods accounted for approximately 19% of the forested area. The remaining 9% of forestland was not stocked with trees at that time. Since that time, forest management has not significantly altered the cover type of TBR (Money 2011a).

USMC-Managed Forestland

General Management Principles

In accordance with the Sikes Act and the Sikes Act Improvement Amendment of 1997 (collectively referred to as the Sikes Act), land and resource management goals should support and come secondary to the Installation's military mission (MCAS Beaufort 2007). In addition to supporting mission training, the USMC manages TBR forest resources to produce a sustained yield of timber products, to maintain quality visual resources, and to provide for enhanced wildlife habitat (MCAS Beaufort 2007). These multiple-use forest management objectives are embodied in the USMC's approach to "ecosystem management." As directed by MCO P5090.2A, Environmental Compliance and Protection Manual (Headquarters, U.S. Marine Corps 1998), by implementing ecosystem management principles, the USMC seeks to enhance the integrity of ecosystems, while also sustaining the biological diversity and resource availability of those ecosystems.

Some of the USMC's ecosystem management principles include: frequent prescribed burns to clear understory vegetation, restoration of indigenous species, and timber harvesting on an extended rotation age (MCAS Beaufort 2007). TBR is within the historical range of the longleaf pine, and much of the land cover is currently comprised of loblolly pine (*Pinus taeda*). As applied to TBR, the USMC provides a safe and effective training environment while also promoting the phased restoration and enhancement of longleaf pine communities and regular fire regimes to improve biological diversity. MCAS Beaufort (and therefore TBR) is an approved Forest Management Installation and must ensure a sustained yield of commercial timber products in accordance with MCO P5090.2A.

General forest management objectives outlined in the TBR INRMP include:

- Conduct prescribed burns tri-annually; reduce understory fuel load and risk of wildfire.
- Identify opportunities for stand conversion to longleaf pine; convert 10 to 20% of identified areas by 2015 (end of the TBR INRMP's 10-year planning period).
- Generate a sustained yield of commercial timber products.

Stand Conditions

Forest communities of TBR include planted pine plantations, mixed pine and hardwood stands, natural longleaf pine stands, and hardwood stands. When the Ten-Year Forest Management Plan was written (mid-1990s), upland stands primarily consisted of slash pine and loblolly pine plantations ranging from 5 to 30 years old (MCAS Beaufort 2007 [Appendix VI]). Due to harvesting and replanting, the composition and ages of the upland stands have not significantly changed (Money 2011a; 2011b). Longleaf pine stands are predominately high value and of sawtimber size, exceeding 50 years in age (MCAS Beaufort 2007 [Appendix VI]). Hardwood stands are generally located in wetlands and along drainage areas, consisting of black gum (*Nyssa sylvatica*), sweetgum (*Liquidambar styraciflua*), sweetbay magnolia (*Magnolia virginiana*), and loblolly bay (*Gordonia lasianthus*). Full forest community descriptions are provided in Section 3.8, Biological Resources.

General management practices in the TBR INRMP call for limiting the size of regeneration cuts to 80 acres and managing pine stands (MCAS Beaufort 2007 [Appendix X]). Additionally, they specify that basal area should be maintained between 60 and 90 square feet per acre (MCAS Beaufort 2007 [Appendix VI]). Because the hardwood acreage located on TBR is managed for long-term wildlife management, wetland benefits, erosion control, and vegetation diversity, it will not be cut.

Basal area can be defined as the cross-section area of the stems of all trees in a stand and is a measurement used to guide management decisions. It is used to determine percent stocking and is generally expressed as square units per unit area.

MCO P5090.2A mandates that USMC forest management practices include harvest, reforestation, afforestation, and silvicultural treatments that promote forest health. As trees mature, in the competition for resources (i.e., water, nutrients, and sunlight), stands become crowded, individual tree growth rates decrease, and individual stems begin to die off. Thus, to maintain forest health, it may be necessary to harvest pine stands as early as 50 years after establishment.

Prior to the preparation of the TBR INRMP, TBR's forestland was primarily managed for timber production, consisting of densely planted loblolly pine plantations managed in even-age stands. Derived timber products included pine pulpwood, chip-n-saw, and sawtimber, managed on a rotating cycle. The use of single-species even-age management and the suppression of competing deciduous vegetation through herbicide application simplify the timber management process and increase stand productivity. However, these treatments significantly reduce the forest's biological diversity, as well as its resistance to disease and insect outbreak (MCAS Beaufort 2007 [Appendix VI]).

Thinning is conducted as necessary for ecosystems management. A 180-acre sale occurred in 2010, a 140-acre sale occurred in 2011, and a 115-acre sale occurred in 2012, with additional sales planned in future years; these are thinning sales to maintain ecosystem health. Similarly, natural disturbances (i.e., wildfire, insect outbreak, or severe weather) may impose additional modifications to the USMC's forest management plan for TBR.

Fuel Management

Between eight and ten wildfires ignite annually at TBR as a result of range training activities. Wildfires escaping cleared range firebreaks have required response assistance from installation personnel, the Georgia Forestry Commission (GFC), and/or from neighboring industrial forestland owners (MCAS Beaufort 2007 [Appendix VI]). Herbaceous fuels present within the aerial gunnery range are periodically burned by range personnel. Range personnel also manage herbaceous fuels along unpaved roads through periodic grading. Both precautions effectively minimize the risk of wildfire outbreak (MCAS Beaufort 2007 [Appendix VI]).

Firebreaks act as fuel-free barriers to contain prescribed fires, as well as to prevent the spread of wildfire. Existing roads and streams on TBR act as effective firebreaks; however, it is expected that additional firebreaks may need to be installed in areas of potential fire risk (MCAS Beaufort 2007). Construction of firebreaks would involve the removal of woody vegetation, as well as soil plowing/disking and leveling. Plowing/disking exposes potential woody fuel sources otherwise hidden below the soil surface; leveling minimizes the disruption of natural hydrologic flow patterns.

Routine prescribed fire reduces understory fuel loads, thereby reducing opportunity for wildfire outbreak resulting from range training activities. In accordance with the TBR INRMP, prescribed fires in pine and mixed pine/hardwood stands occur on a three-year cycle following the initial burn (MCAS Beaufort 2007 [Appendix IX]). Young pine plantations on TBR undergo controlled burning at the earliest possible age, as the increased density and lower crowns can promote the spread of fire. Thinning and prescribed burns are planned for the TBR INRMP ten-year planning period.

McIntosh County-Managed Forestland

A timber cruise was conducted May through July 2009 for the 3,007-acre McIntosh County timber easement, providing detailed data for stand composition and volume. Timber on the easement consists of approximately 2,258 acres of pine and 672 acres of mixed hardwood stands (see Table 3-5). Pine species generally occupy upland areas, while mixed pine-hardwood stands are located along drainages and scattered wet areas (DON 2009a). Pine species include slash, loblolly, and longleaf pine. Mixed hardwood stands are dominated by black gum, oak species, and pond cypress, with naturally generated pine species having a minor presence (DON 2009a). Merchantable timber identified during the timber cruise consisted of thinned and unthinned pine stands, hardwood stands, and a small longleaf pine stand (Table 3-5).

A **timber cruise** is an on-the-ground inventory of a tree stand used to determine a forest's gross and net product volume and value (or timber quality).

Table 3-5
Forested and Non-Forested Areas of the McIntosh County Timber Easement

Type of Forest or Land Area	Acres
Unthinned pine	1,093
Thinned pine	301
Hardwood stands	672
Longleaf pine stand	8
Pre-merchantable pine stands	856
Roads, canals, and non-forested areas	77
Total	**3,007**

Source: DON 2009a.

Unthinned merchantable pine stands are mainly comprised of planted loblolly and slash pine, mostly between 19 and 21 years. Thinned merchantable pine stands average approximately 23.5 years. Merchantable pine stands have an estimated growth rate of approximately 1.45 cords (3.12 tons) per acre per year. Because McIntosh County invested in intensive silvicultural applications of herbicide and fertilizer for younger stands, pre-merchantable timber was estimated to have a growth rate of approximately 1.75 cords (3.76 tons) per acre per year. In late summer 2011, McIntosh County began clear-cutting areas of merchantable pine and hardwood that did not interfere with range operations. As of October 2011, approximately 700 to 800 acres of McIntosh County timber easement area had been clear-cut. Reforestation of many of the clear-cut areas was performed in early 2012 by hand-planting pine trees.

Forestland Management in Proposed Acquisition Areas

Three areas have been proposed as candidates for acquisition: Acquisition Area 1A is located entirely in Long County, northwest of the current TBR; Area 1A comprises 6,231 acres. Acquisition Area 1B borders the current TBR on its northwest in Long County, and TBR's northeast and southeast boundaries in McIntosh County; Area 1B comprises 4,956 acres. Acquisition Area 3 is located in McIntosh and Long Counties north of the current TBR and is adjacent to Acquisition Area 1B; Area 3 comprises 23,674 acres. Industrial forestland makes up the vast majority of each acquisition area. Each of the acquisition areas consists of a mix of pine plantations, hardwood forests, and some mixed pine-hardwood forests. Ownership and key characteristics of the forest resources of each of the areas is discussed below.

Ownership of the acquisition areas includes private, industry-owned forestland, and private, non-industrial forestland. Industrial forestland accounts for approximately 98% of each of the acquisition areas (Table 3-6).

Table 3-6
Ownership of Existing Range and Acquisition Areas (in acres)

Area	Federal Government	State/Local Government	Industrial Forestland	Other	Totals
Existing Range	5,183.0	0.0	0.0	0.0	**5,183.0**
Acquisition Area 1A	0.0	0.0	6,080.9	90.9	**6,171.8**
Acquisition Area 1B	0.0	0.0	4,891.9	1.2	**4,893.1**
Acquisition Area 3	0.0	0.0	23,346.1	92.7	**23,438.8**

Note: Ownership areas are derived from parcel data provided by NAVFAC SE (Salik 2011). The dataset contained gaps in the coverage over roads and rights-of-way. As a result, the total acreage represented in this table may not agree with total acreage of the acquisition areas represented in other parts of this FEIS.

Industrial Forestland

Industrial forestland under consideration for acquisition by the USMC is primarily owned by three separate groups: Rayonier, Inc. (Rayonier), Goodwood Georgia, LLC (Goodwood), and Molpus Woodlands Group, LLC (Molpus), which is a subsidiary of MWF Azalea, LLC. The forest industry manages timber to maximize yield and minimize time investment. Therefore, management plans often prescribe herbicide and fertilization application during stand establishment, mechanical or fire-induced thinning during later stages of stand development, and clear-cut or shelterwood harvesting applications. In most cases, in the vicinity of the proposed acquisition areas, timber producers plant loblolly pine, a fast-growing species with desirable characteristics for fiber and sawtimber production. Some of the growing stock may be varieties selectively bred for fiber production.

Industrial forestland is a term traditionally used to describe land owned by companies or individuals operating and supporting processing facilities and mills (i.e., paper or timber products companies).

Processing facilities and mills may require specific timber types depending on production capabilities. In the vicinity of TBR, desirable timber products include pine pulpwood and pine sawtimber, and, to a lesser degree, hardwood sawtimber. General forest management applications for loblolly pine production are generally consistent throughout the southeastern United States, with stand prescriptions (e.g., thinning, harvesting cycle) altered to generate desired timber products. Table 3-7 displays the estimated annual wood production for pine (based on loblolly pine) and hardwood (based on sweetgum) in the proposed acquisition areas. The estimates are based on site indices for local soil obtained from the United States Department of Agriculture (USDA) NRCS. Approximate timber valuation determinations are provided in Section 3.2, Socioeconomics.

Table 3-7
Forest Productivity of Proposed Acquisition Areas
(in tons per acre per year)

Acquisition Area	Estimated Annual Wood Production	
	Softwood (Loblolly Pine)	Hardwood (Sweetgum)
1A	3.2	3.4
1B	3.3	3.5
3	3.3	3.4

Acreages owned by Rayonier, Goodwood, and Molpus are provided in Table 3-8. Locally, Rayonier's desired product is pine pulpwood, while Goodwood and Molpus's desired product is pine sawtimber.

Table 3-8
Acquisition Study Area Ownership (in acres)

Acquisition Area	Rayonier	Goodwood	Molpus	Other Industrial	Private Non-Industrial	Federal	Totals
1A	1,393.7	4,363.6	0.0	323.6	90.9	0.0	**6,171.8**
1B	0.0	4,891.9	0.0	0.0	1.2	0.0	**4,893.1**
3	17,557.4	1,644.8	4,143.9	0.0	92.7	0.0	**23,438.8**

Notes:
Rayonier includes RTOC Limited Partnership, an affiliate company of Rayonier, Inc.
Goodwood includes Goodwood Georgia, LLC, and FIATP SSF Timber, LLC, which are affiliate companies of Forest Investment Associates of Atlanta, Georgia.
Ownership areas are derived from parcel data provided by NAVFAC SE (Salik 2011). The dataset contained gaps in the coverage over roads and rights-of-way. As a result, the total acreage represented in this table may not agree with total acreage of the acquisition areas represented in other parts of this FEIS.

Rayonier, Inc. Rayonier is a publicly traded real estate investment trust (REIT) based in Jacksonville, Florida. Rayonier owns approximately 731,546 acres in the state of Georgia, including approximately 34,944 acres in Long County and approximately 27,779 acres in McIntosh County. The acreage owned by Rayonier that is being considered for acquisition includes 1,394 acres for Acquisition Area 1A and 17,557 acres for Acquisition Area 3. Forest products include: paper, containerboard, and other fiber-based products, as well as sawtimber and cypress mulch. (Rayonier 2011a; 2011b)

No official information about Rayonier's management approach to its McIntosh County and Long County forestland is currently available; however, observations by USMC field personnel determined that Rayonier-owned parcels within the TBR area are managed primarily for loblolly pine pulp (fiber) products. Under the current management regime, seedlings are planted at a density of 700 to 800 trees per acre. Within stands, trees are uniform in species and age. With the probable exception of herbaceous weed control, minimal intermediate treatment is applied before the time of harvest and stands are replanted shortly following harvest. Among Rayonier's landholdings within the vicinity of TBR, even-age stands are managed in rotations of approximately 25 years, and silvicultural treatments and harvests are staggered.

Under this management regime, stands exhibit limited biological diversity. Although the suppression of an herbaceous understory effectively reduces competition for Rayonier's primarily pine crop, it reduces the amount of foraging opportunities available for wildlife and provides limited natural defense from insect or disease outbreak.

Real estate investment trusts (REITs) own and manage income-producing real estate, including timberlands.

A **Timber Investment Management Organization (TIMO)** is a management group that assists institutional investors in managing their timberland investments.

Goodwood Georgia, LLC. Goodwood is a Timber Investment Management Organization (TIMO). The acreage owned by Goodwood being considered for acquisition includes 4,364 acres, 4,892 acres, and 1,645 acres, for Acquisition Areas 1A, 1B, and 3, respectively. No information on the landholdings of Goodwood or affiliated companies in areas of McIntosh and Long Counties or the state of Georgia beyond the acquisition study areas was available. Observations by USMC field personnel have identified that Goodwood manages forested parcels within the TBR area primarily for pine sawtimber products. Under the current management regime, seedlings are planted at a density of 700 to 800 trees per acre. Within stands, trees are uniform in species and age. Prescriptive treatments likely include herbicide application for suppression of deciduous

understory species, and one to two mechanical thinnings at intermittent periods during stand development to maintain productive growth rates. Among Goodwood's landholding in the vicinity of TBR, even-age stands are managed in rotations of approximately 30 years, and silvicultural treatments and harvests are staggered.

As with pulpwood management, stands exhibit limited biodiversity. Mechanical thinning applications may open-up the understory around age 15, increasing opportunity for wildlife movement; however, stands would likely receive an additional application of herbicide to suppress advantageous deciduous vegetation, further depleting food resources. Single-age, single-species stands are susceptible to insect and disease outbreak.

Molpus Woodlands Group, LLC. Molpus, a subsidiary of MWF Azalea, LLC, owns approximately 4,144 acres in proposed Acquisition Area 3 and no land in Acquisition Areas 1A and 1B. Observations by USMC field personnel indicate that, similar to Goodwood, Molpus manages forested parcels within the TBR area primarily for pine sawtimber products (Money 2011c).

Non-Industrial Private Forestland

It is not feasible to determine the management intentions for the private, non-industrially owned parcels (Table 3-8). Some parcels are predominately stocked with loblolly pine, and wetlands occupy at least part of some parcels. With a few exceptions, the non-industrially owned private parcels in the three acquisition areas are less than 20 acres each.

Tracts of less than 25 acres typically are not owned for timber production. The economies of scale associated with initiating a harvesting operation would require that most of or the entire parcel be harvested at the end of the rotation cycle, at which time the land would most likely be allowed to naturally regenerate. With wetlands and home sites occupying portions of some properties, it is unlikely that the parcels are managed primarily for timber production.

3.1.4 Environmental Consequences

3.1.4.1 Methodology and Evaluation Criteria - Land Use

Potential adverse impacts to land use elements associated with the action alternatives were evaluated, including but not limited to the following:

- Land ownership and/or relocation;
- Land use plan and policy consistency;
- Land use compatibility; and
- Land management of the forestry resource.

For the land use resource, this section evaluates the potential for impacts associated with land ownership and consistency with applicable management plans. Other land use-related analyses are described in the following sections:

- Section 3.3, Recreation, evaluates impacts directly related to active and passive recreational activities, including access to, the availability of, and the diminishment or loss of such resources;
- Section 3.7, Noise, evaluates potentially significant impacts from noise generated by aircraft and ordnance use;
- Section 3.9, Cultural Resources, identifies the results of surveys that were conducted to identify archaeological sites, buildings, and structures that may qualify as historic

properties and discusses potential impacts on those historic properties from the Proposed Action;

- Land use impacts associated with utility ROWs are addressed in Section 3.13, Utilities and Infrastructure.

The types and extent of potential impacts to land use would be determined by the nature of the Proposed Action within each of the land acquisition areas. The criteria for analyzing land use associated with the Proposed Action include:

- Change in ownership and/or relocation of property, for example, residential and commercial establishments;
- Inconsistency with the enforceable provisions of an applicable federal, state, and local land use plan, policy, or control;
- Incompatibility with an existing or future land use and its specific management goals; and/or
- Degradation of an existing land use resulting from inadequate oversight or management.

The criteria noted above are used to determine whether significant impacts would result from any of the action alternatives. Under each alternative, land acquisition would entail a change in ownership and use.

3.1.4.2 Common Elements Among the Action Alternatives - Land Use

Plans and Policies

Coastal Zone Consistency. Compliance with the Coastal Zone Management Act (CZMA) under each of the action alternatives required the preparation of a Coastal Consistency Determination (CCD; Appendix C) in consultation with the GA DNR Coastal Resources Division. Based on the findings within this FEIS, no coastal zone consistency issues were found. On June 25, 2012, the USMC submitted a consistency determination to the Federal Consistency Coordinator for review. The CCD included detailed descriptions of Alternatives 1, 2, 3, and 4 and their anticipated effects upon the land, water, or use of other natural resources located in the state coastal zone. By letter dated September 27, 2012 (Appendix C), the State of Georgia concurred with the USMC's determination of coastal zone consistency.

Compatibility

Under each of the action alternatives, the majority of land acquired would remain consistent with existing forestry management practices, and land management activities would focus more on the application of ecosystem management concepts and principles. New improved and semi-improved target areas under each alternative would range from approximately 200 acres to 400 acres of land depending on the selected alternative. The total acreage for the target areas would, however, represent only 4% to 7% of the total acquisition lands under the Proposed Action. Under each action alternative, military training and operations would generally be compatible with land management goals and objectives.

Land surrounding the proposed acquisition areas also would be expected to have compatible land use with the military mission. Through the development of the land acquisition areas (please refer to Section 2.2.1), all action alternatives were developed to fully contain the WDZs and ensure public safety. Further, noise contours do not exit the proposed boundary (please refer to Section 3.7). If any of the action alternatives are selected, a Range Air Installations Compatible Use Zone (RAICUZ) study would be completed be completed in accordance with "USMC Range Air Installations Compatible Use Zones

[RAICUZ] Program Procedures and Guidelines for Air-to-Ground Range Installation" (Office of the Secretary of the Navy Instruction (OPNAVINST) 3550.1A). The RAICUZ study would make recommendations to address any potential incompatibilities that are discovered.

3.1.4.3 Action Alternatives - Land Use

Alternative 1

Ownership and Relocation

Alternative 1 would include the acquisition of approximately 11,187 acres of land primarily used for commercial timber production. The purchase of Acquisition Areas 1A and 1B would constitute a change in property ownership. However, the vast majority of land associated with Alternative 1 consists of large, contiguous forested areas under private ownership which would be utilized for the same purpose. Alternative 1 land use impacts include a hunting club lease and a hunting lodge (Parcels 6071 and 6069; Figure 3-3), along with a residential housing unit and commercial paintball facility/operation (Parcels 7000 and 7001), all located within Acquisition Area 1A (Figure 3-3). There is also a currently undeveloped, privately owned parcel located within Area 1B (Parcel 4251). Each property and its associated land use would require purchase under Alternative 1. As a percentage of the total acquisition footprint (7%), overall land use impacts associated with Alternative 1 would be considered minimal to negligible. Recreational land uses subject to relocation under Alternative 1 are analyzed in Section 3.3.

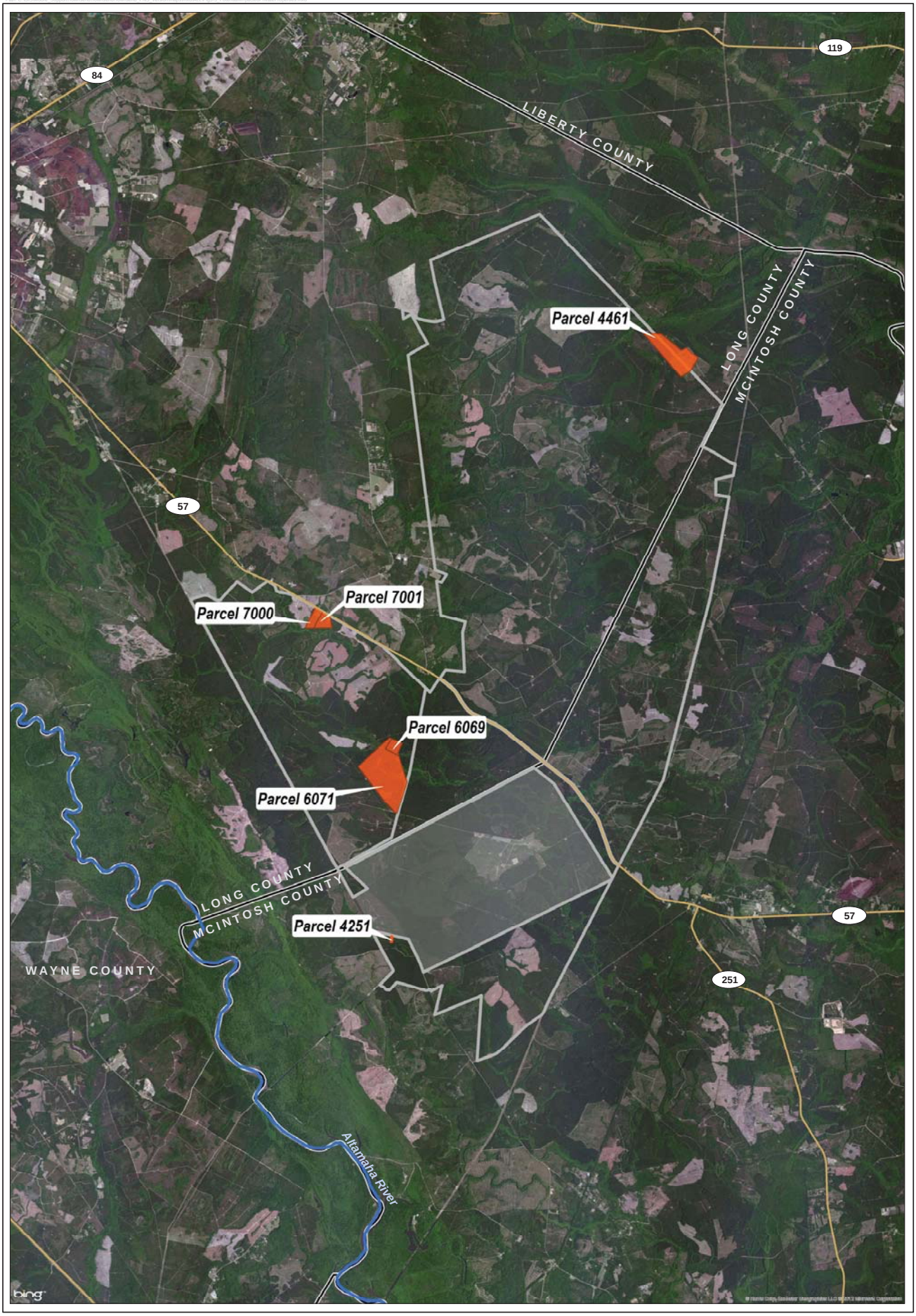
Plans and Policies

Local Comprehensive Planning. Land use within each county jurisdiction is subject to consistency with the enforceable provisions of local and, in some cases, regional comprehensive plans as described in Section 3.1.3. Alternative 1 includes approximately 2,983 acres of land under the jurisdiction of McIntosh County, and 8,204 acres of land under the jurisdiction of Long County.

For McIntosh County, both the existing and the future land use designation associated with Acquisition Areas 1A and 1B is Agriculture/Forestry. Since the majority of Alternative 1 would be subject to forest management, the selection of this alternative would be consistent with the McIntosh County Partial Comprehensive Plan Update (Grant Services and Consulting, Inc. 2008). Alternative 1 also would be consistent with the applicable regional comprehensive plan, the Coastal Georgia Comprehensive Plan (CGRDC 2008).

For Long County, the majority of existing land use associated with Alternative 1 is classified as Undeveloped, while the remaining lands are classified as smaller areas of Agriculture and Forestry, and Residential. The future land use associated with Alternative 1 is primarily zoned as Undeveloped with limited areas zoned for Residential and Commercial use. Therefore, as the majority of Alternative 1 would remain undeveloped, this alternative would be consistent with Long County's Comprehensive Plan (Grant Services and Consulting, Inc. 2005).

Prime Farmland. Section 3.12, Topography, Geology, and Soil describes and analyzes the soil-unit types that guide prime farmland designations under the FPPA. All areas designated as prime farmland under the FPPA are used for silvicultural purposes, not traditional agriculture. Alternative 1 would impact land designated as prime farmland under the FPPA. Approximately 10 acres of prime farmlands would be impacted by the construction and maintenance of Target Area 8 located within Acquisition Area 1B in McIntosh County, precluding this area's use for silvicultural or agricultural practices.



Privately Owned Parcels
Acquisition Areas
Existing Range
Counties
Major Roads
Altamaha River

Figure 3-3
Potentially Impacted Private Properties
Townsend Bombing Range
McIntosh and Long Counties, Georgia

0 1 2 Miles

Sources: Bing 2012, Based on Lusk 2009

Alternative 2

Ownership and Relocation

Alternative 2 would include the acquisition of approximately 23,674 acres of land primarily used for commercial timber production. The purchase of Acquisition Area 3 would constitute a change in property ownership. However, the vast majority of land associated with Alternative 2 consists of large, contiguous forested areas under private ownership and utilized for the same purpose. Alternative 2 potential land use impacts include one privately owned property (Parcel 4461) located within Acquisition Area 3 (Figure 3-3) that would require purchase. Parcel 4461 contains no structures on the property. As a percentage of the total acquisition footprint (5%), overall land use impacts associated with Alternative 2 would be considered minimal to negligible. Recreational land uses subject to relocation under Alternative 2 are analyzed further in Section 3.3.

Plans and Policies

Local Comprehensive Planning. Alternative 2 includes approximately 5,537 acres of land under the jurisdiction of McIntosh County and 18,137 acres of land under the jurisdiction of Long County. Alternative 2, based on the analysis of Alternative 1 above, would be consistent with the enforceable policies of the McIntosh County Partial Comprehensive Plan Update (Grant Services and Consulting, Inc. 2008), the Coastal Georgia Comprehensive Plan (CGRDC 2008) (for McIntosh County), and the Long County, Georgia, Comprehensive Plan (Grant Services and Consulting, Inc. 2005).

Prime Farmland. There would be no direct impacts to prime farmlands associated with Alternative 2 related to the construction and use of Target Areas 1 through 5.

Alternative 3

Ownership and Relocation

Alternative 3 would include the acquisition of approximately 34,861 acres of land primarily used for commercial timber production, and the purchase of Acquisition Areas 1A, 1B, and 3 would constitute a change in property ownership. However, the vast majority of land associated with Alternative 3 consists of large, contiguous forested areas under private ownership and utilized for the same purpose. Alternative 3 would involve the purchase of six privately owned properties (6071, 6069, 7000, 7001, 4251 and 4461; see Figure 3-3) containing one residential housing unit, one commercial paintball facility/operation, and one hunting lodge located within Acquisition Areas 1A and 3. Also, a currently undeveloped, privately owned parcel is located within Area 1B (Parcel 4251). Alternative 3 potential land use impacts would be same as those described in the Alternatives 1 and 2 analyses above. As a percentage of the total acquisition footprint (5%), overall land use impacts associated with Alternative 3 would be considered minimal to negligible.

Plans and Policies

Local Comprehensive Planning. Alternative 3 includes approximately 8,520 acres of land under the jurisdiction of McIntosh County and 26,341 acres of land under the jurisdiction of Long County. Alternative 3, based on the analyses of Alternatives 1 and 2 above, would be consistent with the enforceable policies of McIntosh County Partial Comprehensive Plan Update (Grant Services and Consulting, Inc. 2008), the Coastal Georgia Comprehensive Plan (CGRDC 2008) (for McIntosh County), and the Long County, Georgia, Comprehensive Plan (Grant Services and Consulting, Inc. 2005).

Prime Farmland. The selection of Alternative 3 includes land designated as prime farmland under the FPPA. Approximately 10 acres of prime farmlands would be associated with the construction and use of Target Area 8 located within Acquisition Area 1B in McIntosh County, Georgia, precluding this area's use for silvicultural or agricultural practices.

Alternative 4

Ownership and Relocation

Alternative 4 would include the acquisition of approximately 28,630 acres of land primarily used for commercial timber production, and the purchase of Acquisition Areas 1B and 3 would constitute a change in property ownership. However, the vast majority of land associated with Alternative 4 consists of large, contiguous forested areas under private ownership and utilized for the same purpose. Alternative 4 would involve the purchase of two privately owned properties, Parcels 4251 and 4461, located in Acquisition Areas 1B and 3, respectively (see Figure 3-3). No structures are on Parcel 4251 or Parcel 4461.

Alternative 4 potential land use impacts would be same as those described in the Alternatives 1 and 2 analyses above. As a percentage of the total acquisition footprint (4%), overall land use impacts associated with Alternative 4 would be considered minimal to negligible.

Plans and Policies

Local Comprehensive Planning. Alternative 4 would include the acquisition of approximately 8,520 acres of land under the jurisdiction of McIntosh County and 20,110 acres of land under the jurisdiction of Long County. Alternative 4, based on the analysis of Alternatives 1 and 3 above, would be consistent with the enforceable policies of McIntosh County Partial Comprehensive Plan Update (Grant Services and Consulting, Inc. 2008), the Coastal Georgia Comprehensive Plan (CGRDC 2008) (for McIntosh County), and the Long County, Georgia, Comprehensive Plan (Grant Services and Consulting, Inc. 2005).

Prime Farmland. Under Alternative 4, approximately 10 acres of prime farmlands would be associated with the construction and use of Target Area 8 located within Acquisition Area 1B in McIntosh County, Georgia, precluding this area's use for silvicultural or agricultural practices.

Summary of Impacts

Because each of the action alternatives involves various quantities of land acquisition, there would be impacts to land ownership and possible relocation of housing units and businesses within the acquisition areas. Overall, these impacts to land use would be minimal to negligible and long-term. The selection of any of the alternatives would be consistent with local comprehensive plans, including the McIntosh County Partial Comprehensive Plan Update (Grant Services and Consulting, Inc. 2008) the Coastal Georgia Comprehensive Plan (CGRDC 2008) (for McIntosh County), and the Long County, Georgia, Comprehensive Plan (Grant Services and Consulting, Inc. 2005). Therefore, there would be no impacts to land use compatibility under any of the action alternatives. The action alternatives would have minimal adverse impacts to prime farmland; these impacts are discussed more thoroughly in Section 3.12.4.3. Because the impacts to land use and prime farmland would be minimal in nature and geographic extent, these effects would not be significant overall.

3.1.4.4 No Action Alternative - Land Use

Ownership and Relocation

Under the No Action Alternative, there would be no change in land ownership or use resulting from the acquisition of private property. The selection of this alternative would result in the continuation of commercial forestry operations on lands that surround TBR. Additionally, the No Action Alternative would not require the relocation of select property owners and/or land uses located within the proposed acquisition areas. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

Plans and Policies

Local Comprehensive Planning. The No Action Alternative would not amend the existing or future land uses for McIntosh and Long Counties, Georgia, as described in Sections 3.1.3.3 and 3.1.3.4, respectively. Therefore, the selection of this alternative would be consistent with the local comprehensive plans for each respective county.

Coastal Zone Consistency. The selection of the No Action Alternative would not affect state resources as defined by the federally approved Georgia Coastal Zone Management Program. Therefore, the No Action Alternative would not require a CCD.

Compatibility

Under the No Action Alternative, local and regional land use would remain unchanged and therefore compatible with one another based on current conditions. Timber operations would remain compatible with the existing rural character and residential densities found within the region, and the land area could be used to support future development as guided by the local comprehensive planning process. Therefore, the No Action Alternative would be compatible with existing and future land use within McIntosh and Long Counties, Georgia.

Prime Farmland. No land designated under the FPPA as prime farmland would be impacted by the No Action Alternative. Under the No Action Alternative, there would be no land acquisition and, therefore, no subsequent placement of range infrastructure; thus, there would be no disturbance of prime farmland.

3.1.4.5 Methodology and Evaluation Criteria - Forestland

Because the nature and duration of the potential impacts to forestland for each action alternative are similar, the extent of the affected forestland was the criterion used to compare the forestland consequences of each alternative.

3.1.4.6 Common Elements Among All Action Alternatives – Forestland

The potential consequences of each of the action alternatives are similar in the types of impacts to forest resources that would occur and the duration of those impacts. The nature and duration of forestland impacts are discussed in this subsection. The duration of impacts for each alternative would be for as long as the bombing range would be used and forestlands would be managed by the USMC, which likely would be measured in decades. Changes to rotation lengths would be on the order of at least 50 years. Changes in species and stand composition could last for many decades.

The most important difference among the action alternatives is in the extent of the potential impacts. The extent of impacts for each alternative is discussed in the next section, “Action Alternatives.”

Forest Management

Under each alternative for the Proposed Action, the USMC would regain management authority over the 3,007-acre timber easement currently managed by McIntosh County. Each action alternative also would require acquisition of private land from multiple owners in one or more proposed acquisition areas. The Sikes Act requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. For the purposes of this FEIS, it is assumed that key provisions of the current TBR INRMP would be extended to any newly acquired properties, including the timber easement under management by McIntosh County. However, the USMC would still be required to develop an INRMP for any lands acquired for expansion of TBR. The INRMP would provide for integrated land management, fish and wildlife management, forest management, and outdoor recreation management by implementing an ecosystem approach to natural resources management without interfering with the military readiness or mission of the installation.

Changes in forest management of the McIntosh County timber easement and acquired private forestland would be necessary to make management consistent with the ecosystem approach. The forest management changes and the consequences of those changes are discussed below.

All four action alternatives would result in substantial changes to current forest management practices where land or a timber easement would be acquired by the USMC. Generally, the objectives of forest management would change from the primary objective of wood production based on short-rotation pine plantations to broader objectives using an ecosystem approach to management. The USMC's ecosystem approach is to provide a landscape suitable for containing fires resulting from training activities, which results in greater biodiversity, longer timber rotations, larger trees, and lower stand density. The dense pine plantations would gradually change to more open pine flatwoods and longleaf savannas.

When the USMC adopts an ecosystem approach for newly acquired properties, some of the most notable changes in forest management would include the following:

- **Stand Establishment**
  - Pine stands would be replanted at a rate of 500 to 700 trees per acre. Typical industrial forest planting density in areas near TBR is approximately 700 to 800 trees per acre.
  - Where appropriate, natural regeneration would be achieved by using the seedtree or shelterwood harvest method. Under these methods, approximately 8 to 25 quality trees per acre would be left after harvesting the stands to provide seed for new trees.
  - The USMC would likely implement the management strategy of identifying sites suitable for growing longleaf pine that is part of the current TBR INRMP. Sites that provide conditions suitable for longleaf pine would be planted with that species. The TBR INRMP suggests a transition of 10% to 20% on the McIntosh County Timber Easement during a 10-year period.
- **Thinning and Other Management Measures**
  - Intermediate thinnings would be conducted early in the life of pine stands, usually 15 to 20 years of age. As stands age, additional thinnings and possibly sanitation cuts would be used to produce high-quality sawtimber. Sanitation cuts consist of removing diseased or inferior trees to favor growth of higher quality trees.
  - Stand density, as measured by basal area, would be maintained between 60 and 90 square feet per acre (MCAS Beaufort 2007 [Appendix VI]). Pine plantations in the area typically have a maximum basal area of up to 120 square feet per acre.
  - The USMC would be expected to implement its prescribed burning policy to all newly acquired pine forest areas. That would likely result in conducting prescribed burning on an average of once every three years, based on the current TBR INRMP.
- **Rotation Cuts**
  - Hardwood stands would not be harvested. Instead, they would be allowed to age and develop naturally into uneven aged stands for wildlife management, wetland habitats and functions, erosion control, and vegetation diversity.

- Pine stands rotation cuts would be relatively small clear-cuts. Even-age stand management would be implemented in pine stands.
- Size of cuts. The maximum size of a harvest cut would be approximately 80 acres.
- Stand size. Smaller stands would be created from larger, more uniform stands established under previous ownership; the TBR INRMP calls for gradually reducing stand size to 20 acres.
- Loblolly and slash pine stands would no longer have rotation cuts by age 30 years; instead, their rotation age would be extended up to 80 years. The average age of forest stands on the acquired areas would increase as a result.

The impacts of transitioning forestland from silvicultural management practices to ecosystem management practices that would occur as a result of each action alternative would serve to positively impact:

- ***Forest health.*** Increased monitoring of stand conditions and a reduction in stand density may reduce opportunity for disease and insect outbreak. Maintaining a regular fire regime would allow for the recruitment of fire-dependent species. Increased rotation age for both loblolly and longleaf pine stands would allow trees to reach full maturity, adding long-term value to sawtimber products.
- ***Mission safety.*** Forested areas surrounding target areas act as safety buffers from dropped ordnance (although trees with embedded debris would have reduced merchantable value). A regular fire management regime would reduce understory fuel load, thereby reducing opportunity for wildfire when ordnance deviates from targeted areas. The addition of firebreaks would provide an extended network of access roads for mitigating fire risks.
- ***Sustainability.*** As a side effect of supporting the range mission, the revenue generated through the management, maintenance, and harvesting of forested properties would be available to help support the range forestry program.

Products

As a result of the changes in forest management that the USMC would implement on currently privately owned and County-managed lands, hardwood products would no longer be harvested from hardwood forests. Hardwood trees occurring within pine forest types could be harvested, however.

Pine products would shift from the pulpwood, chip-n-saw, and some sawtimber that result from short (30-year) rotations, to greater proportions of high-quality sawtimber that would result from growing trees for up to 80 years. Intermediate thinnings of pine stands would generate pulpwood at 15 to 20 years and a mix of pulpwood, chip-n-saw, and sawtimber from later thinnings. Allowing stands to reach up to 80 years of age before clear-cutting would result in postponing harvest cuts of larger volumes of sawtimber.

All action alternatives would include the establishment of new target areas. In addition to converting some forested areas to grassland and other uses (see "Conversion of Land Cover and Uses" below), creation of new target areas would result in trees in some areas around the target areas becoming un-merchantable. Debris from munitions and dropped ordnance would become embedded in the wood of the trees directly around the target area. According to the TBR INRMP (MCAS Beaufort 2007), approximately 750 acres within the current TBR boundary are affected in this way. Approximately 500

acres are considered un-merchantable and approximately 250 acres could be limited to the harvesting of poles.

Converting USMC and acquired non-USMC properties to the ecosystem management program would result in postponing harvest of some forest products for considerable periods. The delay in timber revenue associated with the conversion may, at least temporarily, reduce the forest management program's ability to pay for itself. For a discussion of potential economic impacts of the Proposed Action, please refer to Section 3.2.4.

Conversion of Land Cover and Uses

The Proposed Action would result in the disturbance of up to approximately 2,000 acres of forestlands to allow placement or construction of new targets. Between three and eight target areas, each ranging in size from approximately 200 acres to approximately 400 acres, would be established. Each area would include a number of targets that would require clearing the trees and woody vegetation. Target areas would be surrounded by 50-foot firebreaks and boundary fences. Signs would be located on the inside perimeter of the firebreaks at 200-meter intervals or less, or in a way that would insure that a person could not enter the range without seeing at least one sign within a legible distance. Although there are no immediate plans for additional targets, it is anticipated that the tactical targets would be periodically moved throughout the targeted areas to allow for variation in training scenarios. The moving tactical targets would require clearing small amounts of forest within the target areas.

Although existing roads would be used to the greatest extent possible, all target areas would require some degree of road construction or improvement with the possibility that some forested area would be converted to transportation uses. The total acreages of new target areas and areas to be cleared for targets for each action alternative are discussed in Section 3.1.4.2.3.

Other Associated Impacts

Anticipated changes in prescribed burning practices are discussed in Section 3.10, Air Quality. Sales of trees near the target areas could be impacted due to debris from spent munitions and dropped ordinance becoming embedded in the trees. These, and all other potential economic impacts from changes in forestland management for the action alternatives, are discussed in Section 3.2.4.

3.1.4.7 Action Alternatives - Forestland

Alternative 1

This alternative would consist of the purchase of Acquisition Areas 1A and 1B. The total area added to the existing TBR would be 11,187 acres. Three target areas would be developed under this alternative: Target Areas 6 and 7 in Area 1A, and Target Area 8 in Acquisition Area 1B. Total new target areas for Alternative 1 would be approximately 850 acres. Planned clearing for new targets would require approximately 204 acres, but may require additional clearing during the configuration of the WISS.

Approximately 98.1% of this action alternative consists of land that is presently managed as industrial forestland. Approximately 79.4% of the alternative is in one or more pine cover types and approximately 16.4% of the alternative is in one or more hardwood cover types. The changes to forestland resulting from changes in forest management would be noticeable, but would not destabilize the resource. Rather, the changes would serve to improve the ecological diversity and functional value over time and reduce the risk of destructive wildfires

Alternative 2

Alternative 2 would consist of the purchase of Acquisition Area 3, which would add 23,674 acres to the existing TBR. Five target areas would be developed under this alternative: Target Areas 1, 2, 3, 4, and 5. Total new target areas for Alternative 2 would be approximately 1,100 acres. Planned clearing for

new targets would require approximately 194 acres, but may require additional clearing during the configuration of the WISS.

Approximately 98.6% of this alternative consists of land that is presently managed as industrial forestland. Approximately 76.4% of the alternative is in one or more pine cover types and approximately 19.4% of the alternative is in one or more hardwood cover types. The changes to forestland resulting from changes in forest management would be noticeable, but would not destabilize the resource. Rather, the changes would serve to improve the ecological diversity and functional value over time and reduce the risk of destructive wildfires.

Alternative 3

Alternative 3 would add all three acquisition areas, 1A, 1B, and 3, to the current TBR for a total of 34,861 acres. Eight target areas (1 through 8) would be developed under this alternative. Total new target areas for Alternative 3 would be approximately 1,950 acres. Planned clearing for new targets would require approximately 398 acres, but may require additional clearing during the configuration of the WISS.

Approximately 98.4% of this alternative consists of land that is presently managed as industrial forestland. Approximately 77.4% of the alternative is in one or more pine cover types and approximately 18.4% of the alternative is in one or more hardwood cover types. The changes to forestland resulting from changes in forest management would be noticeable, but would not destabilize the resource. Rather, the changes would serve to improve the ecological diversity and functional value over time and reduce the risk of destructive wildfires

Alternative 4

This alternative would add Acquisition Areas 1B and 3 for a total of 28,630 acres. Six target areas, Target Areas 1 through 5 and 8, would be developed under this alternative. Total new target areas for Alternative 4 would be approximately 1,300 acres. Planned clearing for new targets would require approximately 257 acres, but may require additional clearing during the configuration of the WISS.

Approximately 98.6% of this alternative consists of land that is presently managed as industrial forestland. Approximately 77.0% of the alternative is in one or more pine cover types and approximately 18.6% of the alternative is in one or more hardwood cover types. The changes to forestland resulting from changes in forest management would be noticeable, but would not destabilize the resource. Rather, the changes would serve to improve the ecological diversity and functional value over time and reduce the risk of destructive wildfires.

Summary of Impacts

The potential impacts to forestland as a result of each of the action alternatives are similar in the types of impacts that would occur and the duration of those impacts (please refer to Section 3.1.4.6). All four action alternatives would result in substantial changes to current forest management practices where land or a timber easement would be acquired by the USMC. The objective of forest management would change from optimizing fiber production based on short-rotation pine plantations to providing a landscape capable of containing fires resulting from military training based on ecosystem management techniques. Similarly, all action alternatives would include the establishment of new target areas. In addition to converting some forested areas to grassland and other uses, creation of new target areas would result in trees in some areas around the target areas becoming unmarketable. The Proposed Action also would result in the disturbance of forestlands to allow placement or construction of new targets that would require clearing the trees and woody vegetation. These target areas would require some degree of road construction or improvement with the possibility that some forested area would be converted to transportation uses.

Under each alternative, the changes to forestland resulting from changes in forest management would be noticeable, but would not destabilize the resource. Rather, the changes would serve to improve the ecological diversity and functional value over time and reduce the risk of destructive wildfires. These benefits from changes in management strategy are expected to offset the negative effects from the loss of commercial timber production and result in no significant impacts. Table 3-9 summarizes the amount of forestlands that would be affected under each of the action alternatives.

Table 3-9
Summary of Action Alternatives:
Extent of Industrial Ownership, Pine Cover, Hardwood Cover, and New Target Areas

Alternative	Industrial Forest		Pine		Hardwood		New Target Areas Acres
	Acres	Percent	Acres	Percent	Acres	Percent	
1	10,973	98.1%	8,881	79.4%	1,836	16.4%	850
2	23,346	98.6%	18,092	76.4%	4,584	19.4%	1,100
3	34,319	98.4%	26,973	77.4%	6,420	18.4%	1,950
4	28,238	98.6%	22,044	77.0%	5,326	18.6%	1,300

Note: Pine and hardwood acreages are approximate and do not add up to 100% of the industrial forestland. These acreages were based on land cover data and there is acreage within the industrial forestland that is not classified as pine or hardwood.

3.1.4.8 No Action Alternative - Forestland

Under the No Action Alternative, the USMC would not acquire lands in McIntosh and Long Counties, Georgia, adjacent to the existing TBR nor would the USMC acquire a timber easement from McIntosh County within the current TBR boundary. Existing forestland management practices, as described in Section 3.1.3.5, would be expected to remain unchanged. USMC-managed lands within the current TBR boundary would continue to be managed using an ecosystem approach to management for multiple environmental benefits. That would mean a continuation of conversion of suitable areas of TBR to a longleaf pine type forest, 80-year rotations for other pine stands, and no harvesting in hardwood forests. Likewise, forest management by McIntosh County and the private owners of forestlands adjacent to TBR in Acquisition Areas 1A, 1B, and 3 (also described in Section 3.1.3.5) would not be affected by the No Action Alternative. Private owners of industrial and non-industrial forestland would be expected to manage their forest resources for pine pulpwood and sawtimber on rotations of approximately 30 years, and for hardwood pulpwood and sawtimber on rotations of approximately 50 years. Additionally, the types and volumes of forest products currently harvested within the proposed acquisition areas would remain unchanged by the No Action Alternative. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.2 Socioeconomics

This section addresses several different factors that could affect the quality of life and economy in the area surrounding the proposed acquisition area where employees might live, shop, and use public resources. These factors include public services such as fire, police, and medical facilities; educational facilities; and environmental justice. These factors are then evaluated under each alternative, including the No Action Alternative.

3.2.1 Definition of Resource

Socioeconomics is an evaluation of the basic conditions (attributes and resources) associated with the human environment, particularly the population and economic activity within a region. Economic activity generally encompasses regional employment, personal income, and revenues and expenditures. Impacts on these fundamental socioeconomic components can influence other issues such as regional housing availability and provision of community services.

This socioeconomic analysis describes the existing socioeconomic conditions within the Region of Influence (ROI; i.e., McIntosh and Long Counties), including the general socioeconomic setting, population demographics, housing, income, employment, and local revenue sources (including a discussion on timber and school revenues). The data used for this report are based on the most current available information published by federal, state, and local reporting agencies. Federal agency information cited includes the U.S. Census Bureau, U.S. Department of Education, and the U.S. Forest Service. State agencies and institutes cited include the Georgia Department of Revenue, the Georgia Department of Education, the Georgia Office of Planning Budget, and the University of Georgia-Warnell School of Forest Resources. Local information was obtained from the McIntosh County and City of Darien Joint Comprehensive Plan Community Assessment (CGRDC 2007) and the Long County Comprehensive Plan. (Grant Services and Consulting, Inc. 2005).

The existing conditions provide the baseline by which potential socioeconomic changes are measured and are outlined in Section 3.2.3. Section 3.2.4 describes the environmental consequences and potential socioeconomic changes, both positive and negative, for each alternative.

3.2.2 Regulatory Framework

The CEQ regulations implementing NEPA state that when economic or social effects and natural or physical environmental effects are interrelated, the EIS will discuss these effects on the human environment (40 CFR 1508.14). The CEQ regulations further state that the "human environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment." Following from these CEQ regulations, the socioeconomic analysis evaluates how elements of the human environment such as population, employment, housing, and public services might be affected by the Proposed Action.

In 1994, EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was issued to focus the attention of federal agencies on human health and environmental conditions in minority and low-income communities (CEQ 1994). In 1997, EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, expanded the focus to include children populations. EO 12898 and EO 13045 aim to ensure that the environmental effects of federal actions do not fall disproportionately on low-income, minority, and children populations. To support an evaluation of environmental justice issues, this section includes data related to potentially effected minority, low-income, and children populations in the vicinity of the Proposed Action. EOs 12898 and 13045 are described in more detail below.

- ***EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 1994)*** requires federal agencies to identify and take necessary measures to address disproportionately high and adverse human health or environmental effects of its actions on these populations to the greatest extent practicable permitted by law, and also involve representatives of these populations in the community participation and public involvement process. (CEQ 1994).
- ***EO 13045, Protection of Children from Environmental Health Risks and Safety Risks (April 1997)*** requires a similar analysis for children, where federal agencies are required to identify and address potential environmental health risks and safety risks of its actions that may disproportionately affect children. (CEQ 1997).

3.2.3 Affected Environment

3.2.3.1 Socioeconomic General Setting

McIntosh and Long Counties are primarily rural in nature with the majority of populated areas located near and within the county seats.

In determining the appropriate socioeconomic ROI from which to describe the existing conditions, the extent and nature of the action alternatives must be defined. Due to the military's long association with the area, the current facility is an integral part of the community and economy of the region. TBR occupies a 5,183-acre tract of land located in the northwestern portion of McIntosh County, Georgia, near the Long County line (Figure 1-3).

The USMC considers the socioeconomic ROI for this analysis to be McIntosh and Long Counties since the majority of the potential impacts from the Proposed Action would occur or fall within the jurisdiction of these counties. These potential impacts include:

- Potential economic impacts from land acquisition, new construction and operation, and timber harvesting potential and income;
- Fiscal impacts due to potential changes in property taxes and timber sales taxes;
- Potential population displacements; and
- Potential community service impacts.

3.2.3.2 Population Characteristics

This section provides the population demographic characteristics for the ROI by age, gender, race, income, and education. The statistics represent latest available data as reported by the U.S. Census Bureau's 2010 Census, generally based upon self-identification (Table 3-10). Table 3-10 displays the existing demographic composition of the local population within McIntosh and Long Counties.

Table 3-10
Population, Age, and Race Demographic Characteristics

Demographic	State of Georgia	McIntosh County	Long County
Population			
2000	8,186,453	10,847	10,304
2010	9,687,653	14,333	14,464
2015 [(a)]	11,076,619	13,982	13,089
2020 [(a)]	12,189,252	16,039	14,386
2030 [(a)]	14,687,906	20,686	15,744
Percent Change 2000 to 2010	18.3%	32.1%	40.4%
Population Density			
Persons per square mile	167.3	33.1	36.1
Land Area (square miles)	57,906.10	433.4	400.9
Persons per Household			
2000	2.65	2.54	2.88
2010	2.63	2.39	2.81
Percent Change	(0.8%)	(6.3%)	(2.5%)
Gender and Age (2010)			
Male	49.2%	48.0%	48.4%
Female	50.8%	52.0%	51.6%
Over Age 65	10.3%	17.3%	7.3%
Age 18 to 65	64.0%	60.7%	62.8%
Under Age 18	25.7%	22.0%	29.9%
15 to 17 years	4.3%	4.9%	4.0%
10 to 14 years	7.1%	6.0%	8.2%
5 to 9 years	7.2%	5.6%	8.3%
Under 5 years	7.1%	5.5%	9.4%
Race and Hispanic or Latino Origin (2010)			
White persons	59.7%	61.5%	62.4%
Black or African American persons	30.5%	35.9%	25.2%
American Indian and Alaska Native persons	0.3%	0.4%	0.6%
Asian persons	3.2%	0.3%	0.8%
Native Hawaiian and Other Pacific Islander	0.1%	0.0%	0.4%
Persons reporting two or more races	2.1%	1.2%	3.4%
Persons reporting of Hispanic or Latino origin	8.8%	1.6%	12.3%
Persons reporting White not Hispanic origin	55.9%	60.8%	58.7%
Education Levels (2010)			
High School Graduates	83.5%	75.1%	78.7%
Bachelor's Degree or Higher	27.2%	15.0%	9.1%
Income (2010)			
Median household income	$49,347	$39,075	$41,186
Per capita income	$25,134	$20,964	$15,068
Per capita income ranking among 156 Georgia Counties (#1 having lowest per capita income) [(b)]	N/A	#96	#70
Poverty Status (2010)			
Individuals below poverty level	18.0%	19.0%	20.8%
Children under age 18 below poverty level	25.0%	32.8%	29.6%

Sources:
U.S. Census Bureau 2010, except as noted.
(a) State of Georgia Office of Planning and Budget 2010.
(b) GA DCA 2010c.

The 2010 population statistics, in comparison to 2000 levels, represent increases of approximately 32.1% in McIntosh County and 40.4% in Long County, reflecting an average annual growth rate of 3.2% and 4.0%, respectively. Both counties grew faster than the state as a whole. Between 2000 and 2010, the total population in Georgia increased 18.3%, reflecting an average annual growth rate of 1.8%. Between 2010 and 2030, total populations in McIntosh and Long Counties are projected to grow at average annual rates of 0.9% and 2.2%, respectively. Domestic and international migration is the primary source of the state's overall population growth projections (Georgia Office of Planning and Budget 2010). No reasons for the individual county's growth projections were given in the report cited.

Population density, the measure of the number of people per unit of area, is commonly reported as the number of individuals per square mile and serves as an indicator of development. There are approximately 33.1 and 36.1 individuals per square mile in McIntosh and Long Counties, respectively, while the state of Georgia population density is 167.3 persons per square mile (Table 3-10). When compared to the state, both McIntosh and Long Counties are considered sparsely populated and rural in nature, likely due in part to the counties' locations away from large metropolitan areas (e.g., Atlanta) and the large tracts of conservation/refuge lands and undeveloped forested lands.

The largest population center in McIntosh County is the City of Darien, with 1,975 persons, while the largest population center in Long County is the City of Ludowici, with a population of 1,703 persons (U.S. Census Bureau 2010). Together, these counties represent 0.3% of the total Georgia population.

Table 3-10 provides average household size within the ROI, as well as the state, for 2000 and 2010. In 2010, the average household size was 2.39 persons in McIntosh County and 2.81 persons in Long County, comparable to 2.63 persons for the state. Between 2000 and 2010, average household size decreased in the state, and in McIntosh and Long Counties; however, both counties had sharper declines than the state.

The gender and age compositions for both counties are similar to the state's (see Table 3-10). Age characteristics are comparable to that of the state composition from the same year. In McIntosh County, the White and Black populations are slightly higher than those statewide, while the Asian and Hispanic populations are much lower. In Long County, the White and Hispanic populations are each slightly higher, while the Black populations are slightly lower when compared to the state as a whole.

The rate of high school graduates for both counties was slightly lower than that of the state, and the percentage attaining a college degree was lower. The average per capita income for McIntosh and Long Counties was $20,323 and $14,456 respectively, compared to $25,098 for the state. For the same time period, the median household incomes were $34,659 and $37,358, respectively, lower than the state average of $47,469 (U.S. Census Bureau 2009). In 2010, with regard to median per capita income, Long County ranked 70 out of 156 counties (with 1 being the poorest county) and McIntosh County ranked 96 (GA DCA 2010c). The percentages of individuals in each county below the national poverty level are higher than the state average (McIntosh County 21.2%; Long County 23.0%; and State of Georgia 16.6%). (U.S. Census Bureau 2009)

3.2.3.3 Environmental Justice

Per EO 12898 and EO 13045, this section identifies the populations of minority, low-income, and children within McIntosh and Long Counties, while the Environmental Justice Impacts discussion in the Environmental Consequences section (Section 3.2.4.3) focuses on Census Tract and Block, providing a comprehensive accounting of minority, low-income, and children populations within the vicinity of the proposed acquisition areas.

Minority Populations

According to the CEQ, minorities are defined as individuals who are members of the following population groups: Black, American Indian and Alaskan Native, Asian-American, and Hispanic. The CEQ identifies a disproportionate minority population (cumulative total of all minority groups) when the minority population of an affected area exceeds 50% of the general population or the minority population percentage of the affected area is meaningfully greater than the minority population percentage of the general population. (CEQ 1994)

Minority population, based upon self-identification, within the state of Georgia was 42.8% of the total population in 2010. Minority population in McIntosh County in 2010 was 36.9% of the population. According to the CEQ guidelines, the cumulative minority population in McIntosh County is considered less than the general population and is therefore not comprised of a disproportionate percentage of minority groups. Minority population in Long County in 2010 was 38.9% of the population. According to the guidelines, the cumulative minority population in Long County is less than the general population and therefore not comprised of a disproportionate percentage of minority groups. Of note, the individual percentage of Hispanic population is slightly higher in Long County (12.3%) when compared to the state as a whole (8.8%). (U.S. Census Bureau 2010)

Low-Income Populations

The CEQ requires that low-income populations in an affected area be identified with the annual statistical poverty thresholds. Low-income persons are defined as persons whose household incomes are at or below the U.S. Department of Health and Human Services (HHS) poverty threshold guidelines. (U.S. Department of HHS 2011) As reported in the *Federal Register* (FR), Volume 75, No. 148, dated August 2010, the HHS poverty guidelines are $22,050 for a household (four-person family) and $10,830 per person (per capita) (U.S. Department of HHS 2010). From the most recent available data (2010 Census), the median household income for McIntosh County is $39,075, for Long County is $41,186, and for the state is $49,347. The median income per capita is $20,964 for McIntosh County, $15,068 for Long County, and $25,134 for the state (U.S. Census Bureau 2009). In 2010, with regard to median per capita income, Long County ranked 70 out of 156 counties (with 1 being the poorest county) and McIntosh County ranked 96 (GA DCA 2010c). Household and per capita incomes for households and individuals in the ROI residential community are similar to, yet above, the HHS poverty guidelines, and both counties fall around mid-range within the state rankings, therefore the residential community in the ROI is not considered economically disadvantaged.

Child Populations

The CEQ requires that children (defined as people under the age of 18) in an affected area be identified (CEQ 1997). Table 3-10 identifies the child populations within the ROI and provides a breakdown by different age groups. Long County's population of children is similar to the state, while McIntosh County has fewer children than Long County and the state population. Children make up 22.0% of the McIntosh County population; 29.9% of the Long County population, which is comparable to the average population of children throughout the state (25.7%). According to the 2010 Census, about one-third of the children under the age of 18 living in McIntosh and Long Counties lives under the national poverty rate (McIntosh County 32.8%, Long County 29.6%). (U.S. Census Bureau 2010)

3.2.3.4 Regional Housing Characteristics

Available housing stock within the ROI was 9,220 units in McIntosh County and 6,039 units in Long County. Although McIntosh County shows the highest total vacancy rate (35.2%), approximately 61.3% of the vacant units in this county are identified for seasonal, recreational, or occasional use. (U.S. Census Bureau 2010)

As summarized in Table 3-11, housing units in McIntosh and Long Counties accounted for less than 1% of the total number of units in the state in 2010. Between 2000 and 2010, all three geographic regions had increases in total numbers of housing units; however, McIntosh County and Long County experienced much larger gains than the state as a whole. In 2009, the median value of owner-occupied housing units in Long County was $80,000, while the median value of owner-occupied housing units in McIntosh County was $98,000. Both counties trailed the median value of homes across the state ($160,100) (U.S. Census Bureau 2009).

Table 3-11
Housing Demographic Characteristics

Demographic	State of Georgia	McIntosh County	Long County
Available Housing Units			
2000	3,281,737	5,735	4,232
2010	4,088,801	9,220	6,039
Percent Change	24.6%	60.8%	42.7%
Vacancy Rate 2010	**12.30%**	**35.20%**	**16.80%**
Vacant Housing Units 2010	**174,416**	**423**	**574**
For rent	6,792	22	21
Rented, not occupied	83,852	257	75
For sale only	13,118	25	61
Sold, not occupied	81,511	1,992	64
For migratory workers	142,674	530	198
For seasonal, recreational, occasional use	503,217	3,249	1,016

Sources: U.S. Census Bureau 2000 and 2010.

3.2.3.5 Regional Employment - Occupational and Industry Statistics

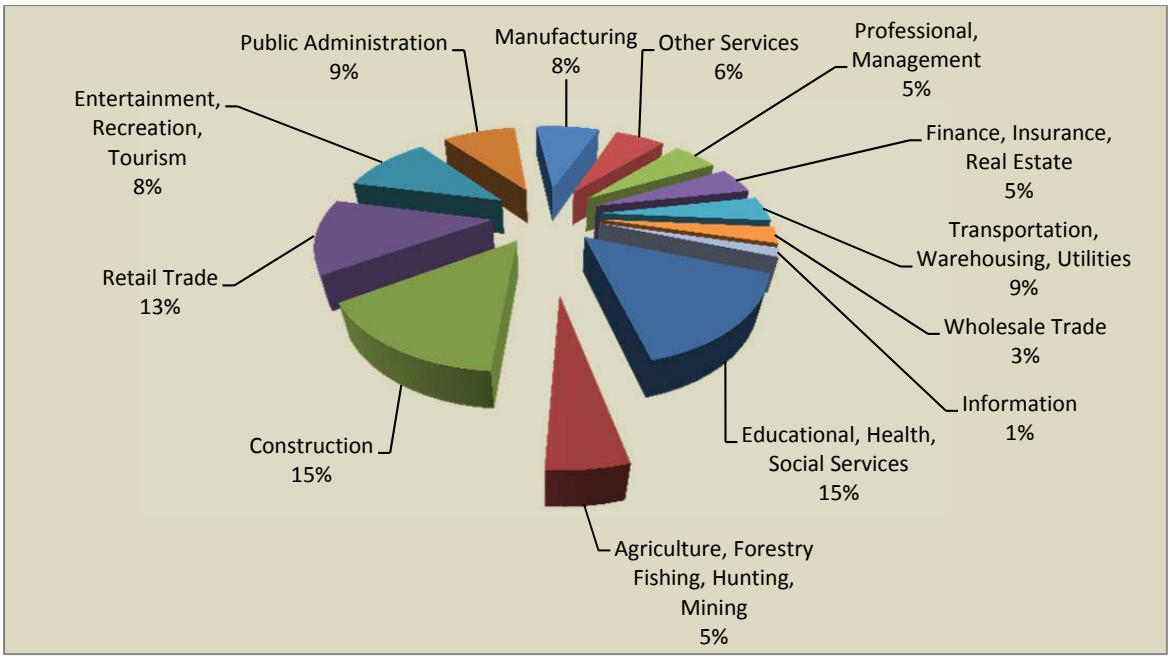
While the occupational industries within the ROI are diversified, the rural nature of the counties is highlighted by the relatively small size of the labor forces. Table 3-12 and Figures 3-4 and 3-5 show employment by industry statistics for McIntosh and Long Counties, respectively, as reported by the U.S. Census Bureau from two surveys generally based upon self-identification: the decennial U.S. Census 2000 and the American Community Survey, average five-year data from 2005 to 2009.

In 2000, no industry exceeded 16% of overall employment; however, by 2009, the employment by industry demonstrated a shift. In Long County, there was a 95.5% decrease in the number of persons employed in the Agriculture, Forestry, Fishing, Hunting, Mining industry and a 61.2% decrease in the persons employed in the Wholesale Trade industry. There was a large increase in the Transportation, Warehousing, Utilities industry and in the Educational, Health, Social Services industry. In McIntosh County, the number of persons employed in the Construction industry increased 35.3% and the Manufacturing industry decreased 30.1%. The number of persons employed in the Public Administration industry increased by 48.3%. Both counties showed increases in construction- and tourism-related jobs and decreases in wholesale- and retail-related jobs. In McIntosh County, educational/health-related jobs and forestry/agricultural-related jobs remained fairly constant, yet in Long County, educational/health-related jobs showed a dramatic increase, while forestry/agricultural-related jobs showed a dramatic decrease. In 2009, despite these changes, no industry comprised over 16% of the total employed persons, suggesting a relatively balanced economy. (U.S. Census Bureau 2000 and 2009)

Table 3-12
Occupation and Industry of Workers

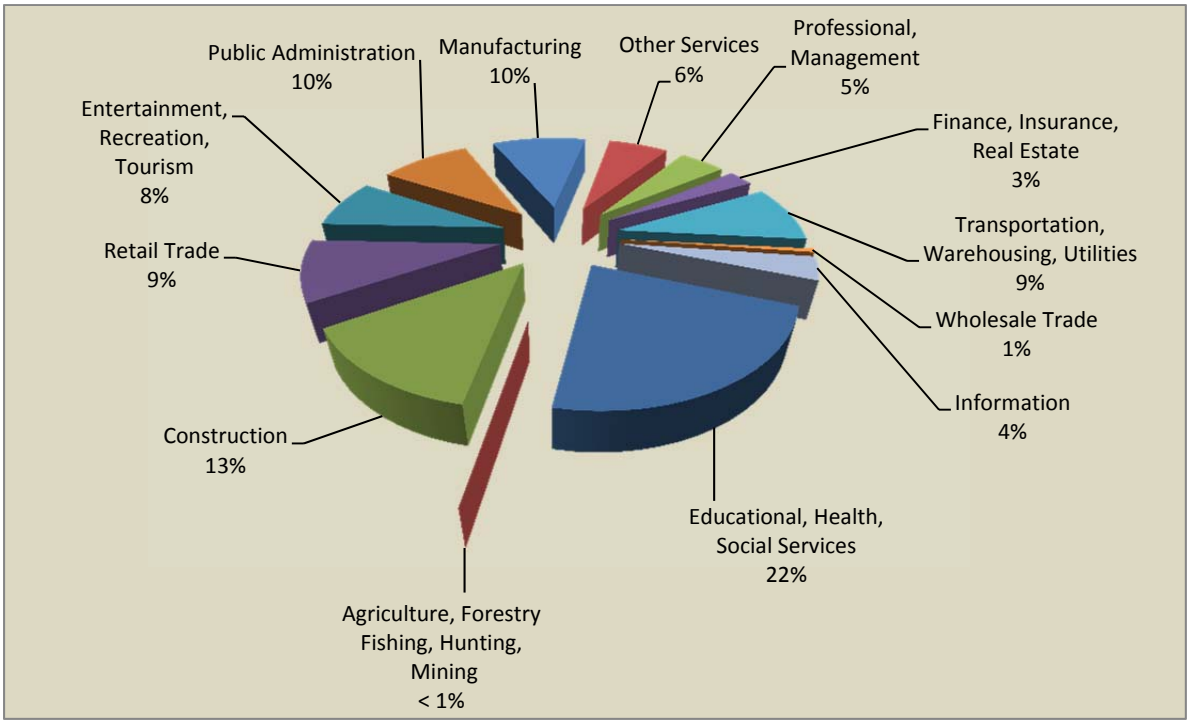
Demographic	State of Georgia	McIntosh County			Long County		
Labor Force Status 2010							
In labor force (age 16 and older)	4,693,711	5,073			6,683		
Employed	4,213,719	4,495			6,275		
Unemployed	479,992	578			408		
Unemployment Rate–Average Annual	10.2%	11.4%			7.2%		
		2000	2005-2009	% Change	2000	2005-2009	% Change
Civilian (non-military) Labor Force		4,424	4,745	7.3	3,854	4,661	20.9
Jobs per Industry							
Construction		516	698	35.3	465	17	32.7
Educational, Health, Social Services		703	739	5.12	610	1,046	71.5
Entertainment, Recreation, Tourism, Accommodation and Food Services		453	505	11.5	283	63	28.3
Finance, Insurance, Real Estate		209	220	5.3	174	122	(29.9)
Forestry, Agriculture, Fishing, Mining		202	238	17.8	156	7	(95.5)
Information, Communications, Media, Technology		76	72	(5.2)	58	165	184.5
Manufacturing		526	368	(30.1)	410	481	17.3
Other Services		231	288	24.7	179	304	74.7
Professional, Scientific, Management		190	257	35.3	194	229	18.0
Public Administration		286	424	48.3	502	450	(10.4)
Retail Trade		654	602	(8.0)	541	434	(19.8)
Transportation, Warehousing, Utilities		156	202	29.5	215	417	94.0
Wholesale Trade		222	132	(40.5)	67	26	(61.2)

Sources: U.S. Census Bureau 2000 and 2009.



Source: U.S. Census Bureau 2009.

Figure 3-4: Employment by Industry, McIntosh County, Georgia



Source: U.S. Census Bureau 2009.

Figure 3-5: Employment by Industry, Long County, Georgia

McIntosh County Labor Force and Industry

While the unemployment rate in McIntosh County (11.4%, see Table 3-12) was relatively high in 2010, workforce drivers for the county include recreation, natural resources, and the county's rural quality of life. The single industry with the largest number of jobs is tourism, likely because of the county's situation along the Atlantic Ocean and numerous waterfront historic sites and recreational opportunities. Educational, Health, Social Services is another large industry in the county. Construction-related jobs, education (McIntosh County School System), and retail are also large industries. Large private employers include the Darien Telephone Company, Piggly Wiggly, Kentucky Fried Chicken, and Southeastern Bank. The county's traditional industry – shrimping and commercial fishing – is in decline, as are the agriculture and forestry industries. Increasing land values are prompting commercial timber companies to sell large tracts of land for residential development, further diminishing overall labor opportunities within McIntosh County. These tracts are often located in environmentally sensitive areas that lack water and sewer service (CGRDC 2007).

Long County Labor Force and Industry

In 2010, the unemployment rate in Long County (7.2%) was lower than that of McIntosh County (11.4%) and the state as a whole (10.2%) (Table 3-12). Workforce opportunities in Long County include commercial nursery/greenhouse operations, retirement communities, eco-tourism, historic tourism, telecommunications, residential development, and selected light industries that are compatible with the county's rural lifestyle. As in McIntosh County, Long County's traditional industries of agriculture and forestry are shrinking due to development pressures. The Long County/Ludowici Industrial Park, centrally located within the city limits along State Hwy. 57, was developed to attract industry through the provision of easy access to the surrounding transportation network as described in Section 3.2.3. In addition to the Fort Stewart military base located in the northeastern portion of the county, the largest Long County private employers in 2005 were Creamers Contracting, Dairy Queen, DeLoach Building Components, Inc., GHM Rock & Sand, and Huddle House. Educational (Long County School System), Health, and Social Services is another large industry in the county. (Grant Services and Consulting, Inc. 2005)

3.2.3.6 County Revenues and Expenditures

One of the main responsibilities of a local government is to provide services and amenities to its citizens through the imposition and collection of taxes, fees, and subsequent allocation of monetary resources through its annual budget. The quality and availability of facilities and services play major roles in attracting and promoting development within a county. Table 3-13 provides expenditures for community services, including public works, judicial, administration, and capital outlays, etc.

Table 3-14 and Figures 3-6 and 3-7 provide summaries of county revenues from property and sales taxes, permits, fees, and other sources from the latest information available. Property and sales taxes accounted for 65.1% of the local revenues in McIntosh County and 70.7% in Long County, (Georgia Department of Audits and Accounts 2009 and 2010) compared to averages of 72.3% nationwide and 65.1% statewide (U.S. Census Bureau 2011). The tax rate, or millage, in each county is set annually by the Board of County Commissioners and the Board of Education. A tax rate of one mill represents a tax liability of one dollar per $1,000 of assessed value of property or sale. Property in Georgia is assessed at 40% of the fair market value (FMV). In 2010, the millage was $12.49 for McIntosh County and $15.71 for Long County (Georgia Department of Revenue 2011b). Generally, about 50% of the local revenues are allocated towards the school budget (Georgia Department of Education 2011); see discussion below under "McIntosh and Long Counties School District Revenues." Of note, McIntosh County's revenues are almost double that of Long County, due in part to McIntosh County's cultural, recreational, and ecological tourism activity.

Table 3-13
County Expenditures for McIntosh and Long Counties, Georgia

Operation Costs	McIntosh County FY Ending Sept 2009		Long County FY Ending June 2010	
	Expenses	%	Expenses	%
General Government	$2,507,491	16.27	$1,021,661	14.45
Judicial Administration	$1,282,339	8.32	$708,675	10.02
Public Administration	$6,600,872	42.83	$2,406,331	34.04
Public Works	$2,089,025	13.55	$1,597,831	22.60
Health and Welfare	$134,881	0.88	$570,815	8.07
Parks, Recreation, and Cultural	$466,967	3.03	$169,783	2.40
Community Development	$433,754	2.81	$229,424	3.24
Total Operation Expenditures	**$13,595,209**	**88.21**	**$6,704,520**	**94.83**
Capital Outlay	$1,666,831	10.81	$220,642	3.12
Debt Service	$150,687	0.98	$144,959	2.05
Total Expenditures	**$15,412,727**	**100**	**$7,070,121**	**100**

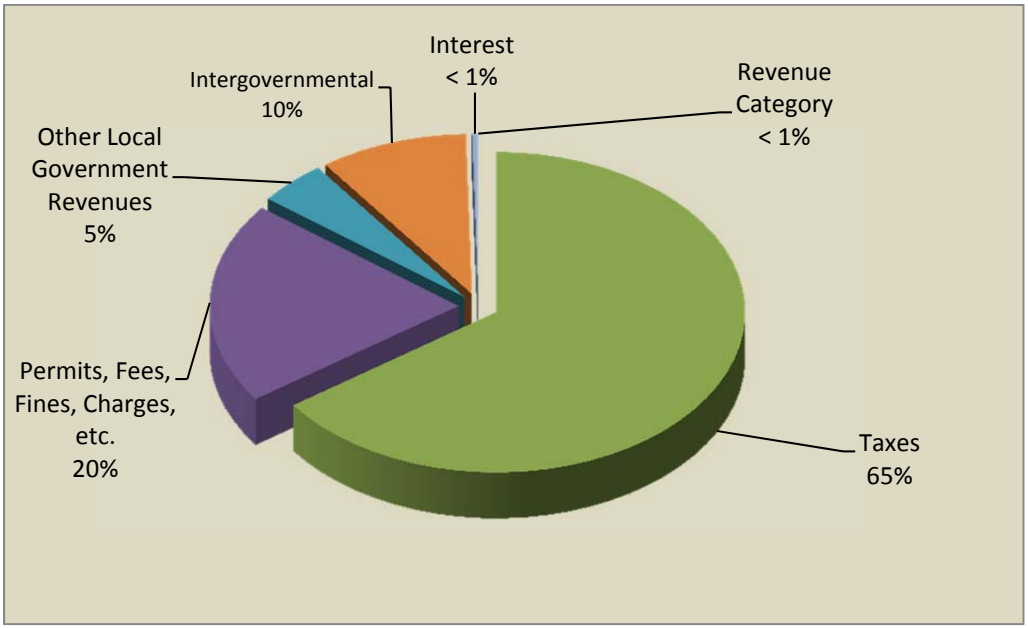
Note: When accounting for capital outlays, McIntosh County expenditure exceeds revenues. In accounting, these types of expenditures are capitalized, or recognized in a budget gradually over the course of an asset's useful life, and usually show as a liability on a balance sheet.

Sources: Georgia Department of Audits and Accounts 2009 and 2010.

Table 3-14
County Revenues for McIntosh and Long Counties, Georgia

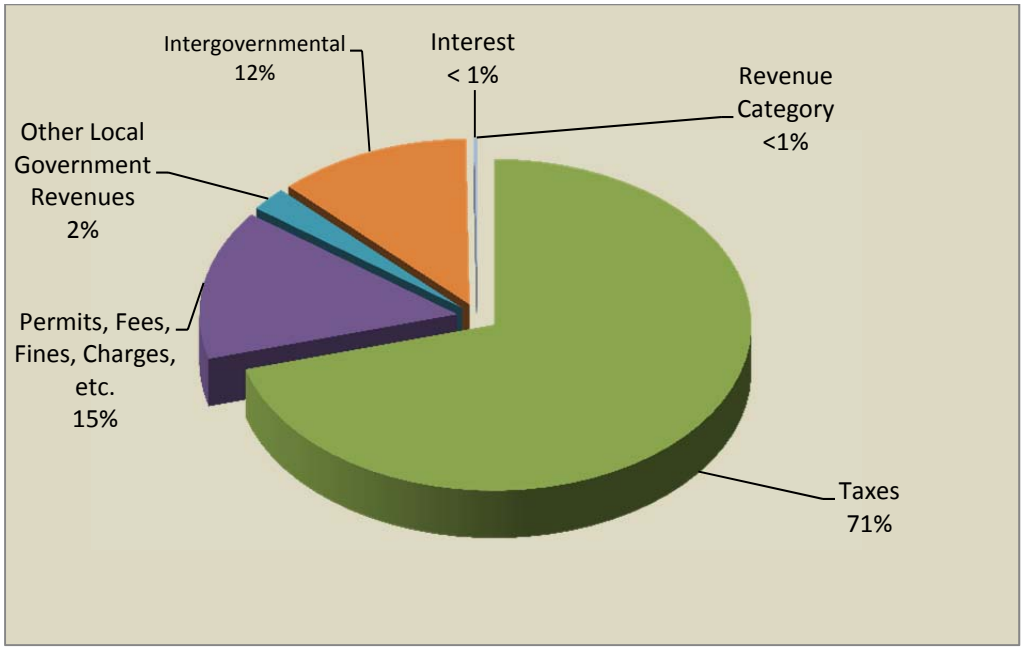
County Revenue All Sources	McIntosh County FY Ending Sept 2009		Long County FY Ending June 2010	
	Revenues	%	Revenues	%
Property Taxes	$5,903,500	41.9	$3,843,573	54.0
Sales Taxes (on Timber, Vehicles, Tourism, Other)	$3,275,055	23.24	$1,189,360	16.7
Permits, Fees, Fines, Charges	$2,869,073	20.36	$1,040,862	14.62
Other Government Revenues	$628,819	4.46	$166,105	2.33
Intergovernmental	$1,358,210	9.64	$866,111	12.16
Interest	$55,504	0.39	$15,694	0.22
Total Revenues	**$14,090,161**	**100**	**$7,121,705**	**100**

Sources: Georgia Department of Audits and Accounts 2009 and 2010.



Source: Georgia Department of Audits and Accounts 2009.

Figure 3-6: McIntosh County, Georgia, Revenues (FY Ending Sept 2009)



Source: Georgia Department of Audits and Accounts 2010.

Figure 3-7: Long County, Georgia, Revenues (FY Ending June 2010)

Basis for Timber Sales Tax

Timber sales are taxed at the County's current tax rate, or millage, and collected in the years when the timber is harvested. The County assesses harvested timber at 100% of its FMV. The FMV of timber is generally equal to the actual sale price, but must be in line with the current prevailing timber price on the open market. (University of Georgia - Warnell School of Forest Resources 1998)

Table 3-15 shows the annual timber sales (assessed value) and sales taxes over the last five years in McIntosh and Long Counties (with historical millage). As shown in Table 3-16, timber sales taxes in year 2010 reflect approximately 0.3% of the McIntosh County revenues and 1.2% of the Long County revenues. Of note, since year 2006, the sales taxes collected from timber harvesting in Long County have been consistently greater, almost twice as much, as those of McIntosh County.

Table 3-15
Historical Harvested Timber Sales Tax Revenues in McIntosh and Long Counties, Georgia

	McIntosh County				Long County			
Year	Millage Rate	Harvested Acres	Assessed Value	Sales Tax	Millage Rate	Harvested Acres	Assessed Value	Sales Tax
2010	12.49	11,156	$3,686,496	$46,044	15.71	21,209	$5,344,223	$83,958
2009	12.49	10,438	$3,413,175	$42,630	15.71	33,395	$6,950,846	$109,198
2008	12.49	59,922	$1,321,863	$16,510	13.06	33,133	$7,252,906	$94,723
2007	12.50	26,694	$4,302,684	$53,784	13.06	22,975	$6,381,888	$83,348
2006	10.50	19,241	$5,212,535	$54,732	18.32	19,194	$6,610,910	$121,112

Note: (a) McIntosh and Long County tax digests did not show the acreages for 2011 at the time of the writing of this FEIS.

Sources: Georgia Department of Revenue 2011a and 2011b.

Table 3-16
County Revenue from Timber Tax for McIntosh and Long Counties, Georgia

County Revenue	McIntosh County		Long County	
	2010	% of Total	2010	% of Total
Timber Tax	**$46,044**	**0.3%**	**$83,958**	**1.2%**
Total Revenues	$14,090,161		$7,121,705	

Source: Georgia Department of Revenue 2011a.

McIntosh and Long Counties School District Revenues

As of June 2010, the McIntosh County School System student enrollment was approximately 1,979 students (McIntosh County Board of Education 2011). The Long County School System student enrollment was approximately 1,995 students (Long County Board of Education 2011a).

The McIntosh and Long County School Districts acquire funds for each year's budget from a combination of county, state, and federal revenues (Georgia Department of Education 2011; see Table 3-17). The Georgia Department of Education develops each year's budget based on projected full-time equivalent (FTE) teacher instructional workload requirements per child, which differs with the actual enrollment. In 2010, McIntosh County's FTE was projected as 1,731, while Long County's FTE was projected as 2,513 (Georgia Department of Education 2011). Under state law, counties are required to levy a minimum property tax rate (based upon the FTE projection) and contribute a portion of the revenue raised to the school system. When school systems with smaller property tax bases per student raise less revenue from the required levy than systems with larger property tax bases per student, the state provides

revenue through a grant to offset the difference (Georgia State University 2003). As shown in Table 3-17, while both counties have essentially the same number of students, Long County's contribution of county revenues was almost half that of McIntosh County, therefore, under the State's guidelines and based upon FTE projections, the State's contribution of revenue offsets the difference.

Table 3-17
School Revenue and Expenditures Report for McIntosh and Long Counties, Georgia, for Fiscal Year 2010

	McIntosh County	Long County
County Revenues	$7,616,104	$3,141,659
State Revenues	$5,718,275	$10,330,226
Federal Revenues	$2,369,290	$3,636,377
Total School Revenues	**$15,703,669**	**$17,108,262**
Local per FTE	$4,400	$1,250
State per FTE	$3,303	$4,111
Federal per FTE	$1,368	$1,447
Revenue Per FTE[(a)]	**$9,071**	**$6,808**
Expenditure per FTE	$8,665	$7,023
Total School Expenditures	**$14,998,655**	**$17,648,379**

Note: (a) School budget revenues/expenditures are based upon FTE, not actual enrollment. In 2010, McIntosh County's FTE was projected as 1,731, while Long County's FTE was projected as 2,513.

Key: FTE = full-time equivalent.

Source: Georgia Department of Education 2011.

Impact Aid

Since 1950, Congress has provided financial assistance to school districts under the Impact Aid Program (now Title VII of the Elementary and Secondary Education Act of 1965). Pursuant to the Soldiers' and Sailors' Civil Relief Act of 1940 (50 United States Code [U.S.C.] 574), Impact Aid funds are considered general aid to the recipient school districts that have lost a portion of their local tax base because of federal ownership of property or have federally connected children, as described below. This assistance may be used in whatever manner the school districts choose in accordance with their local and state requirements. Historically, school districts have used these funds to offset a variety of operational expenses (i.e., teacher and aide salaries, tutoring, advanced placement classes, special enrichment programs, textbook purchasing, computers, after-school programs). Funds are deposited directly into the bank accounts of qualifying school districts by the U.S. Department of Education. Since 1970, the Impact Aid Program has been funded only at a 60% level.

There are four programs and grants under the Impact Aid Program (U.S. Department of Education 2008):

- ***Section 8002.*** Payments for federal property to local school districts that have lost a portion of their local tax base because of federal ownership of property when the federal government has acquired, since 1938, real property with an assessed valuation of at least 10% of all real property in the district at the time of acquisition.
- ***Section 8003.*** Payments for federally connected children to help local school districts educate federally connected children (i.e., children of members of the uniformed services, children who live on federal property, children whose parents work on

federal property). Section 8003 also includes additional payments for children with disabilities who are eligible under the Individuals with Disabilities Education Act.

- ***Section 8007b – Discretionary Construction Grant Program.*** Authorizes competitive grants for emergency repairs and modernization of school facilities to certain eligible school districts that receive Impact Aid.
- ***Section 8008– Facilities Maintenance***. Section 8008 grants help maintain federally owned school facilities that are operated by school districts that serve military installations.

The Long County School District currently receives Impact Aid financial assistance under Sections 8002 and 8003 due to the amount of real property owned and removed from the local tax rolls by the federal government and due to the number of students in the county who have at least one parent stationed at Fort Stewart. Fort Stewart encompasses approximately 28,156 acres or 10.9% of Long County's total acreage. For FY 2011, the school district received $35,868 in 8002 funding and $148,607.85 in 8003 funding. In FY 2011, the school district received a total of $237,362.17 from the Impact Aid Program (Table 3-18); however, this amount reflects a delinquent Section 8002 payment from FY 2009 and FY 2010 (Georgia Department of Education 2010). The Long County School District anticipates receiving $240,000 from this program in FY 2012 (Simmons 2011).

Table 3-18
Federal Impact Aid – Long County

Year	Payments Received	Section 8002 FY2011	Section 8003 FY2011
2011	$237,362 [(a)]	$35,868	$148,608
2012	$240,000 [(b)]		

Notes:
(a) FY 2011 payment received included delinquent Section 8002 payments ($52,886 from FY 2009 and FY 2010).
(b) Projected.

Source: Georgia Department of Education 2010.

To be eligible for Section 8003, a school district must have at least 400 federally connected students in their Average Daily Attendance or at least 3% of all students in the school district's Average Daily Attendance must be federally connected. The Long County School District has a total of 749 federally connected students, including 37 children with disabilities, which is about 38% of all students in the district (Simmons 2011).

In FY 2010, total school revenue per FTE in Long County was $6,808 (see Table 3-17). During the same time, expenditures per FTE in the Long County School District totaled $7,023 for both military and civilian children. Among total revenues, the school district received $4,111 per FTE from the state and $1,447 per FTE from the federal government (including Impact Aid); local taxpayers contributed $1,250 per FTE. (Georgia Department of Education 2011)

The McIntosh County School District does not receive financial assistance under the Impact Aid Program. In FY 2010, total revenue per FTE in McIntosh County was $9,072. During the same time, total expenditure per FTE in the McIntosh School District totaled $8,665 for both military and civilian children. Among total revenues, the school district received $3,303 per FTE from the state and $1,368 per FTE from the federal government. Local taxpayers contributed $4,400 per FTE (Georgia Department of Education 2011).

3.2.3.7 Community Services

This section describes the community and public services available within the ROI, including emergency response protocol and medical facilities, fire and police protection, schools, parks, transportation, utilities, and other public facilities.

McIntosh County Community Services

Intergovernmental coordination occurs between the McIntosh County government and the City of Darien, the county seat. In addition, the GA ANG and local governments provide emergency response assistance to each other through a formal mutual aid agreement and both coordinate closely when TBR is active. Governmental facilities within the city include a city hall, the Darien Police Department, the public works department, the county road department, a post office, and state departmental offices. Some residential areas within the county have immediate access to facilities such as public water and garbage collection and are served by police and volunteer fire protection. Public water and garbage collection is available in the towns of Darien, Eulonia, and Townsend, among others.

The Darien-McIntosh County Volunteer Fire Department provides services both to the city and to the county's unincorporated areas. The fire department is staffed with a combination of volunteers and fulltime personnel and is funded through both McIntosh County's and the City's general funds. While there are no hospitals in McIntosh County, the McIntosh County Health Department operates one health clinic. McIntosh County's Emergency Medical Services (EMS) responds to emergency medical calls, provides advanced life support, emergency medical care to sick and injured persons, and emergency transport. EMS is countywide and funded through McIntosh County's general fund.

The City of Darien Public Works Department maintains a grass-strip airport located in the unincorporated part of the county, approximately 3 miles from Darien. The airport is currently closed to general aviation, but can be used in emergency situations. There are 84.0 miles of state routes, 237.1 miles of county roads, and 19.3 miles of city streets within the county. Other federal highways include I-95 and U.S. Highway 17 running along the eastern section of McIntosh County. Recreational lands designated for use by residents exist throughout the county, with many public and private docks available, as well as park areas that are used for fishing, hiking, and camping. (University of Georgia 2010)

The McIntosh County School District includes pre-school to grade 12 consisting of two elementary schools (Oak Grove Intermediate School and Todd Grant Elementary School), a middle school (McIntosh County Middle School), and a high school (McIntosh County Academy). As of June 2010, the district had 121 full-time teachers and over 1,979 students. (McIntosh County Board of Education 2011)

Long County Community Services

Intergovernmental coordination occurs between the Long County government and the City of Ludowici, the county seat. Ludowici is the only municipality in Long County where public water and sewer service are available. Recreational and park lands designated for the county include recreation facilities in Ludowici and along the Altamaha River. Public safety includes sheriff services, emergency medical services, and volunteer fire protection. The Long County Sheriff's Department, with full-time personnel, provides police protection for all unincorporated areas of Long County. (University of Georgia 2010)

The City of Ludowici and the Long County Commission fund a joint city-county volunteer fire department. Much of the funding needed to support the volunteers comes from donations and local fundraising efforts. There is one station in Ludowici and a pumper truck located in a neighboring county, at the Liberty County Fire Department, to respond to emergencies in the north end of the county. With the abundant forestry reserves throughout the county, in times of emergency, the Ludowici/Long County Fire Department and Fort Stewart assist each other with first responders. Fort Stewart has many forestry

personnel, engineering operators, forestry technicians, and supervisors to assist with fire emergencies by operating tractor/plow units, pumper trucks, fuel trucks, and service trucks. Fort Stewart personnel also manage the prescribed burning at TBR. (Howard 2011a)

While there are no hospitals in Long County, the Long County Health Department operates one clinic in Ludowici. Volunteer EMS is provided to residents in the form of ambulance service. Beyond Long County's Health Department, school infirmaries, one nursing home, and one private pharmacy, no other health care services are available in Long County. Nearby hospitals include Wayne Memorial Hospital in Jesup and Liberty Regional Medical Center in Hinesville. Winn Army Community Hospital is located at Fort Stewart.

The Long County Road Department provides services to the city and unincorporated parts of the county. The county commission runs a public transit system throughout the county that is operated through a combination of fare revenue, county subsidy, and a federal grant administered through the U.S. Department of Transportation (USDOT). Both CSX Railroad and Norfolk Southern serve Long County. Georgia Highways 57 and 38 traverse a portion of the county and are the county's primary arterials. There are 60.9 miles of state highways, 257.7 miles of county roads, and 12.3 miles of city streets within the county. (University of Georgia 2010)

The Long County School District includes pre-school to grade 12 consisting of one elementary school (Smiley Elementary School), a middle school (Walker Middle School), a high school (Long County High School), and one private school (Faith Baptist Christian School). As of June 2010, the district had 119 full-time teachers and over 1,995 students. The district had a total of 749 federally connected students, including 37 children with disabilities. (Long County Board of Education 2011a)

3.2.4 Environmental Consequences

3.2.4.1 Methodology and Evaluation Criteria

Potential socioeconomic changes that may be caused by each alternative are measured against the affected environment (or baseline) conditions and will be used by USMC decision-makers to select an alternative that meets the purpose and need of the Proposed Action. The analysis involved compiling available data and making reasonable assumptions to accurately estimate changes related to the Proposed Action. The socioeconomic impacts evaluated throughout this section were identified from information gathered from the public during the scoping process and during the USMC's examination of the existing conditions and development of the action alternatives.

Estimations for construction and operation of the Proposed Action (Alternatives 1, 2, 3, or 4) are displayed in Table 3-19 and were developed from conceptual plans using limited available information and best professional judgment since precise cost estimates were not available (Howard 2011a). The analysis in "Economic Impact from Construction and Operation" below uses these estimates and 2015 as the "future baseline" year because that is approximately when the Proposed Action would be implemented. For this reason, all expenditures and salaries in the analysis are in year 2015 dollars, and it is assumed that all construction and operations expenditures would be made in the local economy. In addition, the construction activities are assumed to occur over a one-year time period, however, actual construction activities may take longer than one year. The construction workforce would be hired locally to the maximum extent practicable (Howard 2011a).

Table 3-19
Estimations and Assumptions for Regional Economic Impact Analysis

Cost Items:	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	#	($)	#	($)	#	($)	#	($)
Real Estate Acquisition Cost		$21,404,166		$58,700,000		$80,104,166		$67,620,800
1. Construction Phase (Temporary):								
Number of Target Areas	3	---	5	---	8	---	6	---
Number of Targets and Cost (225K Each)	3	$675,000	5	$1,125,000	8	$1,800,000	6	$1,350,000
Fencing and Signage Cost (625K Each)		$1,875,000		$3,125,000		$5,000,000		$3,750,000
Clearing and Grubbing Cost:		---		---		---		---
Target Areas (625K Each)		$1,875,000		$3,125,000		$5,000,000		$3,750,000
Fence Clear Zones and Roads (250K)		$750,000		$1,250,000		$2,000,000		$1,500,000
Additional Observation Tower Cost		--	1	$1,000,000	1	$1,000,000	1	$1,000,000
Relocation Cost of Existing TBR Facilities		$8,000,000		---		---		---
Total Construction Cost less Real Estate Acquisition Cost		**$13,175,000**		**$9,625,000**		**$14,800,000**		**$11,350,000**
2. Annual Operations and Maintenance Phase (Long-Term):								
2a. Manpower and Costs								
Total Manpower (No. of Full-Time Employees) and Earnings	10	**$850,000**	12	**$1,020,000**	18	**$1,530,000**	12	**$1,020,000**
2b. Equipment and Material Supply Cost								
Total Maintenance and Repairs Costs (Local fuel and Miscellaneous Spending)		**$65,742**		**$127,007**		**$192,749**		**$127,007**
2c. Associated Expenditures and Information								
Total Associated Expenditures and Information (Integrated Natural Resource Management Plans)		**$300,000**		**$300,000**		**$300,000**		**$300,000**

Source: Howard 2011a.

Beginning in 2015, it is estimated that the expanded facility would become operational and would require full-time personnel. Operation of the facility would require a full-time chief law enforcement officer, a forester, and two technicians along with range operators when TBR is active, and part-time or contracted labor maintenance crews. Salaries for each position were compiled according to the pay-grade distribution of the required positions. These numbers and salaries were estimated by the USMC using the Georgia Army and Air National Guard manpower standards. New personnel may be hired locally or they would in-migrate to the area for employment. Annual maintenance on target areas, towers, and roads for each action alternative would likely occur through service contracts consisting of mowers, janitorial staff, and utilities maintenance staff. To the extent possible, these service contracts would be filled from the local labor force and related businesses. (Howard 2011a)

3.2.4.2 Common Elements Among the Action Alternatives

The action alternatives have several elements in common. Existing socioeconomic conditions, as described in Section 3.2.3, both within the acquisition areas and throughout the ROI are expected to change to some degree under each action alternative. Under each, the USMC would acquire and manage land within McIntosh and Long Counties and construct and operate infrastructure for the expanded training operations. Under each action alternative, construction would have some beneficial local and regional impacts from the USMC's expenditures on materials and equipment and with spending for maintenance and operation throughout the life of the project. Construction and operation would also have some minor beneficial employment impacts from the creation of temporary jobs during construction and permanent jobs for operation and maintenance.

While none of the action alternatives would have a disproportionate impact on minority, low-income, or children populations, two of the alternatives would require the displacement of two households, demolition of two residential structures, and the displacement of one private business.

As a result of land acquisition under each alternative, timber would no longer be harvested for private revenue within those lands or by McIntosh County within their TBR timber easement and the associated local sales taxes collected from the private sale of timber products would be lost. Also under each action alternative, property tax status of the lands acquired would change from the transfer of privately owned properties to federal ownership, which would reduce the counties' abilities to generate revenue through property taxes. Property tax revenue impacts to the school board currently are offset with Impact Aid and state grants, and under each action alternative these grants may increase.

Under each action alternative, acquisition of lands could potentially include changes in accessibility of private roads; however, impacts on public roadway accessibility (including emergency access) are not anticipated. Under each action alternative, operation of the new facility is not expected to change the counties' community services and the counties' capacities to provide routine law enforcement, or fire protection.

While all of the action alternatives have several elements in common, each alternative has distinct differences. Section 3.2.4.3 describes, in detail, the socioeconomic environment expected to exist in the future within the ROI under each of the action alternatives. A summary of the findings of the potential socioeconomic environmental consequences are displayed by action alternative in the comparison table at the end of Section 3.2.4.3.

3.2.4.3 Action Alternatives

Displacements of Residents and Businesses

Under the Proposed Action, the USMC would acquire all properties in fee simple within the study area of the particular alternative in order to protect the public's health, safety, and welfare. The property owners would not have the opportunity to retain their property. Displaced persons would be relocated in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970

(relocation assistance), as amended by the Uniform Relocation Act of 1987 (U.S. House of Representatives 2010). Figure 2-18 shows the current proposed acquisition areas, designated as Areas 1A, 1B, and 3.

Among the properties comprising the four action alternatives, the majority of the properties are classified as undeveloped forest conservation lands, primarily owned by individuals or companies involved in the forestry industry. In addition to these, Parcel 6069, within Area 1A, has a residence/household (within one housing unit) which would be displaced, and Parcels 7000 and 7001 (both owned by the same individual) within Area 1A, share a residence/household (within one housing unit) which would be displaced (see Figure 3-3). The fields on Parcels 7000 and 7001 are used year-round as a business for the outdoor group participation sport of paintball. There are no residences/households or business-use properties within Areas 1B or 3. As described below, Alternatives 1 and 3 would require displacements (because there are two residences and one business within Area 1A); Alternatives 2 and 4 would not require displacements (Table 3-20).

Table 3-20
Estimated Displacements of Population and Businesses

	Alternative			
	1	2	3	4
McIntosh County				
Residences/Households	0	0	0	0
Estimated Population Displaced	0	0	0	0
Businesses	0	0	0	0
Long County				
Parcel Number(s)	6069, 7000, 7001	N/A	6069, 7000, 7001	N/A
Residences/Households	2	0	2	0
Estimated Population Displaced[(a)]	6 persons	0	6 persons	0
Businesses	1	0	1	0

Source: (a) U.S. Census Bureau 2010.

Alternative 1. Under Alternative 1, Areas 1A and 1B (11,187 acres) would be acquired. Two residences/households and one business would be displaced under Alternative 1, from Area 1A, Long County. Parcel 6069 has one housing unit, and Parcels 7000 and 7001 share one housing unit. According to the Long County Assessor's Office, Parcel 6069 is classified as "Conservation Use," subject to penalties if sold for residential or commercial development before the expiration of a 10-year covenant. No residences/households or businesses are located within Area 1B (no displacements). The other properties within Areas 1A and 1B are vacant and mostly utilized by the forestry industry.

To quantify the potential population displacement impact of Alternative 1, average household size from 2010 was utilized. The average household size in Long County was 2.81 persons. As such, potential population loss to the ROI resulting from the relocation of two households (or six persons) would be less than 0.04% of the 14,464 persons who currently comprise the total population of Long County (U.S. Census Bureau 2010). The loss of two housing units in Long County equates to less than 0.03% of the current 6,039 total housing units within the county (please refer to Section 3.2.3.4). Housing stock in Long County is adequate to absorb two displaced households if the residential property owners desired to stay in the area. According to the U.S. Census Bureau, approximately 16.8% of total housing units in Long County were vacant in 2010. In addition, if all the individuals within the two households were to leave their jobs within the ROI, the reduction in the employed labor force of the county would account for less than 1% of Long County's total labor force.

The fields on Parcels 7000 and 7001 are used year-round as a business for the outdoor group participation sport of paintball (see Figure 3-3). This business would be displaced under Alternative 1, from Area 1A. As with residential relocations, the Uniform Act stipulates that fair compensation or adequate assistance be provided for displaced businesses, recognizing their unique characteristics and needs. Relocation impacts tend to be more of a concern for smaller businesses that cater to a specific clientele or local client base within an area. Potential financial impacts may include costs to obtain suitable replacement sites to meet specific needs, costs of lost customers and memberships fees, and costs to promote a new location in order to attract new business and inform the established client base of a new location. If the business decides to leave the area when displaced, the reduction in the employed labor force of the county would account for less than 1% of Long County's total labor force.

Alternative 2. Under Alternative 2, Area 3 (23,674 acres) would be acquired. No residences/households or businesses are located in Area 3; the other properties within Area 3 are vacant and mostly utilized by the forestry industry. No displacements would be required under Alternative 2.

Alternative 3. Under Alternative 3, a combination of Areas 1A and 1B and Area 3 (34,861 acres) would be acquired. As described for Alternative 1, Parcels Numbers 6069, 7000, 7001, are located within Area 1A (see Figure 3-3), therefore Alternative 3 would likewise involve the displacement of two residences/households (two housing units) and one business. Effects on the Long County population, housing stock, and labor force from these displacements are described above under Alternative 1. No residences/households or businesses are located within Areas 1B or 3. The other properties within Areas 1A, 1B, and 3 are vacant and mostly utilized by the forestry industry.

Alternative 4. Under Alternative 4, Areas 1B and 3 (28,630 acres) would be acquired. No residences/households or businesses are located within Areas 1B or 3. The other properties are vacant and mostly utilized by the forestry industry. No displacements would be required under Alternative 4.

The numbers of displaced population, lost housing units, businesses, and effects on the regional labor force from displacements within the ROI caused under Alternatives 1, 2, 3, or 4 would be considered less than significant.

Environmental Justice Impacts and the Protection of Children

Section 3.2.3.3 showed that under existing conditions, there is no disproportionate concentration of minority, low-income, or children populations within the ROI. As described in Section 3.2.3.4, in the most conservative scenario, acquisitions of land would displace two households or approximately six persons. These households are located within 2010 Census Tract 9702 Block Group 3, Long County.

Table 3-21 shows the population characteristics by Census Block group for the parts of the counties that would be acquired under Alternatives 1, 2, 3, or 4 and, for comparison, for the counties and state overall. As shown, the minority, Hispanic, low-income, and children population characteristics of the block groups for the acquisition areas are similar to or lower than those of the county and state, demonstrating that any socioeconomic or environmental impacts that are attributable to any alternative would apply equally to any affected persons, regardless of minority, income, or age status. In accordance with EOs 12898 and 13045, this analysis shows that the minority, low-income, or children populations within the proposed acquisition area is not "meaningfully greater" than the minority, low-income, or children population percentage of the community of comparison. Therefore, no impacts would occur under any action alternative with respect to environmental justice.

Table 3-21
Environmental Justice and Children Population Characteristics by Census Tract and Block

County/Census Tract	Total Population	Percent Minority	Percent Hispanic	Percent Low-Income	Percent Children Population by Age			
					0 to 4	5 to 9	10 to 14	15 to 17
Long County [(a)]	10,304	39%	12.3%	23%	9.4%	8.3%	8.2%	4.0%
9702 Block 3 [(b)]	*2,535*	*33%*	*2.5%*	*15%*	*11.9%*	*9.1%*	*8.0%*	*4.6%*
McIntosh County [(a)]	10,847	37%	0.3%	21%	5.5%	5.6%	6.0%	4.9%
1101 Block 1 [(b)]	*1,362*	*39%*	*0.5%*	*14%*	*7.7%*	*8.2%*	*7.6%*	*4.1%*
9800 Block 1 (TBR)	0	0%	0%	0%	0%	0%	0%	0%
State of Georgia [(a)]	9,687,653	42.8%	8.80%	16.6%	7.1%	7.2%	7.1%	4.3%

Sources:
(a) U.S. Census Bureau 2010.
(b) U.S. Census Bureau 2000. Although 2010 Census Block total population data were available at the time of publication of this FEIS (Tract 9702 Block 3 = 3,633 persons and Tract 1101 Block 1 = 1,691 persons), the percentages of minority, Hispanic, low-income, and children within those blocks had not yet been released. Therefore, 2000 Census Block data are show in all columns for consistency and comparison purposes.

Economic Impact from Construction and Operation

This section presents the potential employment and economic development impacts within the ROI that would be generated from the construction and operations of the Proposed Action under the four action alternatives.

Construction-related activities associated with the Proposed Action and their related operations and maintenance activities would generate jobs during the construction period and would contribute to local income. Accordingly, direct and indirect economic impacts would result from these expenditures. The economic impacts captured within this analysis focus on those interrelated spending activities occurring between industries (business-to-business) as they respond to the demands of the expanded construction and operational activities of the Proposed Action. Basically, this involves capturing the direct construction expenditures and related indirect expenditures (changes in regional output), and the direct and indirect employment and income earnings potentials associated with the Proposed Action. Induced impacts resulting from increased household incomes due to changes in employment (i.e., spending from the household of a construction laborer) were not included in this analysis.

To calculate the indirect economic impacts to the regional economy, the USMC used Regional Input-Output Modeling System (RIMS II) multipliers. RIMS II multipliers are issued through the Bureau of Economic Analysis under the U.S. Department of Commerce and have been long used for measuring economic impact on numerous military planning projects in the preparation of NEPA-related documents. These multipliers are based on regional information derived from databases analyzing commercial, industrial, and household spending patterns and relationships. These multipliers also estimate the potential number of jobs created or lost as a result of changes in earning and spending patterns from a particular event (U.S. Department of Commerce 2011).

Construction activities (spending, jobs, and related income) are considered the direct impacts of the Proposed Action. The positive economic impacts of construction would affect the region for only a short time because construction would occur only during a one-year period and spending represents a one-time expenditure. Once construction funds leave the region through savings, taxes, or purchases of goods and services outside the region, the positive effects of the construction expenditures would no longer be a factor.

Operational impacts of the facility are considered long-term because the economic impacts represent the annual economic impact that would be present throughout the operational life of TBR. The indirect economic impacts of these jobs and income also were modeled using the direct effect RIMS II multipliers from the “other services” industry, which includes government enterprises.

RIMS II final demand Type-I output multipliers for the construction-industry sector for the two-county study area were applied to the direct construction expenditures for deriving the direct and indirect impacts. Type-I output, employment, and earnings multiples for the construction industry were applied to the direct operation and maintenance expenditures, employment, and earnings for derivation of the direct and indirect impacts. The resulting direct and indirect economic impacts (changes in regional output, employment, and earnings) associated with each alternative are presented in Table 3-22. It should be noted that the cost of land acquisition was not included in the total economic impact calculation because it is considered a transfer of assets that most likely would be used by the seller to purchase other lands or residences that may not be related to a specific economic impact. The employment impacts noted in Table 3-22 include both the direct construction jobs created from construction and operation as well as additional jobs created indirectly from the construction spending in the local community.

Table 3-22
Potential Regional Economic Impacts – Construction-Related Activities (FY 2015 Dollars)

Economic Impact	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Construction Expenditures (Temporary):				
Direct Economic Impact - Construction Expenditures	$13,175,000	$9,625,000	$14,800,000	$11,350,000
Indirect Economic Impact (Change in Regional Output)	$1,635,018	$1,194,463	$1,836,680	$1,408,535
Total Construction-Related Economic Impacts - All Expenditures	**$14,810,018**	**$10,819,463**	**$16,636,680**	**$12,758,535**
Construction Employment and Earnings (Temporary):				
Direct and Indirect Employment Impacts (Jobs)	131	96	147	113
Direct and Indirect Earnings Impacts	**$5,424,148**	**$3,396,064**	**$5,222,000**	**$4,004,709**
Annual Operations and Maintenance Expenditures (Long-Term):				
Direct Economic Impact - Supplies (Equipment and Materials) Expenditures	$65,742	$127,007	$192,749	$127,007
Indirect Economic Impact (Change in Regional Output)	$8,159	$15,762	$23,920	$15,762
Total Annual Operation and Maintenance Impacts - All Expenditures	**$73,901**	**$142,769**	**$216,669**	**$142,769**
Operation and Maintenance Employment and Earnings (Long-Term):				
Direct and Indirect Employment Impacts (Jobs)	12	15	22	15
Direct and Indirect Earnings Impacts	$959,216	$1,168,037	$1,752,845	$1,168,037

Alternative 1 indicates that the injection into the economies of McIntosh and Long Counties of approximately $13,175,000 through construction expenditures would generate an additional $1,635,018 from the increase in indirect economic activity that would occur in the region. Annual operation and maintenance expenditures would have a direct annual impact of economic output of $65,742 and an indirect annual impact of approximately $8,159. The model indicates the creation of 131 temporary jobs during the construction period, translating into approximately $5,424,148 in direct and indirect earnings within the ROI. The model indicates that operation of the facility would result in the creation of 12 permanent direct and indirect jobs, translating into approximately $959,216 per year in direct and indirect earnings.

Alternative 2 indicates that the injection into the economies of McIntosh and Long Counties of approximately $9,625,000 through construction expenditures would indirectly increase regional economic output by approximately $1,194,463. Annual operation and maintenance expenditures would have a direct annual impact of economic output of $127,007 and an indirect annual impact of approximately $15,762. During the construction period, approximately 96 temporary direct and indirect jobs would be created, translating into approximately $3,396,064 direct and indirect earnings within the ROI. Operation of the facility would result in the creation of 15 direct and indirect jobs, translating into approximately $1,168,037 per year in direct and indirect earnings.

Alternative 3 indicates that the injection into the economies of McIntosh and Long Counties of approximately $14,800,000 through construction expenditures would indirectly increase regional economic output by approximately $1,836,680. Annual operation and maintenance expenditures would have a direct annual impact of economic output of $192,749 and an indirect annual impact of approximately $23,920. During the construction period, approximately 147 temporary direct and indirect jobs would be created, translating into approximately $5,222,000 direct and indirect earnings within the ROI. Operation of the facility would result in the creation of 22 direct and indirect jobs, translating into approximately $1,752,845 per year in direct and indirect earnings.

Alternative 4 indicates that the injection into the economies of McIntosh and Long Counties of approximately $11,350,000 through construction expenditures would indirectly increase regional economic output by approximately $1,408,535. Annual operation and maintenance expenditures would have a direct annual impact of economic output of $127,007 and an indirect annual impact of approximately $15,762. During the construction period, approximately 113 temporary direct and indirect jobs would be created, translating into approximately $4,004,709 direct and indirect earnings within the ROI. Operation of the facility would result in the creation of 15 direct and indirect jobs, translating into approximately $1,168,037 per year in direct and indirect earnings.

The labor force was 5,073 persons in McIntosh County, with approximately 578 persons reported as unemployed, and 6,683 persons in Long County, with 408 persons reported as unemployed (U.S. Census Bureau 2010). The creation of jobs described above for construction and operation of each of the action alternatives would have a minor beneficial impact on employment within the ROI.

Forestry Industry - Loss of Harvesting Income, Sales Taxes, and Jobs

As part of all the action alternatives, private lands utilized by the forestry industry would be purchased. In addition, McIntosh County owns a timber easement within the current TBR that is proposed to be purchased. McIntosh County has owned this easement, which consists of timber rights on 3,007 acres, since TBR was acquired by USMC in 1992. The TBR INRMP provides the merchantable timber volumes within TBR (MCAS Beaufort 2007 [Appendix VII]). McIntosh County harvests timber from their easement periodically, including a harvest in 2011. The USMC would pay fair market value for the private lands and the McIntosh County easement.

As a result of private lands and easement acquisitions, timber would no longer be harvested for revenue within the property acquired, and local sales taxes collected from the private sale of timber and

forest products from these lands would be lost. An estimate of the economic value of the harvesting valuation and potential sales tax loss under each alternative is shown in Tables 3-23 and 3-23. These estimates are based on harvested acreages and production rates in the proposed alternative areas and reflect a one-time amount occurring over the timber life cycle (over 30 to 50 years).

Many unknown factors are involved in estimating the loss of future value of timber production and sales, especially since it cannot be known if or when the local industry would have harvested and sold the timber, what other sources (thus far unknown or uninvestigated) might exist that could be harvested within a reasonable distance, or what market conditions might exist in the future for the timber harvesting industry. Upon acquisition of the properties, the commercial timber companies would, however, be afforded the opportunity to transfer their operations, specialized equipment, and capital assets to other timber properties in their possession or acquire other better producing timber properties and continue the overall profitability of the enterprise.

Tables 3-23 and 3-24 are broken down by alternative, areas within the alternative, and county. The first section in Table 3-23 displays the acreages attributable to softwood and hardwood by alternative, area, county, and type of timber. The second section displays the relative valuations based on these same breakouts. Table 3-24 provides the individual county tax loss impacts as computed through application of the respective county millage. In order to compute valuations, the proposed area timber acreages and weighted production quantities (annual tons per acre based on soils types) were allocated based on production rates for expected volumes of various forest products and then applied to their respective price levels to arrive at total valuations.

Table 3-23
Estimate of Timber Valuation by Alternative - McIntosh and Long Counties
(Softwood: 30-year rotation cycle and Hardwood: 50-year rotation cycle)

Alternative	Areas	McIntosh County			Long County		
		Hardwood	Softwood	All Timber	Hardwood	Softwood	All Timber
Timber Acreages							
1	1A + 1B	235	2,042	2,277	1,525	6,267	7,792
2	3	693	4,451	5,144	3,116	12,979	16,095
3	1A + 1B + 3	928	6,493	7,421	4,641	19,246	23,887
4	1B + 3	928	6,493	7,421	3,564	14,345	17,909
Timber Valuation ($)							
1	1A + 1B	$528,163	$3,114,885	$3,643,048	$3,351,585	$9,234,554	$12,586,138
2	3	$1,571,809	$6,953,858	$8,525,668	$6,681,973	$19,478,952	$26,160,925
3	1A + 1B + 3	$2,099,973	$10,068,743	$12,168,716	$10,033,558	$28,713,506	$38,747,063
4	1B + 3	$2,099,973	$10,068,743	$12,168,716	$7,679,617	$21,478,640	$29,158,257

Table 3-24
Estimate of Timber Tax Impact by Alternative – McIntosh and Long Counties

Alternative	Areas	All Timber Value	Value Per Thousand	Millage Rate	Timber Tax
McIntosh County					
1	1A + 1B	$3,643,048	$3,643	12.49	$45,502
2	3	$8,525,668	$8,526	12.49	$106,486
3	1A + 1B + 3	$12,168,716	$12,169	12.49	$151,987
4	1B + 3	$12,168,716	$12,169	12.49	$151,987
Long County					
1	1A + 1B	$12,586,138	$12,586	15.71	$197,728
2	3	$26,160,925	$26,161	15.71	$410,988
3	1A + 1B + 3	$38,747,063	$38,747	15.71	$608,716
4	1B + 3	$29,158,257	$29,158	15.71	$458,076

Production levels (annual tons per acre), developed as part of the Land Use analysis in this FEIS (please refer to Section 3.1), were segregated by specific area and forest products, and were projected out to full maturity for valuation purposes. Softwood production was based on a 30-year maturation cycle, while hardwood had a 50-year cycle. It was assumed that both timber types (softwood and hardwood) were managed timberlands and accordingly thinned on a 15-year cycle producing an intermediate pulpwood harvest. At full maturity, softwood harvest included pulpwood, chip-n-saw, and sawtimber products, while hardwood was limited to a sawtimber product.

Alternative 1. In McIntosh County, an estimated 235 acres of managed hardwood and 2,042 acres of softwood forestland would be produced and potentially harvested once during a 30- to 50- year time period ($3,643,048 assessed valuation equivalent to $45,502 in timber sales tax revenues). In Long County, an estimated 1,525 acres of hardwood and 6,267 acres of softwood forestland would be produced and potentially harvested once during a 30- to 50-year time period ($12,586,138 assessed valuation equivalent to $197,728 in timber sales tax). While tax revenues lost from timber sales would occur only once during the 30- to 50- year time period, for perspective, the annual timber taxes collected in 2010 in McIntosh County was $46,044 and in Long County was $83,958, as reported in Table 3-16. Under Alternative 1, potential loss of timber harvesting sales taxes would be a significant impact.

Alternative 2. In McIntosh County, an estimated 693 acres of managed hardwood and 4,451 acres of softwood forestland would be produced and potentially harvested once during a 30- to 50- year time period ($8,525,668 assessed valuation equivalent to $106,486 in timber sales tax revenues). In Long County, an estimated 3,116 acres of hardwood and 12,979 acres of softwood forestland would be produced and potentially harvested once during a 30- to 50-year time period ($26,160,925 assessed valuation equivalent to $410,988 in timber sales tax). For perspective, the annual timber taxes collected in 2010 in McIntosh County was $46,044 and in Long County was $83,958 (Table 3-16). Under Alternative 2, potential losses of timber harvesting sales taxes would be a significant impact.

Alternative 3. In McIntosh County, an estimated 928 acres of managed hardwood and 6,493 acres of softwood forestland would be produced and potentially harvested once during a 30- to 50-year time period ($12,168,716 assessed valuation equivalent to $151,987 in timber sales tax revenues). In Long County, an estimated 4,641 acres of hardwood and 19,246 acres of softwood forestland would be produced and potentially harvested once during a 30- to 50-year time period ($38,747,063 assessed valuation equivalent to $608,716 in timber sales tax). For perspective, the annual timber taxes collected in 2010 in McIntosh County was $46,044 and in Long County was $83,958 (Table 3-16). Under Alternative 3, potential losses of timber harvesting sales taxes would be a significant impact.

Alternative 4. In McIntosh County, an estimated 928 acres of managed hardwood and 6,493 acres of softwood forestland would be produced and potentially harvested once during a 30- to 50-year time period ($12,168,716 assessed valuation equivalent to $151,987 in timber sales tax revenues). In Long County, an estimated 3,564 acres of hardwood and 14,345 acres of softwood forestland would be produced and potentially harvested once during a 30- to 50- year time period ($29,158,257 assessed valuation equivalent to $458,076 in timber sales tax). For perspective, the annual timber taxes collected in 2010 in McIntosh County was $46,044 and in Long County was $83,958 (Table 3-16). Under Alternative 4, potential losses of timber harvesting sales taxes would be a significant impact.

Forestry Jobs

As indicated in Table 3-12, in 2009, approximately 5% of the civilian labor force in McIntosh County and approximately 0.2% of the labor force of Long County were reported as employed in the forestry-related industries. Jobs in this sector would include those employed at lumber mills and those directly involved in rotational timber management and harvesting. Some unreported labor may include seasonal loggers and lumbermen that travel from job to job on a contractual basis. While the Proposed Action would impact only a small percentage of the counties' forestry-related labor force, upon land acquisition, jobs would likely transfer to other timber production properties. Impacts associated with the

loss of forestry-related jobs from the acquisition of lands under each of the action alternatives would be insignificant.

Local Property Tax Revenues

Property of the United States authorized by an Act of Congress for military purposes is exempt from local property taxation. Private property would be purchased in fee simple by the USMC under each of the action alternatives, and therefore, would be converted to nontaxable property for local and state taxing purposes. With the proposed land acquisitions under each of the action alternatives, McIntosh County's and Long County's total assessed value of taxable property in each county would be reduced.

This analysis provides estimates of the expected impact of the Proposed Action on the annual local property taxes receipts in the affected counties from the proposed USMC acquisition of private property. For this analysis, property tax rates are assumed to remain constant. The fiscal impacts and predicted total tax impacts associated with each alternative are shown in Table 3-25. The table also compares the predicted fiscal impacts relative to 2010 total county property tax receipts and total county revenues.

Table 3-25
Land Acquisition and Associated Tax Loss Summary

	McIntosh County				Long County			
	Total County Acreage		Property Taxes		Total County Acreage		Property Taxes	
	367,680		$5,903,500		258,240		$3,843,573	
Alternative	Acres Acquired	Percent of Total Acreage	Tax Loss	Percent of Total Taxes	Acres Acquired	Percent of Total Acreage	Tax Loss	Percent of Total Taxes
1	2,983	0.8%	$12,708	0.22%	8,204	3.2%	$53,572	1.39%
2	5,537	1.5%	$22,761	0.39%	18,137	7.0%	$118,435	3.08%
3	8,520	2.3%	$35,469	0.60%	26,341	10.2%	$172,007	4.48%
4	8,520	2.3%	$35,469	0.60%	20,110	7.8%	$131,318	3.42%

Alternative 1. Under Alternative 1, privately owned land parcels comprising approximately 2,983 acres in McIntosh County and 8,204 acres in Long County would be acquired by the USMC. Removal of these private parcels from the tax rolls would reduce county tax revenues by approximately $12,708 per year in McIntosh County and $53,572 per year in Long County. As of 2010, the county's total property tax revenue in McIntosh County was over $5.9 million and in Long County was over $3.8 million. The reduction in tax revenues attributable to the implementation of Alternative 1 would be less than 0.3% of current annual county property tax revenue in McIntosh County and approximately 1.4% of current annual county property tax revenue in Long County. Under Alternative 1, the acquisition of lands would have a significant impact on the annual property tax revenues of McIntosh and Long Counties.

As of 2010, the total tax revenues from all sources in McIntosh County were over $14 million and in Long County over $7 million. In relation to overall county tax revenues, this loss of property tax revenues would reduce the McIntosh County overall tax revenues by 0.1% and the Long County overall tax revenues by 0.8%.

Alternative 2. Under Alternative 2, privately owned land parcels comprising approximately 5,537 acres in McIntosh County and 18,137 acres in Long County would be acquired by the USMC. Removal of these private parcels from the tax rolls would reduce county tax revenues by approximately $22,761 per year in McIntosh County and $118,435 per year in Long County. As of 2010, the county's total property tax revenue in McIntosh County was over $5.9 million and in Long County over $3.8 million. The reduction in tax revenues attributable to the implementation of Alternative 2 would be approximately 0.4% of current annual county property tax revenue in McIntosh County and approximately 3.1% of

current annual county property tax revenue in Long County. Under Alternative 2, the acquisition of lands would have a significant impact on the annual property tax revenues of McIntosh and Long Counties. This loss of property tax revenues would reduce the McIntosh County overall tax revenues by 0.2% and the Long County overall tax revenues by 1.7%.

Alternative 3. Under Alternative 3, privately owned land parcels comprising approximately 8,520 acres in McIntosh County and 26,341 acres in Long County would be acquired by the USMC. Removal of these private parcels from the tax rolls would reduce county tax revenues by approximately $35,469 in McIntosh County and $172,007 per year in Long County. As of 2010, the county's total property tax revenue in McIntosh County was over $5.9 million and in Long County over $3.8 million. The reduction in tax revenues attributable to the implementation of Alternative 3 would be approximately 0.6% of current annual county property tax revenue in McIntosh County and 4.5% of current annual county property tax revenue in Long County. Under Alternative 3, the acquisition of lands would have a significant impact on the annual property tax revenues of McIntosh and Long Counties. This loss of property tax revenues would reduce the McIntosh County overall tax revenues by 0.3% and the Long County overall tax revenues by 2.5%.

Alternative 4. Under Alternative 4, privately owned land parcels comprising approximately 8,520 acres in McIntosh County and 20,110 acres in Long County would be acquired by the USMC. Removal of these private parcels from the tax rolls would reduce county tax revenues by approximately $35,469 per year in McIntosh County and $131,318 per year in Long County. As of 2010, the county's total property tax revenue in McIntosh County was over $5.9 million and in Long County over $3.8 million. The reduction in tax revenues attributable to the implementation of Alternative 3 would be approximately 0.6% of current annual county property tax revenue in McIntosh County and 3.4% of current annual county property tax revenue in Long County. Under Alternative 4, the acquisition of lands would have a significant impact on the annual property tax revenues of McIntosh and Long Counties. This loss of property tax revenues would reduce the McIntosh County overall tax revenues by 0.2% and the Long County overall tax revenues by 1.9%.

In summary, the counties' abilities to generate revenue through property taxes would be reduced as a result of each of the action alternatives. Losses of revenues for counties with low tax bases and relatively small populations have the potential to impact county services, education, infrastructure, and other essential services. The actual change in local government revenues may vary depending on the municipalities' response to a reduced tax base. Lost county revenues can delay or reduce capital investments for new infrastructure, timing of maintenance, and spending for essential municipal services such as police and fire protection. Long-term, local governments, with less revenue available, may face the undesirable choice of having to raise property and/or sales taxes or reduce spending.

Impact Aid Payments for Federal Property (Section 8002)

The County School Boards rely on a combination of local, state, and federal revenues for their operating budgets. As described above under "McIntosh and Long Counties School District Revenues," when school systems with smaller property tax bases per student raise less revenue from required property tax levies than systems with larger property tax bases, the state provides revenue through a grant to offset the difference (Georgia State University 2003). Under the State's guidelines, Long County receives a larger contribution of state revenue than that of McIntosh County. Also, as described in "McIntosh and Long Counties School District Revenues" above, Congress provides financial assistance under the Impact Aid Program to school districts that have lost a portion of their local tax base because of federal ownership of property (Section 8002) and/or that have federally connected children (Section 8003). Military installations currently occupy property in both McIntosh and Long Counties and acquisition of private property as part of the Proposed Action would increase federal property holdings in both counties (U.S. Department of Education 2011a). Under the Proposed Action, federally connected children within the two school systems are not expected to significantly increase or decrease.

Long County currently receives federal Impact Aid because Fort Stewart is located on approximately 28,156 acres or approximately 10.9% of the total county real property acreage. TBR is located in McIntosh County and comprises 5,183 acres or approximately 1.4% of the total county real property acreage. To be eligible for Section 8002 Impact Aid, a school district must demonstrate that the federal government, since 1938, has acquired real property with an assessed valuation of at least 10% of all real property in the district at the time of acquisition. Table 3-26 displays the potential acreage in federal ownership by alternative, area, and county.

Alternative 1 would increase federal holding of property in McIntosh County, with relation to total county acreage, from 5,183 to 8,166 acres or from approximately 1.4% to 2.2% of real property acreage; Long County would increase from 28,156 to 36,360 acres or from approximately 10.9% to 14.1% of real property acreage.

Alternative 2 would increase federal holding of property in McIntosh County, with relation to total county acreage, from 5,183 to 10,720 acres or from approximately 1.4% to 2.9%; Long County would increase from 28,156 to 46,293 acres or from approximately 10.9% to 17.9%.

Alternative 3 would increase federal ownership of property in McIntosh County, with relation to total county acreage, from 5,183 to 13,703 acres or from approximately 1.4% to 3.7%; Long County would increase to from 28,156 to 54,497 acres or from approximately 10.9% to 21.1%.

Alternative 4 would increase federal ownership of property in McIntosh County, with relation to total county acreage, from 5,183 to 13,703 acres or from approximately 1.4% to 3.7%; Long County would increase from 28,156 to 48,266 acres or from approximately 10.9% to 18.7%.

Under Section 8002 criteria, McIntosh County would not be eligible to receive Impact Aid since federal property holdings under each of the action alternatives would be less than 10%. However, the Long County School Board may be eligible for additional grants through the Impact Aid Program Section 8002 since federal property ownership in Long County already meets the requirement and, under each action alternative, the percentage of federal ownership would increase.

Federal Payments to Local Governments in Lieu of Taxes

Payments in Lieu of Taxes (PILTs) are federal payments to local governments that help offset losses in property taxes due to nontaxable federal lands within their boundaries. The Department of the Interior collects revenue annually from commercial activities on federal lands, such as oil and gas leasing, livestock grazing, and timber harvesting. A portion of these revenues are shared with the states and counties in the form of revenue-sharing payments. The balance is deposited in the U.S. Treasury, which in turn pays for a broad array of federal activities, including PILT funding to counties. Payment eligibility is reserved for local governments (usually counties) that contain nontaxable federal lands and provide vital government services, such as public safety, housing, social services, transportation, and the environment. The lands proposed to be acquired do not meet the eligibility criteria established for this program in 31 U.S.C. 6901.

An amendment to federal statutory authority governing PILT must be pursued by local and state officials rather than the USMC, as this type of potential mitigation is not within the USMC's control. If an amendment to include the TBR acquisition lands is successful, the amount of PILT payments would likely vary between counties and over time. (U.S. Department of the Interior 2011)

Table 3-26
Impact Aid Areas

Action Alternative	McIntosh County (367,680 Total Acres)					Long County (258,240 Total Acres)				
	Proposed Acquisition Acreage	Current Federal Acreage in County	Federal Percent of Current Total Acreage	Federal Acreage with Acquisition	Percent of Total Acreage with Acquisition	Proposed Acquisition Acreage	Current Federal Acreage in County	Federal Percent of Current Total Acreage	Federal Acreage with Acquisition	Percent of Total Acreage with Acquisition
1	2,983	5,183	1.4%	8,166	2.2%	8,204	28,156	10.9%	36,360	14.1%
2	5,537	5,183	1.4%	10,720	2.9%	18,137	28,156	10.9%	46,293	17.9%
3	8,520	5,183	1.4%	13,703	3.7%	26,341	28,156	10.9%	54,497	21.1%
4	8,520	5,183	1.4%	13,703	3.7%	20,110	28,156	10.9%	48,266	18.7%

Community Services

The Proposed Action would have some minimal effects on municipal services unrelated to tax revenues. This section describes the municipal and community services that may be affected under the Proposed Action.

Implementation of the Proposed Action could potentially include changes in accessibility of private roads; however, impacts on public roadway accessibility (including emergency access) are not anticipated. General security, law enforcement, waste management, maintenance, and other services at the site would be provided by the USMC and would place no additional demand on local community providers. For the current TBR facilities located in McIntosh County, mutual aid agreements are in place with the surrounding counties for emergency aid to the federal properties (firefighting and medical support) on an as-needed basis (Howard 2011a). With changes under the action alternatives, these mutual aid agreements would be expected to be reassessed with the local governments and may need modification or expansion to include the changed and expanded conditions at TBR and to determine if compensation should be made a part of these agreements. No portion of State Hwy. 57 would be closed under any of the action alternatives. The current practice of temporarily closing Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) during certain training activities would continue under any of the action alternatives. Under Alternatives 1, 3, and 4, range officials may temporarily close the portion of Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) that enters the new range boundary when access to the range would conflict with training operations. The road would otherwise remain open. The USMC and GA ANG currently work with emergency services, such as police or fire, to ensure that roads closed during training activities do not stop or delay emergency services from responding. The USMC and GA ANG will continue to work with emergency services to suspend training operations and allow access when necessary. The action alternatives are not expected to have a measurable effect on the counties' capacities to provide routine law enforcement or fire protection.

Construction and operation of the Proposed Action (Alternatives 1, 2, 3, or 4) would have an insignificant impact on community services (unrelated to tax revenues) within the ROI.

Summary of Impacts

This socioeconomic analysis describes anticipated potential socioeconomic changes within the ROI, both positive and negative, that likely would occur under implementation of each alternative. The most current information, quantitative methods, and model-based techniques were used to systematically analyze the potential impacts.

The Proposed Action would have some beneficial local and regional impacts from the USMC's expenditures on materials and equipment during construction and throughout the life of the project for maintenance and operations. The Proposed Action also would have some minor beneficial employment impacts from the creation of temporary jobs during construction and permanent jobs for operation and maintenance.

The Proposed Action would not have a disproportionate impact on minority, low-income, or children populations. However, both Alternatives 1 and 3 would cause the displacement of two residences (or two households, estimated six persons) and one business (other than forestry-industry business), all located within Area 1A, in Long County. There would be no displacements under Alternatives 2 and 4. Displacements among the action alternatives were evaluated in terms of the magnitude of lost and available housing units, displaced occupants and businesses, and the extent of impacts on the regional labor force within the ROI and were found to have an insignificant impact. The displacements under Alternatives 1 and 3 would be mitigated via relocation assistance that would be offered to affected individuals.

As a result of land acquisition, timber would no longer be harvested for private revenue or by McIntosh County within their TBR timber easement. The USMC would pay fair market value for the

lands/easement, but local sales taxes collected from the private sale of timber and forest products from these lands would be lost. While this study estimates future timber harvesting valuation and associated sales tax losses over a 30-year or 50-year cycle, there are many unknown factors involved in estimating a loss of future value of timber production and sales, especially since it cannot be known if or when the local industry would have harvested and sold the timber, or what market conditions might exist in the future for the timber harvesting industry. Moreover, under the action alternatives, the commercial timber companies and associated labor workforce would be afforded the opportunity to transfer their harvesting operations, specialized equipment, and capital assets to other properties in their possession or acquire better producing timber lands to continue their overall profitability of the enterprise. Acquisition of property under Alternative 3, the action alternative with the greatest potential impact, would reduce timber sales taxes in McIntosh County by $151,987 and in Long County by $608,716, over a 30- to 50-year time period. Also, as a result of land acquisition, there would be a loss of property tax revenues in McIntosh and Long Counties. Land acquisition under Alternative 3 would reduce property tax revenues in McIntosh County by 0.6%, and 4.5% in Long County.

According to DOD Financial Management Regulation 7000.14-R "Forty percent of installation net proceeds [of forest product sales] shall be distributed to the state that includes the military installation or facility from which forest products were sold during a fiscal year." There are no legal mechanisms by which the USMC can alter this regulation or any state regulation regarding distribution of revenues to counties. If an installation or facility is located in more than one county within the state, the USMC may provide a description of the acres of the installation or facility situated in each county along with the entitlement to the state.

While the counties' 2010 populations were similar in size (McIntosh: 14,333 persons; Long: 14,464 persons), Long County's total tax revenues from all sources ($7 million) were about half that of McIntosh County ($14 million); therefore the tax revenue losses to Long County would be greater. Long-term losses of sales and property tax revenues could impact local budgetary considerations involving capital expenditures related to infrastructure developments, routine scheduled maintenance, and the provision of essential public services (such as police and fire protection and education). In Long County, property tax revenue impacts to the school board currently are offset with Impact Aid and state grants, and under the Proposed Action these grants would be expected to increase. However, with less revenue available, the local government(s) may have to raise property and/or sales taxes (millage), reduce spending for essential public services, or find revenue from other sources. Unrelated to tax revenues, the construction and operation of the expanded TBR facilities are not expected to have measurable impacts on municipal services.

In summary, while the construction and operation activities associated with the action alternatives would have beneficial impacts on the local and regional economy and create some temporary and permanent jobs, the property and sales tax revenue losses associated with the acquisition of property required to meet the Proposed Action would result in significant impacts. Table 3-27 summarizes the potential impacts and presents a comparison of the action alternatives evaluated.

Table 3-27
Comparison of Action Alternatives – Estimated Socioeconomic Impacts

Characteristics	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	McIntosh County	Long County	McIntosh County	Long County	McIntosh County	Long County	McIntosh County	Long County
Population and Housing Impacts								
Displacement - Households	No impact	2 households (Parcels 6069 and 7000/7001)	No impact	No impact	No impact	2 households (Parcels 6069 and 7000/7001)	No impact	No impact
Displacement - Businesses	No impact	1 business (between Parcels 7000/7001)	No impact	No impact	No impact	1 business (between Parcels 7000/7001)	No impact	No impact
Displacement – Estimated Population	No impact	6 persons	No impact	No impact	No impact	6 persons	No impact	No impact
Environmental Justice and Protection of Children	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact
Economy, Employment, and Income Impacts								
Economic Impact from Construction (One Year) [(a)]	Direct Expenditure Impact:$13.2 million		Direct Expenditure Impact: $9.6 million		Direct Expenditure Impact: $14.8 million		Direct Expenditure Impact: $11.4 million	
	Indirect Impact: $1.6 million		Indirect Impact: $1.2 million		Indirect Impact: $1.8 million		Indirect Impact: $1.4 million	
	Total Earnings Impact: $5.4 million		Total Earnings Impact: $3.4 million		Total Earnings Impact: $5.2 million		Total Earnings Impact: $4.0 million	
	Employment Impact: 131 temporary jobs		Employment Impact: 96 temporary jobs		Employment Impact: 147 temporary jobs		Employment Impact: 113 temporary jobs	
Economic Impact from Operation (Annual) [(b)]	Direct Expenditure Impact:$ $65,742 annually		Direct Expenditure Impact: $127,007 annually		Direct Expenditure Impact: $192,749 annually		Direct Expenditure Impact: $127,007 annually	
	Indirect Impact: $8,159 annually		Indirect Impact: $15,762 annually		Indirect Impact: $23,920 annually		Indirect Impact: $15,762 annually	
	Total Earnings Impact: $959,216 annually		Total Earnings Impact: $1,168,037 annually		Total Earnings Impact: $1,752,845 annually		Total Earnings Impact: $1,168,037 annually	
	Employment Impact: 12 permanent jobs		Employment Impact: 15 permanent jobs		Employment Impact: 22 permanent jobs		Employment Impact: 15 permanent jobs	
Economic Impact from Acquisition of Lands – Property Tax (Annual)	$12,708 Significant Impact	$53,572 Significant Impact	$22,761 Significant Impact	$118,435 Significant Impact	$35,469 Significant Impact	$172,007 Significant Impact	$35,469 Significant Impact	$131,318 Significant Impact
Acquisition of Private Lands and Easements	USMC to pay fair market value	USMC to pay fair market value	USMC to pay fair market value	USMC to pay fair market value	USMC to pay fair market value	USMC to pay fair market value	USMC to pay fair market value	USMC to pay fair market value
Forestry-Related Impacts								
Timber Sales Over Time [(c)]	$3,643,048	$12,586,138	$8,525,668	$26,160,925	$12,168,716	$38,747,063	$12,168,716	$29,158,257
Timber Sales Tax Over Time [(c)]	$45,502 Significant Impact	$197,728 Significant Impact	$106,486 Significant Impact	$410.988 Significant Impact	$151,987 Significant Impact	$608,716 Significant Impact	$151,987 Significant Impact	$458,076 Significant Impact
Public Services Impacts								
Schools and Education	Insignificant Impact	Insignificant Impact May Increase Impact Aid	Insignificant Impact	Insignificant Impact May Increase Impact Aid	Insignificant Impact	Insignificant Impact May Increase Impact Aid	Insignificant Impact	Insignificant Impact May Increase Impact Aid
Community Services	Insignificant Impact	Insignificant Impact	Insignificant Impact	Insignificant Impact	Insignificant Impact	Insignificant Impact	Insignificant Impact	Insignificant Impact

Notes:
(a) Construction expenditures are for a one-year period only.
(b) Operations and Maintenance expenditures are on an annual basis.
(c) Softwood is generally cut once every 30 years and hardwood once every 50 years, therefore value of Timber Sales and Related Sales Taxes would occur incrementally over an extended 30-year or 50-year rotation cycle (not annual losses).

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3.2.4.4 No Action Alternative

Under the No Action Alternative, existing socioeconomic conditions, as described in Section 3.2.3, are expected to continue unchanged. The Proposed Action would not take place and the status quo would continue, the USMC would not acquire any land, and training operations at TBR would not change due to this Proposed Action. No residential or business displacements or changes to the population demographics within the study area or ROI would occur. No changes of property tax status within the study area would occur from the transfer of privately owned properties to federal ownership or from reductions of municipal revenues within the ROI related to property tax changes. There would be no changes to existing land uses, management of forested lands, timber harvesting practices, county revenues from timber sales or taxes, public road access, or community services within the study area or ROI. No additional military presence, construction, employment, or spending would occur within the study area or region. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.3 Recreation

This section describes the existing recreational resources on and around TBR and the potential impacts to private, public, and quasi-public recreational opportunities associated with each of the action alternatives, as well as the No Action Alternative.

3.3.1 Definition of Resource

Recreation generally refers to the use of natural resources in an outdoor setting for human enjoyment. Recreation is generally defined in two categories: active or passive. Active recreation is typically supported by high-infrastructure sites such as athletic fields, playgrounds, and golf courses, and usually involves team participation such as baseball or football. Passive recreation takes place in low-infrastructure sites such as conservation lands, wildlife preserves, campgrounds, and hunting preserves in smaller groups or alone. Passive recreational activities include hunting, fishing, hiking, mountain biking, horseback riding, wildlife viewing, and picnicking, among others. Hunting, the primary recreational use associated with the lands that would be acquired under the Proposed Action, is generally classified as a passive recreational activity and is typically associated with low-infrastructure sites only.

3.3.2 Regulatory Framework

3.3.2.1 Federal

When enacted in 1960, the Sikes Act (16 U.S.C. 670a-670o; 74 Stat. 1052) provided for cooperation by the U.S. Department of the Interior and the DOD with state agencies in planning, developing, and maintaining fish and wildlife resources on military reservations. The statute also addresses natural resources management on military installations and provides for public access to such resources. The 1997 Sikes Act Improvement Act (SAIA; 16 U.S.C. Section 670a *et seq*.) required the Secretary of Defense to carry out a program for integrated natural resources management on military installations (Federal Facilities Environmental Stewardship and Environmental Compliance Center 2011).

TBR range personnel conduct and supervise a limited public hunting program on USMC lands in accordance with Air Station Order (ASO) 1700.2E; the TBR hunting regulations contained therein are provided in Appendix D. The hunting regulations are enforced by the Range Game Warden in coordination with the GA DNR, the state regulatory and enforcement authority for hunting and fishing. All controlled hunting events hosted at TBR are conducted in compliance with applicable state and federal laws and regulations and provisions of the current Hunting Order.

3.3.2.2 State/Local

The GA DNR's Parks, Recreation and Historic Sites Division, pursuant to Georgia Code 12-3-1, implements a comprehensive statewide recreation policy known as the Georgia Statewide Comprehensive Outdoor Recreation Plan (SCORP [GA DNR 2007]). The SCORP also makes the state eligible for federal funds under the Land and Water Conservation Fund. The GA DNR Wildlife Resources Division has primary jurisdiction with respect to fish and wildlife management as the regulatory and enforcement authority for hunting and fishing on State lands (GA DNR 2007).

3.3.3 Affected Environment

3.3.3.1 Regional Setting

A number of public lands and surface waters in the state of Georgia support a variety of recreational activities. These include lands managed by the National Park Service (NPS; approximately 55,629 acres), the USFWS (482,703 acres); the U.S. Forest Service (863,167 acres); the USACE; and the

Tennessee Valley Authority. A significant number of conservation lands are located in the Georgia coastal region including four national wildlife refuges (i.e., Wassaw, Harris Neck, Blackbeard Island, and Wolf Island) located along the East Coast. The region is characterized by an extensive river system that empties into the Atlantic Ocean and provides for numerous inland water-related recreational opportunities. The most notable river in the region is the Altamaha River, which is the largest free-flowing river in the state of Georgia and a primary resource for freshwater recreational activities (GA DNR 2007).

3.3.3.2 Townsend Bombing Range and Vicinity

Public recreational opportunities in the vicinity of TBR, many of which occur along the Altamaha River, include sport fishing, hunting, hiking, camping, horseback riding, bird-watching, photography, and water-based sports such as canoeing, boating, swimming, and kayaking. Hunting and fishing opportunities exist for a variety of game species including white-tailed deer, wild turkey, waterfowl, bobwhite quail, rabbit and other small game species. TBR is located in the Georgia Southern Zone for deer hunting (GA DNR 2011a). Table 3-28 details the species, seasons, and State-defined areas for the 2011-2012 Georgia Hunting Season.

Recreation on and adjacent to TBR is mainly supported by a large tract of land placed under restrictive easement with a commercial timber interest (i.e., Goodwood, a subsidiary of FIATP SSF Timber, LLC; Figure 3-2). Termed the Goodwood-USMC Buffer, the majority of the easement conveyance is contained within Acquisition Areas 1A and 1B. As such, management objectives for TBR include the administration of dual-use programs for forestry and hunting. The TBR hunting program was initiated in 2004 to oversee limited, supervised hunting for deer, feral hogs, coyotes, and, in some cases, wild turkeys on TBR. All hunting activity must occur within USMC-designated areas. Current hunting at TBR is equal opportunity and open to all members of the public, either provided to a beneficiary or administered by an applicant lottery system. Proposed hunting dates and application procedures are published in the local county newspaper prior to each seasonal drawing. In order to avoid conflicts with the military training mission, final approval for specific hunting dates for all seasons is set through coordination between TBR natural resources personnel and the Range Control Officer. The hunting dates and seasons comply with dates established by the GA DNR (Table 3-28). Limited access to TBR for hunting events is summarized in Table 3-29.

Table 3-28
2011-2012 Georgia Hunting Season

Species	Season Dates	Area
Big Game		
Deer	September 10 - October 14 (archery) October 15-21 (primitive weapons)	Statewide
	October 22 – January 1(firearms) October 22 – January 15	Northern Zone Southern Zone
Bear	September 10 – October 14 (archery) October 15 -21 (primitive weapons) October 22 – December 4 (firearms)	Northern Zone
	November 12 (firearms)	Central Zone
	September 29 – October 1 (firearms) October 6 – 8 (firearms) October 13 – 15 (firearms)	Southern Zone
Turkey	March 24 – May 15	Statewide
Feral Hogs	No Closed Season (private lands) Corresponds to deer, turkey, and small game season (U.S. Forest Service and U.S. Army Corps of Engineers lands)	Statewide
Small Game		
Alligator	September 3 – October 2	Statewide/Zone Limit
Crows	November 5 – February 29	Statewide
Dove	September 3-18 October 8-16 November 24 - January 7	Statewide
Fox and Bobcat	December 1 – February 29	Statewide
Grouse, Opossum, and Raccoon	October 15 – February 29	Statewide
Marsh Hens	September 24 – October 31 November 8 – December	Statewide
Quail and Rabbit	November 12 – February 29	Statewide
Squirrel	August 15 – February 29	Statewide
Woodcock	December 10 – January 23	Statewide
Coyotes, Armadillos, Groundhogs, Beavers, Starlings, Pigeons, and English Sparrows	No Closed Season	Statewide
Migratory Birds		
Canada Goose	September 3 – 25 November 19 – 27 December 10 – January 29	Statewide
Teal	September 10 – 25	Statewide
Ducks, Snow Goose, Gallinules, Mergansers, Coots, and Sea Ducks	November 19 – 27 December 10 – January 29	Statewide
King, Clapper, Sora, and Virginia Rails	September 24 - October 31 November 8 – December 9	Statewide
Woodcock	December 10 – January 23	Statewide
Common Snipe	November 15 – February 29	Statewide
Falconry	September 3 – 25 November 19 - February 10	Statewide

Note: TBR and the larger region that contains the range are part of the Georgia Hunting Season, Southern Zone.

Source: GA DNR 2011a.

Table 3-29
Controlled Hunting at Townsend Range

Year	Day(s)	Timeframe and Average Harvest
2004	8	September to January Annual harvest averages 12 to 16 deer and less than 5 feral hogs.
2005	10	
2006	9	

Note: Controlled hunting at TBR may include range access during archery, black powder, rifle or all firearms as approved by the GA DNR.

Source: MCAS Beaufort 2008.

3.3.3.3 State Lands

The State of Georgia has appropriated more than $300 million for land acquisition initiatives. As such, the Georgia SCORP, the State Wildlife Action Plan, and the Land Conservation Plan represent statewide land conservation initiatives that support outdoor recreation and wildlife protection. The GA DNR, State Parks and Historic Sites Office, is primarily responsible for high-infrastructure recreation sites (more than 60 state parks and historic sites totaling more than 80,000 acres) in the state (GA DNR 2012a), while the GA DNR Wildlife Resources Division typically manages the low-infrastructure sites (approximately 90 wildlife management areas [WMAs], 10 public fishing areas, and 17 natural areas totaling more than 1 million acres), many of which are accessible to the general public (GA DNR 2012b).

In addition to public lands, Georgia has more than 500,000 acres of manmade reservoirs, 12,000 miles of freshwater streams, and 2,500 acres of tidal waterways that support a wide variety of water-based recreation. As the third-largest contributor of freshwater to the Atlantic Ocean along the Eastern Seaboard, the Altamaha River is the focal point for freshwater-based recreational activity associated with the Proposed Action. The Altamaha flows for more than 130 miles and its drainage basin lies entirely within the state of Georgia; the 14,000-square-mile watershed encompasses the cities of Athens, Macon, Milledgeville, and parts of metropolitan Atlanta. It is formed by the confluence of the Ocmulgee and Oconee Rivers near Lumber City, Georgia (approximately 60 miles from Townsend, Georgia), and is joined further downstream by the Ohoopee River before entering the Atlantic Ocean north of Brunswick, Georgia, near the City of Darien (New Georgia Encyclopedia 2011). The Altamaha River hosts a variety of recreational activities, ranging from bank and boat fishing, to canoeing and leisure boating, to tournament angling. Boat ramps and landing facilities, as well as a range of other recreational supporting services, are located along the river. Lodging and camping accommodations also are available along the waterway.

State-managed conservation lands in the vicinity of the Proposed Action, many of which have resulted from easement conveyances to the GA DNR, include the Townsend WMA, the Griffin Ridge WMA, and the Penholoway Swamp and Sansavilla WMAs (Figure 3-2). Other regional WMAs located to the southeast of TBR include the Altamaha, Clayhole Swamp, and Paulks Pasture WMAs (GA DNR 2012c).

3.3.3.4 Local Lands

Statewide, local recreation providers, such as county/municipal parks and recreation departments, own less than 1% of the total state land area – approximately 17.2 million acres – and, based on an inventory conducted by the University of Georgia, manage roughly 2,340 sites of mainly high-infrastructure sites totaling an estimated 63,103 acres (GA DNR 2007). Local lands also include private sector lands leased to support quasi-public recreational activity. For the purpose of analysis, lands leased for hunting and fishing and located within the proposed acquisition area are directly associated with the Proposed Action.

3.3.3.5 McIntosh County

McIntosh County offers residents and visitors access to a number of different private, public, and quasi-public recreational areas for fishing, camping, boating, swimming, and hunting. Many such recreational opportunities are concentrated near waterbodies including the Atlantic Ocean to the east or, further inland, the Altamaha River in the northwest part of the county. The county manages a Conservation-Preservation (CP) zoning district and Highway 99 (from Darien to Meridian, Georgia) is designated as the Altamaha Scenic Byway (CGRDC 2007). Three hunting clubs have land that is associated with the proposed acquisition area in McIntosh County.

3.3.3.6 Long County

In Long County, the majority of public parks and recreational areas/facilities are located adjacent to the Altamaha River and near the City of Ludowici. Fishing, hiking, and camping are popular recreational activities within the county. Low-infrastructure recreational sites (e.g., three public boat ramps that provide access to the Altamaha River) are located in the more rural areas of Long County, while high-infrastructure sites are concentrated within Ludowici. The Long County Recreation Department has jurisdiction over these public lands and facilities. In addition, several private and non-profit organizations manage conservation lands within the county (CGRDC 2009).

The only private-sector recreational facility in Long County within the proposed acquisition area is Low Country Paintball. This paintball facility consists of an approximately 63-acre tract of land located within Acquisition Area 1A (Parcels 7000 and 7001; see Figure 3-3) and includes a pro shop, multiple building structures, and a variety of playing fields of varying size and layout. The number of recreational participants varies greatly, but Low Country Paintball usually hosts large scenario games that include 20 or more paintball players per game.

Other private hunting facilities and hunt clubs include Tibet Hunting Club, Clearie Davis Hunting Club, and Portal Hunting Club. These hunting clubs have access to both public and private properties in the area using exchanges, easements, leases, acquisitions, and/or partnerships. Portal Hunting Club, located in Long County on lands adjacent to the northeast portion of Acquisition Area 3, has been in existence for more than 100 years and retains hunting rights on approximately 13,000 acres of land in the Georgia counties of Long, Liberty, and McIntosh (McLeod 2010). Portal Hunting Club has a lease agreement with Molpus Woodlands Group, LLC, for hunting access to land within Acquisition Area 3 in Long County (MCAS Beaufort 2008). At the time of preparation of this FEIS, information on the Tibet Hunting Club and the Clearie Davis Hunting Club was not available.

3.3.4 Environmental Consequences

3.3.4.1 Methodology and Evaluation Criteria

Section 3.1, Land Use, describes the amount of recreation land area associated with each of the action alternatives and analyzes potential changes to land ownership and compatibility for the recreation resource. This section analyzes recreation access and use based on the best available information. The type and extent of potential impacts to recreation would be determined by the nature of the Proposed Action within each of the land acquisition areas. The following criteria were used to evaluate recreation access and use under each of the action alternatives:

- Reduces opportunity for a particular type of recreational activity;
- Reduces the use of, or exceeds the capacity of, a recreation area/site;
- Creates a conflict with an existing recreation use; and/or
- Causes the physical deterioration of a recreation facility or resource.

The evaluation of direct impacts to recreation under the Proposed Action is not directed by recreational-user profiles or visitor-day numbers, as this information is either not available or not able to be confirmed. Therefore, the analyses contained herein are qualitative assessments of the potential for adverse impacts to recreation access and use under each of the action alternatives.

3.3.4.2 Common Elements Among All Action Alternatives

In accordance with applicable DOD and USMC natural resources management program policies, MCAS Beaufort maintains TBR in compliance with the SAIA. The TBR INRMP was developed and approved in 2007 (please refer to Section 3.1.3.5) and remains consistent with the guidance contained in the Handbook for Preparing, Revising, and Implementing Integrated Natural Resources Management Plans on Marine Corps Installations (Headquarters, U.S. Marine Corps 2004). Similarly, MCO 5090.2A and the MCAS Beaufort Hunting Order serve to implement hunting program activities at TBR in compliance with all applicable state and federal laws and regulations. The USMC issues internal regulations for the harvest of fish and wildlife on its land and oversight responsibility for the TBR hunting program is assigned to a qualified game warden. All other forms of outdoor recreation are not compatible with the military mission at TBR.

Under the Proposed Action, the Range Hunting Order would require modification due to extending the controlled hunt program to include the additional acquired lands so that hunting and other forms of low-intensity recreation could occur within those areas to the extent they are compatible with TBR's mission. The additional land would be available to hunters through the managed program. Selected participants in the TBR public hunting program would continue to attend a mandatory safety briefing prior to obtaining access to TBR for a hunting event. Hunting access on the newly acquired land would be equal opportunity and open to all members of the public. All current and future hunting dates and application procedures would be published in local newspapers prior to the seasonal hunting lotteries which determine public participation for scheduled events. Final approvals for specific hunting dates under the Proposed Action (for all seasons) would continue to be coordinated through a qualified USMC natural resources staff member and the Range Control Officer. Under the Proposed Action, all controlled deer hunts would comply with the Georgia Quality Deer Management Program and all applicable GA DNR hunting regulations in a manner compatible with range security and safety considerations.

Under each of the action alternatives, the lands acquired to safely accommodate the delivery of PGMs would continue to support limited public access for hunting and fishing. Whereas hunting and fishing access is currently restricted to private-sector lease agreements, each alternative would expand the amount of military lands potentially available for public use through the range hunting program. All target areas associated with the Proposed Action, however, would be designated as exclusive use and closed to public access.

3.3.4.3 Action Alternatives (1 through 4)

The selection of any of the four action alternative would prevent access to limited quasi-public hunting and fishing areas within Acquisition Areas 1A, 1B, and 3, resulting in a loss of recreational opportunity. However, the action alternatives would create opportunities for increased public access to previously inaccessible privately administered recreation lands through the TBR hunting program. An overall increase in publicly accessible lands associated with the action alternatives would offset some of that lost in the private sector. Although the implementation of the action alternatives would prevent hunting access and use on quasi-public recreation lands, displaced users would largely be accommodated by comparable opportunities provided by other local and regional public recreation venues. Therefore, the loss of opportunity and space available for quasi-public hunting and fishing would be considered a permanent minor impact. The potential impacts to recreation under the action alternatives would be related directly to the amount of land proposed for acquisition. Alternative 1 would be expected to have the least amount of impacts and Alternative 3 the most, with the impacts from Alternatives 2 and 4 being

similar to and in between Alternatives 1 and 3. However, because the adverse impacts to recreation would be minimal and partially offset by beneficial impacts, effects to recreation would not be significant.

3.3.4.4 No Action Alternative

The selection of the No Action Alternative would not include any land acquisition. All existing lease agreements that provide for limited, private recreation access on commercial forestlands in the vicinity of TBR would remain intact over the short term. Over the long term, however, the leased lands could experience a change in ownership (unrelated to the Proposed Action) and private sector access for hunting and fishing could be affected by a change in land ownership and management. Therefore, implementation of the No Action Alternative could result in the fragmentation or loss of existing recreation areas/sites located on commercial forestry lands. Recreational activity under the No Action Alternative also would create the potential for incompatible land use associated with a future change in land ownership and use. Although the No Action Alternative would not result in an immediate loss or displacement of current recreational opportunities supported by commercial forestlands, its selection would preclude future opportunities for public access on the lands proposed for acquisition under each of the action alternatives. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.4 Wetlands

This section describes existing wetland resources within and near TBR, including the proposed acquisition areas, and evaluates potential wetland impacts under each action alternative, as well as the No Action Alternative.

***Wetlands* as defined in 33 CFR Part 328.3:**

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

3.4.1 Definition of Resource

Wetlands include those areas where saturation or inundation with water is influential in the composition of soil and vegetative communities (Cowardin *et al.* 1979). Wetlands are important environmental resources as they provide surface water retention and flood protection, improve water quality by filtering pollutants and retaining excess nutrients, reduce erosion, and provide habitat for various wildlife species.

3.4.2 Regulatory Framework

Wetlands are afforded protection under the Federal Clean Water Act (CWA) and the Georgia Coastal Marshlands Protection Act. Currently no local, county, or municipal wetland regulatory programs exist for McIntosh or Long Counties, Georgia. Federal and state wetland regulations are discussed in detail in the following subsections.

***Waters of the United States* as defined in 33 CFR Part 328.3:**

(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(2) All interstate waters including interstate wetlands;
(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
  (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
  (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
  (iii) Which are used or could be used for industrial purpose by industries in interstate commerce;
(4) All impoundments of waters otherwise defined as waters of the United States under the definition;
(5) Tributaries of waters identified in paragraphs (a) (1) through (4) above;
(6) The territorial seas;
(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1) through (6) above.

3.4.2.1 Clean Water Act

Federally, wetlands are protected under Sections 401 and 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899. The CWA was implemented to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA provides regulatory jurisdiction of wetlands to the USACE. Under Sections 401 and 404 of the CWA, permits must be issued for certain activities that may impact wetlands and waterways. Section 404 of the CWA requires that a permit be obtained for the discharge of dredged or fill material into 'waters of the U.S.,' including wetlands and streams. Waters of the United States and wetlands are specifically defined under 33 CFR Part 328.3. In McIntosh and Long Counties, Georgia, Section 404 permitting is the responsibility of the USACE Savannah District.

The USACE mandates that wetlands exhibit three parameters in order to be classified as a wetland: (1) The vegetative community must be dominated by hydrophytic (water-dwelling)

vegetation; (2) The area must show indicators of surface saturation or inundation; and (3) The area must contain indicators of anaerobic conditions within the soil. The USACE has jurisdiction over any wetland that has a significant nexus to traditional navigable waterways as defined by the CWA (USACE 2008).

3.4.2.2 Coastal Marshlands Protection Act

Tidally influenced wetlands including; intertidal marshes, mudflats, salt marshes, or tidal substrates are protected under the Georgia Coastal Marshlands Protection Act. Jurisdiction of tidally influenced wetlands is given to the GA DNR Coastal Resources Division. Any project that proposes to remove, dredge, fill, drain or alter, or construct over marshlands are required to obtain a permit from the Coastal Resources Division (National Oceanic and Atmospheric Administration [NOAA] and GA DNR Coastal Resources Division 2003). No tidally influenced wetlands are within the Proposed Action area. All non-tidally influenced wetlands within Georgia afford protection under the CWA, and no state regulatory programs are in place for inland wetland systems.

3.4.2.3 Executive Order Number 11990, Protection of Wetlands (1977)

EO 11990 dictates that long- and short-term impacts to wetland environments located on federally owned property must be avoided to the extent possible. Federal agencies are responsible for providing actions to minimize destruction, loss, or degradation of wetlands and to preserve and enhance the natural values of wetland environments. This requirement applies to acquiring, managing, and disposal of federal lands and facilities, construction or improvement projects, and federal activities that may affect land use, water resources, land resources, regulating and licensing activities (EO 11990 1977).

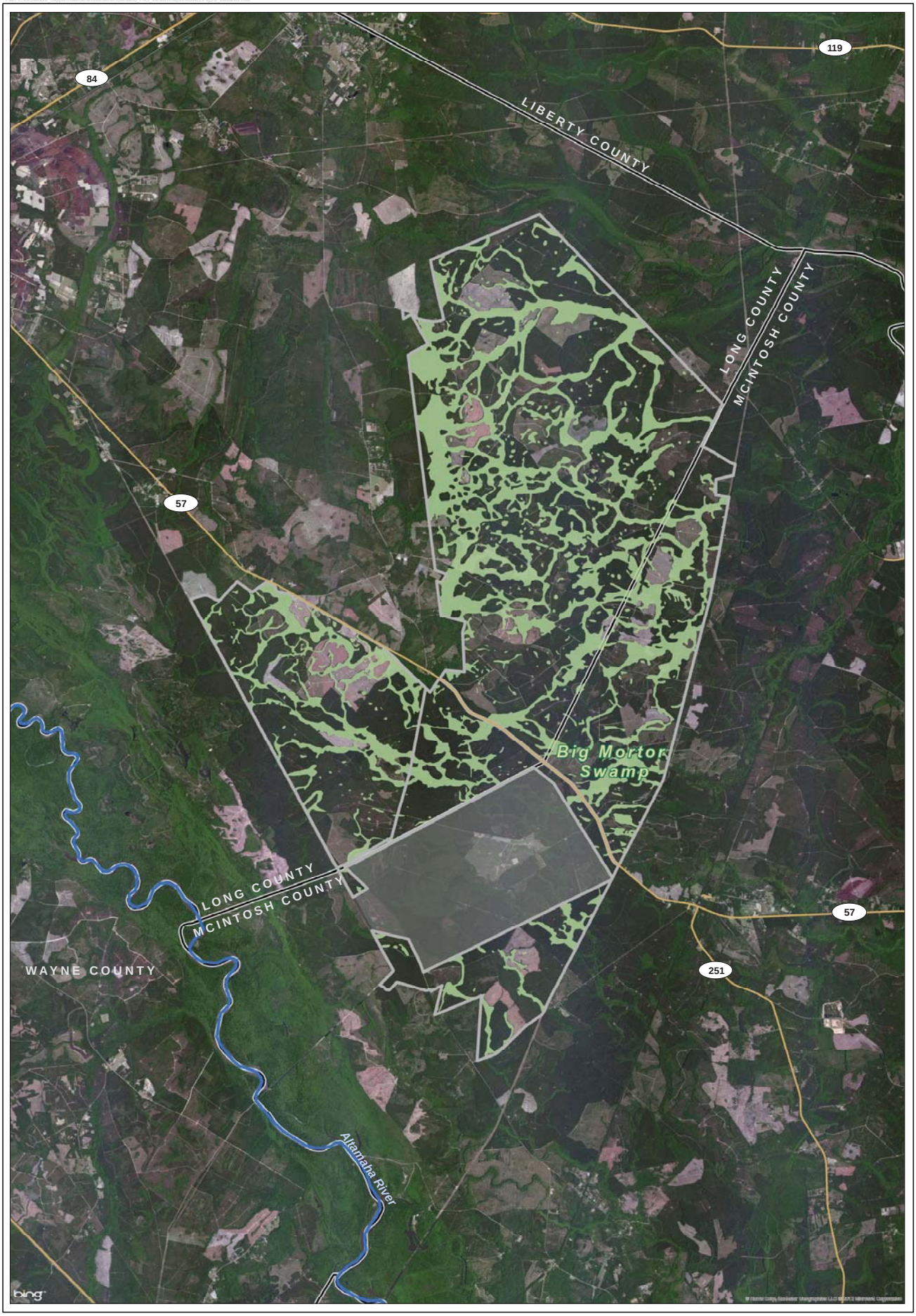
3.4.2.4 Emergency Wetlands Resource Act of 1986

The purpose of the Emergency Wetlands Resource Act of 1986 is to promote conservation of wetlands, and fulfill obligations contained in various migratory bird treaties and conventions. The Act authorized the purchase of wetlands from Land and Water Conservation Fund monies, and required the Secretary of the Interior to establish a National Wetlands Priority Conservation Plan. The National Wetlands Priority Conservation Plan identified the locations and types of wetlands that should be priorities for state and federal acquisition. The Act further requires the Secretary to report to Congress wetland loss and analysis of federal programs and policies inducing loss.

3.4.3 Affected Environment

The proposed acquisition areas are currently managed for silvicultural operations and are harvested on a 15- to 25-year cycle. When harvested, both upland and wetlands areas are clear-cut for timber, and then later bedded, furrowed, and replanted with loblolly pine. Timber harvests within the proposed acquisition areas have historically resulted in both direct and indirect impacts to wetland environments. Existing silvicultural operations harvest timber within both upland and wetland environments and result in habitat fragmentation, changes in hydrology, and reduction or loss of supporting adjacent habitats.

Within the acquisition areas, wetland environments are located within depressional, floodplain, and flow-way areas and are associated with Bull Town Swamp, Big Mortar Swamp, Buffalo Swamp, Cathead Creek, South Newport River, and the Altamaha River. Soil is poorly drained and is composed primarily of sandy loams and clay loams (NRCS 2002a and 2002b). Low topographic relief and low soil permeability increases water retention and ponding within wetland environments and facilitates the establishment of wetland hydrology and anaerobic conditions. Wetlands within the areas are composed of non-tidal environments with emergent, forested or scrub shrub vegetation, and non-tidal open water or un-vegetated environments. Currently, wetlands comprise approximately 28% of the region of the Proposed Action (see Figure 3-8).



Wetlands
Acquisition Areas
Existing Range
Counties
Major Roads
Altamaha River

Figure 3-8
Wetlands
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 1 2 Miles

Sources: Bing 2012, Based on Lusk 2009, USFWS 2010

To identify and quantify wetland environments within the proposed acquisition areas, an informal meeting was conducted on February 15, 2011, with USACE Savannah District staff to discuss the preferred means of determining waters of the U.S. for the acquisition areas. Based on this meeting, it was decided that a Preliminary Jurisdictional Determination (PJD) would provide sufficient detail of wetland boundaries for the purpose of this FEIS. The PJD is a non-binding document that indicates approximate locations of waters of the U.S. pursuant to the CWA and the Rivers and Harbors Act of 1899.

For the PJD, wetlands within the acquisition areas were identified using the USFWS National Wetlands Inventory (NWI) and onsite field surveys of the proposed target areas. Wetland boundaries were delineated using NWI and field survey data and were classified based on the Cowardin classification method (Cowardin *et al.* 1979). Wetland environments comprise 9,841.2 acres of the proposed acquisition areas. Wetland acreages are provided in Table 3-30 and are illustrated on Figure 3-8.

Table 3-30
Wetland Types in Acquisition Areas

Wetland Type	Acres
Area 1A	
Lacustrine Limnetic (L1)	4.9
Palustrine Emergent Wetland (PEM)	179.5
Palustrine Forested Wetland (PFO)	1,150.2
Palustrine Scrub-Shrub Wetland (PSS)	140.3
Palustrine Unconsolidated Bottom (PUB)	0.5
Total	**1,475.4**
Area 1B	
Palustrine Emergent Wetland (PEM)	45.7
Palustrine Forested Wetland (PFO)	724.3
Palustrine Scrub-Shrub Wetland (PSS)	128.8
Palustrine Unconsolidated Bottom (PUB)	0.5
Total	**899.3**
Area 3	
Lacustrine Limnetic (L1)	1.2
Palustrine Emergent Wetland (PEM)	801.6
Palustrine Forested Wetland (PFO)	6,198.1
Palustrine Scrub-Shrub Wetland (PSS)	465.2
Palustrine Unconsolidated Bottom (PUB)	0.4
Total	**7,466.5**

3.4.3.2 Description of Wetlands by Cowardin Classification

Lacustrine Systems. Lacustrine systems are associated with lakes or ponds where un-vegetated open water environments represent greater than 30% of the total area. Lacustrine systems are composed of both littoral and limnetic habitats. The littoral habitat is composed of the wetland habitat located along the shoreline. Lacustrine limnetic (L1) habitat consists of all areas including deep-water habitat beyond the boundary of the littoral area.

Palustrine Emergent Wetland (PEM). Palustrine emergent wetlands are typically inundated during periods of the year and vegetation consists of emergent herbaceous species. A shrub component may be located along the transitional edge of emergent wetlands. Vegetation is typically composed of broom sedge (*Andropogon virginicus* var. *virginicus*), sugarcane plume grass (*Saccharum giganteum*), common fox sedge (*Carex stipata*), *Hypericum* sp., dog fennel (*Eupatorium capillifolium*), wooly panicum (*Panicum scabriusculum*), wiregrass (*Aristida stricta*), hatpins (*Eriocaulon* sp.), wool grass (*Scirpus cyperinus*), soft rush (*Juncus effusus*), pitcher plants (*Sarracenis* sp.), and saw grass (*Cladium mariscus*).

Palustrine Forested Wetland (PFO). Palustrine forested wetlands within the acquisition areas include forested wetlands dominated by pond cypress (*Taxodium ascendens*), sweetgum, red maple (*Acer rubrum*), black gum, sweetbay magnolia, loblolly bay, water oak (*Quercus nigra*), and laurel oak (*Quercus laurifolia*). Sub-canopy species include fetter bush (*Lyonia lucida*), arrow heads (*Sagittaria* sp.), chain fern (*Woodwardia* sp.), and *Iris* species. Forested wetlands are located along the floodplain of streams and rivers, as well as within depressional areas. Surface water is present within topographically low-lying communities for most of the growing season.

Palustrine Scrub-Shrub Wetland (PSS). Palustrine scrub-shrub wetlands consist of shrubs or small trees (less than 35 feet in height), typically including willows (*Salix* spp.), wax myrtle (*Myrica cerifera*), salt bush (*Baccharis halimfolia*), titi (*Cyrilla racemiflora*), sweetgum, and blackberry (*Rubus* sp.). Typically, scrub-shrub wetlands are associated with exterior margins of deeper floodplain wetlands as they transition into uplands. However, typical transitions between upland and wetland environments are absent and planted pine stands are located adjacent to forested wetlands. Within the acquisition areas, scrub-shrub wetlands are located within recently cleared wetlands and disturbed areas. These wetlands have a dense shrub layer with limited herbaceous ground cover species.

Palustrine Unconsolidated Bottom (PUB). Areas of palustrine unconsolidated bottom are typically located along watercourses or low-lying areas subject to ponding. Vegetation is sparse and occupies less than 30% total cover. Open water environments are the main component of these systems and turbid deep water inhibits the growth of vegetation.

3.4.4 Environmental Consequences

3.4.4.1 Methodology and Evaluation Criteria

Direct and indirect impacts to wetlands were quantified based on geographic information system (GIS) analysis of wetland boundaries approved by the USACE in the PJD (Appendix E) and construction footprints of proposed target structures. Direct impacts to wetlands would likely be associated with the construction of targets, roads, and firebreaks. The Proposed Action would include permanent conversion of wetlands to construct targets used for training purposes, and conversion of firebreak areas to herbaceous or emergent wetlands.

3.4.4.2 Common Elements Among All Action Alternatives

Currently, 9,841.2 acres of wetland environments exist within the proposed acquisition areas. A majority of this area would serve as a safety buffer and direct or indirect impacts to wetlands within the buffer area would occur infrequently. Potential direct impacts to wetland environments within the safety buffer would be associated with off-target or stray ordnances that land beyond the limits of the target areas. While the likelihood of an ordnance landing beyond the target area is unlikely, short-term direct effects would be associated with soil and vegetation disturbances due to impact of the stray ordnance. The Proposed Action would result in direct and indirect impacts to wetlands within the target areas. Potential impacts to wetlands would occur only within the target areas and would range from minor short-term impacts associated with changes in land use to long-term permanent wetland loss from filling wetlands for construction of target structures.

Direct wetland impacts include dredging, filling, clearing, or conversion of wetland environments associated with the construction of target infrastructure, access roads, and firebreaks. Within areas sited for construction of targets or roads, existing wetlands would be dredged and filled resulting in a loss of wetland function for these areas. Within the proposed firebreaks, existing forested wetlands would be cleared and maintained in an herbaceous state, resulting in the conversion of wetland habitats from palustrine forested wetlands to palustrine emergent wetlands. These areas would continue to serve as functional wetlands, resulting in no net loss of wetland acreage within the proposed firebreaks.

Indirect impacts to wetland environments are associated with disturbances or activities that reduce or eliminate wetland functions without directly filling, clearing, or dredging wetlands. Indirect impacts associated with the Proposed Action would include habitat fragmentation, changes in wetland type or hydrology, reduction or loss of supporting adjacent habitats, and changes in land use. The Proposed Action would result in a change of land use and land management activities within the target areas. Activities associated with the construction of target structures and roads, as well as a conversion of land use from silvicultural operations to an actively maintained and managed bombing range, would result in indirect effects to wetland environments. While proposed construction activities would be sited to avoid wetland areas, unavoidable wetland impacts would result in the fragmentation of wetland habitats, thus reducing connectivity of hydrologic and vegetative components of existing wetlands. Portions of the proposed target areas are composed of forested and successional upland communities, which support wetland environments by maintaining natural overland surface flow into wetlands and reduce sedimentation and turbidity within wetland environments. Furthermore, these areas provide required upland habitat to support the biological requirements of various amphibian species.

The Proposed Action would seek to clear portions of the target areas and maintain those areas as target structures. Adjacent areas would be maintained in a natural vegetative state to serve as a buffer and to closely resemble real-world conditions with hidden or partially concealed threats for training activities. Following acquisition of the property, the acquisition area and target areas would be managed using an INRMP. Wetland environments would benefit from this INRMP, which includes the conversion of adjacent upland habitats from planted pine to natural upland communities and the establishment of transitional wetland and upland ecotones.

Currently, wetland environments within the acquisition area are part of an active silvicultural operation and maintain a normal farming exemption. This exemption allows for normal farming and silvicultural activities such as plowing, seeding, cultivating, minor drainage, and harvest to be conducted within wetland environments without the issuance of a Section 404 permit. Following acquisition, the USMC would take an ecosystem-based approach to the continued management of forested areas for silvicultural operations, and would maintain a normal farming exemption. Areas that are associated with the construction of target structures or roads would no longer be considered exempt under the normal farming exemption, and any discharge of dredged or fill material into waters of the U.S. would require a Section 404 permit. The USMC would acquire all necessary permits after land acquisition has occurred.

3.4.4.3 Action Alternatives

Direct and Indirect Wetland Impacts

For all action alternatives, any direct or indirect impacts to wetlands would require permits from the USACE under Section 404 of the CWA and under the National Pollutant Discharge Elimination System (NPDES) regulated by the Georgia Environmental Protection Division (GA EPD). Specific construction design would avoid and minimize impacts. Unavoidable impacts will require USACE 404 permits. The construction of target areas would result in 32.7 acres of direct and 519.4 acres of indirect impacts to wetlands; these acreages represent the maximum potential impacts.

Alternative 1

Development of Alternative 1 would result in the acquisition of 2,374.7 acres of wetland environments (Table 3-31). A majority of this area would serve as a safety buffer and no direct or indirect impacts to wetlands within the buffer area are anticipated. Under Alternative 1, the USMC proposes to construct Target Areas 6, 7 and 8. Construction of these target areas would result in direct impacts to 12.0 acres of wetlands and indirect impacts to 178.5 acres of wetlands.

Table 3-31
Alternative 1 - Wetlands

Wetland Type	Acres
Palustrine Emergent Wetland (PEM)	225.2
Palustrine Forested Wetland (PFO)	1,874.4
Palustrine Scrub-Shrub Wetland (PSS)	269.2
Palustrine Unconsolidated Bottom (PUB)	1.0
Lacustrine Limnetic (L1)	4.9
Total	**2,374.7**

Target Area 6. Target Area 6 would include the construction of two mock airfield runways, two simulated POL sites, and two tactical target sites. Construction associated with the development of Target Area 6 would result in the conversion of 2.9 acres of wetlands from palustrine forested wetland to palustrine emergent wetland for the construction of a 50-foot firebreak. The construction of the airfield runways would result in permanent wetland loss of 5.8 acres of palustrine forested wetlands and 0.1 acre of permanent palustrine forested wetland loss associated with construction of a new road to reach the airfield runways. Development of Target Area 6 would result in indirect impacts to 67.9 acres of wetlands. Construction of the airfield runway would result in the permanent indirect wetland impacts associated with the fragmentation of the large palustrine wetlands located within the center of the target area. Fragmentation impacts would occur to the palustrine forested wetland that extends along the eastern boundary as a result of the construction of the 50-foot firebreak. Figure 3-9 illustrates the potential wetland impacts associated with Target Area 6.

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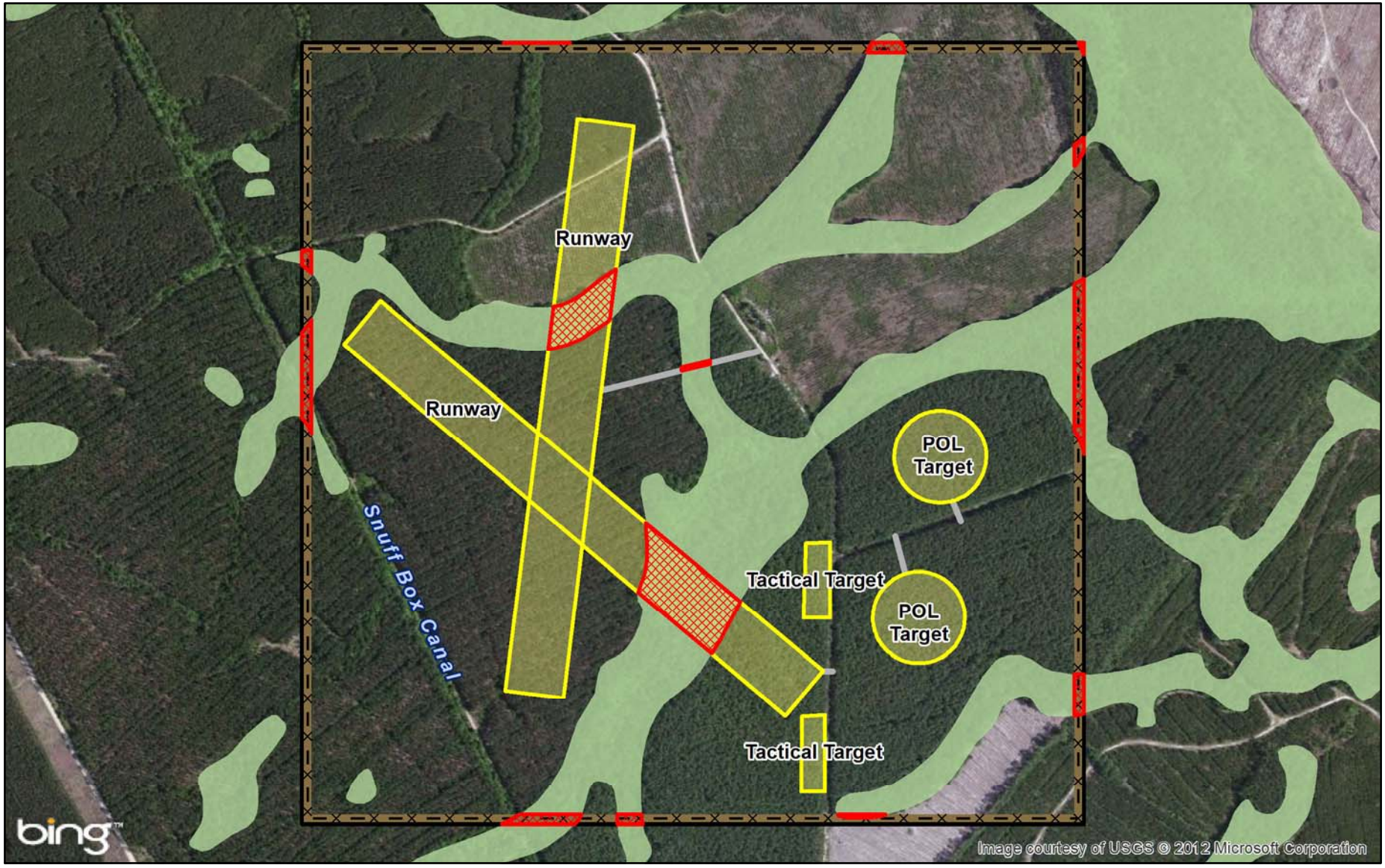

Wetlands
Wetland Impact
Target Area
Target Structure
Firebreak
Fence Line
New Road

POL = Petroleum, Oil, and Lubricant

Figure 3-9
Target Area 6 Wetland Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800
Feet

Sources: Bing 2012, McFadden 2011, Morgan 2011

Target Area 7. The construction of Target Area 7 would result in the conversion of 2.7 acres of palustrine forested wetlands to palustrine emergent wetlands for the construction of a 50-foot firebreak. Currently, a small portion (2.2 acres) of the area designed for the firebreak is composed of palustrine emergent wetlands, and no clearing or conversion impact would be expected for this area. Changes in land use would result in short-term indirect impacts to 85.9 acres of wetlands within Target Area 7. Figure 3-10 illustrates the potential wetland impacts associated with Target Area 7.

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Wetlands
Wetland Impact
Target Area
Target Structure
Firebreak
Fence Line
New Road

UTA = Urban Target Area

Figure 3-10
Target Area 7 Wetland Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800 Feet

Sources: Bing 2012, McFadden 2011, Morgan 2011

Target Area 8. The construction of Target Area 8 would result in the conversion of 0.5 acre of palustrine shrub-scrub wetlands to palustrine emergent wetlands for the construction of a 50-foot firebreak. Development of Target Area 8 would result in short-term indirect impacts to 24.7 acres of wetlands. Indirect impacts are expected to be minor, resulting from changes in land use. Figure 3-11 illustrates the potential wetland impacts associated with Target Area 8.

Alternative 1 would result in minor impacts to wetland environments (Table 3-32). Construction activities for Target Areas 6, 7, and 8 would be limited to small areas associated with target structures and roads. Most of the areas would be maintained in a natural vegetative state to serve as a buffer and to closely resemble real-world conditions with hidden or partially concealed threats for training activities.

The majority of impacts to wetlands would be associated with the construction of the 50-foot firebreak. The construction of the firebreak would result in 6.1 acres of wetland clearing and conversion. For these areas, no net loss of wetland acres is anticipated as impacts would be limited to a conversion of palustrine forested wetlands to palustrine emergent wetlands. Direct dredge or filling impacts associated with the construction of target structure and roads would be limited to 5.9 acres.

Table 3-32
Alternative 1 - Wetland Impacts (in acres)

Impact Type	Target Area			Total	Percent of Total Wetlands Impacted
	6	7	8		
Conversion (PFO to PEM)	2.9	2.7	0.0	5.6	0.2%
Conversion (PSS to PEM)	0.0	0.0	0.5	0.5	0.02%
Permanent Direct (PFO)	5.9	0.0	0.0	5.9	0.2%
Permanent Indirect	67.9	0.0	0.0	67.9	2.0%
Short-Term Indirect	0.0	85.9	24.7	110.6	4.5%

Key:
PEM = Palustrine Emergent Wetland.
PFO = Palustrine Forested Wetland.
PSS = Palustrine Scrub-Shrub Wetland.

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Wetlands
Wetland Impact
Target Area
Target Structure
Firebreak
Fence Line
New Road

Figure 3-11
Target Area 8 Wetland Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800 Feet

Sources: Bing 2012, McFadden 2011, Morgan 2011

Alternative 2

Development of Alternative 2 would result in the acquisition of 7,466.5 acres of wetland environments (Table 3-33). A majority of this area would serve as a safety buffer and no direct or indirect impacts to wetlands within the buffer area are anticipated.

Table 3-33
Alternative 2 - Wetlands

Wetland Type	Acres
Palustrine Emergent Wetland (PEM)	801.6
Palustrine Forested Wetland (PFO)	6,198.1
Palustrine Scrub-Shrub Wetland (PSS)	465.2
Palustrine Unconsolidated Bottom (PUB)	0.4
Lacustrine Limnetic (L1)	1.2
Total	**7,466.5**

Alternative 2 proposes to construct Target Areas 1, 2, 3, 4, and 5. Construction of these target areas would result in direct impacts to 20.7 acres of wetlands and indirect impacts to 340.9 acres of wetlands.

Target Area 1. The construction of the UTA would result in the permanent loss of 0.6 acre of palustrine emergent wetland. Construction of the 50-foot firebreak would result in the conversion of 2.1 acres of wetlands from palustrine forested wetland to palustrine emergent wetland. Development of Target Area 1 would result in permanent indirect impacts to 44.7 acres through the clearing of supporting upland planted pine areas for the construction of the UTA. The proposed location of the UTA is adjacent to two large palustrine forested wetlands. The potential wetland impacts associated with Target Area 1 are illustrated on Figure 3-12 and are summarized in Table 3-34.

Target Area 2. The construction of Target Area 2 would result in the conversion of 1.3 acres of palustrine forested wetlands to palustrine emergent wetlands for the construction of a 50-foot firebreak. Development of Target Area 2 also would result in short-term indirect impacts to 25.2 acres due to changes in land use. The potential wetland impacts associated with Target Area 2 are illustrated on Figure 3-13 and are summarized in Table 3-34.

Table 3-34
Alternative 2 - Wetland Impacts (in acres)

Impact Type	Target Area 1	2	3	4	5	Total	Percent of Total Wetlands Impacted
Conversion (PFO to PEM)	2.1	1.3	4.7	7.2	4.0	19.3	0.3%
Permanent Direct (PFO)	0.0	0.0	0.0	0.8	0.0	0.8	0.01%
Permanent Direct (PEM)	0.6	0.0	0.0	0.0	0.0	0.6	0.01%
Permanent Indirect	44.7	0.0	0.0	77.2	58.1	180.0	2.4%
Short-term Indirect	0.0	25.2	135.7	0.0	0.0	160.9	2.2%

Key:
PEM = Palustrine Emergent Wetland.
PFO = Palustrine Forested Wetland.

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Wetlands
Wetland Impact
Target Area
Target Structure
Firebreak
Fence Line
New Road

SAM = Surface-to-Air Missile
UTA = Urban Target Area

N

0 400 800 Feet

Figure 3-12
Target Area 1 Wetland Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Bing 2012, McFadden 2011, Morgan 2011

Path: C:\GIS\Moore_Support\Townsend\Townsend\Townsend_PNS_Version\maps\mxd\ALL\Fig3-13_TargetArea2_Wet_Impacts.mxd

Wetlands
Wetland Impact
Target Area
Target Structure
Firebreak
Fence Line
New Road

N

0 400 800 Feet

Figure 3-13
Target Area 2 Wetland Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Bing 2012, McFadden 2011, Morgan 2011

Target Area 3. The construction of Target Area 3 would result in the conversion of 4.7 acres of palustrine forested wetlands to palustrine emergent wetlands for the construction of a 50-foot firebreak. Currently, a small portion (0.4 acre) of the area designed for the firebreak is composed of palustrine emergent wetlands, and no clearing or conversion impact would be expected for this area. Development of Target Area 3 would result in short-term indirect impacts to 135.7 acres due to changes in land use. The potential wetland impacts associated with Target Area 3 are illustrated on Figure 3-14 and are summarized in Table 3-34.

Target Area 4. Within Target Area 4, the construction of the tactical convoy target would result in a loss of 0.8 acre of palustrine forested wetlands. The construction of Target Area 4 would result in the conversion of 7.2 acres of wetlands from palustrine forested wetland to palustrine emergent wetland for the construction of a 50-foot firebreak. Development of Target Area 4 also would result in permanent indirect impacts to 77.2 acres. Permanent indirect impacts to wetlands (located along the northeast corner of the target area) would result from the clearing of supporting upland planted pine areas for the construction of the tactical convoy, as well as the construction of the 50-foot firebreak. Construction of the firebreak would result in fragmentation of wetland vegetative communities including the large palustrine forested wetland that expands across the northeastern corner of the target area. The potential wetland impacts associated with Target Area 4 are illustrated on Figure 3-15 and are summarized in Table 3-34.

Target Area 5. The construction of Target Area 5 would result in the conversion of 4.0 acres of palustrine forested wetlands to palustrine emergent wetlands for the construction of a 50-foot firebreak. Development of Target Area 5 also would result in permanent indirect impacts to 58.1 acres associated with the clearing of supporting upland planted pine areas for the construction of the train depot (please refer to Section 2.3.1). The potential wetland impacts associated with Target Area 5 are illustrated on Figure 3-16 and are summarized in Table 3-34.

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Wetlands
Wetland Impact
Target Area
Target Structure
Firebreak
Fence Line

N

0 400 800
Feet

Figure 3-14
Target Area 3 Wetland Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Bing 2012, McFadden 2011, Morgan 2011

Path: C:\GIS\Moore_Support\Townsend\Townsend\Townsend_PNS_Version\maps\mxd\ALL\Fig3-15_TargetArea4_Wet_Impacts.mxd

Wetlands
Wetland Impact
Target Area
Target Structure
Firebreak
Fence Line

N

0 400 800 Feet

Figure 3-15
Target Area 4 Wetland Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Bing 2012, McFadden 2011, Morgan 2011

Path: C:\GIS\Moore_Support\Townsend\Townsend\Townsend_PNS_Version\maps\mxd\ALL\Fig3-16_TargetArea5_Wet_Impacts.mxd

Wetlands
Wetland Impact
Target Area
Target Structure
Firebreak
Fence Line

Figure 3-16
Target Area 5 Wetland Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800 Feet

Sources: Bing 2012, McFadden 2011, Morgan 2011

Alternative 3

Implementation of Alternative 3 would result in the acquisition of 9,841.2 acres of wetland environments (Table 3-35). A majority of this area would serve as a safety buffer and no direct or indirect impacts to wetlands within the buffer area are anticipated.

Table 3-35
Alternative 3 - Wetlands

Wetland Type	Acres
Palustrine Emergent Wetland (PEM)	1,026.8
Palustrine Forested Wetland (PFO)	8,072.6
Palustrine Scrub-Shrub Wetland (PSS)	734.3
Palustrine Unconsolidated Bottom (PUB)	1.4
Lacustrine Limnetic (L1)	6.1
Total	**9,841.2**

Construction of target areas associated with Alternative 3 would result in 32.7 acres of direct and 519.4 acres of indirect impacts to wetlands. Alternative 3 proposes to construct Target Areas 1, 2, 3, 4, 5, 6, 7, and 8, which are discussed above for Alternatives 1 and 2. The potential wetland impacts to the target areas are illustrated on Figures 3-9 through 3-16 and are summarized in Table 3-36.

Table 3-36
Alternative 3 - Wetland Impacts (in acres)

Impact Type	Target Area								Total Impacts	Percent of Total Wetlands Impacted
	1	2	3	4	5	6	7	8		
Conversion (PFO to PEM)	2.1	1.3	4.7	7.2	4.0	2.9	2.7	0.0	24.9	0.3%
Conversion (PFO to PSS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.01%
Permanent Direct (PFO)	0.0	0.0	0.0	0.8	0.0	5.9	0.0	0.0	7.3	0.07%
Permanent Direct (PEM)	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.01%
Permanent Indirect	44.7	0.0	0.0	77.2	58.1	67.9	0.0	0.0	247.9	2.5%
Short-term Indirect	0.0	25.2	135.7	0.0	0.0	0.0	85.9	24.7	271.5	2.8%

Key:
PEM = Palustrine Emergent Wetland.
PFO = Palustrine Forested Wetland.
PSS = Palustrine Scrub-Shrub Wetland.

Alternative 4

Development of Alternative 4 would result in the acquisition of 8,365.8 acres of wetland environments (Table 3-37). The majority of this area would serve as a safety buffer, and no direct or indirect impacts to wetlands within the buffer area are anticipated.

Table 3-37
Alternative 4 - Wetlands

Wetland Type	Acres
Palustrine Emergent Wetland (PEM)	847.3
Palustrine Forested Wetland (PFO)	6,922.4
Palustrine Scrub-Shrub Wetland (PSS)	594.0
Palustrine Unconsolidated Bottom (PUB)	0.9
Lacustrine Limnetic (L1)	1.2
Total	**8,365.8**

Alternative 4 proposes to construct Target Areas 1, 2, 3, 4, 5, and 8, which are discussed above under Alternatives 1 and 2. Construction of these target areas would result in direct impacts to 21.2 acres of wetlands and indirect impacts to 365.6 acres of wetlands. The target areas are illustrated on Figures 3-12 through 3-16 and 3-11, respectively, and are summarized in Table 3-38.

Table 3-38
Alternative 4 - Wetland Impacts (in acres)

Impact Type	Target Area						Total Impacts	Percent of Total Wetlands Impacted
	1	2	3	4	5	8		
Conversion (PFO to PEM)	2.1	1.3	4.7	7.2	4.0	0.0	19.3	0.2%
Conversion (PSS to PEM)	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.01%
Permanent Direct (PFO)	0.0	0.0	0.0	0.8	0.0	0.0	0.8	0.01%
Permanent Direct (PEM)	0.6	0.0	0.0	0.0	0.0	0.0	0.6	0.01%
Permanent Indirect	44.7	0.0	0.00	77.2	58.1	0.0	180.0	2.2%
Short-term Indirect	0.0	25.2	135.7	0.0	0.0	24.7	185.6	2.2%

Key:
PEM = Palustrine Emergent Wetland.
PFO = Palustrine Forested Wetland.
PSS = Palustrine Scrub-Shrub Wetland.

Summary of Impacts

The Proposed Action would result in direct and indirect impacts to wetlands within the target areas. Direct wetland impacts would include dredging, filling, clearing or conversion of wetland environments associated with the construction of target infrastructure, access roads, and firebreaks. Indirect impacts to wetland environments would include disturbances or activities that reduce or eliminate wetland functions, such as habitat fragmentation, changes in wetland type or hydrology, reduction or loss of supporting adjacent habitats, and changes in land use. The Proposed Action also would result in a change of land use and land management activities within the target areas, resulting in indirect effects to wetland environments.

There are 9,841.2 acres of wetland environments within the proposed acquisition areas. Of this total, only a small percentage of these environments would be impacted as a result of each of the action alternatives (Table 3-39). Because the effects to wetlands would be minimal in geographic extent, these direct impacts would not be significant.

Table 3-39
Summary of Total Wetland Impacts by Action Alternative (in acres)

Impact Type	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Total Impacts	Percent of Total Wetlands Impacted	Total Impacts	Percent of Total Wetlands Impacted	Total Impacts	Percent of Total Wetlands Impacted	Total Impacts	Percent of Total Wetlands Impacted
Conversion	6.1	0.2%	19.3	0.3%	25.4	0.3%	19.8	0.2%
Permanent Direct	5.9	0.2%	1.4	0.02%	7.9	0.08%	1.4	0.02%
Permanent Indirect	67.9	2.0%	180.0	2.4%	247.9	2.5%	180.0	2.2%
Short-Term Indirect	110.6	4.5%	160.9	2.2%	271.5	2.8%	185.6	2.2%

Reduction and Minimization of Impacts

In accordance with the CWA, EO 11990, and the Emergency Wetlands Resource Act of 1986, the Proposed Action has sought to minimize direct and indirect impacts to wetland environments. Wetland impacts would be avoided and minimized to the greatest extent possible while maintaining viable training and safety requirements. In the initial planning stages of the Proposed Action, acquisition of Area 2 was removed from further consideration based, in part, on the presence of large acreage of high-quality wetland habitat including bottomland hardwood forest. Approximately 54% (7,927 acres) of Area 2 is composed of wetlands (USFWS 2010a). Please refer to Section 2.4.3 for further discussion about the removal of Area 2 from consideration.

Currently, 9,841.2 acres of wetland environments exist within the acquisition areas. A majority of this area would serve as a safety buffer and no direct or indirect impacts to wetlands within the buffer area would occur. Potential direct and indirect impacts to wetlands would occur only within the proposed target areas and access roads. During the siting of target areas, large wetland systems were avoided for the placement of target areas within the acquisition area, to the extent possible, to maintain viable training and safety requirements. Target structures within the target areas were likewise sited to avoid or minimize wetland impacts from their construction. While wetlands would be avoided to the maximum extent practicable, some wetlands would be unavoidably impacted. The precise scope of the direct and indirect impacts will be defined at a later time when the target array areas are designed. A subsequent environmental evaluation would be conducted as part of any permitting action that may be needed.

3.4.4.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue, the USMC would not acquire any land, and training operations at TBR would not change due to this Proposed Action. No direct or indirect dredge or filling impacts to wetland environments would occur within the proposed target areas. The proposed acquisition areas would continue to be managed for silvicultural operations and would maintain normal farming permit exemptions under the CWA. Timber within wetlands would continue to be cleared and harvested under silvicultural operations. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.5 Water Resources

This section describes existing surface and ground waters within and near TBR, including those areas proposed for acquisition, and evaluates the potential effect under each alternative, including the No Action Alternative.

3.5.1 Definition of Resource

Water resources are defined as un-vegetated surface water environments, floodplains, and subsurface or groundwater environments. Surface waters include streams, creeks, rivers, and manmade water control structures such as canals, ditches, and drains. Floodplains are composed of low-lying areas subject to inundation during the 100-year flood event. Groundwater resources include subsurface waters within aquifers present in coastal Georgia. Groundwater is contained within aquifers composed of porous sand, clay, or limestone material. Within the region of the Proposed Action, groundwater is utilized for industrial, domestic, and irrigation purposes.

3.5.2 Regulatory Framework

3.5.2.1 Clean Water Act

Surface waters that have a direct or ecological connection to traditional navigable waters of the U.S are regulated under the CWA by the USACE. Under the CWA, the USEPA regulates discharge of potential pollutants into waters of the U.S. under the NPDES. (Please refer to Section 3.4.2.1 for a definition of 'waters of the U.S.') Within Georgia, the USEPA has delegated the administration of the NPDES program to the GA EPD.

3.5.2.2 Executive Order Number 11988, Floodplain Management (1977)

EO 11988 requires that modification and development within floodplains be avoided, to the extent practicable. Federal agencies are required to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, and to preserve and restore the natural values of floodplains. This requirement applies to acquiring, managing, and disposal of federal lands and facilities, construction or improvement projects, and federal activities that may affect land use, water resources, land resources, regulating and licensing activities.

3.5.2.3 Energy Independence and Security Act (2007)

The Energy Independence and Security Act requires that development or redevelopment projects involving federal facilities with a footprint exceeding 5,000 square feet use site planning, design, construction, and maintenance strategies to maintain or restore, to the maximum extent technically feasible, the property's pre-development hydrology with regard to the temperature, rate, volume, and duration of flow. The purpose of the Act is to ensure receiving waters are not negatively impacted by changes in runoff associated with federal projects (USEPA 2009).

3.5.3 Affected Environment

3.5.3.1 Surface Waters

The proposed acquisition areas are located in the Outer Coastal Plain, which is characterized by a flat, nearly level topography, composed primarily of sedimentary rocks of marine origin, and alluvial sediments generally sloping southeast toward the Atlantic Ocean (USACE 2008). Surface waters within the area consist of narrow bands of low-gradient flowing waters. Hydrologic flow is generally from west to east into the Atlantic Ocean.

Surface waters within the proposed acquisition areas include intermittent and perennial natural streams, ditches, manmade canals, and forested sloughs (Figure 3-17). Major surface waters within the region include Snuff Box Canal, Tram Road Canal, and tributaries of Bull Town Swamp, Big Mortar Swamp, Buffalo Swamp, Cathead Creek, South Newport River, and the Altamaha River.

The Proposed Action area is within two watersheds. The Altamaha watershed comprises the western portion of Area 1A. The Ogeechee Coastal watershed comprises the eastern portion of Area 1A and encompasses all of Area 1B and Area 3 (U.S. Geological Survey 2006).

Surface waters within the acquisition areas were identified using data from the National Hydrography Dataset (NHD 2010) and onsite field surveys of the proposed target areas. The total linear distances of flowing surface waters including natural streams, tributaries, manmade ditches, and drainages are provided in Table 3-40.

Table 3-40
Surface Waters

Acquisition Area	Miles
Area 1A	10.8
Area 1B	4.5
Area 3	27.8

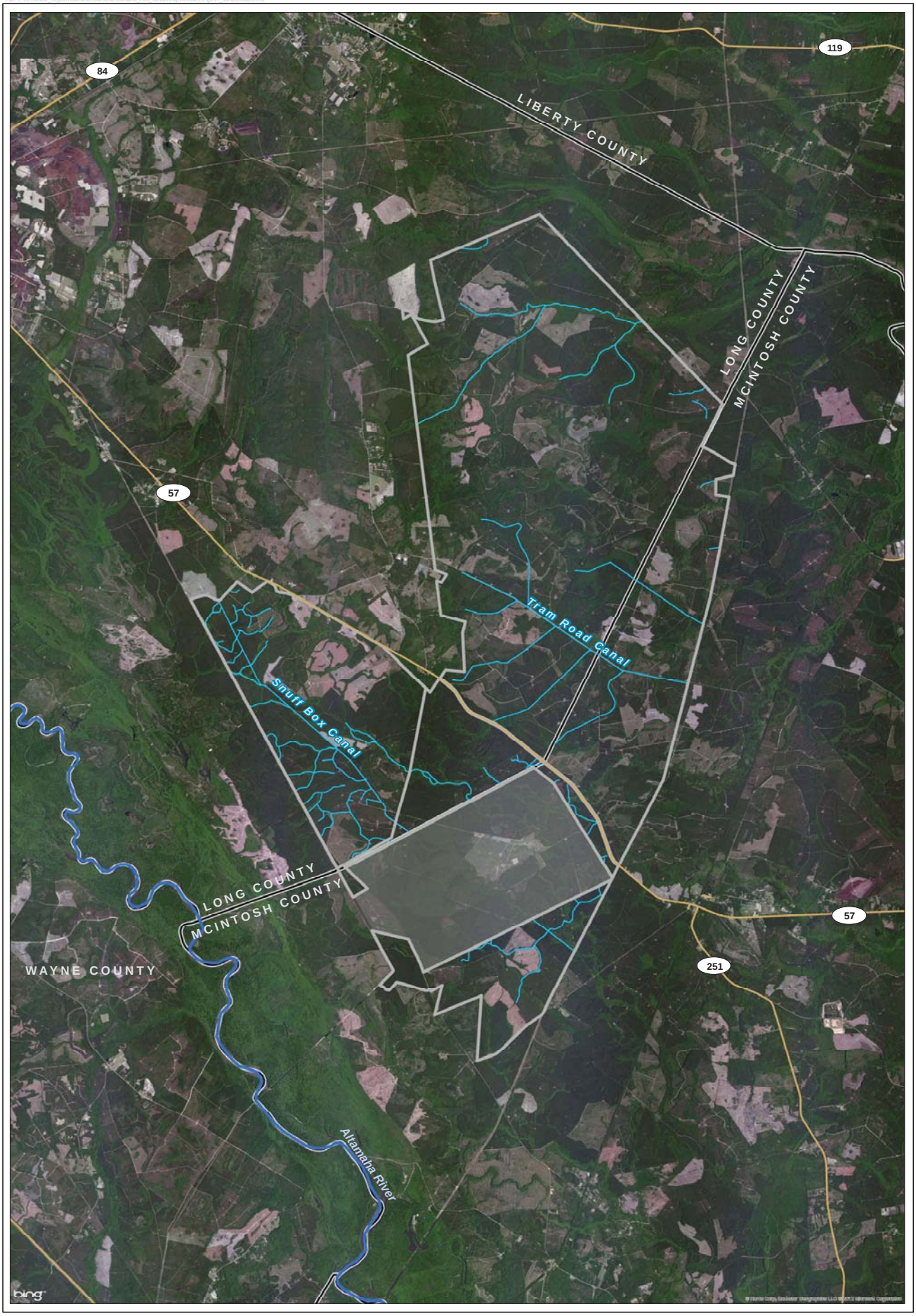
3.5.3.2 Floodplains

Portions of low-lying environments within the acquisition areas are within the 100-year floodplain (Federal Emergency Management Agency [FEMA] 2008; FEMA 2009) (Figure 3-18). Within Acquisition Area 1B, floodplain areas are associated with Big Mortar Swamp and the floodplain of the Altamaha River. Within Acquisition Area 3, floodplain areas are associated with Big Bay Swamp and are predominantly within McIntosh County. Floodplain areas are summarized in Table 3-41.

Table 3-41
Areas within 100-Year Floodplain

Acquisition Area	Acres
Area 1A	0.0
Area 1B	381.6
Area 3	913.9

Sources: FEMA 2008 and 2009.



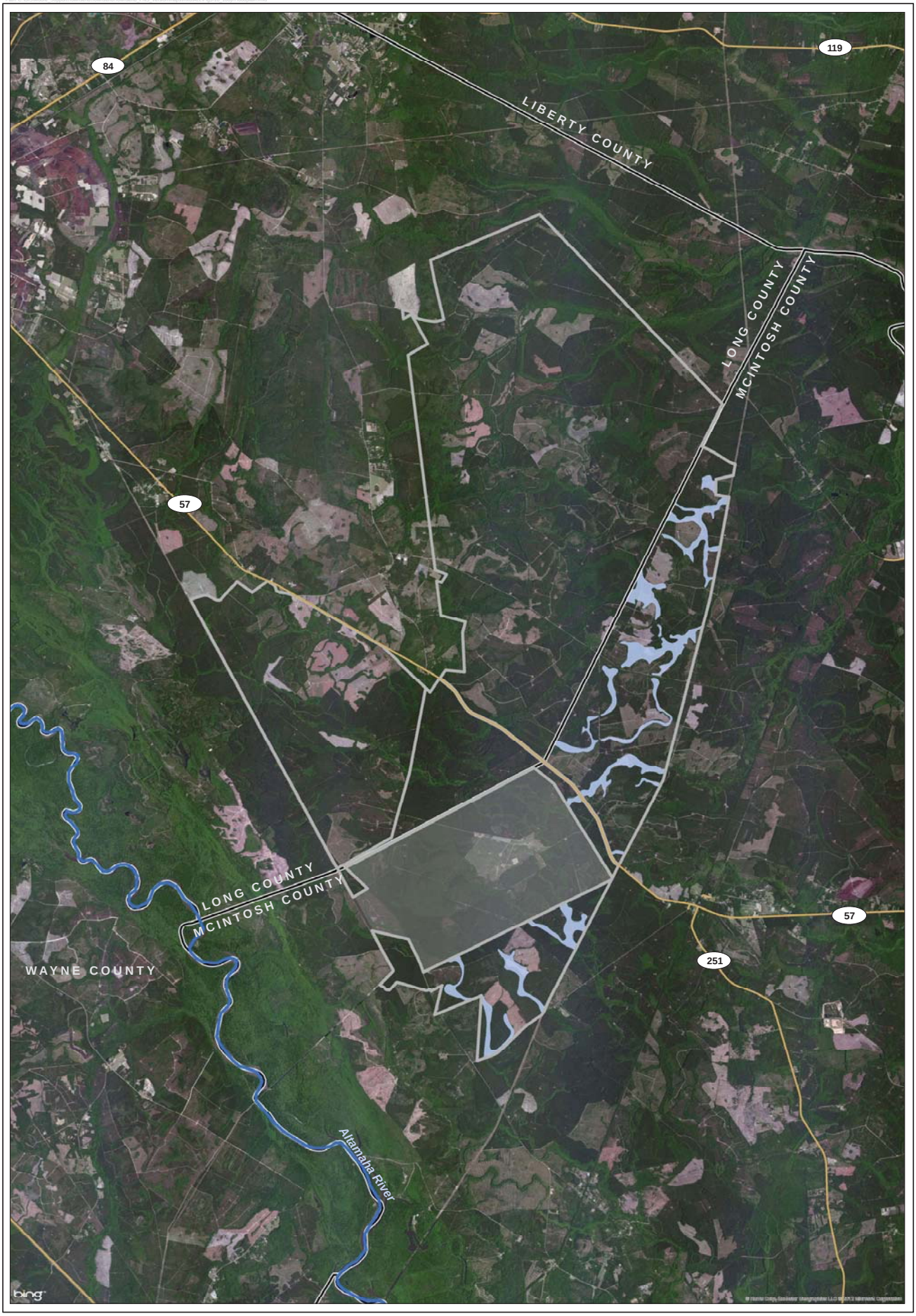
Surface Waters
Acquisition Areas
Existing Range
Counties
Major Roads
Altamaha River

N

0 1 2 Miles

Figure 3-17
Surface Waters
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Bing 2012, Based on Lusk 2009, USGS 2012



100-Year Floodplains
Acquisition Areas
Existing Range
Counties
Major Roads
Altamaha River

N

0 1 2 Miles

Figure 3-18
100-Year Floodplains
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Bing 2012, Based on Lusk 2009, FEMA 2008 & 2009

3.5.3.3 Groundwater

Three aquifer systems are present in the coastal area of Georgia. Below land surface, these are, in order, the surficial aquifer system, the Brunswick aquifer system, and the Floridan aquifer system. Characteristics of each of these aquifer systems are presented in Table 3-42.

In McIntosh and Long Counties, the top of the Upper Floridan aquifer occurs at depths ranging from approximately 310 to 560 feet below sea level and ranges in thickness from approximately 250 to 400 feet (Williams and Gill 2010).

The Upper Floridan aquifer is underlain by the Middle Eocene Avon Park Formation. Hard impermeable limestone and dolostone in the upper part of the formation form a leaky confining unit that separates the Upper Floridan aquifer from the underlying Lower Floridan aquifer (Miller 1986). In McIntosh and Long Counties, the confining unit between the Upper and Lower Floridan aquifer ranges from approximately 50 to 250 feet in thickness (Williams and Gill 2010).

In Coastal Georgia, the Lower Floridan aquifer is comprised of interbedded dolomitic limestone and dolostone of the Middle Eocene Avon Park Formation and Early Eocene Oldsmar Formation (Krause and Randolf 1989). Locally, in the Brunswick, Glynn County, Georgia, area, the Lower Floridan aquifer includes highly permeable limestone and dolostone of the Paleocene Cedar Keys Formation and permeable Late Cretaceous limestone (Krause and Randolf 1989). In coastal Georgia, the Oldsmar Formation or the Cedar Key Formation forms the base of the Lower Floridan aquifer (Krause and Randolf 1989).

In McIntosh and Long Counties, the top of the Lower Floridan aquifer occurs at depths ranging from approximately 725 feet to 1200 feet below sea level and ranges in thickness from approximately 500 to 650 feet (Williams and Gill 2010). Use of the Lower Floridan aquifer in Coastal Georgia is limited by excessive depth, locally poor water quality, and generally low permeability in places (Clarke, Hacke, and Peck 1990).

Table 3-42
Groundwater Resources

Aquifer System	Hydrogeologic Unit	Geologic Unit	General Lithology	Thickness [(a)]	Use
Surficial Aquifer System	Water-table zone	Satilla Formation	Sand, clay and limestone	210 to 280 feet	Rural domestic supply and irrigation
		Cypresshead Formation			
	Confined upper water-bearing zone	Ebenezer Formation			
	Confined lower water-bearing zone				
Brunswick Aquifer System	Confining unit	Coosawhatchie Formation	Fine to coarse slightly phosphatic and calcareous or dolomitic quartz sand	260 to 300 feet	Industrial supply and irrigation
	Upper Brunswick Aquifer				
		Mark Head Formation			
	Confining unit	Parachula Formation			
	Lower Brunswick Aquifer	Tiger Leap Formation			
Floridan Aquifer System	Confining unit	Suwannee Limestone	Limestone and dolostone	50 to 250 feet	Upper Floridan Aquifer is the principal source of potable water in southeastern Georgia. Lower Floridan Aquifer use is limited due to excessive depth and locally poor water quality.
	Upper Floridan Aquifer				
		Ocala Limestone			
	Confining unit	Avon Park Formation			
	Lower Floridan Aquifer			500 to 650 feet	
		Oldsmar Formation			

Note: (a) Thickness ranges for areas in McIntosh and Long Counties, Georgia.

Sources: Clarke 2003; Clarke, Hacke, and Peck 1990; Clarke, Hacke, and Peck 2004; Krause and Randolf 1989; Miller 1986; Priest 2007; Priest and Cherry 2007; Weems and Edwards 2001; Williams and Gill 2010.

Range Environment Vulnerability Assessment

A Range Environmental Vulnerability Assessment (REVA) has been conducted at TBR (Malcolm Pirnie, Inc. 2008). The purpose of the REVA is to identify the potential for a release of munitions constituents (MC) from the operational or range complex to off-range areas. The REVA provides a screening level assessment of the potential for release of MC from the range to human and ecological receptors in off-range areas through use of screening level models of the fate and transport of selected MC hexahydro-trinitro-triazine (RDX), trinitrotoluene (TNT), cyclotetramethylene tetranitramine (HMX) and perchlorate. Because no MC analytical data had been collected, the fate and transport modeling was conducted using conservative input parameters and assumptions to ensure that the MC concentrations were over-predicted. Lead, the most prevalent potentially hazardous component (by weight) of small arms ammunition, was evaluated qualitatively using the Small Arms Range Assessment Protocol, rather than modeled quantitatively, due to the lack of site-specific geochemical data.

REVA Trigger Values are screening level values to which modeling results are compared to determine whether additional actions are needed. The REVA Trigger Values are based on the median value of compiled **method detection limits (MDLs)** from various laboratories (USMC undated). The USEPA defines an MDL as "the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero." **Detection above an MDL simply indicates that the constituent is present in a sample analyzed by the laboratory, not that there is an immediate**

The REVA modeling predicted that perchlorate could migrate from the Heavy Weight Target area (Target 4 at the existing range) in shallow groundwater to Churchill Swamp, the nearest downgradient receptor, at concentrations above the REVA Trigger Value of 0.98 micrograms per liter (µg/L). Although the REVA modeling predicted perchlorate could be present in groundwater at the edge of Churchill Swamp (approximately 2,000 µg/L) at a level above typical analytical method detection limits (REVA Trigger Value), the predicted groundwater concentration was well below the ecological threshold value of 9,300 µg/L. The ecological threshold value was considered an appropriate risk screening level since Churchill Swamp is not used for water supply and therefore not considered a human receptor.

Ecological Threshold Value is the point at which a relatively small change in external conditions causes a large and rapid change in an ecosystem. When an ecological threshold has been passed, the ecosystem may no longer be able to return to its previous state. The trespassing of an ecological threshold often leads to rapid changes in ecosystem health.

The REVA modeling also concluded that the small arms range at TBR has an environmental concern rating of 'moderate' for groundwater due to the shallow depth to groundwater, lack of engineering controls and lead recovery, high precipitation, and low soil and groundwater pH.

The results of the field sampling program were not available during preparation of this FEIS.

3.5.4 Environmental Consequences

3.5.4.1 Surface Waters

Methodology and Evaluation Criteria

Direct and indirect impacts to surface waters were quantified based on GIS analysis of construction footprints of proposed target structures and delineated surface waters from the NHD (U.S. Geological Survey 2010) and onsite field surveys of the proposed target areas. Surface water boundaries were approved by the USACE in the PJD (Appendix E).

Common Elements Among All Action Alternatives

Potential impacts to surface waters as a result of the Proposed Action would occur only within the target areas and would be limited to the construction footprint of target structures within the target areas. Under normal circumstances, ordnances would fall within designated target areas. In the unlikely event that ordnance falls beyond the target area, short-term direct impacts to surface waters beyond the extent of the target structure footprint would be associated with the impact of the stray ordnance. The placement and relocation of the tactical targets would require a minor amount of forest clearing within the target areas as they would be designed to closely resemble real-world conditions with hidden or partially concealed threats. Following construction of the targets, significant portions of the areas would remain vegetated. Timber management activities would include the construction and maintenance of firebreaks encompassing the entire acquisition area and each of the target areas. To construct new firebreaks, existing vegetation would be cleared, plowed, and disked, and permanently maintained in an herbaceous state.

Direct impacts to surface waters would be associated with the construction of targets, roads, and firebreaks. The Proposed Action would include permanent conversion, relocation, or diversion of surface waters to construct hard design tactical targets used for training purposes. Changes to or removal of manmade ditches and drainages would affect current drainage patterns and hydrologic functions within the target areas. Currently, manmade ditches and drainages decrease surface water retention and confine surface water or groundwater flow, effectively draining portions of the target areas.

Indirect impacts to streams would include conversion impacts to vegetation adjacent to the stream. Currently, existing vegetation provides protection of stream function as it reduces sediment run-off into the stream, provides shade to limit water temperatures, and serves as habitat for riparian wildlife in the area.

Any non-exempt, direct or indirect impacts to surface waters would require permits from the USACE under Section 404 of the CWA and under the NPDES regulated by the GA EPD. The USMC would acquire all necessary permits after land acquisition has occurred.

Action Alternatives

Direct and Indirect Surface Water Impacts

Alternative 1. Development of Alternative 1 would result in the acquisition of 15.3 miles of surface waters (Table 3-43). A majority of this area would serve as a safety buffer, and no direct or indirect impacts to surface waters within the buffer area are anticipated. The potential direct and indirect surface water impacts under Alternative 1 are described by target area below and are summarized in Table 3-44.

Table 3-43
Alternative 1 - Surface Waters

Surface Water Type	Miles
Natural Stream Perennial	10.8
Natural Stream Intermittent	2.5
Manmade Ditch/Drainage Intermittent	2.0
Total	**15.3**

Table 3-44
Alternative 1 - Surface Water Impacts (in miles)

Impact Type	Target Area			Total Impacts	Percent of Total Surface Waters Impacted
	6	7	8		
Permanent Direct Manmade Ditch/Drainage	0.0	0.1	0.4	0.5	3.3%
Short-Term Indirect Natural Stream	0.0	0.1	0.0	0.1	0.7%
Short-Term Indirect Manmade Ditch/Drainage	0.05	0.01	0.03	0.09	0.01%

Target Area 6. No natural streams or manmade ditches and drainages occur within the footprints of proposed target structures. Based on NHD (2010) data, no surface waters occur within the proposed target areas. The Proposed Action would result in no direct impacts to surface waters within Target Area 6.

The construction of a 50-foot firebreak within Target Area 6 would result in short-term indirect impacts related to conversion of existing natural vegetation adjacent to surface waters. Construction of the firebreak would result in impacts to 0.05 mile of manmade ditches and drainages. Impacts to surface waters are expected to be minor as these structures provide little habitat for wildlife species in the area. Potential surface water impacts in Target Area 6 are illustrated on Figure 3-19.

Target Area 7. Construction of target structures within Target Area 7 would result in the loss of 0.1 mile of manmade ditches and drainages. Direct impacts to surface waters are expected to be minor as manmade ditches currently serve as drainage for planted timber stands and provide minor habitat and hydrologic function to adjacent areas.

Development of Target Area 7 would result in direct and indirect impacts to natural streams and manmade drainage structures. Construction of the firebreak would result in short-term indirect impacts to 0.1 mile of natural streams. Indirect impacts to streams would include conversion impacts to stream bank vegetation. Currently, existing vegetation provides protection to stream function as it reduces sediment-laden run-off into the stream, provides shade to limit water temperatures, and serves as habitat for riparian wildlife in the area. Construction of the firebreak would result in short-term indirect impacts to 0.01 mile of manmade ditches and drainages. Potential surface water impacts in Target Area 7 are illustrated on Figure 3-20.

Target Area 8. Construction of target structures within Target Area 8 would result in the loss of 0.4 mile of manmade ditches and drainages. Construction of Target Area 8 also would result in short-term indirect impacts to 0.03 mile of manmade ditches and drainages. Indirect impacts would be associated with the development of a 50-foot firebreak and would be limited to conversion impacts of adjacent vegetation. Potential surface water impacts in Target Area 8 are illustrated on Figure 3-21.

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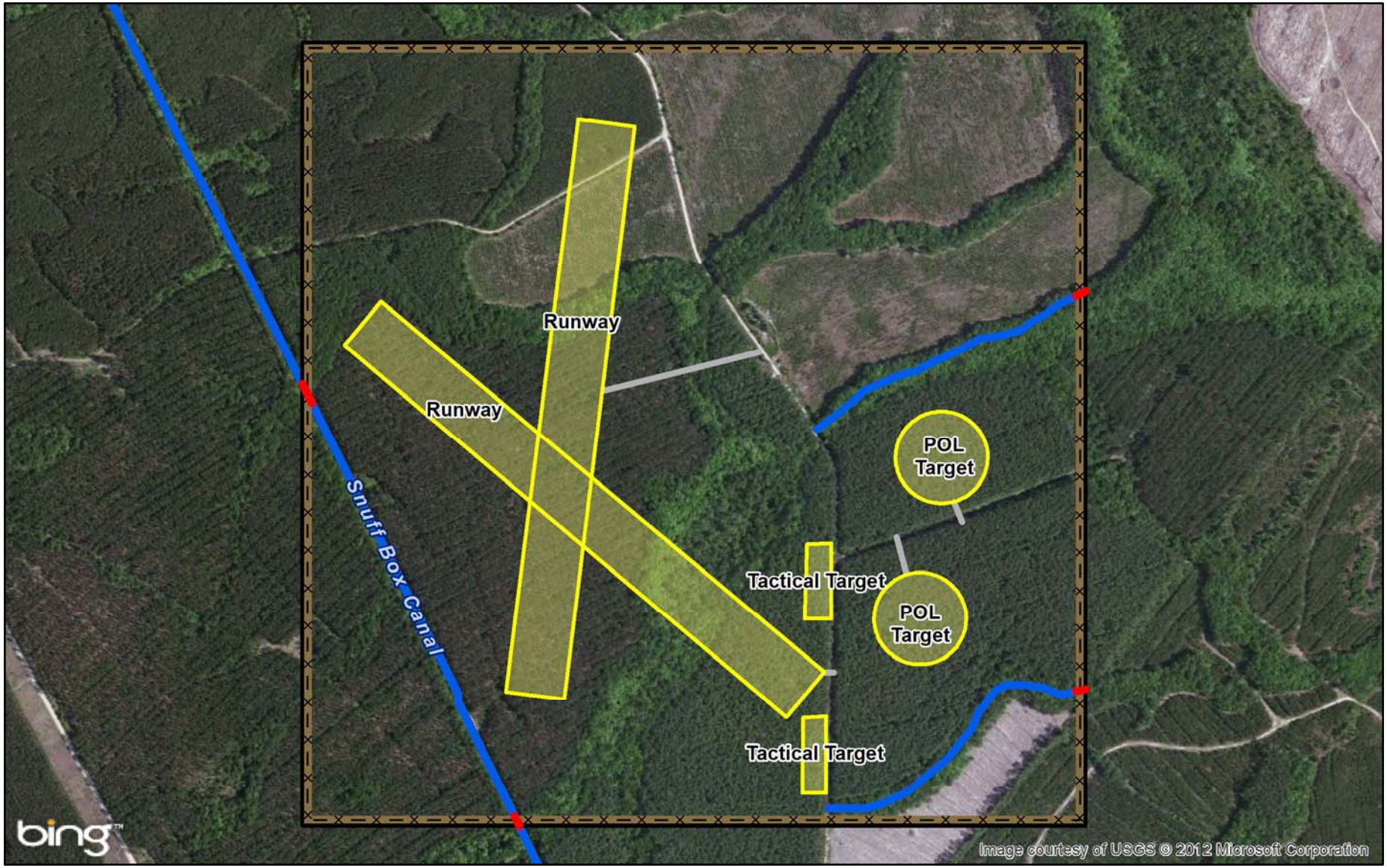

Manmade Ditch/Drainage
Manmade Ditch/Drainage Impact
Fence Line
New Road

Target Area
Target Structure
Firebreak

POL = Petroleum, Oil, and Lubricant

Figure 3-19
Target Area 6 Surface Water Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800
Feet

Sources: Bing 2012, USGS 2010, McFadden 2011

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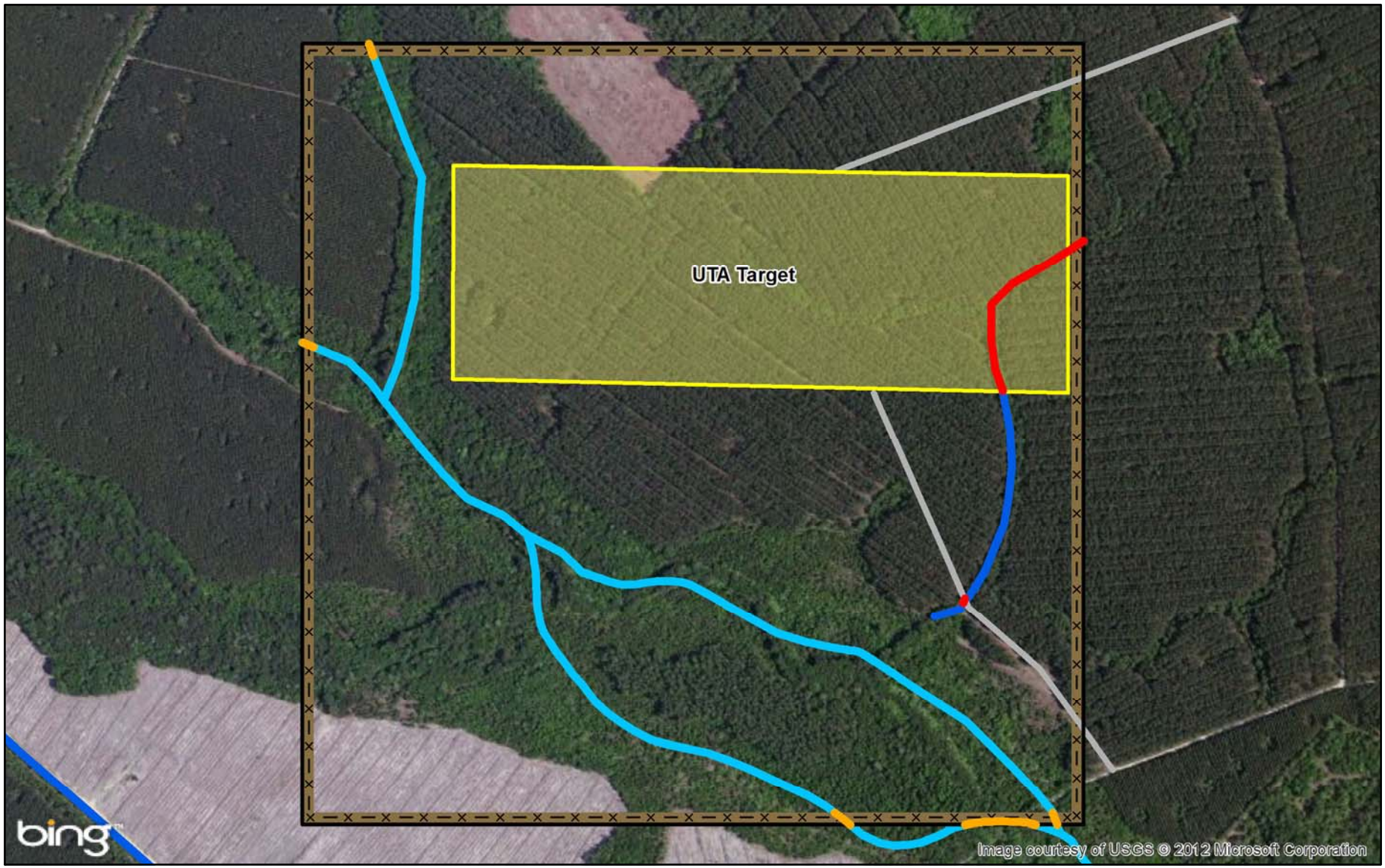


Manmade Ditch/Drainage
Natural Stream
Manmade Ditch/Drainage Impact
Natural Stream Impact

UTA = Urban Target Area

Target Area
Target Structure
Firebreak
Fence Line
New Road

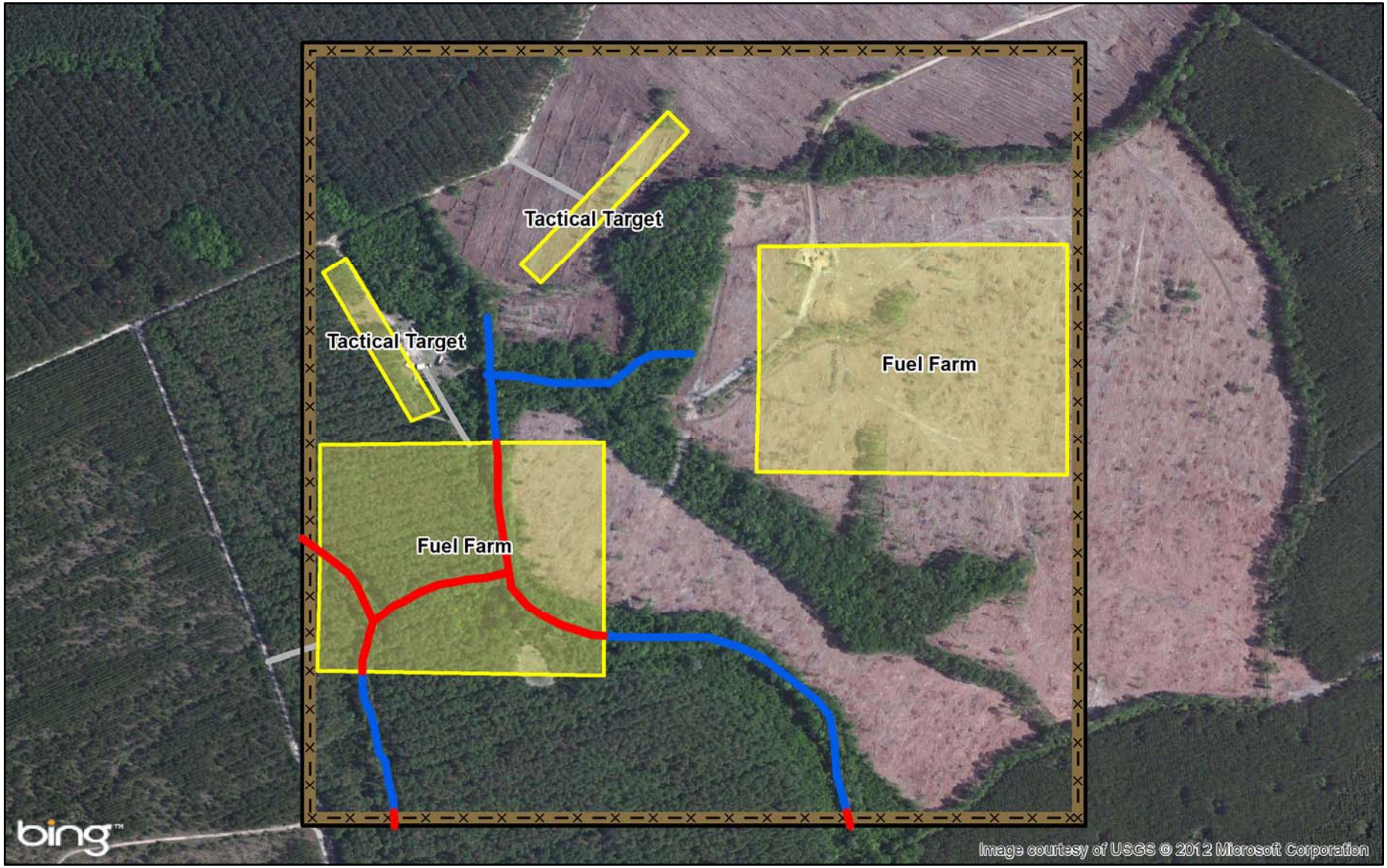
Figure 3-20
Target Area 7 Surface Water Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 300 600 Feet

Sources: Bing 2012, USGS 2010, McFadden 2011

Path: C:\GIS\Moore_Support\Townsend\Townsend\Townsend_PNS_Version\maps\mxd\ALL\Fig3-21_TargetArea8_SW_Impact.mxd



Manmade Ditch/Drainage
Manmade Ditch/Drainage Impact
Fence Line
New Road
Target Area
Target Structure
Firebreak

Figure 3-21
Target Area 8 Surface Water Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800 Feet

Sources: Bing 2012, USGS 2010, McFadden 2011

Alternative 2. Alternative 2 would result in the acquisition of 27.8 miles of surface waters (Table 3-45). A majority of this area would serve as a safety buffer, and no direct or indirect impacts to surface waters within the buffer area are anticipated. The direct and indirect surface water impacts under Alternative 2 are described by target area below and are summarized in Table 3-46.

Table 3-45
Alternative 2 - Surface Waters

Surface Water Type	Miles
Natural Stream Perennial	14.9
Natural Stream Intermittent	2.7
Manmade Ditch/Drainage Perennial	7.4
Manmade Ditch/Drainage Intermittent	2.8
Total	**27.8**

Table 3-46
Alternative 2 - Surface Water Impacts (in miles)

Impact Type	Target Area					Total Impacts	Percent of Total Surface Waters Impacted
	1	2	3	4	5		
Permanent Direct Manmade Ditch/Drainage	0.06	0.05	0.0	0.0	0.0	0.11	0.4%
Short-Term Indirect Natural Stream	0.0	0.02	0.0	0.0	0.0	0.02	<0.01%
Short-Term Indirect Manmade Ditch/Drainage	0.04	0.04	0.0	0.03	0.01	0.12	0.4%

Key:
km = kilometer(s).
mi = mile(s).

Target Area 1. Construction of target structures would result in the loss of 0.06 mile of manmade ditches and drainages. Direct impacts to surface waters are expected to be minor as manmade ditches currently serve as drainage for planted timber stands and provide minor habitat and hydrologic function to adjacent areas. Development of Target Area 1 also would result in short-term indirect impacts to 0.04 mile of manmade ditches and drainages. Indirect impacts would be associated with the development of a 50-foot firebreak and would be limited to conversion impacts of adjacent vegetation. Potential surface water impacts in Target Area 1 are illustrated on Figure 3-22.

Target Area 2. Target structure construction within Target Area 2 would result in the loss of 0.05 mile of manmade ditches and drainages. Development of Target Area 2 also would result in short-term indirect impacts to 0.02 mile of natural streams. Indirect impacts would be associated with the development of a 50-foot firebreak and would be limited to conversion impacts to adjacent vegetation. Additionally, 0.04 mile of short-term indirect impacts to manmade ditches and drainages would be associated with the development of the firebreak. Potential surface water impacts in Target Area 2 are illustrated on Figure 3-23.

Target Area 3. No direct or indirect impacts to surface waters as a result of the Proposed Action would occur within Target Area 3. No natural streams or manmade ditches and drainages were observed within the footprints of proposed target structures. No surface waters are mapped by NHD (2010) data within proposed target structures. The Proposed Action would result in no impacts to surface waters within Target Area 3.

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Manmade Ditch/Drainage
Manmade Ditch/Drainage Impact
Fence Line
New Road

Target Area
Target Structure
Firebreak

SAM = Surface-to-Air Missile
UTA = Urban Training Area

Figure 3-22
Target Area 1 Surface Water Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800 Feet

Sources: Bing 2012, USGS 2010, McFadden 2011

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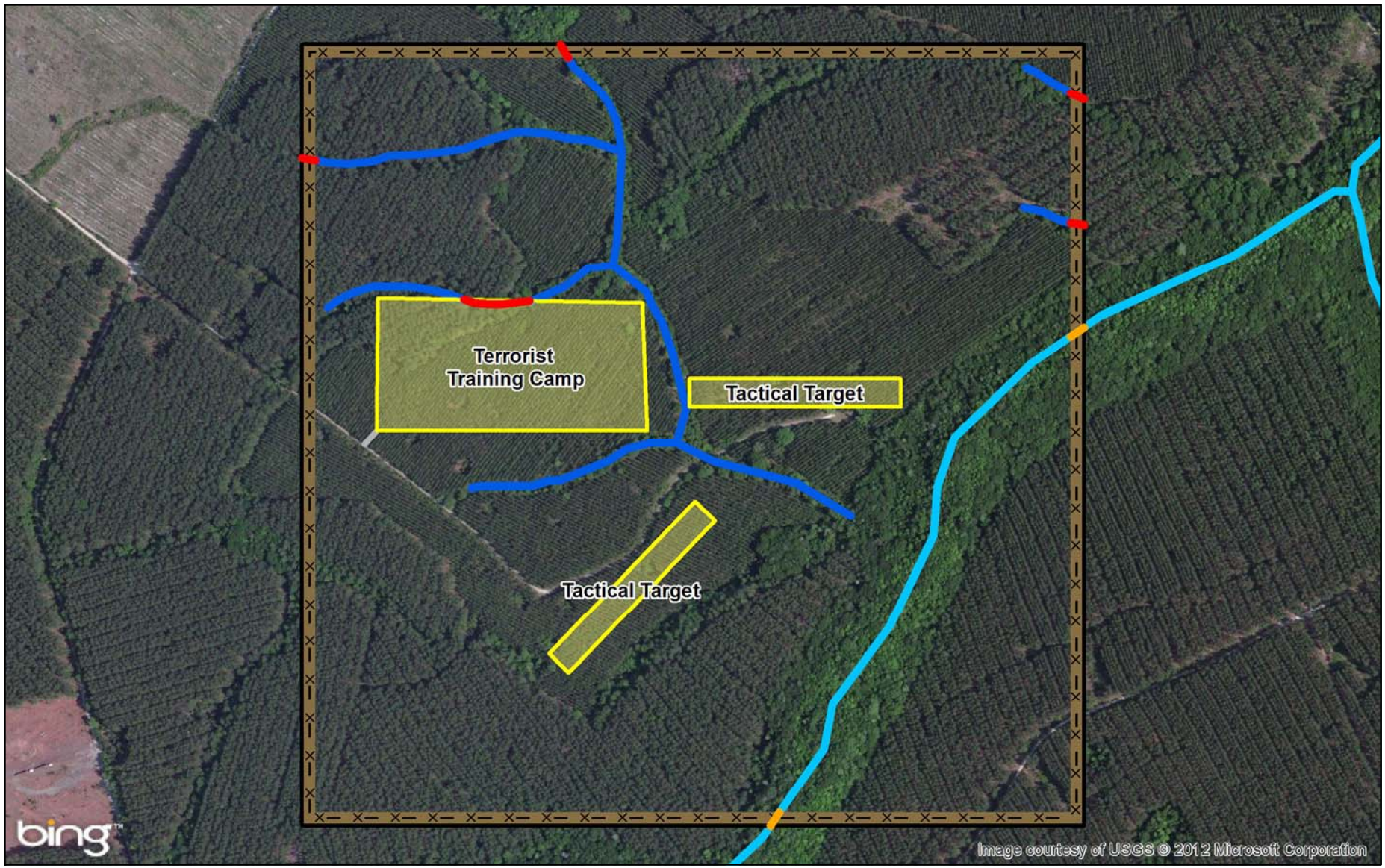

Manmade Ditch/Drainage
Natural Stream
Manmade Ditch/Drainage Impact
Natural Stream Impact

Target Area
Target Structure
Firebreak
Fence Line
New Road

Figure 3-23
Target Area 2 Surface Water Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800 Feet

Sources: Bing 2012, USGS 2010, McFadden 2011

Target Area 4. Development of a 50-foot firebreak within Target Area 4 would result in short-term indirect impacts to 0.03 mile of manmade ditches and drainages. Impacts are expected to be minor as they would be limited to conversion impacts to adjacent vegetation. No surface waters are located within the proposed footprint of target structures within Target Area 4. No natural streams or manmade ditches and drainages were observed within the footprints of proposed target structures. No surface waters are mapped by NHD (2010) data within proposed target structures. The Proposed Action would result in no direct impacts to surface waters within Target Area 4. Potential surface water impacts in Target Area 4 are illustrated on Figure 3-24.

Target Area 5. Construction of Target Area 5 would result in the short-term indirect impact of 0.01 mile of manmade ditches and drainages. No surface waters are located within the proposed footprint of target structures within Target Area 5. No natural streams or manmade ditches and drainages were observed within the footprints of proposed target structures. No surface waters are mapped by NHD (2010) data within proposed target structures. The Proposed Action would result in no direct impacts to surface waters within Target Area 5. Potential surface water impacts in Target Area 5 are illustrated on Figure 3-25.

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Manmade Ditch/Drainage
Manmade Ditch/Drainage Impact
Fence Line
Target Area
Target Structure
Firebreak

Figure 3-24
Target Area 4 Surface Water Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800 Feet

Sources: Bing 2012, USGS 2010, McFadden 2011

Path: C:\GIS\Moore_Support\Townsend\Townsend\Townsend_PNS_Version\maps\mxd\ALL\Fig3-25_TargetArea5_SW_Impact.mxd

Manmade Ditch/Drainage
Manmade Ditch/Drainage Impact
Fence Line
Target Area
Target Structure
Firebreak

Figure 3-25
Target Area 5 Surface Water Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800 Feet

Sources: Bing 2012, USGS 2010, McFadden 2011

Alternative 3. Alternative 3 would result in the acquisition of 43.1 miles of surface waters (Table 3-47). A majority of this area would serve as a safety buffer, and no direct or indirect impacts to surface waters within the buffer area are anticipated.

Table 3-47
Alternative 3 - Surface Waters

Surface Water Type	Miles
Natural Stream Perennial	25.7
Natural Stream Intermittent	5.2
Manmade Ditch/Drainage Perennial	7.4
Manmade Ditch/Drainage Intermittent	4.8
Total	**43.1**

Alternative 3 proposes to construct Target Areas 1, 2, 3, 4, 5, 6, 7, and 8 (which are previously discussed above for Alternatives 1 and 2). Construction of these target areas under Alternative 3 would result in the loss of 0.61 mile of manmade ditches and drainages; short-term indirect impacts to 0.21 mile of manmade ditches and drainages; and short-term indirect impacts to 0.12 mile of natural streams (Table 3-48). Potential impacts to surface waters in the target areas associated with Alternative 3 are illustrated on Figures 3-19 to 3-25.

Table 3-48
Alternative 3 - Surface Water Impacts (in miles)

Impact Type	Target Area								Total Impacts	Percent of Total Surface Waters Impacted
	1	2	3	4	5	6	7	8		
Permanent Direct Manmade Ditch/Drainage	0.06	0.05	0.0	0.0	0.0	0.0	0.1	0.4	0.61	1.4%
Short-Term Indirect Natural Stream	0.0	0.02	0.0	0.0	0.0	0.0	0.1	0.0	0.12	0.3%
Short-Term Indirect Manmade Ditch/Drainage	0.04	0.04	0.0	0.03	0.01	0.05	0.01	0.03	0.21	0.5%

Alternative 4. Alternative 4 would result in the acquisition of 32.3 miles of surface waters (Table 3-49). A majority of this area would serve as a safety buffer, and no direct or indirect impacts to surface waters within the buffer area are anticipated.

Table 3-49
Alternative 4 - Surface Waters

Surface Water Type	Miles
Stream Perennial	18.0
Stream Intermittent	3.1
Manmade Ditch/Drainage Perennial	7.4
Manmade Ditch/Drainage Intermittent	3.8
Total	**32.3**

Alternative 4 proposes to construct Target Areas 1, 2, 3, 4, 5, and 8 (which are previously discussed above for Alternatives 1 and 2). Construction of these target areas under Alternative 4 would result in the loss of 0.51 mile of manmade ditches and drainages; short-term indirect impacts to 0.15 mile of manmade ditches and drainages; and short-term indirect impacts to 0.02 mile of natural streams (Table 3-50). Potential impacts to surface waters in the target areas associated with Alternative 4 are illustrated on Figures 3-21 to 3-25.

Table 3-50
Alternative 4 - Surface Water Impacts (in miles)

Impact Type	Target Area						Total Impacts	Percent of Total Surface Waters Impacted
	1	2	3	4	5	8		
Permanent Direct Manmade Ditch/Drainage	0.06	0.05	0.0	0.0	0.0	0.4	0.51	1.6%
Short-term Indirect Natural Stream	0.0	0.02	0.0	0.0	0.0	0.0	0.02	0.1%
Short-term Indirect Manmade Ditch/Drainage	0.04	0.04	0.0	0.03	0.01	0.03	0.15	0.5%

Summary of Impacts. Potential impacts to surface waters as a result of the Proposed Action would occur only within the target areas and would be limited to the construction footprint of target structures within the target areas. Direct impacts to surface waters would be associated with the construction of targets, roads, and firebreaks, including permanent conversion, relocation, or diversion of surface waters to construct hard design tactical targets used for training purposes. Indirect impacts to streams would include conversion impacts to vegetation adjacent to the stream.

There are 43.1 miles of surface waters within the proposed acquisition areas. Of this total, only a small percentage of these surface waters would be impacted as a result of each of the action alternatives (Table 3-51); therefore, no significant impacts to surface waters are anticipated from the Proposed Action.

Table 3-51
Summary of Total Potential Surface Water Impacts (in miles) by Action Alternative

Impact Type	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Total Impacts	Percent of Total Surface Waters Impacted	Total Impacts	Percent of Total Surface Waters Impacted	Total Impacts	Percent of Total Surface Waters Impacted	Total Impacts	Percent of Total Surface Waters Impacted
Permanent Direct Manmade Ditch/Drainage	0.5	3.3%	0.11	0.4%	0.61	1.4%	0.51	1.6%
Short-Term Indirect Natural Stream	0.1	0.7%	0.02	<0.01%	0.12	0.3%	0.02	0.1%
Short-Term Indirect Manmade Ditch/Drainage	0.09	0.01%	0.12	0.4%	0.21	0.5%	0.15	0.5%

Reduction and Minimization of Impacts

In accordance with the CWA, the Proposed Action has sought to reduce and minimize direct and indirect impacts to surface water environments. Surface water impacts have been avoided and minimized to the greatest extent possible while maintaining viable training and safety requirements.

A majority of the proposed acquisition areas would serve as a safety buffer, and no direct or indirect impacts to surface waters within the buffer area are anticipated. Potential direct and indirect impacts to surface waters would occur only within the proposed target areas. During the siting of target areas, surface water systems were avoided for the placement of target areas within the acquisition area to the extent possible to maintain viable training and safety requirements. Target structures were sited within the target areas to avoid or minimize surface water impacts associated with target construction.

Surface waters located within the proposed target areas are composed primarily of manmade ditches and drainages. These surface water systems serve to alter natural hydrologic functions of adjacent lands and provide little habitat for wildlife species in the area.

Short-term temporary impacts to surface waters associated with the conversion of adjacent vegetation would be reduced and mitigated through the use of best management practices (BMPs) during construction to limit sediment discharge into surface waters. Additionally, areas designated as firebreaks would be maintained in an herbaceous state and natural vegetation would be allowed to regrow in previously cleared areas.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. The USMC would not acquire any land and training operations at TBR would not change due to this Proposed Action. As a result, no direct or indirect impacts to surface waters would occur. The areas would continue to be managed for silvicultural operations, and natural streams, ditches, and drainages would continue to function in their current capacity. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.5.4.2 Floodplains

Impacts to floodplains as a result of the Proposed Action would be limited to the construction footprint of target structures within target areas. In accordance with EO 11988, the proposed target areas have been sited to avoid floodplains and to minimize impacts to the greatest extent possible while maintaining viable training and safety requirements. Currently, 100-year floodplains are located only within Target Areas 5 and 8. Direct impacts to floodplains would be associated with the construction of targets and roads.

Methodology and Evaluation Criteria

Direct and indirect impacts to floodplains were quantified based on GIS analysis of construction footprints of proposed target structures and FEMA-designated floodplains.

Action Alternatives

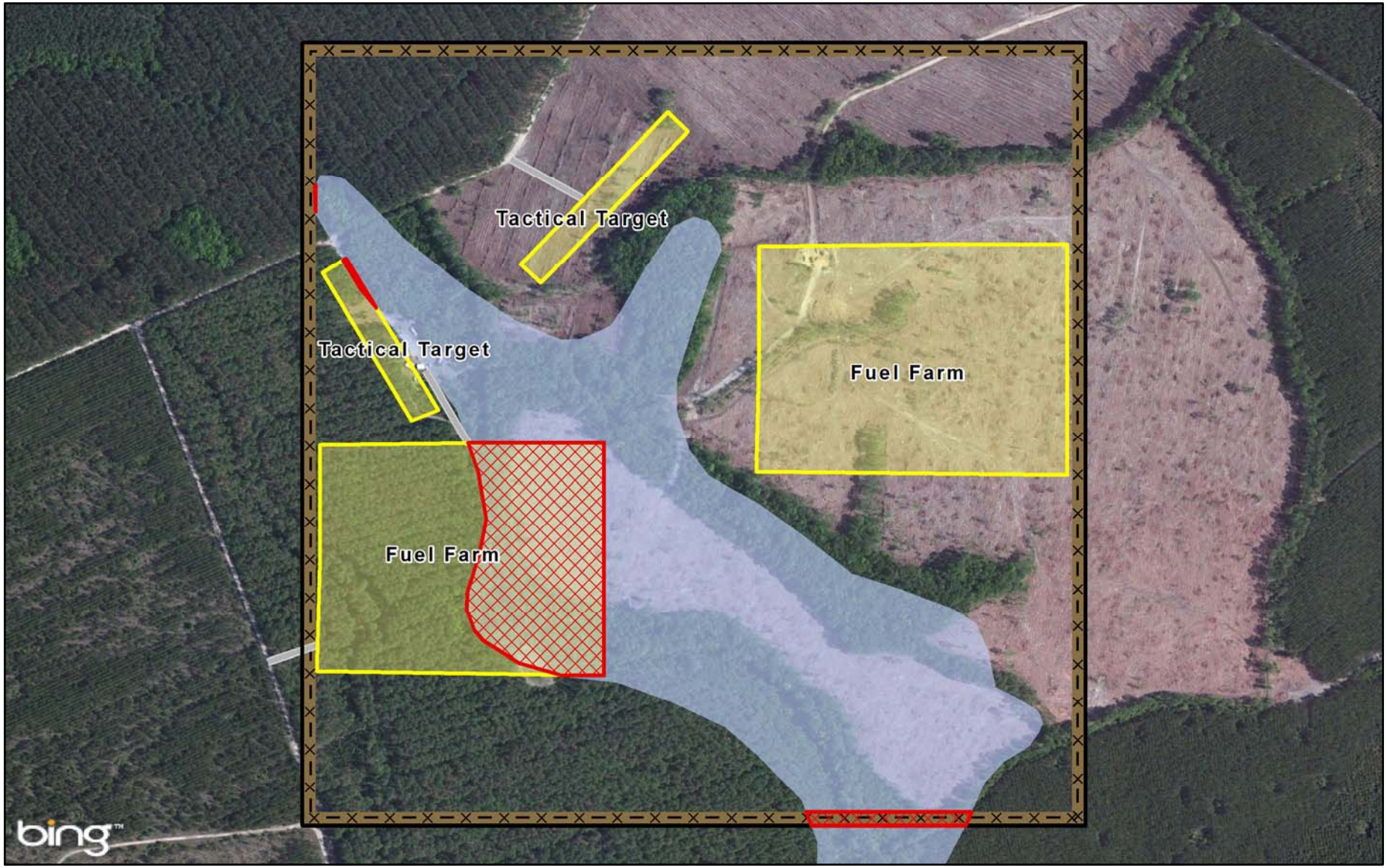
Direct and Indirect Impacts to Floodplains

Alternative 1. There are 381.6 acres of floodplains within Acquisition Areas 1A and 1B. Construction activities and impacts to floodplains would be limited to the proposed target areas. No floodplains are located within Target Areas 6 or 7. Approximately 56.4 acres of floodplain are located within Target Area 8. The westernmost fuel farm and tactical target array within Target Area 8 would be located within floodplains and construction would occur on 10.0 acres of floodplains (Table 3-52 and Figure 3-26). Construction of the fuel farm and tactical targets would require vegetation clearing and the placement of small target structures. No major impervious structures are proposed to be constructed within the floodplain areas and no major impacts to floodplain functionality are anticipated. Water storage, percolation, and water recharge levels are anticipated to remain near their current capacity. Minor amounts of fill material would be located within the construction footprint, and compensating stormwater and floodplain storage would not be required. Therefore, no direct or indirect impacts to floodplains would occur as a result of Alternative 1.

Table 3-52
Alternative 1 - Floodplain Impacts (in acres)

Impact Type	Target Area			Total Impacts	Percent of Total Floodplains Impacted
	6	7	8		
Permanent Indirect Impacts	0.0	0.0	10.0	10.0	2.6%

Alternative 2. Under Alternative 2, approximately 913.9 acres of floodplain would be acquired. No direct or indirect impacts to floodplains are anticipated under Alternative 2. No floodplains are located within Target Areas 1, 2, 3, or 4. Target Area 5 contains 39.6 acres of floodplains; however, no target structures would be located within floodplains. Therefore, no direct or indirect impacts to floodplains would occur as a result of Alternative 2.



Target Area
Target Structure
Firebreak
Fence Line
New Road
Floodplain
Floodplain Impact

Figure 3-26
Target Area 8 Floodplain Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

0 400 800 Feet

Sources: Bing 2012, McFadden 2011, FEMA 2008 & 2009

Alternative 3. Alternative 3 would result in the acquisition of 1,295.5 acres of floodplains. Construction activities and impacts to floodplains would be limited to the proposed target areas. No floodplains are located within Target Areas 1, 2, 3, 4, 6, or 7. Target Area 5 contains 39.6 acres of floodplains; however, no target structures would be located within floodplains. Approximately 56.4 acres of floodplains are located within Target Area 8. Within Target Area 8, construction of the westernmost fuel farm and tactical target array would occur on 10.0 acres of floodplains (Figure 3-26 and Table 3-53). The functionality of the floodplains in Target Areas 5 and 8 is not expected to be impacted.

Table 3-53
Alternative 3 - Floodplain Impacts (in acres)

Impact Type	Target Area								Total Impacts	Percent of Total Floodplains Impacted
	1	2	3	4	5	6	7	8		
Permanent Indirect Impacts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	10.0	0.8%

Alternative 4. There are 1,295.5 acres of floodplains within Acquisition Areas 1B and 3. As discussed under Alternative 3, construction activities and impacts to floodplains would be limited to Target Area 8 (Table 3-54 and Figure 3-26). Alternative 4 is expected to have the same impacts as Alternative 3 and, like Alternative 3, the impacts to floodplains in Target Area 8 are not expected to impact the floodplain's functionality.

Table 3-54
Alternative 4 - Floodplain Impacts (in acres)

Impact Type	Target Area						Total Impacts	Percent of Total Floodplains Impacted
	1	2	3	4	5	8		
Permanent Indirect Impacts	0.0	0.0	0.0	0.0	0.0	10.0	10.0	0.8%

Summary of Impacts. Construction activities, including vegetation clearing and the placement of small target structures, and impacts to floodplains would be limited to the proposed target areas. No major impervious structures are proposed to be constructed within the floodplain areas and no major impacts to the functionality of the floodplain are anticipated under any action alternative. There are 1,295.5 acres of floodplains located within the proposed acquisition areas. Only a small percentage of these floodplains would be impacted (within the target areas only) as a result of each of the action alternatives (Table 3-55); therefore, no significant impacts to floodplains are anticipated from the Proposed Action.

Table 3-55
Summary of Potential Floodplain Impacts by Action Alternative (in acres)

Alternative	Target Area								Total Impacts	Percent of Total Floodplains Impacted
	1	2	3	4	5	6	7	8		
1						0.0	0.0	10.0	10.0	2.6%
2	0.0	0.0	0.0	0.0	0.0				0.0	0.0%
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	10.0	0.8%
4	0.0	0.0	0.0	0.0	0.0			10.0	10.0	0.8%

No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. The USMC would not acquire any land and training operations at TBR would not change due to this Proposed Action. No direct impacts to floodplains would occur and floodplains would

continue to serve hydrologic functions, such as water storage and water recharge, in their current capacity. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.5.4.3 Groundwater

Action Alternatives

Alternative 1

Proposed Alternative 1 includes the relocation of the existing range compound facilities and observation tower on TBR to the northern corner of Area 1B (Figure 2-9). Alternative 1 would require the installation of a new supply well at the relocated range compound. After relocation of the range compound facilities, it is anticipated that the existing supply well at the former range compound area would be taken out of service. Consequently, groundwater usage under Alternative 1 is anticipated to be similar to current groundwater usage. Therefore, Alternative 1 is not anticipated to have any impact on groundwater in the Floridan aquifer.

Alternatives 2 through 4

Under Alternatives 2, 3, and 4, the existing range compound facilities and observation tower would not be relocated and the existing supply well at TBR would remain in use, with groundwater usage anticipated to be similar to current groundwater usage. Additionally, a new observation tower would be constructed in the southwestern corner of Area 3 (Figure 2-9). The new tower would require a new well and a slight increase in groundwater usage is anticipated. The minor usage increase a new well would create under Alternatives 2, 3, and 4 is not anticipated to impact groundwater in the Floridan aquifer.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. The existing supply well at TBR would remain in use with groundwater usage continuing at current levels. Therefore, there would be no impacts to groundwater in the Floridan aquifer under the No Action Alternative. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.6 Airspace

This section describes the existing operations conducted at TBR and the airspace components that support training exercises at TBR. Operations and airspace associated with the Proposed Action and action alternatives, as well as the No Action Alternative, are evaluated for potential impacts under each alternative scenario.

3.6.1 Definition of Resource

The nation's airspace is designed and managed by the FAA and is arranged to meet both the individual and collective needs of all military, commercial, and general aviation interests. Navigable airspace is categorized as either regulatory or non-regulatory. Four types of airspace are within those two categories: Controlled, Uncontrolled, Special Use, and Other. All airspace is organized according to the operating and flight rules that apply to the use of each area (Figure 3-27). Classification of each airspace area is contingent on the complexity or density of aircraft operations, the types of operations, the required level of safety, and national and public interest.

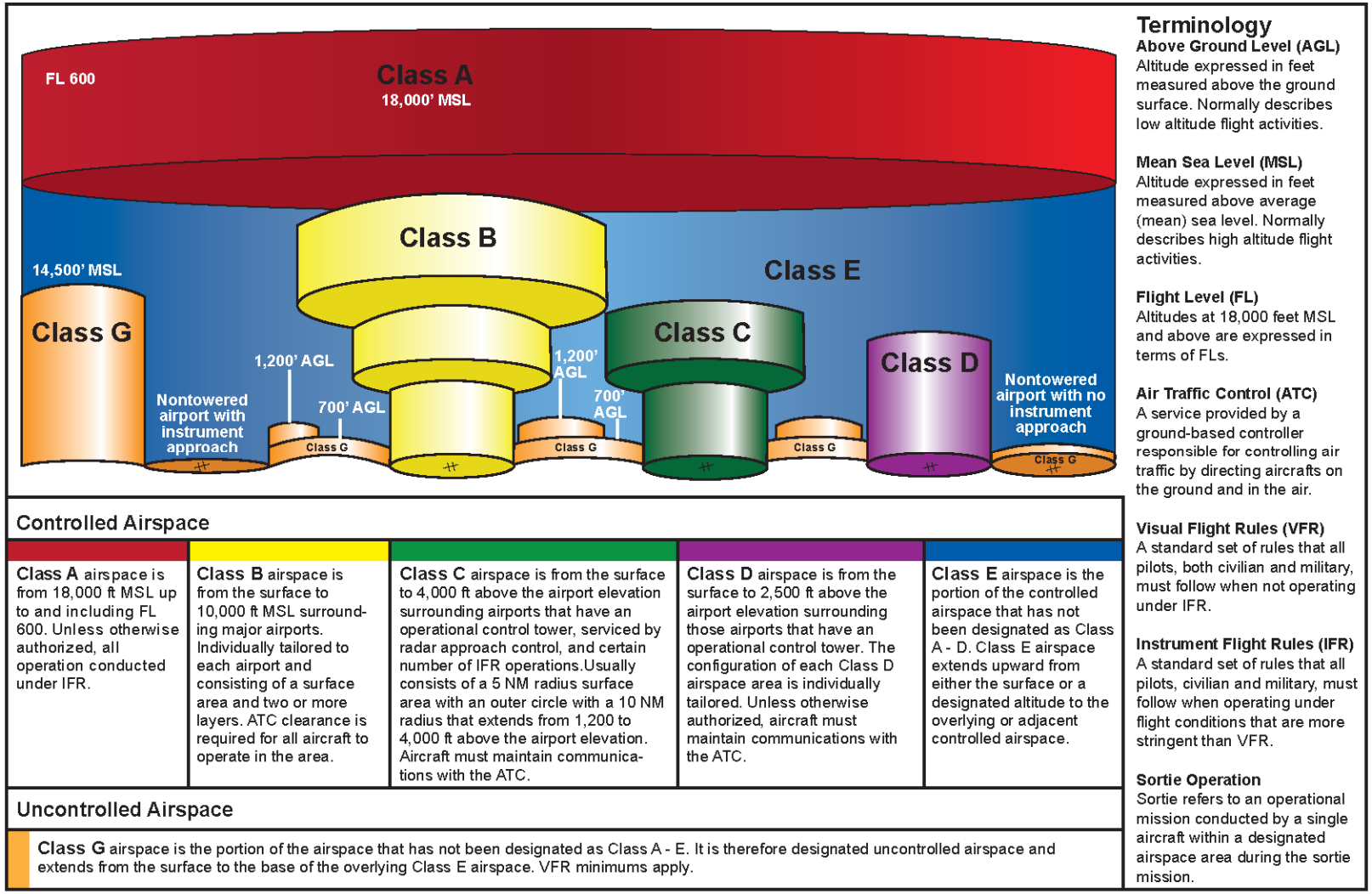


Figure 3-27: FAA-Designated Airspace

Controlled airspace, designated Class A through Class E, is a generic term that covers the different classifications of airspace and defined dimensions within which Air Traffic Control (ATC) service is provided in accordance with the airspace classification. Uncontrolled airspace, designated Class G, is the portion of the airspace not designated as Class A through Class E and where ATC has no authority or responsibility to control air traffic, but there are Visual Flight Rules (VFR) minimums that apply (FAA 2008). Class G airspace extends from the surface upward to the overlying Class E airspace (see Figure 3-27).

Special Use Airspace (SUA) is the designation for airspace in which certain activities must be confined or where limitations may be imposed on aircraft operations that are not part of those activities. The airspace components associated with TBR are classified as SUA. SUA is generally defined by the nature of training curricula and in the interest of public safety. SUA classifications include:

- **Prohibited Areas:** Airspace of defined dimensions within which aircraft flight is prohibited.
- **Restricted Areas:** Areas where operations are hazardous to non-participating aircraft and contain airspace within which flight of aircraft, while not wholly prohibited, is subject to restrictions.
- **Warning Areas (W-Areas):** Airspace of defined dimensions, extending from 12 NM outward from the coast of the United States, containing activity that may be hazardous to nonparticipating aircraft. These areas may contain a wide variety of aircraft and on-aircraft activities, such as aerial gunnery, bombing, aircraft carrier operations, surface and subsurface operations, naval gunfire, and missile shoots.
- **Military Operations Areas (MOAs):** Airspace with defined vertical and lateral limits established for the purpose of separating certain military training activities from Instrument Flight Rules (IFR) traffic.
- **Alert Areas:** Areas that may contain a high volume of pilot training or an unusual type of aerial activity. Pilots should exercise caution in Alert Areas.
- **Controlled Firing Areas (CFAs):** Areas that contain activities which, if not conducted in a controlled environment, could be hazardous to non-participating aircraft.

Regulatory SUA includes Prohibited Areas and Restricted Areas where changes to airspace dimensions require a formal amendment to 14 CFR Part 73, Aeronautics and Space - Special Use Airspace. The other SUA designations do not require a rulemaking process. Additional information on SUA designations is compiled and published annually in FAA Order JO 7400.8, Special Use Airspace (USDOT 2011).

The “Other” airspace category is a general term referring to the majority of the remaining airspace, including local airport advisory, MTR, temporary flight restriction, parachute jump aircraft operations, published VFR routes, terminal radar service area, and national security areas. MTRs are airspace corridors that support low-level ingress and egress to/from SUA, and that help to maintain proficiency in tactical flying. These routes are usually established below 10,000 feet MSL for operations at speeds in excess of 250 knots. MTRs have both vertical and lateral defined limits within which flight operations are contained. Non-participating aircraft are not prohibited from flying within an MTR; however, see-and-avoid procedures must be exercised when operating through or near these routes.

3.6.2 Regulatory Framework

The Federal Aviation Act (as amended) provides the FAA with exclusive authority to safely and efficiently manage all national airspace within the continental United States. As described in Section 1.4, the FAA was invited to participate as a cooperating agency and accepted by letter dated April 8, 2011 (see Appendix A). The Act further provides for FAA consideration (when exercising responsibility) of national defense, commercial aviation, general aviation, and public right of freedom in exercising its jurisdiction for transit through the navigable airspace. FAA Order JO 7610.4P, Special Operations, Chapter 9, Military Operations Requirements, contains FAA policies concerning airspace utilization for military operations. Processes for establishing or modifying regulatory airspace, such as Restricted Areas, are considered rulemaking and require public notification and participation, as outlined in FAA Order 7400.2, Procedures for Handling Airspace Matters. Processes for establishing or modifying non-regulatory airspace, such as MOAs, are non-rulemaking but may still require public awareness and involvement, as appropriate.

Airspace use is frequently reviewed by the FAA, the DOD, airport operators, and other affected stakeholders to ensure operational efficiency, user compatibility, and flight safety are maintained to the greatest extent possible. In this regard, DOD agencies responsible for managing the scheduled use of each SUA area submit annual SUA utilization reports to the FAA that describe the types of activities conducted in the airspace, the times and altitudes used, and other details that characterize airspace use. This information is considered in the FAA's overall management of the National Airspace System and SUA program (FAA 2008).

As part of the USDOT, the FAA is organized around a national headquarters in Washington, D.C., and its subordinate regions. The regions are charged with airspace administration and enforcement within their respective jurisdictions. With respect to the Proposed Action, the FAA's Eastern Service Area serves this function. The Federal Aviation Regulations contained in 14 CFR, Aeronautics and Space. Regulations that are associated with the Proposed Action primarily include 14 CFR, Volume 2, Parts 60-139 of Chapter I, Subchapter E, "Airspace" and Subchapter F, "Air Traffic and General Operating Rules."

Each of the military services within the DOD interfaces with the FAA by assigning military representatives to FAA headquarters and subordinate regions including the Eastern Service Area. Military representatives to the FAA provide guidance and coordination to assigned military units with respect to airspace use, establishment, and revision. Military Service representatives are located at the majority of FAA regional headquarters throughout the U.S., including the Eastern Service Area (Interagency Aviation Management Council 2003).

NEPA compliance and other environmental responsibilities are integral components of the FAA mission. Per FAA Order 7400.2, Chapter 32, "Environmental Matters," airspace and environmental review are to remain separate processes conducted in tandem, to the extent possible. FAA procedures for processing SUA aeronautical actions are outlined in 7400.2, Part V, "Procedures for Handling Airspace Matters." SUA procedures for environmental actions are contained in FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures." After completion of the Record of Decision (ROD) for this EIS, the FAA's NEPA process will begin analyzing the proposed SUA modification discussed in this FEIS.

The Proposed Action would be subject to the Memorandum of Understanding (MOU) between the FAA and the DOD (October 4, 2005) concerning the review of SUA environmental actions. The MOU promotes early coordination between FAA and DOD during the environmental review process associated with the establishment, designation, and modification of SUA. Any modification of SUA resulting from the implementation of the Proposed Action would reside under the jurisdiction of the Eastern Service Center, Operations Support Group, College Park, Georgia – the focal point for airspace and environmental matters (USDOT 2011).

As set forth in Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. Section 303(c)) the FAA and other USDOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless the following conditions apply: 1) There is no feasible and prudent alternative to the use of land, and 2) The action includes all possible planning to minimize harm to the property resulting from use. However, pursuant to Section 1079 of Public Law 105-85, military flight operations or designations of airspace for military flight operations may not be treated as a transportation program or project for the purposes of 49 U.S.C. 303(c); therefore, Section 4(f) is not being considered as part of this analysis.

3.6.3 Affected Environment

3.6.3.1 National Airspace

The National Airspace System (NAS) comprises all the airspace over the continental U.S. from ground level up to 60,000 feet MSL. FAA regulations establish and define the airspace sections that are part of the NAS. FAA airspace classifications are broadly based on the following criteria:

- The complexity or density of aircraft movements;
- The nature of operations conducted within the airspace;
- The level of safety required; and
- The national and public interest.

Aviation flight rules govern the NAS and are generally divided into two types: Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). The majority of VFR airspace is designated for general aviation and allows pilots to fly off published routes using visual references on the ground (e.g., highways, power lines, and railroads). Aircraft under VFR must have adequate visibility (approximately 3 miles) and cloud clearance (at least 500 feet) to "see and avoid" other aircraft. VFR altitudes are restricted to below 18,000 feet MSL and do not require flight clearance from ATC.

Aircraft under IFR require the use of radar and navigational aid systems to maintain separation with other aircraft utilizing the NAS. The FAA Air Route Traffic Control Center (ARTCC), also termed ATC, manages the safe separation and control of aircraft operating under IFR. Instrumented flight routes and altitude directions allow pilots to navigate parts of the NAS that support relatively large amounts of traffic such as en-route structures or airspace corridors utilized by both IFR and VFR traffic. Additionally, Terminal Radar Approach Control (TRACON) facilities serve to transition NAS traffic to/from the en-route system to a terminal environment (Interagency Aviation Management Council 2003).

FAA-defined airspace associated with the Proposed Action includes the following classifications:

- ***Class A:*** Airspace from 18,000 feet MSL up to 60,000 feet MSL, including the airspace overlying the waters within 12 NM of the coast. All operations must be under IFR and under direct control of air traffic controllers;
- ***SUA:*** These types include Prohibited Airspace, Restricted Airspace, W-Areas, MOAs, Alert Areas, and CFAs (TBR's SUA is discussed in more detail in Section 3.6.3.3); and
- ***"Other" Airspace:*** Within this category, the majority of airspace associated with the Proposed Action is MTR.

Aviation operations that occur routinely in Class E airspace are coordinated with the applicable ARTCC or TRACON.

3.6.3.2 Regional Airspace

TBR is one of seven USMC air combat/air-to-ground ranges in the United States. TBR's SUA consists of a Restricted Area (R-3007), the Coastal MOAs, and MTRs in the vicinity. R-3007 connects to the coastal MOAs and MTRs, an area collectively termed the Coastal Airspace Complex (CAC; Figure 3-28).

The CAC supports more realistic training scenarios such as aircraft carrier-based deployments to targets over land, and high altitude deliveries into R-3007. Table 3-56 defines the airspace complex, including its connectivity with the land ranges that underlie R-3007. Regional airports in the vicinity of TBR include the Savannah/Hilton Head International Airport, Glynco Jetport, and the Malcolm McKinnon Airport (AMEC Earth and Environmental, Inc. [AMEC] 2005).

Table 3-56
Coastal Airspace Complex

Airspace Type	Airspace Definition
Restricted Airspace	
R-3007A	Surface to, but not including, 13,000 feet MSL
R-3007B	1,200 feet AGL to, but not including, 13,000 feet MSL
R-3007C	100 feet AGL to, but not including, 13,000 feet MSL
R-3007D	13,000 feet MSL to 25,000 MSL (FL 250)
Coastal Military Operations Areas (MOAs)	
Coastal 1 East /ATCAA	300 feet AGL to, but not including, 18,000 MSL (FL 180)
Coastal 1 West /ATCAA	300 feet AGL to, but not including, 18,000 MSL (FL 180)
Coastal 2 MOA /ATCAA	300 feet AGL to, but not including, 18,000 MSL (FL 180)
Coastal 4 MOA /ATCAA	14,000 feet MSL to, but not including, 18,000 MSL (FL 180)
Coastal 5 MOA /ATCAA	300 feet AGL to, but not including, 18,000 MSL (FL 180)
Coastal 6 MOA /ATCAA	10,001 feet MSL to, but not including, 18,000 MSL (FL 180)
Coastal 7 MOA /ATCAA	10,001 feet MSL to, but not including, 18,000 (FL 180)
Coastal 8 MOA/ATCAA	11,000 feet MSL to, but not including, 18,000 MSL (FL 180)
Coastal Strike ALTRV	16,000 feet MSL to 20,000 MSL (FL 200) (as assigned by ATC) [(a)]

Notes:
ATCAAs were established to permit the continuation of MOA operations above 18,000 feet MSL. Therefore, Visual Flight Rules (VFR) aircraft are permitted to enter an MOA but not an ATCAA due to altitude restrictions.
The USMC and MAG-31 training requirements necessitate an air-to-ground range that supports the employment of PGMs from altitudes up to 25,000 feet MSL.
(a) Maximum of two consecutive altitudes.

Key:
AGL = above ground level.
ATC = Air Traffic Control.
ATCAA = Air Traffic Control Assigned Airspace.
FL = flight level.
MSL = mean sea level.

Sources: FAA 2006a and 2006b.

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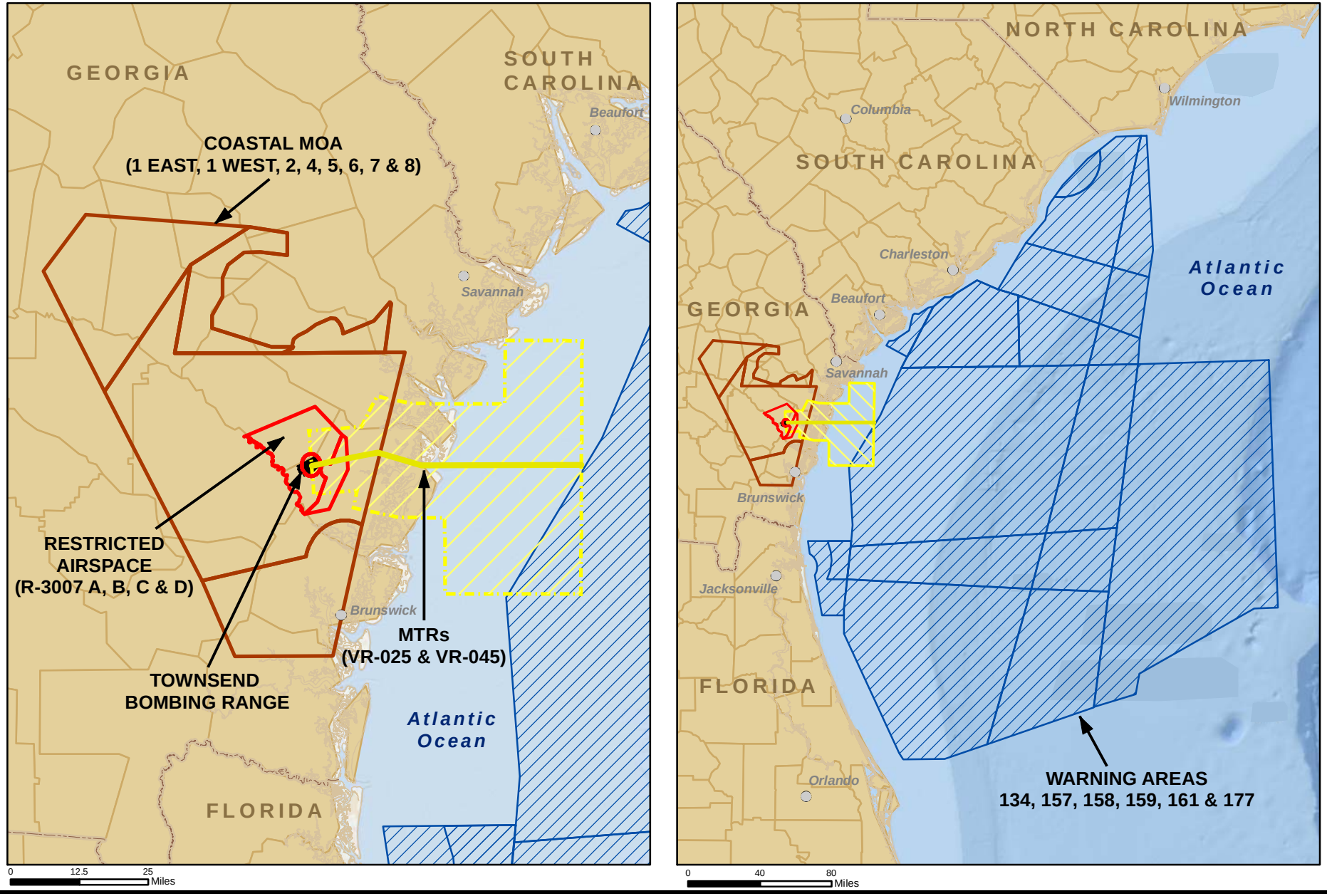

Restricted Airspace
Townsend Bombing Range
Military Training Routes (MTRs)
Coastal Military Operating Area (MOA)
Warning Areas
Counties

Figure 3-28
Coastal Airspace Complex
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Esri 2008; Based on Lusk 2009

3.6.3.3 Special Use Airspace

SUA associated with the Proposed Action includes Restricted Airspace, MOAs, and MTRs. Restricted Area 3007 (R-3007) overlies the land component of TBR, which is linked to the larger Jacksonville Range Complex through a series of MOAs and MTRs that provide access to the Eastern Seaboard including offshore Warning Area 157 (W-157). R-3007 covers approximately 288 square miles, extending from just southeast of TBR to the northwest, and is divided into four sub-areas designated R-3007A through R-3007D. Two Visual Route (VR) MTRs (VR-025 and VR-045) provide ingress and egress to TBR from the Atlantic Coast using the same course line (one to enter and the other to exit the R-3007). VR-025 is used for eastbound egress and VR-045 is used for westbound ingress to TBR. In addition, VR-1003 provides access to TBR; this MTR, along with a network of other MTRs, provides access to the Coastal MOA. W-157A and the Beaufort Tactical Aircrew Combat Training System Range advanced aircrew training facility are located seaward of the CAC, approximately 25 and 30 miles offshore, respectively. W-157A, the Beaufort Tactical Aircrew Combat Training System Range, and the Tactical Combat Training System relay site located off the Georgia coast provide for high-quality, air-to-air engagement analysis on ingress/egress by strike aircraft. In total, R-3007 and the Coastal MOAs include approximately 2,829 square miles of airspace. Table 3-57 further describes the SUA designations associated with the Proposed Action.

Table 3-57
Special Use Airspace Associated with the Proposed Action

SUA	Description		Altitude
Restricted Area	Areas where on-going or intermittent aircraft operations create a hazard to non-military transient aircraft.		Variable
	R-3007	R-3007A	Surface to 12,999 MSL
		R-3007B	1,200 AGL to 12,999 MSL
		R-3007C	100 AGL to 12,999 MSL
		R-3007D	13,000 MSL to 25,000 MSL (FL 250)
Military Operations Area (MOA) [(a)]	Airspace designated for military training activities, including air combat maneuvers.		Variable up to 18,000 feet MSL
Military Training Route (MTR)	Airspace designated for use as low-level, high-speed military routes over varied terrains.		Surface to 18,000 feet MSL[(b)]
	VR-045	Low-level route used for eastbound exit from R-3007.	500 AGL to 4,000 MSL
	VR-025	Low-level route used for westbound entry to R-3007.	
	VR-1003	Low-level route used for northeast entry to R-3007.	
	VR-1002 and VR-1004	Low-level routes that enter the Coastal MOA from the northwest (and provide access to R-3007).	

Notes:
The Coastal Airspace Complex is scheduled and managed by the Georgia Air National Guard Savannah Combat Readiness Training Center at Savannah/Hilton Head International Airport.
The USMC and MAG-31 training requirements necessitate an air-to-ground range that supports the employment of PGMs from altitudes up to 25,000 feet MSL.
(a) Please refer to Table 3-56.
(b) Most operations occur below 10,000 feet MSL.

Key:
AGL = above ground level.
FL = flight level.
MSL = mean sea level.
ATCAA - air traffic control assigned airspace.
ALTRV = altitude reservations.

Sources: MCAS Beaufort 2008 and CRTCI 13-212VI, Air Bases Order 3572.1 Part 1 (February 10, 2010).

SUA Scheduling and Management

When SUA is inactive, the ATC facility with airspace jurisdiction exercises Controlling Agency responsibilities and provides general aviation with safe passage (14 CFR 73.15). As the Using Agency, Savannah CRTC is responsible for scheduling, managing, containing, and reporting SUA utilization for all TBR users. The Savannah CRTC assumes this responsibility for the CAC and is the single point-of-contact for military airspace requests contained therein.

DOD-delegated authorities for airspace management are the frontline resources necessary to de-conflict airspace and disseminate information on behalf of military aircraft operating within the NAS. Military airspace controllers include scheduling "authorities" (for SUA) and "activities" (for MTR) (Interagency Aviation Management Council 2003). As previously noted, the Commanding Officer, MCAS Beaufort, South Carolina, has delegated the responsibility of air operations associated with TBR to the GA ANG Savannah CRTC through a host-tenant agreement (N62467-98-RP-00211).

3.6.4 Environmental Consequences

3.6.4.1 Methodology and Evaluation Criteria

Methodology used to assess the impacts to airspace were based on the extent to which the Proposed Action would affect the navigable airspace environment by: 1) negatively affecting movement of other air traffic in the area; 2) compromising ATC systems or facilities; or 3) causing an increase in midair collision potential between military and non-participating civilian aircraft. The extent of the potential impacts was based on the degree that the proposed airspace modifications would change existing relationships with federal airways, airport-related air traffic operations, and the effect the modifications would have on IFR and VFR air traffic. Given that the airspace modification portion of the Proposed Action only proposes to modify Restricted Area R-3007A, this is the focus of the analysis.

The evaluation criteria considered the extent to which the SUA modification proposal may impact the safe, orderly, and expeditious flow of all air traffic. Any effects on airway or route use, general aviation activities, airports/airfields, or ATC system capabilities that may affect air traffic flows in the region could be considered a potential significant impact. Any potential effects the Proposed Action would have on flight safety and operations and/or current private and commercial flight activities would be considered a direct impact, regardless of the level of significance. Indirect impacts include such factors as any increased time, attention, fuel/maintenance costs, etc., that a pilot may experience to plan and conduct any flights around the modified SUA, if necessary.

3.6.4.2 Action Alternatives (1 through 4)

Figure 3-28 depicts the SUA associated with TBR including Restricted Area R-3007 proposed for modification. Under all of the action alternatives, the USMC proposes to modify Restricted Area R-3007A by extending the current restricted area laterally to the proposed acquisition area boundary, eliminating the current gap from 100 feet AGL down to the surface of the ground over the areas proposed for acquisition. This extension, which would apply only to the existing restricted airspace over lands proposed for acquisition by the DON, would unite the airspace with acquired land to enable the delivery of inert ordnance in order to comply with FAA regulations. It is not an indication that fixed-wing flight operations would be conducted at altitudes below 100 feet. There would be no lateral modification of the R-3007 complex as part of the Proposed Action.

The FAA is a cooperating agency and has decision-making authority in the establishment, designation, and modification of SUA, per requirements in FAA Order 7400.2, "Procedures for Handling Airspace." Thus, the USMC would work with the FAA to amend R-3007C to match the real-estate footprint of the land acquired under the alternative that is selected. This configuration would allow mission requirements to be met more effectively within this expanded airspace structure and is intended

to make scheduling, controlling, and use of the airspace easier and safer. In addition, modification of R-3007 would not impact any private and/or commercial flight tracks. The proposed airspace modifications would result in positive impacts on airspace management and safety by reducing the potential conflicts with non-participating civilian air traffic in the area. Existing air traffic routes in the area are anticipated to remain unchanged. Similarly, the USMC and GA ANG currently work with emergency services, such as air ambulance, to suspend training operations and allow access through the restricted airspace. This working relationship will continue in the future and no loss or delay of emergency services is expected. Overall, the proposed airspace modification is not expected to have any negative direct and/or indirect impacts on airspace and therefore, the effects to airspace under the action alternatives would not be significant.

3.6.4.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. No changes would occur to the existing SUA. The current operations would continue to have a minimal effect on other military or civil aviation airspace uses in the region. Coordination between the ARTCC and military scheduling agencies would continue to ensure the compatible use of all airspace in this region. Therefore, no impacts to airspace resources would occur under the No Action Alternative. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.7 Noise

This section discusses aircraft and ordnance noise at TBR, including how noise is measured, the human response to various noise levels, and the noise impact of the Proposed Action and action alternatives, as well as the No Action Alternative.

3.7.1 Definition of Resource

DON and USMC guidelines (OPNAVINST 11010.36C and MCO 11010.16) define noise zones and recommend land uses compatible within these zones. Local governments are encouraged to apply these guidelines when making decisions about land use.

Noise is unwanted sound that interferes with normal activities or diminishes the quality of the environment. Noise can result in the potential for hearing damage, communications interference, sleep disruption, or general annoyance. Although exposure to very high noise levels can cause hearing loss, the principal human response to noise is annoyance. Reaction to noise is influenced by the type of noise, the perceived importance of the noise, the setting, the time of day, the type of activity during which the noise occurs, and individual sensitivity. Recognition of sound is based on the noise receptor and its response to sound's primary physical attributes: intensity, frequency, frequency distribution, variation over time, and duration. Perception of sound is subjective as not all noise receptors are affected the same way by the same sounds.

Sound is often measured and described in terms of its overall energy, taking all frequencies into account. However, the human hearing process is not the same at all frequencies. Humans are less sensitive to low frequencies (less than 250 Hertz [Hz]) than mid-frequencies (500 Hz to 1,000 Hz) (USEPA 1974). Humans are most sensitive to frequencies in the 1,000- to 5,000-Hz range.

The intensity of the sound is measured in units called decibels (dB). The dB system of measuring sound provides a simplified relationship between the physical intensity of sound and its perceived loudness to the human ear. Sound intensity increases or decreases exponentially with each dB of change. For example, compared to a 1 dB level, 10 dB yields a sound level 10 times more intense, while a 20-dB level equates to 100 times more intense, and a 30-dB level is 1,000 times more intense. However, to mimic the human ear's sensitivity and perception, the measurements are often adjusted, or weighted. Environmental and industrial noise measurements are typically on an "A-weighted" scale (denoted as dBA) that screens out the very high- and low-sound frequencies to more accurately reflect what people hear (Figure 3-29). Other weightings, such as "C-weighted" (denoted dBC), are typically applied to impulse sounds such as a sonic boom or ordnance detonation.

In accordance with DOD guidelines and standard practice for environmental impact analysis documents, the noise analysis herein utilizes the A-weighted scale and the following noise descriptors: Maximum Sound Level (L_{max}), Sound Exposure Level (SEL), and Day-Night Average Sound Level (DNL). Established by the Federal Interagency Committee on Noise, the A-weighted scale is recommended by the USEPA, is used by most federal agencies when defining the noise environment, and is applied as a land use planning tool for predicting potential annoyance both inside and outside an Installation's boundaries. DNL describes the average daily acoustic energy over an entire year—meaning that the whole spectrum of sound, from quiet to loud noises, is averaged across the year. DNL also adds an additional 10 dB to events occurring between 10:00 p.m. to 7:00 a.m. This 10-dB "penalty" represents the added intrusiveness of sounds occurring during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels at night are typically lower. By combining factors most noticeable about noise annoyance – maximum noise levels, duration, and the number of events over a 24-hour period – DNL provides a single measure of overall noise impact.

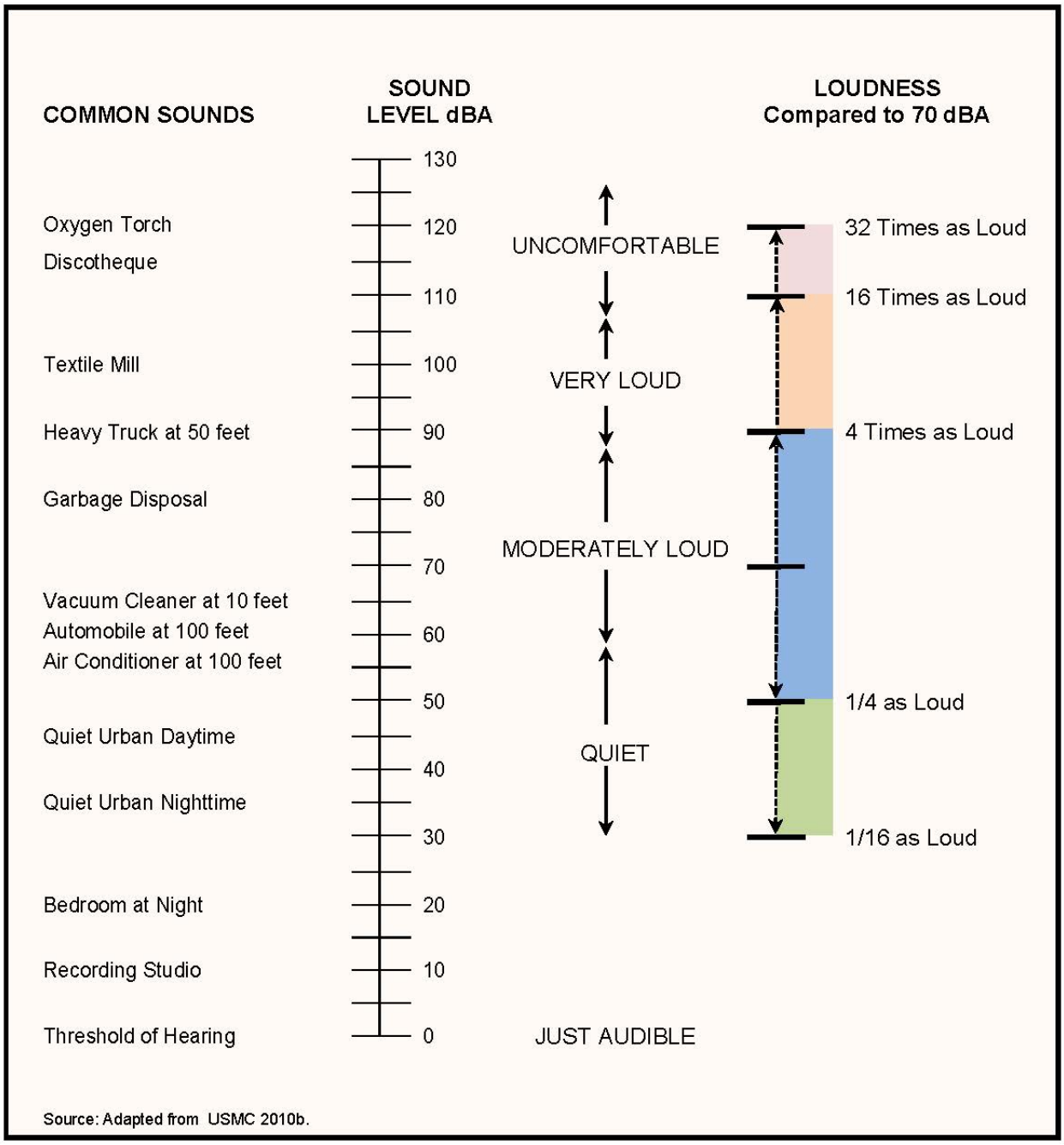

Figure 3-29: Typical A-Weighted Sound Levels of Common Sounds

The three principal types of noise sources that affect the environment are mobile sources, stationary sources, and construction sources. Mobile sources are those noise sources that move in relation to a noise receptor—including automobiles, buses, trucks, aircraft, and trains. Stationary sources of noise, as the name implies, do not move in relation to a noise receptor. Typical stationary noise sources include machinery or mechanical equipment associated with industrial and manufacturing operations or building heating, ventilating, and air-conditioning systems. Construction noise sources comprise both mobile (e.g., trucks, bulldozers, etc.) and stationary (e.g., compressors, pile drivers, power tools, etc.) sources. Construction noise is always considered to be temporary regardless of the construction duration.

3.7.2 Regulatory Framework

Aircraft noise guidelines have been adopted in cooperation with other federal agencies including the U.S. Department of Housing and Urban Development (HUD), the USEPA, the FAA, the DOD, and various state and local agencies.

3.7.2.1 Federal

The passage of the Noise Pollution and Abatement Act of 1972 (a.k.a., Noise Control Act) directed the USEPA to develop regulations for a variety of noise emissions. Additional noise abatement guidance is provided in 40 CFR 201-211, HUD noise regulations, 24 CFR 51 Subpart B, DOD Instruction 4715.13, USMC Air Installations Compatible Use Zones (AICUZ) and USMC RAICUZ noise programs, and MCO 5090.2A, Chapter 13, "Noise Management." Federal programs and policies addressing noise abatement specific to TBR are described further below.

USMC RAICUZ Program

The USMC's RAICUZ program is designed to protect public health, safety, and welfare, and to preserve the operational capabilities of air-to-ground ranges. The RAICUZ program includes range safety and noise analyses, and provides land use recommendations compatible with Range Compatibility Zones and noise zones associated with the military range operations. The noise exposure from aircraft is divided into three noise zones:

- Noise Zone 1 (DNL less than 65 dBA) is an area that generally is considered an area of low or no noise impact;
- Noise Zone 2 (DNL 65 to 74 dBA) is an area of moderate impact where some land use controls for noise sensitive uses are desired; and
- Noise Zone 3 (DNL 75 dBA and above) is the area of highest potential noise impact and requires the greatest degree of land use control (OPNAVINST 3550.1A).

To compare ordnance noise, which is C-weighted noise, to A-weighted noise levels, the criterion level is adjusted on the principle of equal annoyance. The 62 and 70 dBC ordnance noise contours correspond to 65 and 75 dBA aircraft contours, respectively (DON 2008). Therefore, ordnance noise levels below 62, 62 to 70, and above 70 dBC correspond to the RAICUZ Noise Zones 1, 2, and 3, respectively (DON 2008).

TBR Comprehensive Range Plan and Business Strategy

The Comprehensive Range Plan and Business Strategy (GA ANG 2005) guides the long-range planning for the use and improvement of TBR. The plan provides comprehensive range planning to include land space, airspace, range facilities, targets, instrumentation, environmental items, local community and government use of adjacent land, legal liability, rehabilitation, range operations, safety, range cleanup, and future plans or other actions that may have an impact on the range. This document is revised periodically and can incorporate new guidance to address noise-related issues and abatement procedures to ensure TBR's near- and long-term needs are compatible with the surrounding land uses.

3.7.2.2 State and Local

Local zoning ordinances and building codes are the principal tools for local governments to regulate and manage noise. Local governments are granted the authority to adopt zoning regulations to protect the health, safety, welfare, and aesthetics of their citizens pursuant to Article IX, Section II, Paragraph IV of the Constitution of the State of Georgia, and reaffirmed with the Zoning Procedures Law, Official Code of Georgia Annotated (O.C.G.A.) § 36-66-1 (2009). The GA DCA establishes the minimum local noise building codes and noise assessment requirements under HUD Guidelines (24

C.F.R. 51 Subpart B) outlined in the GA DCA (2010a) Environmental Manual. Noise associated with military and civilian airfield/aircraft operations must be considered in noise assessments. All new construction and rehabilitation projects must meet the GA DCA requirements for sound.

Most local plans created for towns or cities have a noise element that sets forth existing sound levels and states goals for each land use class and numerical planning standards to evaluate future development proposals with regard to noise pollution. However, neither McIntosh County nor Long County have noise ordinances and/or building codes that dictate new construction design and materials to abate noise exposure specific to TBR. Thus, the GA DCA minimum noise building codes and the HUD noise assessment guidelines are the primary regulations influencing new construction surrounding TBR. McIntosh County and City of Darien Joint Comprehensive Plan Community Assessment (CGRDC 2007) has limited information regarding restricting development and incompatible uses near TBR when factors of noise, hazard, and possible expansion are considered, but does not outline appropriate sound levels and/or stated noise exposure goals.

3.7.3 Affected Environment

3.7.3.1 Flight Operations

Military aircraft flight training operations are a source of noise associated with TBR. Around and underneath TBR's training SUA units, the noise environment is normally described in terms of the time-average sound level generated by aircraft operating in that airspace. Flights within SUA can be highly variable in occurrence and location. Noise from the use of inert (non-explosive) ordnance also is associated with training operations at TBR. The aerial strafing operations are the primary source of generating noise at TBR. This noise is impulsive in nature with sudden bursts of noise from the firing of high-caliber guns (20-millimeter to 50-millimeter) (Blue Ridge Research and Consulting, LLC [BRRC] 2012).

Noise levels from training operations at TBR are based on the following:

- Aircraft model and type;
- Aircraft power settings, speeds, and altitudes;
- Type of flight operation;
- Number of operations per day;
- Time of operation;
- Flight path;
- Type of ordnance (Note, there is no difference in the noise level of an inert general-purpose bomb and an inert PGM);
- Terrain;
- Surface type; and
- Weather data (temperature and humidity).

Additional noise sources include vehicular traffic and construction.

The noise affected environment is based on the current MAG-31 F/A-18 flight training operations at TBR, which include the following general training events:

- Close Air Support (CAS);
- Aerial Reconnaissance (AR);
- Air Interdiction (AI);
- Large Force Exercise (LFE); and
- Low Altitude Training (LAT).

These events involve flights with no ordnance and some with general-purpose bombs, laser-guided rounds, and strafing. The current training operations do not include the use of PGMs. The baseline condition considered 2,358 flight operations annually. Under TBR's current configuration, approximately 350 acres of cleared target areas include a number of stationary targets, a movable target, a UTA, a strafe pit, and infrared targets; each of these support the annual flight operations. The flight operations utilize the entire SUA and generate a range of noise levels within those different airspace units. In conjunction with this FEIS, a noise study was completed to compare the noise impact from both current and proposed MAG-31 training operations at TBR. Modeling noise generated from the deployment of ordnance during training operations is very complex due to the nature of the operations. One of the key reasons for the difficulty is that the aircraft deploying the ordnances rarely fly the exact flight track and, in some cases, the flight track is simply a generalized fan where the pilot can approach the target from a range of headings (BRRC 2012).

For the noise analysis, a uniform distribution of the operations within each defined airspace unit was assumed (see Appendix F). The altitude at which the flight operations are conducted is a key parameter that influences the noise exposure levels at TBR. As altitude increases, the air temperature and density decrease, which impacts the way sound travels and the noise level is experienced on the ground. Sound levels are greater at higher temperatures, which normally occur closer to ground level. In addition, noise exposure is greater at lower altitudes due to the higher air density. Sound is refracted upward at higher altitudes which further reduces the noise exposure on the ground. Table 3-58 provides the altitude distributions for the various mission types for the current TBR operational conditions. Currently, 41.7% of all operations at TBR are conducted above 10,000 feet AGL, and 19.7% are conducted at low altitudes (0 to 3,000 feet AGL) (BRRC 2012).

Table 3-58
Altitude Distributions for Current Operations at Townsend Bombing Range

Altitude Range (above ground level)	Composite	Sorties
0 to 3,000 feet	19.7%	465
3,000 to 10,000 feet	38.6%	910
Above 10,000 feet	41.7%	983

Source: BRRC 2012.

Noise Exposure From Flight Operations

Table 3-59 provides the general noise levels for the different airspace units associated with operations at TBR and the Coastal MOA complex. The maximum noise level experienced within any of the airspace units is up to approximately 55dBA, which occurs within R-3007. The flight operations associated with strafing training events conducted within TBR are responsible for the highest impact on existing noise levels within R-3007. This is due to the nature of the flight pattern during the strafing operation, which features a left-turn pattern including a straight run-in distance of 1.3 NM to the target at low altitude (BRRC 2012). All of the Coastal MOAs experience noise levels below 49 dBA because the aircraft maintain an altitude greater than 10,000 feet throughout most of those areas. Figure 3-30 shows the noise contours for the existing conditions within TBR boundaries.

Table 3-59
Noise Level Distributions for Current Operations at Townsend Bombing Range within Airspace Units

	R-3007	Coastal MOA 1	Coastal MOA 2	Coastal MOA 4	Coastal MOA 5	Coastal MOA 8
Current Noise Level (dBA) Conditions	48 to 55	38 to 49	47	36 to 47	36	36

Key:
dBA = A-weighted decibel(s).
MOA = Military Operations Area.
R-3007 = Restricted Area 3007.

Source: BRRC 2012.

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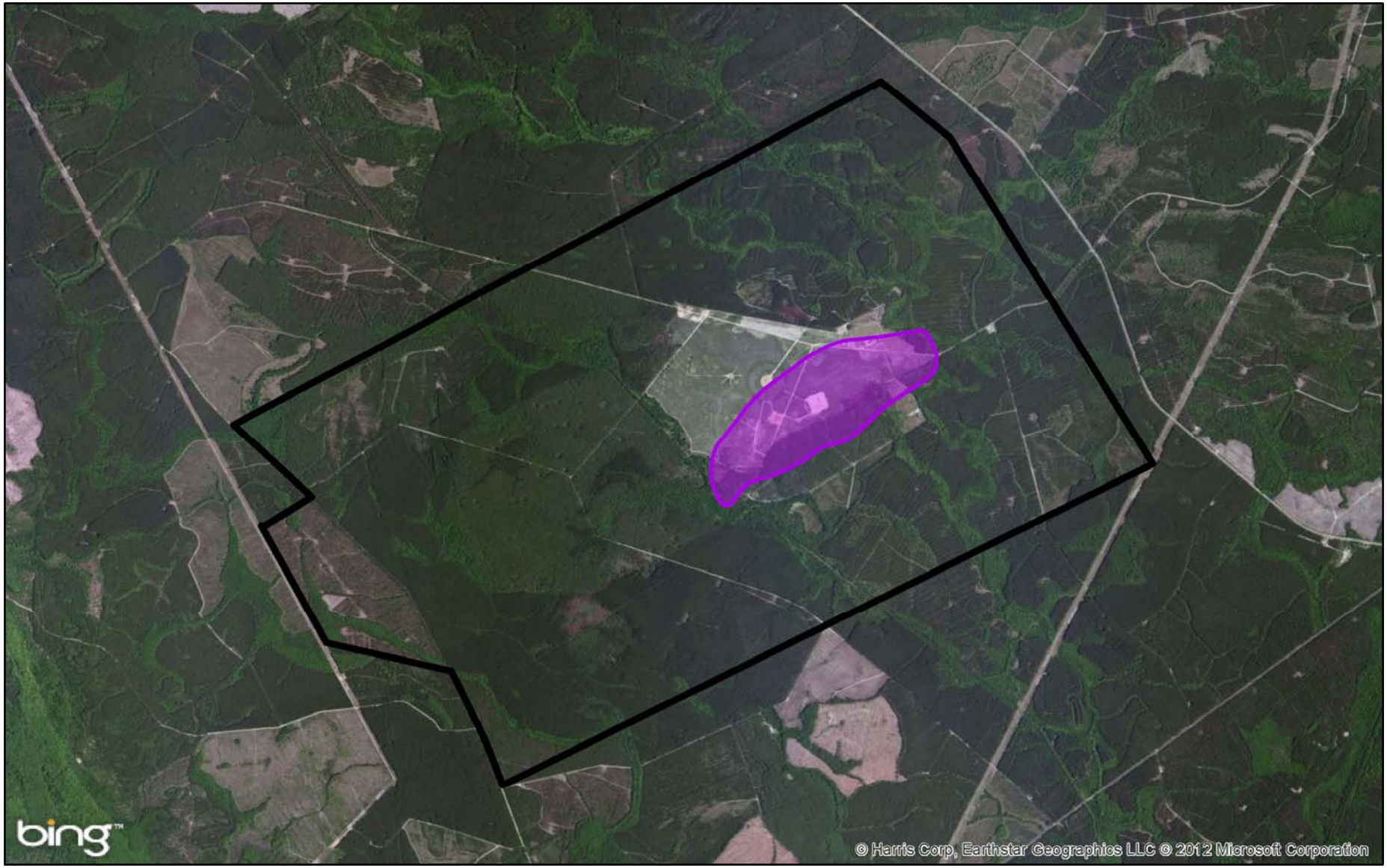

Existing Range Boundary

55-dB Noise Contour

dB = Decibel
MAG = Marine Aircraft Group

Figure 3-30
Noise Contour for Current MAG-31 Aircraft Operations
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 3,000 6,000 Feet

Sources: Based on Lusk 2009, Bing 2012, BRRC 2012

3.7.3.2 Ordnance

TBR supports a variety of ordnance delivery to carry out training activities. All current TBR training involves the use of only inert munitions, which contain no explosives. The projected baseline level of ordnance activity within TBR is based on the annual MAG-31 F/A-18 sorties of 2,358 presented in Table 2-5. The gunnery strafing operations (large caliber weapon firing) are the key source of noise on the range and thus are the only ordnance-delivery operation analyzed in this FEIS. Existing noise conditions are based on the maximum number of rounds fired during the 94 strafing sorties conducted annually. These operations are conducted on the scored strafing pits centered within the current TBR boundaries.

Noise Exposure from Ordnance

Gunnery strafing operations generate two sound components: 1) ballistic waves (i.e., sonic booms) from the bullets, and 2) muzzle blast from the gun firing. The ballistic waves from the bullets only occur forward of the firing point, whereas muzzle blast can be heard in all directions (BRRC 2012). These noise events are calculated using the C-weighted metrics to account for this impulse of noise. The existing 57, 62, and 70 dBC noise contours for the strafe training events are shown on Figure 3-31, which illustrates that the loudest portions of the current air gunnery noise remain well within the range boundaries.

These C-weighted cumulative average noise levels are used to determine impacts. However, the peak sound pressure is also of interest when impulsive sounds are analyzed. Peak pressure is represented on the decibel scale with symbol dBPk. The U.S. Army has established peak levels of 115 dBPk and 130 dBPk that correspond to the likelihood of complaints from the nearby population. Peak level 115 dBPk is the level at which some complaints may occur and complaints are expected at peak level 130 dBPk (BRRC 2012). Peak contours are not from any individual firing event, but from the range of possible firing events at TBR. For air gunnery, the primary drivers of the maximum peak levels are the ballistic waves from the supersonic delivery of the bullets. Peak levels above 130 dBPk remain within the range boundary whereas the 115 dBPk contour exits the range boundary (Figure 3-32). Further discussion on the peak levels from strafing operations at TBR is presented in Appendix F.

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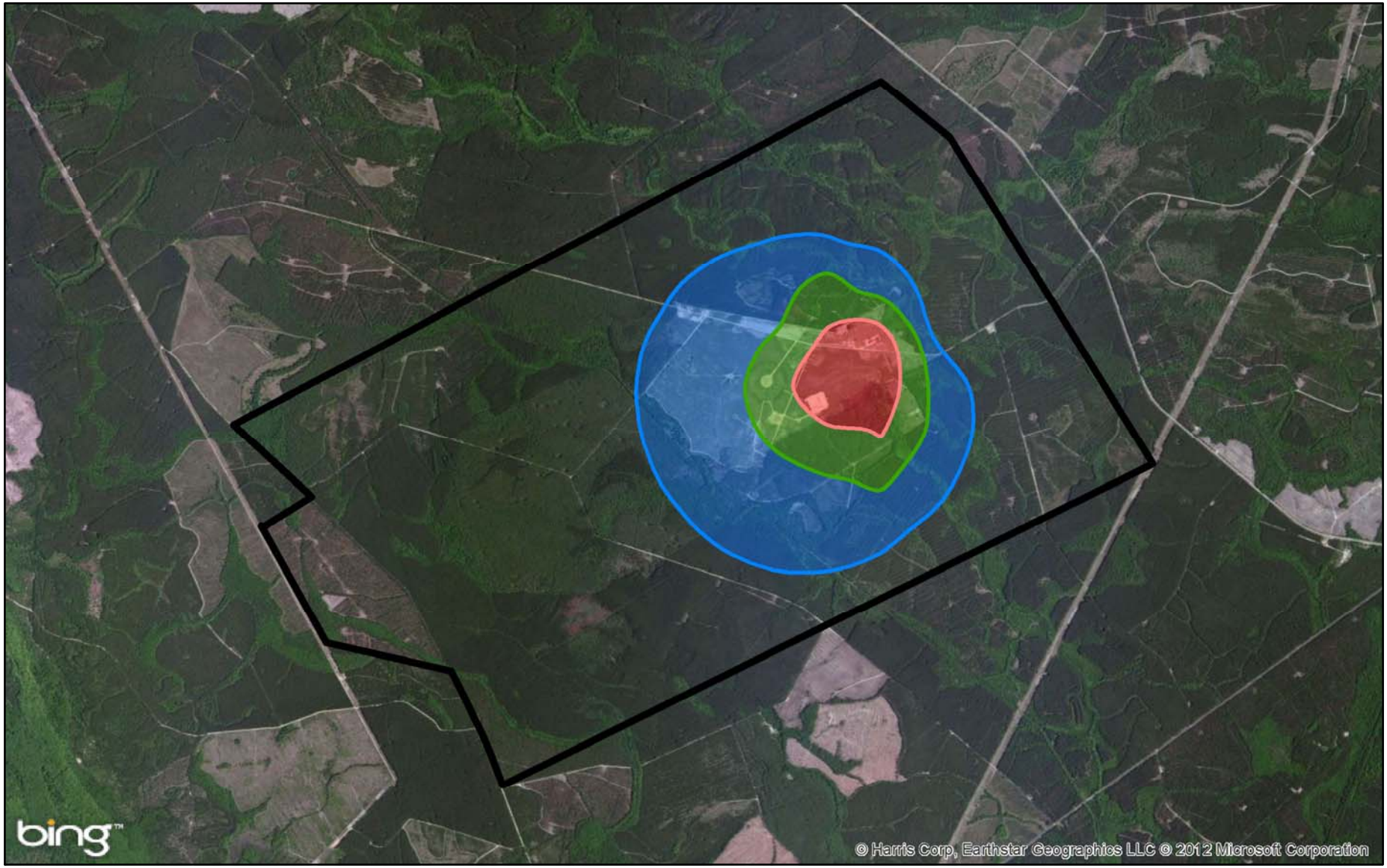

57-dB Noise Contour
62-dB Noise Contour
70-dB Noise Contour
Existing Range Boundary

dB = Decibel
MAG = Marine Aircraft Group

Figure 3-31
Noise Contours for Current MAG-31 Aircraft Strafing Operations
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 3,000 6,000 Feet

Sources: Based on Lusk 2009, Bing 2012, BRRC 2012

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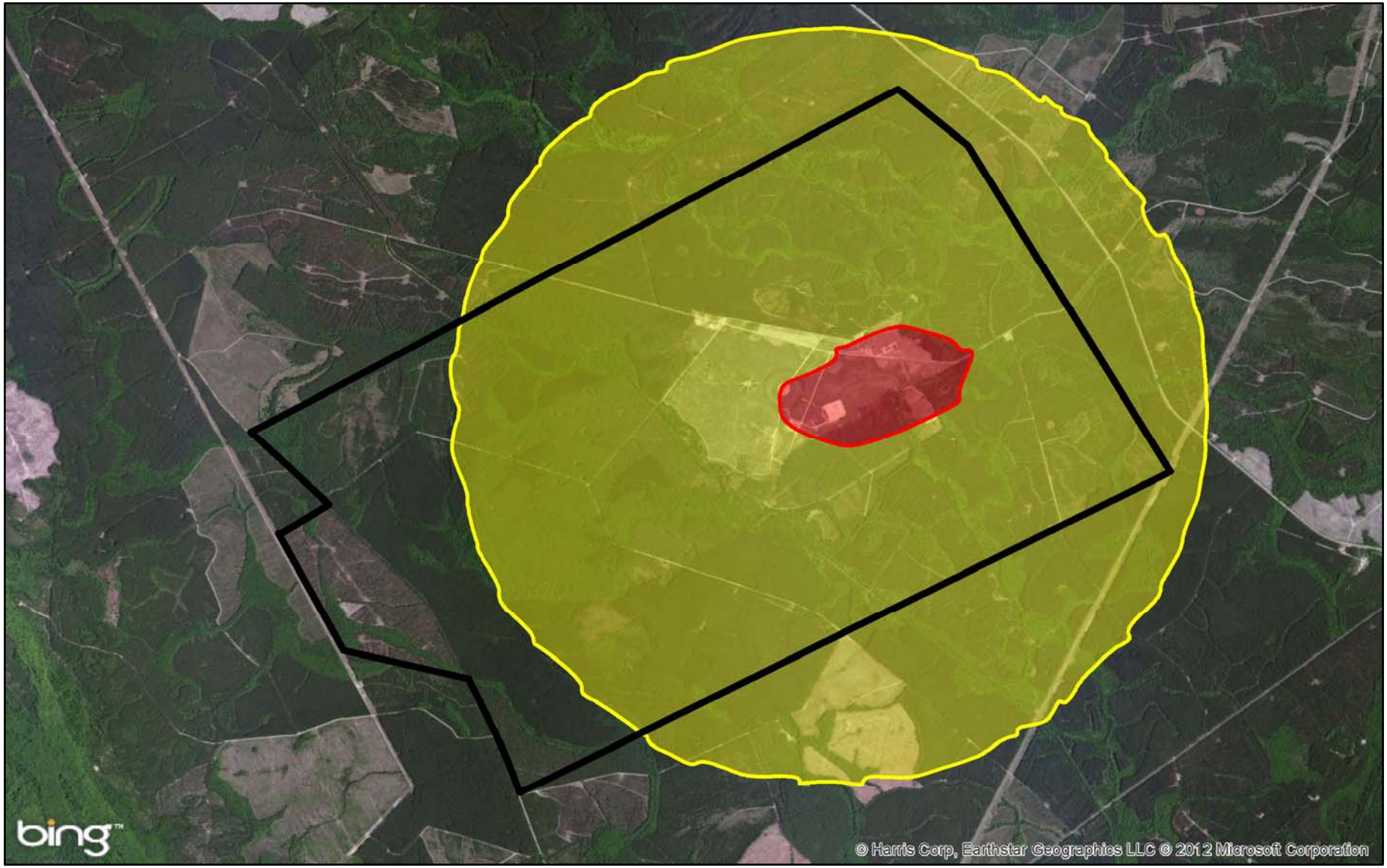


115-dB Noise Contour
130-dB Noise Contour
Existing Range Boundary

dB = Decibel
MAG = Marine Aircraft Group

Figure 3-32
Peak Noise for Current MAG-31 Aircraft Strafing Operations
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 3,000 6,000 Feet

Sources: Based on Lusk 2009, Bing 2012, BRRC 2012

3.7.4 Environmental Consequences

3.7.4.1 Methodology and Evaluation Criteria

For this noise analysis, only changes in MAG-31 F/A-18 operations are analyzed. This limitation does not restrict the comparison between current and alternative scenarios since the MAG-31 F/A-18s are the primary users of the range, as well as one of the loudest aircraft types operating at TBR. As identified in the affected environment section, two noise environments (airspace and ordnance) are analyzed in this FEIS. This same approach is carried forward in determining noise impacts for each of the action alternatives. Analyses of aircraft and ordnance noise exposure within the action alternatives were accomplished using a group of computer-based programs. These programs model operations of the F/A-18 flight training activities conducted throughout a normal year at TBR, which are based on the current training readiness requirements used by the USMC.

Aircraft Noise Modeling

The analyses of TBR aircraft noise exposures underneath the SUA were accomplished using MOA Range NoiseMap (MR_NMAP). The U.S. Air Force developed this general-purpose computer model for calculating noise exposures occurring away from airbases since aircraft noise is also an issue within MOAs and at ranges, as well as along MTRs. This model expands the calculation of noise exposures away from airbases by using algorithms from both NOISEMAP and ROUTEMAP modeling software (BRRC 2012). These models use the NOISEFILE database developed by the Air Force that has data on the speed and power setting of the aircraft and its trajectory, all of which dictate the noise exposure. MR_NMAP uses two primary noise models to calculate the noise exposure: track and area operations. Track operations are for operations that have a well-defined flight track, such as strafing tracks (BRRC 2012). Area operations are for operations that do not have well-defined tracks but occur within a defined area, such as air-to-air combat within an MOA (BRRC 2012).

Ordnance Noise Modeling

As previously stated, modeling noise generated from the deployment of ordnance during training operations is very complex due to the nature of the operations. One of the key reasons for the difficulty is that the aircraft deploying the ordnances rarely fly the exact flight track, and in some cases, the flight track is simply a generalized fan where the pilot can approach the target from a range of headings (BRRC 2012). Thus multiple computer programs have been developed to address the generation and propagation of noise from air-weaponry operations such as strafing. The Air Gunnery Noise Model, used to assess the ordnance noise exposure within the proposed land acquisition areas at TBR, utilizes these various programs. Individual aspects of the modeling are tasked with calculating the noise caused by the sonic boom from the projectile, determining noise from individual firing points together with their distribution probabilities, and for determining the muzzle blast and propulsion noise. The model does not represent noise from a single bullet fired, but rather indicates the average noise expected once a large number of bullets have been fired. The noise footprint and noise contours from the gunnery strafing operations are then determined. These contours incorporate the noise from low-angle strafing (allowed at the existing strafe pit and proposed for Target Area 5) and high-angle strafing (allowed at the existing strafe pit and proposed for Target Areas 1 through 8). Further details on the various computer programs utilized in the ordnance noise modeling are presented in Appendix F.

Evaluation Criteria

The existing USMC's RAICUZ guidelines (please refer to Section 3.7.2.1) were used to analyze noise impacts on potential sensitive land uses surrounding TBR identified in Section 3.1, Land Use. The RAICUZ program is designed to protect public health, safety, and welfare, and to preserve the operational capabilities of air-to-ground ranges. The land use recommendations outlined in the RAICUZ guidance for compatibility within specific noise zones associated with the military range operations were the basis of

determining impacts from the Proposed Action. Areas exposed to DNL below 65 dBA (Noise Zone 1) are considered acceptable with low or no noise impact. The 65 dBA is the level most commonly used for noise planning purposes. Areas exposed to 65 dBA and above (Noise Zones 2 and 3) are considered moderate to high impact per the RAICUZ guidelines. Furthermore, the USEPA identified 55 dBA and below as the level at which there is effectively no adverse impact (USEPA 1972).

The RAICUZ Instruction is expressed in terms of A-weighted noise levels. To compare ordnance noise, which is in terms of C-weighted noise levels, to A-weighted noise levels, the criterion level is adjusted on the principle of equal annoyance. The 62 and 70 dBC correspond to 65 and 75 dBA criteria, respectively (DON 2008). Therefore, ordnance noise levels below 62, 62 to 70, and above 70 dBC correspond to Noise Zones 1, 2, and 3, respectively (DON 2008).

3.7.4.2 Action Alternatives (1 through 4)

Flight Operations

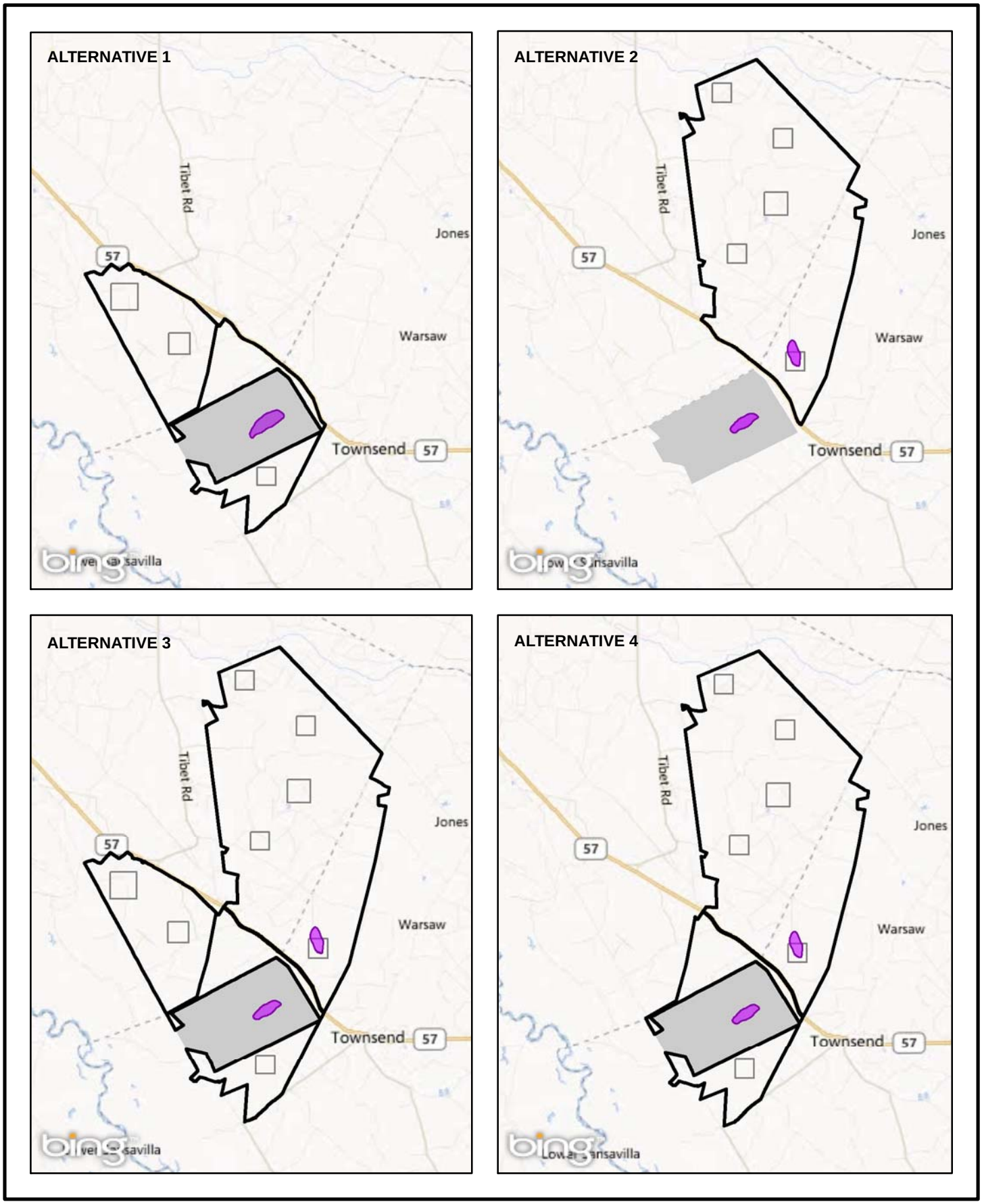
Under its current configuration, TBR is unable to meet all the operational training requirements of the current F/A-18 aircrew training syllabus, including the delivery of PGMs. The USMC and MAG-31 training requirements necessitate an air-to-ground range that supports the employment of PGMs. Table 3-60 provides the projected annual F/A-18 flight operations at TBR for each alternative. As a result, the Proposed Action would expand TBR's PGM flight operational capabilities. Expanded PGM training would not significantly increase noise at TBR. The 94 strafing sorties conducted annually, which are the primary source of noise on TBR, would remain the same throughout each action alternative. Thus, the maximum noise level from strafing flight operations due to the Proposed Action would not exceed 55 dBA for any of the action alternatives (Figure 3-33); this is not considered significant per RAICUZ and USEPA guidelines.

Table 3-60
Annual Sorties Conducted by Action Alternative

Sortie [(a)] Type	TBR (existing)	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Precision-Guided Munitions (PGMs)	NA	1,226	1,509	1,509	1,509
General Purpose	1,332	1,131	1,226	1,226	1,226
Laser-Guided Training Round	377	377	376	376	376
No Ordnance [(b)]	272	472	754	754	754
Low Altitude Training	283	283	284	284	284
Scored Strafe	94	94	94	94	94
Totals	**2,358**	**3,583**	**4,243**	**4,243**	**4,243**

Notes:
(a) A sortie is one aircraft flying from MCAS Beaufort to TBR, conducting 30 minutes of training, and returning to base.
(b) Any training event that does not involve the use of ordnance.

Source: Wilson 2011.



55-dB Noise Contour
Target Area
Acquisition Areas
Existing Range

dB = Decibel
MAG = Marine Aircraft Group

Figure 3-33
Noise Contours for Proposed MAG-31 Aircraft Operations
Townsend Bombing Range
McIntosh and Long Counties, Georgia

0 2.75 5.5 Miles

Sources: Based on Lusk 2009, Bing 2012, BRRC 2012

Altitude Distributions for Proposed Operations

Table 3-61 provides the altitude distributions for the various mission types for the existing condition and each action alternative. As a result of the Proposed Action, the percent of operations conducted below 3,000 feet AGL would decrease under each of the action alternatives. Furthermore, the addition of PGM missions at TBR would move more sorties above 10,000 feet, resulting in approximately 57% of all operations conducted at higher altitudes. This would further reduce the aircraft noise exposure experienced near the ground. Thus, the addition of PGMs would not have a significant impact on noise within the SUA.

Table 3-61
Altitude Distributions for Sorties at Townsend Bombing Range

Altitude Range (above ground level)	Composite	Sorties
TBR (Existing)		
0 to 3,000 feet	19.7%	465
3,000 to 10,000 feet	38.6%	910
Above 10,000 feet	41.7%	983
Alternative 1		
0 to 3,000 feet	16.3%	584
3,000 to 10,000 feet	26.8%	960
Above 10,000 feet	56.9%	2039
Alternatives 2 through 4		
0 to 3,000 feet	15.7%	666
3,000 to 10,000 feet	27.4%	1163
Above 10,000 feet	56.9%	2414

Source: BRRC 2012.

Ordnance

Figure 3-34 shows the 57, 62, and 70 dBC noise contours that would be generated by the strafing operations for each of the action alternatives. The gunnery strafing noise contours show that noise would not disperse out much farther than the target area boundaries. The existing strafe target at TBR, as well as the one planned for Target Area 5, would allow low-angle strafe and therefore would have slightly larger noise contours. Low-angle strafe, as opposed to high-angle strafe, allows pilots to take a flatter approach into a target, which mean the noise associated with that training event disperses outward rather than toward the ground like noise from high-angle training events. Target Areas 1, 2, 3, 4, 6, 7, and 8 would allow only high-angle strafe. As illustrated on Figure 3-34, the loudest portions (70 dBC) of the air gunnery noise would remain well within the range boundaries for each of the action alternatives. Further, no sensitive land uses (i.e., residential) would be within the 65 dBA (62 dBC) or greater noise zone. As such, per the RAICUZ guidelines, no significant impacts are expected from the strafing operations for any of the action alternatives.

Another aspect of air gunnery noise is the potential for noise complaints, which can arise from their impulsive character. As previously stated in Section 3.7.3.2, peak noise is measured only to identify potential areas where complaints may occur, not to determine an action's level of impact. The U.S. Army has established peak levels of 115 and 130 dBPk that correspond to the likelihood of complaints from the nearby population. Peak level 115 dBPk is the level at which some complaints may occur and complaints are expected at peak level 130 dBPk (BRRC 2012). Figure 3-35 illustrates the peak noise levels for the range of strafing operations expected at TBR. These contours are not from any individual firing event but from the range of possible firing events at the range. Peak levels above 130 dBPk would remain within the range boundary. Some outside of the range may be exposed to levels between 115 and 130 dBPk, which may generate a few sporadic complaints from the surrounding population. Most of the levels going

off range would be primarily between 115 and 120 dBPk, which is the lower end of the marginal complaint range.

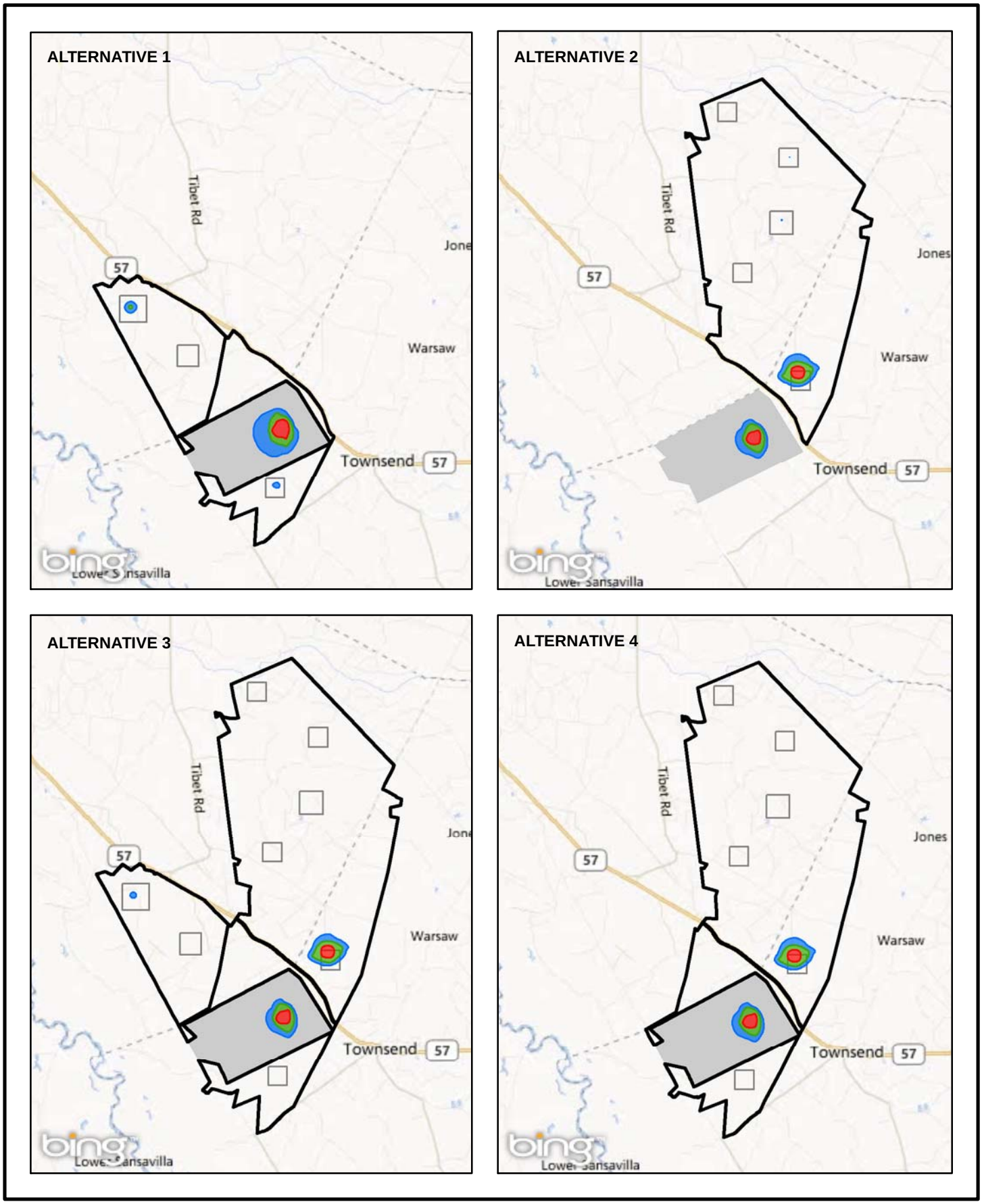
The USMC and GA ANG are committed to being good neighbors and realize that sound affects everyone differently. Members of the community who have concerns about noise from training events should contact the range at (912) 963-3007.

Summary of Impacts

Implementation of the Proposed Action would not result in significant impacts to noise exposure from aircraft flight and/or gunnery strafing operations associated with TBR. No areas outside the proposed range boundaries would be exposed to DNL at or above 65 dBA (62 dBC), which is considered acceptable per the USMC's RAICUZ Instruction and is deemed no impact.

3.7.4.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. The current operations would continue to have no impact on persons and/or sensitive noise receptors. The SUA would continue to experience the same level of aircraft noise exposure which does not exceed levels above 55 dBA. Current air gunnery noise conditions with maximum 70 dBC levels would remain well within the existing range boundaries. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.



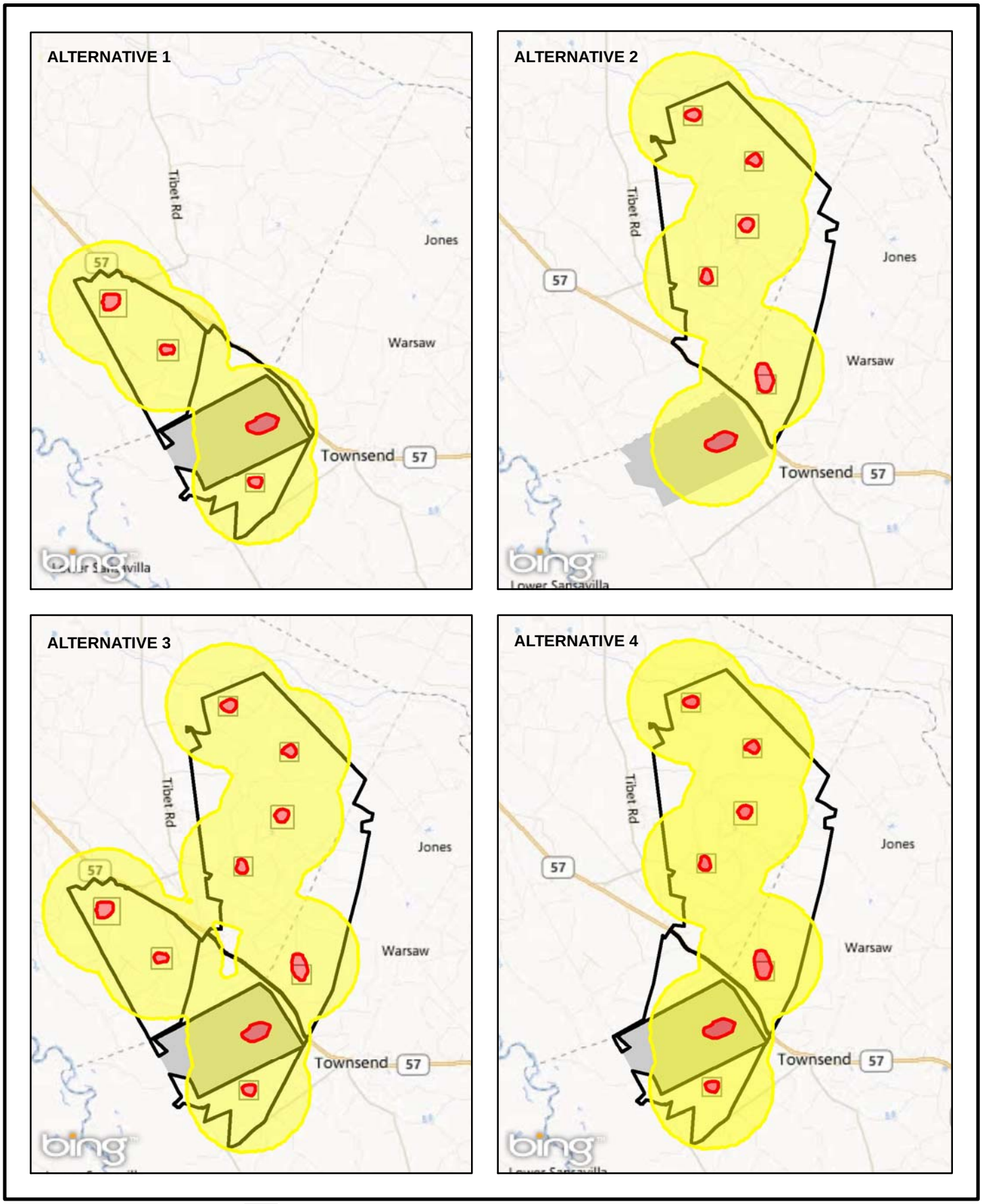
57-dB Noise Contour
62-dB Noise Contour
70-dB Noise Contour
Target Area
Acquisition Areas
Existing Range

dB = Decibel
MAG = Marine Aircraft Group

0 2.75 5.5 Miles

Sources: Based on Lusk 2009, Bing 2012, BRRC 2012

Figure 3-34
Noise Contours for Proposed MAG-31 Aircraft Strafing Operations
Townsend Bombing Range
McIntosh and Long Counties, Georgia



115-dB Noise Contour
130-dB Noise Contour
Target Area
Acquisition Areas
Existing Range

dB = Decibel
MAG = Marine Aircraft Group

Figure 3-35
Peak Noise for Proposed
MAG-31 Aircraft Strafing Operations
Townsend Bombing Range
McIntosh and Long Counties, Georgia

0 2.75 5.5 Miles

Sources: Based on Lusk 2009, Bing 2012, BRRC 2012

3.8 Biological Resources

This section describes existing biological resources within and near TBR, including those areas proposed for acquisition, and evaluates the potential biological effects under each alternative, including the No Action Alternative. While this section addresses vegetative communities and habitats, the marketable resources in forestland are addressed in Section 3.1.3.5.

3.8.1 Definition of Resource

Biological resources addressed in this section include plant and animal species, including special status species, and their associated habitats. Vegetation includes terrestrial and palustrine plant species and communities. Wildlife includes common animal species within the proposed acquisition area. Special status species include those plant or animal species that afford federal or state protection. The area of potential effect for biological resources comprises all lands within the proposed acquisition areas.

3.8.2 Regulatory Framework

Biological resources including wildlife and plant species are afforded protection under a framework of federal and state regulations. These regulations are detailed in the following subsections.

3.8.2.1 Endangered Species Act of 1973

The Endangered Species Act of 1973 (ESA) provides protection to fish, wildlife and plants whose populations are determined to be threatened or endangered, and associated critical habitat. Regulatory action under the ESA is administered by the USFWS and the NOAA. The ESA requires federal agencies in consultation with the USFWS, to ensure that federal actions are not likely to adversely affect listed species or result in destruction of critical habitat of listed species. Critical habitat, designated by USFWS, consists of the specific areas within the geographical area occupied by a listed species on which are found physical or biological features essential to the conservation of the species and which may require special management considerations or protection. It also may consist of specific areas outside the geographical area occupied by a listed species that are determined to be essential for the conservation of that species.

3.8.2.2 Migratory Bird Treaty Act of 1918

Take is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof.

The original Migratory Bird Treaty of 1918 (MBTA) protects over 800 species of birds (50 CFR 10.13). The MBTA prohibits the 'take' of any listed migratory bird species without a permit issued by the USFWS (USFWS 2009b). Under Section 315 of the 2003 National Defense Authorization Act, interim regulations were developed to exempt the DOD from MBTA penalties for the incidental take of migratory birds during military readiness activities. In 2007, these regulations were issued by the USFWS under the final military readiness rule authorizing the DOD to incidentally take migratory birds (76 FR 32224-32225 and Baldwin 2003)

MBTA permit policies are developed by the Division of Migratory Bird Management and permits are issued by Regional Bird Permit Offices. The Regional Bird Permit Office for Georgia is USFWS Region 4, headquartered in Atlanta, Georgia. Federal activities that may result in the adverse effect of a migratory bird species are further regulated by EO 13186, discussed in detail below.

3.8.2.3 EO 13186, Responsibility of Federal Agencies to Protect Migratory Birds

EO 13186 directs executive departments and agencies to take certain actions to further implement obligations of the MBTA. Under EO 13186, federal agencies are required to implement an MOU with the USFWS for any projects that may affect migratory birds.

3.8.2.4 Bald and Golden Eagle Protection Act of 1940

The Bald and Golden Eagle Protection Act, originally passed in 1940 (16 U.S.C. 668-668c), prohibits the take of bald or golden eagles without a permit issued by the Secretary of the Interior. In addition, the Act provides protection to bald and golden eagles' nesting sites from human-induced alterations by restricting activity that result in the interruption of normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment (USFWS 2010b).

3.8.2.5 Georgia Endangered Wildlife Act of 1973 and Georgia Wildflower Preservation Act of 1973

Legal protection is provided to state-listed plant and animal species under the Georgia Endangered Wildlife Act of 1973 and the Georgia Wildflower Preservation Act of 1973. Authorization is given to the GA DNR to review and amend the list as necessary. Under these Acts it is prohibited to harass, capture, kill, cut, dig or remove any state-listed plant or animal species.

3.8.2.6 Sikes Act Improvement Act of 1997 and the Integrated Natural Resources Management Plan

The Sikes Act Improvement Act of 1997 (SAIA; PL 105-85) directs the DOD to develop and implement Integrated Natural Resources Management Plans (INRMPs) for the management, enhancement and protection of natural resources on its lands. The TBR has an INRMP and, once the acquisition of land under the selected action alternative occurs, the TBR INRMP would be updated to include the newly acquired areas. Natural resources surveys would be conducted as needed to identify resources to be addressed in the updated INRMP and to implement natural resources projects programmed in the INRMP. The SAIA requires the INRMP be prepared in cooperation with the USFWS and the state fish and wildlife agency (GA DNR). The INRMP would then be reviewed on an annual basis by the MCAS Beaufort Natural Resources Manager and in coordination with the USFWS and GA DNR.

3.8.3 Affected Environment

3.8.3.1 Vegetation

The acquisition areas are within the Outer Coastal Plain Land Resource Region and are located approximately 2 miles north of the Altamaha River in McIntosh and Long Counties, Georgia. The area is characterized as having flat, nearly level topography, composed primarily of sedimentary rocks of marine origin, and alluvial sediments generally sloping southeast toward the Atlantic (USACE 2008). Vegetation consists of coastal flatwood species and is dominated by loblolly pine, sweetgum, black gum, red maple, bald cypress (*Taxodium distichum*), saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), broom sedge (*Andropogon* sp.), and wiregrass.

Historically, vegetative communities within southeast Georgia were composed of expansive mesic pine flatwoods maintained by frequent fire regimes, and bottomland floodplain wetland environments located along rivers and natural drainage features. Silvicultural operations, fire suppression, flood control, and logging have eliminated these historical communities. Currently, the area consists of large tracts of planted loblolly pine where natural hydrology and fire regimes have been suppressed due to timber management activities. Terrestrial environments within the acquisition areas consist of densely planted loblolly pine stands with limited vegetative species diversity.

Natural vegetative land cover for the acquisition areas was quantified using data provided by the GA DNR Coastal Resource Mapping project. The project, completed in 2010, delineated ecological vegetative communities found in McIntosh and Long Counties (Thompson 2010 and Elliott 2010, respectively). The GA DNR Coastal Resource Mapping project classified habitats based on the NatureServe International Ecological Classification Standard for Terrestrial Ecological Classifications (NatureServe 2007). This classification system describes both wetland and upland habitats and incorporates geographic location, spatial constraints, natural disturbance regime, and vegetative components of various ecological vegetative communities, and provides a more detailed description of ecological vegetative communities than the Cowardin classification method. Ecological vegetative communities are provided in Table 3-62, followed by detailed descriptions of each community.

Table 3-62
Vegetative Communities Within the Townsend Bombing Range Acquisition Areas

Habitat	Acres	Percent of Total
Area 1A		
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	969.6	15.9%
Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	37.1	0.6%
Atlantic Coastal Plain Upland Longleaf Pine Woodland	10.3	0.2%
Early Successional Vegetation	674.9	11.1%
Loblolly Pine-Water Oak-Sweetgum Successional Vegetation	86.9	1.4%
Open Field	33.6	0.6%
Pine Plantation	4,069.2	66.7%
Southern Atlantic Coastal Plain Depression Pondshore	44.8	0.7%
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	174.2	2.9%
Total	**6,100.6**	
Area 1B		
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	703.8	14.9%
Early Successional Vegetation	125.4	2.7%
Loblolly Pine-Water Oak-Sweetgum Successional Vegetation	10.6	0.2%
Open Field	0.8	<0.1%
Pine Plantation	3,631.5	77.0%
Southern Atlantic Coastal Plain Depression Pondshore	21.2	0.4%
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	64.4	1.4%
Southern Coastal Plain Nonriverine Basin Swamp	11.2	0.2%
Successional Hardwood Forest	16.8	0.4%
Successional Pine Forest	131.2	2.8%
Total	**4,716.9**	
Area 3		
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	3,574.9	15.6%
Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	277.9	1.2%
Atlantic Coastal Plain Upland Longleaf Pine Woodland	37.5	0.2%
Early Successional Vegetation	2,668.1	11.6%
Loblolly Pine-Water Oak-Sweetgum Successional Vegetation	46.0	0.2%
Pine Plantation	14,740.1	64.3%
Southern Atlantic Coastal Plain Depression Pondshore	260.5	1.1%
Southern Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest	9.6	<0.1%
Southern Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest	31.6	0.1%
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	285.6	1.2%
Southern Coastal Plain Mesic Slope Forest	25.6	0.1%
Southern Coastal Plain Non-riverine Basin Swamp	606.6	2.6%
Successional Hardwood Forest	40.8	0.2%
Successional Pine Forest	312.8	1.4%
Total	**22,919.4**	

Note: Total area does not include non-ecological communities such as developed areas or transportation structures; therefore, the total acreage of ecological communities does not equal the acreage of the entire acquisition area.

Sources: Thompson 2010; Elliott 2010.

Atlantic Coastal Plain Blackwater Stream Floodplain Floodplain Forest

This community exists within low-lying areas associated with narrow bands of dense canopy hardwood species located in the floodplains of small streams and rivers. Seasonal and periodic flooding is an important ecological factor where inundation limits species compositions to flood-tolerant species. Vegetation is composed of wetland tree species such as bald cypress and black gum, with associated species including red maple, sweetbay magnolia, loblolly bay, water oak, and laurel oak (NatureServe 2007).

Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall

This community consists of seepage-fed wetlands often associated with ravines or side-slopes, along the headwaters of streams, or in areas of high groundwater. Vegetation consists of woody plant species with a dense shrub layer. Common species include black gum, red maple, tulip tree (*Liriodendron tulipifera*), titi (*Cryilla racemiflora*), fetterbush (*Lonia lucida*), gallberry, and coastal dog hopple (*Leucothoe axillaris*) (NatureServe 2007).

Atlantic Coastal Plain Upland Longleaf Pine Woodland

This community occurs on upland sites composed of loamy to sandy flats. Soils are acidic and typically infertile. Vegetation is dominated by longleaf pine, with a well-developed herbaceous layer typically composed of wiregrass (NatureServe 2007).

Early Successional Vegetation

This community is located in recently disturbed areas often associated with recent fire, hurricanes, or mechanical clearing activities. Vegetation is dominated by early successional and shrub species such as winged sumac (*Rhus copallinum*), blackberry, broom sedge, gallberry, wax myrtle, and saltbush.

Loblolly Pine-Water Oak-Sweetgum Successional Vegetation

This community is associated with disturbed moist pine flatwoods or planted pine areas and represents a transition from early successional vegetation communities by the presence and establishment of a more defined canopy. This community is located on topographically flat and low elevations and is identified by a mixture of loblolly pine, water oak, and sweetgum where no one species is dominant.

Open Field

This community is a maintained environment lacking a distinguished canopy or shrub layer. Species composition consists of grasses and weedy successional species. Perpetual maintenance, such as prescribed burns, herbicide application, or mechanical cutting maintains these areas in an herbaceous state.

Pine Plantation

This community consists of densely planted loblolly pine stands that are actively managed for silvicultural operations. Management activities for these areas include herbicide application, ditching and draining, and furrowing. Species composition is limited and many of these plantation communities lack age distribution of tree species. Mid- and understory species are inhibited due to low light penetration and herbicide application. Pine plantation environments lack transition between adjacent environments and are typically bound by access roads, ditches, or maintained timber stands.

Southern Atlantic Coastal Plain Depression Pondshore

This community consists of a small basin formed by soil subsidence, swales, or natural blockage of small drainages. Hydrology varies from deep ponds with permanent water to shallow seasonally inundated ponds. Vegetation is typically composed of bald cypress and black gum (NatureServe 2007).

Southern Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest

This community is located in dry to slightly moist sites generally on the upper to mid slope of bluffs or hillslopes. Vegetation is dominated by oak and hickory species including; water oak, white oak (*Quercus alba*), Southern red oak (*Quercus falcata*), and pignut hickory (*Carya glabra*) (NatureServe 2007).

Southern Atlantic Coastal Plain Non-riverine Swamp and Wet Hardwood Forest

These communities consist of poorly drained areas saturated or inundated by rainfall. These communities are located beyond the influence of streams or tidal areas. Vegetation consists of hardwood or mixed forests of pond cypress, blackgum, water oak, and red maple (NatureServe 2007).

Southern Coastal Plain Non-riverine Basin Swamp

This community occupies large seasonally inundated basins with peat substrates. These communities are located beyond the influence of streams. Common vegetation includes pond cypress, black gum, slash pine (*Pinus elliotti*), titi, and fetterbush (NatureServe 2007).

Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods

These communities are natural pine communities distributed throughout the Atlantic Coastal Plain. These environments consist of open canopy areas with wet, seasonally saturated soils. Open canopies facilitate the development of diverse herbaceous groundcover species, and frequent fire limits development and recruitment of hardwood and shrub species. Tree species are composed of pine species including shortleaf pine, loblolly pine, and slash pine. Groundcover species are variant and dependent upon the frequency of fire and hydrologic conditions. Common species associated with wet pine savanna and flatwood communities include gallbery, saw palmetto, wiregrass, fetterbush, broom sedge, *Xyris* species, spike rush, chain fern, maiden cane (*Amphicarpum muhlenbergianum*), and *Hypercium* species.

Southern Coastal Plain Mesic Slope Forest

This community is composed of forested areas located along hill slopes or bluffs where fire is infrequent. Canopies are composed of Southern magnolia (*Magnolia grandiflora*), American beech (*Fagus grandifolia*), spruce pine (*Pinus glabra*), and various oak species (NatureServe 2007).

Successional Hardwood Forest

This community is associated with recently harvested or disturbed areas often in mesic or topographically low-lying areas. This community represents a transition from early successional vegetation communities by the presence and establishment of a more defined canopy stratum. Vegetation is dependent upon the previously converted community but is characterized by a hardwood canopy stratum consisting of species such as red maple, water oak, laurel oak, beech, or hickory species.

Successional Pine Forest

This community is associated with recently cleared or harvested pine plantation areas. Following harvest, areas are furrowed and replanted with pine species. Initially, the successional pine forest communities are composed of early successional and shrub species such as winged sumac, blackberry, broom sedge, gallberry, wax myrtle, and saltbush. Over time, planted pine species mature and outcompete herbaceous and shrub species as the community transitions back into a pine plantation environment.

3.8.3.2 Wildlife

Wildlife within the region of the acquisition areas consists of mammal, reptile, amphibian, and avian species common throughout the southeastern coastal plain. Examples of common wildlife species know to occur within the region are listed in Table 3-63.

Table 3-63
Examples of Common Wildlife Species Known to Occur within the Region

Common Name	Scientific Name	Common Name	Scientific Name
Mammals		**Amphibians**	
Feral Pig	*Sus scrofa*	Southern Toad	*Anaxyrus terrestris*
White-tailed Deer	*Odocoileus virginianus*	Bull Frog	*Rana catesbeiana*
Coyote	*Canis latrans*	Ornate Chorus Frog	*Pseudacris ornata*
Raccoon	*Procyon lotor*	Southern Leopard Frog	*Rana sphenocephala*
Marsh Rabbit	*Sylvilagus palustris*	Green Tree Frog	*Hyla cinerea*
Eastern Cotton Tail	*Sylvilagus floridanus*	Eastern Spadefoot Toad	*Scaphiopus holbrookii*
Nine Banded Armadillo	*Dasypus novemcinctus*	Lesser Siren	*Siren intermedia*
Least Shrew	*Cryptotis parva*	Mole Salamander	*Ambystoma talpoideum*
Eastern Mole	*Scalopus aquaticus*	Dwarf Salamander	*Eurycea quadridigitata*
River Otter	*Lutra canadensis*		
Long-tailed Weasel	*Mustela frenata*	**Birds**	
Bobcat	*Felis rufus*	Wood Duck	*Anix sponsa*
Eastern Red Bat	*Lasiurus borealis*	Carolina Wren	*Thryothorus ludovicianus*
Seminole Bat	*Lasiurus seminolus*	Chimney Swift	*Chaetura pelagica*
Gray Squirrel	*Sciurus carolinensis*	Brown Thrasher	*Toxostoma rufum*
Beaver	*Castor canadensis*	Northern Cardinal	*Cardinalis cardinalis*
Cotton Mouse	*Peromyscus gossypinus*	Turkey	*Meleagris gallopavo*
		Northern Bobwhite Quail	*Colinus virginianus*
Reptiles		Red-Shouldered Hawk	*Buteo lineatus*
Black Racer	*Coluber constrictor*	Osprey	*Pandion haliaetus*
Black Rat Snake	*Elaphe obsoleta*	American Kestrel	*Falco sparverius*
Coachwhip Snake	*Masticophis flagellum*	Northern Harrier	*Circus cyaneus*
Eastern King Snake	*Lampropeltis getula*	Snowy Egret	*Egretta thula*
Yellow Rat Snake	*Elaphe obsoleta quadrivittata*	Cattle Egret	*Bubulcus ibis*
Corn Snake	*Pantherophis guttatus*	Night Heron	*Nycticorax nycticorax*
Eastern Mud Snake	*Farancia abacura*	Wood Duck	*Aix sponsa*
Eastern Diamondback Rattlesnake	*Crotalus adamanteus*	Killdeer	*Charadrius vociferus*
Cottonmouth	*Agkistrodon piscivorus*	Downy Woodpecker	*Picoides pubescens*
Banded Water Snake	*Nerodia fasciata fasciata*	Pileated Woodpecker	*Dryocopus pileatus*
Musk Turtle	*Sternotherus odoratus*	Red-eyed Vireo	*Vireo olivaceus*
Yellow-bellied Slider	*Trachemys scripta scripta*	Blue Jay	*Cyanocitta cristata*
Eastern Mud Turtle	*Kinosternon subrubrum*	Mourning Dove	*Zenaida macroura*
Box Turtle	*Terrapene carolina*	American Crow	*Corvus brachyrhynchos*
Green Anole	*Anolis carolinensis*	Cerulean Warbler	*Dendroica cerulean*
Ground Skink	*Scincella lateralis*	Barred Owl	*Strix varia*

Source: MCAS Beaufort 2007.

Mammalian species within the region of the proposed acquisition areas utilize both upland and wetland habitats for feeding, breeding, and refuge. Upland wildlife habitat is primarily composed of low-quality habitat of managed timber stands. Within pine timber stands, dense tree canopies limit the development of herbaceous and groundcover plant species needed to support food requirements for wildlife species. Mammalian species distribution within managed pine timber stands is limited to

transient species such as raccoon, armadillo, coyote, feral pig, cotton mouse, and gray squirrel that have the ability to forage and seek suitable food resources within larger areas. Wetland habitats within the region of the acquisition areas provide higher quality wildlife habitat with mature native tree species and adequate vegetation diversity within the sub-canopy and herbaceous layers. Large, mature tree species provide refuge for mammalian species such as the bobcat, raccoon, gray squirrel, and roosting areas for eastern red and Seminole bats. Hardwood species such as oaks and hickories located within wetlands and along wetland and upland transitional areas provide food for species such as white-tailed deer, feral pig, and the gray squirrel. Water environments are utilized by various prey species such as fish, reptile, and amphibians and provide feeding opportunities for species such as the bobcat, river otter, and long-tailed weasel.

Reptile species utilize upland and wetland habitats within the region of the Proposed Action for feeding, breeding, refuge, and to regulate body temperatures. Upland pine timber stands provide habitat for small rodent, lizard, and avian species, which are prey species for snakes such as the black racer, black rat snake, yellow rat snake, eastern diamond back rattlesnake, and corn snake. Wetland environments provide standing water and shaded environments for reptile species to regulate body temperatures. Water environments within wetlands are utilized by various prey species such as fish and amphibians, and provide feeding opportunities for species such as turtles, the cottonmouth snake, and the banded water snake.

Amphibian species use both upland and wetland habitats and require water environments to complete portions of their life cycles. Amphibian species such as frogs and salamanders utilize small depressional wetland and open water environments for breeding. Amphibian species often reside within wetlands or open-water environments and use upland environments for foraging and to regulate body temperature as they provide dry and sunny environments.

The GA DNR Department of Wildlife Management appropriates state funds for wildlife management programs for game species. Game species include alligators, white-tailed deer, waterfowl, and small game species such as quail, dove, grouse, rabbits, and squirrels. The GA DNR Department of Wildlife Management maintains more than 90 tracts of public WMAs. The Townsend WMA and the Barrington WMA are in the general vicinity of the Proposed Action (see Figure 3-2). The GA DNR also maintains a Non-game Conservation Section of the Wildlife Resources Division which is funded through voluntary contributions and grants.

Nuisance wildlife species are those that have a negative impact to other wildlife or ecosystems and cause economic or environmental harm to the region. Nuisance wildlife species include coyote, armadillo, and feral pig. The coyote is a highly adaptable predatory mammal that preys upon small game species such as mice, rabbits, and deer. The coyote is considered a nuisance species as it poses a threat to livestock, poultry, and occasionally to house pets such as dogs and cats. The armadillo and feral pig are considered nuisance species as they cause harm to vegetation and ecosystems by rutting and burrowing.

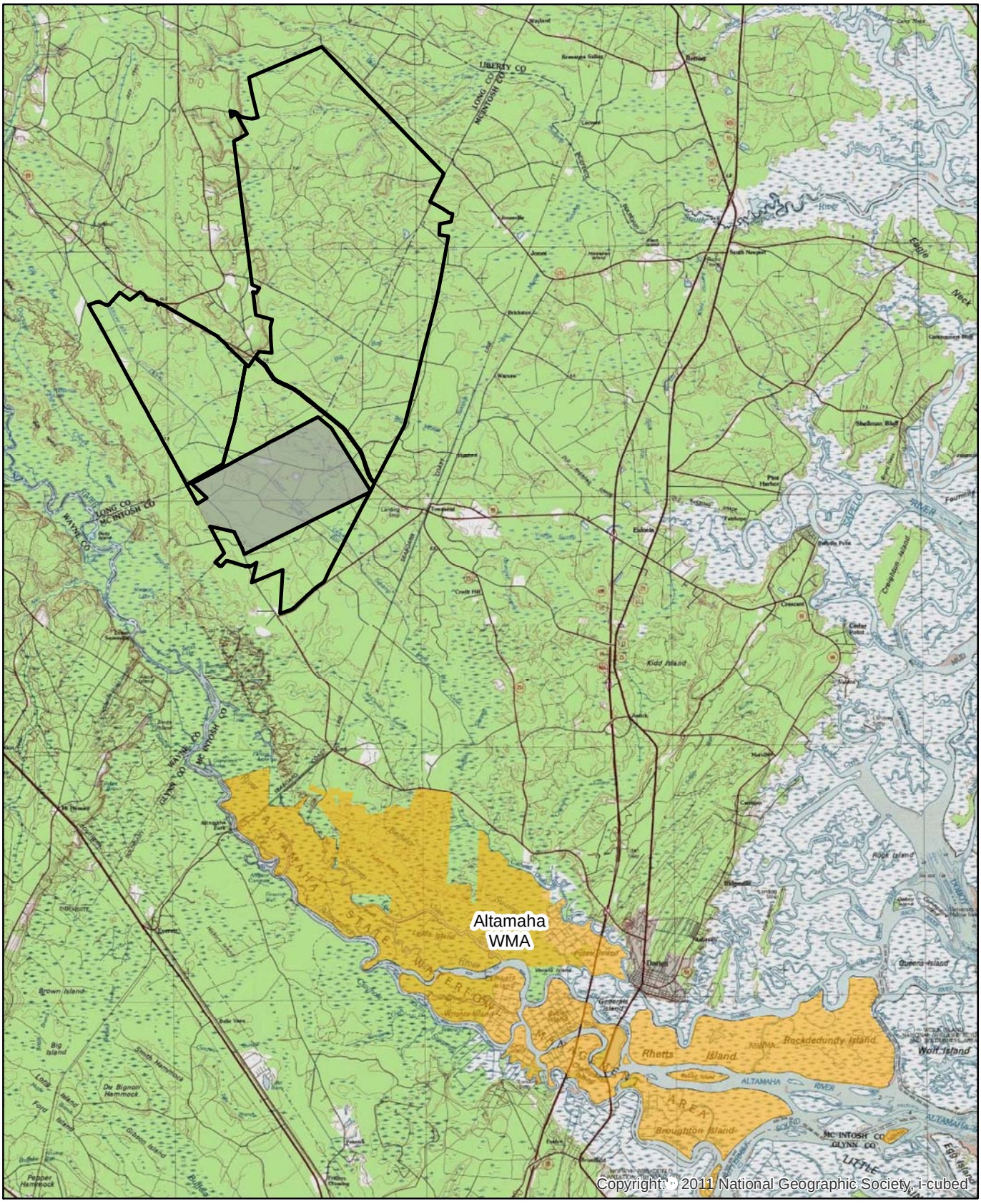
Migratory birds use the coastal areas of southeast Georgia for resting habitat, foraging, and stopover points during spring and fall migrations. While no Important Bird Areas (IBAs) are defined by the Atlanta Audubon Society within the proposed acquisition areas, an IBA is located east of the proposed acquisition areas at the Altamaha River WMA (Figure 3-36).

Important Bird Areas

IBAs are key sites for conservation – small enough to be conserved in their entirety and often already part of a protected-area network. They do one (or more) of three things:

- Hold significant numbers of one or more globally threatened species;
- Are one of a set of sites that together hold a suite of restricted-range species or biome-restricted species; and/or
- Have exceptionally large numbers of migratory or congregatory species.

(Birdlife International 2011)



Important Bird Area
Acquisition Areas
Existing Range

WMA = Wildlife Management Area

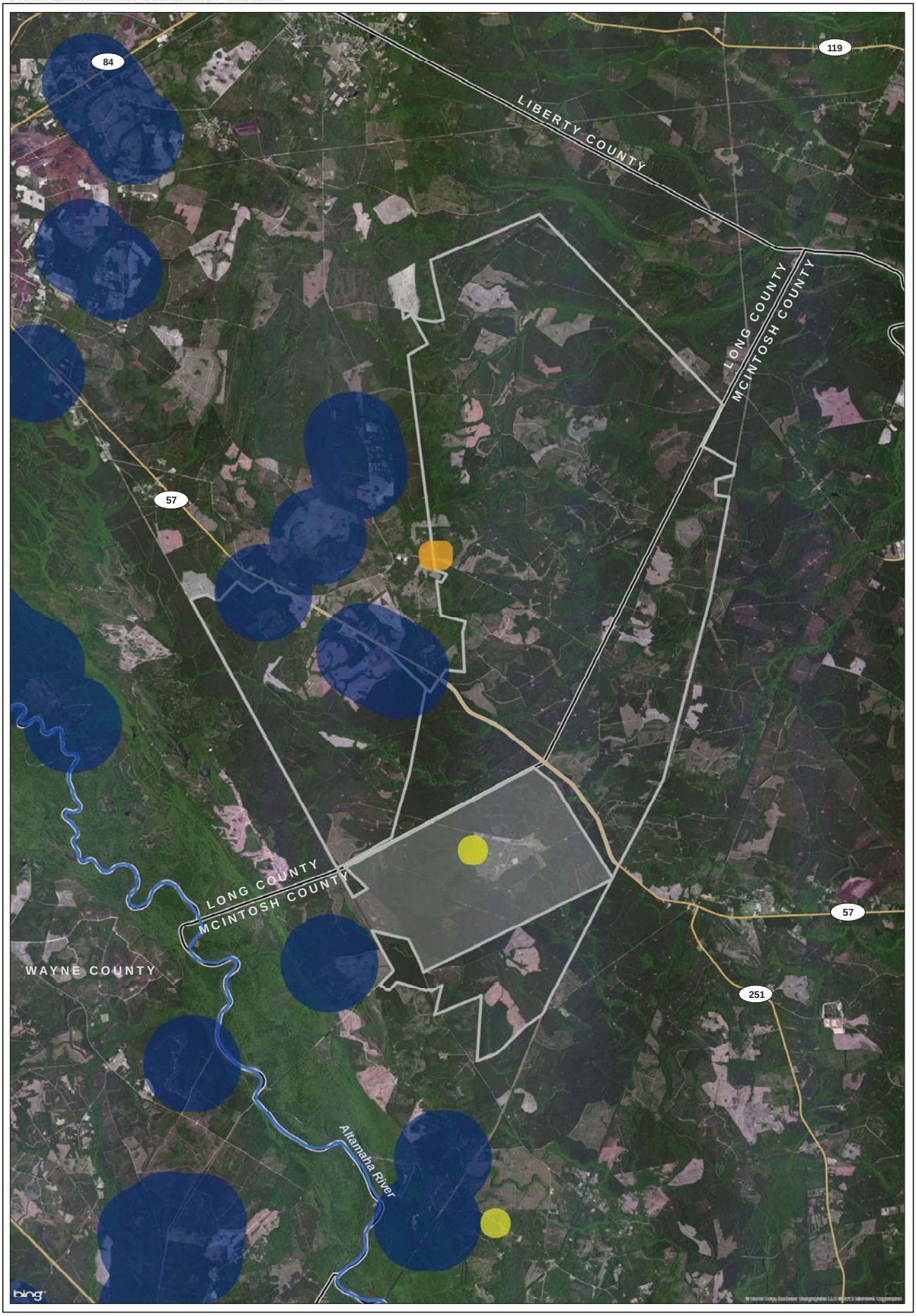
Figure 3-36
Important Bird Areas
Townsend Bombing Range
McIntosh and Long Counties, Georgia

0 2 4 Miles

Sources: Based on Lusk 2009, Esri 2011, Atlanta Audubon Society 2011

3.8.3.3 Threatened and Endangered Species

Fourteen (14) federally and state-listed threatened and endangered species have the potential to occur within the proposed acquisition areas as determined through informal consultation with the USFWS and GA DNR in November and December 2010 (Figure 3-37). No portions of the proposed acquisition areas contain critical habitat as defined by the ESA for federally listed species.



Eastern Indigo Snake
Frosted Flatwoods Salamander
Gopher Tortoise
Acquisition Areas
Existing Range
Counties
Major Roads
Altamaha River

Figure 3-37
Known Occurrences of
Threatened and Endangered Species
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 1 2 Miles

Sources: Bing 2012, USFWS 2009,
Based on Lusk 2009

Species with the potential to occur within the acquisition areas are listed in Table 3-64, followed by detailed descriptions of habitat requirements for each species.

Table 3-64
Federally and State-Protected Species Potentially Within the Townsend Bombing Range Acquisition Areas

Scientific Name	Common Name	Federal Listing	State Listing	Habitat Requirements
Amphibians				
Ambystoma cingulatum	Frosted Flatwoods Salamander	T	T	Ephemeral or depressional wetlands isolated from larger waterbodies with a tree-less ecotone and adjacent open pine flatwoods or pine savannas
Notophthalmus perstriatus	Striped Newt	C		Ephemeral or depressional wetlands isolated from larger waterbodies adjacent to sandy or xeric habitats
Reptiles				
Drymarchon couperi	Eastern Indigo Snake	T	T	Pine flatwoods, scrubby flatwoods, dry prairie, hardwood hammocks, edges of freshwater wetlands, coastal dunes, agricultural land, disturbed areas
Gopherus polyphemus	Gopher Tortoise	C	T	Open canopy area of sandhill, pine flatwoods, scrub, dry prairie, xeric hammock, pine-mixed hardwoods
Birds				
Vermivora bachmanii	Bachman's Warbler	E		No confirmed observation of species in United States since 1962
Dendroica kirtlandii	Kirtland's Warbler	E		Only breeds in open jack pine forests of central Michigan, migration stopover in open canopy pine environments of coastal Georgia
Mycteria americana	Wood Stork	E	E	Freshwater marshes, forested wetlands, roadside and agricultural ditches, tidal creeks, estuaries
Haliaeetus leucocephalus	Bald Eagle	*		Requires tall mature trees for nesting
Plants				
Elliottia racemosa	Georgia Plume		T	Xeric sand and oak ridges
Leitneria floridana	Corkwood		T	Shaded marshes with red maple, cypress and tupelo
Fothergilla gardenii	Dwarf Witch-Adler		T	Shrub dominated ecotone of upland swamps, Carolina bays, and wet savannas
Pteroglossaspis eristata	Giant Orchid		T	Scrub oak, sandhills and open pine flatwoods
Baptista arachnifera	Hairy Rattleweed	E	E	Sandy soils in open pine flatwoods, intensively managed slash pine plantations, and along road and power line rights-of-way
Sageretia minutiflora	Tiny-leaf Buckthorn		T	Calcareous rock bluffs, shell middens and evergreen hammocks along stream banks

Note: * Protected under the Bald and Golden Eagle Act of 1940.

Key:
C = Candidate Species
E = Endangered
T = Threatened

Sources: Bogan and Alderman 2008; Chafin 2007; Florida Fish and Wildlife Conservation Commission 2010; Florida Natural Areas Inventory 2000; Johnson *et al.* 2001; National Marine Fisheries Service 1998; Patrick, Allison, and Krakow 1995; Speake, Diemer, and McGlincy 1981; USFWS 2005, 1999, 1986, 2007, and 2008b, 2012.

Eastern Indigo Snake

The eastern indigo snake is a large, black, non-venomous snake found in the southeastern U.S. Eastern indigo snakes use a variety of habitats that include pine flatwoods, scrubby flatwoods, high pine, dry prairie, hardwood hammocks, edges of freshwater wetlands, agricultural land, coastal dunes, and disturbed areas. Eastern indigo snakes are often associated with the burrows of the gopher tortoise, where they seek shelter from high temperatures and lay eggs. In areas lacking tortoise burrows, decayed stumps and logs are important habitat features used for cover. Eastern indigo snakes eat a variety of small mammals, amphibians, and other reptiles, including eastern diamondback rattlesnakes and gopher tortoise hatchlings. In Georgia, the eastern indigo snake is most often associated with sand ridge habitats that often occur along major coastal plain streams (Speake, Diemer, and McGlincy 1981).

The eastern indigo snake was federally listed as a threatened species on January 31, 1978 (43 FR 4026) as a result of individuals taken into captivity in the illegal pet trade. The objective of the plan was to ensure that numerous populations continue to exist in the historical range of the species. Once this was established, the plan called for all states within the range to provide legal protection; delisting would then be considered as eastern indigo snakes would be protected from interstate commerce by the Lacey Act (USFWS 2008a). However, because habitat loss has become a more serious threat to the long-term viability of the species, the eastern indigo snake remains a protected species.

Observations of the eastern indigo snake have been documented within Acquisition Area 1A and just west of Acquisition Area 3 by the USFWS Georgia Ecological Services Field Office. The eastern indigo snake is known to have a large range and utilizes a variety of habitats and therefore may utilize habitats within the proposed acquisition areas.

Frosted Flatwoods Salamander

The frosted flatwoods salamander utilizes small, open-canopy depressional wetlands during their breeding and transition period of October to April. Breeding habitats include ephemeral wetlands, depressional wetlands dominated by pond cypress, blackgum, and slash pine that are seasonally flooded and geographically isolated from other waterbodies (USFWS 2005). These breeding habitats are typically devoid of predatory fish. Optimum breeding habitats are supported by appropriate upland habitats within 1,500 feet of a breeding site. Supporting upland habitats include moderately moist open pine flatwoods or pine savannas with a transitional open canopy ecotone between upland and wetland habitats to facilitate transition between habitats (Appendix G).

The frosted flatwoods salamander was listed as threatened on April 1, 1999 (64 FR 15691) as populations declined due to loss of suitable habitat. Fire suppression and conversion of longleaf pine flatwoods into slash and loblolly pine plantations is the major threat to the frosted flatwoods salamander. Fire suppression has led to an increase in slash and loblolly pine species, an increase in hardwood species, and a decrease in herbaceous groundcover. The combination of these factors has reduced the availability of suitable breeding ponds for the frosted flatwoods salamander (74 FR 6700).

The frosted flatwoods salamander has been documented at TBR and may utilize ephemeral wetlands or ponds within the proposed acquisition areas (MCAS Beaufort 2007, USFWS 2009c).

Gopher Tortoise

The gopher tortoise is separated into two populations by the USFWS. The western population, listed as threatened on July 7, 1987 (52 FR 25376), is defined as those individuals that are found west of the Mobile and Tombigbee Rivers in Alabama, Mississippi, and Louisiana. All gopher tortoises located to the east are part of the eastern population. *Federal Register* Docket No. FWS–R4–ES–2009–0029 (dated July 27, 2011; 76 FR 45130) states that listing the eastern population is warranted but precluded by higher priority actions. As such, the gopher tortoise is listed as a candidate species in an effort to conserve habitat to prevent the species from becoming listed. Likewise, the gopher tortoise is listed as threatened by the GA DNR.

Gopher tortoises are common in most types of upland communities with open canopies. They are commonly found in habitats such as sandhill, pine flatwoods, scrub, scrubby flatwoods, dry prairies, xeric hammock, pine-mixed hardwoods, and coastal dunes. Gopher tortoises construct burrows in sandy soils. The gopher tortoise resides in these burrows which protect them from other species and extreme heat. These burrows also provide similar protection for over 350 other commensal species. Key species known to occupy gopher tortoise burrows include the eastern indigo snake, eastern diamondback rattlesnake, and gopher frogs (Florida Fish and Wildlife Conservation Commission 2010).

Gopher tortoises have been observed within xeric areas of Acquisition Area 3 and may occur within other open sandy environments within the proposed acquisition areas.

Striped Newt

The striped newt was recently added to the candidate species list of USFWS threatened and endangered species on June 7, 2011 (76 FR 32911). The striped newt is a small salamander found only in Georgia and Florida. Habitat includes longleaf pine-dominated savanna, scrub, or sandhills dominated by grass species. During the spring, the striped newt transitions from uplands into depressional and ephemeral wetlands to lay eggs. Suitable breeding habitat consists of shallow, isolated ponds, and wetlands devoid of fish. The primary threat to striped newts is habitat loss due to fire suppression and hardwood invasion (76 FR 32911-32923).

The striped newt has not been documented on TBR, but may utilize ephemeral wetlands or ponds within the proposed acquisition areas.

Bachman's Warbler

The Bachman's warbler is a small warbler that inhabits swamps and forested lowlands. A confirmed and official documentation of the Bachman's warbler has not been reported in the United States since 1962 (USWFS 2005). Historically the Bachman's warbler bred in the southeastern United States and wintered in western Cuba.

No known observations of the Bachman's warbler have been documented within the proposed acquisition areas. The species has likely been extirpated from the area.

Kirtland's Warbler

The Kirtland's warbler has one of the most restricted breeding ranges of any North American bird. It breeds in the open jack pine (*Pinus banksiana*) plains of central Michigan. The bird overwinters in the Bahamas with spring departures occurring in late April and early May, and fall migrations between August and October (USFWS 1999). During migration, the Kirtland's warbler utilizes thickets and deciduous trees. The primary migration route follows a narrow band through South Carolina, North Carolina, Virginia, West Virginia, and Ohio before reaching nesting grounds in Michigan (USFWS 1999). When warblers make their spring migration, the first quarter of the route is over water (Mayfield 1988). Some research has shown that migration occurs without any stops or with limited stopovers (Mayfield 1988; USFWS 1999). These studies concluded that observations of warblers outside the main migration route were likely strays, as a disproportionate number of documented observations occurred in Ohio and Michigan, the last quarter of the migratory route.

Occurrences of the Kirtland's warbler within the proposed acquisition areas are likely rare as the proposed acquisition areas are outside the main migratory route. Suitable stopover habitat exists for the Kirtland's warbler within deciduous forested wetlands, successional hardwood forest, and early successional vegetation areas with a dense shrub component.

Wood Stork

The wood stork was listed as federally endangered on February 28, 1984 (49 FR 7332). The wood stork is a colonial bird that nests in large rookeries often constructed in cypress, black gum (*Nyssa*

sylvatica var. *biflora*), and southern willow (*Salix carolina*). Wood storks utilize the same nesting colonies from year to year as long as they remain undisturbed (USFWS 1986). They feed in flocks on small fish, crustaceans, amphibians, reptiles, and arthropods found within freshwater marshes, flooded roadside and agricultural ditches, and depressions in cypress heads, swamp sloughs, tidal creeks and pools, and estuaries. The wood stork is known to travel long distances (up to 80 miles) in search of feeding areas. Past research on Georgia wood stork colonies has found that foraging occurs 80% of the time within a 12-mile radius (USFWS 1986).

A known wood stork rookery is located approximately 9 miles northwest of Acquisition Areas 1A and 3 (USFWS 2009c). Given the wood storks' ability to travel great distances, portions of the acquisition areas are likely utilized by wood stork as foraging habitat.

Bald Eagle

Bald eagles are large raptors and utilize lakes, ponds, rivers, estuaries, and the coastal areas as habitat (USFWS 2007). Breeding bald eagles typically lay one to three eggs per year, typically nesting in treetops or cliffs. Perching areas also are an important habitat feature (USFWS 2007). Eggs hatch within 35 days and fledglings fly within three months.

The bald eagle was listed as an endangered species in 1967 in the contiguous U.S. under the Endangered Species Preservation Act (the precursor to the ESA). In 1978, the bald eagle was listed as endangered in 43 of the 48 contiguous states and as threatened in the other five states. The identified reason for the decline in this species was nesting failure due to use of the pesticide dichloro-diphenyltrichloroethane (DDT) and habitat destruction. In 1999, the USFWS reclassified the bald eagle from endangered to threatened because the population had recovered to approximately 4,500 breeding pairs. The bald eagle was officially delisted in 2007 with an estimated 9,789 breeding pairs (USFWS 2011). As part of the action of delisting this species, the species will be monitored and the population status will be reviewed every five years (USFWS 2011). In addition, the bald eagle is federally protected under the Bald and Golden Eagle Act and the MBTA.

No known bald eagle nests have been documented within the proposed acquisition areas. Bald eagles may utilize wetland environments within the proposed acquisition areas for hunting and foraging.

Georgia Plume

The Georgia plume is a small tree or shrub that inhabits xeric environments including sand ridges and oak ridges. The flowering period is from June to July; however, the plant rarely produces seeds and propagates by spreading root sprouts, forming large patches. The Georgia plume is found only within the state of Georgia (Chafin 2007).

Portions of the western boundary of Acquisition Area 3 contain xeric environments suitable for the Georgia plume.

Corkwood

Corkwood is a deciduous shrub or small tree that forms a large multi-stemmed colony varying from 5 to 25 feet in height and spread. Corkwood is found in shaded marshes accompanied by red maple, cypress, and tupelo and prefers moist poorly drained soils. Flowering occurs in late spring (Patrick, Allison, and Krakow 1995). Distribution of the species includes south Georgia, north Florida, east Texas, east Arkansas, and southeast Missouri. The main threats to the species are impacts to wetlands and alteration of stream or river hydrology (Chafin 2007).

Suitable habitat for the corkwood exists within forested wetland environments within the proposed acquisition areas.

Dwarf Witch-alder

Dwarf witch-alder is a colonial deciduous shrub that is found in flat, low-lying swampy areas particularly in the shrub-dominated margins of upland swamps, Carolina bays, and wet savannas. The flowering period is from March to April, and fruiting occurs between August and October (Patrick, Allison, and Krakow 1995). The species is found throughout the Coastal Plain of Georgia, Florida, Alabama, South Carolina, and North Carolina. The main threat to the species is fire suppression, disruption of natural hydrology, and clearing and draining wetlands (Chafin 2007).

Suitable habitat for the dwarf witch-alder exists along the edges of forested wetland environments within the proposed acquisition areas.

Giant Orchid

The giant orchid is found in sandy environments including scrub oak and sandhills, as well as open pine flatwoods. The flowering period is from June to November (Florida Natural Areas Inventory 2000).

Portions of the western boundary of Acquisition Area 3 contain xeric environments suitable for the giant orchid.

Hairy Rattleweed

Hairy rattleweed is a perennial legume that inhabits sandy soils in open pine flatwoods, intensively managed slash pine plantations, and along road and power line ROWs. It is known to occur only in Brantley and Wayne Counties, Georgia (USFWS 2012).

Tiny-leaf Buckthorn

Tiny-leaf buckthorn is a deciduous shrub found on calcareous rock bluffs, shell middens, and evergreen hammocks along stream banks (Patrick, Allison, and Krakow 1995). The species occurs within Georgia, Florida, Alabama, Mississippi, South Carolina, and North Carolina (Chafin 2007). No large surface waters systems with calcareous rock bluffs, shell middens, or evergreen hammocks are known to occur within the proposed acquisition areas, and it is unlikely that tiny-leaf buckthorn is found within the proposed acquisition areas.

3.8.4 Environmental Consequences

3.8.4.1 Vegetation

Methodology and Evaluation Criteria

Direct and indirect impacts to natural vegetative communities were quantified based on GIS analysis of ecological vegetative community data provided by the GA DNR Coastal Resource Mapping project.

Common Elements Among All Action Alternatives

Vegetation within the acquisition areas is composed primarily of managed timber stands of loblolly pine (please refer to Section 3.8.3.1). Direct impacts to existing vegetation are anticipated to occur only within the target areas and in those areas designated for target structures, roads, and firebreaks. The Proposed Action would include permanent conversion of natural ecological communities in order to construct target areas used for training purposes and conversion of firebreak areas to herbaceous cover. Within the target areas, tactical targets would be periodically moved to allow for variation in the training scenarios. The placement and relocation of the tactical targets would require a minor amount of forest clearing within the target areas as they would be designed to closely resemble real-world conditions with hidden or partially concealed threats. Timber management activities also would include the construction and maintenance of firebreaks encompassing the entire proposed acquisition area, and each of the target

areas. To construct new firebreaks, existing vegetation would be cleared, plowed, and disked, and permanently maintained in an herbaceous state.

As part of the Proposed Action, land within the acquisition areas would be utilized as a buffer and maintained in a natural state. Following acquisition of the property, forest management activities would be similar to those management activities currently implemented on the existing range as outlined in the TBR INRMP. The goal of these forest management activities is to support mission training, provide forest products, enhance wildlife habitat, and maintain aesthetics using ecosystem management concepts to guide management decisions (MCAS Beaufort 2007). The objectives of the long-term management plan are to conduct prescribed burns on pine and pine/hardwood stands in order to mimic natural fire regimes; evaluate pine stands for conversion to longleaf pine where conditions are suitable; and to produce a sustained yield of commercial timber products from native species in a manner consistent with ecosystem management (MCAS Beaufort 2007). The management plan would seek to burn existing upland pine environments within the target areas on a yearly basis and those areas within the acquisition areas on a two- to four-year rotation. Implementation of an ecosystem management plan for vegetation and timber resources within the acquisition areas would serve to improve existing vegetative communities. Introduction of natural fire regimes and periodic and selective harvest of timber would open tree canopies and increase biodiversity within the shrub and herbaceous stratums

Direct impacts to existing vegetation as a result of the Proposed Action would be limited to the construction footprint of target structures and firebreaks within the target areas. Within areas designated for target structures, all existing vegetation would be removed and would remain in an un-vegetated state. The establishment of firebreaks within the target areas would result in conversion impacts to existing vegetative communities. Firebreaks would remain vegetated, but would be maintained in an herbaceous state.

Indirect impacts to vegetation are anticipated as a result of fragmentation of habitats associated with construction of target structures, roads, and firebreaks. There is a remote chance that ordnance would land outside the designated target structure. In this unlikely event, direct impacts to vegetation and soil would occur from the impact or fragmentation of the ordnance and its subsequent removal.

Action Alternatives

Alternative 1

Approximately 10,817.9 acres of natural vegetation exists within Acquisition Areas 1A and 1B (Table 3-65). Impacts to existing vegetation as result of the Proposed Action would be limited to the construction footprint of target structures and firebreaks within the target areas, and a majority of the area would serve as a safety buffer and remain vegetated.

Alternative 1 proposes to construct Target Areas 6, 7, and 8, and construction of these target areas would result in impacts to 826.9 acres of existing vegetation (Table 3-66 and Figures 3-38, 3-39, and 3-40, respectively).

Table 3-65
Alternative 1 - Existing Vegetation

Natural Vegetative Community	Acres	Percent of Total
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	1,673.5	15.5
Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	37.1	0.3
Atlantic Coastal Plain Upland Longleaf Pine Woodland	10.3	0.1
Early Successional Vegetation	800.3	7.4
Loblolly Pine-Water Oak-Sweetgum Successional Vegetation	97.5	0.9
Open Field	34.5	0.3
Pine Plantation	7,700.8	71.2
Southern Atlantic Coastal Plain Depression Pondshore	66.1	0.6
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	238.6	2.2
Southern Coastal Plain Nonriverine Basin Swamp	11.2	0.1
Successional Hardwood Forest	16.8	0.2
Successional Pine Forest	131.2	1.2
Total [(a)]	**10,817.9**	**100.0**

Note: (a) Total area does not include non-ecological communities such as developed areas or transportation structures.

Table 3-66
Alternative 1 – Potential Impacts to Existing Vegetation

Natural Vegetative Community	Acres
Target Area 6	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	78.3
Early Successional Vegetation	62
Pine Plantation	243
Total	**383.4**
Target Area 7	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	21.7
Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	1.6
Early Successional Vegetation	75.3
Pine Plantation	149
Southern Atlantic Coastal Plain Depression Pondshore	1.6
Total	**249.2**
Target Area 8	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	23.6
Early Successional Vegetation	15.8
Pine Plantation	146.3
Southern Atlantic Coastal Plain Depression Pondshore	1.6
Successional Pine Forest	7.1
Total	**194.4**

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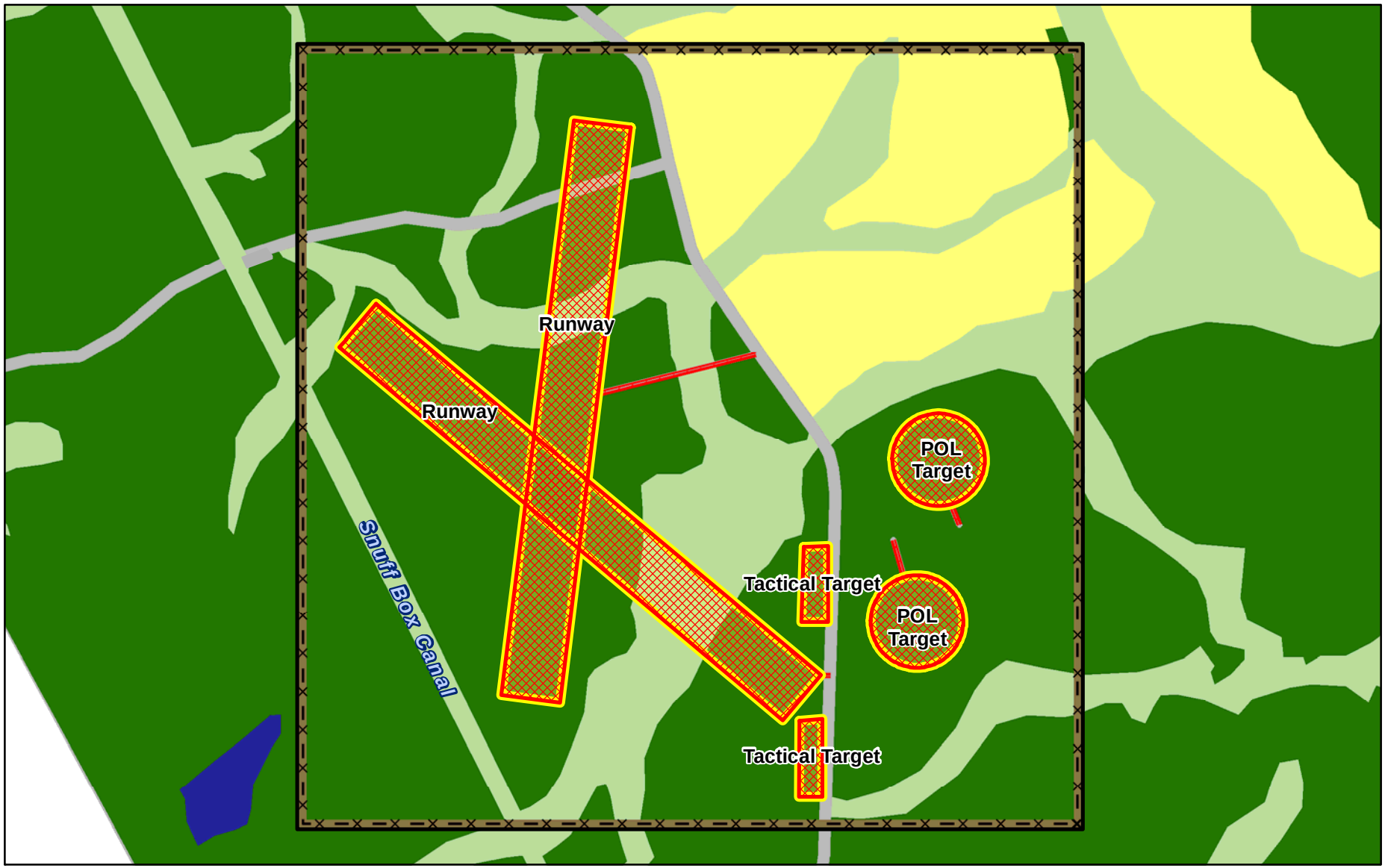

Vegetation Impact
Atlantic Coastal Plain Blackwater Stream Floodplain Forest
Early Successional Vegetation
Pine Plantation
Southern Atlantic Coastal Plain Depression Pondshore
Transportation

Target Area
Target Structure
Firebreak
Fence Line
New Road
POL = Petroleum, Oil, and Lubricant

N

0 400 800 Feet

Figure 3-38
Target Area 6 Vegetation Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Elliott 2010, McFadden 2011

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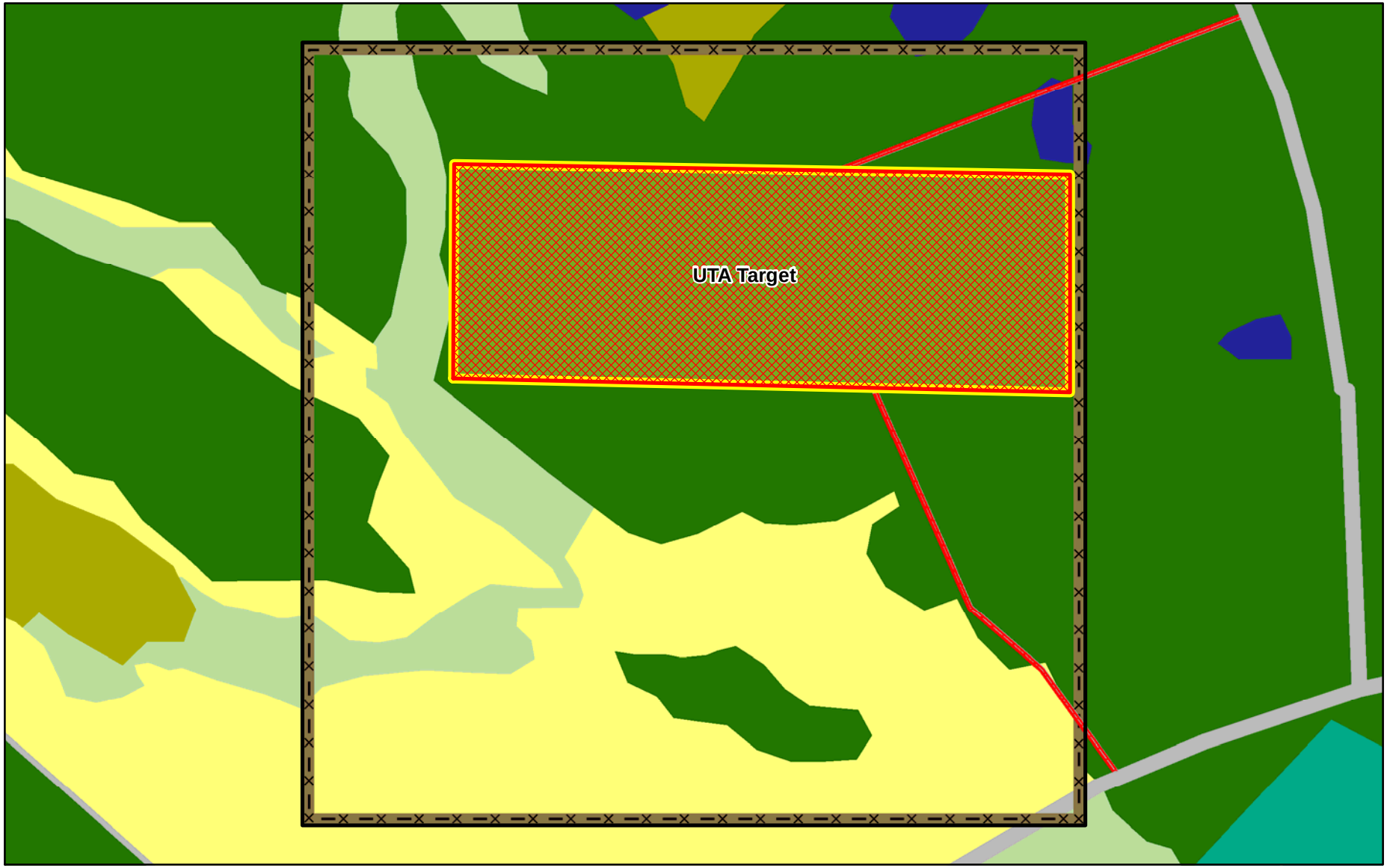

Vegetation Impact
Atlantic Coastal Plain Blackwater Stream Floodplain Forest
Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall
Early Successional Vegetation
Pine Plantation
Southern Atlantic Coastal Plain Depression Pondshore
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods

Transportation
Target Area
Target Structure
Firebreak
Fence Line
New Road

UTA = Urban Target Area

N

0 400 800 Feet

Sources: Elliott 2010, McFadden 2011

Figure 3-39
Target Area 7 Vegetation Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

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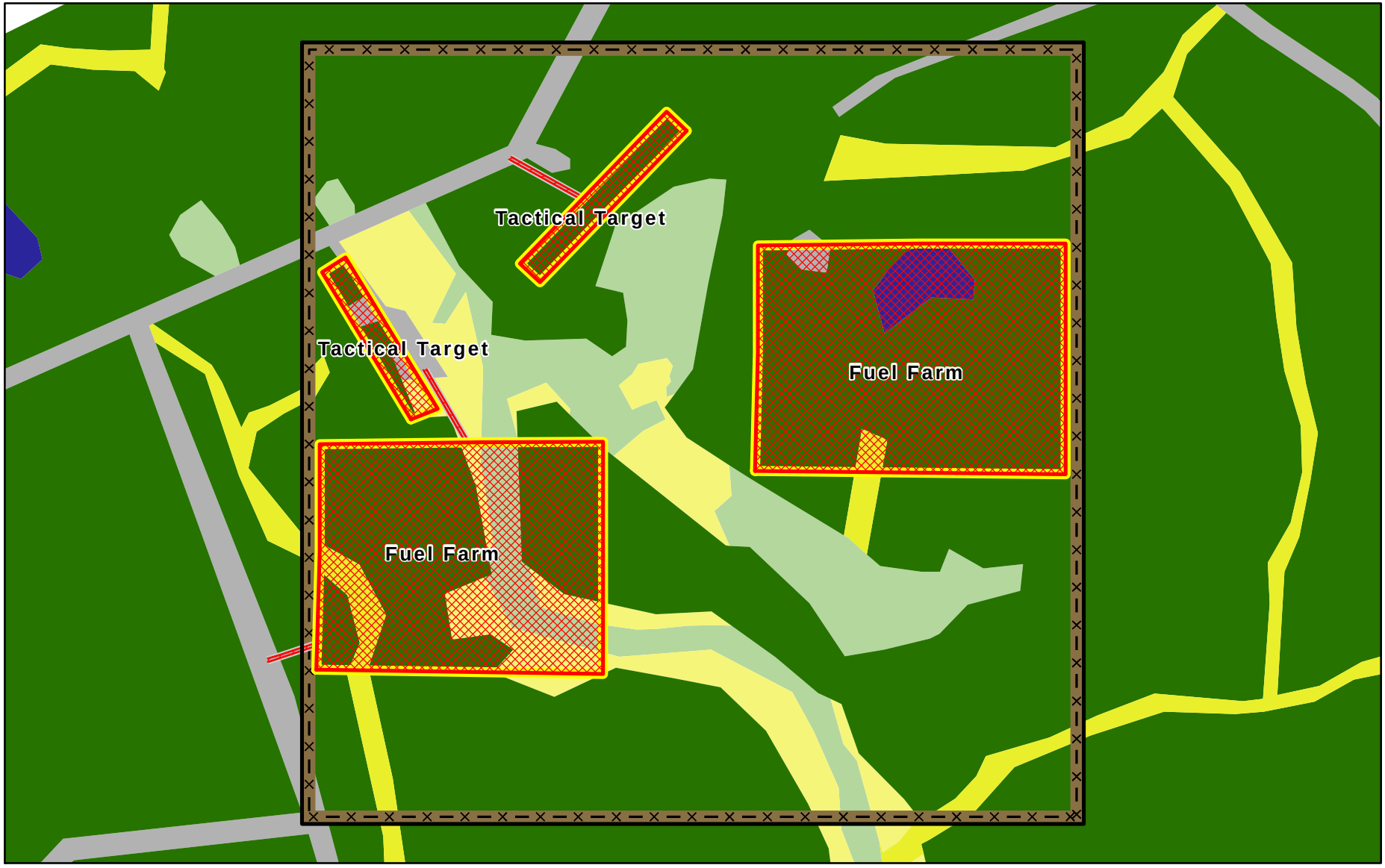

Vegetation Impact
Atlantic Coastal Plain Blackwater Stream Floodplain Forest
Early Successional Vegetation
Pine Plantation
Southern Atlantic Coastal Plain Depression Pondshore
Successional Pine Forest
Transportation

Target Area
Target Structure
Firebreak
Fence Line
New Road

N

0 400 800 Feet

Figure 3-40
Target Area 8 Vegetation Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Elliott 2010, McFadden 2011

Alternative 2

Approximately 22,919.4 acres of natural vegetation exists within Acquisition Area 3 (Table 3-67). Impacts to existing vegetation as a result of the Proposed Action would be limited to the construction footprint of target structures and firebreaks within the target areas, and a majority of the area would serve as a safety buffer and remain vegetated.

Table 3-67
Alternative 2 - Existing Vegetation

Natural Vegetative Community	Acres	Percent of Total
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	3,574.9	15.6%
Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	277.9	1.2%
Atlantic Coastal Plain Upland Longleaf Pine Woodland	37.5	0.2%
Early Successional Vegetation	2,668.1	11.6%
Loblolly Pine-Water Oak-Sweetgum Successional Vegetation	46.0	0.2%
Pine Plantation	14,740.1	64.3%
Southern Atlantic Coastal Plain Depression Pondshore	260.5	1.1%
Southern Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest	9.6	<0.1%
Southern Atlantic Coastal Plain Non-riverine Swamp and Wet Hardwood Forest	31.6	0.1%
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	285.6	1.2%
Southern Coastal Plain Mesic Slope Forest	25.6	0.1%
Southern Coastal Plain Non-riverine Basin Swamp	606.6	2.6%
Successional Hardwood Forest	40.8	0.2%
Successional Pine Forest	312.8	1.4%
Total [(a)]	**22,919.4**	**100.0**

Note: (a) Total area does not include non-ecological communities such as developed areas or transportation structures.

Alternative 2 proposes to construct Target Areas 1, 2, 3, 4, and 5, and construction of these target areas under Alternative 2 would result in 1,062.2 acres of impacts to existing vegetation (Table 3-68 and Figures 3-41 through 3-45, respectively).

Table 3-68
Alternative 2 - Potential Impacts to Existing Vegetation

Natural Vegetative Community	Acres
Target Area 1	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	47.2
Pine Plantation	140.8
Southern Atlantic Coastal Plain Depression Pondshore	2.6
Total	**190.6**
Target Area 2	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	38
Pine Plantation	157.8
Total	**195.7**
Target Area 3	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	70.5
Early Successional Vegetation	35
Pine Plantation	179.3
Southern Atlantic Coastal Plain Depression Pondshore	1.1
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	5.4
Total	**291.2**
Target Area 4	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	6.3
Early Successional Vegetation	73.7
Pine Plantation	109.7
Southern Atlantic Coastal Plain Depression Pondshore	0.8
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	3.2
Total	**193.7**
Target Area 5	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	37.7
Early Successional Vegetation	4.3
Pine Plantation	138.9
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	1.8
Successional Hardwood Forest	2.8
Successional Pine Forest	5.3
Total	**190.9**

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Vegetation Impact
Atlantic Coastal Plain Blackwater Stream Floodplain Forest
Early Successional Vegetation
Pine Plantation
Southern Atlantic Coastal Plain Depression Pondshore
Transportation

Target Area
Target Structure
Firebreak
Fence Line
New Road

SAM = Surface-to-Air Missile
UTA = Urban Training Area

N

0 400 800 Feet

Sources: Elliott 2010, McFadden 2011

Figure 3-41
Target Area 1 Vegetation Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

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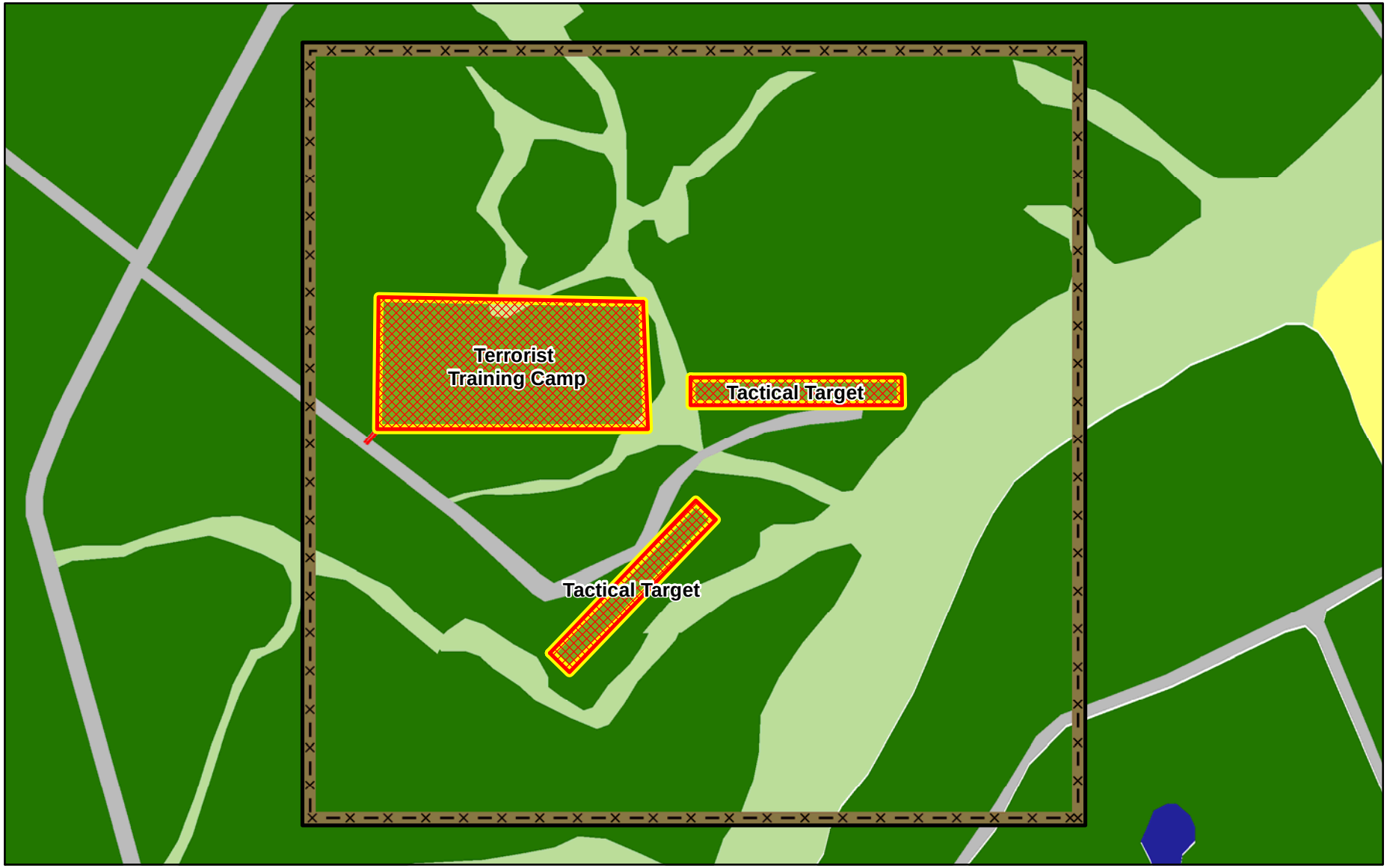

Vegetation Impact
Atlantic Coastal Plain Blackwater Stream Floodplain Forest
Early Successional Vegetation
Pine Plantation
Southern Atlantic Coastal Plain Depression Pondshore
Transportation

Target Area
Target Structure
Firebreak
Fence Line
New Road

N

0 400 800
Feet

Sources: Elliott 2010, McFadden 2011

Figure 3-42
Target Area 2 Vegetation Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

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Vegetation Impact
Atlantic Coastal Plain Blackwater Stream Floodplain Forest
Early Successional Vegetation
Pine Plantation
Southern Atlantic Coastal Plain Depression Pondshore
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods
Transportation

Target Area
Target Structure
Firebreak
Fence Line

N

0 400 800
Feet

Figure 3-43
Target Area 3 Vegetation Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Elliott 2010, McFadden 2011

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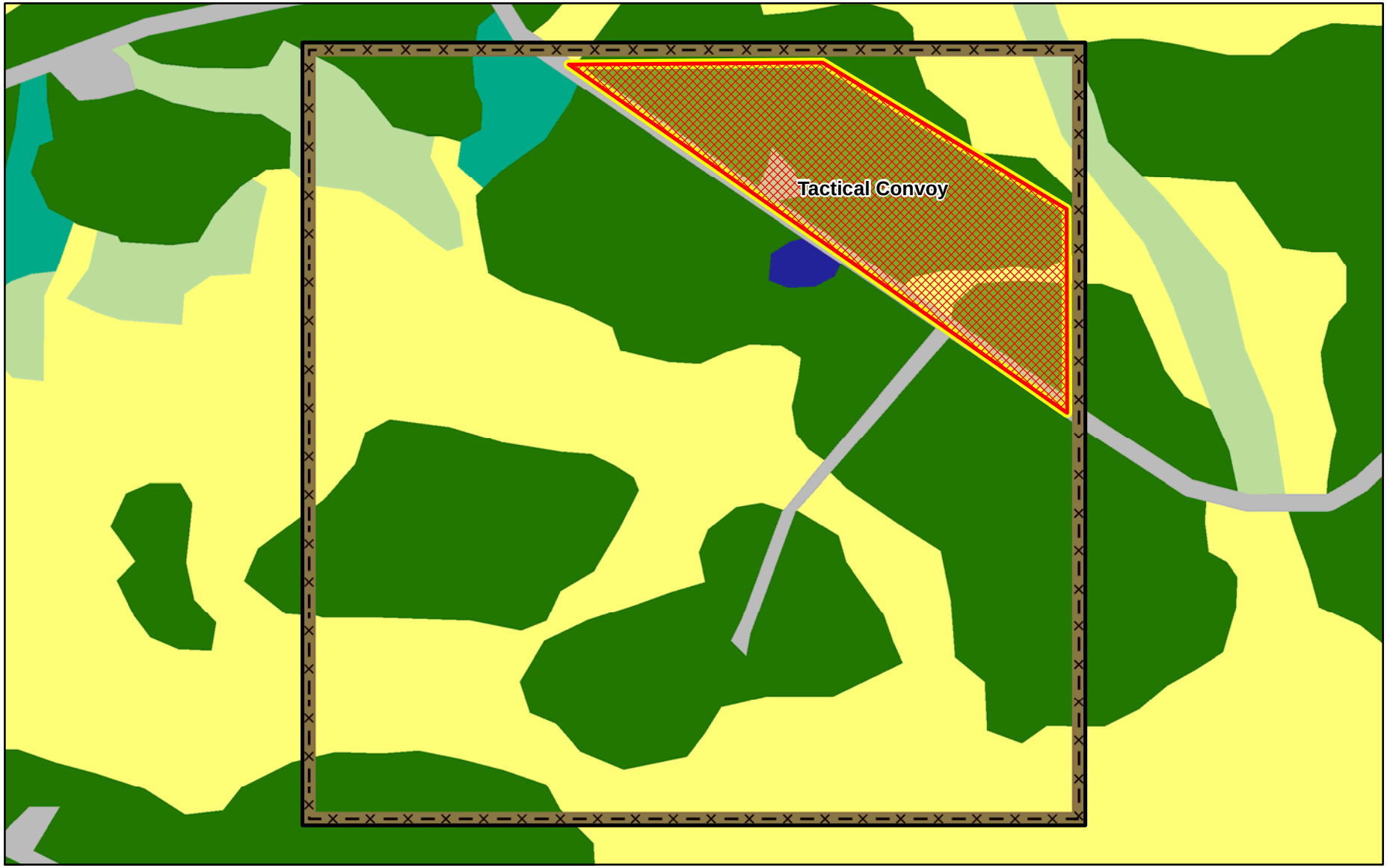

Vegetation Impact
Atlantic Coastal Plain Blackwater Stream Floodplain Forest
Early Successional Vegetation
Pine Plantation
Southern Atlantic Coastal Plain Depression Pondshore
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods
Transportation
Target Area
Target Structure
Firebreak
Fence Line

N

0 400 800
Feet

Figure 3-44
Target Area 4 Vegetation Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Elliott 2010, McFadden 2011

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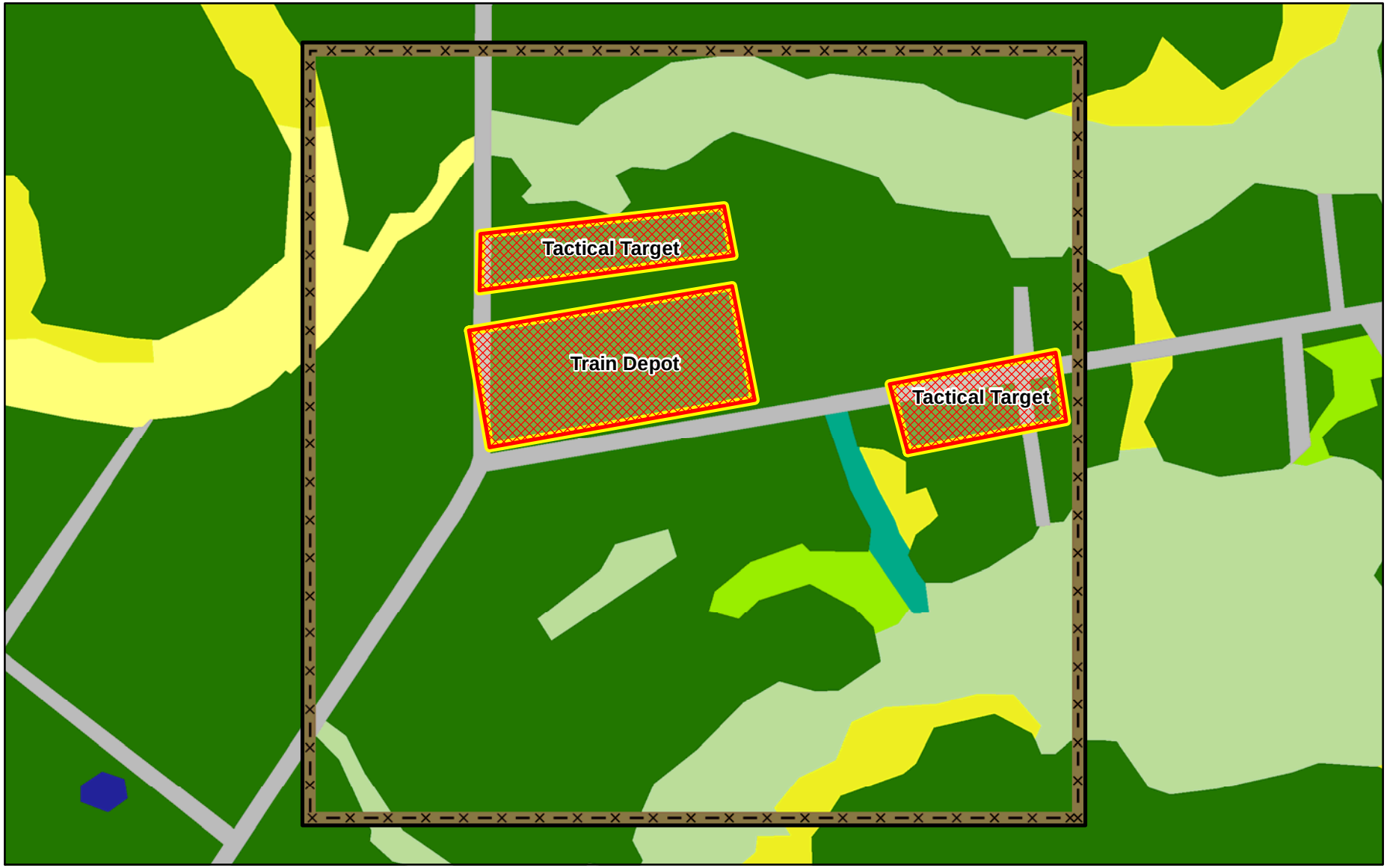


Vegetation Impact
Atlantic Coastal Plain Blackwater Stream Floodplain Forest
Early Successional Vegetation
Pine Plantation
Southern Atlantic Coastal Plain Depression Pondshore
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods
Successional Hardwood Forest
Successional Pine Forest
Transportation
Target Area
Target Structure
Firebreak
Fence Line

N

0 400 800 Feet

Figure 3-45
Target Area 5 Vegetation Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Elliott 2010, McFadden 2011

Alternative 3

Approximately 33,737.2 acres of natural vegetation exist within Acquisition Areas 1A, 1B, and 3 (Table 3-69). Impacts to existing vegetation as a result of the Proposed Action would be limited to the construction footprint of target structures and firebreaks within the target areas, and a majority of the area would serve as a safety buffer and remain vegetated.

Table 3-69
Alternative 3 - Existing Vegetation

Natural Vegetative Community	Acres	Percent of Total
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	5,248.4	15.6
Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	315.0	0.9
Atlantic Coastal Plain Upland Longleaf Pine Woodland	47.8	0.1
Early Successional Vegetation	3,468.4	10.3
Loblolly Pine-Water Oak-Sweetgum Successional Vegetation	143.5	0.4
Open Field	34.5	0.1
Pine Plantation	22,440.8	66.5
Southern Atlantic Coastal Plain Depression Pondshore	326.6	1.0
Southern Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest	74.0	0.2
Southern Atlantic Coastal Plain Non-riverine Swamp and Wet Hardwood Forest	42.8	0.1
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	476.6	1.4
Southern Coastal Plain Mesic Slope Forest	25.6	0.1
Southern Coastal Plain Nonriverine Basin Swamp	737.8	2.2
Successional Hardwood Forest	40.8	0.1
Successional Pine Forest	314.6	0.9
Total [(a)]	**33,737.2**	**100.0**

Note: (a) Total area does not include non-ecological communities such as developed areas or transportation structures.

Alternative 3 proposes to construct Target Areas 1, 2, 3, 4, 5, 6, 7, and 8. Construction of these target areas would result in 1,889.0 acres of impacts to existing vegetation as detailed in Table 3-70 and illustrated on Figures 3-38 through 3-45.

Table 3-70
Alternative 3 - Potential Impacts to Existing Vegetation

Natural Vegetative Community	Acres
Target Area 1	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	47.2
Pine Plantation	140.8
Southern Atlantic Coastal Plain Depression Pondshore	2.6
Total	**190.6**
Target Area 2	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	38
Pine Plantation	157.8
Total	**195.7**
Target Area 3	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	70.5
Early Successional Vegetation	35
Pine Plantation	179.3
Southern Atlantic Coastal Plain Depression Pondshore	1.1
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	5.4
Total	**291.2**

Table 3-70
Alternative 3 - Potential Impacts to Existing Vegetation

Natural Vegetative Community	Acres
Target Area 4	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	6.3
Early Successional Vegetation	73.7
Pine Plantation	109.7
Southern Atlantic Coastal Plain Depression Pondshore	0.8
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	3.2
Total	**193.7**
Target Area 5	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	37.7
Early Successional Vegetation	4.3
Pine Plantation	138.9
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	1.8
Successional Hardwood Forest	2.8
Successional Pine Forest	5.3
Total	**190.9**
Target Area 6	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	78.3
Early Successional Vegetation	62
Pine Plantation	243
Total	**383.4**
Target Area 7	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	21.7
Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	1.6
Early Successional Vegetation	75.3
Pine Plantation	149
Southern Atlantic Coastal Plain Depression Pondshore	1.6
Total	**249.2**
Target Area 8	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	23.6
Early Successional Vegetation	15.8
Pine Plantation	146.3
Southern Atlantic Coastal Plain Depression Pondshore	1.6
Successional Pine Forest	7.1
Total	**194.4**

Alternative 4

Approximately 27,636.4 acres of natural vegetation exist within Acquisition Areas 1B and 3 (Table 3-71). Impacts to existing vegetation as a result of the Proposed Action would be limited to the construction footprint of target structures and firebreaks within the target areas, and a majority of the area would serve as a safety buffer and remain vegetated.

Alternative 4 proposes to construct Target Areas 1, 2, 3, 4, 5, and 8. Construction of these target areas would result in 1,065.9 acres of impacts to existing vegetation as summarized in Table 3-72 and illustrated on Figures 3-41 through 3-45 and 3-40, respectively).

Table 3-71
Alternative 4 - Existing Vegetation

Natural Vegetative Community	Acres	Percent of Total
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	4,278.7	15.5
Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall	277.9	1.0
Atlantic Coastal Plain Upland Longleaf Pine Woodland	37.5	0.1
Early Successional Vegetation	2,793.5	10.1
Loblolly Pine-Water Oak-Sweetgum Successional Vegetation	56.6	0.2
Open Field	0.8	<0.1
Pine Plantation	18,371.6	66.5
Southern Atlantic Coastal Plain Depression Pondshore	281.8	1.0
Southern Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest	9.6	<0.1
Southern Atlantic Coastal Plain Non-riverine Swamp and Wet Hardwood Forest	31.6	0.1
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	350.0	1.3
Southern Coastal Plain Mesic Slope Forest	25.6	0.1
Southern Coastal Plain Non-riverine Basin Swamp	617.8	2.2
Successional Hardwood Forest	57.6	0.2
Successional Pine Forest	445.8	1.6
Total [(a)]	**27,636.4**	**100.0**

Note: (a) Total area does not include non-ecological communities such as developed areas or transportation structures.

Table 3-72
Alternative 4 - Potential Impacts to Existing Vegetation

Natural Vegetative Community	Acres
Target Area 1	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	47.2
Pine Plantation	140.8
Southern Atlantic Coastal Plain Depression Pondshore	2.6
Total	**190.6**
Target Area 2	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	38
Pine Plantation	157.8
Total	**195.7**
Target Area 3	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	70.5
Early Successional Vegetation	35
Pine Plantation	179.3
Southern Atlantic Coastal Plain Depression Pondshore	1.1
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	5.4
Total	**291.2**

Table 3-72
Alternative 4 - Potential Impacts to Existing Vegetation

Natural Vegetative Community	Acres
Target Area 4	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	6.3
Early Successional Vegetation	73.7
Pine Plantation	109.7
Southern Atlantic Coastal Plain Depression Pondshore	0.8
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	3.2
Total	**193.7**
Target Area 5	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	37.7
Early Successional Vegetation	4.3
Pine Plantation	138.9
Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods	1.8
Successional Hardwood Forest	2.8
Successional Pine Forest	5.3
Total	**190.9**
Target Area 8	
Atlantic Coastal Plain Blackwater Stream Floodplain Forest	23.6
Early Successional Vegetation	15.8
Pine Plantation	146.3
Southern Atlantic Coastal Plain Depression Pondshore	1.6
Successional Pine Forest	7.1
Total	**194.4**

Summary of Impacts

As discussed above under "Common Elements Among All Action Alternatives," direct impacts to existing vegetation are anticipated to occur only within the target areas and in those areas designated for target structures, roads, and firebreaks. The Proposed Action would include permanent conversion of natural ecological communities in order to construct target areas used for training purposes and conversion of firebreak areas to herbaceous cover. To construct new firebreaks, existing vegetation would be cleared, plowed, and disked, and permanently maintained in an herbaceous state. Indirect impacts to vegetation are anticipated as a result of fragmentation of habitats associated with construction of target structures, roads, and firebreaks. Also as part of the Proposed Action, land within the acquisition areas would be utilized as a buffer and maintained in a natural state.

Approximately 33,737.2 acres of natural vegetation are located within the proposed acquisition areas. Of this total, varying small percentages of these vegetative communities would be impacted as a result of each of the action alternatives (Table 3-73); therefore, no significant impacts to vegetation are anticipated from the Proposed Action.

Table 3-73
Summary of Potential Vegetation Impacts by Action Alternative (in acres)

Alternative	Target Area								Total Impacts
	1	2	3	4	5	6	7	8	
1						383.4	249.2	194.4	827.0
2	190.6	195.7	291.2	193.7	190.9				1,062.1
3	190.6	195.7	291.2	193.7	190.9	383.4	249.2	194.4	1,889.1
4	190.6	195.7	291.2	193.7	190.9			194.4	1,256.5

No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. The USMC would not acquire any land and training operations at TBR would not change due to this Proposed Action. No direct or indirect impacts to existing vegetation would occur. The areas would continue to be managed for silvicultural operations. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.8.4.2 Wildlife, Including Threatened and Endangered Species

Methodology and Evaluation Criteria

Potential effects to wildlife species as result of the Proposed Action were examined and summarized for all the action alternatives. To determine if the Proposed Action may adversely affect wildlife, the biological and life history requirements of wildlife species known to occur within McIntosh and Long Counties were reviewed. A desktop habitat analysis of lands within all action alternatives was completed to determine which wildlife species may utilize lands within the proposed acquisition areas.

To determine if the Proposed Action may affect threatened and endangered species, informal consultations with the USFWS and the GA DNR were conducted. A list of threatened and endangered species with the potential to occur within the Proposed Action area was compiled by reviewing biological and life history requirements and information from the USFWS and the GA DNR for threatened and endangered species known to occur within McIntosh and Long Counties, Georgia.

Desktop habitat assessments were conducted to determine which threatened or endangered species are likely to occur within the proposed acquisition areas. For those species determined likely to occur within the proposed acquisition areas, field surveys and habitat assessments were conducted within the target areas to determine if threatened or endangered species utilized lands within the proposed target areas. It was determined that no impacts were likely to threatened or endangered species beyond the limits of the target areas as these areas would remain in their current state as a vegetated buffer. Any needed firebreaks would be constructed consistent with BMPs taking wildlife, including threatened and endangered species, into consideration. No impacts to wildlife, including threatened and endangered species, are anticipated as a result of firebreak construction.

Common Elements Among All Action Alternatives

Currently, the acquisition areas are composed of dense monoculture planted pine which serves as low-quality habitat for wildlife species in the area. Silvicultural operations such as timber harvesting, fire suppression, ditching, and replanting have displaced wildlife species within the area.

Following acquisition of the property, implementation of an INRMP for vegetation and timber resources within the acquisition areas would serve to improve existing vegetative communities. Wildlife within the acquisition area would benefit from ecosystem management practices, as habitats would be converted from dense pine stands to more natural pine ecosystems. Introduction of natural fire regimes and periodic and selective harvest of timber would open tree canopies and increase biodiversity within the shrub and herbaceous layers. As a result, wildlife would benefit from improved food resources, enhanced habitat connectivity, conversion to natural pine ecosystems, and improvements of the quality of shrub and herbaceous stratums for nesting activities.

Potential impacts to wildlife would occur only within the target areas and would range from minor short-term impacts associated with temporary displacement during construction to long-term impacts associated with permanent loss or alteration of habitat due to clearing for construction of target structures. Modification in land use from an active silvicultural operation to a maintained bombing range would result in minor negative effects to wildlife species. Planted pine areas are frequently harvested by clear-cutting, fragmenting habitat. Under the Proposed Action, only small portions within the target areas would be cleared for target construction while the remaining portions of the target areas would remain

vegetated. Wildlife species may be temporarily displaced within the target areas during target construction, when noise, traffic, and human activity levels increase. These impacts are expected to be minor as sufficient habitat within the buffer area would remain to support any wildlife displaced during construction activities.

Impacts to Migratory Birds

Migratory birds are protected under the MBTA and EO 13186. The Proposed Action seeks to acquire up to 34,861 acres of land within the southeast Georgia coastal plain. Various bird species including raptors, wading birds, and songbirds protected under the MBTA are known to utilize habitats within the proposed acquisition areas.

Direct impacts to migratory birds would result from potential bird mortality from land-clearing activities. Direct impacts could be reduced and minimized through the use of BMPs, such as limiting construction activities to non-nesting periods or conducting nest surveys prior to construction or land clearing.

Indirect impacts to migratory birds include construction noise, increased human activity, and the removal of existing vegetation and habitat. During construction activities, migratory birds may be displaced due to construction noise or human activity. The removal or conversion of natural vegetation would reduce the availability of nesting and foraging habitat for migratory birds. These impacts are expected to be short-term as migratory birds would return to the areas following construction and sufficient habitat exists for migratory birds to relocate nearby during construction. Following construction of the target areas, significant portions of the areas would remain vegetated and would continue to provide habitat for migratory birds; therefore, vegetative removal and conversion impacts to migratory birds are anticipated to be minor.

Following acquisition of the property, a large buffer area of up to 32,861 acres (94% of the proposed acquisition area) would remain undisturbed by development of the expanded range. Within the buffer area, lands would be managed with an ecosystem-based management approach, resulting in a change in land use from current silvicultural operations. Migratory birds within the area would benefit from the implementation of ecosystem management, as habitats would be converted from dense pine stands to more natural pine ecosystems and grassy areas. Conversion of dense planted timber stands to natural pine ecosystems would increase vegetative diversity and provide improved food and foraging areas for migratory birds. In addition, reduction of dense tree canopies, establishment of shrub layers, and variations in tree age would provide improved nesting environments for migratory birds.

Impacts to Threatened and Endangered Species

Federally Endangered Species Consultation

Section 7 of the ESA requires federal agencies to consult with the USFWS if a federal action may affect listed species. The USMC initiated informal consultation at a meeting conducted on November 30, 2010, among NAVFAC SE, MCAS Beaufort, and the USFWS Coastal Ecological Services office. At this meeting, it was established that the USMC would provide follow-up field surveys for listed species potentially affected by the Proposed Action.

As part of the EIS process, it was determined and confirmed through informal consultation that the federally listed eastern indigo snake, frosted flatwoods salamander, wood stork, and the candidate species gopher tortoise and striped newt have the potential to occur within the proposed target areas and would require follow-up field surveys. It was further determined that no suitable habitat exists for the federally listed Bachman's warbler, Kirtland's warbler, bald eagle, or hairy rattleweed within the proposed target areas, and therefore would not require field surveys (Appendix G).

Threatened and endangered species surveys were conducted in spring 2011 for the eastern indigo snake, frosted flatwoods salamander, wood stork, striped newt, and gopher tortoise.

Effects Analysis

Under Section 7 consultation of the ESA, federal agencies are required to determine whether their actions may affect listed species or designated critical habitat. If the Proposed Action may affect listed or proposed listed species or designated critical habitat, federal agencies must provide a summary of effects determination to the USFWS and request concurrence with the findings. The findings of the summary of effects analysis classifies effects by the following determinations:

- ***No effect.*** There will be no impacts positive or negative to listed or proposed resources. No concurrence from the USFWS is required.
- ***May affect, but is not likely to adversely affect.*** All effects are beneficial, insignificant, or discountable. Beneficial effects are those that have positive effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are not measureable or cannot be evaluated. Discountable effects are those unlikely to occur. These determinations require concurrence from the USFWS.
- ***May affect, and is likely to adversely affect.*** Listed or proposed listed species or designated critical habitat are likely exposed to the Proposed Action and will respond in a negative manner to the exposure.

A determination of effects on threatened and endangered species was submitted to the USFWS on August 2, 2011, and the USFWS provided concurrence on September 22, 2011 (Appendix G). Based on discussions during informal consultation, potential effects to threatened and endangered species were likely to occur only within the proposed target areas. It was determined that no effect would occur to any threatened or endangered species unless suitable habitat existed within the proposed target impact areas. As such, it was determined during informal consultation that no effects would occur to the Bachman's warbler, Kirtland's warbler, bald eagle, or hairy rattleweed as result of the Proposed Action.

A determination of effects was submitted to the USFWS on August 2, 2011, for the remaining listed species based upon the presence or absence of the species or its suitable habitat within the proposed target areas. The findings of the determinations of effect are provided in Table 3-74 and are discussed in the following subsections.

Table 3-74
Summary of Effects on Federal Threatened and Endangered Species

Species	Summary of Effects
Eastern Indigo Snake	May affect, not likely to adversely affect
Gopher Tortoise	May affect, not likely to adversely affect
Frosted Flatwoods Salamander	No effect
Striped Newt	No effect
Wood Stork	May affect, not likely to adversely affect
Kirtland's Warbler	No effect
Bachman's Warbler	No effect
Bald Eagle	No effect
Hairy Rattleweed	No effect

Source: See Appendix G.

Summary of Effects on Federal Threatened and Endangered Species

No federal threatened and endangered species are likely to be adversely affected by the Proposed Action.

May affect, not likely to adversely affect

- Eastern Indigo Snake. Field surveys identified two areas considered suitable habitat for the eastern indigo snake. The first area consists of a 1.8-acre open canopy upland habitat located within Target Area 3 (associated with Alternatives 2 and 3). This upland area was adjacent to emergent wetlands to the east. The NRCS classified soils within this area as Bladen Fine Sandy Loam, defined as hydric, poorly drained soils. Field surveys determined that this small upland area had coarse sandy soils supporting loblolly pine, saw palmetto, gallberry, broom sedge (*Andropogon* sp.), and shiny blueberry (*Vaccinium myrsinites*). The area was surveyed using pedestrian transects for the presence of gopher tortoise burrows; however, no burrows or eastern indigo snakes were observed in the field. The construction of the 19-acre conventional bull's-eye target would impact suitable habitat for the eastern indigo snake and gopher tortoise identified within Target Area 3. Therefore, construction of the conventional bull's-eye target may affect, but is not likely to adversely affect, the eastern indigo snake as no gopher tortoise burrows or evidence of eastern indigo snakes were observed in the area.

  The second area with suitable eastern indigo snake habitat was identified within Target Area 6 (associated with Alternatives 1 and 3). The USFWS Georgia Ecological Services Field Office maintains a GIS database of threatened and endangered species ranges in Georgia. This database indicates that a known occurrence of indigo snake was documented within the vicinity of Target Area 6. Field surveys located a 12.8-acre sandy upland area of planted immature loblolly pines on the east side of an existing access road and adjacent to mature forested wetland areas. The NRCS classified soils within this area as Mascotte Fine Sand, defined as partially hydric, poorly drained soils. Vegetation in this area included loblolly pine, saw palmetto, gallberry, broom sedge, winged sumac, and shiny blueberry. The area was surveyed using pedestrian transects for the presence of gopher tortoise burrows; however, no burrows or eastern indigo snakes were observed in the field. No proposed target structure or roads would be located within suitable gopher tortoise habitat identified in Target Area 6.

  The remainder of the target areas consists of densely planted stands of loblolly pine with low species diversity. The majority of these areas contain poorly drained soils that do not meet suitable habitat requirements for the eastern indigo snake.

- Gopher Tortoise. Onsite field surveys located two areas that would be considered suitable gopher tortoise habitat. These are the same areas identified previously as suitable eastern indigo snake habitat located within Target Areas 3 and 6 (associated with Alternatives 1, 2, and 3). Both areas were surveyed using pedestrian transects for the presence of gopher tortoise burrows; however, no burrows or tortoises were observed.

  Active gopher tortoise burrows were observed within the acquisition area along New Road near the intersection of GC&P Road. This area consists of an open sandy xeric environment that has been replanted with longleaf pine. Multiple gopher tortoise burrows were located within 200 feet of the road. This area is located within the buffer area and no impacts are anticipated for this location.

- Wood Stork. The USFWS Georgia Ecological Services Field Offices GIS database of threatened and endangered species ranges in Georgia indicates a known wood stork rookery located 9 miles northwest of proposed Acquisition Areas 1A and 3. No additional wood stork rookeries are known to occur in the study area. Past research on Georgia wood stork colonies has found that foraging occurs 80% of the time within a 12-mile radius (USFWS 1986). Target Areas 1, 2, 3, 4, 6, and 7 (associated with all action alternatives) are within 12 miles of the rookery located to the northwest of Acquisition Areas 1A and 3. Due to the proposed acquisition area's proximity to the known rookery and the ability of wood storks to travel long distances for foraging, it can be assumed that all wetland habitats within these target areas may be utilized as foraging habitat for wood storks. Wood storks have been documented to forage within open water and wetland environments at TBR (MCAS Beaufort 2007).

  The Proposed Action is unlikely to adversely affect wood storks within the area. Potential impacts to wetland environments and foraging habitat for the wood stork have been significantly reduced and avoided to the greatest extent possible. A maximum total of 9,841.2 acres of wetland habitat would remain in the buffer area following acquisition of the property and would continue to provide suitable foraging habitat for wood storks. Within the proposed target areas, target structures have been sited to avoid wetlands entirely or to be located at the edge of wetland environments to minimize impacts. The anticipated maximum impact to wetland environments and foraging habitat for wood storks is limited to 0.3% of wetlands within the proposed acquisition area. Drainage structures, such as roadside ditches, canals and drainage ditches currently located within the target areas, would remain in the post-project condition. As such, the Proposed Action may affect but is unlikely to adversely affect wood storks.

Findings of No Effect

- Frosted Flatwoods Salamander and Striped Newt. To identify potential breeding ponds and suitable habitat for frosted flatwoods salamander and striped newt, pedestrian transects were conducted at 50- to 100-foot intervals throughout all areas classified as wetland habitats identified by the NWI maps (USFWS 2010a; *also see* Appendix G).

  Isolated ephemeral ponds were located within Target Areas 1, 3, 6, 7, and 8 (associated with all action alternatives). No salamanders were observed under leaf debris in any of these ponds. The ponds located within Target Areas 6 and 7 supported some amphibian species, including tadpoles and frogs; however, no salamander species were observed in these ponds. During consultation with the USFWS, a habitat-based survey methodology was established to determine if flatwoods salamanders or striped newts were likely to utilize potential breeding ponds located during field surveys. To determine if identified ephemeral ponds serve as potential breeding ponds, a thorough assessment of the pond, pond shore, and adjacent upland was conducted. Positive indicators were absence of deep water, a treeless pond shore, and adjacency to open pine savannas or pine flatwoods. Any areas that maintain appropriate habitat within the pond, adjacent upland, and treeless pond shore were then assumed to be potentially utilized as a frosted flatwoods salamander or striped newt breeding pond.

Field surveys found that no ponds within the proposed target areas met suitable habitat requirements for the frosted flatwoods salamander and striped newt, as they did not have treeless pond shores or were not supported by appropriate upland habitats including open pine savannas, pine flatwoods, or sand scrub upland environments. Based on the findings that no suitable habitat was identified within the target areas (as communicated by letter to the USFWS on May 2, 2011), no effects to frosted flatwoods salamander or striped newt are anticipated as a result of the Proposed Action.

- Bachman's Warbler. A confirmed and official documentation of the Bachman's warbler has not been reported in the United States since 1962 (USFWS 2005). As such, no effects to the Bachman's warbler are likely as a result of the Proposed Action.
- Kirtland's Warbler. The Kirtland's warbler is potentially present only in the state of Georgia for a limited time during its migratory period (spring migration April and early May and fall migrations between August and October [USFWS 1999]). Because the primary migration route for Kirkland's warbler lies north and northeast of Georgia and, since research indicates they may migrate without stopovers and that warblers within the state of Georgia are likely stray birds, no effect to this species is likely as result of the Proposed Action.
- Bald Eagle. Currently, there are no documented bald eagle nests within the acquisition areas. The proposed acquisition areas are currently managed for silvicultural operations and are composed primarily of dense planted pine stands, recently cleared pine stands, and forested wetlands. Bald eagles require tall, mature trees for nesting purposes. Due to clearing activities associated with active management of timber, trees are harvested well before they reach maturity; as a result, no suitable nesting habitat within the proposed acquisition areas exists for bald eagles. No effect to this species is likely as result of the Proposed Action.
- Hairy Rattleweed. Hairy rattleweed is a perennial legume that inhabits sandy soils in open pine flatwoods, intensively managed slash pine plantations, and along road and power line ROWs. It is known to occur only in Brantley and Wayne Counties, Georgia (USFWS 2012). No suitable habitat exists for the hairy rattleweed within the acquisition areas and, therefore, no effect to this species is likely as a result of the Proposed Action.

State-Protected Species

Legal protection is provided to state-listed plant and animal species under the Georgia Endangered Wildlife Act of 1973 and the Georgia Wildflower Preservation Act of 1973. Authorization is given to the GA DNR to review and amend the list as necessary. Under these Acts, it is prohibited to harass, capture, kill, cut, dig, or remove any state-listed plant or animal species.

As defined by Georgia state law, state-listed species are afforded protection on public lands, and state law specifically states that rules and regulations related to the protection of state-protected species shall not affect rights in private property owners nor impede construction of any nature. However, the GA DNR routinely makes recommendations to guide more environmentally friendly development in areas where state-protected plant and animal species are known to occur.

Effects Analysis

As part of the EIS process, it was established that the USMC, in addition to conducting surveys for federally listed species, would provide follow-up field surveys for state-listed species potentially affected by the Proposed Action. State-listed species that are not protected under the ESA include: Georgia plume, corkwood, dwarf witch-alder, giant orchid, and tiny-leaf buckthorn (Appendix G).

In preparation of this FEIS, literature regarding life histories, biology, and habitat requirements was reviewed and it was determined that the state-listed corkwood and dwarf witch-alder have the potential to occur within the proposed target areas and would require follow-up field surveys. It was further determined that no suitable habitat exists within the proposed acquisition areas for the state-listed Georgia plume, giant orchid, or tiny-leaf buckthorn.

Field surveys were conducted in spring 2011 for the state-listed corkwood and dwarf witch-alder. Findings of these surveys were submitted to the GA DNR on May 2, 2011 (Appendix G). These findings are summarized below.

Summary of Effects on State-Protected Species

No state-protected species are likely to be adversely affected by the Proposed Action.

Findings of No Effect

Corkwood and Dwarf Witch-alder. In spring 2011, pedestrian transects were conducted at 50- to 100-foot intervals throughout all areas identified as suitable habitat for corkwood and dwarf witch-alder. Suitable habitat for corkwood was defined as wetland environments dominated by red maple, cypress, and black gum. Suitable habitat for dwarf witch-alder was defined as transitional shrub areas along the margins of swamps and bays.

Most wetland systems surveyed contained some portions of suitable habitat for corkwood or dwarf witch-alder. However, within the target areas, no specimens were identified or observed. No adverse impacts to these species are likely as result of the Proposed Action.

Georgia Plume. The Georgia plume is found in xeric environments including sand ridges and oak ridges. No portions of the target areas contain xeric habitats, and therefore, no adverse impacts to the species are likely as a result of the Proposed Action.

Giant Orchid. The giant orchid is found in sandy environments including scrub oak and sandhills, as well as open pine flatwoods. No portions of the target areas contain scrub oak or sandhill communities. The target areas are composed primarily of dense planted pine stands, recently cleared pine stands, and forested wetlands. A majority of soils within these areas are classified hydric by the NRCS and do not maintain ample soil permeability to support the giant orchid. Therefore, no adverse impacts to the giant orchid are likely as a result of the Proposed Action.

Tiny-leaf buckthorn. The tiny-leaf buckthorn is found on calcareous rock bluffs, shell middens, and evergreen hammocks along stream banks (Patrick, Allison, and Krakow 1995). No portions of the target areas contain appropriate habitat for tiny-leaf buckthorn, and therefore, no direct or indirect impacts to habitat of the tiny-leaf buckthorn are anticipated.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. The USMC would not acquire any land and training operations at TBR would not change due to this Proposed Action. No direct or indirect impacts to existing wildlife would occur. The areas would continue to be managed for silvicultural operations. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.9 Cultural Resources

This section describes existing cultural resources within, and near TBR, including those areas proposed for acquisition, and evaluates potential cultural resource impacts under each alternative, including the No Action Alternative.

3.9.1 Definition of Resource

The USMC's definition of cultural resources is tiered off the DOD Instructions for Cultural Resources Management (DOD Instruction 4715.16, September 18, 2008). These instructions define cultural resources as:

- historic properties (any district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places [NRHP]), including artifacts, records, and material remains related to such a property or resource;
- cultural items such as those defined in the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA);
- American Indian, Eskimo, Aleut, or Native Hawaiian sacred sites for which access is protected under the American Indian Religious Freedom Act (AIRFA);
- archaeological artifact collections and associated records defined under regulations for the curation of federally owned and administered archaeological collections (36 CFR Part 79); and
- archaeological resources as defined by the Archaeological Resources Protection Act of 1979, as amended (ARPA) (16 U.S.C. 470aa-mm) (DOD Instruction 1715.16).

Historic properties are a subset of cultural resources. They are defined as any prehistoric or historic district, site, building, structure or object that meets the criteria for inclusion (listed) in, or are determined eligible for inclusion (listing) in, the NRHP (36 CFR 800.16(l)). National Register criteria are found in 36 CFR Part 60. The term "historic properties" includes artifacts, records, and remains that are related to and/or located within such properties. The term also includes properties that are of traditional religious and cultural importance to a Native American tribe and that meet National Register criteria. National Historic Landmarks (NHLs), which are also listed in the NRHP, are specially designated historic properties that have been determined to be of exceptional value to the nation as a whole (in accordance with National Register criteria found in 36 CFR Part 65).

For the purposes of analyzing the Proposed Action, cultural resources have been grouped to reflect the categories identified in the "U.S. Marine Corps Cultural Resources Program Guide" (USMC 2009b), consisting of: archaeological resources (prehistoric and historic archaeological sites and districts); historic built resources (buildings, structures, objects, landscapes or districts, and other built features such as roads, railroads, canals, etc.); and traditional cultural properties (TCPs), including archaeological sites and properties of traditional religious and cultural importance (USMC 2009b). In general, specific locations of archaeological resources and TCPs are kept confidential because of the concern for cultural sensitivity and vandalism. Therefore, maps or figures with specific locations of cultural resources and/or historic properties are not included in this section or elsewhere in this FEIS.

3.9.2 Regulatory Framework

3.9.2.1 Regulatory Context

Under Title 1 of NEPA, the federal government is responsible for supporting the preservation of important historic, cultural, and natural aspects of our national heritage (CEQ 2011, Headquarters Marine Corps 2009). The evaluation of the Proposed Action's impacts on cultural resources addresses the requirements of NEPA and was conducted in accordance with CEQ regulations for implementing NEPA at 40 CFR Parts 1500-1508 and in accordance with the "United States Marine Corps National Environmental Policy Act (NEPA) Manual" (Headquarters Marine Corps 2009).

Implementing regulations for NEPA compliance requires coordinating environmental impact analysis with the studies required for compliance with the National Historic Preservation Act (NHPA) of 1966, as amended, and other environmental review laws and executive orders. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and is the primary federal regulation driving the analysis of impacts and effects on cultural resources for the Proposed Action. Compliance with Section 106 of the NHPA has been conducted for the Proposed Action in accordance with the implementing regulations at 36 CFR Part 800 (please refer to Section 3.9.2.2).

The USMC has conducted compliance activities for cultural resources in accordance with DOD references and guidance, including:

- DOD Directive 4710.1, Archaeological and Historic Resources Management (June 21, 1984);
- DOD Instruction 4715.16, Cultural Resources Management (September 18, 2008);
- Secretary of the Navy Instruction (SECNAVINST) 5090.6A, Environmental Planning for Department of the Navy Actions (26 April 2004);
- SECNAVINST 4000.35A, Department of the Navy Cultural Resources Program, (9 April 2011);
- U.S. Marine Corps Cultural Resources Program Guide (USMC 2009b); and
- MCO 5090.2A, Chapter 8, "Cultural Resources Management," which provides cultural resources policy (including consultation) for the USMC.

As set forth in Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. Section 303(c)) the FAA and other USDOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless the following conditions apply: 1) There is no feasible and prudent alternative to the use of land, and 2) The action includes all possible planning to minimize harm to the property resulting from use. However, pursuant to Section 1079 of Public Law 105-85, military flight operations or designations of airspace for military flight operations may not be treated as a transportation program or project for the purposes of 49 U.S.C. 303(c); therefore, Section 4(f) is not being considered as part of this analysis.

Once the ROD for this FEIS is signed and acquisition of the land under the selected alternative occurs, the MCAS Beaufort Integrated Cultural Resources Management Plan (ICRMP; USACE 2007) will be updated to include the newly acquired areas or a separate ICRMP will be developed. The updated ICRMP will provide installation-specific guidance for the management of cultural resources within the newly acquired area.

The USMC will remain responsible for compliance with the NHPA (including Section 106 and Section 110, as appropriate), and, for future actions, also will be responsible for compliance with the following laws, regulations, executive orders, and guidance, as appropriate:

- The Advisory Council on Historic Preservation's (ACHP's) regulations for the Protection of Historic and Cultural Properties (36 CFR Part 800);
- The Archaeological and Historic Resources Preservation Act of 1974;
- ARPA;
- NAGPRA;
- AIRFA;
- EO 13007, Indian Sacred Sites, 1996;
- EO 13175, Consultation and Coordination with Indian Tribal Governments, 2000; and,
- EO 13287, Preserve America, 2003 (updated 2009) (Headquarters Marine Corps 2009).

3.9.2.2 Compliance with Section 106 of the NHPA

Definition of Area of Potential Effects

The area of potential effects (APE) for an undertaking is defined as the geographic area or areas where the Proposed Action may directly or indirectly cause alterations in the character or use of historic properties, if such properties exist (36 CFR 800.16(d). For the purposes of compliance with Section 106 of the NHPA, the USMC has defined the APE for the Proposed Action as the proposed acquisition area boundaries. The APE includes the eight proposed target areas and any associated areas that would be disturbed as a result of construction activities. The remaining areas of the APE would be indirectly affected by changes in ownership and future undertakings by the USMC.

Consultation with Federal and State Agencies and Other Interested Parties

The USMC consulted with the Georgia State Historic Preservation Officer (SHPO), the ACHP, 21 federally recognized Indian tribes, and 15 other potential interested parties (see Appendix A). As a result of consultation with the Georgia SHPO, a Programmatic Agreement (PA) was developed for the Proposed Action (see Appendix H). The results of Section 106 consultation efforts and the stipulations of the PA are summarized below.

Georgia State Historic Preservation Officer

The USMC initiated NHPA Section 106 consultation with the Georgia SHPO in accordance with 36 CFR Part 800 on January 19, 2011 (see Appendix H). The purpose of this initial consultation letter was to introduce the Proposed Action (i.e., undertaking) to the Georgia SHPO and to obtain concurrence on the APE for the Proposed Action. Additionally, this consultation letter confirmed a meeting on February 1, 2011, among the USMC, the DON, and Georgia SHPO staff at the GA DNR in Atlanta, Georgia, to identify any issues or concerns regarding the identification of historic properties that may be located within the APE (Drawdy 2011b). During this meeting, the Georgia SHPO concurred with the APE for the Proposed Action, and the phased approach for compliance with Section 106 of the NHPA. During the same meeting, the USMC, the DON, and the Georgia SHPO also agreed to the archaeological survey methodology and to the development of a PA for acquisition activities included in the Proposed Action (Drawdy 2011c). The PA, included in Appendix H, was signed by the Georgia SHPO on March 6, 2012 (Anderson-Cordova 2011a, 2011b; Drawdy 2011c, 2011d; USMC 2012).

Advisory Council on Historic Preservation

The USMC initiated NHPA Section 106 consultation with the ACHP in accordance with 36 CFR Part 800 on August 11, 2011 (see Appendix H). The purpose of this initial consultation letter was to

introduce the Proposed Action to the ACHP and to invite the ACHP to participate in the Section 106 consultation process and in the development of the PA for the Proposed Action (Drawdy 2011e). In their response to the USMC (Wallace 2011), the ACHP indicated that additional information would be necessary before the ACHP could determine the need to participate in the Section 106 consultation process for the Proposed Action.

The USMC provided this additional information to the ACHP on February 6, 2012 (see Appendix H). In their response to the USMC, the ACHP indicated that they were declining to participate in the Section 106 process for the Proposed Action (Wallace 2012a).

On June 12, 2012, the USMC filed the executed PA with the ACHP per 36 CFR 800.6 (b)(1)(iv). The ACHP acknowledged receipt of the PA on June 18, 2012, thereby completing the consultation requirements of Section 106 of the NHPA and the ACHP's regulations.

Native American Consultation

Although there are no federally or state-recognized Indian tribes within the state of Georgia (Bureau of Indian Affairs 2011, NPS 2011a, National Conference of State Legislatures 2011), the USMC identified a total of 21 federally recognized Indian tribes in other states that may have an interest in the location of the Proposed Action for ancestral or historical reasons.

Section 106 consultation was initiated by the USMC with the 21 federally recognized Indian tribes on April 29 and October 4, 2011 (see Appendix H). The purpose of this consultation was to introduce the Proposed Action to the tribes, determine whether the tribes were interested in participating in the consultation process as Section 106 consulting parties, and to identify any tribal issues or concerns, including, but not limited to, archaeological resources, properties of traditional religious or cultural importance, or TCPs. Additional consultation with the 21 federally recognized Indian tribes was conducted on December 13, 2011, providing information for the outcome of the archaeological and historic built resource investigations and providing a copy of the draft PA for review and comment.

Eight federally recognized Indian tribes responded to the USMC's Section 106 consultation inquiries for the Proposed Action: Alabama-Coushatta Tribe of Texas, Cherokee Nation, Oklahoma, Choctaw Nation of Oklahoma, Eastern Shawnee Tribe of Oklahoma, Miccosukee Tribe of Indians of Florida, Muscogee (Creek) Nation, Seminole Tribe of Florida, and United Keetoowah Band of Cherokee Indians in Oklahoma. Written responses can be seen in Appendix H.

The USMC has continued to provide information to all 21 federally recognized Indian tribes as part of its consultation responsibilities pursuant to Section 106 of the NHPA and its implementing regulation at 36 CFR Part 800.

Other Consulting Parties

In accordance with 36 CFR Part 800, Section 106 consultation was initiated by the USMC with a total of 15 other consulting parties or parties that may have a potential interest in the Proposed Action on September 13, 2011, or October 7, 2011 (Appendix H). These parties included landowners and companies holding timber leases within the proposed acquisition areas; representatives of local governments with jurisdiction over lands included in the proposed acquisition areas (McIntosh County Manager and Long County Commissioners Office); and other parties (local historical society, environmental organizations, etc.) with a demonstrated interest in the proposed acquisition areas. To date, the USMC has received one response to the initiation of Section 106 consultation with other potential consulting parties. This response, from Molpus Woodlands Group (a landowner), requested only that a right-of-entry (ROE) agreement be obtained before conducting any surveys (Collins 2011; see Appendix H). No responses have been received from any of the 14 other potential consulting or interested parties.

Programmatic Agreement

The PA that was developed for the Proposed Action was received and filed by the ACHP on June 18, 2012. The PA acknowledged that the effects of the acquisition of the proposed expansion area on historic properties could not be fully determined prior to the signing of the ROD (see Appendix H).

The stipulations of the PA include measures for: initiating additional consultation with the Georgia SHPO and any federally recognized Indian tribes on future actions within the APE for the Proposed Action; expanding the ICRMP for MCAS Beaufort to include the land proposed for acquisition for TBR or developing a separate ICRMP for TBR if more appropriate; and curating all artifacts, field notes, maps, drawings, and data resulting from archaeological investigations conducted on land acquired by the government as part of the Proposed Action in the appropriate repository that either meets the standards in 36 CFR Part 79 or is consistent with NAGPRA, if more appropriate (USMC 2012).

3.9.3 Affected Environment

3.9.3.1 Cultural Context

This section discusses the prehistoric and historic cultural contexts for the APE for the Proposed Action and its immediate vicinity, consisting of a 1-mile buffer area around the proposed acquisition areas. This information provides the cultural background supporting the conclusions and recommendations for cultural resources identified within the APE.

Prehistoric Cultural Context

The prehistoric cultural context for the APE is divided into four broad time-periods before European contact: Paleo-Indian (prior to 8000 BC), Archaic (8000 to 1000 BC), Woodland (1000 BC to AD 1000), and Mississippian (AD 1000 to AD 1500). Native Americans present at the time of European contact, considered to be AD 1540, are generally ascribed to the Proto-historic or Historic Aboriginal period. Prehistoric occupation of the APE and/or its immediate vicinity has been documented as beginning during the Early Archaic period and extending through the Proto-historic cultural period (Hendryx, Arbuthnot, and Linville 2011; USACE 2007).

Proto-Historic / Historic / Modern Native American Cultural Context

Early historic Indian tribes located in what is now the state of Georgia were members of the Southeast cultural area. Major early historic Indian tribes included the Cherokee, Muscogee, Hitchiti, Timucua, Guale, and Cusabo. Minor early historic tribes included Kashinta, Chiaha, Yamasee, Tamathli, Apatichicola, Sawokit, Yusanga, Utina, Icafui, and Tacatacuru. The Cherokee were linguistically distinct; the Muscogee, Hitchiti, Kashinta, Chiaha, Yamasee, Tamathli, Apatichicola and Sawokit were members of the Gulf linguistic stock; and the Timucua, Yusanga, Utina, Icafui, and Tacatacuru were members of the Timucua linguistic stock. Insufficient information for cultural affiliation or linguistic stock was available for the two coastal tribes, the Guale and Cusabo (Sturtevant 1967).

As stated previously, no federally recognized Indian tribes are currently located in the state of Georgia (Bureau of Indian Affairs 2011; NPS 2011a). In consultation databases maintained by the NPS, five tribes have indicated an interest in the State of Georgia, although none of these tribes have indicated a specific interest in McIntosh or Long Counties: the Eastern Band of Cherokee Indians of North Carolina; the Muscogee (Creek) Nation, Oklahoma; the Seminole Nation of Oklahoma; the Seminole Tribe of Florida (Dania, Big Cypress, Brighton, Hollywood and Tampa Reservations), and United Keetoowah Band of Cherokee Indians in Oklahoma (NPS 2011d, 2012). As indicated in Section 3.9.2.2, the USMC consulted with these five tribes pursuant to Section 106 of the NHPA. While unspecified Cherokee and Creek Indian tribes proved their original tribal occupancy of lands within Georgia during cases heard before the Indian Claims Commission, these lands do not include McIntosh or Long Counties

(NPS 2011b). Additionally, McIntosh and Long Counties are not included in any Indian land cessions made by federal treaty between 1784 and 1894 (NPS 2011c).

There are no state-recognized Indian tribes in Georgia (National Conference of State Legislatures 2011).

Historic Cultural Context

Early historic exploration and settlement in the vicinity of the APE and the surrounding 1-mile buffer area were centered on the Altamaha River. The Altamaha River is located southwest of the APE, and forms the border between Wayne County on the west of the river and McIntosh and Long Counties on the east.

Coastal areas of Georgia may have been explored by the French as early as the 1560s and, in the late 16th Century, Franciscan friars from Spain established a mission on a bluff that was the site of a former Indian village. The location of the Spanish mission was near the current location of Darien, a town at the mouth of the Altamaha River.

Between 1721 and 1729, the English from South Carolina established and maintained Fort King George, the southernmost outpost of the British Empire in North America, along the coast of what is now McIntosh County at the mouth of the Altamaha River. In 1736, the British established the town of Darien at the site of the abandoned Fort King George and established additional forts in interior portions of Georgia along the Altamaha River. Fort Mount Venture was one such interior fort, established in the mid-1730s on the Altamaha River near Sansavilla Bluff, which is approximately 2 miles southwest of the APE in Wayne County (Hendryx, Arbuthnot, and Linville 2011; USACE 2007).

Mount Venture was one of the earliest settled places in what was otherwise considered an undesirable region of pine barrens and wiregrass. It was a trading post as well as a defensive position against Spanish incursions from the south, but became a target for Spanish-allied Yemassee Indians, who burned the fort and killed most of its occupants in 1742. In 1752, the British built another fort, Fort Barrington, on Sansavilla Bluff as a defense against the Spanish and Indians. The region continued to be the location of a number of border incidents among the Spanish, the English, and local Native Americans until the Revolutionary War when Fort Barrington was overtaken by American colonial forces, renamed Fort Howe, and used to mount invasions of British East Florida (Hendryx, Arbuthnot, and Linville 2011; USACE 2007).

A historical marker and a county park commemorate the location of Fort Barrington, and the road that linked Fort Barrington with Savannah is still present, located west of the current TBR boundaries along the western edge of Acquisition Areas 1A and 1B. Old Barrington Road was an important part of the trade route between the Carolinas and Florida in the early 1700s and was critical during the Revolutionary War for troop movements.

After the Revolutionary War, settlement and development of the region was slow, although the Altamaha River remained a central artery for access to the region. McIntosh County was formed in 1793, and Darien became the county seat in 1816. Long County was not formed until 1920. Containing relatively poor soil for agricultural purposes, the region was recognized for its timber resources, and exploitation of this resource was the primary driver for economic use and development in the vicinity of the APE. Timber was rafted down the Altamaha River from interior regions to Darien on the coast for processing throughout the 19th and early 20th Centuries and, by the late 19th Century, naval stores and timber industries became increasingly prevalent in the region. By the late 19th Century, railroads were constructed to facilitate the transport of timber products to Darien, supporting the town's growth into one of the busiest timber ports on the Atlantic Coast in the decades following the Civil War. African-Americans displaced after the Civil War found employment in the lumber mills and docks around Darien, and the town hosted vessels from Europe, South America, and the Far East, which came to take on cargoes of lumber at the turn of the 20th Century. Despite the growth of Darien, and another town, Jesup,

which was located at the crossing of two railroad lines in Wayne County, the region remained rural and development was sparse (Hendryx, Arbuthnot, and Linville 2011).

By the 1910s, the virgin stands of timber along the Altamaha River were depleted, and timber and naval stores and industries largely abandoned the region for other parts of the South by the 1920s. However, in the mid-20th Century, new demand for timber revitalized the timber industry as a result of advances in forestry science and planted pine. Several paper mills opened in the region, providing a new source of employment for area residents. Paper companies continue to operate in the area, including several of the landowners for the proposed acquisition areas comprising the APE (Hendryx, Arbuthnot, and Linville 2011).

Military Context

The history of military use within the APE, which began with the establishment of Townsend Range Complex by the Army Air Corps in the 1940s, is discussed in Section 4.2.1.2.

3.9.3.2 Cultural Resources Identified for the Proposed Action

The USMC conducted a desktop cultural resources analysis of the APE between November 2010 and January 2011 (Hendryx, Arbuthnot, and Linville 2011). The purpose of this desktop cultural resources analysis was to identify previously recorded cultural resources within the APE and to classify proposed land acquisition areas as containing high and low probability of possessing archaeological resources in accordance with the Georgia Standards and Guidelines for Archaeological Surveys (Georgia Council of Professional Archaeologists n.d.).

Subsequent to the desktop cultural resources analysis, the USMC conducted an archaeological investigation between August 14 and October 14, 2011, for the TBR expansion areas in McIntosh and Long Counties. The USMC was able to secure ROE access for, and completely survey, six of the eight proposed target areas (Areas 3, 4, 5, 6, 7 and 8) for archaeological resources. Target Area 1 was also surveyed for archaeological resources with the exception of approximately 21 acres for which ROE was not obtained. ROE was not obtained for Target Area 2 and this area was not surveyed (Hendryx 2012). If acquisition occurs, any previously unsurveyed lands within proposed target areas would be surveyed in accordance with the PA executed with the GA SHPO. The purpose of the archaeological investigation was to identify the locations of archaeological resources to facilitate future planning efforts, and to assist in the assessment of potential effects the Proposed Action may have on historic properties, should they be present, pursuant to Section 106 of the NHPA and its implementing regulations at 36 CFR Part 800. Results of the archaeological investigation are summarized below.

The USMC conducted a reconnaissance survey for historic built resources (Appendix I) between August and October 2011 for the TBR expansion areas in McIntosh and Long Counties. The survey area consisted of 24,031.22 acres of the 34,861 acres proposed for expansion. ROE agreements were not obtained for the remaining 10,829.78 acres within the expansion area and these areas were not surveyed (Michael 2012). No buildings or structures were observed on USGS Maps, aerial photography, or from the public ROW for the remaining 10,829.78 acres. The purpose of the reconnaissance survey was to identify the locations of aboveground built resources within the expansion areas and to assess the need for further evaluation of these resources to determine their NRHP-eligibility. Results of the historic built resources assessment are summarized below.

Archaeological Sensitivity and Previous Survey Coverage

The archaeological sensitivity assessments for the APE were developed in accordance with the Georgia Standards and Guidelines for Archaeological Surveys and presented in the desktop cultural resources analysis for the Proposed Action. Low probability areas were defined as areas with slopes greater than 10 percent; areas of very poorly drained soil (as determined by subsurface inspection); and areas that have been previously disturbed to such a degree that archaeological materials, if present, are no

longer in context. All other areas that do not meet the criteria of low probability are considered to be high probability areas (Georgia Council of Professional Archaeologists 2001, *as cited in* Hendryx, Arbuthnot, and Linville 2011).

Based on archaeological sensitivity assessments developed for the APE, approximately 77% (approximately 4,796 acres) of Acquisition Area 1A, approximately 70% (approximately 3,472 acres) of Acquisition Area 1B, and approximately 74% (approximately 17,633 acres) of Acquisition Area 3 are considered to have a high probability for containing archaeological deposits. The archaeological sensitivity of approximately 13% (approximately 648 acres) of Area 1B is unknown because soils in this area have not been subject to previous classification and could not be used as a variable in assessing archaeological sensitivity. Remaining portions of Acquisition Areas 1A, 1B and 3 are considered to have a low probability for containing archaeological deposits (Hendryx, Arbuthnot, and Linville 2011).

Previous survey coverage of portions of the APE included five cultural resources investigations conducted between 1996 and 2005. Four of these investigations were conducted within TBR, which is surrounded by, but not included in, the APE. One cultural resources investigation was conducted outside TBR, along the eastern edges of Acquisition Areas 1B and 3. As a result of these investigations, eight previously recorded archaeological sites were identified within the APE (as shown in Table 3-75). No previously recorded historic built resources were identified within the APE. Five of the archaeological resources were previously recommended not eligible for the NRHP; the remaining three were not previously evaluated for NRHP eligibility. (Hendryx, Arbuthnot, and Linville 2011)

Archaeological Resources

A total of 29 archaeological resources have been identified within the APE, including the nine archaeological resources identified during previously conducted cultural resources investigations for unrelated actions in Acquisition Areas 1B and 3 (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012). Eighteen (18) are archaeological sites (nine previously recorded sites and nine newly identified sites) and 11 are newly identified isolated finds (see Table 3-75).

Eight of the nine previously recorded archaeological sites (five prehistoric sites, one historic site, and two multi-component [prehistoric and historic] sites) are located outside the target areas. Five of these eight previously recorded archaeological sites were previously recommended not eligible for inclusion in the NRHP; three have not been evaluated for NRHP-eligibility (Hendryx, Arbuthnot, and Linville 2011). The Snuff Box Canal (9MC345), which is classified as both an archaeological site and historic built resource, is located within a target area and has not been evaluated for NRHP eligibility (Hendryx, Arbuthnot, and Linville 2011).

The nine newly identified archaeological sites (five prehistoric sites and four multi-component [prehistoric and historic] sites) are all located within target areas. Additional archaeological investigation (evaluation to determine NRHP eligibility) is recommended for five of the newly identified archaeological sites (Sites 2, 4, 5, 6, and 7). The remaining four newly identified archaeological sites (Sites 1, 3, 8, and 9) and the 11 isolated finds (Isolates 1 through 11) have been recommended not eligible for inclusion in the NRHP and no further investigations have been recommended (Hendryx 2012).

The NRHP eligibility of archaeological resources would be determined after acquisition and, based on these determinations, the USMC would determine how best to avoid or minimize any potential adverse effects on historic properties in accordance with the PA executed with the Georgia SHPO for this undertaking. If effects to historic properties cannot be avoided or minimized, the USMC shall resolve adverse effects per 36 CFR 800.6 in accordance with the PA executed with the Georgia SHPO.

Table 3-75
Known Archaeological Resources within the Area of Potential Effects (APE) for the Proposed Action

Name	Location (Area)	Within Target Area	Alternative(s)	Description	NRHP-eligibility Recommendation	Comments
Previously Recorded Archaeological Sites Within the APE but Outside the Target Areas						
Site 9MC48	Within Area 1B	No	1, 3, 4	Multi-component archaeological site (prehistoric [Late Archaic] and historic artifact scatters)	Previously recommended Not Eligible for the NRHP	No further investigations recommended
Site 9MC49	Within Area 1B	No	1, 3, 4	Multi-component archaeological site (prehistoric [unspecified] and historic [late 19th/early 20th Century] artifact scatters)	Previously recommended Not Eligible for the NRHP	No further investigations recommended
Site 9MC51	Within Area 3	No	2, 3, 4	Historic (late 19th to early 20th Century) archaeological site	Previously recommended Not Eligible for the NRHP	No further investigations recommended
Site 9MC176	Within Area 3	No	2, 3, 4	Prehistoric (unspecified) archaeological site	Unevaluated	Further investigations would be necessary to determine NRHP-eligibility
Site 9MC177	Within Area 3	No	2, 3, 4	Prehistoric (Late Archaic-Stallings Island) archaeological site	Unevaluated	Further investigations would be necessary to determine NRHP-eligibility
Site 9MC178	Within Area 3	No	2, 3, 4	Prehistoric (unspecified) archaeological site	Unevaluated	Further investigations would be necessary to determine NRHP-eligibility
Site 9MC345[(a)]	Within Areas 1A and 1B	Yes[(b)]	1, 3, 4	Historic (mid-20th Century) ditch/canal constructed by the Union Camp Corp. timber company in the 1960s to drain the area for logging purposes; has both archaeological and built components.	Unevaluated	Further investigations would be necessary to determine NRHP-eligibility
Site 9MC399	Within Area 3	No	2, 3, 4	Prehistoric (unspecified) archaeological site	Previously recommended Not Eligible for the NRHP	No further investigations recommended
Site 9MC400	Within Area 3	No	2, 3, 4	Prehistoric (Middle Woodland-Deptford) archaeological site	Previously recommended Not Eligible for the NRHP	No further investigations recommended
Newly Identified Archaeological Sites Within the APE and Within the Target Areas						
Site 1	Within Area 1B	Yes	1, 3, 4	Multi-component archaeological site (prehistoric [unspecified] and historic [late 19th/early 20th Century] artifact scatters)	Not Eligible for the NRHP	No further investigations recommended

Table 3-75
Known Archaeological Resources within the Area of Potential Effects (APE) for the Proposed Action

Name	Location (Area)	Within Target Area	Alternative(s)	Description	NRHP-eligibility Recommendation	Comments
Site 2	Within Area 1B	Yes	1, 3, 4	Multi-component archaeological site (prehistoric [Late Archaic and Woodland] site and historic [unspecified] artifact scatter)	Undetermined	Site evaluation recommended
Site 3	Within Area 1B	Yes	1, 3, 4	Prehistoric archaeological site (unspecified post-Archaic site)	Not Eligible for the NRHP	No further investigations recommended
Site 4	Within Area 1B	Yes	1, 3, 4	Multi-component archaeological site (single prehistoric [unspecified] artifact and historic [19th to early 20th Century] artifact scatter)	Undetermined	Site evaluation recommended
Site 5	Within Area 3	Yes	2, 3, 4	Multi-component archaeological site (prehistoric [Middle Woodland-Deptford and Late Woodland/Early Mississippian-St. Catherines Plain] site and historic [early 19th to early 20th Century] farmstead site)	Undetermined	Site evaluation recommended
Site 6	Within Area 3	Yes	2, 3, 4	Prehistoric archaeological site (Early Archaic through Mississippian quarry site)	Undetermined	Site evaluation recommended
Site 7	Within Area 3	Yes	2, 3, 4	Prehistoric archaeological site (Middle Woodland-Deptford)	Undetermined	Site evaluation recommended
Site 8	Within Area 3	Yes	2, 3, 4	Prehistoric archaeological site (unspecified)	Not Eligible for the NRHP	No further investigations recommended
Site 9	Within Area 3	Yes	2, 3, 4	Prehistoric archaeological site (unspecified)	Not Eligible for the NRHP	No further investigations recommended
Newly Identified Isolated Finds Within the APE and Within the Target Areas						
Isolate 1	Within Area 1B	Yes	1, 3, 4	Isolated prehistoric artifact	Not Eligible for the NRHP	No further investigations recommended
Isolate 2	Within Area 1B	Yes	1, 3, 4	Isolated prehistoric artifact	Not Eligible for the NRHP	No further investigations recommended
Isolate 3	Within Area 1B	Yes	1, 3, 4	Isolated prehistoric artifact	Not Eligible for the NRHP	No further investigations recommended
Isolate 4	Within Area 1B	Yes	1, 3, 4	Isolated historic artifact	Not Eligible for the NRHP	No further investigations recommended
Isolate 5	Within Area 1B	Yes	1, 3, 4	Isolated historic artifact	Not Eligible for the NRHP	No further investigations recommended
Isolate 6	Within Area 1B	Yes	1, 3, 4	Isolated prehistoric artifact	Not Eligible for the NRHP	No further investigations recommended

Table 3-75
Known Archaeological Resources within the Area of Potential Effects (APE) for the Proposed Action

Name	Location (Area)	Within Target Area	Alternative(s)	Description	NRHP-eligibility Recommendation	Comments
Isolate 7	Within Area 3	Yes	2, 3, 4	Isolated prehistoric artifact	Not Eligible for the NRHP	No further investigations recommended
Isolate 8	Within Area 3	Yes	2, 3, 4	Isolated prehistoric artifact	Not Eligible for the NRHP	No further investigations recommended
Isolate 9	Within Area 3	Yes	2, 3, 4	Isolated historic artifact	Not Eligible for the NRHP	No further investigations recommended
Isolate 10	Within Area 3	Yes	2, 3, 4	Isolated prehistoric artifact	Not Eligible for the NRHP	No further investigations recommended
Isolate 11	Within Area 3	Yes	2, 3, 4	Isolated prehistoric artifact	Not Eligible for the NRHP	No further investigations recommended

Note: (a) Site 9MC345 (Snuff Box Canal) is also considered a built resource.
(b) Site 9MC345 (Snuff Box Canal) is primarily located outside the target areas; however, it does enter Target Area 6.

Key: NRHP = National Register of Historic Places.

Sources: Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012.

Historic Built Resources

As a result of the historic built resources assessment conducted for the Proposed Action (Appendix I), six built resources were identified within the APE (see Table 3-76). Two of the six historic built resources, the Hunt Club building and a portion of the Snuff Box Canal (9MC345), are within Target Area 6. None of the other four built resources are located within any target areas.

NRHP-eligibility evaluations are recommended for five built resources identified within the APE (the House, Snuff Box Canal [Site 9MC345], Old Barrington Road, Georgia Coast & Piedmont Railroad, and Rozier Cemetery) (Michael 2012). The sixth built resource identified within the APE (the Hunt Club building) does not appear to qualify as eligible for inclusion in the NRHP because it is less than 50 years old and does not appear to meet any National Register criteria considerations; no further evaluation of this resource is recommended (Michael 2012).

The NRHP-eligibility of built resources would be determined after acquisition and, based on these determinations, the USMC would determine how best to avoid or minimize any potential adverse effects on historic properties in accordance with the PA executed with the Georgia SHPO for this undertaking. If effects to historic properties cannot be avoided or minimized, the USMC shall resolve adverse effects per 36 CFR 800.6 in accordance with the PA executed with the Georgia SHPO.

Traditional Cultural Properties and Sacred Sites

No TCPs or sacred sites have been identified within the APE.

Table 3-76
Built Resources Identified within the Area of Potential Effects (APE) for the Proposed Action

Name	Location (Area)	Within Target Area	Alternative(s)	Description	NRHP-eligibility Recommendation	Comments
House	Within Area 1A	No	1, 3	Two-story, three-bay, side-gable frame Colonial Revival style house	Undetermined	Additional evaluation to determine NRHP-eligibility recommended
Hunt Club	Within Area 1A	Yes	1, 3	Vernacular gable-front one-room building constructed from salvaged materials and utilitarian in nature	Not eligible for the NRHP	Less than 50 years old; no further evaluation recommended
Snuff Box Canal (9MC345) [(a)]	Traverses Areas 1A and 1B	Yes	1, 3, 4	Historic (mid-20th Century) ditch/canal constructed by the Union Camp Corp. timber company in the 1960s to drain the area for logging purposes; has both archaeological and built components.	Undetermined	Additional evaluation to determine NRHP-eligibility recommended
Old Barrington Road	Traverses the edge of Areas 1A and 1B	No	1, 3, 4	Early road established in the mid-18th Century to connect Fort Barrington on the Altamaha River with the town of Darien on the coast; also known as Blue's Reach Road or Old Cox Road; locally known as an old Indian trail	Undetermined	Additional evaluation to determine NRHP-eligibility recommended
Georgia Coast & Piedmont Railroad	Within Area 3	No	2, 3, 4	Bed of an abandoned late 19th to early 20th Century railroad constructed to facilitate shipment of timber from the interior of Georgia to the coast	Undetermined	Additional evaluation to determine NRHP-eligibility recommended
Rozier Cemetery	Within Area 3	No	2, 3, 4	Mid-19th Century cemetery	Undetermined	Additional evaluation to determine NRHP-eligibility recommended

Note: (a) Snuff Box Canal is also considered an archaeological resource.

Key: NRHP = National Register of Historic Places.

Sources: Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012; Michael 2012.

3.9.4 Environmental Consequences

3.9.4.1 Methodology and Evaluation Criteria

The methodology for evaluating the environmental consequences of the Proposed Action was developed in compliance with NEPA and with Section 106 of the NHPA. The potential impacts on cultural resources were evaluated in terms of whether they would be direct or indirect, temporary or permanent, beneficial or negative, and whether they would be associated with construction activities or post-construction use of the APE. The potential for ground-disturbing activities in target areas that would result in the destruction of archaeological resources or demolition of built resources (i.e., direct impacts) were of particular concern. The potential for indirect impacts on built resources within the APE, but outside target areas, also was evaluated, including indirect impacts of post-construction use of target areas that would result in visual, auditory, and/or vibrational impacts and the indirect impacts of acquisition that would result in the eventual deterioration of vacated built resources, which would not be maintained or monitored.

The potential effects on historic properties were evaluated in terms of whether impacts would result in a finding of no historic properties affected, no adverse effect on historic properties, or adverse effect on historic properties. Due to the size of the APE, the USMC has elected to identify historic properties in a phased approach, consistent with 36 CFR 800.4(b)(2). This phased approach consisted of surveys to identify archaeological resources in the target areas and surveys to identify built resources within the entire APE.

Any necessary additional investigations within the APE for the Proposed Action, including target areas, would be conducted in the future following acquisition and in compliance with the NHPA. Future investigations would include determining the NRHP-eligibility of cultural resources based on National Register criteria, and NPS criteria for architectural integrity, as summarized in Tables 3-77 and 3-78, respectively, and following the determination of NRHP-eligibility, applying specific criteria for identifying the adverse effects of the Proposed Action on historic properties, as summarized in Table 3-79. As shown in Table 3-79, the effects of an undertaking on a historic property are predicted by evaluating the significant characteristics of the resource and the design and anticipated consequences of the Proposed Action.

Table 3-77
National Register Criteria for Historic Significance

36 Code of Federal Regulations [CFR] 60.4, Part 1

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and :

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
B. That are associated with the lives of persons significant in our past; or
C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. That have yielded, or may be likely to yield, information important in prehistory or history.

36 CFR 60.4, Part II

Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

A. A religious property deriving primary significant form architectural or artistic distinction or historical importance; or
B. A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
C. A birthplace or grave of a historical figures of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
D. A cemetery which derives its primary significance from graves or persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
E. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
F. A property primarily commemorative in intent if design, age, traditions, or symbolic value has invested it with its own exceptional significance; or
G. A property achieving significance within the past 50 years if it is of exceptional importance.

Source: U.S. Department of the Interior 1995.

Table 3-78
Integrity Aspects

Aspect of Integrity	Property Attributes
Location	Must not have been moved.
Design	Must retain historic elements that create the form, plan, space, structure, and style of the property.
Setting	Setting must retain its historic character.
Materials	Must retain the key exterior materials dating from the period of its historic significance.
Workmanship	Methods of construction form its time of significance must be evident.
Feeling	Physical features must convey its historic character.
Association	Must be the actual place where a historic event or activity occurred and must be sufficiently intact to convey that relationship to an observer.

Source: U.S. Department of the Interior 1995.

Table 3-79
Criteria of Adverse Effect

"An adverse effect is found when an undertaking may later, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative" (36 CFR 800.5(a)(1)).

Examples of Adverse Effect

"Adverse effects on historic properties include, but are not limited to:

1. Physical destruction of or damage to all or part of the property;
2. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;
3. Removal of the property from its historic location;
4. Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
5. Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
6. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
7. Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance" (36 CFR 800.5(a)(2).

Source: ACHP 2012.

3.9.4.2 Common Elements Among All Action Alternatives

All four action alternatives for the Proposed Action would result in the acquisition of private land by the federal government and include USMC land stewardship of acquired property. Following acquisition, cultural resources located within acquired areas would be managed consistent with federal statutes and regulations and USMC guidance for cultural resources (please refer to Section 3.9.2.1).

Each of the four action alternatives for the Proposed Action includes plans for the development and use of target areas within acquired areas. The number of target areas proposed for development and use varies between three to eight target areas, depending on the alternative. No development or use of lands outside target areas is included in any of the four action alternatives for the Proposed Action.

Implementation of any of the action alternatives for the Proposed Action would have no temporary or permanent, direct or indirect, negative impacts on archaeological resources outside target areas. This is because no construction in, or use of, these areas is included in any of the action alternatives. However, the action alternatives would have the potential to result in permanent, indirect, negative impacts on built resources (such as the House) because these buildings would be vacated following acquisition, would deteriorate over time, and the USMC would not maintain or monitor their condition. Finally, the action alternatives have the potential to result in direct, negative, permanent impacts on cultural resources located within target areas, including archaeological resources and built resources (structures and buildings). However, regardless of which action alternative for the Proposed Action is selected, the USMC would conduct any necessary additional investigations within target areas after acquisition occurs to identify cultural resources and determine their NRHP-eligibility in accordance with the NHPA and the updated ICRMP. As necessary, the USMC would evaluate how best to avoid any potential adverse effects of any future actions within the APE on historic properties in accordance with the NHPA and any other applicable laws and regulations. The USMC would manage remaining portions

of acquired areas (outside target areas) in accordance with the updated ICRMP, regardless of which action alternative for the Proposed Action is selected.

Alternative-specific impacts for each of the four action alternatives for the Proposed Action are discussed in greater detail in Section 3.9.4.3. For the purpose of this analysis, it is assumed that cultural resources located within target areas would be destroyed or demolished during development and/or use of the target areas. If any archaeological and/or built resources located within target areas are determined eligible for listing in the NRHP in the future, destruction or demolition of these resources would be considered an adverse effect on a historic property. Pursuant to the executed PA, the USMC shall consult with the GA SHPO and interested Native American tribes to avoid or minimize adverse effects to historic properties. If effects to historic properties cannot be avoided or minimized, the USMC shall resolve adverse effects per 36 CFR 800.6.

The USMC has determined that use of target areas would have no new indirect visual and/or audible impacts on built resources identified outside the target areas. Evaluation of proposed training activities indicates that any indirect visual impacts of training would be contained entirely within proposed acquisition areas, which are currently within Restricted Airspace R-3007 within which training activities already are allowed to occur. Evaluation of noise modeling for training activities indicates that any indirect audible impacts (from noise associated with flight patterns and training activities) would be contained entirely within the limits of all of the new target areas except Target Area 5; all of the modeled noise impacts associated with Target Area 5 would be contained entirely within the limits of the acquisition area surrounding this target.

3.9.4.3 Action Alternatives

Alternative 1

A total of 16 cultural resources have been identified to date within the Alternative 1 acquisition areas: six archaeological sites, six isolated archaeological finds, three built resources, and one archaeological and built resource (see Tables 3-75 and 3-76). Five cultural resources are located outside the Alternative 1 target areas: two archaeological sites (Sites 9MC48 and 9MC49), two built resources (House and Old Barrington Road), and portions of one archaeological/built resource (Snuff Box Canal [9MC345]). Twelve (12) cultural resources are located entirely or partially within the Alternative 1 target areas: four archaeological sites (Sites 1 through 4), six isolated archaeological finds (Isolates 1 through 6), one built resource (the Hunt Club building), and other portions of the archaeological/built resource (Snuff Box Canal [9MC345]) (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012; Michael 2012).

Implementation of Alternative 1 would have no temporary or permanent, direct or indirect, negative impacts on four of the five cultural resources located outside the Alternative 1 target areas – two archaeological sites (9MC48 and 9MC49), one built resource (Old Barrington Road), and portions of the archaeological/built resources (Snuff Box Canal [9MC345]) – because no construction in or use of these areas is included in Alternative 1. Implementation of Alternative 1 would have a permanent, indirect, negative impact on one cultural resource located outside the Alternative 1 target areas (House), because the building would be vacated after acquisition and would deteriorate over time as the USMC would not maintain or monitor this built resource. Implementation of Alternative 1 has the potential to result in permanent, direct, negative impacts on the twelve cultural resources located entirely or partially within the Alternative 1 target areas. These impacts would result from the destruction or demolition of these cultural resources during construction and/or use of the target areas if they cannot be avoided.

Nine of the 12 cultural resources located entirely or partially within the Alternative 1 target areas have been recommended not eligible for inclusion in the NRHP: archaeological Sites 1 and 3, Isolates 1 through 6, and the Hunt Club building. No further work has been recommended for these nine cultural resources (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012; Michael 2012). The NRHP-eligibility of two of the three remaining cultural resources within the Alternative 1 target areas (archaeological Sites

2 and 4) is undetermined. Avoidance or additional archaeological investigations (site evaluations) to determine NRHP-eligibility have been recommended for the two archaeological sites (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012). The NRHP-eligibility of the remaining cultural resource within the Alternative 1 target areas, a portion of the Snuff Box Canal (9MC345), is undetermined. Avoidance or evaluation to determine NRHP-eligibility has been recommended for this archaeological/built resource (Michael 2012).

The majority of the Alternative 1 acquisition areas, including the three target areas, has been surveyed for built resources (Michael 2012); ROE was not obtained for the historic built resources survey of portions of Alternative 1 that are outside target areas. Approximately 835 acres (8%) of the Alternative 1 acquisition areas, comprising Target Areas 6, 7 and 8, have been surveyed for archaeological resources (Hendryx 2012).

If Alternative 1 is selected and acquisition occurs, the USMC would conduct any necessary additional investigations to determine the NRHP eligibility of any cultural resources in target areas in accordance with the PA executed with the Georgia SHPO. The USMC shall consult with the GA SHPO and interested Native American tribes to avoid or minimize adverse effects to historic properties. If effects to historic properties cannot be avoided or minimized, the USMC shall resolve adverse effects per 36 CFR 800.6. The USMC would manage remaining portions of Alternative 1 that are outside target areas in accordance with the updated ICRMP.

Alternative 2

A total of 18 cultural resources have been identified to date within the Alternative 2 acquisition area: eleven archaeological sites, five isolated archaeological finds, and two built resources (see Tables 3-75 and 3-76). Eight cultural resources are located outside Alternative 2's five proposed target areas: six archaeological sites (9MC51, 9MC176, 9MC177, 9MC178, 9MC399 and 9MC400) and two built resources (Rozier Cemetery and Georgia Coast & Piedmont Railroad). Ten cultural resources are located inside the Alternative 2 target areas: five archaeological sites (Sites 5 through 9) and five isolated archaeological finds (Isolates 7 through 11) (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012; Michael 2012).

Implementation of Alternative 2 would have no temporary or permanent, direct or indirect, negative impacts on the eight cultural resources located outside the Alternative 2 target areas, because no construction in or use of these areas is included in Alternative 2. Implementation of Alternative 2 has the potential to result in permanent, direct, negative impacts on the ten cultural resources located within the Alternative 2 target areas. These impacts would result from the destruction or demolition of these cultural resources during construction and/or use of the target areas if they cannot be avoided.

Seven of the 10 cultural resources located within the Alternative 2 target areas have been recommended not eligible for inclusion in the NRHP: archaeological Sites 8 and 9 and Isolates 7 through 11. No further work has been recommended for these seven cultural resources (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012). The NRHP-eligibility of the three remaining cultural resources within the Alternative 2 target areas (archaeological Sites 5, 6, and 7) is undetermined. Avoidance or additional archaeological investigations (site evaluations) to determine NRHP-eligibility have been recommended for the three archaeological sites (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012).

The majority of the Alternative 2 acquisition areas, with the exception of approximately 21 acres of Target Area 1 and all of Target Area 2, has been surveyed for built resources (Michael 2012); ROE was not obtained for the historic built resources survey of these target areas or for portions of Alternative 2 that are outside target areas. Approximately 879 acres (4%) of the Alternative 2 acquisition area, comprising the majority of Target Area 1 and all of Target areas 3, 4, and 5, have been surveyed for archaeological resources. Additional surveys for archaeological resources were previously conducted

along the eastern edge of the Alternative 2 acquisition area prior to construction of the existing Cypress natural gas pipeline (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012).

If Alternative 2 is selected and acquisition occurs, the USMC would survey any previously unsurveyed lands within proposed target areas and would determine the NRHP eligibility of any cultural resources in target areas in accordance with the PA executed with the Georgia SHPO. The USMC shall consult with the GA SHPO and interested Native American tribes to avoid or minimize adverse effects to historic properties. If effects to historic properties cannot be avoided or minimized, the USMC shall resolve adverse effects per 36 CFR 800.6. The USMC would manage remaining portions of Alternative 2 that are outside target areas in accordance with the updated ICRMP.

Alternative 3

A total of 34 cultural resources have been identified to date within the Alternative 3 acquisition areas: seventeen archaeological sites, eleven isolated archaeological finds, and six built resources (see Table 3-75 and 3-76). Thirteen (13) cultural resources are located outside the eight Alternative 3 proposed target areas: eight archaeological sites (Sites 9MC48, 9MC49, 9MC51, 9MC176, 9MC177, 9MC178, 9MC399, and 9MC400), four built resources (House, Old Barrington Road, Rozier Cemetery, and Georgia Coast & Piedmont Railroad), and portions of one archaeological/built resource (Snuff Box Canal [9MC345]). Twenty-two (22) cultural resources are located entirely or partially inside the Alternative 3 target areas surveyed to date: nine archaeological sites (Sites 1 through 9), eleven isolated archaeological finds (Isolates 1 through 11), one built resource (the Hunt Club building, and other portions of the archaeological/built resource (Snuff Box Canal [9MC345]) (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012; Michael 2012).

Implementation of Alternative 3 would have no temporary or permanent, direct or indirect, negative impacts on the 13 cultural resources located outside the Alternative 3 target areas, because no construction in or use of these areas is included in Alternative 3. Implementation of Alternative 3 has the potential to result in permanent, direct, negative impacts on the 22 cultural resources located entirely or partially within the Alternative 3 target areas. These impacts would result from the destruction or demolition of these cultural resources during construction and/or use of the target areas if they cannot be avoided.

Sixteen (16) of the 22 cultural resources located entirely or partially within the Alternative 3 target areas have been recommended not eligible for inclusion in the NRHP: archaeological Sites 1, 3, 8 and 9; Isolates 1 through 11; and one built resource (the Hunt Club building). No further work has been recommended for these 16 cultural resources (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012; Michael 2012). The NRHP-eligibility of the five of the six remaining cultural resources within the Alternative 3 target areas (archaeological Sites 2, 4 5, 6 and 7) is undetermined. Avoidance or additional archaeological investigations (site evaluations) to determine NRHP-eligibility have been recommended for the five archaeological sites (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012). The NRHP-eligibility of the remaining cultural resource within the Alternative 3 target areas, a portion of the Snuff Box Canal (9MC345), is undetermined. Avoidance or evaluation to determine NRHP-eligibility has been recommended for this archaeological/built resource (Michael 2012).

The majority of Alternative 3 acquisition areas has been surveyed for historic built resources (Michael 2012); ROE was not obtained for the historic built resources survey of approximately 21 acres of Target Area 1, all of Target Area 2, and portions of Alternative 3 that are outside target areas. Approximately 1,814 acres (5%) of the Alternative 3 acquisition area, comprising the majority of Target Area 1 and all of Target Areas 3 through 8, have been surveyed for archaeological resources. Additional surveys for archaeological resources were conducted along the eastern edge of the Alternative 3 acquisition area prior to construction of the existing Cypress natural gas pipeline (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012).

If Alternative 3 is selected and acquisition occurs, the USMC would survey any previously unsurveyed lands within proposed target areas and would determine the NRHP eligibility of any cultural resources in target areas in accordance with the PA executed with the Georgia SHPO. The USMC shall consult with the GA SHPO and interested Native American tribes to avoid or minimize adverse effects to historic properties. If effects to historic properties cannot be avoided or minimized, the USMC shall resolve adverse effects per 36 CFR 800.6. The USMC would manage remaining portions of Alternative 3 that are outside target areas in accordance with the updated ICRMP.

Alternative 4

A total of 32 cultural resources have been identified to date within the Alternative 4 acquisition areas: seventeen archaeological sites, eleven isolated archaeological finds, three built resources, and one archaeological and built resource (see Table 3-75 and 3-76). Twelve (12) cultural resources are located outside the five Alternative 4 proposed target areas: eight archaeological sites (9MC48, 9MC49, 9MC51, 9MC176, 9MC177, 9MC178, 9MC399 and 9MC400), three built resources (Old Barrington Road, Rozier Cemetery, and Georgia Coast & Piedmont Railroad), and portions of one archaeological/built resources (Snuff Box Canal [9MC345]). Twenty (20) cultural resources are located inside the Alternative 4 target areas surveyed to date: nine archaeological sites (Sites 1 through 9) and eleven isolated archaeological finds (Isolates 1 through 11) (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012; Michael 2012).

Implementation of Alternative 4 would have no temporary or permanent, direct or indirect, negative impacts on the twelve cultural resources located outside the Alternative 4 target areas because no construction in or use of these areas is included in Alternative 4. Implementation of Alternative 4 has the potential to result in permanent, direct, negative impacts on the 20 cultural resources located within the Alternative 4 target areas. These impacts would result from the destruction or demolition of these cultural resources during construction and/or use of the target areas if they cannot be avoided.

Fifteen (15) of the 20 cultural resources located within the Alternative 4 target areas have been recommended not eligible for inclusion in the NRHP: archaeological Sites 1, 3, 8, and 9. and Isolates 1 through 11. No further work has been recommended for these 15 cultural resources (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012). The NRHP-eligibility of the five remaining cultural resources within the Alternative 4 target areas (archaeological Sites 2, 4, 5, 6, and 7) is undetermined. Avoidance or additional archaeological investigations (site evaluations) to determine NRHP-eligibility have been recommended for these five archaeological sites (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012).

The majority of Alternative 4 acquisition areas have been surveyed for built resources (Michael 2012); ROE was not obtained for the historic built resources survey of approximately 21 acres of Target Area 1, all of Target Area 2, and portions of Alternative 4 that are outside target areas. Approximately 1,079 acres (4%) of the Alternative 4 acquisition area, comprising the majority of Target Area 1 and all of Target Areas 3, 4, 5, and 8, have been surveyed for archaeological resources. Additional surveys for archaeological resources were conducted along the eastern edge of the Alternative 4 acquisition area prior to construction of the existing Cypress natural gas pipeline (Hendryx, Arbuthnot, and Linville 2011; Hendryx 2012).

If Alternative 4 is selected and acquisition occurs, the USMC would survey any previously unsurveyed lands within proposed target areas and would determine the NRHP eligibility of any cultural resources in target areas in accordance with the PA executed with the Georgia SHPO. The USMC shall consult with the GA SHPO and interested Native American tribes to avoid or minimize adverse effects to historic properties. If effects to historic properties cannot be avoided or minimized, the USMC shall resolve adverse effects per 36 CFR 800.6. The USMC would manage remaining portions of Alternative 4 that are outside target areas in accordance with the updated ICRMP.

Summary of Impacts

As discussed in the subsections above, implementation of any of the action alternatives for the Proposed Action would have no temporary or permanent, direct or indirect, negative impacts on archaeological resources located outside the target areas, because no construction in or use of these areas is included in any of the action alternatives. However, implementation of any of the action alternatives for the Proposed Action would have the potential to result in permanent, indirect, negative impacts on built resources that are buildings located outside the target areas, because these buildings would be vacated following acquisition, would deteriorate over time, and the USMC would not monitor or maintain these buildings. Additionally, implementation of any of the action alternatives for the Proposed Action would have the potential to result in permanent, direct, negative impacts on cultural resources located entirely or partially within the target areas. Construction activities that would impact cultural resources in the target areas would include dredging, filling, and clearing associated with the construction of target infrastructure, access roads, and firebreaks. Activities associated with use that would impact cultural resources in the target areas would include surface and subsurface ground disturbance during training. However, following acquisition, the USMC would conduct any necessary additional investigations within target areas to identify cultural resources and determine their NRHP eligibility. Based on the results of NRHP-eligibility determinations, the USMC would evaluate how to best avoid or minimize any potential adverse effects on cultural resources and/or historic properties if any are present. These actions are anticipated to prevent significant impacts to cultural resources.

Implementation of any of the action alternatives for the Proposed Action would result in direct, beneficial, long-term, or permanent impacts on cultural resources as a result of property acquisition because they would be managed in accordance with the updated ICRMP and would be afforded protection consistent with federal statutes and regulations and USMC guidance for cultural resources (please refer to Section 3.9.2.1). Additionally, any future archaeological investigations or architectural evaluations that are determined necessary and/or conducted for cultural resources, including those resources that are outside target areas or in areas that have not yet been surveyed, would be conducted in accordance with the NHPA and other applicable federal statutes and regulations (please refer to Section 3.9.2.1). A summary of cultural resources data by action alternative is presented in Table 3-80.

Table 3-80
Summary of Cultural Resources Data by Action Alternative

	Action Alternative			
	1	2	3	4
Acres Surveyed (%)	835 (8%)	879 (4%)	1,814 (5%)	1,079 (4%)
Total Number of Cultural Resources	16	18	34	32
Inside Target Areas				
Number of Cultural Resources	12	10	22	20
Outside Target Areas				
Number of Cultural Resources	4	8	12	12

3.9.4.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue; the USMC would not acquire any land and training operations at TBR would not change due to this Proposed Action. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action. The proposed acquisition areas would continue to be managed for silvicultural operations and timber would continue to be cleared and harvested under silvicultural operations.

Under the No Action Alternative, the current potential for impacts on cultural resources from management of the proposed acquisition areas for silviculture would continue. Potential impacts from

silvicultural operations on cultural resources, including resources that may be eligible for inclusion in the NRHP, would be direct, negative, and permanent. These impacts would result from surface and subsurface disturbance or destruction of archaeological sites or built resources with an archaeological component, such as the Snuff Box Canal (9MC345) and the Georgia Coast & Piedmont Railroad.

Based on current silvicultural operations, it is likely that the No Action Alternative would not result in any new direct impacts on built resources that are structural in nature (House, the Hunt Club building, Rozier Cemetery, or Old Barrington Road), as these built resources are outside of, or avoided during, current silvicultural operations. Additionally, the No Action Alternative would not result in any new indirect visual or audible impacts on any of the built resources that are structural in nature, as the settings of these resources are currently characterized by silvicultural operations.

Finally, if the No Action Alternative is implemented, all of the cultural resources identified within the acquisition areas to date would not be afforded protection consistent with federal statutes and regulations and USMC guidance for cultural resources (please refer to Section 3.9.2.1). Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.10 Air Quality

This section describes existing air quality within, and near TBR, including those areas proposed for acquisition, and evaluates potential air quality impacts under each alternative, including the No Action Alternative.

3.10.1 Definition of Resource

The air quality in this area is dependent, not only on the quantities of air pollutants emitted from manmade and natural sources, but also on prevailing meteorological conditions. The USEPA has set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. These pollutants are emitted from numerous and diverse sources. Primary standards establish limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards establish limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings. The USEPA periodically reviews the standards and the science upon which the standards are based. USEPA has established NAAQS for seven principal pollutants, which are called "criteria" pollutants:

- carbon monoxide (CO);
- lead;
- nitrogen dioxide (NO_2);
- ozone;
- particulate matter less than or equal to 10 microns in diameter (PM_{10});
- particulate matter less than 2.5 microns in diameter ($PM_{2.5}$); and
- sulfur dioxide (SO_2).

Ozone is not emitted directly from emission sources but is created at near-ground level by a chemical reaction between oxides of nitrogen (NO_X) and volatile organic compounds (VOC) in the presence of sunlight. As a result, NO_X and VOC are often referred to as ozone precursors and are regulated as a means to prevent the formation of ground-level ozone. NAAQS are summarized in Table 3-81. A discussion of the greenhouse gas (GHG) emissions is included in Section 4.3.9.1 of this FEIS.

Table 3-81
Summary of National Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS [a]	
		Primary	Secondary
Carbon Monoxide (CO)	8-hour	9 ppm	-
	1-hour	35 ppm	-
Lead	3-month (rolling average)	0.15 µg/m^3	0.15 µg/m^3
	Quarterly	1.5 µg/m^3	1.5 µg/m^3
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm	0.053 ppm
	1-hour	0.100 ppm [b]	-
Ozone	8-hour	0.075 ppm [c] (0.08 ppm [d])	0.075 ppm [c] (0.08 ppm [d])
Particulate Matter (PM_{10})	24-hour	150 µg/m^3 [e]	150 µg/m^3 [e]
Particulate Matter ($PM_{2.5}$)	Annual	15.0 µg/m^3 [f]	15.0 µg/m^3 [f]
	24-hour	35 µg/m^3 [g]	35 µg/m^3 [g]
Sulfur Dioxide (SO_2)	Annual	0.03 ppm[h]	-
	24-hour	0.14 ppm[h]	-
	3-hour	-	0.5 ppm
	1-hour	0.075 ppm [i]	-

Notes:
(a) Short-term standards (averaging times of 24 hours or less) for CO and SO_2 are not to be exceeded more than once per year.
(b) The 3-year average of the 98th percentile of the daily maximum 1-hour average must not exceed 0.100 ppm.
(c) 2008 standard. The 3-year average of the 4th highest daily maximum 8-hour average concentration over each year must not exceed 0.075 ppm.
(d) 1997 standard. The 3-year average of the 4th highest daily maximum 8-hour average concentration over each year must not exceed 0.075 ppm. This standard and the implementation rules for this standard will remain in place as the USEPA undertakes rulemaking to address the transition from the 1997 standard to the 2008 standard.
(e) Not to be exceeded more than once per year on average over 3 years.
(f) The 3-year average of the weighted annual mean $PM_{2.5}$ concentrations must not exceed 15.0 µg/m^3.
(g) The 3-year average of the 98th percentile of 24-hour concentrations within an area must not exceed 35 µg/m^3.
(h) The annual and 24-hour SO_2 standards were revoked in June 2010. However, these standards remain in effect until one year after an area is designated for the 1-hour standard (established in 2010), except in areas designated nonattainment for the annual and 24-hour standards, where these standards remain in effect until implementation plans to attain or maintain the 2010 1-hour standard are approved. The USEPA has not yet designated areas for the 2010 1-hour standard, but indicates that areas will be designated by June 2012.
(i) The 3-year average of the 99th percentile of the daily maximum 1-hour average must not exceed 0.075 ppm.

Key:
µg/m^3 = micrograms per cubic meter.
ppm = parts per million.

Source: 40 CFR Part 50.

3.10.2 Regulatory Framework

Ambient air quality and air pollutant emissions from stationary and mobile sources are managed under a framework of federal, state, and local rules and regulations.

3.10.2.1 Federal Regulations

The USEPA is the principal federal agency responsible for air quality management in the United States. The Clean Air Act (CAA) is the law that defines USEPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. Under the CAA, the USEPA oversees implementation of federal programs for permitting new and modified stationary sources, controlling toxic air contaminants, and reducing emissions from motor vehicles and other mobile sources.

As part of the CAA, the General Conformity Rule requires federal agencies to ensure that actions taken by those agencies conform to the applicable State Implementation Plan (SIP). The SIP is a plan prepared by a state or local agency to address attaining an air quality standard (for areas designated nonattainment or maintenance) or maintaining compliance with air quality standards. The General Conformity Rule applies only to direct and/or indirect emissions caused by the actions that occur in areas designated as non-attainment or maintenance. Given that TBR is in an attainment area for all criteria pollutants (with no maintenance area designations), the General Conformity Rule is not applicable to the Proposed Action or the action alternatives.

Class I air quality areas are pristine areas requiring special protection from air quality impacts under federal air permitting regulations. Typically, these are areas managed by the NPS, the USFWS, or the U.S. Forest Service. The quantity and type of emissions as well as distance to a Class I area determine whether impacts would be considered significant. For emission sources considered major under air permitting regulations that are within 62 miles of a Class I area, specific air quality analyses are performed. TBR is located within 62 miles of two Class I Wilderness Areas; approximately 25 miles and 55 miles from the Wolf Island Wilderness Area and Okefenokee Wilderness Area, respectively. However, TBR is not currently a major emission source.

In February 2010, the CEQ issued Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions (CEQ 2010). In this guidance, the CEQ provides recommendations related to the quantitative and/or qualitative assessment of GHG emissions from proposed actions. Additional discussion of GHG emissions from the Proposed Action and action alternatives is included in the discussion of cumulative impacts in Section 4.

3.10.2.2 State Regulations

The Air Protection Branch of the GA EPD is responsible for protecting Georgia's air quality through the regulation of emissions from industrial and mobile sources. The Air Protection Branch also monitors levels of air pollutants throughout the state and is responsible for issuing permits for stationary sources, emission inventory development, and administrating air pollution control regulations. An air quality permit has not been issued for TBR because the only stationary air emission sources on-site are small emergency generators that are exempt from permitting requirements.

The Georgia Forestry Commission (GFC) is the state agency responsible for the protection and conservation of Georgia's forest resources. The GFC provides a wide variety of services including fire detection, issuing burn permits, wildfire suppression and prevention services, emergency and incident command system expertise, rural fire department assistance, forest management assistance to landowners and communities, the marketing and utilization of forest resources and nature services, and growing and selling quality tree seedlings for planting. Prescribed burning at TBR is conducted in accordance with guidance established by the GFC.

3.10.3 Affected Environment

3.10.3.1 Climate and Meteorology

The area has a temperate climate, with seasonal mean temperatures in the low 50s (in degrees Fahrenheit [ºF] or low 10s in degrees Celsius [ºC]) in winter, high 60s ºF (high teens ºC) in spring and autumn, and the low 80s ºF (high 20s ºC) in summer. The lowest temperatures are below 10ºF (below 20ºC) and the highest temperatures are about 100ºF (38ºC). The normal annual rainfall for the area is slightly below 50 inches. About half of the rainfall occurs in the summer thunderstorm season. The remainder, produced principally by squall-line and frontal showers, is spread over the other nine months. Snow is a rarity and even a trace does not occur on an average of once a year. Severe tropical storms affect this area about once in 10 years. Sunshine is adequate in all seasons and seldom are there more than two days in succession without sunshine. Dry, continental air masses reach this area in summer mostly by

moving down the Atlantic coast giving way to cooler northeast winds. Such air masses reaching this area from the northwest or west in summer give way to mostly clear skies and high temperatures.

3.10.3.2 Baseline Air Quality

The USEPA compares ambient air criteria pollutant measurements to NAAQS to assess the status of air quality of regions within the U.S. Based on these comparisons, regions are designated as one of the following categories for the criteria air pollutants:

- ***Attainment.*** A region is designated as attainment if monitoring shows ambient concentrations of a specific pollutant are less than or equal to NAAQS. An attainment area for a NAAQS that has been redesignated from nonattainment is classified as a "maintenance area" for a 10-year period to ensure that the air quality improvements are sustained.
- ***Nonattainment.*** If a NAAQS is exceeded for a pollutant, then the region is designated as nonattainment for that pollutant. Nonattainment areas can be further classified based on the severity of the exceedance of the relevant standard.
- ***Unclassifiable.*** An area is designated as unclassifiable if the ambient air monitoring data are incomplete and do not support a designation of attainment or nonattainment.

McIntosh and Long Counties are currently designated as "in attainment" for all criteria pollutants. These counties are not designated as maintenance areas for any criteria pollutant.

3.10.3.3 TBR Existing Emissions

The existing emissions sources at TBR include fires (prescribed and wild), vehicle and equipment use, inert ordnance delivery, land disturbance activities, which occur during some range maintenance activities (e.g., raking the strafe pit), and aircraft operations. Of these sources, the highest levels of emissions are particulates and CO emitted from prescribed and wild fires. As indicated above, all prescribed fires at TBR are undertaken in accordance with guidance established by the GFC. This guidance alleviates air quality impacts by calling for fires to be set under predetermined conditions that have been chosen to reduce the drift of smoke across occupied land. Under the TBR prescribed fire program, approximately 930 acres of forested area are burned annually and approximately 380 acres of the developed areas of TBR (primarily the air-to-ground target area) are burned annually. Wildfires burn less than 1 acre per year as a result of prompt response by TBR fire crews (MCAS Beaufort 2007). Further, the prescribed fire program lessens the potential for wildfires and therefore reduces unmanaged air emissions. However, the forested areas at TBR could be subject to wildfires (particularly during drought conditions).

Annual aircraft emissions associated with the CAC were evaluated in the "Final Supplemental Environmental Assessment for Proposed Coastal Airspace Complex, Georgia Air National Guard," referred to herein as the 'CAC SEA' (AMEC 2005). The air quality analysis in the CAC SEA included estimated emissions associated with projected flying operations in the proposed CAC. The projected flying operations and emissions serve as the existing condition emissions for the FEIS herein because the airspace changes evaluated in the CAC SEA have already been implemented.

The aircraft emissions estimates were based on emissions factors published in the Air Force aircraft engine emissions estimator ESL-TR-85-14 (Seitchek 1985) and in Jagielski and O'Brien (1994). Air quality impacts based on the aircraft emissions were assessed with the multiple aircraft instantaneous line source (MAILS) dispersion model, ESL-TR-89-59 (Liebsch 1992). Background concentration values were added to the results from MAILS. The analysis determined the percentage that aircraft emissions contributed to ambient concentrations compared to the NAAQS. Results ranged from less than 1% (for

CO and NO_2) up to 23% (for PM_{10} on an annual basis). These values indicate existing background concentrations are dominant in the area. The analysis concluded that aircraft operations within the CAC would have a negligible effect on ambient air quality. Furthermore, it is noted in the analysis that many of the proposed aircraft operations would be at a sufficient altitude that the emissions would not affect ground-level concentrations of air pollutants. A 3,000-foot AGL ceiling is a conservative estimate of the average ceiling height of a stable temperature inversion common to the coastal maritime airshed. This type of inversion can significantly inhibit, if not effectively block, vertical and widespread lateral dispersion of air pollutants generated from aircraft operating above the inversion.

Construction and maintenance equipment are mobile emission sources at TBR. The current levels of emissions from these sources are detailed in Table 3-82.

Table 3-82
Operational Equipment Emissions for Existing Conditions

Scenario	Construction Emissions (tons)					
	Volatile Organic Compounds (VOC)	Carbon Monoxide (CO)	Oxides of Nitrogen (NO_X)	Sulfur Dioxide (SO_2)	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)
Existing Conditions	0.25	1.26	2.41	0.27	0.12	0.12

3.10.4 Environmental Consequences

3.10.4.1 Methodology and Evaluation Criteria

This air quality analysis estimated the magnitude of emissions that would occur from proposed construction and operational activities for each project alternative. The potential for proposed emissions to affect public lands outside TBR, including the Wolf Island Wilderness Area and Okefenokee Wilderness Area which are the nearest federal Class I areas to TBR, were evaluated. The nearest borders of Wolf Island Wilderness Area and Okefenokee Wilderness Area to proposed activities are approximately 25 miles and 55 miles, respectively.

The potential effects of GHG emissions are by nature global and cumulative as individual sources of GHG emissions are not large enough to have any appreciable effect on climate changes. Therefore, the impacts of GHG emissions associated with the action alternatives to climate change are discussed in the context of cumulative impacts in Section 4.

The proposed acquisition areas are designated as 'attainment' for all NAAQS pollutants. Construction and operational emissions were assessed to determine the potential for exceedances of NAAQS.

3.10.4.2 Common Elements Among Action Alternatives

Construction

Air quality impacts from construction activities proposed under each action alternative would occur from combustion emissions generated from the use of fossil fuel-powered equipment/vehicles and fugitive dust emissions (PM_{10}/$PM_{2.5}$) due to the operation of equipment on exposed soil. The construction activities associated with each action alternative were analyzed in order to estimate proposed combustion and fugitive dust emissions. Proposed construction is not expected to be initiated until 2014.

Emission factors needed to derive construction source emission rates were obtained from the USEPA's Compilation of Air Pollution Emission Factors, AP-42, Volume I (USEPA 1995) and the

NONROAD emission model for off-road construction equipment. Appendix J includes data, assumptions, and calculations used to estimate construction emissions.

Operations

Air quality impacts associated with proposed operational activities under each action alternative would occur from combustion emissions from prescribed burning activities and additional use of fossil fuel-powered on-road and off-road equipment and fugitive dust emissions ($PM_{10}/PM_{2.5}$) due to the operation of vehicles and equipment on exposed soil. The operational activities associated with each action alternative were analyzed in order to estimate proposed combustion and fugitive dust emissions.

Operational data used to calculate proposed emissions under each action alternative were obtained from the USMC. Emission factors used to calculate emissions for proposed sources were obtained from the USEPA's Compilation of Air Pollution Emission Factors, AP-42, Volume I (USEPA 1995). Appendix J includes data, assumptions, and calculations used to estimate operational emissions.

Under all action alternatives, the maximum number of aircraft sorties (4,243) at TBR would not change appreciably from the aircraft sortie level (4,000) that was evaluated in the CAC SEA (AMEC 2005). Air pollutant emissions from all current aircraft operations in the CAC were evaluated in the CAC SEA (AMEC 2005). Emissions from aircraft sorties at TBR are a subset of all aircraft emissions included in the Coastal Airspace air quality analysis. The analysis concluded that aircraft sorties within the CAC would have a negligible effect on ambient air quality. The analysis showed that existing and projected air quality would be better than NAAQS. Furthermore, it is noted in the analysis that many of the proposed aircraft operations would be at a sufficient altitude that the emissions would not affect ground-level concentrations of air pollutants.

3.10.4.3 Action Alternatives

Alternative 1

Construction

Construction-related emissions, in particular the land-clearing, earthmoving, and development activities associated with Alternative 1, would have a temporary minor impact on local air quality. Air pollutants would be emitted from engine exhaust of diesel and gasoline-fueled construction equipment and on-road vehicles (i.e., delivery trucks, worker vehicles). On-site construction activities and vehicle travel on local/access roads also would generate fugitive dust emissions. Initially, Alternative 1 would involve the clearance of approximately 200 acres of land (approximately 157 acres for target placement and 43 acres for firebreaks) within the proposed target areas. A summary of estimated construction emissions for Alternative 1 is provided in Table 3-83.

Table 3-83
Construction Emissions for Each Action Alternative

Alternative	Construction Emissions (tons)					
	Volatile Organic Compounds (VOC)	Carbon Monoxide (CO)	Oxides of Nitrogen (NO_X)	Sulfur Dioxide (SO_2)	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)
1	1.6	8.4	4.5	0.010	10	1.4
2	1.4	7.3	3.9	0.009	8.4	1.2
3	3.0	16	8.3	0.018	17	2.6
4	1.9	10	5.3	0.012	11	1.7

Although emissions would increase during construction activities, particularly with regard to PM_{10}, the short-term nature of the construction would preclude any substantial negative impact, as the bulk of the work is not expected to exceed one year in duration. The short-term nature of the construction emissions would ensure that they would not have an impact on visibility in the two Class I Wilderness Areas located within 55 miles of TBR (Wolf Island Wilderness Area and Okefenokee Wilderness Area).

Operations

Alternative 1 would have long-term moderate adverse effects on air quality. These effects primarily would be due to combustion emissions from prescribed burning activities. Minor long-term impacts also would occur due to combustion emissions from additional on and off-road vehicle use, equipment use, and fugitive particulate emissions on the newly acquired lands. Alternative 1 would not threaten the attainment status of the region or lead to a violation of any federal, state, or local air regulation.

Prescribed burning is the largest source of air emissions at the existing TBR and is likely to be for the newly acquired lands under Alternative 1. Prescribed burning is part of the USMC's ongoing ecosystem management program at TBR. Under the current TBR prescribed fire program, an estimated 1,310 acres of land is subject to controlled burning on an annual basis. Because of the substantial area of land being acquired, approximately 2,950 acres of additional land would be subject annually to prescribed fires under Alternative 1 as compared to existing conditions. Thus, emissions associated with prescribed burning in the newly acquired lands are expected to be greater than those currently on the existing TBR. The potential emissions associated with prescribed burning under Alternative 1 are summarized in Table 3-84.

Table 3-84
Emissions Due to Prescribed Fires During Operation Under Each Alternative

Alternative	Prescribed Fire Emissions (tons/year)			
	Volatile Organic Compounds (VOC)	Carbon Monoxide (CO)	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)
1	43	2,995	546	546
2	74	5,148	938	938
3	104	7,224	1,317	1,317
4	87	6,072	1,107	1,107
No Action	13	919	168	168

Emissions from prescribed burning would be partially offset by any amount of existing burning activities within the lands that would be acquired as part of Alternative 1, but would stop during the land acquisition process. The actual levels of current prescribed burning and related emissions on new lands are unknown at this time; however, it is assumed that some prescribed burning from timber management may occur within these areas, as well as occasional wildfires. This analysis assumes that the current off-site prescribed burning activities and subsequent emissions are minute compared to the resource management practices that would be implemented under Alternative 1 and the amount of emissions offset would be negligible.

Federal land managers recognize prescribed fire as a valuable tool; they also recognize that emissions from prescribed fire can be a significant source of air pollution. Smoke particles are in the size range ($PM_{2.5}$) that plays a significant role in visibility impairment. Particulate matter is the main pollutant of concern from smoke because it can cause serious health problems, especially for people with respiratory illness (Federal Land Managers' Air Quality Related Values Work Group [FLAG] 2010). The increased use of prescribed fires may increase the frequency of air quality impacts to local residents. During prescribed fires, emissions of particulate matter and other air pollutants would likely increase

ambient air pollutant concentrations in areas downwind of the fire locations. Those likely to be impacted most are those residences and other receptors located in proximity to the acquisition area (such as those near Area 1A and Area 3 and further out from the acquisition area to the east in the town of Townsend). In addition, particulate emissions may temporarily decrease visibility, which can be a concern on roads near the acquisition areas.

Although prescribed burning is an appreciable source of air emissions, it is a critical management tool for fire-dependent natural communities, and its benefits are well understood. It reduces naturally occurring fuels within forest areas, helping to prevent catastrophic wildfires; it provides an affordable, environmentally sound method for preparing an area for seeding or planting; it helps to control or eliminate some disease in pines or other species; it is an efficient and economical tool for improving the habitat for certain wildlife species; and it is an irreplaceable process in maintaining biological diversity and balance. Prescribed fire allows the land manager to mimic natural fire return intervals under controlled conditions where smoke management can minimize air quality impacts. The alternative is wildfires, which can be very difficult to control and may cause much more severe air quality impacts (FLAG 2010). As one component of fire management, prescribed fire is used to alter, maintain, or restore vegetative communities; achieve desired resource conditions; and to protect life, property, and values that would be degraded and/or destroyed by wildfire (USDA and USDOI 2008).

Prescribed fire is a land management tool used for multiple landscape objectives. Prescribed fire allows land managers to mimic natural fire return intervals under controlled conditions where smoke management can minimize air quality impacts. The alternative is wildfires, which can be very difficult to control and may cause much more severe air quality impacts. A modeling assessment suggests that using prescribed fire to minimize wildfires can result in a net reduction in fine particle ($PM_{2.5}$) emissions in the long-term (FLAG 2010). In the Pacific Northwest, wildfire emissions were found to be greater than prescribed fire emissions in the same airshed (Ottmar 1996).

All prescribed burning at TBR would continue to be conducted in accordance with guidance established by the GFC, the state agency responsible for the protection and conservation of Georgia's forest resources. GFC guidance alleviates air quality impacts by calling for fires to be set under predetermined conditions that have been chosen to reduce the drift of smoke across occupied land. Georgia's smoke management plan (GA DNR 2008) details Georgia's basic framework of procedures and requirements for managing prescriptive fires. The GA DNR and the GFC developed this plan with cooperation from federal military bases located in Georgia, the USFWS, and groups and associations representing environmental interests or private individuals in Georgia. The plan includes the following components to reduce citizen's exposure to air pollution, impaired visibility, and nuisance caused by prescribed fire smoke: smoke mitigation (including avoiding smoke sensitive areas, selecting good smoke dispersion conditions, managing released emissions), smoke dispersion evaluation, public notification, and air quality monitoring. In addition, the GFC offers assistance with prescribed burning and writing a burn plan, provides a certification program for those who practice prescribed burning, and issues burn permits.

Under Alternative 1, it is anticipated that range maintenance activities would increase commensurate with the increase in size of the target area at TBR. Alternative 1 would include an increase in target area acreage compared to the target area under the existing condition. This expected increase in range maintenance is likely to result in an increase in mobile source emissions proportional to maintenance of this larger area. The existing operational emissions were presented in Table 3-82. Given the relatively low level of current emissions, the impacts associated with increased emissions under Alternative 1 would be minor.

Alternative 2

Construction

Overall potential effects on air quality due to construction activities under Alternative 2 would be similar in nature and overall level to those described under Alternative 1. Construction-related emissions, in particular the land-clearing, earthmoving, and development activities associated with Alternative 2, would have a temporary minor impact on local air quality. Combustion emissions would be generated from construction equipment and vehicles, and fugitive dust emissions would be caused by on-site construction activities and vehicle travel on local/access roads. Slightly less construction emissions are expected for Alternative 2 compared to Alternative 1 as Alternative 2 would involve less land clearing within the proposed target areas (i.e., approximately 174 acres of land, including approximately 106 acres for target placement and 68 acres for firebreaks). Estimated construction emissions for Alternative 2 are summarized in Table 3-83.

The short-term nature of the construction would preclude any substantial negative impact, as the bulk of the work is not expected to exceed six months in duration.

Operations

Overall potential effects on air quality due to operational activities under Alternative 2 would be similar in nature to those described under Alternative 1. As with Alternative 1, implementation of the TBR prescribed fire program under Alternative 2 would have long-term moderate adverse effects on air quality.

Due to the much larger land acquisition area compared to Alternative 1, greater amounts of combustion emissions from prescribed fires are expected for Alternative 2. An estimated 6,025 acres of additional land would be subject annually to prescribed fires under Alternative 2 as compared to existing conditions. The potential emissions associated with prescribed burning under Alternative 2 are summarized in Table 3-84. Although prescribed burning would be an appreciable source of air emissions, as indicated under Alternative 1, it is a critical management tool for fire-dependent natural communities. All prescribed burning at TBR would continue to be conducted in accordance with guidance established by the GFC.

As with Alternative 1, it is anticipated that range maintenance activities would increase under Alternative 2 commensurate with the increase in size of the target area at TBR. Given, the relatively low level of current emissions, the impacts associated with increased emissions under Alternative 2 would be minor.

Alternative 3

Construction

Overall potential effects on air quality due to construction activities under Alternative 3 would be similar in nature and overall level to those described under Alternative 1. Construction-related emissions, in particular the land-clearing, earthmoving, and development activities associated with Alternative 3, would have a temporary minor impact on local air quality. Combustion emissions would be generated from construction equipment and vehicles and fugitive dust emissions would be caused by onsite construction activities and vehicle travel on local/access roads. More construction emissions are expected for Alternative 3 as compared to Alternatives 1, 2, and 4 as Alternative 3 would involve more land clearing within the proposed target areas (i.e., approximately 379 acres of land, including approximately 263 acres for target placement and 111 acres for firebreaks). Estimated construction emissions for Alternative 3 are summarized in Table 3-83.

The short-term nature of the construction would preclude any substantial negative impact, as the bulk of the work is not expected to exceed six months duration.

Operations

Overall potential effects on air quality due to operational activities under Alternative 3 would be similar in nature to those described under Alternative 1. As with Alternative 1, implementation of the TBR prescribed fire program under Alternative 3 would have long-term moderate adverse effects on air quality.

Due to the much larger land acquisition area, greater amounts of combustion emissions from prescribed fires are expected for Alternative 3 as compared to Alternatives 1, 2, and 4. An estimated 8,980 acres of additional land would be subject annually to prescribed fires under Alternative 3 as compared to existing conditions. The potential emissions associated with prescribed burning under Alternative 3 are summarized in Table 3-84. All prescribed burning at TBR would continue to be conducted in accordance with guidance established by the GFC.

As with Alternative 1, range maintenance activities likely would increase under Alternative 3 commensurate with the increase in size of the air-to-ground impact area at TBR. Given, the relatively low level of current emissions, the impacts associated with increased emissions under Alternative 3 would be minor.

Alternative 4

Construction

Overall potential effects on air quality due to construction activities under Alternative 4 would be similar in nature and overall level to those described under Alternative 1. Construction-related emissions, in particular the land-clearing, earthmoving, and development activities associated with Alternative 4 would have a temporary minor impact on local air quality. Combustion emissions would be generated from construction equipment and vehicles and fugitive dust emissions would be caused by onsite construction activities and vehicle travel on local/access roads. Slightly more construction emissions are expected for Alternative 4 as compared to Alternatives 1 and 2 as Alternative 4 would involve more land clearing within the proposed target areas (i.e., approximately 237 acres of land, including approximately 156 acres for target placement and 81 acres for firebreaks). Estimated construction emissions for Alternative 4 are summarized in Table 3-83.

The short-term nature of the construction would preclude any substantial negative impact, as the bulk of the work is not expected to exceed six months in duration.

Operations

Overall potential effects on air quality due to operational activities under Alternative 4 would be similar in nature to those described under Alternative 1. As with Alternative 1, implementation of the TBR prescribed fire program under Alternative 4 would have long-term moderate adverse effects on air quality.

Due to the much larger land acquisition area, greater amounts of combustion emissions from prescribed fires are expected for Alternative 4 as compared to Alternatives 1 and 2. An estimated 7,340 acres of additional land would be subject annually to prescribed fires under Alternative 4 compared to existing conditions. The potential emissions associated with prescribed burning under Alternative 4 are summarized in Table 3-84. All prescribed burning at TBR would continue to be conducted in accordance with guidance established by the GFC.

As with Alternative 1, range maintenance activities likely would increase under Alternative 4 commensurate with the increase in size of the air-to-ground impact area at TBR. Given, the relatively low level of current emissions, the impacts associated with increased emissions under Alternative 4 would be minor.

Summary of Impacts

For all action alternatives, proposed construction activities would generate emissions. However, these emission increases would be short-term and limited to construction activities and would therefore produce less than significant short-term impacts to air quality.

For all action alternatives, the increased need for prescribed fires as part of the USMC's ongoing ecosystem management program at TBR would create moderate, long-term, adverse air quality impacts. Although prescribed burning is an appreciable source of air emissions, it is a critical management tool for fire-dependent natural communities. Prescribed fire allows land managers to mimic natural fire return intervals under controlled conditions where smoke management can minimize air quality impacts. The alternative is wildfires, which can be very difficult to control and may cause much more severe air quality impacts. As discussed earlier, a modeling assessment suggests that using prescribed fire to minimize wildfires can result in a net reduction in fine particle ($PM_{2.5}$) emissions in the long term (FLAG 2010). In the Pacific Northwest, wildfire emissions were found to be greater than prescribed fire emissions in the same airshed (Ottmar 1996).

For all action alternatives, range maintenance activities would increase commensurate with the increase in size of the air-to-ground impact area at TBR. However, the impacts associated with increased emissions would be minor.

For all action alternatives, proposed emissions are anticipated to produce less than significant impacts to air quality values and visibility impairment within the pristine Class I areas of the Wolf Island and Okefenokee Wilderness Areas.

3.10.4.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. Air quality impacts would not differ from air quality impacts generated by existing TBR operations. Therefore, the No Action Alternative would not result in any new air quality impacts compared to existing conditions. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.11 Transportation

This section describes the local and regional transportation network on and around TBR. Potential impacts to these public and private roadways are then evaluated for each of the alternatives, including the No Action Alternative.

3.11.1 Definition of Resource

For the purpose of analysis, the transportation network includes public roads managed by federal, state, and municipal/county governments; private roadways; and other transportation corridors (paved/unpaved) that sometimes require vehicle access. In general, primary roads are in reference to the federal interstate highway system, secondary roads comprise the state highway system, and local or collector roads are used to access the interstates and highways. Traffic congestion is characterized by the Level of Service (LOS) ranging from A, least congested, to F, most congested (Transportation Research Board 2000).

3.11.2 Regulatory Framework

The Federal Highway Administration is authorized to develop and maintain the interstate highway network. The GDOT has jurisdiction over the state and local roadway networks. Transportation providers such as counties or municipalities may also enforce local standards for roadway location, design, development and use (GDOT 2011a).

3.11.3 Affected Environment

3.11.3.1 Regional Setting

The transportation network in the southeast Georgia region largely reflects commuter travel patterns as related to the major employment centers. Savannah, Georgia, is the largest regional employer and population center, while Statesboro, Hinesville, Jesup, and Brunswick, Georgia, and Jacksonville, Florida, represent secondary and tertiary urban areas. The majority of the southeast Georgia coastal region is characterized by state and county roadways in low-density rural areas. Natural constraints to the transportation system include marshlands and rivers.

I-95, a four- to six-lane interstate expressway, bisects southeast Georgia from north to south (Figures 1-3 and 3-46). It connects the region with South Carolina to the north and Florida to the south and, on a smaller scale, provides access to and from the Georgia counties of Camden, Glynn, McIntosh, Liberty, Bryan, and Chatham. As the most heavily traveled roadway in the region, I-95 is classified as a Rural and Urban Interstate Principal Arterial. I-16 connects the urban areas of Atlanta and Macon, Georgia, and represents the major east to west transportation route in the state. Additionally, I-75 is a major north-to-south corridor that generally traverses the center of the state converging with I-16 in Macon, Georgia. In the event of an emergency evacuation, I-95, I-75, and I-16 collectively expedite the process through a series of lane reversals. The lane reversal on I-16 expedites the evacuation of the Georgia Coast, while various state and local roads direct traffic inland and towards the interstate highway system during an emergency event.

Other important regional transportation routes include U.S. Highways 25 and 84. U.S. 25, the majority of which has four lanes, runs from the City of Brunswick (south of TBR) northwest through Jesup, Georgia. U.S. 84, also referred to as the Wiregrass Georgia Parkway, is an east-west route that originates east of I-95 in Midway, Georgia, before moving west across the state. The two highways are jointly located from Jesup, Georgia, to the City of Ludowici, at which point they intersect with State Hwy. 57, approximately 17 miles northwest of TBR, where U.S. 25 turns to the northwest while U.S. 85

continues to the northeast towards Hinesville, Georgia. U.S. 17 generally parallels I-95 and provides an alternative north-south route along the Eastern Seaboard before its intersection with I-16 further north in Savannah, Georgia (Jordan, Jones, and Goulding 2009).

Other significant features that influence the regional transportation network include the Altamaha Historic Scenic Byway, which starts in Glynn County north of Brunswick and follows SR 99 until its merger with U.S. 17. It then proceeds north through McIntosh County and towards the City of Darien (CGRDC 2007).

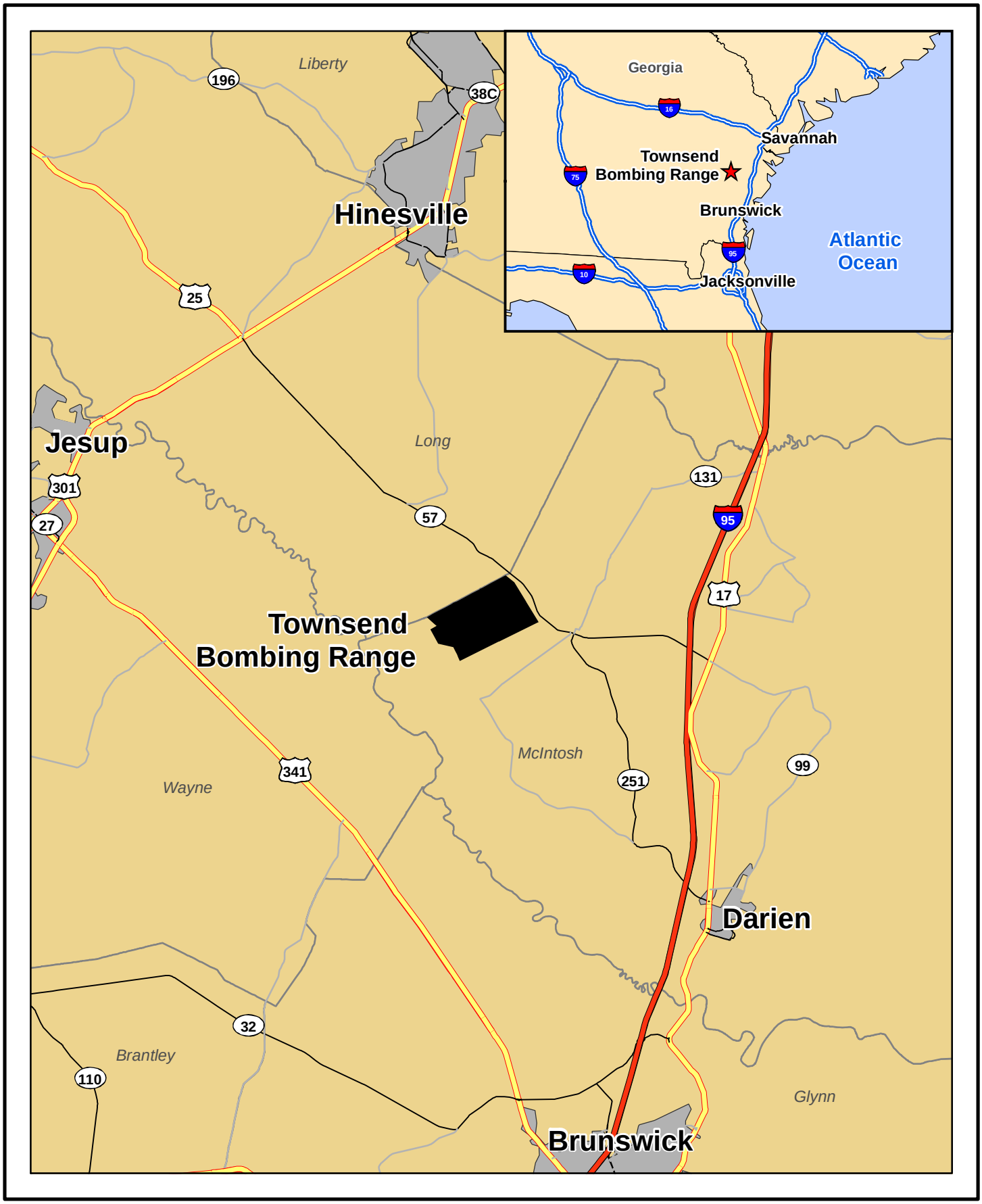
The primary state roads associated with the Proposed Action include State Hwy. 57, SR 251, and SR 99 (Jordan, Jones, and Goulding 2009) (Figure 3-46). The affected environment for the local roadway network is described in more detail below; however, Table 3-85 identifies state and county roadway designations associated with the Proposed Action in McIntosh and Long Counties.

Table 3-85
State and County Roadway Classifications

County	State Routes		County Roads	
	Road Type	Total Mileage	Road Type	Total Mileage
McIntosh	Rural Interstate, Rural Minor; Arterial; and Rural Major Collector	84	Rural Major Collector; Rural Minor Collector; and Rural Local	235
Long	Rural Principal Arterial; Rural Minor Arterial; and Rural Major Collector	59	Rural Major Collector; Rural Minor Collector; and Rural Local	239

Note: The remaining road types for Long County include small segments of Urbanized Principal Arterial (State Road; 2 miles) and Urbanized Collector and Urbanized Local (County Roads; 15 miles).

Source: GDOT 2010.



Urban Area
Existing Range
Counties

N

0 2.25 4.5 Miles

Figure 3-46
Regional Roadways
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Esri 2008, Based on Lusk 2009

3.11.3.2 Townsend Bombing Range

TBR is centrally located between the Gulf Coast and the Eastern Seaboard and, as such, is an ideal venue in support of military training requirements. TBR is used by more than 125 air and ground units from DOD installations on the East Coast and Carrier Battle Groups in the Atlantic Ocean. The majority of these units are within 300 miles of TBR, including MCAS Beaufort (70 NM), Naval Station Mayport (70 NM), Naval Air Station (NAS) Jacksonville (82 NM), and the Jacksonville Operating Area (OPAREA [40 NM]) located offshore in the state/federal waters seaward of the continental U.S. in the southeast (GA ANG 2005).

I-95 passes 5 miles to the east of TBR and, in terms of Average Annual Daily Traffic (AADT), is the most significant roadway with proximity to TBR. Connected to I-95 from the east, State Hwy. 57 is a two-lane highway that runs through the community of Townsend, and roughly parallels the northeastern range boundary before terminating in the community of Ludowici. Main access to the TBR cantonment area, the location of operational support facilities at TBR, is provided by Tram Road, which is owned and maintained by the USMC and GA ANG. In total, 17 entry/exit points are used to control vehicle access. All such vehicle access points, with the exception of Tram Road, occur on unpaved, dirt roads along the range perimeter. Other local roadways that facilitate access to TBR from the northwest portion of McIntosh County include Tibet Road and King Road (Figure 3-47).

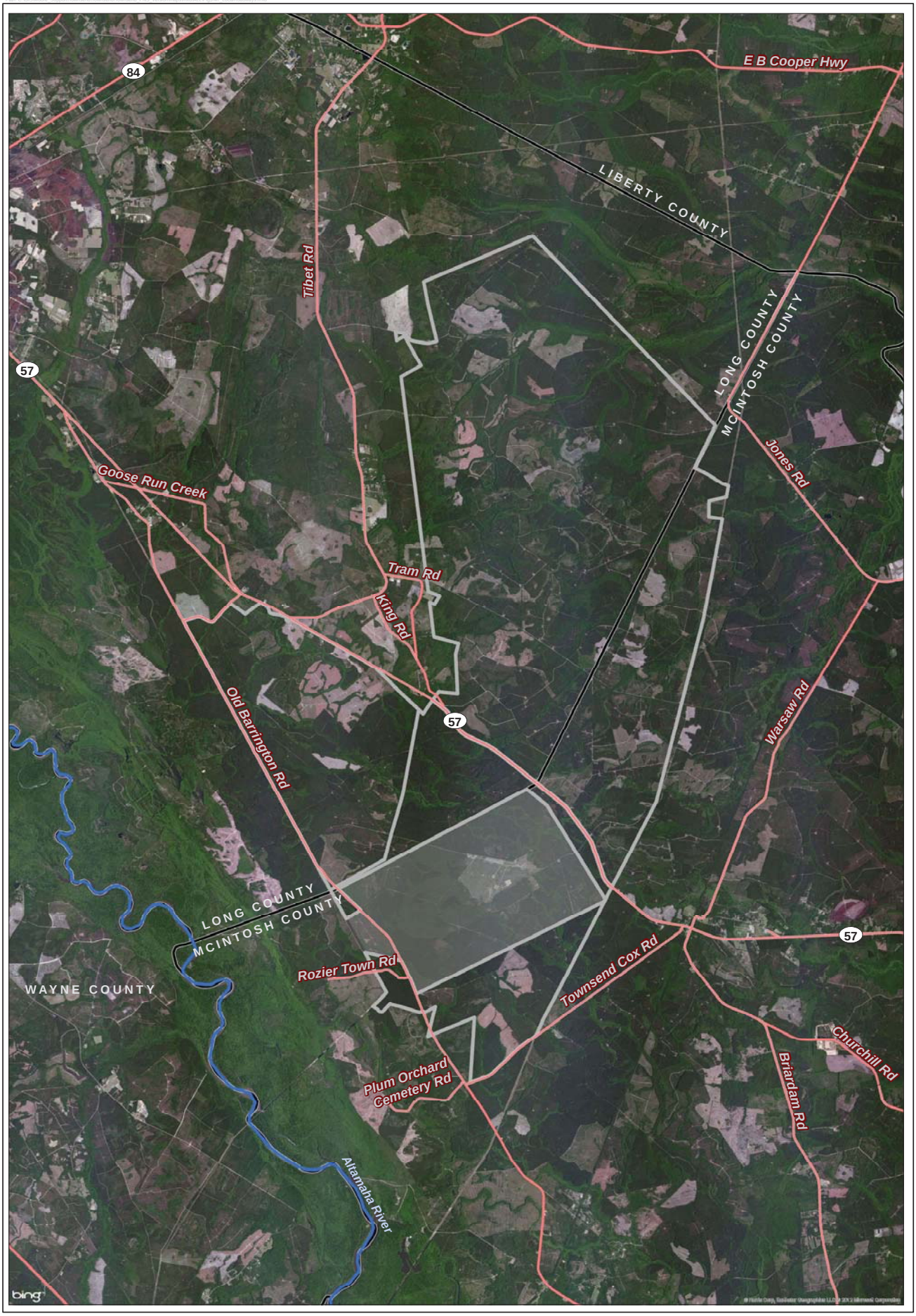
All on-range roads are owned and managed by the USMC and the GA ANG. These roads provide for vehicle circulation through a series of largely unpaved dirt roads totaling approximately 24 miles. On-range roads are primarily used for military operations; however, non-military uses may include forestry management and natural resources management, and on occasion, recreational hunting. Additionally, on privately owned lands surrounding TBR, the transportation network consists of numerous paved and unpaved roads that are generally not accessible to the public, such as those used for commercial timber (MCAS Beaufort 2008).

The majority of the roadways within land Acquisition Areas 1A, 1B, and 3 are unpaved dirt roads used to support logging equipment for timber harvesting and silvicultural practices. Table 3-86 and Figure 3-47 present the miles of roadways within and adjacent to (within 0.5 mile of) each land acquisition area.

Table 3-86
Roadways Within and Adjacent to Land Acquisition Areas

Roadway Description	Miles Within			Miles Adjacent		
	Area 1A	Area 1B	Area 3	Area 1A	Area 1B	Area 3
Unpaved Timber Access Roads	30.62	20.36	92.94	23.1	65.77	48.46
Unpaved Local Roads	0.97	2.21	0.0	4.68	0.51	1.27
Paved Local Roads	0.0	0.0	0.0	0.86	2.58	3.34
Secondary Roadways (State Hwy. 57)	0.0	0.0	0.0	4.88	4.80	4.74
Regional Roadways	0.0	0.0	0.0	0.0	0.0	0.0
Totals	**31.59**	**22.57**	**92.94**	**33.52**	**73.59**	**57.81**

Note: Adjacent = within 0.5-mile radius.



Major Roads
Counties
Acquisition Areas
Altamaha River
Existing Range

Figure 3-47
Local Roadways
Townsend Bombing Range
McIntosh and Long Counties, Georgia

0 1 2 Miles

Sources: Bing 2012, Based on Lusk 2009

3.11.3.3 McIntosh County

McIntosh County is one of three county jurisdictions (from a 10-county region in southeast Georgia) that does not have a transportation plan. McIntosh County's Highway Maintenance Facility is responsible for 311 miles of county/city roads, 80 miles of which are unpaved. The rural nature of the county is indicated by approximately 700 miles of unpaved roads under public and private ownership (Jordan, Jones, and Goulding 2009).

I-95 bisects the eastern portion of McIntosh County and maintains three interchanges that collectively service the county. U.S. 17 generally parallels I-95 from north to south and is part of the Altamaha Historic Scenic Byway designation by GDOT. The highway supports approximately 3,000 to 6,000 motorists per day during its peak season (CGRDC 2007). State Hwy. 57 leaving McIntosh County is identified as a coastal evacuation route westbound to Ludowici, Long County to U.S. 301/25 to Glennville, Georgia, and continuing on State Hwy. 57 to U.S. 280 towards Lyon (by way of Reidsville) (CGRDC 2007).

In general, travel patterns in McIntosh County are centered on I-95 as the primary north-to-south corridor. State Hwy. 57 provides a convenient route to/from the western parts of the county and links with I-16, the primary east-to-west corridor in the state. A large percentage of county residents commute to another jurisdiction for employment. The AADT for McIntosh County is estimated at 858 northbound on Eulonia/Wiregrass Trail/State Hwy. 57 and at 1,347 southbound for the same portion of road (GDOT 2010). The average annual two-way traffic for State Hwy. 57 in 2006 was 2,550, an approximately 7% increase from the previous year (MCAS Beaufort 2008).

3.11.3.4 Long County

Like McIntosh County, Long County does not have a transportation plan. The Long County line generally coincides with the northern boundary of TBR. The county serves as a "bedroom" community for a labor force that is predominately employed in Liberty, Tatnall, Chatham, and Wayne Counties. Thus, approximately 67% of Long County residents commute from these surrounding counties. The county's mean commuter travel time is estimated to be roughly 30 minutes. (CGRDC 2009)

State Hwy. 57, SR 38, and U.S. 84 comprise the primary arterial roads that provide transportation in Long County, as well as to other areas within the region. Traffic congestion is limited by the rural character of Long County and generally occurs on an intermittent basis in select urban areas. Long County travel patterns reflect the use of U.S. 84/SR 38 between Wayne County to the southwest and Hinesville and Savannah to the northeast (CGRDC 2009).

3.11.4 Environmental Consequences

3.11.4.1 Methodology and Evaluation Criteria

Road construction/improvement is part of the Proposed Action and as such, is a component of each of the action alternatives. The selected action alternative would determine the type and extent of impacts to the roadway network, which includes various public/private and paved/unpaved roads within the proposed land acquisition areas. This section evaluates potential impacts to vehicle transportation and circulation associated with the action alternatives within the immediate vicinity (0.5 mile) of TBR and the proposed land acquisition areas. Impacts relating to land acquisition and increased use of public roadways are addressed in this analysis.

For the purpose of analysis, potential impacts to transportation resources associated with each of the action alternatives may be determined "significant" under the following public roadway conditions:

- Reduction in access;

- Potential for disruption of transportation pattern and systems;
- Substantial increase in traffic volumes and flow;
- Elimination of intersection or roadways; and/or
- Decrease in LOS (Table 3-87).

Table 3-87
Motor Vehicle Level-of-Service Descriptions

LOS Rate	Description
A	Free flow
B	Reasonably free flow
C	Stable flow
D	Approaching unstable flow
E	Unstable flow
F	Forced or breakdown flow

Source: Transportation Research Board 2000.

LOS is determined, in part, by using roadway capacity, which is defined as the maximum rate at which vehicles can pass through a given point in an hour under prevailing conditions. The more degraded the LOS is for a given intersection, the smaller the increase in traffic volume required to decrease that LOS. Another factor that is used to determining roadway LOS impacts is "delay" times.

Delay is defined by the *Highway Capacity Manual (HCM) 2000* (Transportation Research Board 2000) as "the additional travel time experienced by a driver, passenger, or pedestrian."

Direct impacts on transportation related to the Proposed Action are associated with an increased work force during the construction phase as well as the stationing of additional personnel at TBR. Implementation of the Proposed Action could potentially include changes in accessibility of private roads; however, impacts on public roadway accessibility are not anticipated. Indirect impacts related to transportation during construction activities include noise and air quality, as addressed in Sections 3.7 and 3.10, respectively. Impacts related to the construction of additional range infrastructure and target areas for the Proposed Action under each alternative are discussed further in Section 3.13, Utilities and Infrastructure. The following evaluation is based on available traffic data and stated assumptions; no quantitative studies of vehicle activity have been conducted for this FEIS.

3.11.4.2 Common Elements Among Action Alternatives

No primary or secondary roadways traverse any of the acquisition areas; however, secondary and paved public roadways are adjacent to both areas. Approximately 9 miles of State Hwy. 57 runs along the northern boundaries of Areas 1A and 1B. Portions (4.74 miles) of that same segment of State Hwy. 57 run along the southern boundary of Area 3. Tibet Road runs adjacent to the western boundary of Area 3. A small segment (1.6 miles) of Old Townsend Road runs along the southern boundary of Area 1B.

The lands within the proposed acquisition areas are privately owned and are not publicly accessible. Thus, the roadways are not utilized as public transportation thoroughfares. In addition, there are no major intersections (i.e., an intersection that has sufficient traffic volume to warrant a traffic signal) in the vicinity of the proposed acquisition areas. The nearest signaled intersection is in the town of Ludowici, approximately 15.0 miles to the northwest.

Most vehicular circulation through the land acquisition areas is for timber management, but authorized access is permitted for recreational hunting (lease agreements). Private access to land parcels

surrounding the acquisition areas could potentially be impacted by the Proposed Action if access to those lands were by means of roadways within the acquisition areas. Access to adjacent public roadways is not expected to be impacted by the Proposed Action. Figure 3-47 presents the roadways within each acquisition area.

No portion of State Hwy. 57 would be closed under any of the action alternatives. The current practice of temporarily closing Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) during certain training activities would continue under any of the action alternatives. Under Alternatives 1, 3, and 4 Range officials may close the portion of Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) that enters the new range boundary when access to the range would conflict with training operations. The road would otherwise remain open. The USMC and GA ANG currently work with emergency services, such as police or fire, to ensure that roads closed during training activities do not stop or delay emergency services from responding. The USMC and GA ANG will continue to work with emergency services to suspend training operations and allow access when necessary.

3.11.4.3 Action Alternatives

Alternative 1

Under Alternative 1, the USMC proposes to acquire Areas 1A and 1B located to the northwest and southeast of the existing TBR boundary along the south side of State Hwy. 57, totaling approximately 11,187 acres. Land Acquisition Areas 1A and 1B, under Alternative 1, do not contain any paved public roadways (Table 3-86). All roads within these acquisition areas are unpaved (total 54.16 miles) and are primarily used for timber harvesting. Therefore, acquisition of state and/or locally owned through-roads and/or ROWs would not be part of Alternative 1. Existing public roads surrounding Areas 1A and 1B that provide access to private property would not be impacted. Under Alternative 1, no portions of State Hwy. 57 would be closed.

Construction activities associated with the installation of target areas under Alternative 1 would have no long-term impact on public transportation resources. These activities would take place in remote areas on TBR lands where traffic would not be affected. Additional range access and service roadways (unpaved) within land acquisition areas would be created to construct and maintain target infrastructure and to enhance the ability of range personnel to maneuver for mission support purposes. All new target areas would be located in close proximity to existing timber management roadways. Therefore, the amount of additional on-range roadways needed would be limited since existing unpaved roads would be utilized. However, any proposed roads within the range used for access to target areas would be managed similar to current TBR practices.

Short-term transportation impacts during construction activities may occur due to additional construction equipment and vehicles utilizing State Hwy. 57 to access the acquisition area. Any delays to motorists during construction would be limited to construction vehicles potentially having to yield to oncoming traffic while turning off State Hwy. 57 into TBR property and additional motorists having to slow or stop behind them. These types of delays are not anticipated to be significant enough to cause a decrease in LOS. In addition, there are multiple existing gated access points to Areas 1A and 1B along State Hwy. 57 and surrounding areas that can be utilized during construction that would allow for the dispersal of traffic.

The proposed increase of 10 range personnel to meet additional mission support requirements would not have a significant impact on the traffic volume of the local transportation network. Overall, the area is characterized by low population density, which does not see substantial traffic volumes on a daily basis. In addition, most of the roadway network within the acquisition areas is rural. These additional personnel would utilize the surrounding public roadways to access the training areas within Areas 1A and 1B; however, the volume would not cause a significant impact or disrupt current LOS. In addition,

multiple gated access points can be utilized during operation and maintenance that would allow for the dispersal of traffic.

Under Alternative 1, long-term impacts on primary, secondary, and local public roadways would not occur from military activity/vehicles on roadways within the acquisition areas. No substantial increase in traffic volumes, reduction in access, and/or decrease in LOS due to Alternative 1 is anticipated. Impacts to Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) would continue due to the current practice of temporarily closing the road during certain training activities. Range officials may close the portion of Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) that enters the new range boundary when access to the range would conflict with training operations. The road would otherwise remain open.

Alternative 2

Under Alternative 2, the USMC proposes the acquisition of approximately 23,480 acres located north-northeast of TBR and to the north of State Hwy. 57 (Area 3). Land acquisition Area 3, under Alternative 2, does not contain any paved public roadways (Table 3-86). All roads within the acquisition area are unpaved and primarily used for timber harvesting; the roads total approximately 92 miles.

Impacts to transportation would be similar to those described under Alternative 1 and would result in short-term, minor, adverse impacts from construction. Also, similar to Alternative 1, no significant long-term adverse impacts would occur from USMC acquisition since all acquired roads would be private. Under Alternative 2, no portions of State Hwy. 57 would be closed. Impacts to Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) would continue due to the current practice of temporarily closing the road during certain training activities when access to the range would conflict with training operations. The road would otherwise remain open. Construction activities would take place in remote areas on TBR lands where traffic would not be affected. All new target areas would be located in close proximity to existing timber management roadways. Private access to land parcels surrounding the acquisition area could potentially be impacted by Alternative 2. These potential impacts would be caused in the case where a property owner owns multiple tracks of land within and/or adjacent to Area 3 and currently utilizes private, unpaved roadways in Area 3 to access the various properties. However, the impact on a property owner in this situation would be alleviated due the abundance of other local roadways surrounding the area that could be used as a detour to gain access. Under Alternative 2, a proposed increase of 12 range personnel is anticipated to meet additional mission support requirements. However, no long-term transportation impacts are anticipated with the addition of these personnel.

Alternative 3

Under Alternative 3, the USMC proposes to acquire a combination of the property proposed for acquisition under Alternative 1 and Alternative 2. Alternative 3 proposes to acquire Areas 1A, 1B, and 3. Land acquisition under this alternative would total approximately 34,667 acres. Land acquisition areas under Alternative 3 contain no paved public roadways (Table 3-86). All roads within these acquisition areas, totaling approximately 146 miles, are unpaved and primarily used for timber harvesting.

Impacts to transportation would be similar to those described under Alternatives 1 and 2 and would result in short-term, minor, adverse impacts from construction. Under Alternative 3, no portions of State Hwy. 57 would be closed. Impacts to Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) would continue due to the current practice of temporarily closing the road during certain training activities. Range officials may close the portion of Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) that enters the new range boundary when access to the range would conflict with training operations. The road would otherwise remain open. Also, similar to Alternatives 1 and 2, no significant long-term adverse impacts with increased traffic volumes, reduction in access, and/or decrease in LOS would occur from USMC acquisition since all acquired roads would be private.

Alternative 3 would warrant the greatest number of additional range personnel for mission support requirements with 18. However, this increase in personnel is not anticipated to be significant enough to impact traffic volumes around TBR and/or to decrease the LOS of the roadways.

Alternative 4

Under Alternative 4, the USMC proposes to acquire a combination of the property proposed for acquisition under Alternative 1 and Alternative 2. Alternative 4 proposes to acquire Areas 1B and 3. Land acquisition under this alternative would total approximately 28,436 acres. Land acquisition Areas 1B and 3 do not contain any paved public roadways. There are approximately 115 miles of unpaved roads in these areas.

Impacts to transportation would be similar to those described under Alternatives 1 and 2 and would result in short-term, minor, adverse impacts from construction. Under Alternative 4, no portions of State Hwy. 57 would be closed. Impacts to Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) would continue due to the current practice of temporarily closing the road during certain training activities. Range officials may close the portion of Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) that enters the new range boundary when access to the range would conflict with training operations. The road would otherwise remain open. Also, similar to Alternatives 1 and 2, no significant long-term adverse impacts would occur from USMC acquisition since all acquired roads would be private. Lastly, this alternative would require 12 additional range personnel to meet additional mission support requirements. Impacts such as increased traffic volumes, reduction in access, and/or a decrease in LOS would not be anticipated to occur under Alternative 4.

Summary of Impacts

During periods of construction, similar impacts to transportation would occur under each of the action alternatives. There would be no long-term impacts on public transportation resources as a result of these activities. Short-term transportation impacts during construction activities may occur due to additional construction equipment and vehicles utilizing State Hwy. 57 to access the acquisition area. Any delays to motorists during construction would be limited to construction vehicles potentially having to yield to oncoming traffic while turning off State Hwy. 57 into TBR property and additional motorists having to slow or stop behind them. No portion of State Hwy. 57 would be closed under any of the action alternatives. The current practice of temporarily closing Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) during certain training activities would continue under any of the action alternatives. Under Alternatives 1, 3, and 4 Range officials may close the portion of Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) that enters the new range boundary when access to the range would conflict with training operations. The road would otherwise remain open.

Following construction, the proposed increase of range personnel would not have a significant impact on the traffic volume of the local transportation network. Overall, the area is characterized by low population density, which does not see substantial traffic volumes on a daily basis. These additional personnel would utilize the surrounding public roadways to access new training areas; however, the volume would not cause a significant impact or disrupt current LOS. Because no long-term impacts on primary, secondary, and local public roadways would occur from daily operations under any of the action alternatives, impacts to transportation under the Proposed Action would not be significant.

3.11.4.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. The acquisition and use of additional lands to support the DOD and TBR training requirements would not occur due to this Proposed Action. Therefore, no impacts to transportation resources would occur as there would be no increase in traffic due to construction efforts and/or from additional range personnel. Impacts to Blue's Reach Road (a.k.a. Old Barrington Road and Old Cox Road) would continue to occur due to the current practice of temporarily closing the section of the road

that enters the existing range boundary during certain training activities when access to the range would conflict with training operations. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.12 Topography, Geology, and Soils

This section describes existing topography, geology, and soils within and near TBR, including those areas proposed for acquisition, and evaluates potential impacts under each alternative, including the No Action Alternative.

3.12.1 Definition of Resource

Topography describes the physical surface characteristics of the land such as elevation, slope, and general surface features. The geology of an area includes consolidated earthen materials (bedrock) and unconsolidated earthen materials. Soil consists of weathered bedrock or unconsolidated parent material and decomposed organic matter from plants, bacteria, fungi, and other living things.

The ROI for this resource is limited to lands disturbed by construction, operation, and maintenance activities.

3.12.2 Regulatory Framework

The Georgia Erosion and Sedimentation Act of 1975 (O.C.G.A. 12-7-1 through 12-7-22) requires governing authorities of each Georgia county and municipality to adopt comprehensive ordinances governing land-disturbing activities within their boundaries. The ordinances must contain technical principles as provided in the Act and procedures for issuance of permits. The law requires the use of BMPs for all land-disturbing activities. Prior to conducting land-disturbing activities, a permit must be obtained from a local issuing authority or a notice of intent must be provided to the GA EPD. Permit issuance requires an Erosion and Sediment Control Plan approved by the appropriate Soil and Water Conservation District. The provisions of this Act do not apply to surface mining, granite quarrying, or agricultural and forestry operations.

3.12.3 Affected Environment

3.12.3.1 Topography

TBR is located in the Barrier Island Sequence District of the Coastal Plain Physiographic Province (Clark and Zisa 1976). The barrier island sequence consists of barrier islands, marshes, level plains, and a series of terraces resulting from sea-level advances and retreats during the Pleistocene age (Krause and Randolf 1989). Within the Barrier Island Sequence District, elevations range from sea level to approximately 160 feet above sea level with a progression of step-like increases in elevation from east to west. Land surface elevations in the TBR vicinity range from 13 to 60 feet above sea level.

3.12.3.2 Geologic Setting

The coastal area of Georgia is underlain by a thick sequence of unconsolidated layers of sand and clay and poorly cemented to very dense layers of limestone and dolostone (Clarke, Hacke, and Peck 1990). These deposits range in age from Paleocene to recent, and overlie Paleozoic to Mesozoic igneous, metamorphic and sedimentary rocks (Chowns and Williams 1983). These sedimentary strata strike southwest-northeast, then dip and thicken to the southeast, and reach a maximum thickness of about 5,500 feet in Camden County (Wait and Davis 1986). The geologic units that underlie TBR and vicinity are highlighted in Table 3-88.

Table 3-88
Townsend Bombing Range and Vicinity Geologic Units

Unit	Description
Satilla Formation	• Heterogeneous mixture of yellow brown to greenish gray sand, clay, and silt. • 40 to 50 feet thick in McIntosh and Long Counties.
Cypresshead Formation	• Reddish brown to orange thin to thickly bedded and massive planar to cross-bedded fine to pebbly coarse sand. • Thin to absent in McIntosh and Long Counties.
Ebenezer Formation	• Pale olive to grayish yellow green clayey variably micaceous and phosphatic very fine to fine sand. • 230 feet and 170 feet thick in McIntosh and Long Counties, respectively.
Coosawhatchie Formation	• Olive grey phosphatic clay, brown phosphorite, and micaceous clayey slightly phosphatic sand. • 100 feet and 25 feet thick in McIntosh and Long Counties, respectively.
Marks Head Formation	• Phosphatic clayey, slightly dolomitic sand, and sandy clay with scattered beds of dolostone, limestone, and siliceous claystone. • 50 feet and 65 feet thick in McIntosh and Long Counties, respectively.
Parachula Formation	• Sand, clay, calcite, and dolomite in varying admixtures and is variably phosphatic. • 60 feet and 40 feet thick in McIntosh and Long Counties, respectively.
Tiger Leap Formation	• Heterogeneous mixture of variably phosphatic, micaceous calcareous, and dolomitic clayey sand, and variably fossilferous clayey and phosphatic sandy limestone and dolostone. • 90 feet and 130 feet thick in McIntosh and Long Counties, respectively.
Suwannee Limestone	• White to tan fossilferous limestone and minor dolostone. • 120 feet thick in McIntosh County.
Ocala Limestone	• White to cream fossilferous limestone that is slightly glauconitic in the lower part of the formation. • 300 feet thick in McIntosh and Long Counties.
Avon Park Formation	• Interbedded cream to brown limestone and glauconitic dolostone. • 550 to 1,000 feet thick in McIntosh and Long Counties.
Oldsmar Formation	• Off-white to light grey limestone interbedded with tan to light brown dolostone that is commonly vuggy. • 100 to 400 feet thick in McIntosh and Long Counties.
Clayton Formation	• Sandy glauconitic limestone, glauconitic sand, clayey sand and small amounts of dark grey clay. • Top of the Clayton Formation occurs in McIntosh and Long Counties at elevations of approximately 1,400 to 2,200 feet below sea level.

Sources: Weems and Edwards 2001; Clarke, Hacke, and Peck 1990; Miller 1986; Priest and Cherry 2007; Priest 2007; Huddlestun 1988.

3.12.3.3 Soils

Soils present in the proposed acquisition areas and their characteristics were obtained from the USDA NRCS Soil Survey Geographic (SSURGO) database (NRCS 2002a, 2002b, 2006, and 2007b). Forty (40) soil map units are present in the proposed acquisition areas. These map units include 38 soil map units; a map unit consisting of areas where soil materials have been disturbed, overturned, or removed; and a map unit consisting of areas where soil surveys have not been conducted. Certain soil types have been determined to be of higher agricultural value, including those designated as prime farmland and farmland of statewide importance, as further described below.

'Prime farmland' is defined by the USDA as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. These lands economically produce sustained high crop yields when proper management and acceptable farming methods are applied. Prime farmland is important for meeting the country's short- and long-term needs for food and fiber.

'Farmland of statewide importance' is land that does not meet the criteria for prime farmland, but economically produces high yields of crops when acceptable farming methods are used. The criteria for defining farmland of statewide importance are determined by the appropriate state agencies. These lands are an important part of the state's agricultural resource base.

Due to the importance of soils designated as prime farmland and farmland of statewide importance on sustaining high crop yields, these soil types are discussed separately in the impact analysis in Section 3.12.4.3. Map units and prime farmland present in each of the proposed acquisition areas, as well as the acreage and the percentage of the total that occur within each acquisition area, are described in Table 3-89. Soil map units present in each of the proposed acquisition areas are illustrated in Appendix K.

Table 3-89
Townsend Bombing Range and Vicinity Soil Resources

Soils Type	Description	Acres (% of total)		
		Area 1A	Area 1B	Area 3
Albany Loamy Fine Sand	• 0 to 2% slopes. • Very deep, somewhat poorly drained soil occurs on low-lying uplands. • Seasonal high water table that ranges from 1 to 2.5 feet below the surface for 4 months of the year. • Slightly to moderately susceptible to erosion by water. • Very highly susceptible to wind erosion.	Not Present	Not Present	143.1 (0.61%)
Bayboro Clay Loam	• Very deep, very poorly drained soil occurs on low-lying uplands and in depressions. • Seasonal high water table at the surface for 7 months of the year (frequently ponded). • Slightly to moderately susceptible to erosion by water. • Very slightly susceptible to wind erosion.	Not Present	311.2 (6.28%)	1069.5 (4.51%)
Bayboro Loam	• Very deep, very poorly drained soil occurs on low-lying uplands and in depressions. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 7 months of the year. • Slightly to moderately susceptible to erosion by water. • Very slightly susceptible to wind erosion.	1387.6 (22.27%)	522.2 (10.54%)	1553.5 (6.62%)
Bladen Fine Sandy Loam	• Very deep, poorly drained soil on fluvial or marine terraces. • Seasonal high water table ranges from 0 to 1 foot below the surface for 6 months of the year. • Moderately susceptible to erosion by water. • Highly susceptible to wind erosion.	426.9 (6.85%)	102.0 (2.06%)	1954.1 (8.32%)
Bladen Loam and Clay Loam	• Very deep, poorly drained soil on fluvial or marine terraces. • Seasonal high water table at the surface for 6 months of the year (frequently ponded). • Moderately susceptible to erosion by water. • Very slightly susceptible to wind erosion.	Not Present	602.6 (12.16%)	1101.5 (4.65%)
Bladen-Coxville Fine Sandy Loams	• Intermingled soils; 40% Coxville, 60% Bladen. • Very deep, poorly drained soils on flats. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 6 months of the year. • Slightly to moderately susceptible to erosion by water. • Highly susceptible to wind erosion.	Not Present	179.9 (3.63%)	1084.1 (4.57%)
Blanton Sand	• 0 to 3% slopes. • Very deep, moderately well drained soil that occurs on uplands. • Seasonal high water table that ranges from 2.5 to 4 feet below the surface for 4 months of the year. • Slightly susceptible to erosion by water. • Extremely susceptible to wind erosion.	85.9 (1.38%)	Not Present	207.2 (0.88%)

Table 3-89
Townsend Bombing Range and Vicinity Soil Resources

Soils Type	Description	Acres (% of total)		
		Area 1A	Area 1B	Area 3
Cape Fear Fine Sandy Loam	• Very deep, very poorly drained soil occurs on stream terraces. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 7 months of the year. • Slightly to moderately susceptible to erosion by water. • Highly susceptible to wind erosion.	Not Present	Not Present	1947.1 (8.29%)
Chipley Sand	• 0 to 4% slopes. • Very deep, moderately well drained soil on low-lying uplands. • Seasonal high water table that ranges from 2 to 3 feet below the surface for 5 months of the year. • Slightly susceptible to erosion by water. • Extremely susceptible to wind erosion.	7.5 (0.12%)	Not Present	46.7 (0.20%)
Dunbar Fine Sandy Loam	• 0 to 2% slopes. • Very deep, somewhat poorly drained soil occurs on broad low-lying uplands. • Seasonal high water table that ranges from 1 to 2.5 feet below the surface for 7 months of the year. • Moderately susceptible to erosion by water. • Highly susceptible to wind erosion.	Not Present	52.5 (1.06%)	155.1 (0.65%)
Echaw and Centenary Fine Sands	• Intermingled soils; 60% Echaw, 35% Centenary, 5% Minor Components. • Very deep, moderately well to well drained soils on low-lying uplands, broad ridges and flats. • Seasonal high water table that ranges from 2.5 to 5 feet below the surface for 4 to 6 months of the year. • Slightly susceptible to erosion by water. • Extremely susceptible to wind erosion.	Not Present	Not Present	51.5 (0.22%)
Ellabelle Loamy Sand	• Very deep, very poorly drained soil occurs on along small drainage ways and in depressions. • Seasonal high water table occurs in this soil at the surface for 6 months of the year (frequently ponded or flooded). • Slightly susceptible to erosion by water. • Very highly susceptible to wind erosion.	30.4 (0.49%)	Not Present	1219.3 (5.19%)
Eulonia Fine Sandy Loam	• Very deep, moderately well drained soil occurs on uplands and stream terraces. • Seasonal high water table that ranges from 1.5 to 3.5 feet below the surface for 6 months of the year. • Moderately susceptible to erosion by water. • Highly susceptible to wind erosion. • Prime Farmland (Long County).	Not Present	Not Present	11.6 (0.05%)

Table 3-89
Townsend Bombing Range and Vicinity Soil Resources

Soils Type	Description	Acres (% of total)		
		Area 1A	Area 1B	Area 3
Eulonia-Fairhope Fine Sandy Loams	• 0 to 2% slopes. • Intermingled soils; 75% Eulonia, 25% Fairhope. • Very deep, moderately well drained soils on uplands and stream terraces. • Seasonal high water table that ranges from 1.5 to 3.5 feet below the surface for 6 months of the year. • Moderately susceptible to erosion by water. • Highly susceptible to wind erosion. • Prime Farmland (McIntosh County).	Not Present	167.3 (3.38%)	64.6 (0.27%)
Eulonia-Fairhope Fine Sandy Loams (Thick Surfaces- 0 to 2% Slopes)	• 0 to 2% slopes. • Intermingled soils; 60% Eulonia, 40% Fairhope. • Very deep, somewhat poorly drained soils on stream terraces and broad flats. • Seasonal high water table that ranges from 1 to 2.5 feet below the surface for 5 months of the year. • Slightly to moderately susceptible to erosion by water. • Very highly susceptible to wind erosion. • Farmland of statewide importance (McIntosh County).	Not Present	40.0 (0.81%)	39.1 (0.16%)
Eulonia-Fairhope Fine Sandy Loams (Thick Surfaces- 2 to 5% Slopes)	• Same information as listed just above.	Not Present	Not Present	6.9 (0.03%)
Johnston and Bibb Soils	• Intermingled soils; 60% Johnston, 40% Bibb. • Very deep, very poorly drained soils on floodplains. • Seasonal high water table at the surface for 8 months of the year, frequently flooded (Johnston). • Seasonal high water table that ranges from 0.5 to 1 foot below the surface for 5 months of the year, frequently flooded (Bibb). • Slightly to moderately susceptible to erosion by water. • Highly susceptible to wind erosion.	Not Present	Not Present	60.7 (0.26%)
Lakeland Sand	• 0 to 2% slopes. • Very deep, moderately well drained soil that occurs on uplands. • Seasonal high water table that ranges from 4 to greater than 6 feet below the surface for 3 months of the year. • Slightly susceptible to erosion by water. • Extremely susceptible to wind erosion.	Not Present	Not Present	13.1 (0.06%)

Table 3-89
Townsend Bombing Range and Vicinity Soil Resources

Soils Type	Description	Acres (% of total)		
		Area 1A	Area 1B	Area 3
Leefield Loamy Sand	• Very deep, somewhat poorly drained soil occurs on uplands. • Seasonal high water table occurs in this soil at a depth ranging from 1.5 to 2.5 feet for 4 months of the year. • Slightly susceptible to erosion by water. • Very highly susceptible to wind erosion. • Farmland of statewide importance (Long County).	26.2 (0.42%)	Not Present	Not Present
Leon Fine Sand	• Very deep, poorly drained soil occurs on low uplands and upland flats. • Seasonal high water table that ranges from 0.5 to 1.5 feet below the surface for 7 months of the year. • Slightly susceptible to erosion by water. • Extremely susceptible to wind erosion.	Not Present	156.0 (3.15%)	159.6 (0.67%)
Lynchburg Loamy Fine Sand (Thick Surface, Clayey Substratum)	• 0 to 2% slopes. • Very deep, somewhat poorly drained soil that occurs on stream terraces and broad flats. • Seasonal high water table that ranges from 1 to 2.5 feet below the surface for 5 months of the year. • Slightly to moderately susceptible to erosion by water. • Very highly susceptible to wind erosion.	Not Present	17.2 (0.35%)	84.6 (0.36%)
Mandarin Fine Sand	• Very deep, poorly drained soil that occurs on ridges and knolls. • Seasonal high water table that ranges from 1.5 to 3.5 feet below the surface for 7 months of the year. • Slightly susceptible to erosion by water. • Very highly susceptible to wind erosion.	1.4 (0.02%)	Not Present	42.0 (0.18%)
Mascotte Fine Sand	• Very deep, poorly drained soil that occurs on broad low-lying areas, on low stream terraces and in depressions. • Seasonal high water table occurs in this soil at a depth ranging from 0.5 to 1.5 feet for 7 months of the year. • Slightly to moderately susceptible to erosion by water. • Extremely susceptible to wind erosion. • Farmland of statewide importance (Long County).	126.0 (2.02%)	Not Present	455.6 (1.94%)
Meggett Fine Sandy Loam	• Very deep, poorly drained soil occurs on floodplains and low terraces. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 6 months of the year. • Moderately susceptible to erosion by water. • Highly susceptible to wind erosion.	24.9 (0.40%)	Not Present	147.2 (0.63%)
Meggett Loam	• Same information as Meggett Fine Sandy Loam with the exception that Meggett Loam is very slightly susceptible to wind erosion.	Not Present	Not Present	34.2 (0.14%)

Table 3-89
Townsend Bombing Range and Vicinity Soil Resources

Soils Type	Description	Acres (% of total)		
		Area 1A	Area 1B	Area 3
Ocilla Loamy Fine Sand	• Very deep, somewhat poorly drained soil occurs on stream terraces and on broad flats. • Seasonal high water table occurs in this soil at a depth ranging from 1 to 2.5 feet for 5 months of the year. • Slightly to moderately susceptible to erosion by water. • Very highly susceptible to wind erosion. • Farmland of statewide importance (Long County).	72.9 (1.17%)	12.6 (0.25%)	684.1 (2.91%)
Ona Fine Sand	• Very deep, poorly drained soil occurs on broad low-lying areas. • Seasonal high water table that ranges from 0.5 to 1.5 feet below the surface for 7 months of the year. • Slightly to moderately susceptible to erosion by water. • Extremely susceptible to wind erosion.	Not Present	25.1 (0.51%)	53.8 (0.22%)
Pelham Loamy Sand	• Very deep, poorly drained soil that occurs along drainage ways. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 4 months of the year (frequently flooded). • Slightly to moderately susceptible to erosion by water. • Very highly susceptible to wind erosion.	17.8 (0.29%)	Not Present	Not Present
Pits	• Areas that have been disturbed or overturned or where soil materials have been removed. • Some pits may retain several feet of water the year around.	14.0 (0.23%)	Not Present	Not Present
Plummer Sands	• Very deep, poorly drained soil occurs on low flats, in depressions and along drainage ways. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 8 months of the year. • Slightly susceptible to erosion by water. • Extremely susceptible to wind erosion.	Not Present	36.7 (0.74%)	150.4 (0.63%)
Pooler Fine Sandy Loam	• Very deep, poorly drained soil occurs on broad flats and in depressions. • Seasonal high water table occurs in this soil a depth ranging from 0 to 1 foot for 6 months of the year. • Slightly to moderately susceptible to erosion by water. • Highly susceptible to wind erosion.	1425.3 (22.87%)	498.1 (10.05%)	5191.9 (22.11%)
Pooler-Bladen Complex	• Intermingled soils; 60% Pooler, 40% Bladen. • Very deep, poorly drained soils on flats. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 6 months of the year. • Slightly to moderately susceptible to erosion by water. • Highly susceptible to wind erosion.	2347.2 (37.67%)	748.5 (15.10%)	3209.3 (13.67%)

Table 3-89
Townsend Bombing Range and Vicinity Soil Resources

Soils Type	Description	Acres (% of total)		
		Area 1A	Area 1B	Area 3
Portsmouth Loam	• Very deep, very poorly drained soil occurs along small drainage ways and in depressions. • Seasonal high water table occurs in this soil at the surface for 6 months of the year (frequently flooded/ponded). • Slightly susceptible to erosion by water. • Very highly susceptible to wind erosion.	Not Present	Not Present	14.8 (0.06%)
Riceboro Loamy Fine Sand	• Very deep, poorly drained soil occurs on broad flats and in slight depressions. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 5 months of the year (frequently flooded). • Slightly to moderately susceptible to erosion by water. • Extremely susceptible to wind erosion.	52.2 (0.84%)	10.5 (0.21%)	577.4 (2.46%)
Stilson Loamy Sand	• Very deep moderately well drained soil that occurs on smooth uplands. • Seasonal high water table that ranges from 2.5 to 3 feet below the surface for 4 months of the year. • Slightly to moderately susceptible to erosion by water. • Very highly susceptible to wind erosion. • Farmland of statewide importance (Long County).	29.8 (0.48%)	Not Present	Not Present
Wahee Sandy Loam	• Very deep, somewhat poorly drained soil occurs on fluvial or marine terraces. • Seasonal high water table that ranges from 0.5 to 1.5 feet below the surface for 4 months of the year (frequently flooded). • Moderately susceptible to erosion by water. • Highly susceptible to wind erosion.	155.0 (2.49%)	65.3 (1.32%)	609.0 (2.59%)
Weston Loamy Fine Sand	• Very deep, poorly drained soil occurs on broad flats, in depressions and along drainage ways. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 6 months of the year. • Slightly susceptible to erosion by water. • Very highly susceptible to wind erosion.	Not Present	235.1 (4.74%)	1196.3 (5.06%)
Weston Loamy Sand (Thick Surface)	• Very deep, poorly drained soil occurs on broad flats and in slight depressions. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 5 months of the year (occasionally flooded). • Slightly to moderately susceptible to erosion by water. • Extremely susceptible to wind erosion.	Not Present	513.6 (10.37%)	334.6 (1.41%)

Table 3-89
Townsend Bombing Range and Vicinity Soil Resources

Soils Type	Description	Acres (% of total)		
		Area 1A	Area 1B	Area 3
Weston Very Coarse Sand	• Very deep, poorly drained soil occurs on broad flats, in depressions and along drainage ways. • Seasonal high water table that ranges from 0 to 1 foot below the surface for 6 months of the year. • Slightly susceptible to erosion by water. • Very highly susceptible to wind erosion.	Not Present	10.8 (0.22%)	Not Present
Not Surveyed	• Areas where no soil survey has been conducted.	Not Present	648.3 (13.08%)	Not Present

Sources: NRCS 2002a, 2002b, 2006, and 2007b.

3.12.4 Environmental Consequences

3.12.4.1 Topography

Alternative 1

Under Alternative 1, minor impacts to topography would occur. Alternative 1 would include construction of roads, target structures, and firebreaks which may require grading. In addition, the existing range compound facilities and observation tower on TBR would be relocated to the northern corner of Area 1B (Figure 2-9). Construction of the new range compound facilities may require grading or filling during building foundation preparation and road, parking area, and maintenance area construction. However, these impacts to topography from implementation of Alternative 1 would not be significant.

Alternatives 2, 3, and 4

Under Alternatives 2, 3, and 4, minor impacts to topography would occur. Each of these action alternatives would include construction of roads, target structures, and firebreaks which may require grading. The existing range compound facilities and observation tower on TBR would not be relocated under these alternatives; however, a new observation tower would be constructed in the southwestern corner of Area 3 (Figure 2-9). Consequently, the impacts to topography that could result from implementing any of these action alternatives are anticipated to be less than those caused by Alternative 1 due to less land being disturbed and would not be significant.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. No construction associated with roads, target structures, or firebreaks would occur. Similarly, neither grading nor filling activities associated with relocating the existing compound facilities or observation tower would occur. Consequently, no impacts to topography would occur. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.12.4.2 Geology

Alternatives 1 through 4

The action alternatives would have no direct impacts on geologic resources and would not increase potential for exposure to unstable geologic units. Land acquisition would result in the long-term restriction of access to potentially developable mineral resources such as sand and gravel that may be present in the proposed acquisition areas. However, given that no active surface mines are present in the proposed acquisition areas (GA EPD 2011a), the action alternatives would not result in the loss of production of any mineral resource. Consequently, the long-term restriction of access to mineral resources in the proposed acquisition areas is not considered significant.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. No lands would be acquired, and no direct impacts to geologic resources would occur. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.12.4.3 Soils

Common Elements Among All Action Alternatives

Under the four action alternatives, up to eight target areas would be constructed. Soil types present in each target area, the acreage, and the percentage of the total acreage of the target area are presented in Table 3-90. Descriptions of the soil types were presented previously in Table 3-89. Prime farmland and farmland of statewide importance have increased value related to their importance for sustaining high crop yields (please refer to Section 3.12.3.3). Due to this importance, potential impacts on soils with these designations are shown separately. Table 3-91 presents the total acres of prime farmland and farmland of statewide importance present in each of the target areas and their percentage of the total target area acreage. Soil types designated as prime farmland or farmland of statewide importance were previously identified in Table 3-89. However, it is important to note that the areas designated as prime farmland within the proposed acquisition area are used for silvicultural purposes only and not traditional agricultural practices.

Portions of each target area would be cleared for construction of target structures and firebreaks. Existing roads would be used to the greatest extent possible, but all target areas would require some degree of road construction or improvement. Under Alternative 1, the existing facilities would be relocated to the northern corner of Area 1B (Figure 2-9), while under Alternatives 2, 3, and 4, a new observation tower would be constructed in the southwestern corner of Area 3 (Figure 2-9).

Impacts

Moderate, short-term, direct impacts to soils would occur during target structure and roadway construction. Areas sited for target structures, firebreaks, and roads would be cleared of vegetation, and earthmoving activities would be conducted, which would result in soil disturbance that would increase the potential for soil erosion by wind or water. Use of heavy equipment during construction activities could result in soil compaction, which could result in reduced soil productivity.

Moderate, short-term, direct impacts to soils would occur during construction of the new range compound facilities. Construction of the new range compound facilities may require vegetation clearing, grading or filling during construction of buildings, roads, parking areas and maintenance areas which would result in soil disturbance that would increase the potential for soil erosion. Minor, permanent, direct impacts to soils would occur from the construction of the new range compound facilities. Soils disturbed during construction of foundations for the new range facility buildings would remain in that condition for the life of the building.

Minor, short-term, indirect impacts would consist of transport of sediment from disturbed areas to adjacent areas.

Moderate, long-term, direct impacts to soils would occur from munitions delivery, road use, road and target maintenance, and EOD clearance. Each of these activities would result in soil disturbance that would increase the potential for soil erosion.

Table 3-90
Target Area Soil Resources

Soil Type	Target Area 1		Target Area 2		Target Area 3		Target Area 4		Target Area 5		Target Area 6		Target Area 7		Target Area 8	
	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total
Albany loamy fine sand, 0 to 2% slopes	8.4	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bayboro clay loam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	16.7	0.0	0.0	0.0	0.0	25.6	12.8
Bayboro loam	7.2	3.6	0.0	0.0	0.0	0.0	50.8	25.4	0.0	0.0	90.2	22.6	106.7	42.8	0.0	0.0
Bladen fine sandy loam	0.0	0.0	7.9	4.0	173.0	57.8	0.0	0.0	0.0	0.0	0.0	0.0	7.8	3.1	0.0	0.0
Bladen loam and clay loam	0.0	0.0	0.0	0.0	0.0	0.0	15.8	7.9	0.0	0.0	0.0	0.0	0.0	0.0	50.1	25.1
Bladen-Coxville fine sandy loams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.4	13.2	0.0	0.0	0.0	0.0	2.0	1.0
Cape Fear fine sandy loam	0.0	0.0	39.6	19.8	80.2	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunbar fine sandy loam, 0 to 2% slopes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.6	15.3	0.0	0.0	0.0	0.0	0.0	0.0
Eulonia-Fairhope fine sandy loams, 0 to 2% slopes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.1	8.1
Eulonia-Fairhope loamy fine sands, thick surfaces, 0 to 2% slopes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Eulonia-Fairhope loamy fine sands, thick surfaces, 2 to 5% slopes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Leon fine sand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	6.0
Lynchburg loamy fine sand, thick surface, clayey substratum, 0 to 2% slopes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	1.6	0.0	0.0	0.0	0.0	0.0	0.0
Mascotte fine sand	0.0	0.0	0.0	0.0	4.8	1.6	12.7	6.4	0.0	0.0	35.7	8.9	0.0	0.0	0.0	0.0
Ocilla loamy fine sand	0.0	0.0	0.0	0.0	0.0	0.0	12.8	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pooler fine sandy loam	184.1	92.2	133.1	66.6	27.4	9.1	107.6	53.9	0.0	0.0	147.1	36.8	11.7	4.7	0.0	0.0
Pooler-Bladen complex	0.0	0.0	0.0	0.0	14.1	4.7	0.0	0.0	0.0	0.0	106.7	26.7	123.3	49.4	0.0	0.0

Table 3-90
Target Area Soil Resources

Soil Type	Target Area 1		Target Area 2		Target Area 3		Target Area 4		Target Area 5		Target Area 6		Target Area 7		Target Area 8	
	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total
Wahee sandy loam	0.0	0.0	19.2	9.6	0.0	0.0	0.0	0.0	0.0	0.0	20.1	5.0	0.0	0.0	0.0	0.0
Weston loamy fine sand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.5	41.8	0.0	0.0	0.0	0.0	30.1	15.1
Weston loamy sand, thick surface	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5	10.3	0.0	0.0	0.0	0.0	36.0	18.0
Not Surveyed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.7	13.9
Totals	**199.7**	**100**	**199.8**	**100**	**299.5**	**100**	**199.7**	**100**	**199.8**	**100**	**399.8**	**100**	**249.5**	**100**	**199.6**	**100**

Table 3-91
Important Farmland in Target Areas

Farmland Category	Target Area 1		Target Area 2		Target Area 3		Target Area 4		Target Area 5		Target Area 6		Target Area 7		Target Area 8	
	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	% of Total
Prime Farmland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.1	8.1
Farmland of Statewide Importance	0.0	0.0	0.0	0.0	4.8	1.6	25.5	12.8	2.2	1.1	35.7	8.9	0.0	0.0	0.0	0.0
Totals	**0.0**	**0.0**	**0.0**	**0.0**	**4.8**	**1.6**	**25.5**	**12.8**	**2.2**	**1.1**	**35.7**	**8.9**	**0.0**	**0.0**	**16.1**	**8.1**

Reduction and Minimization of Impacts

Implementation of the Proposed Action would require acquisition of an NPDES permit. The NPDES permit would include an Erosion, Sedimentation, and Pollution Control Plan (ESPCP) which would identify measures to minimize impacts to soils, such as implementing BMPs and other erosion and sedimentation control measures. The BMPs and erosion and sedimentation control measures would be designed and implemented in accordance with the "Manual for Erosion and Sediment Control in Georgia" (Georgia Soil and Water Conservation Commission 2000). BMPs included in the ESPCP may include erosion-control matting, silt fencing, brush barriers, channel stabilization, storm drain inlet protection, temporary and permanent seeding, mulch application, and dust control. The application of any BMP would depend on specific ground conditions present in the areas disturbed by construction. The ESPCP also would require (during construction activities) the implementation of a temporary Spill Prevention, Control, and Countermeasures Plan to prevent and/or minimize release of hazardous materials onto ground surfaces. Following completion of construction activities, soil erosion would be minimized by reestablishing vegetation on areas disturbed during construction that would not be disturbed on an ongoing basis by range operations.

Long-term impacts to soils that would result from range support activities would be managed according to the TBR INRMP (MCAS Beaufort 2007). The INRMP includes the use of BMPs for all natural resource operations and includes a number of management actions intended to control soil erosion, based on the following principles:

- Minimizing areas of disturbance by leaving intact stream buffers, forest conservation areas, wetlands, highly erodible soils, steep slopes, environmental features, and stormwater filtration areas;
- Stabilizing and protecting disturbed areas that are highly susceptible to erosion as soon as possible;
- Minimizing runoff velocities;
- Protecting waterways and stabilizing drainage ways that are highly susceptible to erosion as soon as practicable;
- Retaining sediment within construction sites; and
- Reducing exposure time.

Action Alternatives

Alternative 1

Under Alternative 1, Target Areas 6, 7, and 8 would be constructed, and the existing range compound facilities and observation tower on TBR would be relocated to the northern corner of Area 1B (Figure 2-9). Construction of target structures, firebreaks, and roads would result in direct impacts to soil resources on approximately 206.65 acres, of which 17.36 acres would be direct impacts to important farmland, which consists of prime farmland (used for silvicultural purposes only) and farmland of statewide importance. Relocation of the range compound facilities and observation tower would result in direct impacts to soil on up to approximately 60 acres. Table 3-92 presents direct soils impacts for Alternative 1. Table 3-93 presents direct impacts to important farmland for Alternative 1. Potential impacts to soil in Target Areas 6, 7, and 8 are illustrated on Figures 3-48, 3-49, and 3-50, respectively.

Table 3-92
Alternative 1 - Direct Impacts to Soil Resources (in acres)

Target Area	Target Structures	Firebreaks	Roads	Total Impacts
6	54.77	18.93	0.56	74.26
7	54.28	14.91	1.79	70.98
8	47.81	13.31	0.29	61.41
Totals	**156.86**	**47.15**	**2.64**	**206.65**

Table 3-93
Alternative 1 - Direct Impacts to Important Farmland (in acres)

Target Area	Prime Farmland	Farmland of Statewide Importance	Total Impacts
6	0	6.93	6.93
7	0	0	0
8	10.43	0	10.43
Totals	**10.43**	**6.93**	**17.36**

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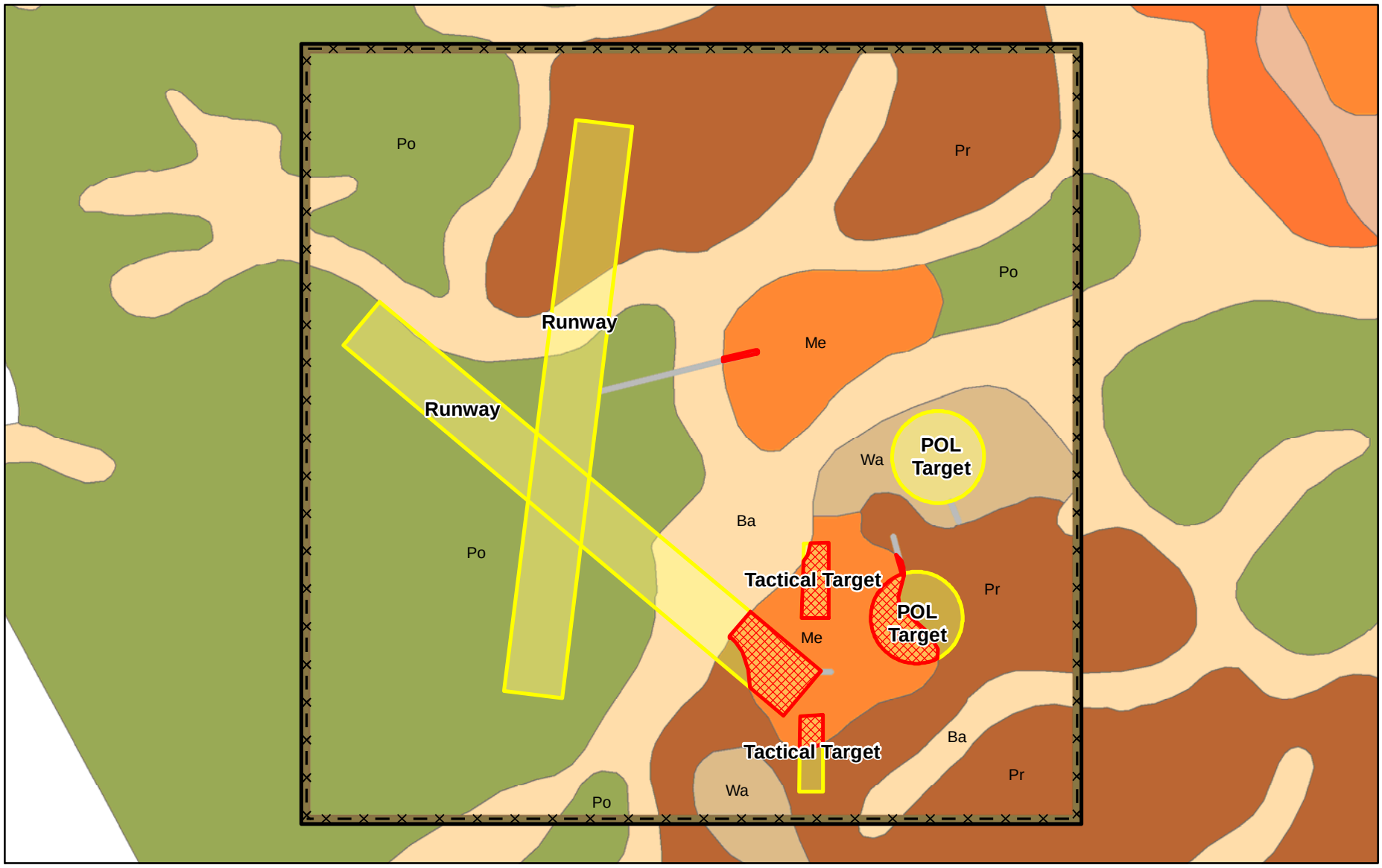

Farmland of Statewide Importance
Ba-Bayboro loam
Me-Mascotte fine sand
Po-Pooler fine sandy loam
Pr-Pooler-Bladen complex
Wa-Wahee sandy loam

Target Area
Target Structure
Firebreak
Fence Line
New Road
POL = Petroleum, Oil, and Lubricant

N

0 400 800 Feet

Figure 3-48
Target Area 6 Soil Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: NRCS 2002a, McFadden 2011

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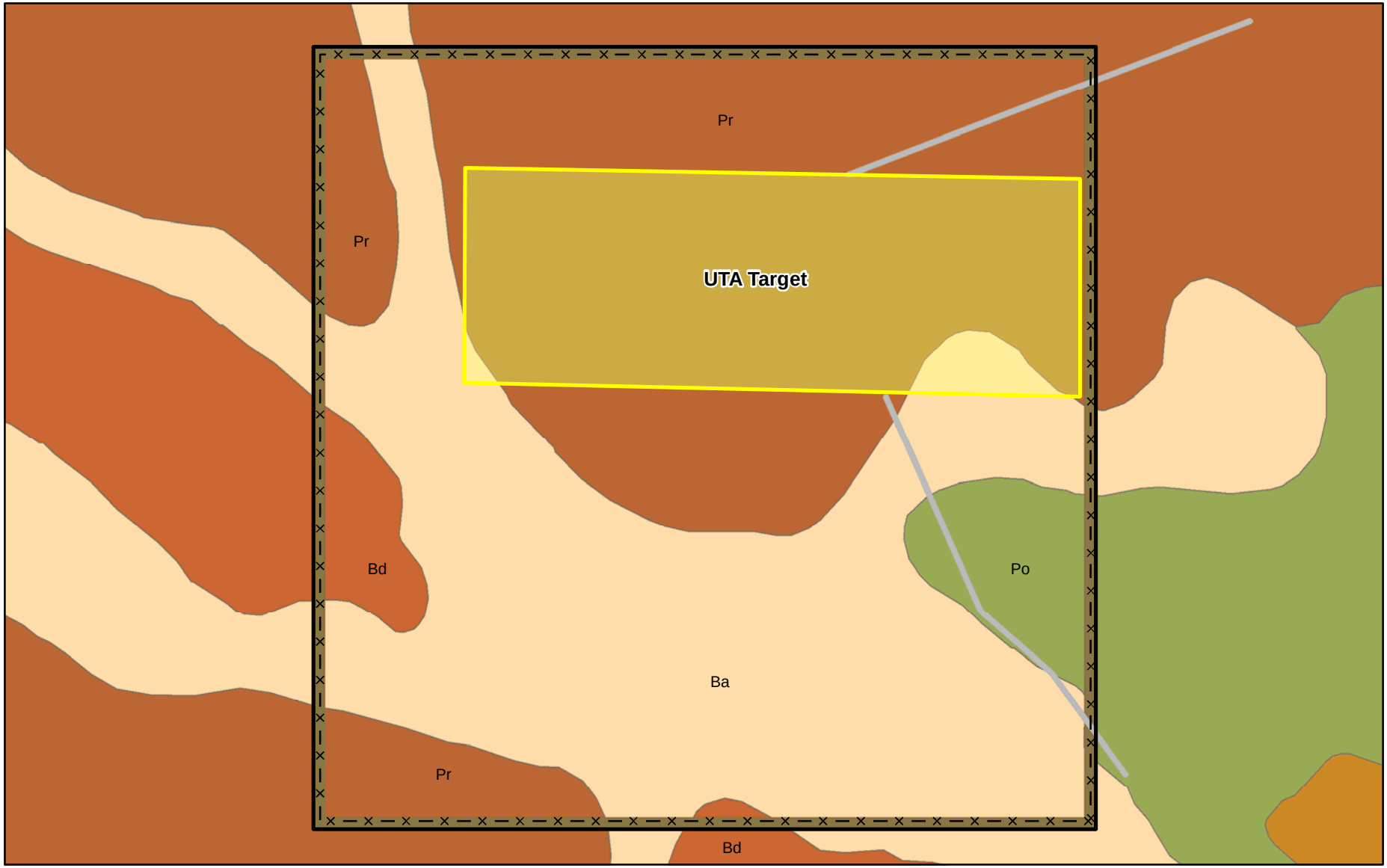

Ba-Bayboro loam
Bd-Bladen fine sandy loam
Po-Pooler fine sandy loam
Pr-Pooler-Bladen complex

Target Area
Target Structure
Firebreak
Fence Line

New Road
UTA = Urban Target Area

N

0 400 800 Feet

Figure 3-49
Target Area 7 Soil Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: NRCS 2002a, McFadden 2011

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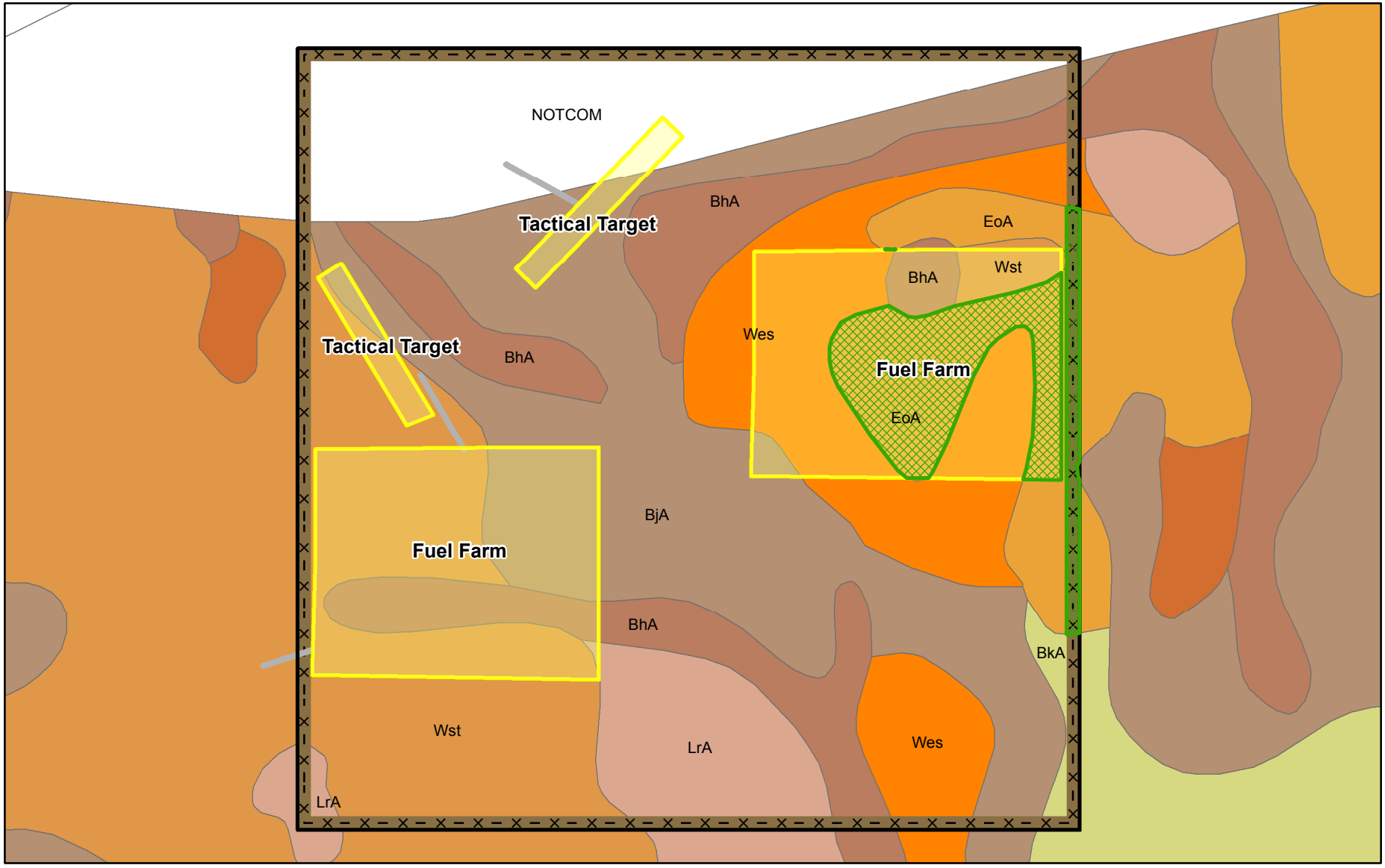

Prime Farmland
BhA-Bayboro clay loam
BjA-Bladen loam and clay loam
BkA-Bladen-Coxville fine sandy loams
EoA-Eulonia-Fairhope fine sandy loams, 0 to 2 percent slopes

LrA-Leon fine sand
NOTCOM-Not Complete
Wes-Weston loamy fine sand
Wst-Weston loamy sand, thick surface

Target Area
Target Structure
Firebreak
Fence Line
New Road

NOTCOM = Data not included in the NRCS soil survey

N

0 400 800 Feet

Figure 3-50
Target Area 8 Soil Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: NRCS 2002b, McFadden 2011

Alternative 2

Under Alternative 2, Target Areas 1, 2, 3, 4, and 5 would be constructed, and a new observation tower would be constructed in the southwestern corner of Area 3 (Figure 2-9). Construction of target structures, firebreaks, and roads would result in direct impacts to soil resources on approximately 173.75 acres, of which 8.07 acres would be direct impacts to important farmland, which consists of prime farmland (used for silvicultural purposes only) and farmland of statewide importance. Construction of a new observation tower would result in direct impacts to soil on up to approximately 60 acres. Table 3-94 presents direct soils impacts for Alternative 2. Table 3-95 presents direct impacts to important farmland for Alternative 2. Potential impacts to soil in Target Areas 1, 2, 3, 4, and 5 are illustrated on Figures 3-51 through 3-55, respectively.

Table 3-94
Alternative 2 - Direct Impacts to Soil Resources

Target Area	Target Structures	Firebreaks	Roads	Total Impacts
1	25.07	13.31	0.04	38.42
2	15.12	13.31	0.03	28.46
3	23.00	16.36	0	39.36
4	22.59	13.31	0	35.90
5	18.30	13.31	0	31.61
Totals	**104.08**	**69.6**	**0.07**	**173.75**

Table 3-95
Alternative 2 - Direct Impacts to Important Farmland

Target Area	Prime Farmland	Farmland of Statewide Importance	Total Impacts
1	0	0	0
2	0	0	0
3	0	1.37	1.37
4	0	5.59	5.59
5	0	1.12	1.12
Totals	**0**	**8.07**	**8.07**

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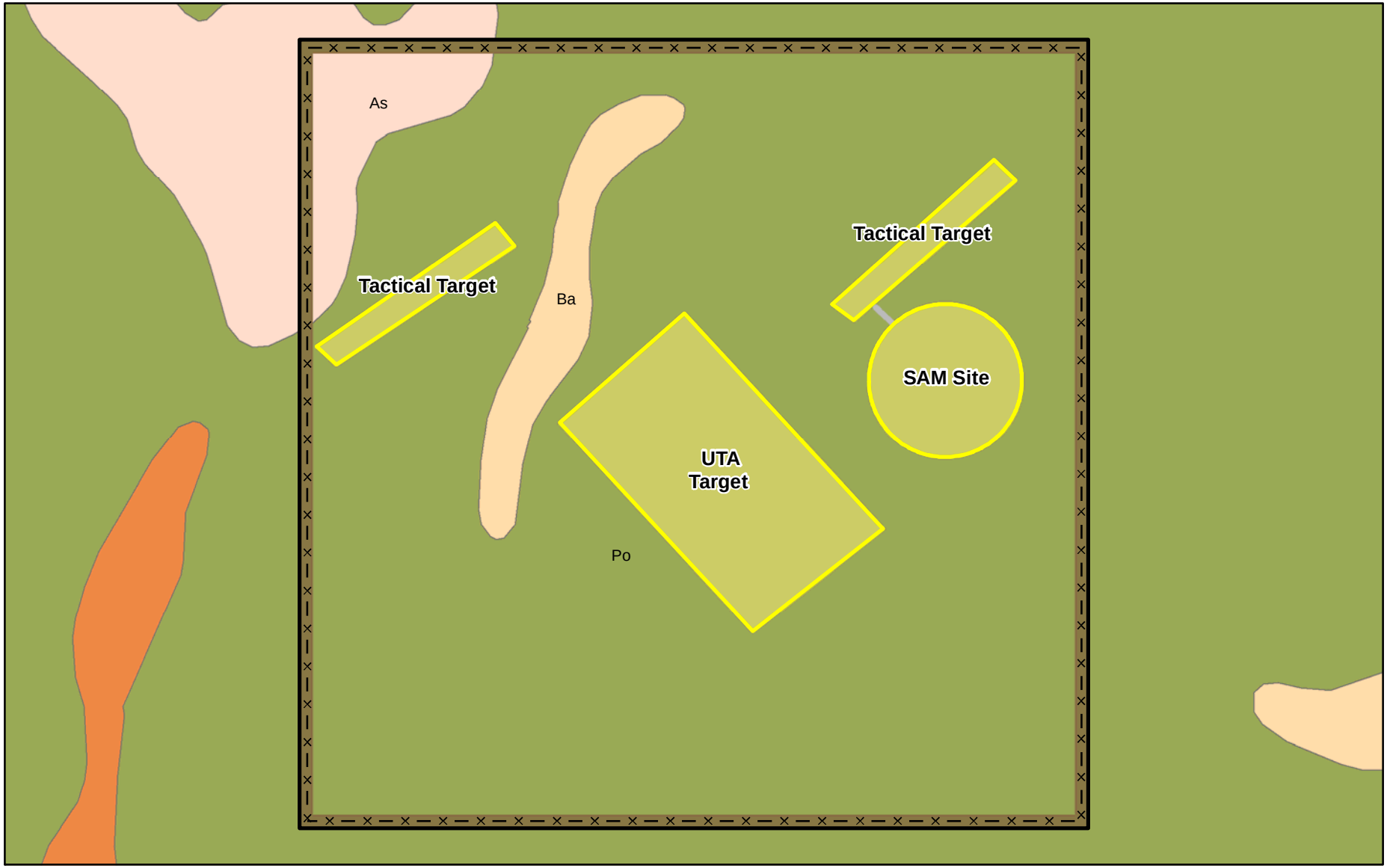


As-Albany loamy fine sand, 0 to 2 percent slopes
Ba-Bayboro loam
Po-Pooler fine sandy loam

Target Area
Target Structure
Firebreak

Fence Line
New Road

SAM = Surface-to-Air Missile
UTA = Urban Target Area

N

0 400 800 Feet

Sources: NRCS 2002a, McFadden 2011

Figure 3-51
Target Area 1 Soil Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Path: C:\GIS\Moore_Support\Townsend\Townsend\Townsend_PNS_Version\maps\mxd\ALL\Fig3-52_TargetArea2_Soil_Impacts.mxd

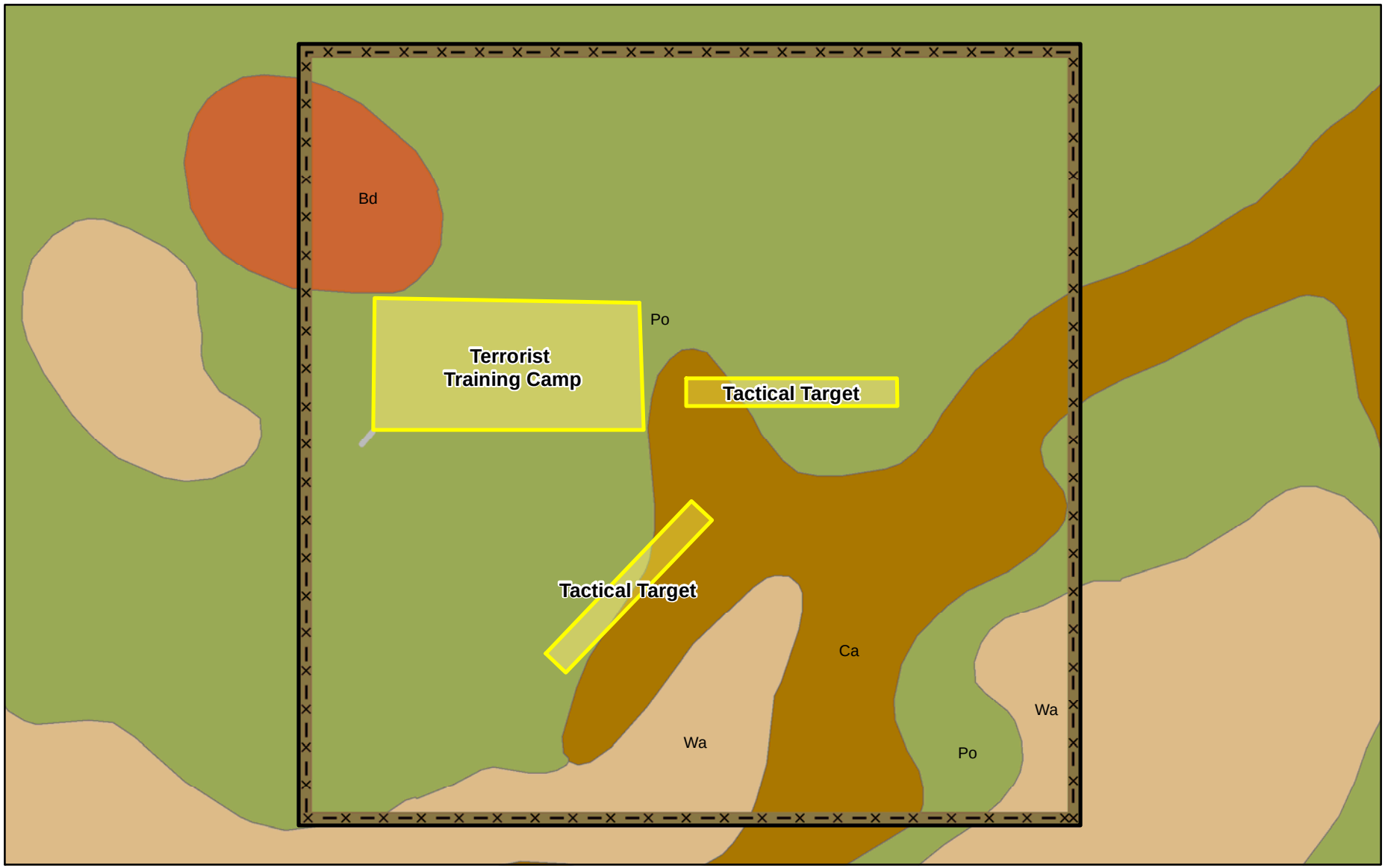
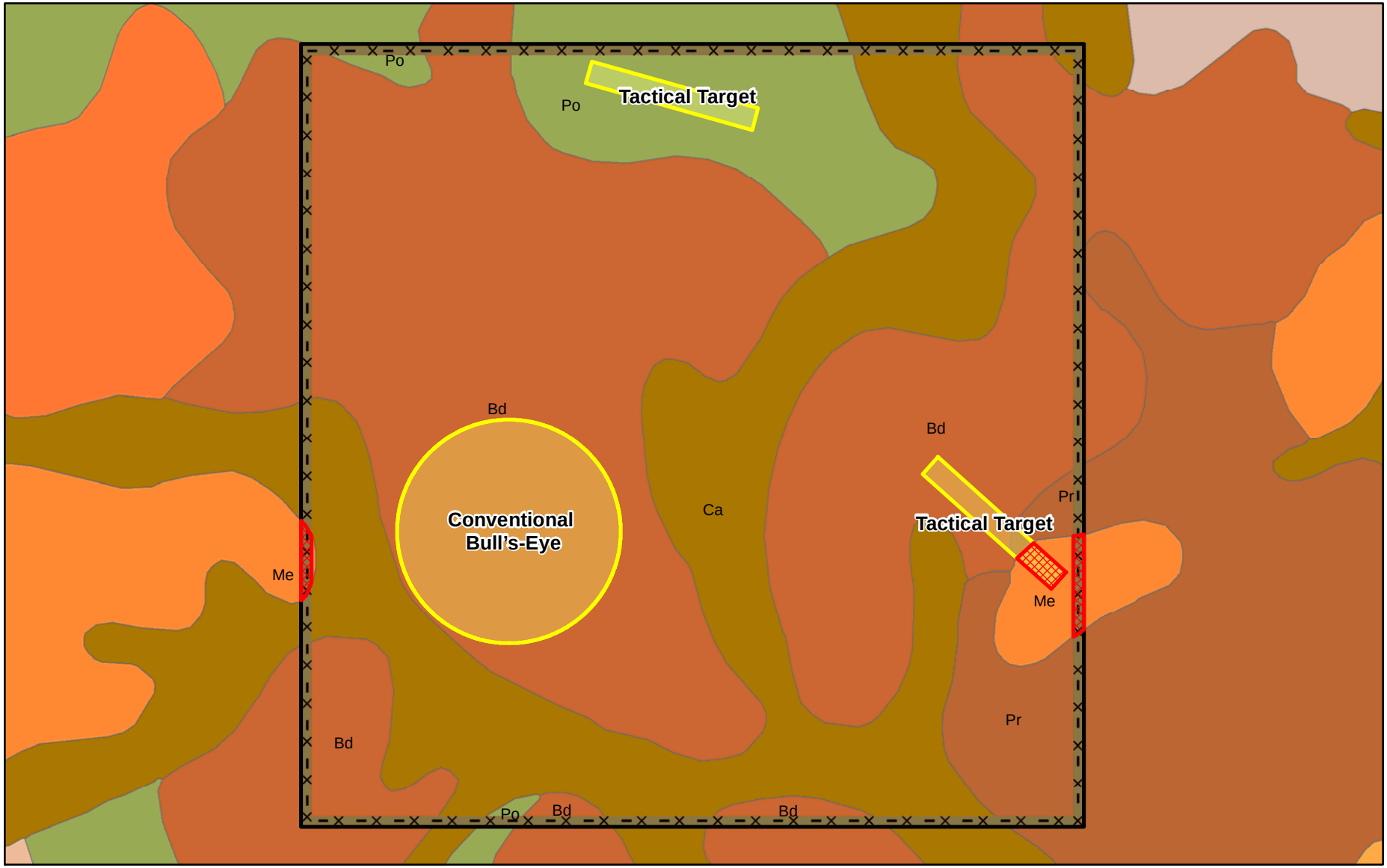


Figure 3-52
Target Area 2 Soil Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: NRCS 2002a, McFadden 2011



Farmland of Statewide Importance
Bd-Bladen fine sandy loam
Ca-Cape Fear fine sandy loam
Me-Mascotte fine sand
Po-Pooler fine sandy loam
Pr-Pooler-Bladen complex
Target Area
Target Structure
Firebreak
Fence Line

Figure 3-53
Target Area 3 Soil Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 400 800
Feet

Sources: NRCS 2002a, McFadden 2011

Path: C:\GIS\Moore_Support\Townsend\Townsend\Townsend_PNS_Version\maps\mxd\ALL\Fig3-54_TargetArea4_Soil_Impacts.mxd

- Farmland of Statewide Importance
- Ba-Bayboro loam
- Bd-Bladen fine sandy loam
- Me-Mascotte fine sand
- Oc-Ocilla loamy fine sand
- Po-Pooler fine sandy loam
- Target Area
- Target Structure
- Firebreak
- Fence Line

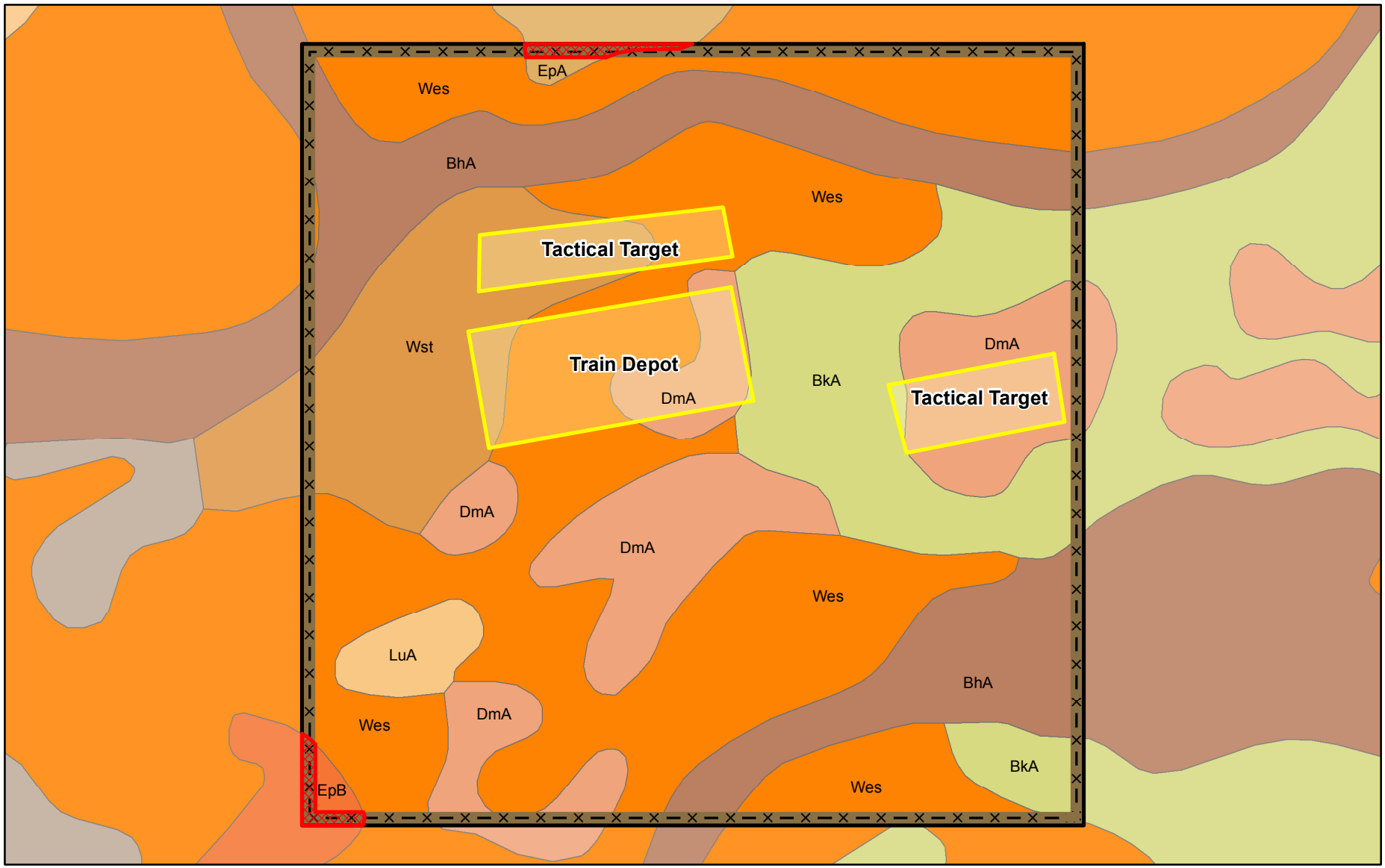
N

0 400 800 Feet

Figure 3-54
Target Area 4 Soil Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: NRCS 2002a, McFadden 2011

Path: C:\GIS\Moore_Support\Townsend\Townsend\Townsend_PNS_Version\maps\mxd\ALL\Fig3-55_TargetArea5_Soil_Impacts.mxd



Farmland of Statewide Importance
BhA-Bayboro clay loam
BkA-Bladen-Coxville fine sandy loams
DmA-Dunbar fine sandy loam, 0 to 2 percent slopes
EpA-Eulonia-Fairhope loamy fine sands, thick surfaces, 0 to 2 percent slopes
EpB-Eulonia-Fairhope loamy fine sands, thick surfaces, 2 to 5 percent slopes
LuA-Lynchburg loamy fine sand, thick surface, clayey substratum, 0 to 2 percent slopes
Wes-Weston loamy fine sand
Wst-Weston loamy sand, thick surface
Target Area
Target Structure
Firebreak
Fence Line

N

0 400 800 Feet

Figure 3-55
Target Area 5 Soil Impacts
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: NRCS 2002b, McFadden 2011

Alternative 3

Under Alternative 3, Target Areas 1, 2, 3, 4, 5, 6, 7, and 8 would be constructed, and a new observation tower would be constructed in the southwestern corner of Area 3 (Figure 2-9). Construction of target structures, firebreaks, and roads would result in direct impacts to soil resources on approximately 380.40 acres, of which 25.43 acres would be direct impacts to important farmland, which consists of prime farmland (used for silvicultural purposes only) and farmland of statewide importance. Construction of a new observation tower would result in direct impacts to soil on up to approximately 60 acres. Table 3-96 presents direct soils impacts for Alternative 3. Table 3-97 presents direct impacts to important farmland for Alternative 3. Potential impacts to soil in Target Areas 1, 2, 3, 4, 5, 6, 7, and 8 are illustrated on Figures 3-48 through 3-55.

Table 3-96
Alternative 3 - Direct Impacts to Soil Resources (in acres)

Target Area	Target Structures	Firebreaks	Roads	Total Impacts
1	25.07	13.31	0.04	38.42
2	15.12	13.31	0.03	28.46
3	23.00	16.36	0	39.36
4	22.59	13.31	0	35.9
5	18.30	13.31	0	31.61
6	54.77	18.93	0.56	74.26
7	54.28	14.91	1.79	70.98
8	47.81	13.31	0.29	61.41
Totals	**260.94**	**116.75**	**2.71**	**380.40**

Table 3-97
Alternative 3 - Direct Impacts to Important Farmland (in acres)

Target Area	Prime Farmland	Farmland of Statewide Importance	Total Impacts
1	0	0	0
2	0	0	0
3	0	1.37	1.37
4	0	5.59	5.59
5	0	1.12	1.12
6	0	6.93	6.93
7	0	0	0
8	10.43	0	10.43
Totals	**10.43**	**15.00**	**25.43**

Alternative 4

Under Alternative 4, Target Areas 1, 2, 3, 4, 5, and 8 would be constructed and a new observation tower would be constructed in the southwestern corner of Area 3 (Figure 2-9). Construction of target structures, firebreaks, and roads would result in direct impacts to soil resources on approximately 235.16 acres, of which 18.50 acres would be direct impacts to important farmland, which consists of prime farmland (used for silvicultural purposes only) and farmland of statewide importance. Construction of a new observation tower would result in direct impacts to soil on up to approximately 60 acres. Table 3-98 presents direct soils impacts for Alternative 4. Table 3-99 presents direct impacts to important farmland for Alternative 4. Potential impacts to soil in Target Areas 1, 2, 3, 4, 5, and 8 are illustrated on Figures 3-51 through 3-55 and 3-50, respectively.

Table 3-98
Alternative 4 - Direct Impacts to Soil Resources (in acres)

Target Area	Target Structures	Firebreaks	Roads	Total Impacts
1	25.07	13.31	0.04	38.42
2	15.12	13.31	0.03	28.46
3	23.00	16.36	0	39.36
4	22.59	13.31	0	35.90
5	18.30	13.31	0	31.61
8	47.81	13.31	0.29	61.41
Totals	**151.89**	**82.91**	**0.36**	**235.16**

Table 3-99
Alternative 4 - Direct Impacts to Important Farmland (in acres)

Target Area	Prime Farmland	Farmland of Statewide Importance	Total Impacts
1	0	0	0
2	0	0	0
3	0	1.37	1.37
4	0	5.59	5.59
5	0	1.12	1.12
8	10.43	0	10.43
Totals	**10.43**	**8.07**	**18.50**

Summary of Impacts

The greatest direct impacts to soil resources would occur under Alternative 3. The least direct impacts to soil resources would occur under Alternative 2. Direct impacts to soil resources under Alternatives 1 and 4 would be intermediate between the Alternative 2 and 3 impacts. Direct impacts to prime farmland (used for silvicultural purposes only) under Alternatives 1, 3, and 4 would be the same. No direct impacts to prime farmland would occur under Alternative 2. Alternative 3 would result in the greatest direct impacts to farmland of statewide importance. Impacts to farmland of statewide importance under Alternatives 1, 2, and 4 would be similar. However, potential impacts to soil resources under any of the action alternatives would be relatively minimal and therefore would not be significant. The direct impacts to soil resources for Alternatives 1 through 4 are summarized in Table 3-100. Direct impacts to important farmland for Alternatives 1 through 4 are summarized in Table 3-101.

Table 3-100
Summary of Direct Impacts to Soil Resources for Action Alternatives (in acres)

Alternative	Target Structures	Firebreaks	Roads	Total Impacts
1	156.86	47.15	2.64	206.65
2	104.08	69.60	0.07	173.75
3	260.94	116.75	2.71	380.40
4	151.89	82.91	0.36	235.16

Table 3-101
Summary of Direct Impacts to Important Farmland for Action Alternatives (in acres)

Alternative	Prime Farmland	Farmland of Statewide Importance	Total Impacts
1	10.43	6.93	17.36
2	0	8.07	8.07
3	10.43	15.00	25.43
4	10.43	8.07	18.50

No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. No direct impacts to soil resources other than the direct impacts resulting from current range operation and maintenance activities would occur. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.13 Utilities and Infrastructure

This section describes the built environment, which includes utility systems, facilities, and related infrastructure associated with the Proposed Action. Potential impacts from the development and use of the built environment are analyzed for each alternative, including the No Action Alternative.

3.13.1 Definition of Resource

For the purpose of the impact analysis, utility systems include infrastructure for the collection, conveyance, and/or disposal of potable water, wastewater, stormwater, and solid waste, as well as telecommunications and electricity/natural gas transmission systems. Range infrastructure refers to mission- and training-related structures such as buildings, fixed/movable targets, and other physical infrastructure in support of military activities.

3.13.2 Regulatory Framework

3.13.2.1 Federal

Potable Water and Wastewater

The Safe Drinking Water Act (42 U.S.C. §300f et seq. [1974]) was established to protect the quality of water drawn from above and (as amended) underground potable water sources. The Act grants the USEPA authority to enforce standards for the protection of underground sources of drinking water. The Act does not, however, regulate private wells that serve fewer than 25 individuals (USEPA 2004a). Operations that use septic systems capable of handling the sole sanitary waste of more than 20 persons per day (40 CFR 144.81[9]) are subject to federal or state underground injection control regulations established by the Act (USEPA 2004b).

Section 108 of the Federal Facilities Compliance Act (October 6, 1992, Public Law 102-386) contains provisions for the regulation of federally owned treatment works (FOTW). The Federal Facilities Compliance Act provides that FOTWs complying with the pre-treatment standards contained in Section 307 of the CWA (33 U.S.C. §1251 et seq. [1972]) and similar standards are excluded from regulation under the Resource Conservation and Recovery Act (RCRA; 42 U.S.C. §6901 et seq. [1976]). (USEPA 2010)

Stormwater

The CWA addresses pollutant discharges into the navigable waters of the U.S. through the enforcement of surface water quality standards. Point and non-point source pollutant discharges into CWA-defined surface waters are regulated through the CWA NPDES permit program. The USEPA Construction General Permit (CGP) addresses stormwater discharges from construction activities that disturb 1 or more acres, or smaller sites that are part of a larger common plan of development or sale. NPDES CGP permits are administered by authorized states, including Georgia, or the USEPA, depending on the location of a construction site (USEPA 2011a).

Solid Waste

Under the Federal Facilities Compliance Act, all federal agencies are subject to the substantive and procedural requirements of all applicable federal, state, and local solid waste laws (Department of Energy 2011). RCRA regulates the management of hazardous waste from “cradle-to-grave” – generation, transportation, treatment, storage, and disposal. It establishes a framework for the management of non-hazardous solid waste under Subtitle D of the Act.

Telecommunications

The Federal Communications Commission (FCC) was established by the Communications Act of 1934 and operates as an independent U.S. government agency with Congressional oversight. The 1934 public law that created the FCC was most recently amended by the Telecommunications Act of 1996. The FCC regulates interstate and international communications by radio, television, wire, satellite and cable in all 50 states, the District of Columbia and U.S. territories (FCC n.d.).

Electricity / Natural Gas

The Federal Energy Regulatory Commission (FERC), an independent agency that regulates the interstate transmission of electricity, natural gas, and oil, was created by the Department of Energy Organization Act (1977). The agency's broad authority to regulate energy production, storage, processing, and distribution comes from the Federal Power Act (1935), the Natural Gas Act (1938), the Public Utility Regulatory Policies Act (1978), the Energy Policy Act of 1992, and the Energy Policy Act of 2005 (Georgia Environmental Finance Authority n.d.). The Energy Policy Act of 2005 granted the FERC rulemaking authority to:

- Prevent market manipulation in wholesale power and gas markets, and in electric transmission and gas transportation services;
- Oversee mandatory reliability standards governing the nation's electrical grid;
- Assess civil penalties for violations of the applicable energy statutes; and to
- Approve the siting of transmission facilities under certain circumstances (traditionally a matter of state or local jurisdiction) **(**Pillsbury Winthrop Shaw Pittman, LLP 2010).

The FERC also has an oversight role for interstate transmission systems with respect to environmental matters. Many areas outside of FERC jurisdiction are dealt with by State Public Utility Commissions (FERC 2012).

Range Infrastructure

EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance (October 2009), establishes federal government policy to increase energy efficiency; conserve and protect water resources; eliminate waste and prevent pollution; and develop and operate buildings in a cost-effective, sustainable manner. Military Standard 3007 (MIL-STD-3007), "Department of Defense Standard Practice for Unified Facilities Criteria and Unified Facilities Guide Specifications," defines procedures for the ongoing development of planning, design, construction, and operation and management criteria for DOD components and participating organizations (National Institute of Building Sciences 2011). Unified Facilities Criteria (UFCs) apply to all construction, repair and maintenance projects including those associated with the Proposed Action.

All UFCs are developed and implemented consistent with applicable public laws, executive orders, federal regulations, and DOD Instructions and Directives. The Proposed Action would be consistent with UFC 2-000-05N, "Facility Planning for Navy and Marine Corps Shore Installations," including the following criteria organized by category codes or series:

- ***100 Series.*** Operational and Training Facilities;
- ***400 Series.*** Supply Facilities;
- ***600 Series.*** Administrative Facilities;
- ***700 Series.*** Housing and Community; and

- ***800 Series.*** Utilities and Ground Improvements (NAVFAC 2005).

3.13.2.2 State and Local

Potable Water and Wastewater

Regional commissions have been established to coordinate water resources planning with the GA DCA. There are 12 such commissions in Georgia, including the Coastal Regional Commission which encompasses McIntosh and Long Counties (GA EPD 2010a). Potable water and wastewater systems in Georgia are subject to state and regional water management plans and policies.

The GA EPD adopted the Coastal Georgia Water and Wastewater Permitting Plan for Managing Salt Water Intrusion in 2006. The plan guides all water and wastewater permitting for a 24-county coastal area and establishes three sub-regions for this purpose. The sub-regions are defined based on vulnerability to saltwater intrusion. The counties associated with the Proposed Action (McIntosh and Long) are part of Sub-Region 3, which includes 19 counties (and a portion of Effingham County north of Highway 10) (GA EPD 2007). Additionally, the GA EPD and the Georgia Department of Human Resources, Office of Facilities and Support Services, both provide general guidance, provisions, and regulations for the withdrawal and use of groundwater for community and private well systems in the state (Thomas & Hutton Engineering and PBS&J 2009).

Stormwater

Construction associated with the implementation of the Proposed Action would require regulatory compliance for the control of stormwater runoff from disturbed sites. The GA EPD (re)issued NPDES General Permits numbers GAR100001, GAR1100002, and GAR100003 for stormwater discharges associated with construction activity in 2008. The Georgia Stormwater Management Manual (also termed the "Blue Book") and its Coastal Stormwater Supplement (2009) guide stormwater management efforts associated with the land development process (GA EPD 2011b).

Solid Waste

The Georgia Comprehensive Solid Waste Management Act requires the GA DCA, in cooperation with the GA EPD and Environmental Finance Authority, to report on the status of local and regional solid waste management on an annual basis. The annual report includes the number and types of solid waste handling facilities in the state, and the remaining capacity of each permitted solid waste handling facility (GA EPD 2011c).

Telecommunications/Electricity/Natural Gas

As noted in Section 3.13.2.1, there are many areas where FERC jurisdiction is delegated to State Public Utility Commissions, including the following (as well as other state-level mandates):

- Regulation of retail electricity and natural gas sales to consumers;
- Approval for the physical construction of electric generation facilities;
- Regulation of local distribution pipelines of natural gas; and
- Reliability problems related to failures of local distribution facilities (FERC 2012).

The Georgia Public Service Commission (GPSC) regulates electricity, natural gas, and telecommunications systems at the state level. Whether or not a utility is regulated by the GPSC is determined by the type of service and whether the utility is owned by investors. More specifically, the GPSC regulates the rates charged and the services provided by most intrastate, investor-owned telecommunications, natural gas, and electric utilities operating in Georgia. Additionally, the GPSC

enforces safety regulations, reviews long-range planning documents for service areas under its jurisdiction, and oversees the process by which energy/telecommunication companies acquire new assets (e.g., generation capacity or pipeline capacity). The GPSC has limited regulatory authority (e.g., territorial disputes) over publicly owned, non-profit utilities such as electric membership corporations and municipal-owned utility systems that are largely self-regulated by an appropriate governing body (e.g., local government or similar governing body) (Georgia Environmental Finance Authority n.d.).

As an investor-owned electric utility company, Georgia Power Company is subject to GPSC regulatory authority for electricity and natural gas services. One investor-owned natural gas distribution company, Atmos Energy Company, is regulated by the GPSC; the Commission also regulates the pipeline and distribution charges of Atlanta Gas Light under the provisions of the Natural Gas Competition and Deregulation Act (1997). In total, GPSC has authority over an estimated 36,000 miles of gas distribution and transmission lines (GPSC 2012).

3.13.3 Affected Environment

3.13.3.1 Regional Setting

Potable Water and Wastewater

The water resources of coastal Georgia include the Upper Floridan aquifer, an important source of groundwater along the southeastern Atlantic Seaboard, and the lower portions of five major river basins, the Savannah, Ogeechee, Altamaha, Satilla, and St. Mary's. The Upper Floridan aquifer has experienced lateral saltwater intrusion in the Hilton Head, South Carolina, area from overuse of the aquifer in/around Savannah, Georgia. As such, the aquifer is subject to withdrawal limits in several of the state's more urbanized areas. Average per capita water use in the Georgia coastal region is significantly lower than that for the state as a whole and primarily is associated with industrial and recreational activities.

State-defined service delivery areas provide the framework for potable water and wastewater systems and operations in Georgia. With respect to the Proposed Action, the nearby metropolitan areas of Savannah, Statesboro, Hinesville, and Brunswick, Georgia, maintain and operate large municipal water and wastewater systems. The only publicly operated water and wastewater facilities in McIntosh and Long Counties provide service to the City of Darien and the City of Ludowici, Georgia, respectively. Many parts of southeastern Georgia, including the location of the Proposed Action, rely on private groundwater wells and septic systems (CGRDC 2009).

According to the Coastal Georgia Water, Sewer and Storm Inventory (Thomas & Hutton Engineering and PBS&J 2009), the permitted water capacity for McIntosh County is 1.0 million gallons per day (mgd) with actual usage estimated at 0.3 mgd. The available capacity is estimated at approximately 0.70 mgd or 2,350 equivalent residential units. The inventory denotes water capacity data for Long County as "not applicable" or as having not established a permitted water capacity. Additionally, the inventory denotes wastewater capacity for the counties of McIntosh and Long as "not applicable" due to the absence of such facilities in the unincorporated areas of each respective county.

Stormwater

Stormwater infrastructure in the Georgia coastal region is generally limited to select metropolitan areas such as Savannah and Brunswick. McIntosh and Long Counties do not currently manage or maintain stormwater infrastructure (Thomas & Hutton Engineering and PBS&J 2009).

Solid Waste

Numerous public and private solid waste facilities are located in the Georgia coastal region. According to the Coastal Georgia Water, Sewer, and Storm Inventory (Thomas & Hutton Engineering and PBS&J 2009), remaining permitted capacity for the region for the municipal solid waste landfill is

approximately 22 years; construction and demolition (C&D) waste for the region has remaining permitted capacity of approximately 330 years (Thomas & Hutton Engineering and PBS&J 2009).

McIntosh County has one municipal landfill, the 16-acre King Road Municipal Landfill, which was permitted in 1990 (# 098-003D[SL]) and is located approximately 5 miles southeast of TBR. The landfill is expected to remain operational until 2027 (CGRDC 2007) with a remaining capacity of approximately 576,070 cubic yards (Thomas & Hutton Engineering and PBS&J 2009). McIntosh County is also permitted for a 20-acre inert landfill at the same location for the disposal of non-municipal waste, such as yard waste and construction debris (CGRDC 2007). No solid waste landfills are currently located in Long County. Solid waste from Long County is disposed of at the King Road Municipal Landfill.

Telecommunications

The Georgia coastal region, compared to the state's more urbanized areas, has a relatively limited amount of telecommunications infrastructure. Telephone service providers in Long County currently include Windstream Communications, Inc. and CenturyLink, Inc. The Darien Telephone Company, Inc. provides telephone service to all McIntosh County residents. (Georgia Telecommunications Association n.d.)

Electricity / Natural Gas

Electrical service in the Georgia coastal region is provided primarily by Georgia Power Company. In 2010, the company provided service to approximately 278,117 customers within the region and maintained an operational capacity of approximately 2,122,037 kilowatts of power (Georgia Power Company 2010).

3.13.3.2 Townsend Bombing Range

Potable Water and Wastewater

The existing facilities and training areas at TBR are supported by a groundwater well located adjacent to the existing administrative buildings in the cantonment area. An on-site storage tank with a capacity of approximately 900 gallons provides water for firefighting purposes (MCAS Beaufort 2008). Approximately 2,000 gallons of potable water per day are currently withdrawn from the well for use by 15 range personnel. A septic system is used to manage wastewater.

Stormwater

There is currently no stormwater infrastructure associated with TBR.

Solid Waste

All non-hazardous solid waste generated from training and operations at TBR is disposed of at the King Road Municipal Landfill described above.

Telecommunications

The Long County Commission recently approved four proposed cellular towers. One location is unknown, but the other proposed locations are: (1) Moody Bridge Road (310 feet AGL); (2) Ludowici (310 feet AGL); and (3) Old Barrington Road (360 feet AGL) (Figure 3-56; Howard 2011b).

In McIntosh County, two FCC-registered antenna towers are in proximity to the Proposed Action, both of which are located along the I-95 corridor and close to the City of Darien. Additionally, two FCC-registered cellular towers are located east of I-95 in the same general area (City-data.com 2009).

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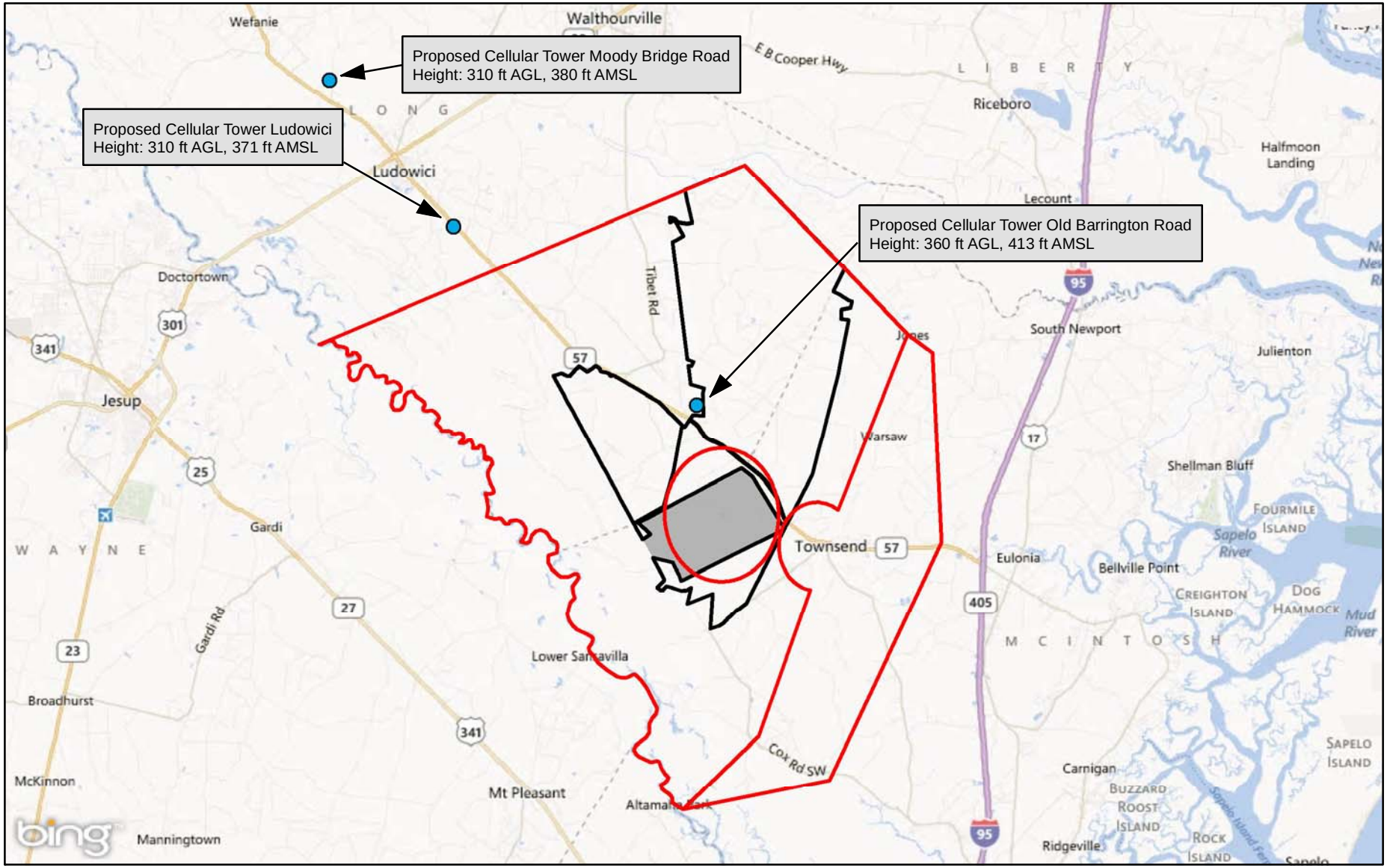

Acquisition Areas
Existing Range Boundary
Proposed Cellular Tower
Restricted Airspace

ft AGL = feet above ground level
ft AMSL = feet above mean sea level

Figure 3-56
Proposed Cellular Tower Locations
Townsend Bombing Range
McIntosh and Long Counties, Georgia

0 2.5 5 Miles

Sources: Esri 2009a,
Based on Lusk 2009, Howard 2011

Electricity/Natural Gas

Currently, two Georgia Power Company electric distribution lines and a Southern Natural Gas pipeline are located in the vicinity of TBR (see Figure 2-18). A utility corridor located east of TBR contains one of the electrical distribution lines and the natural gas pipeline, while the other power distribution line borders a portion of TBR's western-southwestern boundary where it enters McIntosh County from Long County (MCAS Beaufort 2008). The existing range cantonment area and associated facilities are connected to the Georgia Power Company electrical grid (Georgia Power Company 2010).

Range Infrastructure

There are currently 21 buildings or structures located on TBR that total approximately 13,900 square feet in area and support an estimated 16 assigned personnel. The primary operational support facilities include:

- Building 5003 (personnel/administrative/maintenance);
- Building 5001 (administrative/storage/morale, welfare, and recreation);
- Building 5020 (main control tower);
- Building 5019 (restroom facilities);
- Buildings 5016 and 5006 (maintenance/storage); and
- Building 5004 (flank tower) (MCAS Beaufort 2008).

Section 3.6 describes the existing target areas, training structures, and infrastructure.

3.13.4 Environmental Consequences

3.13.4.1 Methodology and Evaluation Criteria

The criteria used to evaluate potential impacts to the built environment systems, structures, and infrastructure includes, but is not limited to, the following:

- Existing physical condition;
- Existing and future capacity; and
- Compliance with applicable laws and regulations.

The built environment includes utility systems, facilities, and related infrastructure that may be affected under each of the action alternatives. Section 3.13.4.3 evaluates the potential adverse impacts to the built environment associated with the Proposed Action.

3.13.4.2 Common Elements Among the Action Alternatives

The following utility and infrastructure systems have common elements associated with the Proposed Action that do not require further analysis under each of the respective action alternatives. That is, the scope and extent of potential adverse impacts to the following utility and infrastructure systems would be similar in nature under each action alternative, and all potential impacts were determined to be either non-existent or minimal to negligible based on established standards and best practice.

Potable Water and Wastewater

All potable water and wastewater requirements associated with the Proposed Action would rely on separate systems developed, operated, and maintained by the USMC. Both the quantity and quality of

potable water in the Georgia coastal region is sufficient to support water/wastewater needs under each alternative. As described in Section 3.13.2.2, the action alternatives would be located within the Coastal Georgia Water and Wastewater Permitting Plan, Sub-Region 3, which allows for the continued use of the Upper Floridan aquifer based on real-time conditions. That is, McIntosh and Long Counties are not part of any State-administered moratorium areas that place restrictions on the quantity of groundwater withdrawals.

Projected water use under each alternative would depend on its intended purpose; that is, for training and operations support (e.g., target/equipment maintenance, firefighting, and similar) or for day-to-day operations (e.g., potable, sewage, landscape maintenance, and similar). Water use associated with training and operations, to some extent, would be a function of the amount of land area acquired under each alternative. Domestic water use under each alternative, however, would be based on a minor increase to personnel and related facilities. The Proposed Action could increase the number of range personnel, depending on the alternative selected, by approximately 8 to 14 people. Therefore, there may be 23 to 29 personnel at an expanded range. Approximately 2,000 gallons of potable water per day are currently withdrawn from the well for use by 15 range personnel. Groundwater withdrawal is not expected to exceed the permit threshold of 100,000 gallons per day. Therefore, each action alternative would have a minimal impact on the estimated 0.70 mgd available water capacity for McIntosh County; Long County does not currently have a permitted water capacity. If the ROD calls for the acquisition of property, the USMC would continue to consult with GA DNR and the Environmental Protection Division's Watershed Protection Branch to ensure all required permits are obtained.

Each alternative would be consistent with state guidelines for water supply wells such as minimum distances from septic tanks (50 feet); septic tank absorption fields (100 feet); sewers (10 feet); and solid waste disposal sites (1,000 feet). Additionally, no wells would be located within any FEMA-defined floodplains. All site determinations, design criteria, and operation and maintenance associated with each alternative would be consistent with the applicable USMC UFC for water supply systems.

McIntosh and Long Counties do not currently have permitted wastewater capacity. Under each alternative, site locations and design criteria for wastewater storage and/or treatment infrastructure (i.e., septic systems) would be determined by local conditions. All site determinations, design criteria, and operation and maintenance would be consistent with the applicable USMC UFC for wastewater treatment systems.

Stormwater

Under each alternative, stormwater discharges associated with construction activities would comply with the requirements of the CWA NPDES permit program as administered by the GA EPD.

Solid Waste

Solid waste generated under each alternative would increase during construction activities before returning to near baseline levels over the long-term. Each alternative includes the construction and maintenance of mission support facilities and infrastructure that would increase C&D waste in the short-term. Solid waste generated from training and operations under each alternative would represent only a slight increase under each alternative. The Georgia coastal region has remaining public C&D capacity of more than 26 million cubic yards and a municipal solid waste capacity of more than 20 million cubic yards (GA DCA 2010b). Therefore, adverse impacts to solid waste disposal associated with each of the action alternatives would be short-term and minimal.

Telecommunications

Under each action alternative, potentially adverse impacts would be associated with aircraft operations in close proximity to telecommunications infrastructure. The modernization and expansion of TBR would alter the location and frequency of aircraft maneuvers in and around the range. New training curriculums would alter aircraft ingress/egress routes, altitudes, distances (from target), and similar

variables such that there would be more potential for safety hazards associated with the location of existing or proposed telecommunications infrastructure.

Electricity/Natural Gas

Facility Use

The electrical/natural gas needs associated with proposed facilities for Alternatives 1 through 4 would represent only a slight increase in demand from an associated increase in personnel. Electricity requirements for training and operations infrastructure would be met by solar power or commercial power, but would have a backup generator. Alternative 4 would not involve any new facility construction or significant increases to the electrical/natural gas demand.

Rights-of-Way

As described in Section 3.13.3.2, two utility ROWs are located near TBR, one of which briefly parallels its southwestern boundary in McIntosh County. Depending on the alternative selected, the ROW corridors would parallel a portion of the expanded range (Figure 2-18). The Proposed Action does not include the acquisition of the power lines or the current utility ROWs. No utility transmission lines or associated ROWs would be affected by the Proposed Action. Relocation of lines would not be required and access to ROWs and easements would not be hindered. Therefore, service reliability would not be affected by the Proposed Action. Utility ROWs on or adjacent to active military lands are generally viewed as compatible land uses that provide a net public benefit.

Range Infrastructure

Facility Construction

Facility construction associated with Alternative 1 would involve approximately 60 acres of land area associated with the proposed relocation of the existing range facilities to the northern corner of Area 1B (Figure 2-9). Under Alternatives 2, 3, and 4, a new observation tower would be constructed in the southwestern corner of Area 3 (Figure 2-9). The development footprint under each of these action alternatives would be approximately 13,900 square feet. Additionally, all facility construction would comply with UFC 3-600-01 (Design: Fire Protection Engineering for Facilities) and UFC 4-010-01 (Design: DOD Minimum Antiterrorism Standards for Buildings). New facility construction would be associated with Alternative 4.

Target Instrumentation

Each of the action alternatives would include site preparation and construction of range infrastructure/instrumentation such as those associated with weapons scoring, target illumination, and video surveillance. The target sites associated with the Proposed Action would require space for the construction of control towers, equipment storage facilities, and target arrays. Each site would attach to a single mode fiber-optic line connecting the individual target areas to the range operations center which, as previously discussed, is proposed to be relocated to either the northern corner of Area 1B or remain in its current location. These various range system components would be used to evaluate air-to-ground training exercises, for battle damage assessment, and for safety purposes. Under each of the action alternatives, the majority of range infrastructure would be located at the edge of target areas in order to reduce tree obstruction. Range system components include the following:

- ***Weapon Impact Scoring System (WISS).*** A bomb scoring system used for the evaluation and feedback of ordnance delivery to target (all Target Areas);
- ***Tactical Area Safety Surveillance System (TASSS).*** A full coverage (i.e., 360 degrees) video safety surveillance (all Target Areas);
- ***Moving Improved Remote Strafe Scoring System (MIRSSS).*** A remote controlled target array used for "strafe" exercises (Target Area 5 only);

- ***Range Safety Lighting System (RSLS).*** A perimeter target lighting safety system that defines the target area perimeter and targets on the range (all Target Areas);
- ***Single mode fiber-optic lines.*** Lines that interconnect with towers located on the target sites and extend to connection points at the range operations center.

Prior to the installation of target instrumentation, each action alternative would require the installation of new equipment at the range operations center, as well as the fiber-optic lines that would connect to the proposed target sites. All new fiber-optic lines would be, to the extent practicable, placed on forest roadways, co-located with existing underground utilities, or within other previously disturbed areas (Naval Surface Warfare Center 2012).

3.13.4.3 Action Alternatives

Alternative 1

The selection of Alternative 1 would include upgrades to existing instrumentation on TBR, such as the WISS towers, the Improved Remote Strafe Scoring System (IRSSS), and the MIRSSS. Equipment upgrades under Alternative 1 would include the establishment of one TASSS node on an existing flank tower and 15 RSLS units covering the existing range perimeter.

Under Alternative 1, the acquisition of Areas 1A and 1B would include site preparation and construction of range infrastructure/instrumentation for Target Areas 6, 7, and 8. Infrastructure/ instrumentation associated with these target areas would include approximately 10 WISS towers; 10 equipment shelters; 12 RSLS units; 10 solar power subsystems or equivalent commercial power systems; and four associated TASSS nodes. Impacts to utility systems would be the same for each alternative and are outlined in Section 3.13.4.2.

Alternative 2

Under Alternative 2, the acquisition of Area 3 would include site preparation and construction of range infrastructure/instrumentation for Target Areas 1 through 5. Infrastructure/instrumentation associated with these target areas would include approximately 12 WISS towers; 12 equipment shelters; 20 RSLS units; 12 solar power subsystems or equivalent commercial power systems; 2 MIRSS tracks; and 6 associated TASSS nodes. Impacts to utility systems would be the same for each alternative and are outlined above in Section 3.13.4.2.

Alternative 3

Under Alternative 3, the acquisition of Areas 1A, 1B, and 3 would include site preparation and construction of range infrastructure/instrumentation for Target Areas 1 through 8. Infrastructure/ instrumentation associated with these target areas would include approximately 22 WISS towers; 22 equipment shelters; 32 RSLS units; 22 solar power subsystems or equivalent commercial power systems; 2 MIRSS tracks; and 10 associated TASSS nodes. Impacts to utility systems would be the same for each alternative and are outlined in Section 3.13.4.2.

Alternative 4

Under Alternative 4, the acquisition of Areas 1B and 3 would include site preparation and construction of range infrastructure/instrumentation for Target Areas 1 through 5 and 8. Infrastructure/instrumentation associated with these target areas would include approximately 16 WISS towers; 16 equipment shelters; 24 RSLS units; 16 solar power subsystems or equivalent commercial power systems; 2 MIRSS tracks; and 8 associated TASSS nodes (Naval Surface Warfare Center 2012). Impacts to utility systems would be the same for each alternative and are outlined in Section 3.13.4.2.

Summary of Impacts

Each of the action alternatives would have minimal impacts on utilities, such as potable water, wastewater, stormwater, solid waste, electricity/natural gas, and telecommunications as a result of increased personnel at TBR. However, because the increase in personnel under each of the action alternatives would be minimal, the existing utility systems in McIntosh and Long Counties would be able to absorb increases in usage and demand upon these utilities. As such, the impacts to utility systems would not be significant under any of the action alternatives. Similarly, there would be an increase of range infrastructure under each of the action alternatives to varying extents. However, all required infrastructure would be confined to the revised boundary of TBR (depending on the alternative selected) and as previously mentioned, would not have any significant effects to utility systems in McIntosh and Long Counties.

3.13.4.4 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. There would be no additional demand on utility systems or facilities and related infrastructure beyond current levels of use. Baseline utilization of resources such as water, energy, and landfill space would not be impacted. In addition, no facility construction or infrastructure development (and maintenance) would be associated with the No Action Alternative. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

3.14 Hazardous Materials and Waste

This section describes existing hazardous materials and wastes within and near TBR, including the proposed acquisition areas, and evaluates potential hazardous materials and wastes impacts under each alternative, including the No Action Alternative.

3.14.1 Resource Definition

Hazardous materials, as defined under the Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (EPCRA), are any substances that, due to quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health, welfare, or the environment. Examples of hazardous materials include petroleum products/fuels, natural gas, synthetic gas, and toxic chemicals.

Hazardous wastes, listed under the RCRA, are defined as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that pose a substantive present or potential hazard to human health or the environment. In addition, hazardous wastes must meet either a hazardous characteristic of ignitability, corrosivity, toxicity, or reactivity under 40 CFR 261 (Identification and Listing of Hazardous Waste) or be listed as a waste under 40 CFR 261.

3.14.2 Regulatory Framework

Hazardous materials and wastes are managed under a framework of federal, state, and local rules and regulations. The USEPA is the federal agency directed under the RCRA to develop regulations to manage hazardous materials and wastes. Section 3010 of Subtitle C of the RCRA requires any person who generates, transports, or recycles regulated wastes, or who owns or operates a facility for the treatment, storage, or disposal of regulated wastes to notify the USEPA of their activities, including the location and general description of the activities and the regulated wastes handled. All of the RCRA regulations governing hazardous waste identification, classification, generation, management, and disposal are contained in 40 CFR 260 (Hazardous Waste Management System).

The State of Georgia has been authorized by the USEPA to administer a hazardous waste regulatory program and to enforce the RCRA requirements. Facilities operating in the state of Georgia, either government or private, which generate or store hazardous waste, are regulated through the Hazardous Waste Management Programs of the Land Protection Branch of the GA EPD. Hazardous waste regulations applicable to the state of Georgia are incorporated into the Georgia Hazardous Waste Management Act, Title 12, Chapter 8, Article 3, Part 1 of the Official Code of Georgia and are enforced by the GA EPD.

Aboveground storage tanks (ASTs) in Georgia are regulated by the Georgia State Minimum Standard Code, the state fire code which adopts National Fire Protection Association (NFPA) Code 30 (Flammable and Combustible Liquids) and NFPA Code 30A (Motor Fuel Dispensing Facilities and Repair Garages) with substantial additions.

Underground storage tanks (USTs) are regulated under the Georgia Underground Storage Tank Act (GUSTA), O.C.G.A. § 12-13-1 et seq. (1988). Existing rules and regulations pertaining to USTs are listed in O.C.G.A 391-3-15. UST operating requirements, release detection (leaking USTs or LUSTs), reporting, corrective actions and abandonment incorporate by reference 40 CFR Part 280, Technical Standards and Corrective Action Requirements for Owners and Operators of USTs. Georgia has established the Georgia UST Trust Fund to assure the funding of emergency, preventive, or corrective actions necessary when public health or safety is, or potentially may be, threatened from a release of

regulated substances from an UST and to provide compensation for third-party liability. The Trust Fund is available to owners and operators of USTs that participated in the program.

3.14.3 Affected Environment

3.14.3.1 Townsend Bombing Range

TBR has several forms of hazardous and non-hazardous wastes generated or stored on site as a result of routine mission activities. These include expended munitions, fuel, and minor amounts of hazardous wastes. Expended munitions are generated from training activities at TBR. Vehicles and equipment used at TBR to carry materials and personnel to the various maintenance and target areas are fueled using storage tanks located on site. Vehicle and equipment maintenance and repair is primarily performed on site and as a result, several types of hazardous wastes are generated including used oil and batteries.

3.14.3.2 Petroleum Storage Tank Management

ASTs are present on site at TBR. According to the 2008 Oil and Hazardous Substances Spill Prevention and Response (SPR) Plan (URS 2008), the facility at that time had a 1,000-gallon diesel and a 250-gallon gasoline AST on site. The ASTs were used to fuel vehicles and equipment. Since the SPR Plan was written, the tanks have been replaced with one 500-gallon diesel and one 500-gallon gasoline AST, which is the configuration currently on TBR. In addition, TBR has positioned a generator on site with a maximum fuel capacity of 200 gallons. Based on this, the total aboveground storage capacity for this facility is 1,200 gallons (URS 2008). There are no underground storage tanks (USTs) or leaking USTs (LUSTs) at TBR.

3.14.3.3 Hazardous Waste Management

The GA ANG maintains a Hazardous Waste Management Plan (GA ANG 2008) which applies to the 165th Airlift Wing and the CRTC of the GA ANG, located at the Savannah/Hilton Head International Airport in Savannah, Georgia; the 224th Joint Communication Support Squadron and the 165th Air Support Operations Squadron located at Brunswick, Georgia; and TBR (GA ANG 2008).

3.14.3.4 Hazardous Waste Generator Status

Title 40 CFR 262 (Standards Applicable to Generators of Hazardous Waste) delineates categories of hazardous waste generators based on the amount of kilograms of hazardous waste generated per month. Generators of waste greater than 1,000 kg (2,205 pounds) per month are large-quantity generators (LQGs); generators of 100 to 1,000 kilograms (220 to 2,205 pounds) per month are small-quantity generators (SQGs); and generators of less than 100 kilograms (220 pounds) per month are conditionally exempt small quantity generators (CESQGs). CESQGs are exempt from several requirements with which larger generators must comply. These requirements include obtaining an USEPA identification (ID) number, using a manifest for shipping, reporting to the USEPA on a biannual basis, and disposing of generated hazardous waste at a permitted treatment, storage, or disposal (TSD) facility. CESQGs can accumulate no more than 1,000 kilograms (2,205 pounds) of hazardous waste throughout the entire facility at one time, but are not limited by the amount of time hazardous waste can be accumulated on site (GA ANG 2008).

TBR is regulated by the GA EPD as a CESQG of hazardous wastes. However, the 165th Air Mobility Environmental Management Office requires the regulations contained in 40 CFR 262.34 for SQGs of hazardous waste to be followed at TBR as a good management practice (GA ANG 2008).

As a requirement for being a SQG, TBR has been assigned USEPA ID number GAD984319624, which is used to track hazardous waste generation and disposal. TBR accumulates hazardous waste for up to 180 days unless the waste must be transported greater than 200 miles to a permitted TSD facility. If the

hazardous waste must be transported to a TSD facility, the SQG can accumulate for up to 270 days on TBR. The small amount of hazardous wastes generated is managed for disposal through the Defense Reutilization and Marketing Office (DRMO) (GA ANG 2008).

3.14.3.5 Hazardous Waste Management

Hazardous wastes are collected and stored at several areas on TBR. The central accumulation site is an area where hazardous waste is accumulated in containers for a period of time based on generator status. Currently, this site is located in an area north of building #1 (Figure 3-57). The date hazardous waste is placed in the central accumulation site appears on the container and is tracked using a container log. The central accumulation site container log is maintained to provide a record of the total amount of hazardous waste accumulated at the facility (GA ANG 2008).

Two satellite accumulation points are located at TBR at or near the points of generation of hazardous waste. One is in the Range Control Center, Building 1, and the other in Facility 16 (Figure 3-57). Each satellite accumulation point is under the control of the shop supervisor for the process generating the waste. The maximum volume that may be accumulated at these sites is 55 gallons of a hazardous waste. Containers located in the satellite accumulation point may consist of one 55-gallon drum or a combination of containers equaling 55 gallons. Once 55 gallons of a hazardous waste have been containerized, the hazardous waste is moved to the central accumulation site within 72 hours or moved off site by the DRMO (GA ANG 2008).

The primary hazardous wastes generated at TBR include oil-soaked pads and rags, used oil, system one residue, waste solder, nickel-cadmium batteries, and lead acid batteries (GA ANG 2008). The batteries, residue, and used oil waste are generated during equipment and vehicle maintenance and repair while the solder is associated with the welding of target structures. Table 3-102 provides a description of each waste stream generated by TBR.

Table 3-102
Waste Stream Inventory

Waste Stream Name	USEPA Hazardous Waste Code	USDOT Description (for hazardous waste) or Management Description (for other waste streams)
Oil-Soaked Pads and Rags	N/A	Non-regulated
Used Oil	N/A	Recycled by Contractor
System One Residue	N/A	Non-regulated (Off-Spec. Used Oil [(a)])
Waste Solder	D008, D011	Hazardous Waste Solid, n.o.s [(b)]., 9, NA3077, PGIII (lead, silver)
Nickel-Cadmium (Ni-Cad) Batteries	N/A	Batteries, Dry, containing Potassium Hydroxide Solid, 8, UN3028, PGIII Universal Waste
Lead-acid Batteries	N/A	Batteries, wet, non-spillable, 8, UN2800, PGIII Universal Waste

Notes:
(a) Off-specification used oil. Term for used oil exceeding certain specification limits such as metals and halogen content and flashpoint.
(b) n.o.s. – not otherwise specified. Either a mixture of hazardous materials or possibly new hazardous materials that have not been give their own proper shipping name.

Key:
USDOT = U.S. Department of Transportation.
USEPA = U.S. Environmental Protection Agency.

Source: GA ANG 2008.

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Hazardous Waste Accumulation Site

SAM = Surface-to-Air Missile

Figure 3-57
Hazardous Waste Accumulation Sites
Townsend Bombing Range
McIntosh and Long Counties, Georgia

N

0 100 200 Feet

Sources: MCAS Beaufort 2008, Bing 2012

3.14.3.6 Munitions-Related Wastes

Munitions fragments and residues are generated on a recurring basis as a result of the range training missions. Under current practices, munitions debris is recovered/removed from the target areas for the purpose of storage, reclamation, treatment, and disposal (GA ANG n.d.).

Current practices are necessary for compliance with DOD Directive 4715.11 (Environmental and Explosives Safety Management on Operational Ranges Within the United States, dated May 2004). It is DOD policy to use and manage ranges in a manner that supports national security objectives and maintains the high state of operational readiness essential to the U.S. Armed Forces. The directive ensures the long-term viability of the ranges while protecting human health and the environment. Additionally, range management must comply with USMC Order 3550.9 (Marine Corps Ground Range Certification and Recertification Program); Air Force Instruction (AFI) 13-212 (Range Planning and Operations); and AFI 13-212 (Air National Guard Supplement 1).

The Military Munitions Rule (MMR; 40 CFR 266), promulgated in 1997, identifies the management standards that apply to military munitions wastes if they are deemed hazardous under the MMR or 40 CFR 261. Military munitions used for their intended purposes on ranges or collected for further evaluation, such as recycling, are not considered waste per the MMR (40 CFR 266.202), as incorporated by reference by the State of Georgia Environmental Rule 391-3-11-.10(3).

3.14.3.7 Proposed Acquisition Areas

Currently, no field surveys have been conducted by the USMC within the proposed acquisition areas to identify potential hazardous wastes, petroleum storage tanks, small landfills, or other potential waste-containing sites. Identification of potential contaminated sites would be prepared during the land acquisition process after the ROD for this FEIS is signed. As required by the USEPA and DOD policy, the USMC would prepare an Environmental Condition of Property (ECP) report during the acquisition process. The ECP report would provide the USMC with information about baseline environmental conditions on the lands to further identify and characterize contamination potential and to identify any remediation measures. The ECP assessment also would assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP report would be prepared using DON Environmental Policy Memorandum 06-06 (Streamlined Environmental Procedures Applicable to Non-BRAC [Base Realignment and Closure] Real Estate Actions); DON Policy for Streamlining the Assessments, Documentation, and Disclosure of the ECP for Non-BRAC Real Estate Actions (May 2006); American Society for Testing and Materials (ASTM) International E2247-08 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property (2008); and, ASTM E1527-05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (2005).

The purpose of the ECP is to compile available, factual environmental information and render an opinion regarding the environmental data collected and reviewed. The ECP will incorporate information required by CERCLA and the Community Environmental Response Facilitation Act of 1992 to identify portions of the property that meet the definition of "uncontaminated" within the meaning of CERCLA 120(h)(4).

Environmental sampling and analysis is not typically conducted as part of the Phase I ECP report preparation. When present, recognized environmental concerns are further investigated during Phase II Environmental Site Assessments and additional studies may be performed. For this Proposed Action, the Phase II Environmental Site Assessment would occur during the land acquisition process after the ROD for this FEIS is signed.

The land proposed for acquisition primarily consists of forest/timber production and agricultural land (please refer to Section 3.1). Based on the history of the area and prior land use, various solid and hazardous wastes may be found abandoned on the acquired properties. Such abandoned material may include drums with or without materials inside, batteries, old paint, pesticides, herbicides, and other chemicals. In addition, contaminated sites may be present due to past use including agricultural use of pesticides and the treatment of lumber with creosote. Storage tanks that either presently contain or previously contained fuel or other petroleum products also may be present within the proposed acquisition areas.

In August 2011, a computerized environmental database review using an online service (Environmental Data Resources [EDR]) was used to access any federal, state, and tribal records of sites within approximately 2 miles of the proposed acquisition areas. The review was conducted to locate any known regulated sites within the proposed acquisition areas that may have been impacted by hazardous materials and wastes. The databases provide information about environmental activities that may affect air, water, and land resources. Appendix L provides a complete list of the databases that were searched, as well as the results of the search.

The computerized database review identified only one facility within the area searched (the existing TBR). TBR is listed as a DOD site in the database as a RCRA-CESQG. However, the database search identified 41 orphan sites. Orphan sites are sites with poor or inadequate address information that could not be mapped. Identification of these sites in the searched databases indicates that the sites are known and may be active in an environmental program (i.e., AST, Dry Cleaners, etc.), but the current status of these sites is unknown. A summary of the orphan sites are presented in Table 3-103. Seventeen (17) of the 41 orphan site locations were identified using other sources, such as phone directories and company websites, and were found to be outside the proposed acquisition areas. These 17 locations are shown on Figure 3-58 (with the exception of one site in the city of Brunswick which is outside the figure's display area.) The 24 remaining sites were not located and are highlighted in Table 3-103.

As previously discussed in this section, identification of potential contaminated sites, including the orphan sites, would occur during the land acquisition process. The USMC would investigate the proposed acquisition area and prepare an ECP report before any real property is acquired or transferred. However, based on information collected so far, no hazardous waste sites are anticipated to be in any of the potential acquisition areas.

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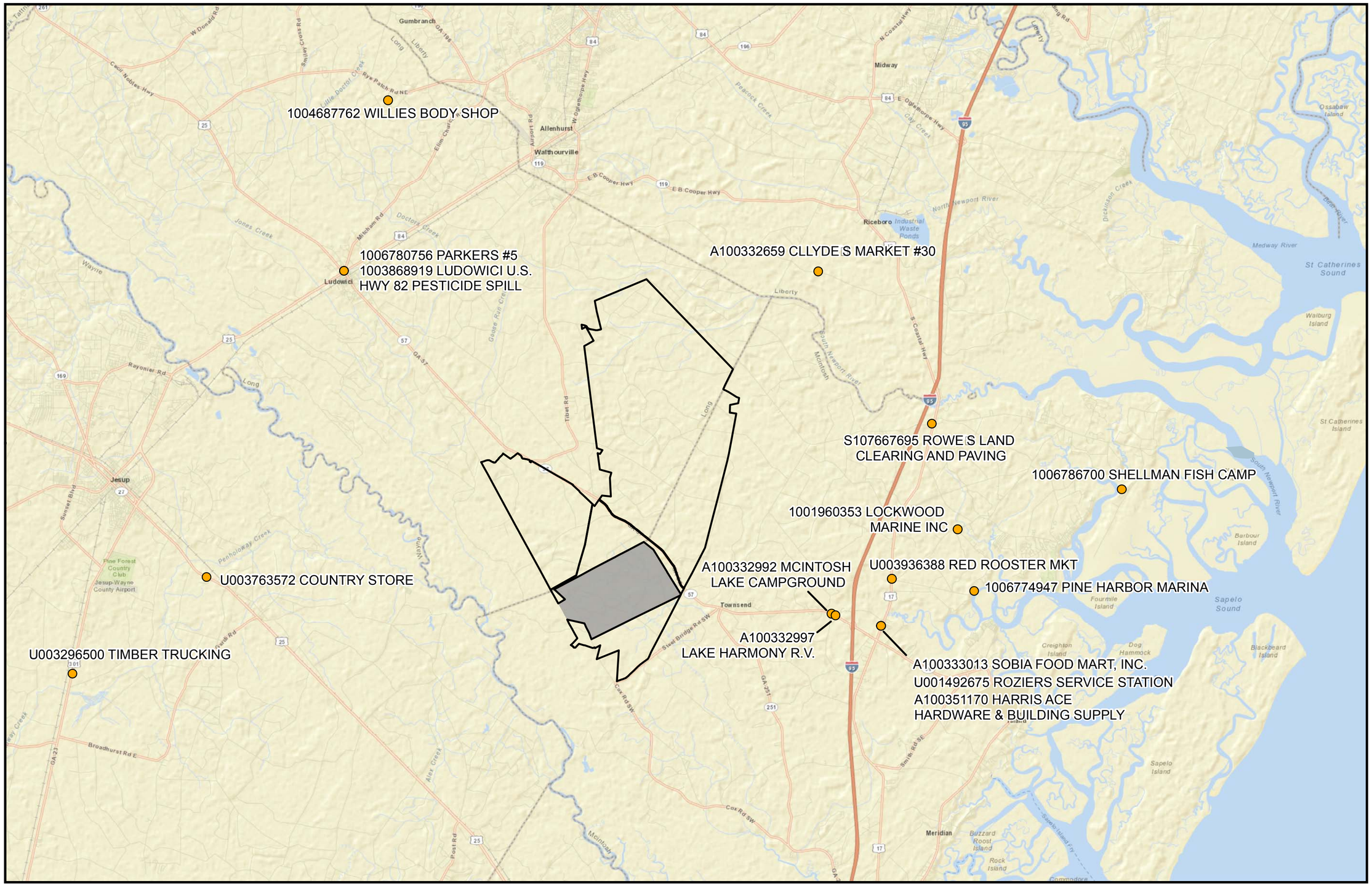

Figure 3-58
Orphan Sites
Townsend Bombing Range
McIntosh and Long Counties, Georgia

Sources: Esri 2010, EDR 2011

Table 3-103
Summary of Orphan Sites

City	EDR ID - Site Name	Site Address	Internet Information	Latitude	Longitude	Zip Code - Database(s)
BRUNSWICK	S109144870 PLANT MCMANUS SUBSTATION [(a)]	1 CRISPEN BOULEVARD	1 CRISPEN BOULEVARD	31 12' 45.57" N	81 32' 45.84" W	31543 SHWS
EULONIA	A100332982 LIBERTY PROPANE INC.	HWY 57	1330 GA Hwy 57, Townsend, GA 31331			31331 AST
EULONIA	A100332987 EULONIA RENTAL (CLOSED)	RT 1	14641 US Highway 17, Townsend GA 31331			31331 AST
HORTENSE	1006778052 FLOWERS & CONSIGNMENT ETC	HWY 32 E				31543 FINDS, LUST, UST, FINANCIAL ASSURANCE
HORTENSE	1006793691 PAIGES MINIT MART #1	USHY 301 & GA	Phone: 912-473-2599			31543 AST, FINDS, LUST
HORTENSE	A100328044 ROBERSON BAIT & TACKLE (CLOSED)	RT 1				31543 AST
JESUP	U003296500 TIMBER TRUCKING	6287 HWY 301 S	Troupe Trucking	31 30' 33.68" N	81 54' 28.57" W	31546 LUST, UST, FINANCIAL ASSURANCE
JESUP	U003763572 COUNTRY STORE	USHY 341 DOTPARCEL 95	Golden Isle Market 4350 US Highway 341 B	31 33' 29.30" N	18 49' 41.93" W	31546 LUST, UST, FINANCIAL ASSURANCE
LUDOWICI	1003868919 LUDOWICI U.S. HWY 82 PESTICIDE SPILL	U.S. HWY 82	US Highway 84	34 42' 39.77" N	81 44' 33.81" W	31316 CERC-NFRAP
LUDOWICI	1003869779 HAN-HAR METAL FINISHING COMPANY	LONG COUNTY INDUSTRIAL PARK	Phone: 912-545-2777			31316 CERC-NFRAP, US BROWNFIELDS, DEL SHWS
LUDOWICI	1004687734 HINESVILLE RECYCLING CO	RT 3 BOX 30				31316 RCRA-NonGen, FINDS
LUDOWICI	1004687762 WILLIES BODY SHOP	RT 1 BOX 61 - 1	507 Smith Cox Ln NE	31 48' 00.21" N	81 43' 10.17" W	31316 RCRA-CESQG, FINDS
LUDOWICI	1006775212 COUNTY LINE STATION	RT 2				31316 UST, FINANCIAL ASSURANCE
LUDOWICI	1006780699 BILLINGS SERVICE STATION	HWY 301 S				31316 LUST, UST, FINANCIAL ASSURANCE
LUDOWICI	1006780735 COUNTY MAINTENANCE YARD	HWY 82 E				31316 FINDS, UST, FINANCIAL ASSURANC
LUDOWICI	1006780756 PARKERS #5	HWY 301 S & GA	U.S. 84 at 301 Ludowici, Georgia	31 42' 48.34" N	81 44' 45.71"W	31316 FINDS, UST, FINANCIAL ASSURANC, LUST
LUDOWICI	A100332699 THE ANYTHING MARKET	HWY 84 W				31316 AST

Table 3-103
Summary of Orphan Sites

City	EDR ID - Site Name	Site Address	Internet Information	Latitude	Longitude	Zip Code - Database(s)
LUDOWICI	A100346605 BEARDS CREEK COUNTRY STORE	14230 CECIL NOBLES HWY				31316 AST, LUST
LUDOWICI	U001629014 FLASH FOODS #25	HWY 84 & MAIN ST				31316 LUST, UST, FINANCIAL ASSURANCE
LUDOWICI	U003551558 LUDOWICI TEXACO STATION	USHY 301 S				31316 UST, FINANCIAL ASSURANCE
LUDOWICI	U003920759 COUNTY LINE STATION	RT 2				31316 UST, FINANCIAL ASSURANCE
RICEBORO	A100332659 CLLYDE'S MARKET #30	10880 COASTAL HWY		31 42' 43.02" N	81 27' 51.01" W	31323 AST
RICEBORO	A100332672 QUAN'S FOOD MART	11223 COASTAL HWY	Phone: 912-884-2764			31323 AST
TOWNSEND	1001960353 LOCKWOOD MARINE INC	ROUTE 2 BOX 2277	5191 Shellman Rd, Townsend, GA	31 34' 49.76" N	81 22'56.56" W	31331 RCRA-NonGen, FINDS
TOWNSEND	1006774947 PINE HARBOR MARINA	PINE HARBOR MARIN	1162 Pine Harbor Marina Rd NE	31 32' 56.76" N	81 22' 22.26" W	31331 FINDS, LUST, UST, FINANCIAL
TOWNSEND	1006786700 SHELLMAN FISH CAMP	RT 2	1058 River Road, NE	31 36' 04.07" N	81 17' 05.41" W	31331 FINDS, UST, FINANCIAL ASSURANC
TOWNSEND	1006786718 ARYUN	RT 3	Aryun Enterprises 1100 GA Hwy 57, Townsend			31331 FINDS, UST, FINANCIAL ASSURANC
TOWNSEND	A100332980 NETTLES GAS COMPANY CLOSED	HWY 17				AST
TOWNSEND	A100332984 EULONIA TEXACO STATION (CLOSED)	USHY 17 & GA				31331 AST
TOWNSEND	A100332992 MCINTOSH LAKE CAMPGROUND	RT 3	1093 McIntosh Lake Lane, S.W.	31 32' 17.15" N	81 27' 27.16" W	31331 AST
TOWNSEND	A100332996 BELLE BLUFF ISLAND MARINA (CLOSED)	RT 3	(912) 832-5323			31331 AST
TOWNSEND	A100332997 LAKE HARMONY R.V.	RT 3	1088 Lake Harmony Drive SW	31 32" 13.86" N	81 27' 18.71" W	31331 AST
TOWNSEND	A100332999 SPEEDWAY FOODS	RT 3				31331 AST
TOWNSEND	A100333010 PEACHES #4	RT 3				31331 AST
TOWNSEND	A100333013 SOBIA FOOD MART, INC.	1326 USHY 17	15227 Highway 17 NE	31 31' 54.11" N	81 25' 41.80" W	31331 AST
TOWNSEND	A100351170 HARRIS ACE HARDWARE & BUILDING SUPPLY	15453 USHY 17	15227 Highway 17 NE	31 31' 54.11" N	81 25' 41.80" W	31331 AST

Table 3-103
Summary of Orphan Sites

City	EDR ID - Site Name	Site Address	Internet Information	Latitude	Longitude	Zip Code - Database(s)
TOWNSEND	S107667437 MCINTOSH CO-KING RD (INERT)	SE NS KING RD E				SWF/LF
TOWNSEND	S107667695 ROWE'S LAND CLEARING AND PAVING	HARRIS NECK RD	2798 Jones Road	31 38' 03.10" N	81 23' 50.23" W	SWF/LF
TOWNSEND	S109505581 EULONIA CLEANERS	HWY 17 and HWY 99				31331 DRYCLEANERS
TOWNSEND	U001492675 ROZIERS SERVICE STATION	HWY 99	15262 Highway 17	31 31' 54.11" N	81 25' 41.80" W	31331 LUST, UST, FINANCIAL ASSURANCE
TOWNSEND	U003936388 RED ROOSTER MKT	HWY 17 and PINE HARBOR RD		31 33' 19.97" N	81 25' 17.98" W	31331 UST, FINANCIAL ASSURANCE

Notes:
Sites with latitude/longitude identified are illustrated on Figure 3-58.
Sites highlighted green could not be located.
(a) Site is not shown on Figure 3-58 due to location outside the figure's display area.

Key:
AST = Aboveground Storage Tank (database).
CERC-NFRAP = Comprehensive Environmental Response Compensation (and Liability Information)-No Further Remedial Action Planned.
CESQG = conditionally exempt small quantity generator.
FINDS = Facility Index System.
LUST = Leaking Underground Storage Tank (database).
RCRA-NonGen = Resource Conservation and Recovery Act sites not generating hazardous waste.
SHWS = State Hazardous Waste Site (Inventory).
SWF/FL = Solid Waste Facility/Landfill Site (database)
UST = Underground Storage Tank (database).

Source: Environmental Data Resources, Inc. 2011.

3.14.4 Environmental Consequences

3.14.4.1 Action Alternatives (1 through 4)

With the expansion of TBR through the acquisition of adjacent lands, it is possible that the fleet of vehicles and equipment used to maintain and operate the facility may increase. Petroleum storage and refueling capacity is not expected to increase to accommodate the potential additional vehicles and/or equipment. Wastes generated from maintenance operations would be consistent with those currently generated at TBR and would include both hazardous waste (e.g., used oil) and regulated non-hazardous waste (e.g., pads or towels used to absorb oil or fuel). These wastes would be managed through the existing waste management system according to prescribed procedures already in place, which include the requirement that no hazardous waste would be disposed of, left, buried, or abandoned at TBR. No change to permits, hazardous waste generator status, or management would be required. Therefore, the generation of hazardous waste under each alternative would result in less than significant impacts to public health and safety.

Each action alternative would involve the acquisition of land currently used for timber production. Timber harvesting activities require the use of fuels and lubricants in a variety of equipment. Some toxic pollutants in the waste materials generated from logging operations include organic compounds such as fuels, lubricating oil, and solvents, which can be toxic at very low concentrations and may be present in the proposed acquisition areas.

Based on the available records and the EDR search conducted as part of this FEIS, there are no significant issues associated with sites reviewed in the search. Seventeen (17) out of the 41 orphan sites identified were located well outside the proposed acquisition areas (please refer to Section 3.14.3.7). However, 24 orphan sites identified in the search were not located at all. Based on the available information, it is not anticipated that these orphan sites would be within the acquisition areas or have significant contamination issues associated with them; however, a final determination would be made through completion of an ECP report once it is determined which properties the USMC is interested in purchasing and the ROD for this FEIS is signed.

3.14.4.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and the status quo would continue. The existing levels of hazardous materials and waste generated would continue and all existing management, documentation, storage, transportation, and disposal practices would continue. Therefore, there would be no impacts from hazardous materials and waste under the No Action Alternative. Implementation of the No Action Alternative would not meet the USMC purpose and need for the Proposed Action.

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