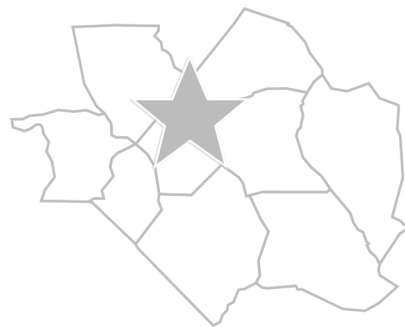


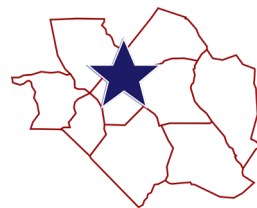
FORT BRAGG

JOINT LAND USE STUDY



September 2018





FORT BRAGG

JOINT LAND USE STUDY

September 2018

Prepared for

Mid-Carolina Council of Governments &
Fort Bragg Regional Land Use Advisory Commission

Study Partners

Counties of Cumberland, Harnett, Hoke, Moore, Richmond, Scotland

Municipalities of Aberdeen, Eastover, Erwin, Fayetteville, Hoffman,
Hope Mills, Laurinburg, Lillington, Pinebluff, Pinehurst, Raeford,
Southern Pines, Spring Lake, Vass, Wagram, Whispering Pines

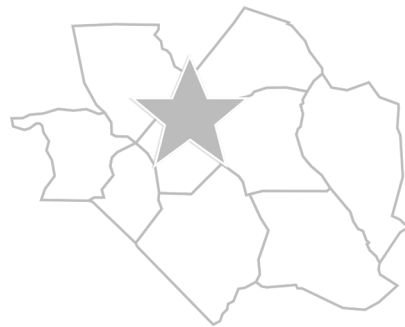
Prepared by

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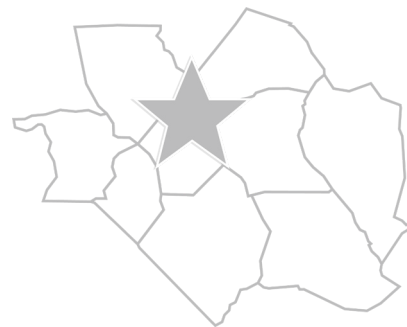


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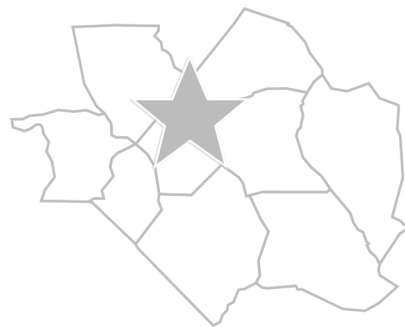
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EXECUTIVE **SUMMARY**

FORT BRAGG JOINT LAND USE STUDY



EXECUTIVE SUMMARY

The Regional Land Use Advisory Commission, along with its many partners, has fostered collaboration across the Fort Bragg region for nearly three decades to protect the civilian population from military training impacts; to protect the Longleaf Pine Ecosystem; and to protect the military training mission from incompatible development. This study evaluates the region's current state of compatible growth and provides a series of recommendations on how to continue moving forward together.

STUDY PURPOSE

The overarching purpose of this JLUS is to identify additional ways that Fort Bragg and the neighboring civilian communities can continue working together cooperatively to encourage compatible growth, to ensure the long term viability of the Longleaf Pine Ecosystem and the sustainability of Fort Bragg's mission. While many important goals and objectives were established as part of this process, the primary guiding goals were to identify ways to:

- Protect the civilian population from military impacts;
- Protect the Longleaf Pine Ecosystem; and
- Protect the Military Training Mission from incompatible development.

STUDY ORGANIZATION

The study was organized into eight sections as follows:

- Section One - Introduction
- Section Two - Regional Growth Trends
- Section Three - Land Use Trends
- Section Four - Environmental Factors
- Section Five - Fort Bragg
- Section Six - Land Use Compatibility Factors
- Section Seven - Compatible Growth Framework
- Section Eight - Recommendations

SECTION ONE - INTRODUCTION

The plan begins with an overview of the study process and meeting dates, the study area and public engagement activities. The JLUS process began in October 2016 and concluded in August of 2018 with County Commissioner presentations taking place in September and October of 2018.

SECTION TWO - REGIONAL GROWTH TRENDS

This section of the study includes important factors across the region that influence growth and development. Particularly, this section focuses on the regional population and housing characteristics and projected growth in the region. By 2030, the regional population is projected to reach nearly 785,000 residents, or nearly 200,000 more than lived in the region in the year 2000, if the projections hold true.

SECTION THREE - LAND USE TRENDS

This section focuses on the past, current and potential future land use and development. The existing land use pattern is one of the key compatibility factors utilized in this study. Based on regional growth trends and land use, it is likely that the primary development trends that have driven the growth of the region for the last 30 - 40 years are likely to continue, perhaps with a pause along the way, but there is no significant change expected in the overall trend.

SECTION FOUR - ENVIRONMENTAL FACTORS

The environmental section of this study inventories conditions and challenges throughout the region related to threatened and endangered species, water quality, air quality, prime farmland, climate effects and other natural factors. While over 30,000 acres of land around Fort Bragg have been protected since the beginning of the North Carolina Sandhills Conservation Partnership and the 2003 JLUS, the Longleaf Pine Ecosystem is still in need of further protection.

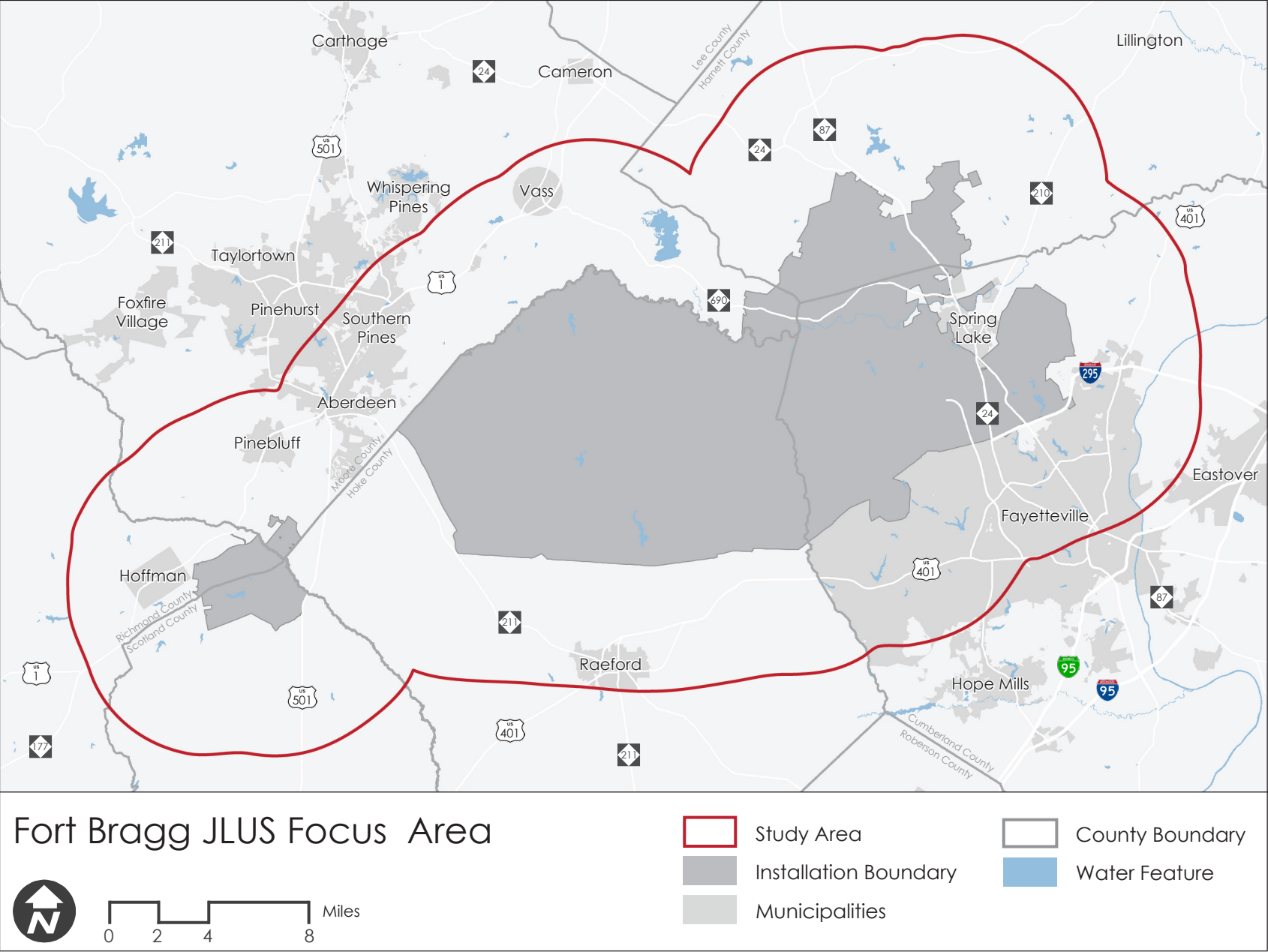
SECTION FIVE - FORT BRAGG

Fort Bragg is the largest U.S. military installation in terms of population with approximately 53,700 troops and another 14,000 civilians who work on post. This section focuses on the training and mission footprint at Fort Bragg. The training mission at Fort Bragg is in transition as the Army moves away from the its focus on counterinsurgency warfare back to a decisive action training environment. Additionally, FORSCOM's training guidance now directs all operational units to execute level one deployment readiness exercises (DRE) semi-annually and level two DREs annually. This change in focus will most likely cause a continued increase in combined arms live fire maneuver training on Fort Bragg with an expected increase in levels of noise, dust, vibration, etc.

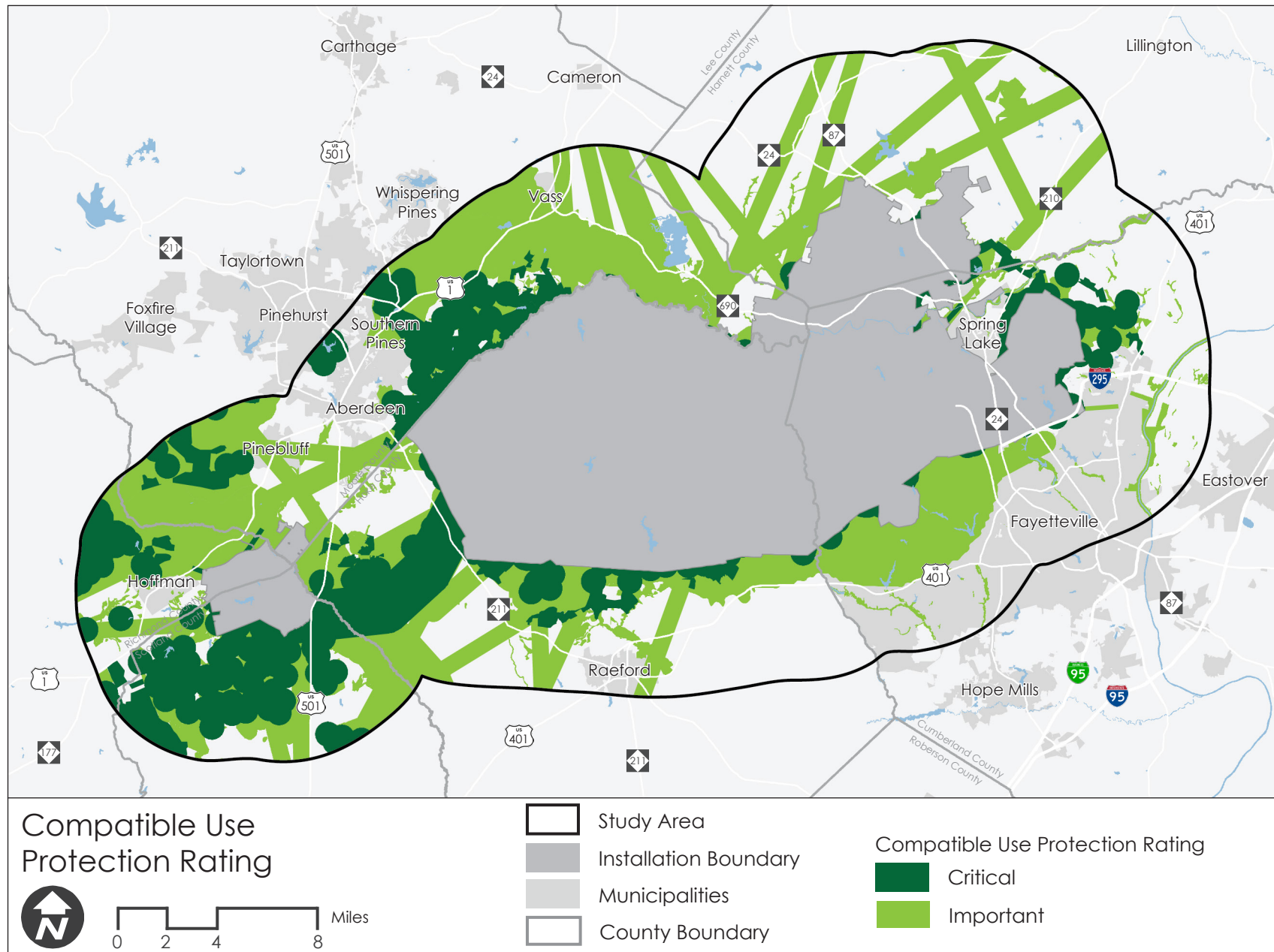
SECTION SIX - LAND USE COMPATIBILITY FACTORS

This section examines the degree of compatibility between civilian land uses and military training operations. While there are several areas of land use compatibility concern identified in the study, in general, the region has not experienced significant changes in land use compatibility since the 2003 JLUS. However, to prepare for changes in the training at Fort Bragg and new missions, such as the Gray Eagle unmanned aerial system (UAS), the study utilized a new and refined set of compatibility criteria. This was done to identify the lands that have been determined to be either "critical" or "important" to protect and to ensure the future compatible growth of the

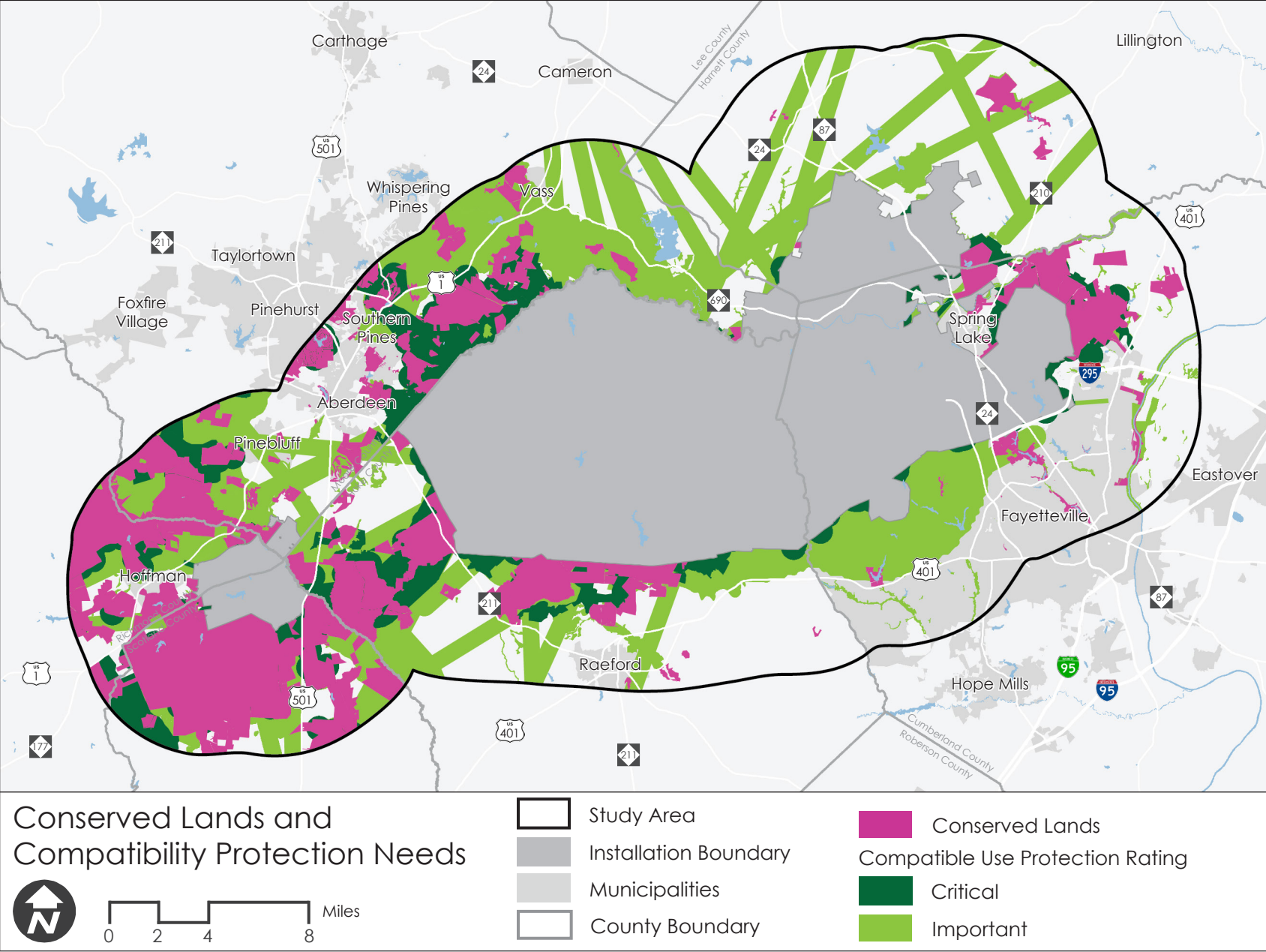
▼ JLUS FOCUS AREA



▼ COMPATIBLE USE PROTECTION RATING MAP



▼ CONSERVED LANDS AND COMPATIBILITY PROTECTION NEEDS MAP



region, with regard to both military training and environmental factors that influence military readiness.

SECTION SEVEN - COMPATIBLE GROWTH FRAMEWORK

This section identifies the tools that are available to the study partners to help them establish a framework for compatible growth. The tools consist of a wide range of voluntary to regulatory approaches for implementation as determined appropriate by each community.

SECTION EIGHT - RECOMMENDATIONS

This section of the report provides recommendations that the study partners should consider for adoption to implement the goals of the Joint Land Use Study. In addition, implementation strategies for regional, community-specific and Fort Bragg actions were developed as a means to provide direct guidance on how the recommendations can be implemented by the study partners.

STUDY RECOMMENDATIONS

A broad range of twenty-nine recommendations were developed for consideration by the study partners in the region. The recommendations were organized into four categories as outlined below.

- Regional Coordination (RC)
- Compatible Growth (CG)
- Environmental (E)
- Fort Bragg (FB)

REGIONAL COORDINATION (RC)

The Regional Land Use Advisory Commission is a strong, guiding force that has led the way in developing and implementing policies and programs that support the sustainment of the military training mission at Fort Bragg. In order to maintain the significant momentum that it has developed, RLUAC should examine its organizational structure, mission statement, and strategic goals to ensure that it continues to provide the leadership role and successes that have made it the lead agency for civil-military cooperation in the region.

COMPATIBLE GROWTH (CG)

While the region has had general success in limiting new incompatible development areas of land use, action is still needed by local and regional governments to adopt plans and policies that help protect the Fort Bragg training mission. Specifically, local government partners should utilize their plans

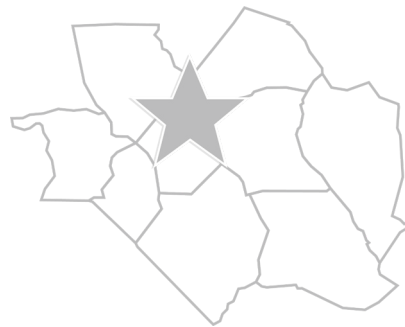
and policies to direct development away from areas that are identified as “critical” and “important” to conserve.

ENVIRONMENTAL (E)

The region should maintain and improve its efforts to protect and preserve the natural environment. The protection of the Longleaf Pine Ecosystem, water quality, and air quality are important to the sustainment of the region's economic future and military training mission.

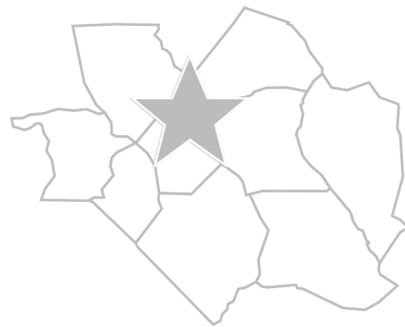
FORT BRAGG (FB)

While many of the recommendations focus on the participating local governments, Fort Bragg also plays an important role in the implementation of the study. It's continued leadership and commitment to the region's communities will help foster implementation of the recommendations and guarantee the continuation of the successful partnerships and collaboration that exists in the region.



INTRODUCTION **SECTION ONE**

FORT BRAGG JOINT LAND USE STUDY



INTRODUCTION

The Fort Bragg Joint Land Use Study (JLUS) identifies ways to protect the military training mission at Fort Bragg and Camp Mackall from incompatible urban development, the health and safety of the civilian population living near the military boundaries, and the sustainability of the Longleaf Pine ecosystem within the region.

1.1 STUDY PURPOSE

Across the country, as communities surrounding military installations experience population growth and urban development, the military's ability to maintain its testing, training and operational missions can be impacted. In an effort to encourage military installations and communities to plan for the future collaboratively, the U.S. Department of Defense created the Joint Land Use Study program, which is administered by the Office of Economic Adjustment. The JLUS process brings together business leaders, citizens, local, state and federal officials, property owners, military officials and others to identify opportunities for growth that is compatible, helping to preserve the military's ability to test and train and the community's ability to expand its economic opportunities.

Although a Joint Land Use Study is primarily funded by the Office of Economic Adjustment, the communities that receive JLUS funding are responsible for developing and implementing the JLUS. The Mid-Carolina Council of Governments served as the region's sponsor for the Fort Bragg JLUS, while the Regional

Land Use Advisory Commission was responsible for managing the grant process and the completion of the study. This is the fourth Joint Land Use Study effort in the Fort Bragg Region. The initial JLUS was completed in 1991 with a comprehensive update in 2003, and a 5-year update in 2008.

The study partners included the entire membership of the Regional Land Use Advisory Commission. The RLUAC membership includes the counties of Cumberland, Harnett, Hoke, Moore, Richmond, Robeson, Sampson and Scotland and the municipalities of Aberdeen, Eastover, Erwin, Fayetteville, Hoffman, Hope Mills, Laurinburg, Lillington, Pinebluff, Pinehurst, Raeford, Southern Pines, Spring Lake, Vass, Wagram and Whispering Pines. The membership also includes the following non-voting, partner organizations: Fort Bragg, Mid-Carolina Council of Governments, NC Department of Commerce, NC Department of Environmental Quality, NC Department of Military & Veterans Affairs, Sandhills Area Land Trust, Sustainable Sandhills, The Nature Conservancy, and US Fish and Wildlife Service.

The overarching purpose of the Fort Bragg JLUS was to identify additional ways that Fort Bragg and the neighboring civilian communities could work together cooperatively to encourage compatible growth, helping to ensure the long term viability and sustainability of Fort Bragg's mission. While many important goals and objectives were established as part of this process, the primary guiding goals were to:

- Protect the civilian population from military impacts;
- Protect the Longleaf Pine Ecosystem; and
- Protect the Military Training Mission from incompatible development

1.2 STUDY PROCESS

With the Mid-Carolina Council of Governments serving as the study sponsor, representatives from the region's municipalities, counties and other partners participated through the Regional Land Use Advisory Commission. The Board of Directors of RLUAC served as the Policy Committee with the entire membership of RLUAC serving as the Technical Committee. The RLUAC Board of Directors was given the charge to guide the overall direction of the process and to approve the final report. The Technical Committee provided additional input and review throughout the project. The meeting dates and milestones from the Joint Land Use Study Process are highlighted in Table 1.1.

▼ IMAGE 1.1 RLUAC MEETING, FEBRUARY 16, 2017



▼ TABLE 1.1 MEETING DATES & PROJECT MILESTONES

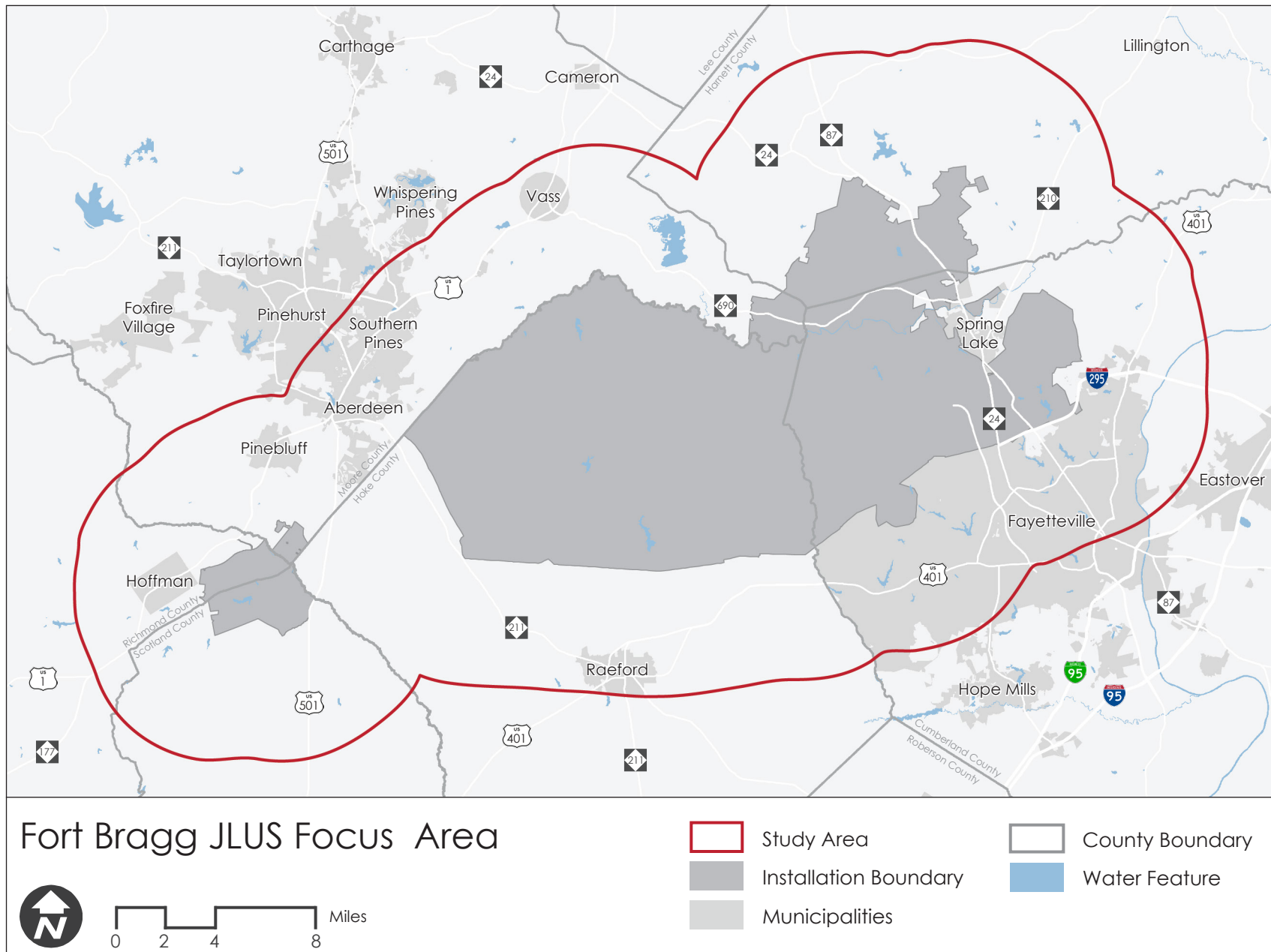
2016 Meeting Dates & Project Milestones	
October	<ul style="list-style-type: none"> • Project Initiation • RLUAC Board of Directors Meeting • Background Research
November	<ul style="list-style-type: none"> • RLUAC Quarterly Membership Meeting • Data Collection and Mapping
December	<ul style="list-style-type: none"> • Background Research and Review • County Commissioner Update Meeting (Harnett)

▼ TABLE 1.1 MEETING DATES & PROJECT MILESTONES (CONTINUED)

2017 Meeting Dates & Project Milestones	
January	<ul style="list-style-type: none"> • Stakeholder/Focus Group Interviews • RLUAC Board of Directors Meeting • Data Collection and Mapping
February	<ul style="list-style-type: none"> • Stakeholder/Focus Group Interviews • County Commissioner Update Meetings (Hoke, More and Scotland) • RLUAC Quarterly Membership Meeting
March	<ul style="list-style-type: none"> • County Commissioner Update Meetings (Cumberland and Richmond)
April	<ul style="list-style-type: none"> • RLUAC Board of Directors Meeting
May	<ul style="list-style-type: none"> • RLUAC Quarterly Membership Meeting • Review Background Research
June	<ul style="list-style-type: none"> • Compatibility Analysis
July	<ul style="list-style-type: none"> • RLUAC Board of Directors Meeting
August	<ul style="list-style-type: none"> • RLUAC Quarterly Membership Meeting • Draft Compatibility Analysis
September	<ul style="list-style-type: none"> • Compatibility Analysis
October	<ul style="list-style-type: none"> • RLUAC Board of Directors Meeting
November	<ul style="list-style-type: none"> • RLUAC Quarterly Membership Meeting • Final Compatibility Analysis
December	<ul style="list-style-type: none"> • Preparation of Draft Recommendations

2018 Meeting Dates & Project Milestones	
January	<ul style="list-style-type: none"> • RLUAC Board of Directors Meeting • Review Draft Recommendations • County Commissioner Update Meetings (Cumberland, Harnett, Hoke, Moore and Scotland)
February	<ul style="list-style-type: none"> • RLUAC Quarterly Membership Meeting • Review Draft Recommendations
March	<ul style="list-style-type: none"> • Revise Recommendations • Prepare Draft Implementation Plan
April	<ul style="list-style-type: none"> • RLUAC Board of Directors Meeting
May	<ul style="list-style-type: none"> • RLUAC Quarterly Membership Meeting • Final Recommendations & Implementation
June	<ul style="list-style-type: none"> • Draft Joint Land Use Study Preparation
July	<ul style="list-style-type: none"> • Draft Joint Land Use Study Preparation
August	<ul style="list-style-type: none"> • RLUAC Quarterly Membership Meeting
September	<ul style="list-style-type: none"> • County Commissioner Update Meetings
October	<ul style="list-style-type: none"> • County Commissioner Update Meetings
November	<ul style="list-style-type: none"> • RLUAC Endorsement of Completed JLUS

▼ MAP 1.1 JLUS FOCUS AREA



1.3 JLUS FOCUS AREA

The primary study area included Fort Bragg and the six counties and twelve municipalities adjacent to the installation. The area of study expands 5 miles from the outer boundary of the 162,000 acre installation. A map of the primary study area is displayed in Map 1.1. Specifically, the study area included the counties of Cumberland, Harnett, Hoke, Moore, Richmond and Scotland and the cities of Aberdeen, Eastover, Fayetteville, Hoffman, Hope Mills, Pinebluff, Pinehurst, Raeford, Southern Pines, Spring Lake, Vass, and Whispering Pines.

1.4 PUBLIC ENGAGEMENT

During the study process, the public was engaged at key points through quarterly RLUAC meetings, stakeholder/focus group meetings, and County Board of Commissioner meetings. The RLUAC website also included a separate page dedicated to the JLUS, which included links to all presentations and draft documents prepared during the process.

STAKEHOLDER AND FOCUS GROUP MEETINGS

During January and February of 2017, key stakeholders were interviewed and focus group meetings were held to identify compatibility issues and growth trends across the region. Over 80 people were interviewed and included the major groups listed in Table 1.2. In addition to the interviews, a stakeholder survey was developed and distributed throughout the region to gather input from additional individuals and groups that were unable to attend an in-person interview.

PUBLIC MEETINGS AND OUTREACH

The entire RLUAC membership met 8 times during the process to hear presentations and provide input into the study, while the RLUAC Board of Directors met a total of 7 times during the process. In addition, presentations were given at Board of Commissioner meetings at three points during the process in each of the six counties that are within the study area. The first round of presentations to the Boards of Commissioners provided general information about the study process and schedule. The second round of meetings focused on the compatibility analysis with the final round of meetings focusing on the recommendations and implementation of the JLUS.

▼ IMAGE 1.2 RLUAC MEETING, NOVEMBER 16, 2017



▼ TABLE 1.2 STAKEHOLDER AND FOCUS GROUPS

Municipalities

Town of Aberdeen

Town of Eastover

City of Fayetteville

Town of Hope Mills

City of Laurinburg

Village of Pinehurst

City of Raeford

Town of Southern Pines

Town of Spring Lake

Counties

Cumberland County

Harnett County

Hoke County

Moore County

Richmond County

Scotland County

Governmental Agencies

MCCOG

NCDOT

FAMPO

FAST

US Fish and Wildlife

NC DEQ

NC Commerce

NC Forestry

NC Cooperative Extension

Fayetteville PWC

Harnett County Utilities

Community/Business**Organizations**

Sustainable Sandhills

Sandhills Area Land Trust

The Nature Conservancy

Greenfields Sandhills

NC State University

Fort Bragg

Environmental

Master Planning

Range Control

Plans, Analysis & Integration

Office

43rd AMOG Airspace

Management

DPTMS

Airfield Division

82nd Aviation Combat Brigade

Energy and Utilities Branch

Garrison Public Affairs

USAJFKSWCS

USASOC

JSOC

Post Housing

ATC Chief

AT&A

Staff Judge Advocate

NEC Frequency Control

Manager



1.5 FORT BRAGG JOINT LAND USE STUDY HISTORY

As mentioned previously, the Joint Land Use Study process is not new to the Fort Bragg Region. Since the completion of the first JLUS in 1991, subsequent studies have been completed resulting in implementation successes that have been recognized nationally. In particular, the 2003 JLUS process was well timed with many regional sustainability efforts, including initiatives by Fort Bragg to become a national leader in sustainability. As a result, the many local governments, Fort Bragg and other regional partners have worked collaboratively for nearly three decades to help sustain the military training mission at Fort Bragg, while protecting the civilian population and protecting the Longleaf Pine Ecosystem.

STATE OF NORTH CAROLINA ACTIONS

Many of the 2003 and 2008 Joint Land Use Study recommendations focused on legislative actions to be taken by the State of North Carolina's General Assembly. While the State has taken many actions to help sustain the military training mission statewide, the specific actions related to previous Fort Bragg JLUS recommendations are listed below.

- **Notice of Land Use Planning Changes to Military Bases (2004 & 2013)** - The General Assembly amended the state statutes governing planning and zoning in 2004 and again in 2014 to require local governments to notify the commanders of military bases regarding any proposed subdivisions, telecommunications towers, windmills or

zoning changes located within five miles of the military boundaries.

- **Allocation of Funding for identified Trust Funds for Land Purchases near Military Bases** - The state has provided additional/prioritized funding for conservation of land adjacent to military bases through the Clean Water Management Trust Fund, Conservation Trust Fund, and the Agricultural Development and Farmland Preservation (ADFP) Trust Fund.

FORT BRAGG ACTIONS

The Joint Land Use Study process and recommendations are not solely focused on actions that need to be implemented by local and state governments only. Fort Bragg has implemented many of the Joint Land Use Study recommendations and continues to play an active role in the compatible land use planning process through the Regional Land Use Advisory Commission. Some of the specific actions implemented by Fort Bragg are outlined below.

- **Presentation of Development and Construction Plan Updates** - Fort Bragg shares updates on its internal planning initiatives and construction projects with the membership of RLUAC on a regular basis, keeping the local governments informed and providing opportunity for comments.
- **Protection of Natural Habitat Areas** - Fort Bragg continues to preserve and protect the natural habitat areas on the

installation, while maintaining collaborative relationships through the Sandhills Conservation Partnership to help conserve and protect natural resources and lands off post.

- **Noise Study Updates** - Fort Bragg updates noise contours and shares the results of the noise studies with RLUAC and the region.
- **Transportation Planning** - Fort Bragg has helped fund regional transportation studies and actively participates in regional transportation planning meetings.
- **New Aerial Photography** - Fort Bragg makes updates to the aerial photography of the reservation available to RLUAC and other regional organizations and partners.

RLUAC ACTIONS

The Regional Land Use Advisory Commission (RLUAC) is a non-profit 501(C)3 membership based organization located in the Sandhills of North Carolina consisting of twenty-three units of local government: eight counties and fifteen municipalities. The twenty-seven year old organization was the first regional group established in the country to coordinate land use decisions between the military and the local governments. RLUAC has contributed to the implementation of the JLUS in a variety of ways focusing on the highlights described below.

- **Review of Local Government Land Use Changes** - In 2007, Fort Bragg contracted with RLUAC to review local government land use changes within 5 miles of Fort

Bragg in accordance with state statute, making non-binding recommendations that are consistent with the JLUS. Since beginning that service in 2008, RLUAC has reviewed over 1,300 cases. A number of cases that were not compatible were withdrawn by the applicants.

- **GIS Database** - RLUAC maintains a multi-jurisdictional GIS database containing regional land use data and other relevant data for use by its regional partners and anyone in the general public desiring to make informed decisions regarding land use and their property.
- **Legislative and Statewide Advocacy** - RLUAC has actively participated in the legislative process to ensure concerns and interest of the Fort Bragg Region are presented in a comprehensive manner. RLUAC's efforts have led to several statewide laws to help protect military installations and training lands.
- **Telecom Tower and Light Pollution Study** - RLUAC completed a telecommunications tower and light pollution study that has been utilized by local governments to inform decisions on tower location and placement and consideration and adoption of lighting standards that help reduce light emissions at night.
- **2018 JLUS Update** - RLUAC was charged with the responsibility of writing the OEA grant application to fund the 2018 JLUS. RLUAC also managed the completion of the study as part of a contractual agreement with Mid-Carolina Council of Governments, organizing regular

regional meetings with the study partners to review and provide input into the study.

LOCAL GOVERNMENT ACTIONS

Many of the local governments have adopted military related zoning regulations to help implement the Joint Land Use Study recommendations over the past decade. The specific regulations and plans that have been adopted or amended are identified in more detail in Section 7. A few of the highlights of local government actions are outlined below.

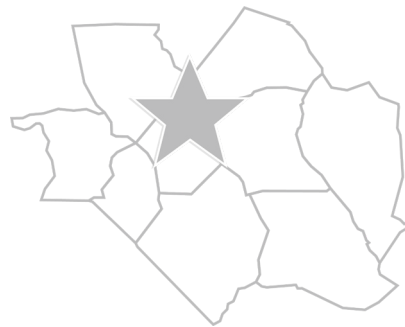
- **Cumberland County** - Cumberland County adopted a process to lease development rights from owners of property designated as “critical” and “important” in previous studies.
- **Hoke County** - Hoke County prepared a new Land Use Plan that embraced the land use patterns identified in the 2003 Joint Land Use Study.
- **Town of Spring Lake** - The Town of Spring Lake has coordinated with Fort Bragg on the use of small unmanned aerial vehicles for Town events and other related projects. The Town also works closely with Fort Bragg on advancing sustainable and compatible land use planning practices.

OTHER ACTIONS

Over 30,000 acres of land have been preserved or protected in the Fort Bragg region over the last 15 years by a variety of

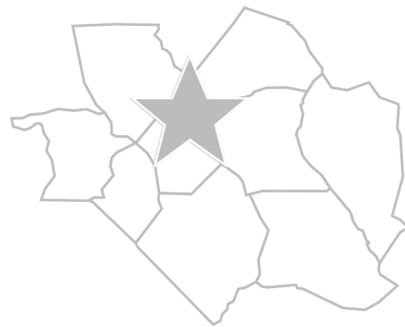
methods, funding, partners and organizations. Although, much work is still needed, many of these land and easement acquisitions have helped the region reach recovery status with the red-cockaded woodpecker. Specific actions by regional partners since the 2003 and 2008 JLUS recommendations are described below.

- **Land Purchases**
 - The Nature Conservancy purchased land and development rights along or near the Fort Bragg boundary in Hoke and Cumberland Counties. The properties were identified as “critical” to protect in previous studies.
 - The State of North Carolina purchased land in Cumberland County, adjacent to Fort Bragg, for the creation of a State Park. The land was identified as “critical” in previous studies.
 - The North Carolina Clean Water Trust Fund embraced the JLUS designations of critical and important for their future land acquisition.
- **Real Estate Disclosure/Notification Changes** - RLUAC worked closely with the NC Real Estate Commission to adopt a rule modifying the residential real property disclosure form to include a required disclosure of impacts from “military” sources on the same line in the disclosure that other “nuisance” type impacts are disclosed.



REGIONAL GROWTH TRENDS **SECTION TWO**

FORT BRAGG JOINT LAND USE STUDY



REGIONAL GROWTH TRENDS

2.1 POPULATION TRENDS

Between 2000 and 2010, the six counties that comprise the region that makes up the broader JLUS study area grew by nearly 70,000 residents, an increase of over 11% (see Table 2.1). Leading the way in the rate of growth over this period were Hoke County and Harnett County, which saw growth rates of 40% and 26%, respectively, over the decade. Despite being in the second position in the rate of growth, Harnett County saw the largest absolute number of new residents, with just over 23,000 more people in the county in 2010 than in 2000, which accounted for around 1/3 of the total growth in the region.

At the other end of the spectrum were Scotland and Richmond Counties, each of which saw an essentially flat population growth rate over that period, meaning that all of the growth in the region occurred in the other four counties. Looking forward, the NC State Demographer's Office has developed population projections based on migration, birth and death rates that anticipate a similar regional rate of growth will be achieved during the period of 2010 and 2020. During the current decade, however, it is projected that Scotland and Richmond Counties will actually see a slight population decline, while the region as a whole grows by another 11%. This projection trend carries forward through to 2030, as the NC State Demographer's Office

▼ TABLE 2.1 COUNTY POPULATION CHANGE AND PROJECTIONS

COUNTY	2000	2010	2000 - 2010 GROWTH	2020 (PROJECTED)	2010 - 2020 GROWTH	2030 (PROJECTED)	2020 - 2030 GROWTH
Cumberland	302,963	319,431	5%	345,664	8%	364,385	5%
Harnett	91,025	114,678	26%	138,799	21%	160,844	16%
Hoke	33,646	46,952	40%	58,366	24%	70,738	21%
Moore	74,769	88,247	18%	99,561	13%	108,326	9%
Richmond	46,564	46,639	0%	45,850	-2%	45,574	-1%
Scotland	35,998	36,157	0%	35,246	-3%	33,819	-4%
Total	584,965	652,104	11%	723,486	11%	783,686	8%

projects continued steady growth across the region between 2020 and 2030, although at 8%, slightly slower in the previous decades. Again, however, it is projected that Scotland and Richmond Counties will continue to see a slow rate of population decline, meaning that over a period of three decades, all of the growth in the region will be focused on Cumberland, Harnett, Hoke and Moore Counties.

By 2030, the regional population is projected to reach nearly 785,000 residents, or nearly 200,000 more than lived in the region in 2000, if the projections hold true. This would represent an overall growth rate of nearly 35%, with Hoke County seeing the most dramatic rate of growth, with its population projected to more than double over the three-decade period, going from around 34,000 in 2000 to a projected 71,000 in 2030.

With regard to municipal growth, (see Table 2.2) all but two of the municipalities in the JLUS focus area (those that fall within 5 miles of Fort Bragg) saw significant growth between 2000 and 2010. Leading the way was Fayetteville, which saw an increase of nearly 80,000 residents over this period (a rate of increase of 66%). While Fayetteville experienced strong organic growth during this period, major annexation actions (including the major westward expansion of the city and the legislative annexation of a large portion of Fort Bragg) significantly boosted the city's population. In fact, all but two of the cities that fall at least partially within the 5 mile JLUS focus area saw positive,

double-digit growth rates during the course of the decade. Aberdeen had the absolute highest rate of growth, with its population increasing by 86% between 2000 and 2010. The two municipalities that saw a population decline were Hoffman and Vass, experiencing declines of -6% and -4%, respectively. In total, over 100,000 more people were living in cities that fall within the JLUS focus area in 2010 than there were in 2000. This includes the population of Eastover, which incorporated in 2007.

Beginning the decade emerging from recession, population growth in the municipalities slowed significantly in all cases, with one municipality (Pinebluff) reversing a 21% growth rate between 2000 and 2010 and moving to a negative growth rate (-6%) between 2010 and 2015. During this period, only 8,000 new residents were added to these municipalities population totals, a 5 year growth rate of only 3% between them, compared to 59% during the decade before.

In addition to the recession, statutory changes to annexation laws halted, and in some cases, reversed annexations initiated by municipalities - a once key component of growth. Despite the negative economic effects of the recession, two of the cities, Spring Lake and Pinehurst saw growth rates in the double digits, and each of the other municipalities which had grown during the prior decade, except Pinebluff, grew over this next 5 year period. The population declines seen in Vass and Hoffman

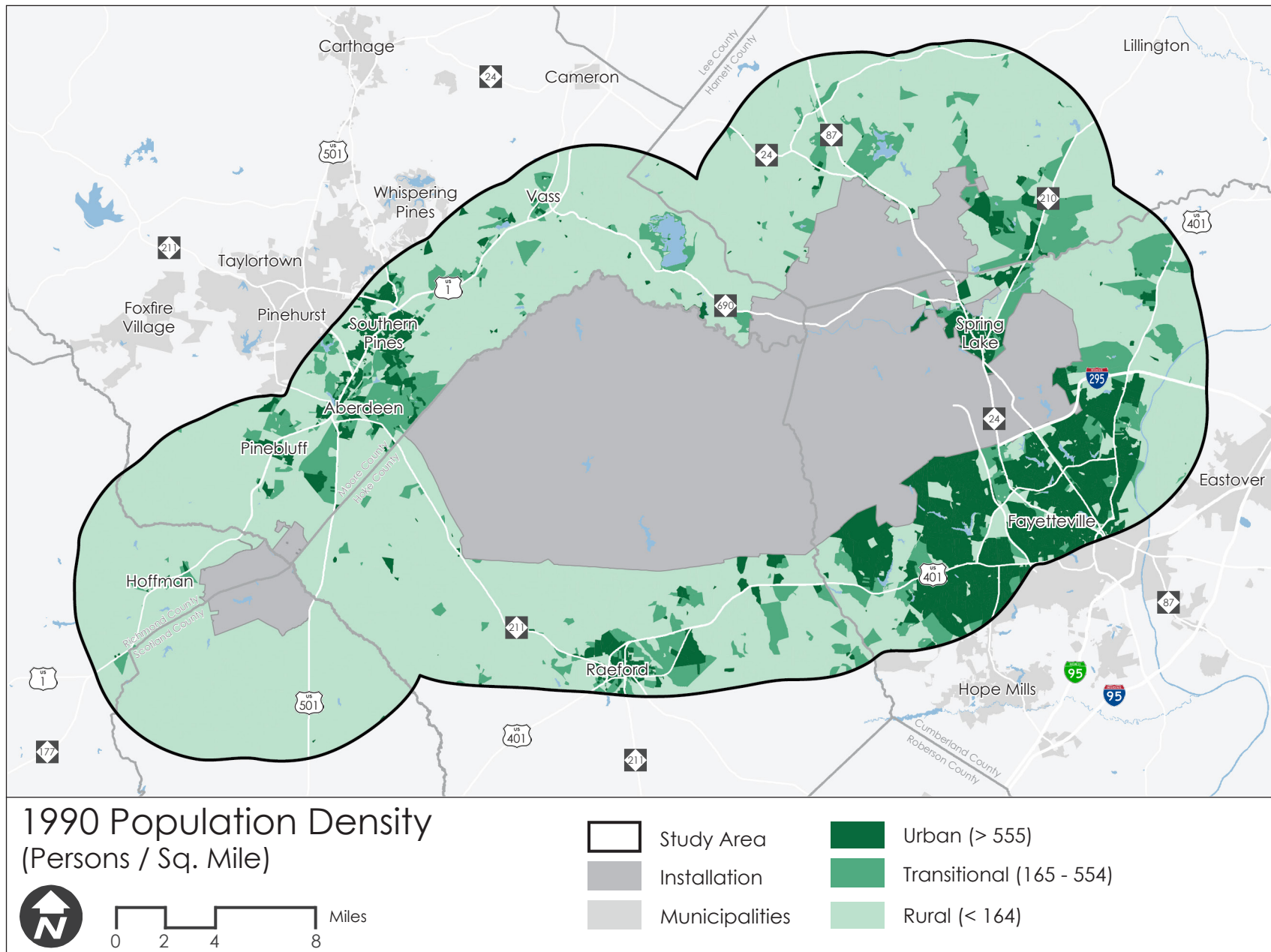
continued during the first part of the decade, with the rate of decline slowing somewhat in Hoffman, while accelerating in Vass. Two cities, Fayetteville and Eastover saw essentially flat population growth from 2010 to 2015, both with rates of around 1% -a significant turnaround from Fayetteville's growth rate between 2000 and 2010.

Given the return to sound economic expansion in recent years, it is expected that growth rates will accelerate, as projected in the NC State Demographer's population projections. Whether that will lead to a return of strong municipal growth in the region is yet to be confirmed.

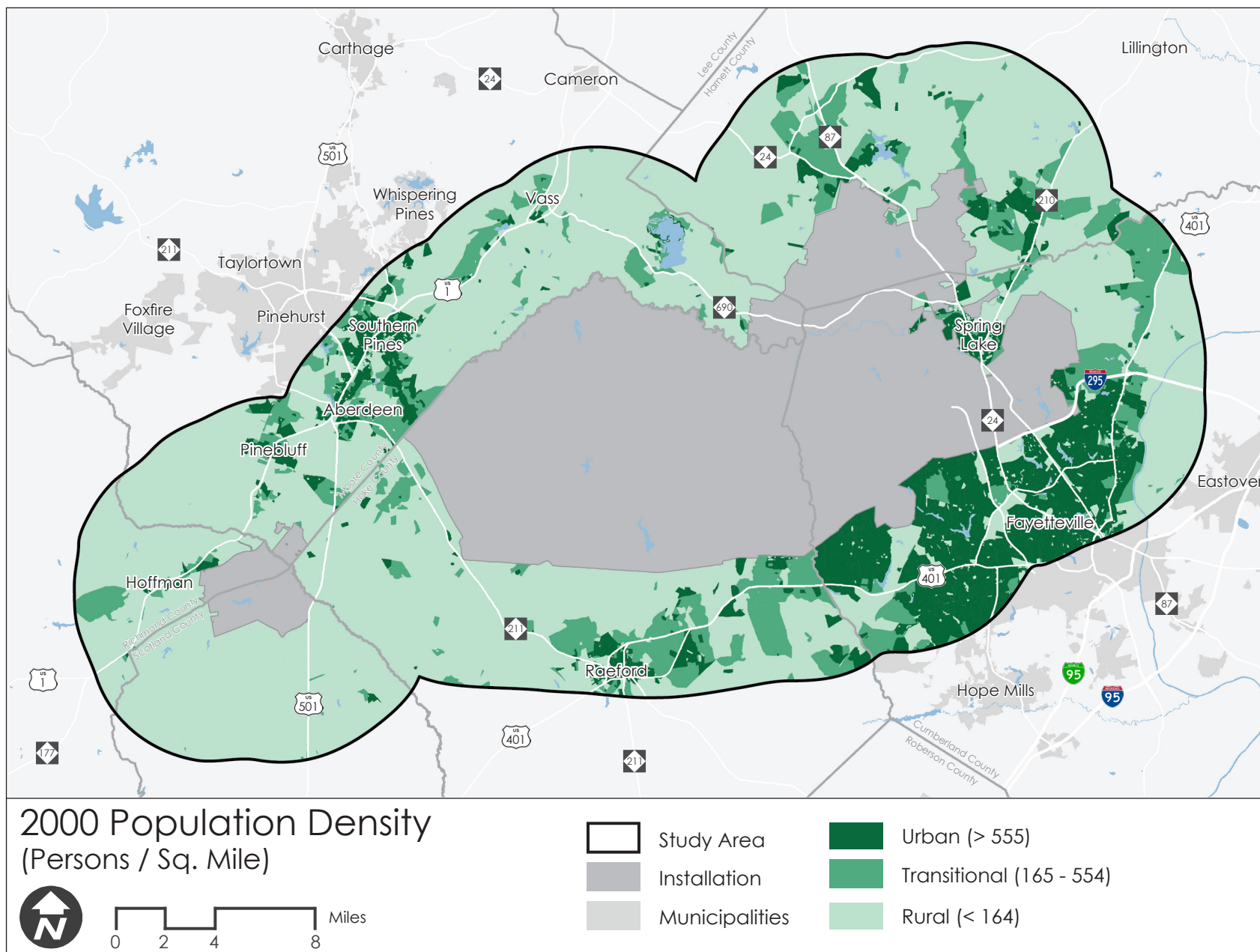
▼ TABLE 2.2 MUNICIPAL POPULATION GROWTH

MUNICIPALITY	POPULATION 2000	POPULATION 2010	2000 TO 2010 GROWTH	POPULATION 2015	2010 TO 2015 GROWTH
Aberdeen	3,400	6,350	87%	6,914	9%
Eastover (incorp. 2007)	N/A	3,628	N/A	3,681	1%
Fayetteville	121,015	200,564	66%	202,521	1%
Hoffman	624	588	-6%	572	-3%
Hope Mills	11,237	15,176	35%	16,123	6%
Pinebluff	1,109	1,337	21%	1,255	-6%
Pinehurst	9,706	13,124	35%	15,313	17%
Raeford	3,386	4,611	36%	4,830	5%
Spring Lake	8,098	11,964	48%	13,336	11%
Southern Pines	10,918	12,334	13%	13,018	6%
Vass	750	720	-4%	637	-12%
Whispering Pines	2,090	2,928	40%	3,067	5%
Total	172,333	273,324	59%	281,267	3%

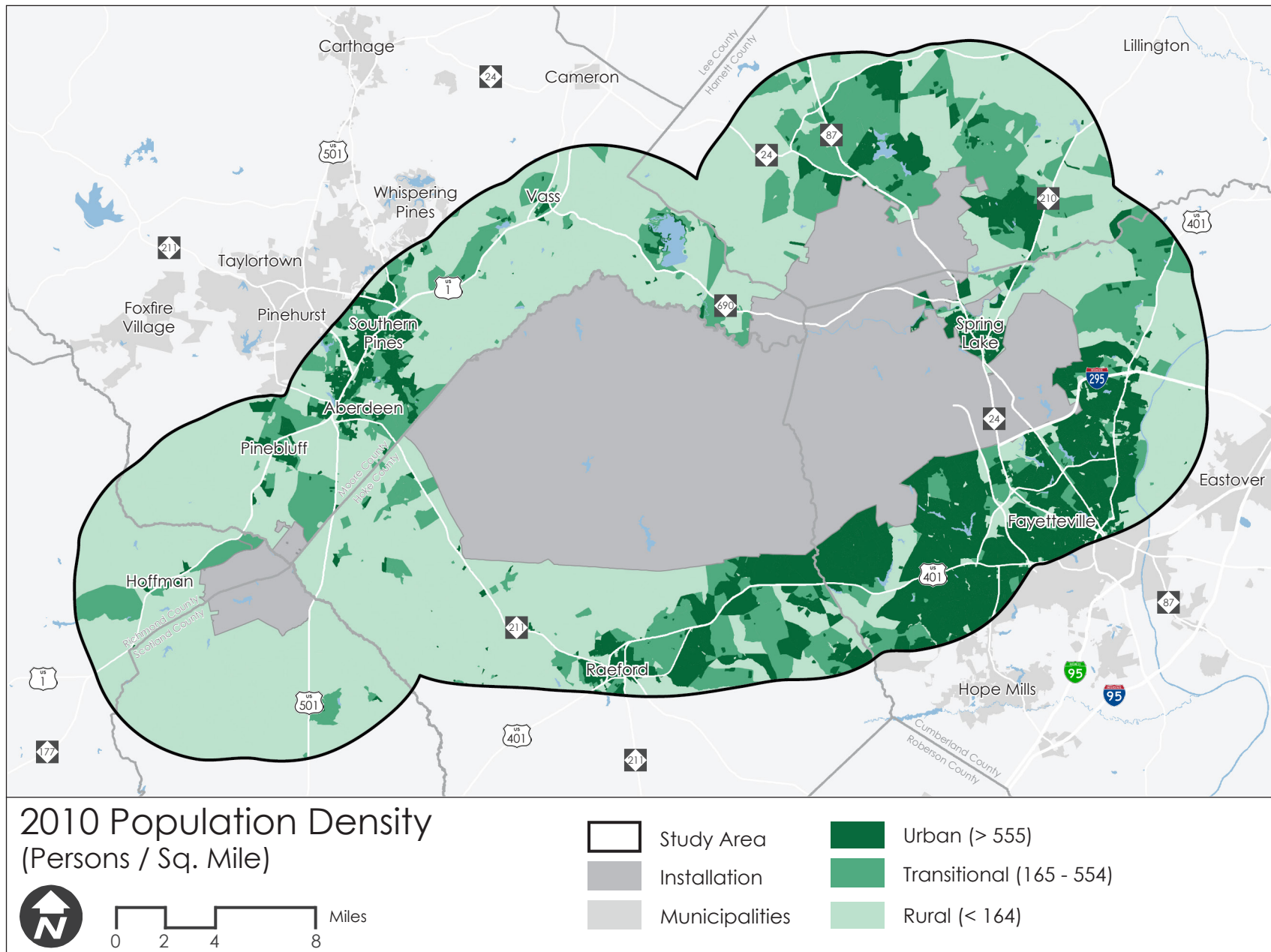
▼ MAP 2.1: 1990 U.S. CENSUS BLOCKS, POPULATION DENSITY



▼ MAP 2.2 2000 U.S. CENSUS BLOCKS, POPULATION DENSITY



▼ MAP 2.3 2010 U.S. CENSUS BLOCKS, POPULATION DENSITY



The series of maps shown on previous pages (Maps 2.1-2.3) detail the spatial change in population density in the five mile area around Fort Bragg between 1990 and 2010. In order to maintain consistency with previous Joint Land Use Studies the same block level population density categories were used. The three categories used to display the data are:

- Urban - Greater than 555 residents per square mile
- Transitional - Between 165-554 residents per square mile
- Rural - Fewer than 164 residents per square mile

The maps clearly demonstrate the steady progression of dense urban development within the JLUS focus area over the past

few decades. Of particular note are the significant densification observed between 1990 and 2010 in western Cumberland County and eastern Hoke County. Although not as dramatic, a similar increase in population density can be observed along the NC 87 corridor in southern Harnett County and in eastern Moore County around Aberdeen, Pinehurst and Southern Pines.

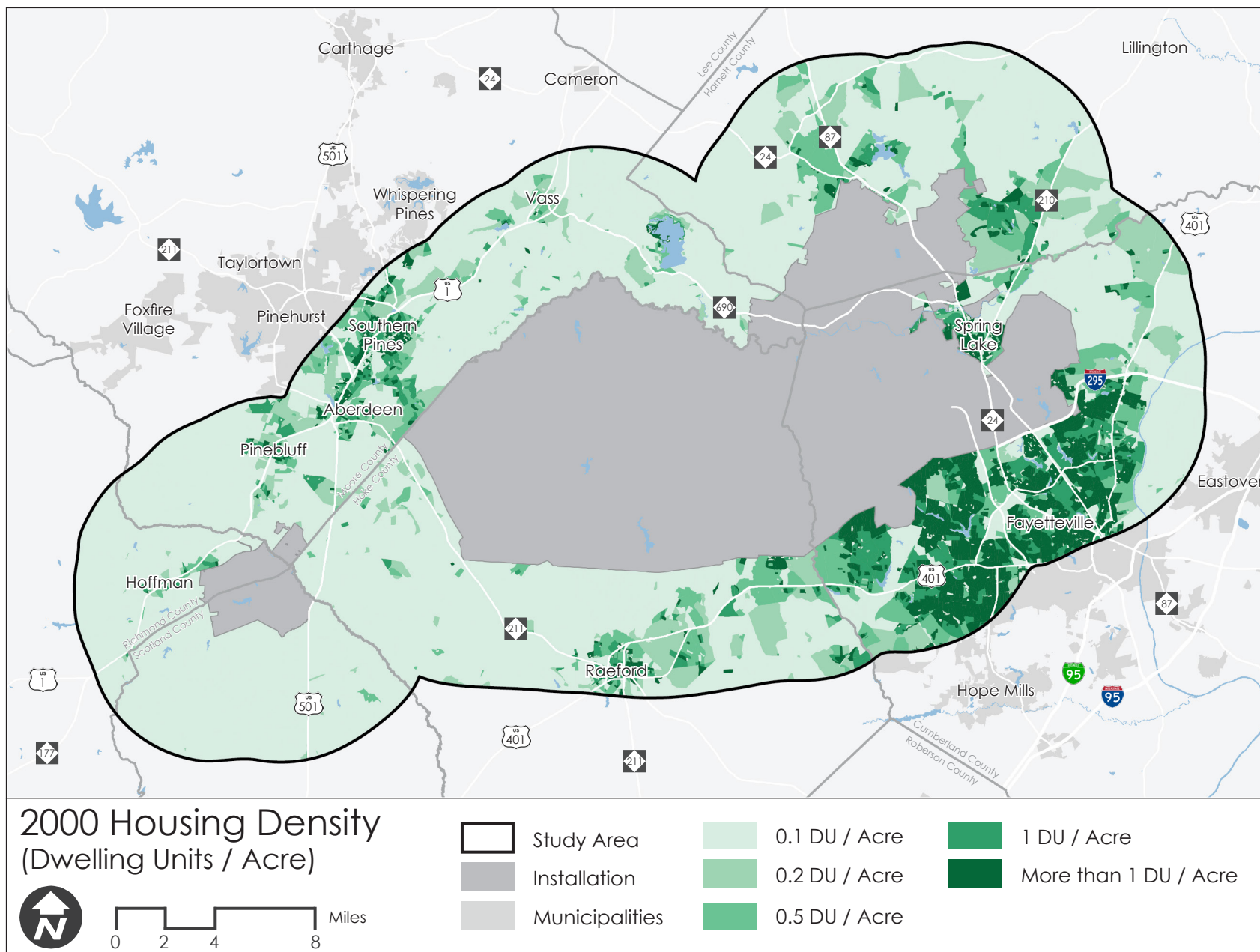
2.2 HOUSING TRENDS

The growth in the region's housing stock exceeded the growth in population between 2000 and 2010, with the supply of housing increasing by 17%, compared to a population growth rate of only 11% region-wide. This was true in five of the six counties, with Harnett being the only county where the rate of housing growth fell below the rate of population growth. Overall,

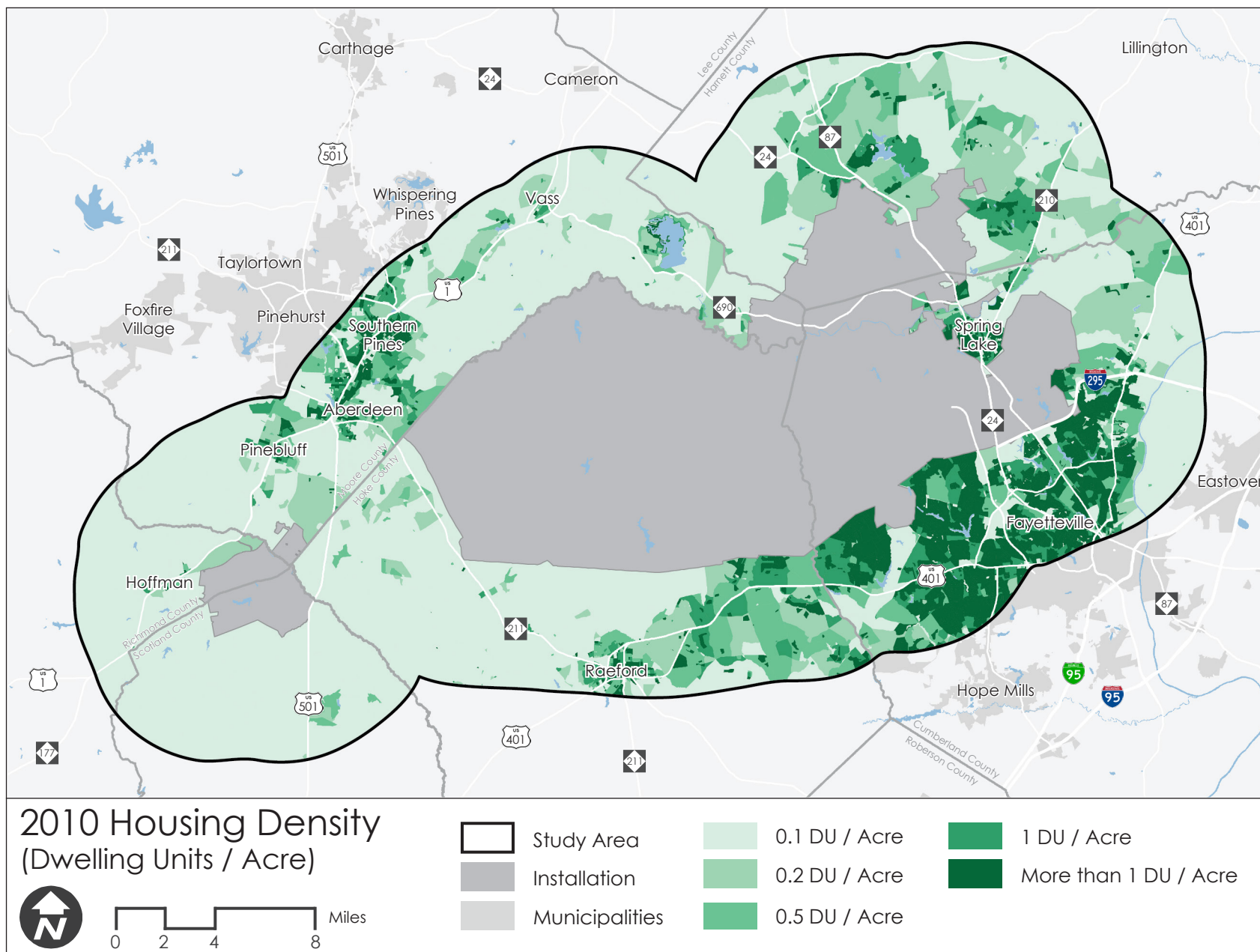
▼ TABLE 2.3 COUNTY HOUSING GROWTH

COUNTY	DWELLING UNITS 2000	DWELLING UNITS 2010	2000 TO 2010 GROWTH	DWELLING UNITS 2015	2010 TO 2015 GROWTH
Cumberland	118,425	135,524	14%	142,119	5%
Harnett	38,605	46,731	21%	48,676	4%
Hoke	12,518	18,211	45%	19,529	7%
Moore	35,151	43,940	25%	44,881	2%
Richmond	19,886	20,738	4%	20,943	1%
Scotland	14,693	15,193	3%	15,173	0%
Total	239,278	280,337	17%	291,321	4%

▼ MAP 2.4 2000 US CENSUS BLOCK LEVEL HOUSING DENSITY



▼ MAP 2.5 2010 US CENSUS BLOCK LEVEL HOUSING DENSITY



Cumberland County saw the greatest spread between the population growth rate (5% and the rate of housing construction (14%) during that period. Demographic trends in Cumberland County, namely more young, single, residents, likely account for some of the additional housing growth. Although BRAC related growth anticipation also likely played a sizable role in the amount of housing constructed, particularly between 2005 and

the beginning of the recession. Between 2000 and 2010 even Scotland and Richmond Counties saw positive housing growth rates, despite a flat population during this period.

Interestingly, the rate of housing growth in the municipalities in the JLUS focus area grew at a slower rate than did the overall population in the cities, when taken together. Each of

▼ TABLE 2.4 MUNICIPAL HOUSING GROWTH

MUNICIPALITY	DWELLING UNITS 2000	DWELLING UNITS 2010	2000 TO 2010 GROWTH	DWELLING UNITS 2015	2010 TO 2015 GROWTH
Aberdeen	1,655	3,081	86%	3,118	1%
Eastover (incorp. 2007)	N/A	1,637	N/A	1,717	5%
Fayetteville	53,565	87,005	62%	91,987	6%
Hoffman	238	237	0%	243	3%
Hope Mills	4,497	6,048	34%	6,133	1%
Pinebluff	481	579	20%	568	-2%
Pinehurst	5,668	7,634	35%	9,223	21%
Raeford	1,440	1,950	35%	2,035	4%
Spring Lake	3,623	4,855	34%	5,366	11%
Southern Pines	5,488	6,859	25%	6,997	2%
Whispering Pines	1,054	1,365	30%	1,245	-9%
Vass	351	348	-1%	330	-5%
Total	78,060	121,970	56%	128,962	6%

the municipalities that experienced population growth also experienced growth in their housing stock, while the two cities that were experiencing population decline between 2000 and 2010 also saw flat or negative housing growth. The overall rate of housing growth was fastest in Aberdeen, with an 86% increase, which was equal to its population growth during this period. Fayetteville, which had the second highest housing growth rate, actually saw a slower rate of growth in its housing stock than it saw in its population (62% to 66%, respectively). Each of the other municipalities in the JLUS focus area saw growth rates in the double digits, while over 43,000 new homes were built in the cities over the decade.

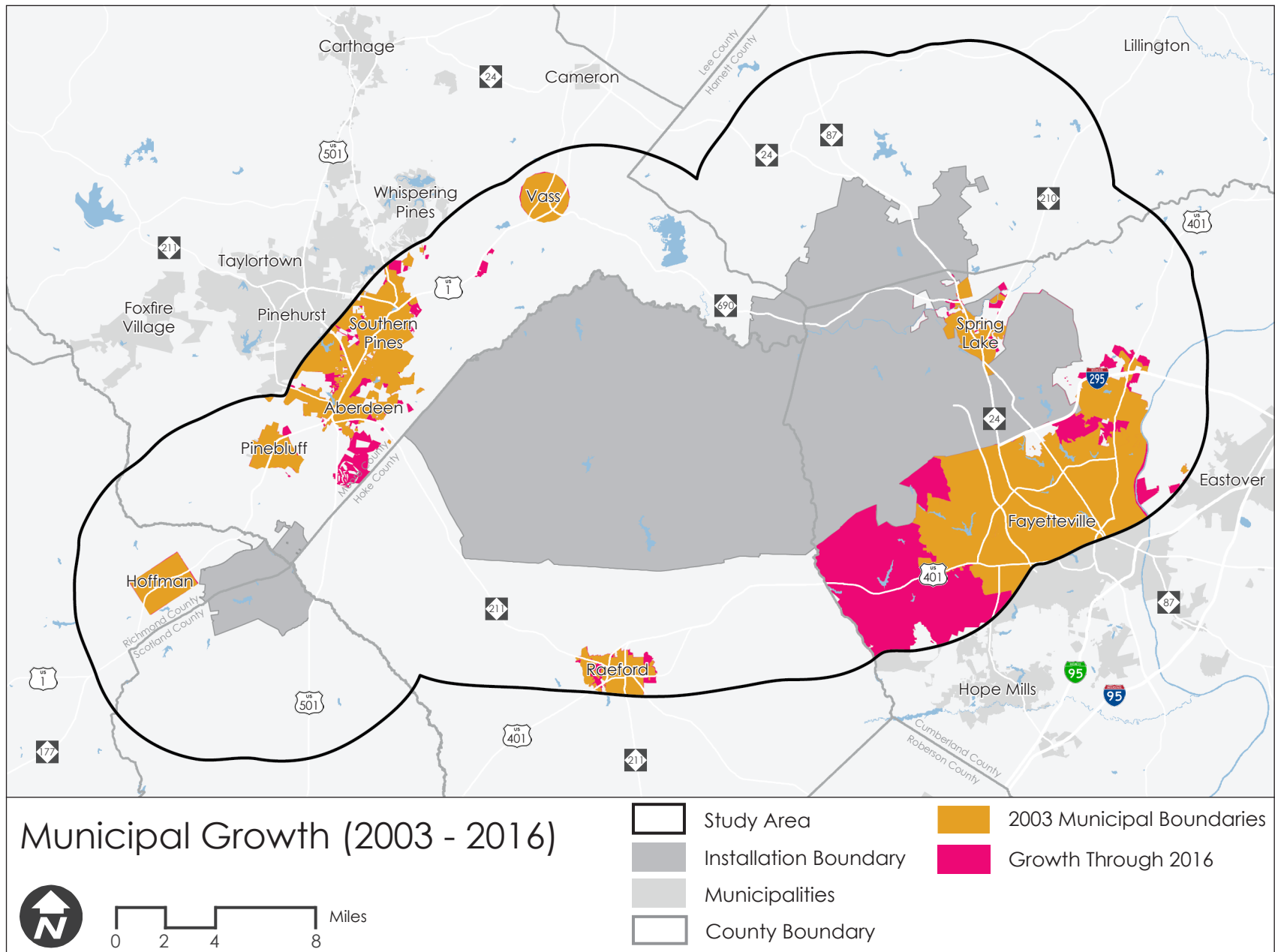
Housing growth rates and population growth rates decoupled between 2010 and 2015, meaning that there ceased to be a significant amount of correlation between housing growth rates and population growth during this period, with regard to the municipalities. In Hoffman, for example, there was a 3% decline in population, but an estimated 3% increase in the housing stock. At the other end of the spectrum, Aberdeen saw an estimated 9% growth in its population during the 5 year period, but only a 1% increase in its housing stock. While housing markets are not the same across the region, it is likely that, just like in many other parts of the country, there was significant absorption of existing unsold housing stock as opposed to new building going on as the nation emerged from the recession and housing downturn.

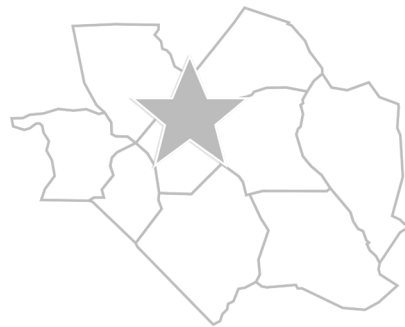
Maps 2.4 and 2.5 detail the block level housing density in the five mile JLUS focus area in 2000 and 2010. This data provides the same growth picture as the population density maps, with increasing housing density observed in western Cumberland, eastern Hoke, southern Harnett, and eastern Moore Counties, in the high population growth corridors.

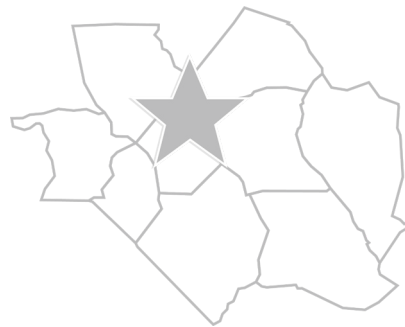
2.3 MUNICIPAL GROWTH TRENDS

As a point of reference to the previous JLUS, a map is provided on the following page that details the growth in municipal boundaries between 2003 and 2016. The majority of this municipal growth took place prior to the adoption of new annexation statutes by the General Assembly, and so it is somewhat tilted toward pre-2010 growth, as a review of the similar map in the last JLUS would reveal. The growth of municipal borders often used to be a leading indicator of impending population and housing growth, but, with changes in annexation laws, greater availability of utilities in unincorporated areas, and similar factors, the presence or absence of a municipality in an area is no longer a strong indicator of urban or suburban density development. If anything, this map, when compared to the population and housing density maps, reveals just how much of the growth in the focus area has taken place outside of municipalities. This means, in part, that it is necessary for both county and municipal governments to exercise vigilance regarding the impact of urban growth around Fort Bragg.

▼ MAP 2.6 MUNICIPAL GROWTH 2003-2016

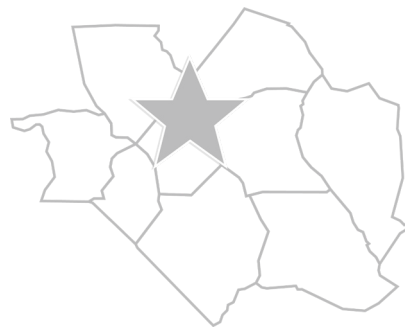






LAND USE TRENDS
SECTION THREE

FORT BRAGG JOINT LAND USE STUDY



LAND USE TRENDS

3.1 LAND COVER CHANGE

As part of the JLUS, land cover data from satellite imagery was analyzed to provide a baseline of areas that were developed, used for agriculture, or remained part of the natural landscape. 2008, the base year for the last update of the Fort Bragg JLUS was chosen, so that trends since its completion and ongoing implementation could be reviewed.

The patterns of change / difference in the land cover data between 2008 and 2016 (the most recent year that data was available for) are more important than statistics, given some inherent inaccuracy in landscape scale remote sensing data. Some general trends can be observed between the 2008 land cover map (Map 3.1) and the 2016 land cover map (Map 3.2). First among these is a general trend showing a decrease in the amount of land identified as being in use for agricultural purposes, particularly the smaller and scattered areas of agricultural land from the 2008 land cover map. These areas, it appears, tend to have converted back to natural land cover over this 8 year period, with the larger, more in-tact tracts appearing to remain in stable agricultural use. The other major trend found in the data is best observed in Map 3.3, which details only the developed land cover change between 2008 and 2016. This data provides confirmation of the densification trends that was shown to be occurring in the Census data in western Cumberland, eastern Hoke, southern Harnett and eastern Moore Counties.

3.2 LAND SUBDIVISION PATTERN

The 2016 tax parcel data was collected from each of the counties in the JLUS focus areas, consolidated, and refined to aide in the identification of land subdivision patterns in the focus area. The purpose of this is to identify areas of densification, with the division of land into smaller parcels serving as a leading indicator of impending development activity (although this can be delayed during economic downturns). Trends observed in this data provide additional insight and advanced notice of potential changes in development patterns, and with constant updates, it can be used to spot emerging trends, while land cover data is more useful in observing landscape scale changes over time.

The land subdivision pattern map (Map 3.4) displays the tax parcel data in terms of density / lot size. The map reveals an emerging pattern, particularly in western Cumberland and eastern Hoke counties, with lots smaller than 1 acre in size, creeping into areas that are fairly rural in nature. The emergence of these isolated pockets of dense land subdivision activity in areas surrounded by much larger parcels is a good indicator of pending transition toward a more suburban or urban overall land use pattern. These same trends are observed in southern Harnett County, but are not as evident in eastern Moore County - the other area previously identified as becoming more dense via other indicators. Given the nature of the housing market and overall economic picture there, it is likely that land subdivision is

occurring in ways that are not as evident as in areas where desired or necessary. This further demonstrates the need to consult and monitor multiple types and sources of data when attempting to identify landscape scale growth and development trends.

3.3 ZONING

The zoning data from each of the communities that comprise the JLUS focus area was compiled (except Scotland County which does not maintain digital zoning data) and generalized to develop a unified regional view of the type of general land use regulation that has been enacted by each of the jurisdictions. The resulting map provides, perhaps, one of the most clear pictures of past and pending development trends in the region. This is due to the general trend in local government to not proactively zone land for development purposes, except in response to a request from a landowner / developer. The two primary items of interest to observe in the JLUS focus area zoning map (see Map 3.5) are those areas that have been given a general “urban / suburban” residential zoning classification and those that remain in a “rural / agricultural” zoning classification.

In western Cumberland and eastern Hoke counties, the trend toward piecemeal zoning of tracts as they are brought to market for housing development is quite evident, and consistent with the land subdivision pattern data and the landcover data. Scattered “suburban / urban” density residential zoning is a likely indicator that future zoning decisions will occur in the same area and in the same manner as the previous zoning decisions.

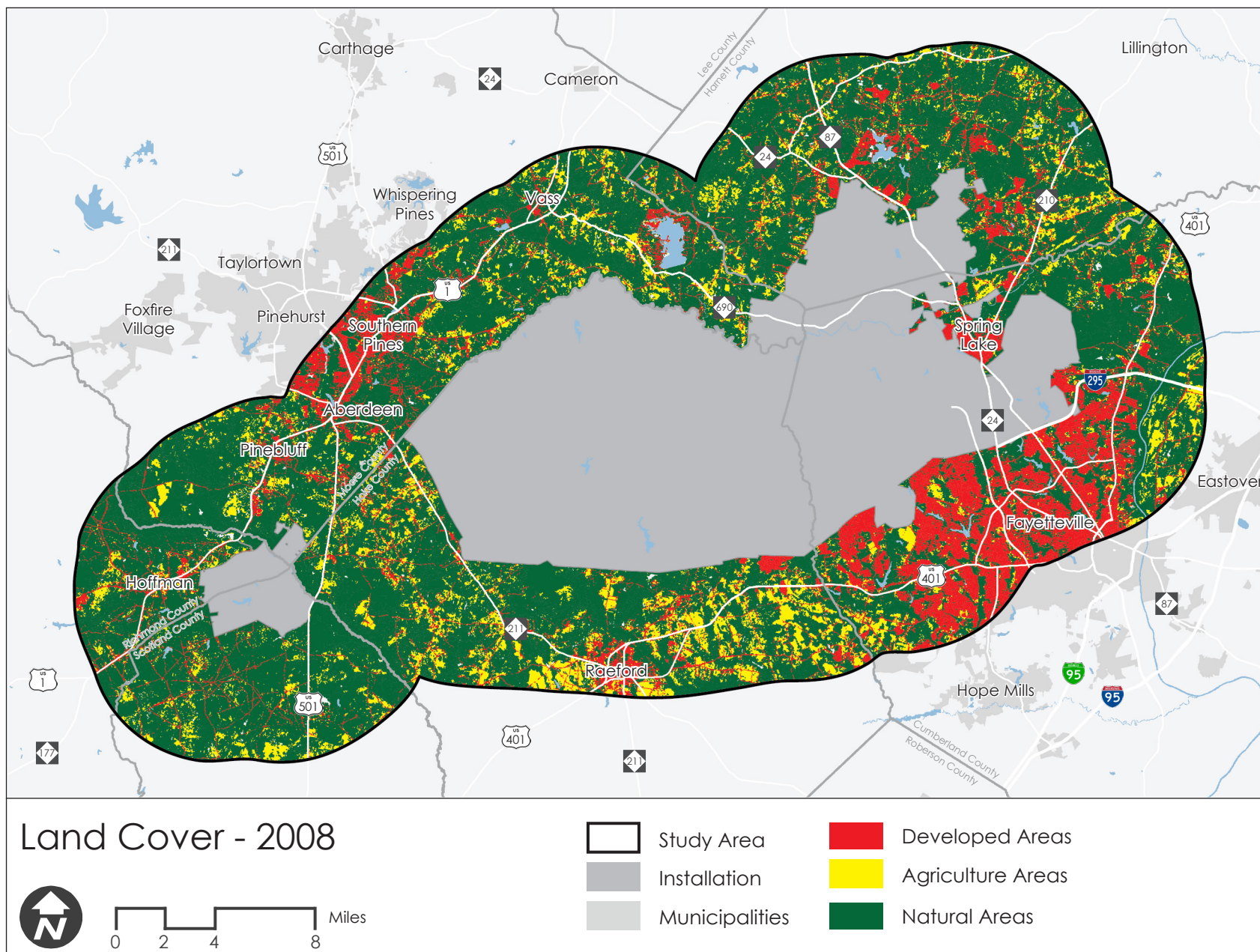
3.4 GENERAL OBSERVATIONS

The data presented in this section presents a fairly clear picture of both the land use changes that have occurred, and those that are likely to occur. When coupled with the population and housing growth data, a pattern of western expansion from the Fayetteville urban area into Hoke County is evident. Based on the sheer momentum inherent in ongoing land development activity, it is not likely to stop or change course, absent some significant economic challenges. In that case it would likely only pause until prosperity returns. Similar development trends are happening north of Fort Bragg in southern Harnett County, as well as in eastern Moore County, although for different reasons.

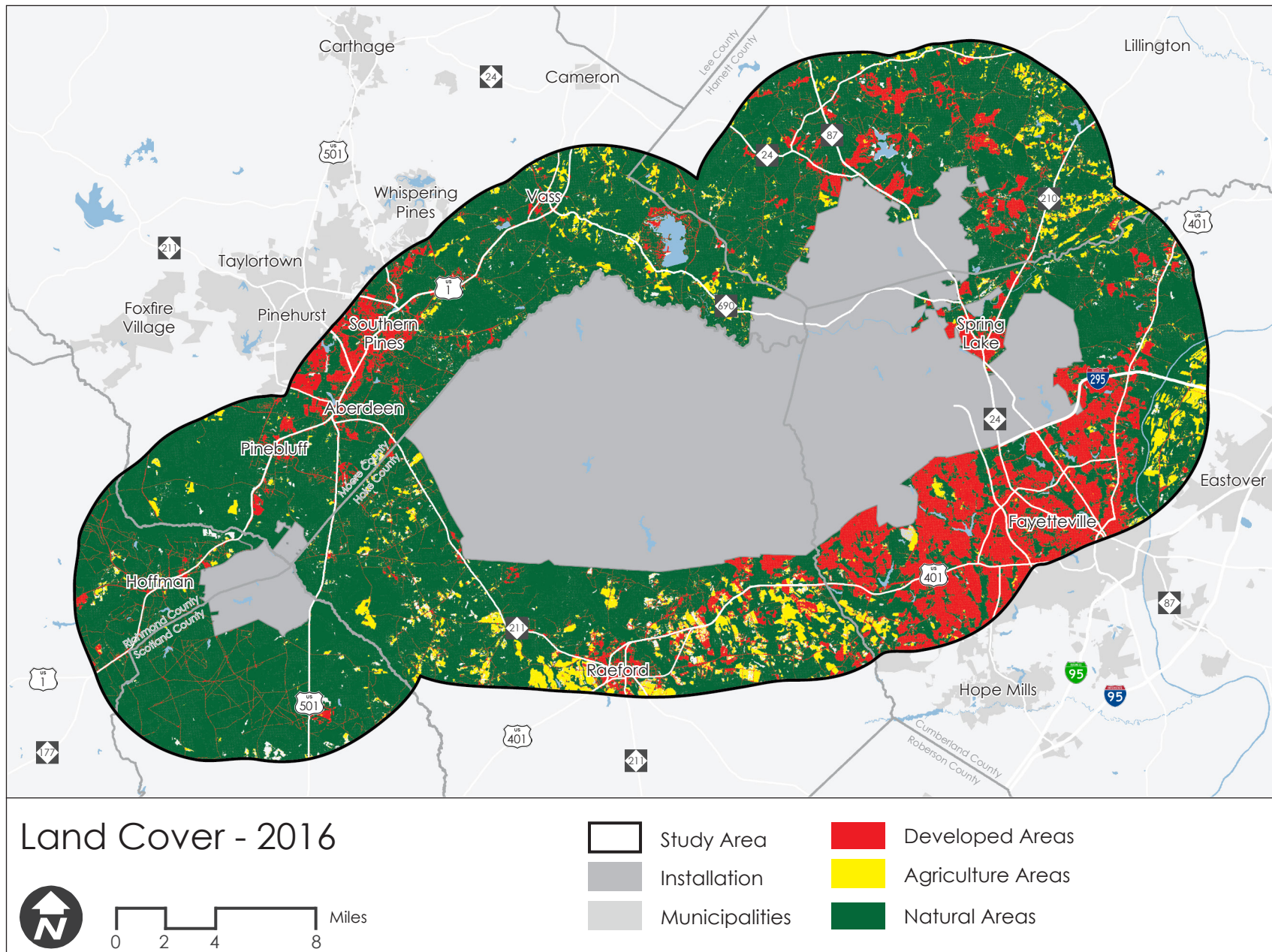
The development activity in southern Harnett county, while tied to Fort Bragg, is also driven, at least in part, by workers from the Triangle or split military ./ Triangle working families looking for housing in more affordable areas. The development activity in eastern Moore County is more driven by leisure and retirement focused development, which may be more resilient and be able to continue fairly unabated as long as the region remains fashionable for retirement living, despite any housing market disruption caused by an economic downturn.

Simply put, it is likely that the development trends that have driven the growth of the region for the last 30-40 years are likely to continue, perhaps with a pause along the way, but there is no significant change expected in the overall trend.

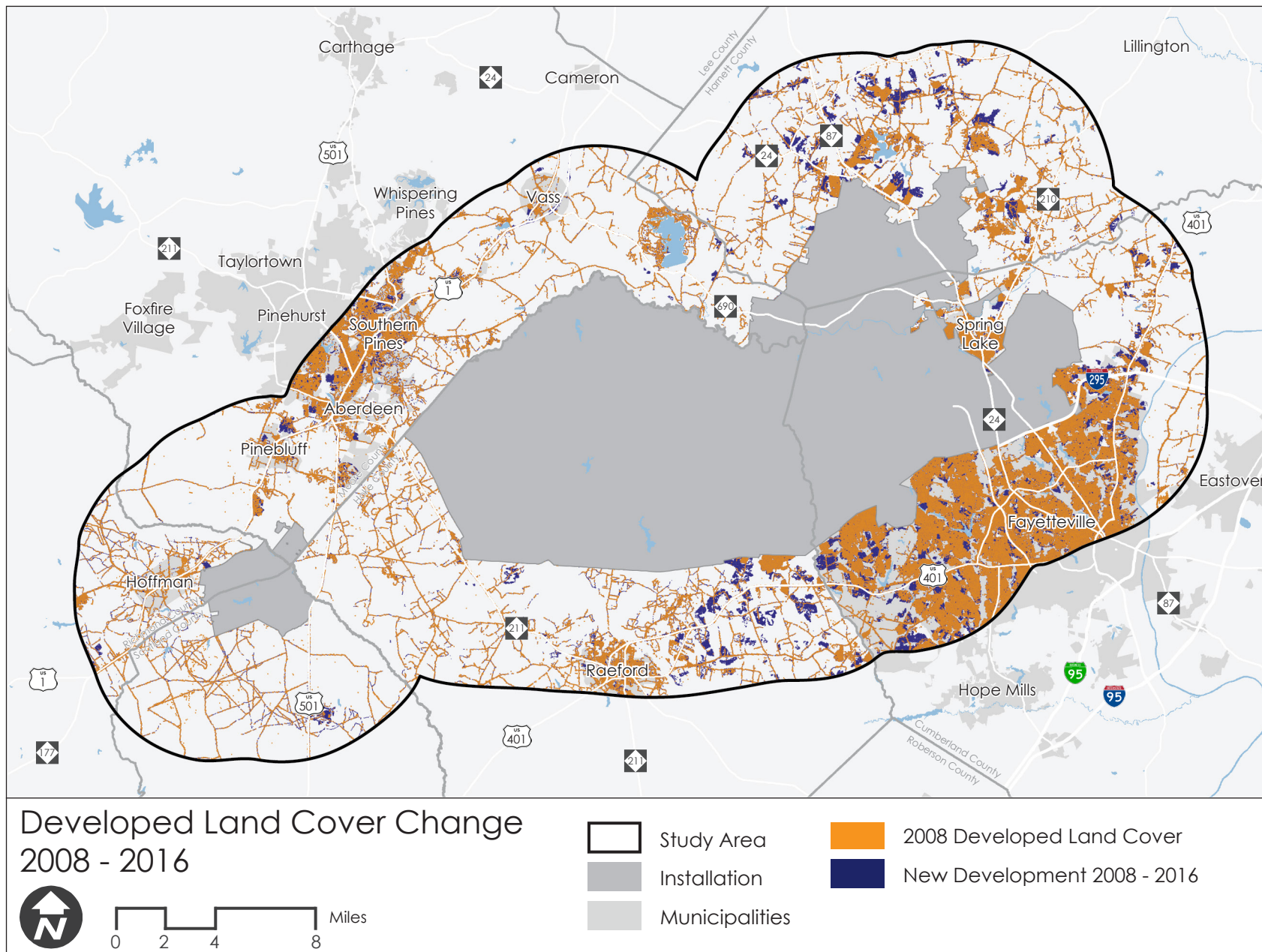
▼ MAP 3.1 2008 LAND COVER



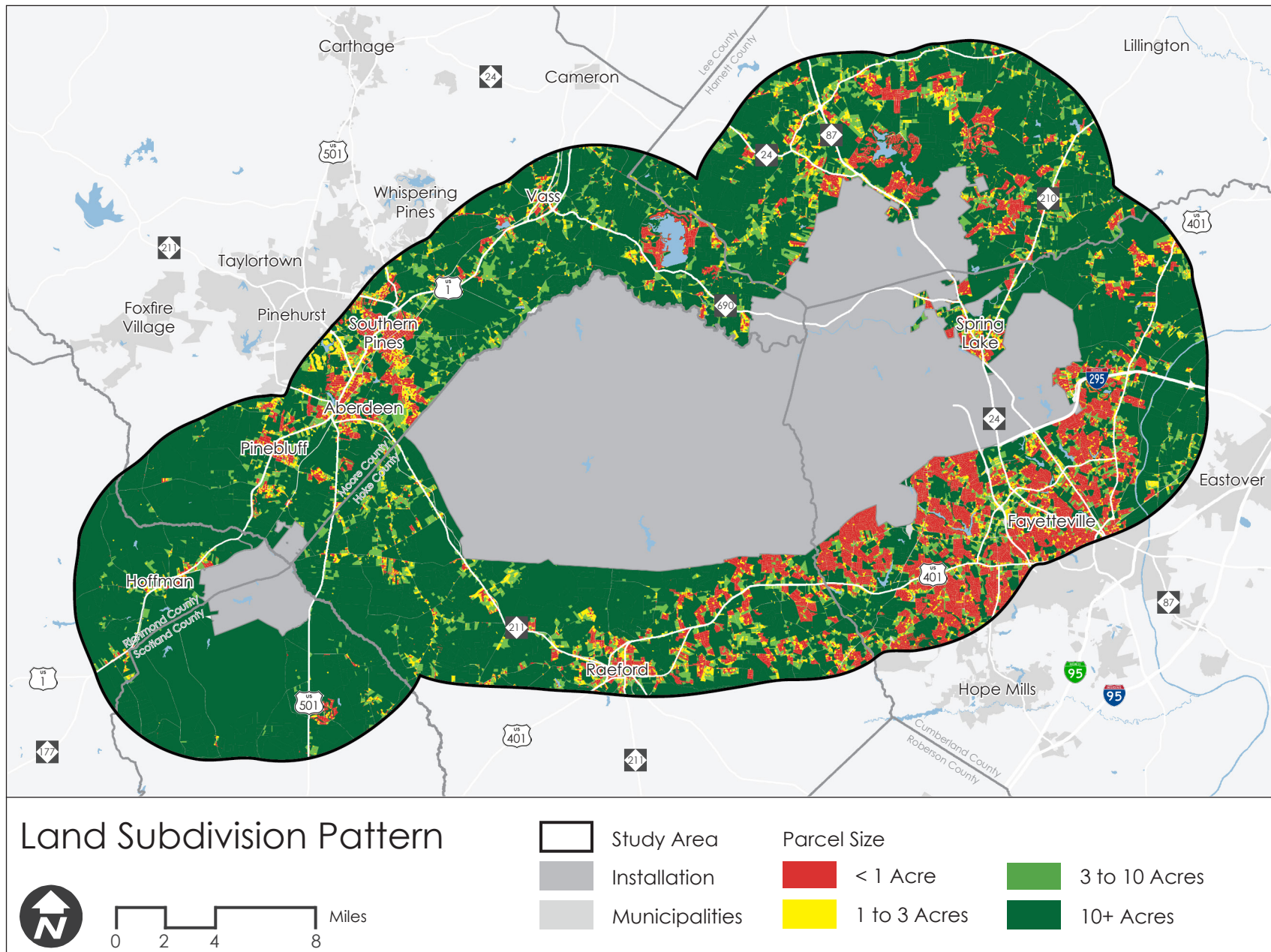
▼ MAP 3.2 2016 LAND COVER



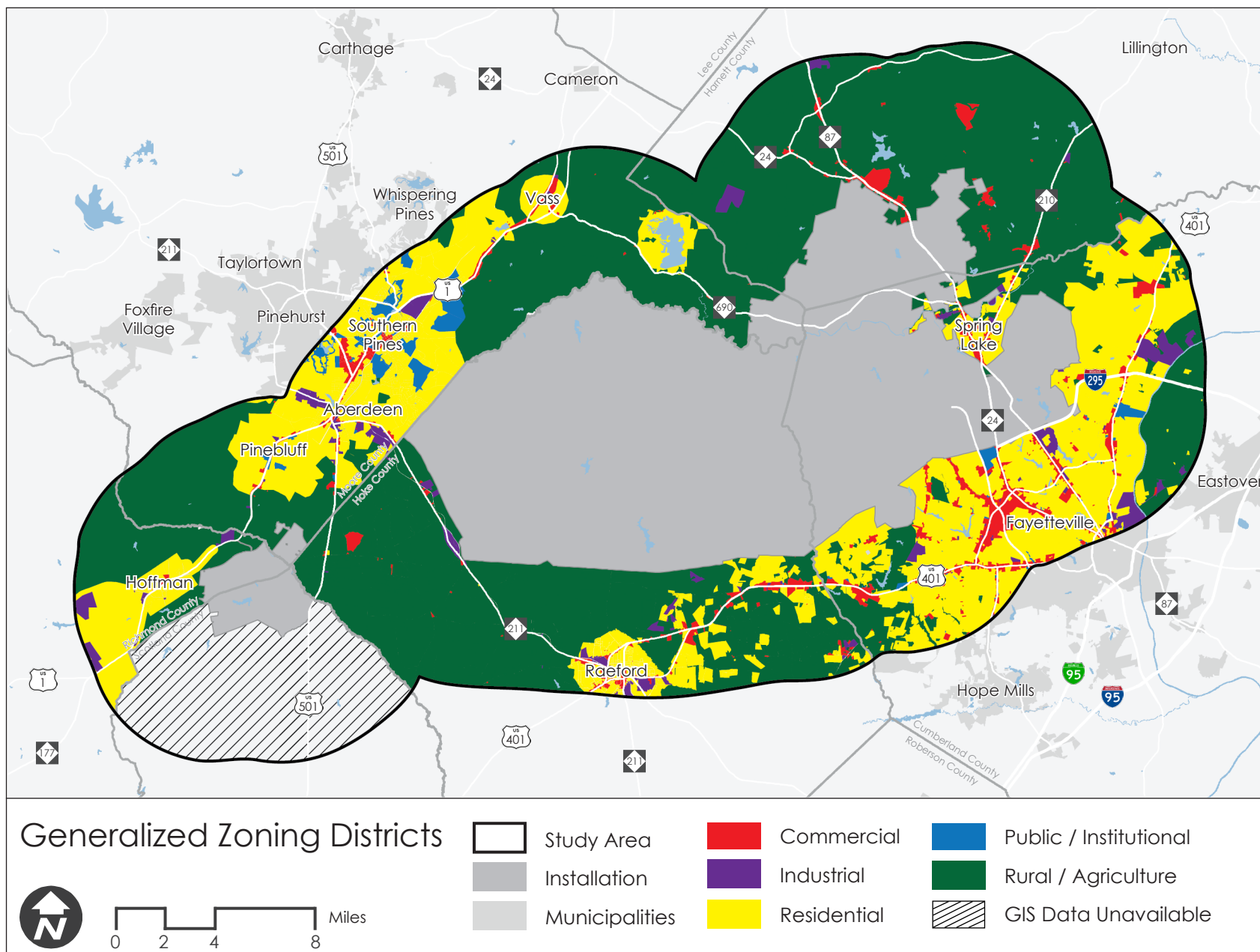
▼ MAP 3.3 DEVELOPED LAND COVER CHANGE - 2008 TO 2016

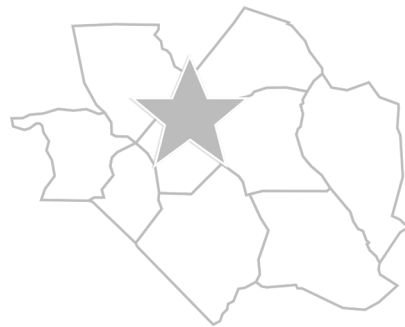


▼ MAP 3.4 LAND SUBDIVISION PATTERN



▼ MAP 3.5 GENERALIZED ZONING DISTRICTS

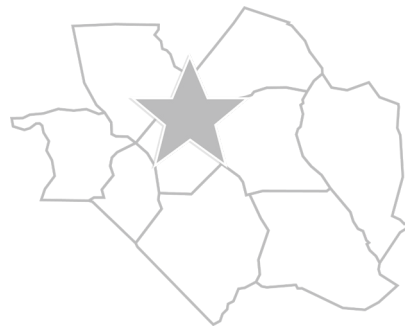




ENVIRONMENTAL FACTORS

SECTION FOUR

FORT BRAGG JOINT LAND USE STUDY



ENVIRONMENTAL FACTORS

4.1 OVERVIEW

One of the hallmarks of the Fort Bragg Region is the many accomplishments among the region's partners in working to preserve and protect the Longleaf Pine Ecosystem. The region's often divisive history, stemming from the red-cockaded woodpecker controversy in the 1980s and early 1990s, eventually led to a collaborative approach between the United States Army and environmental organizations across the Sandhills. The Army made a conscious decision to become a leader in sustainability and began to work in partnership with the region's environmental organizations, taking steps internally to make the necessary changes for becoming sustainable. As a result, the North Carolina Sandhills Conservation Partnership (NCSCP) was created in April 2000 with the mission to protect, enhance, and restore the unique Sandhills environment. The primary members of the partnership include the U.S. Fish and Wildlife Service, U.S. Army at Fort Bragg, U.S. Army Environmental Command, North Carolina Office of Conservation, Planning, and Community Affairs, North Carolina Wildlife Resources Commission, North Carolina Division of Parks and Recreation, North Carolina Forest Service, The Nature Conservancy, Sandhills Area Land Trust and the Sandhills Ecological Institute. Even though each participating organization has a different set of objectives, members understand that working together is the best solution for accomplishing mutual goals. In 2010, a new Memorandum of Understanding was signed, which reinforces the agreement between partners to cooperatively implement conservation

strategies that generate benefits for Sandhills natural resources and the people of the region.

The Regional Land Use Advisory Commission joined the partnership as a stakeholder in 2001, which heavily influenced the 2003 Fort Bragg JLUS. The 2003 JLUS was the first such study to thoroughly evaluate and include environmental factors in the development of recommendations and implementation strategies. The 2003 JLUS became a national example and benchmark for subsequent JLUS efforts across the country. The regional efforts contributed to the recovery of the red-cockaded woodpecker population and the expansion of training by Fort Bragg into areas that were previously closed. Over 30,000 acres of land around Fort Bragg have been protected since the beginning of the partnership and the 2003 JLUS. This section provides a summary of environmental elements that are important to the future of the region and the training mission at Fort Bragg.

4.2 THREATENED AND ENDANGERED SPECIES

Managing and monitoring Federally-listed threatened and endangered (T&E) species is a significant natural resource management obligation for the region. In the JLUS study area, the Army and Fort Bragg manage the majority of land and the bulk of habitat and environmental management responsibilities lie with the Army. In accordance with the Endangered Species Act (ESA), the Army must assist in the recovery efforts of all

listed T&E species and their habitats currently under the Army's land management authority. The ESA requires all federal agencies to conserve T&E species through the use of all methods and procedures necessary to bring any listed species to the point where protections pursuant to the ESA are no longer necessary.

The sections below describe the issues of current and potential encroachment from Federally threatened or endangered species, provide background on the local encroachment situation, describe the current situation, and provide conclusions and recommendations to address the challenge.

EXISTING CONDITIONS

Federally threatened and endangered species are known to occur in the JLUS focus Area. These species include:

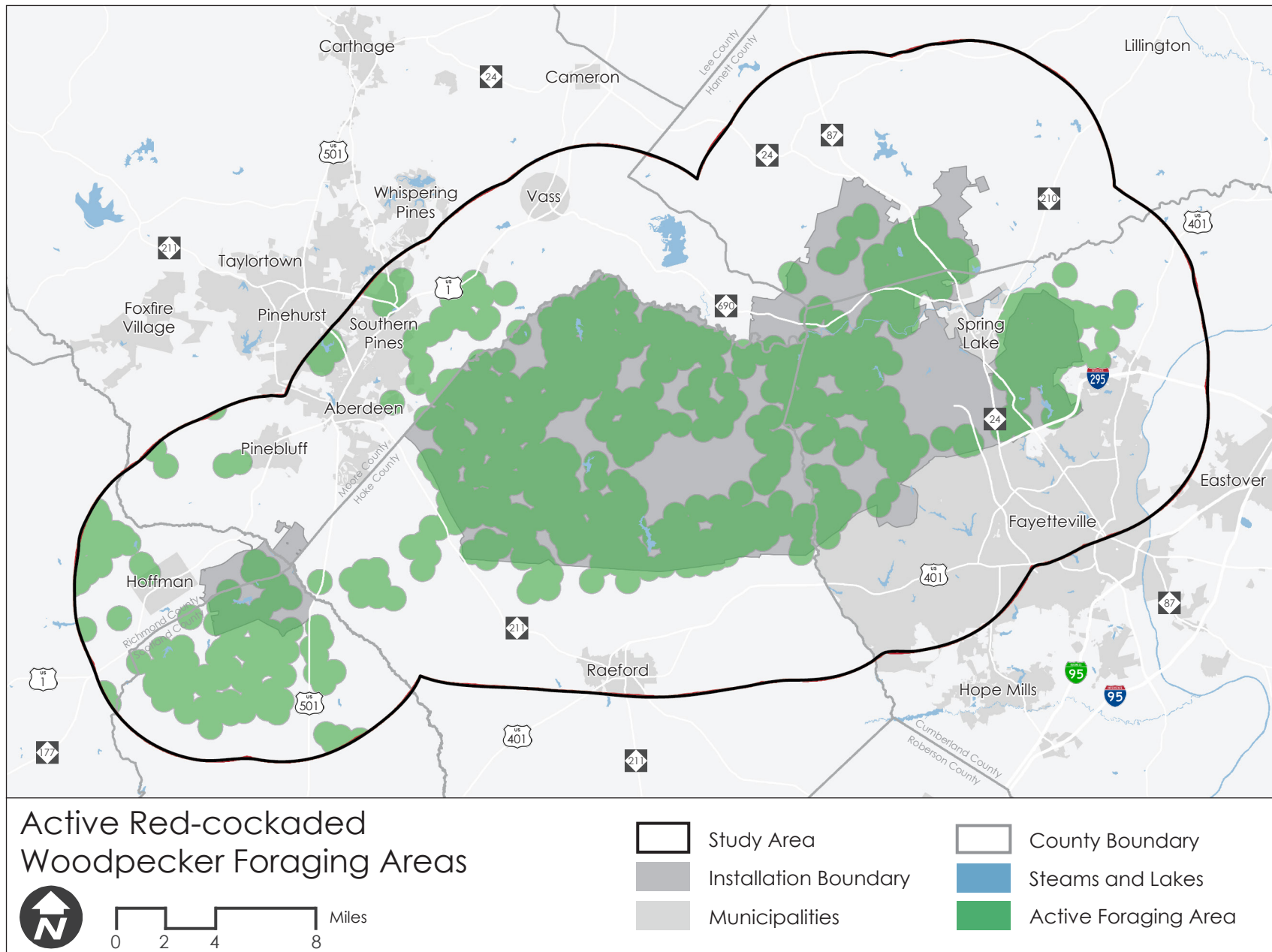
- Red-cockaded woodpecker (*Dryobates borealis*), Endangered
- Michaux's sumac (*Rhus michauxii*), Endangered
- Rough-leaved loosestrife (*Lysimachia asperulaefolia*), Endangered
- American chaffseed (*Schwalbea Americana*), Endangered
- American burying beetle (*Nicrophorus americanus*), Endangered
- Saint Francis Satyr (*Neonympha mitchellii francisci*), Endangered
- Northern long-eared bat (*Myotis septentrionalis*), Threatened

For the red-cockaded woodpecker (RCW), Fort Bragg is currently under a Biological Opinion (BO) to restore and maintain potential breeding groups (PBG) and long-leaf pine habitat. Under the BO, Fort Bragg is required to maintain 350 PBG. Fort Bragg has been extremely successful

▼ IMAGE 4.1 RED-COCKADED WOODPECKER



▼ MAP 4.1 RED-COCKADED WOODPECKER ACTIVE FORAGING AREAS



at restoring the RCW. As of 2016, there are 522 estimated PBG on Fort Bragg, making it the second largest population of RCW in the world. Almost 98% of the restrictions placed on training at Fort Bragg have been removed, freeing more than 5,000 acres for unrestricted training. The only remaining restrictions are on sites within the Green Belt and Camp Mackall and a few selected sensitive sites (Range Complex Master Plan[RCMP]). The region's efforts to conserve areas off post that have a high habitat rating will help provide the needed areas for the RCW population to thrive. In addition, the establishment of wildlife connectors between highly rated habitat areas and RCW populations on Fort Bragg will help ensure the overall health of the RCW population well into the future.

Presently, there are only 22 known populations of Michaux's sumac. Seven of those populations are located on Fort Bragg and one is on Camp Mackall. Military training is prohibited in endangered plant sites, requiring units to relocate or change operational plans when encountering these sites. Locations are permanently marked with yellow diamond-shaped signs on nearby trees and are off-limits to military activity (RCMP).

Rough-leaved loosestrife, a species endemic to the Sandhills of North Carolina, currently has 55 known locations within North Carolina. Twenty-five of the locations are on Fort Bragg. One site can be found on Camp Mackall (RCMP).

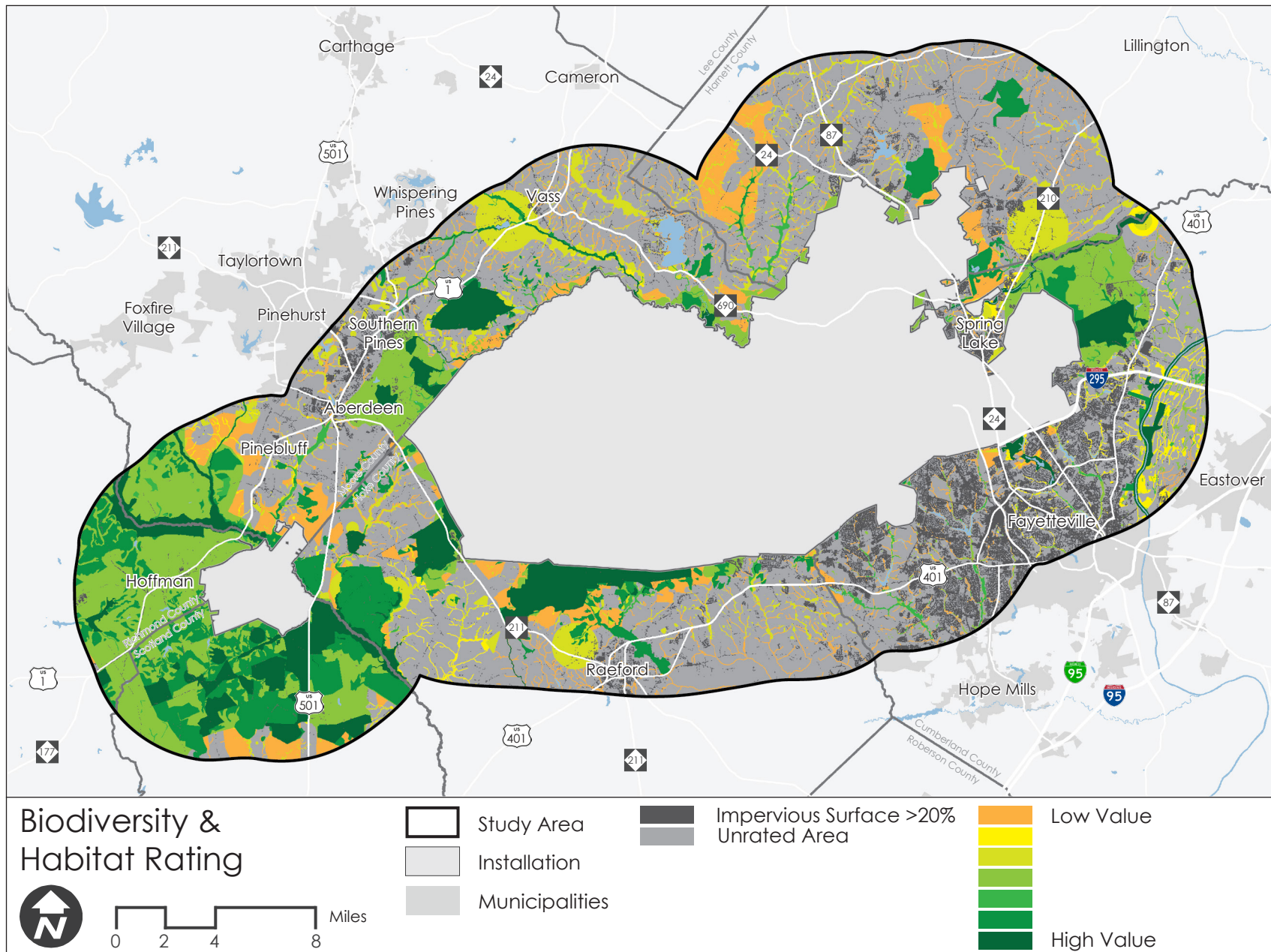
American Chaffseed can be found in five states: North Carolina, Georgia, South Carolina, Florida, and New Jersey. Of the 71 known populations in these five states, 18 are located in North Carolina, 17 of which can be found on Fort Bragg. American Chaffseed's habitat is located in the duded impact area and it does not have a significant impact on military training (RCMP).

Historically, the American Burying Beetle was widespread across much of eastern North America from the Great Plains to the Atlantic seaboard. Currently populations are only known to occur in western Arkansas, eastern Oklahoma, central and southern Nebraska, southeastern Kansas, south central South Dakota, and Block Island, Rhode Island, an island off the Atlantic coast. There is one specimen in the Entomology collection at North Carolina State University that was collected in Harnett County in 1938; however, the status on Fort Bragg is unknown as there are no records of any surveys being conducted in the area.

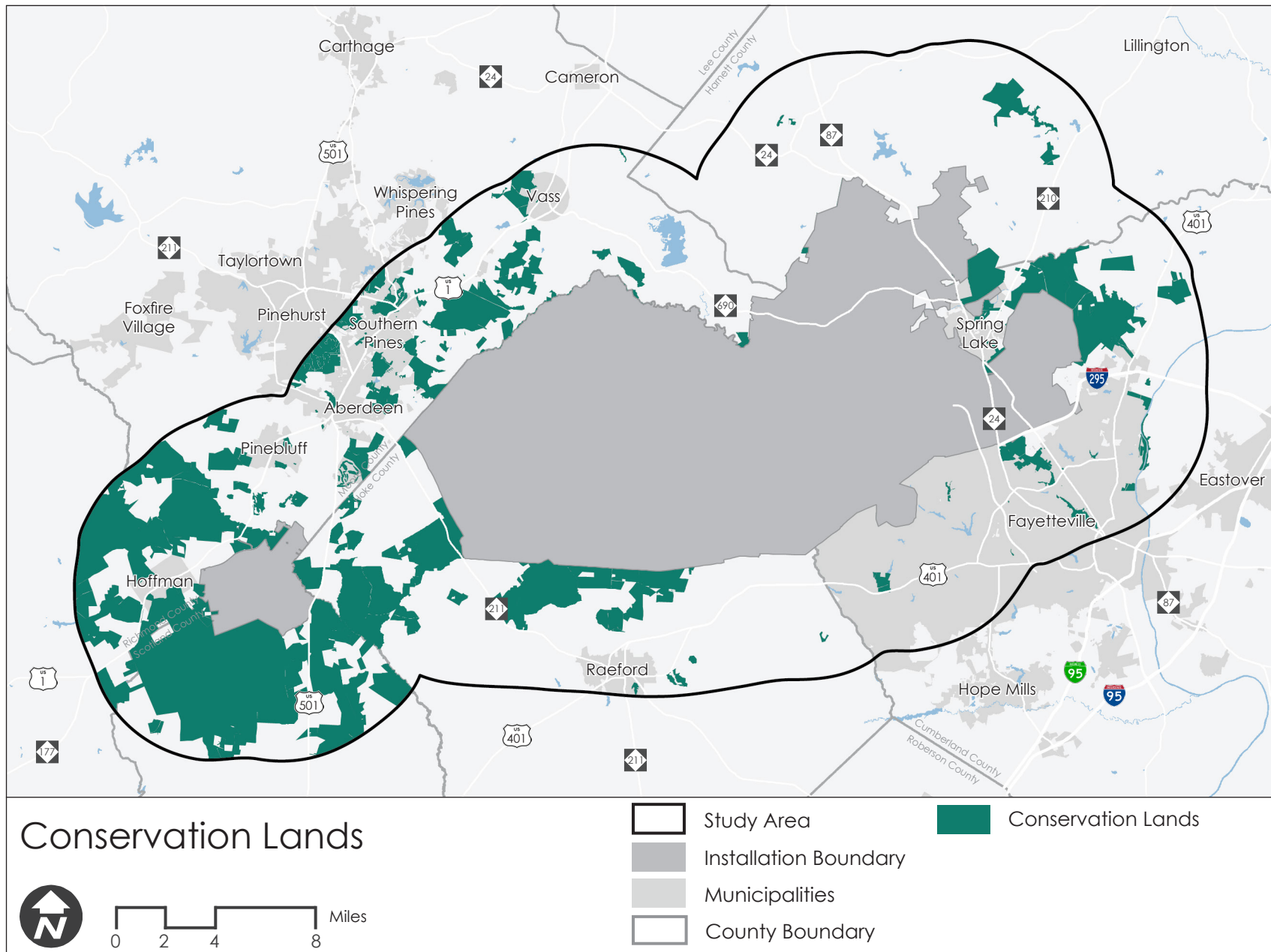
Saint Francis Satyr is one of the rarest and least known butterflies. On Fort Bragg, it has 19 known colonies. This extremely small geographic range encompasses only a few square miles, with approximately 80 percent of known colonies occurring in the impact areas of Fort Bragg (RCMP).

Northern long-eared bats (NLEB) are widely distributed across eastern North America from Manitoba across southern Canada

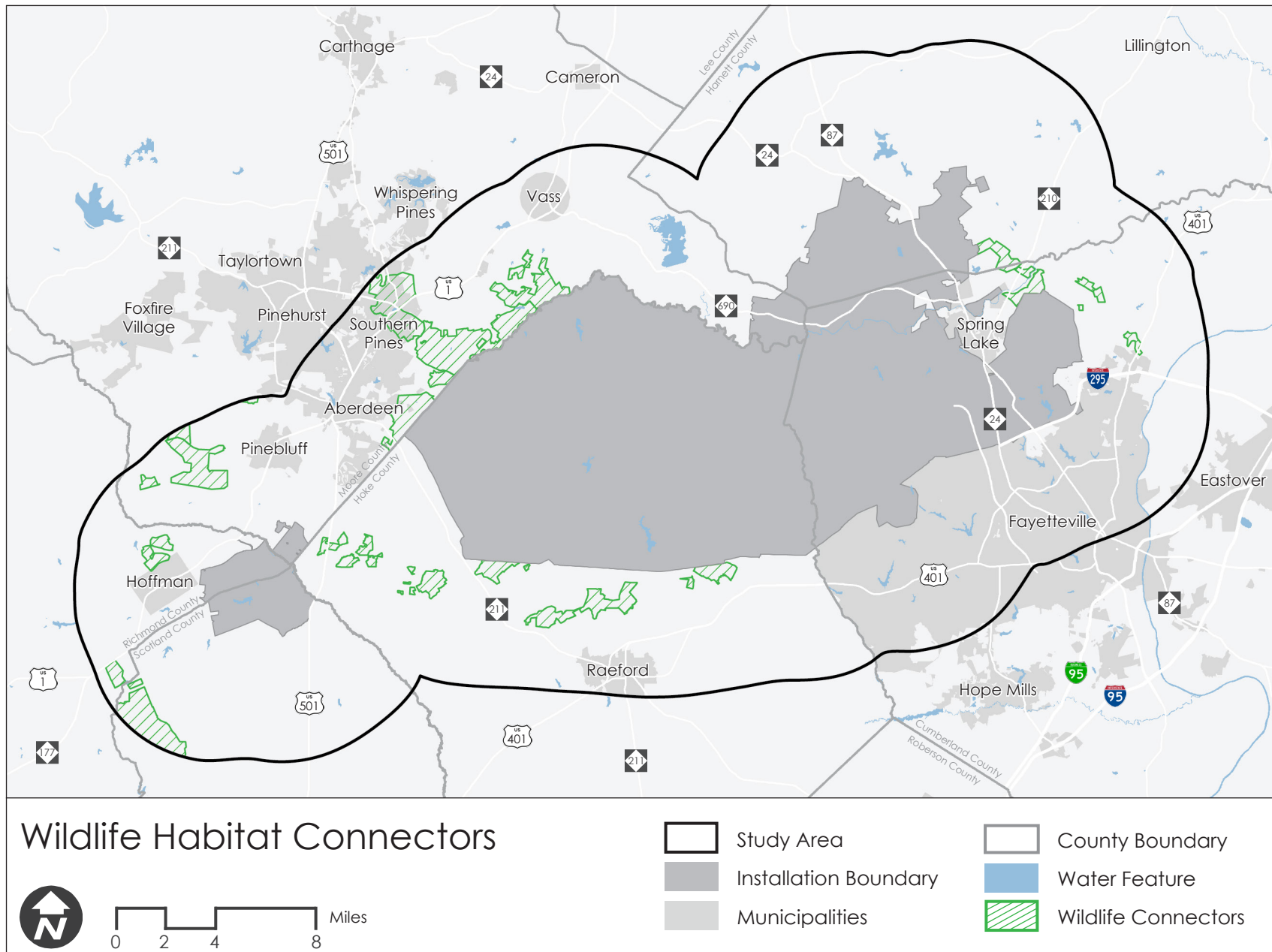
▼ MAP 4.2 BIODIVERSITY & HABITAT RATING



▼ MAP 4.3 CONSERVATION LANDS



▼ MAP 4.4 WILDLIFE CONNECTORS



to Newfoundland, south to northern Florida, west through the south central states and northwest to the Dakotas. NLEB have been heavily impacted by white nose syndrome (WNS), with losses of up to 98% of populations in some parts of its range. Although Fort Bragg has no documentation of NLEB captures, echolocation calls, maternity roosts or hibernacula, Moore and Harnett counties are listed by the USFWS as part of the NLEB range and the WNS zone.

ENDANGERED SPECIES CHALLENGES

Challenges that the region could face include:

- RCW populations are highly connected on Fort Bragg, but less so in the surrounding landscape. The most important dispersal habitats on private lands occur in areas that are highly suitable for commercial, residential and industrial development.
- Supporting and maintaining the mission of the largest US Army base (by population) by limiting encroachments due to natural resources and by providing quality, realistic, sustainable training lands.
- Protecting, managing, maintaining and monitoring RCW PBG and habitat in order to assist with the species recovery with a view to continue removing restrictions established through the Biological Opinion.
- Supporting and conducting leading, innovative scientific research that will help protect Fort Bragg's training lands from future endangered species listings.

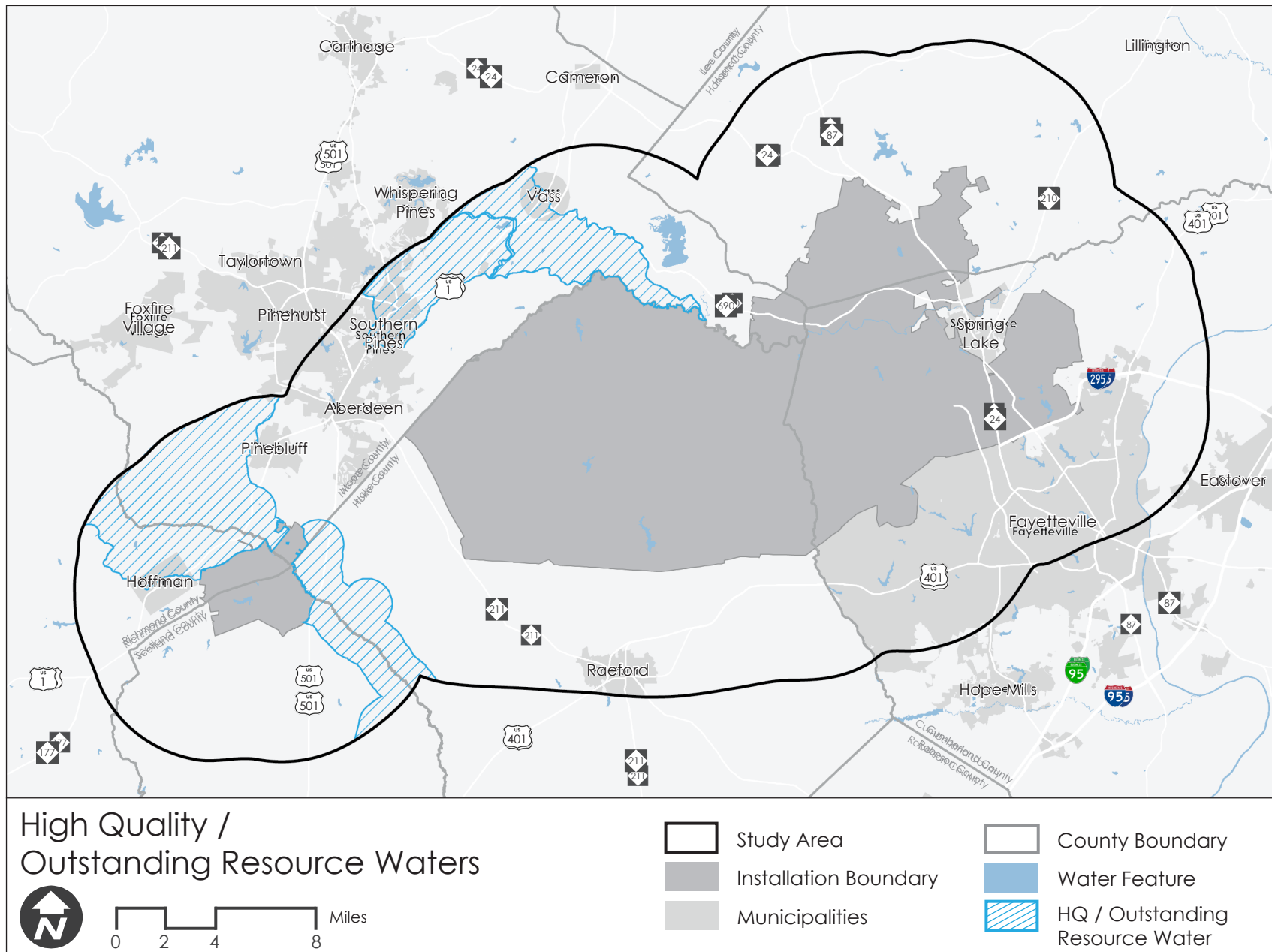
ENDANGERED SPECIES SUMMARY

Working closely with USFWS, Fort Bragg has made tremendous progress in mitigating the impacts of its endangered species. Fort Bragg uses ecosystem management practices to monitor, maintain, and restore natural communities and improve habitat conditions for rare, threatened, and endangered species. By implementing a landscape-level, ecosystem management approach to restore the longleaf pine-wiregrass ecosystem, Fort Bragg focuses on the restoration of natural communities as the primary means of conserving biodiversity, recovering endangered species, improving wildlife habitat, and sustaining military training lands.

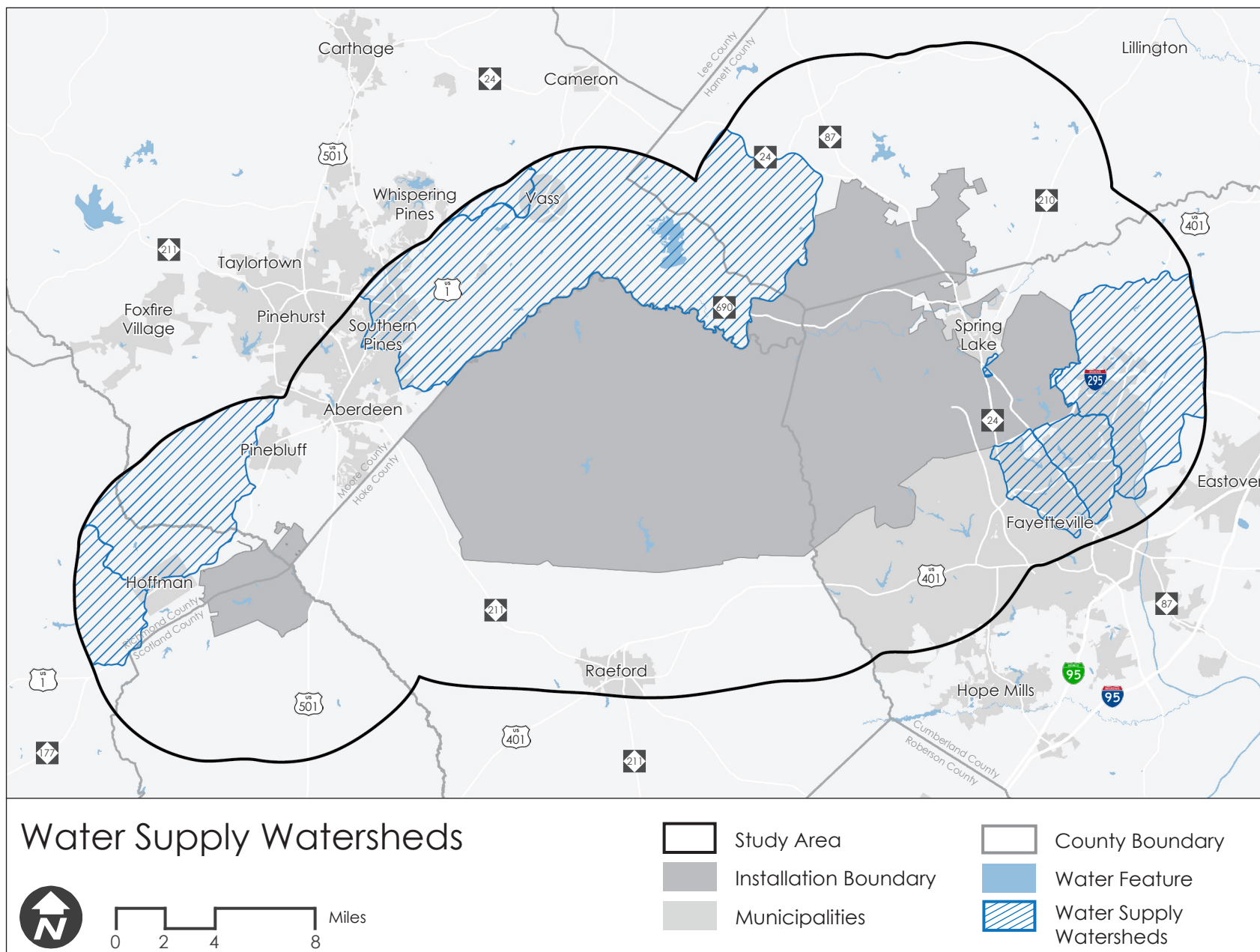
4.3 WATER QUALITY

Maintaining healthy water bodies at Fort Bragg and Camp Mackall supports ecological and human health and is reinforced by federal and state laws and regulations; AR 200-1 also promotes the importance of maintaining healthy water resource systems on the installation. Fort Bragg's procedures to protect and improve the water quality in existing surface waters extends to, but is not limited to: streams, wetlands, lakes, and impoundments. These watersheds feed into the Cape Fear Basin and the Lumber River Basin, two major river basins in the region. These basins support municipal drinking water supplies for surrounding communities upstream and downstream of Fort Bragg and Camp Mackall. In addition, these river basins are used for potable water supply, agriculture, and recreation.

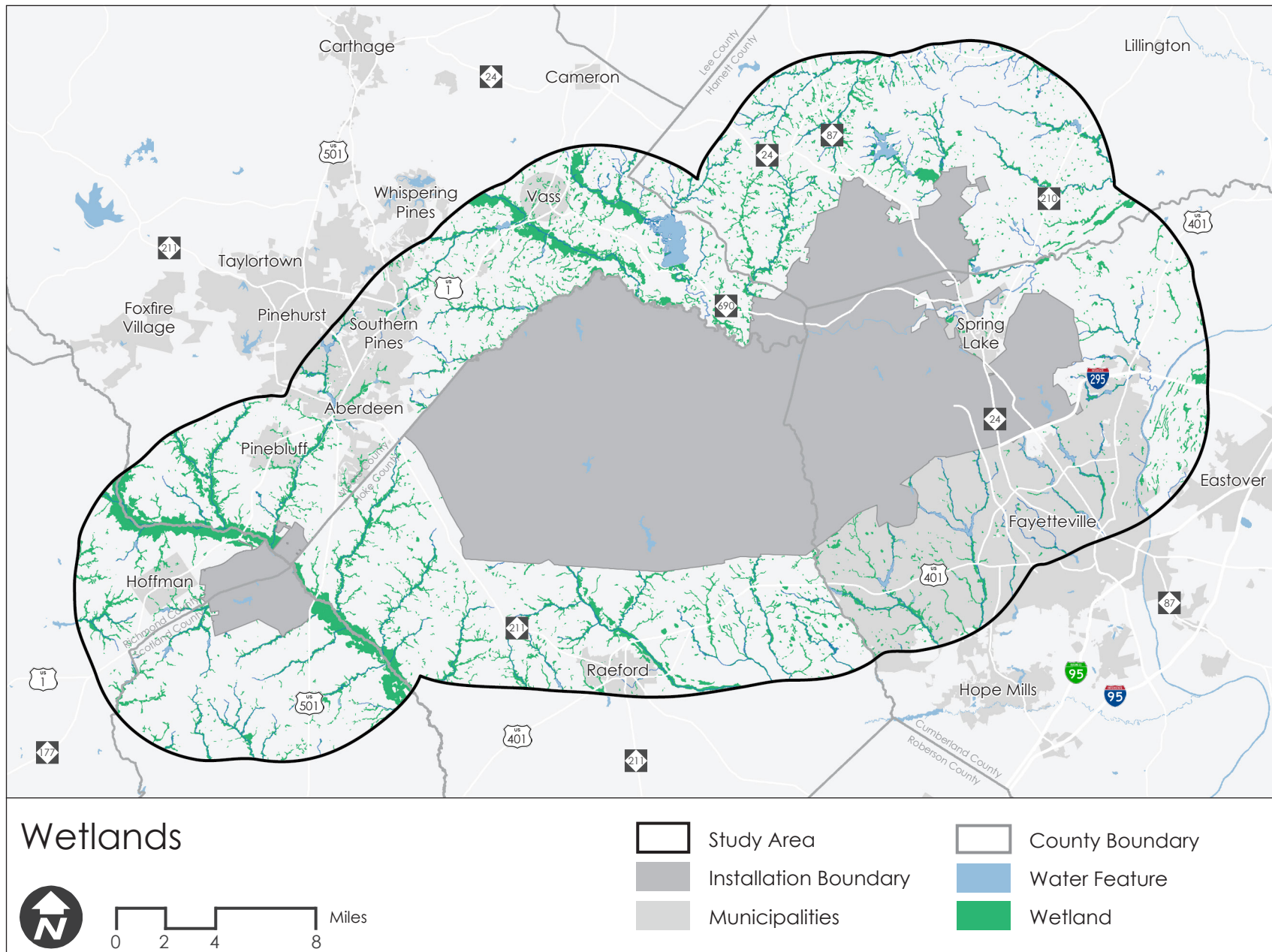
▼ MAP 4.5 HIGH QUALITY / OUTSTANDING RESOURCE WATER



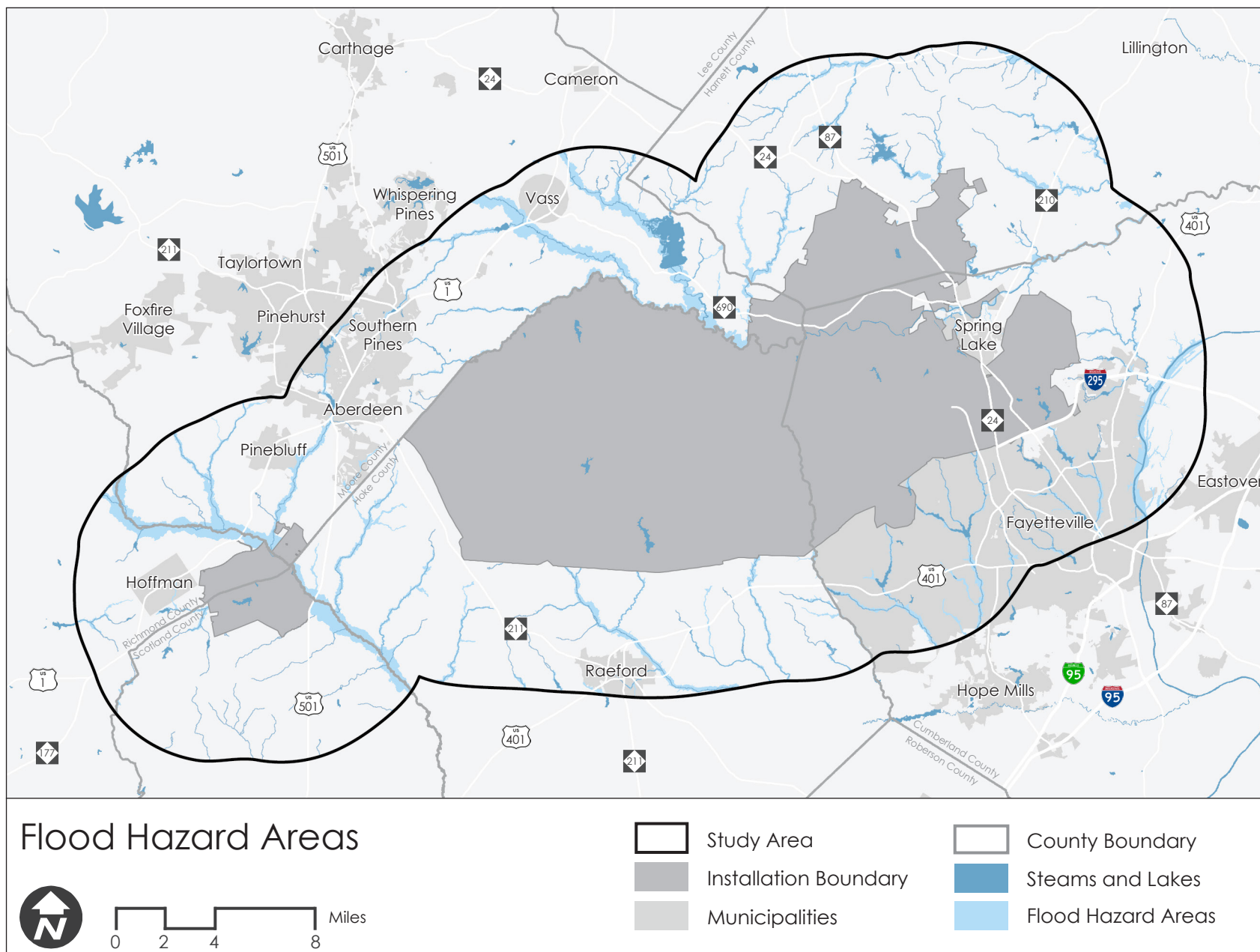
▼ MAP 4.6 WATER SUPPLY WATERSHEDS



▼ MAP 4.7 WETLANDS



▼ MAP 4.8 FLOOD HAZARD AREAS



The water that drains from the Installation has the potential to affect water resources. It is important to maintain high quality water standards so water remains potable and preserves the ecological integrity of the water resources in and around Fort Bragg. Water of a low quality is unable to support a diverse and healthy population of aquatic life which would have an adverse effect on biodiversity and cause potential human health implications.

Fort Bragg uses a watershed management approach to protect water quality and conserve aquatic resources. Management includes implementing chemical and biological monitoring programs to track changes in water quality. Regular monitoring programs are used to identify potential erosion problems and any associated sedimentation impacts to wetlands and streams. Fort Bragg will implement erosion control and habitat restoration projects to help stabilize identified eroded areas and restore degraded wetlands and streams.

The Water Management Section within the Environmental Conservation Branch at Fort Bragg focuses on improving water quality and promoting conservation on Fort Bragg through management of the installation's major potential sources of contamination: soil erosion, sedimentation, pollution and excessive storm water runoff. These sources degrade water quality, stream habitats, wetlands, and floodplains.

Sedimentation is the leading water quality threat on Fort Bragg; construction and land maintenance activities have resulted in erosion and sediment deposition in tributaries, creeks, streams, and wetlands throughout the installation.

To minimize the impact to water quality, earth-disturbing activities [including tank ditches, demo shots, trenches, Tactical Operations Center (TOC) positions, and vehicle defilade positions] are prohibited within 100 feet of streams, rivers, ponds, lakes, and other natural waterways.

HYDRAULIC FRACTURING

Almost 80% of natural gas wells drilled in the next decade will require hydraulic fracturing. Fracturing allows access to formations, like shale oil and shale gas. Geologists have identified natural gas shale formations throughout parts of Lee, Chatham, Durham, Wake and Orange counties. However, it is likely that the majority of extraction in the near future will occur in the far eastern North Carolina counties or offshore (Walt Haven, NC Geological Survey, personal communication).

WATER QUALITY CHALLENGES

Potential water quality challenges include:

- Restrictions placed on training
- A need to control or eliminate runoff and erosion through sound vegetative and land management practices

- A need to consider non-point source pollution abatement in all construction projects, installation operations, and land management plans and activities
- Concerns regarding fertilizers and run-off from golf courses and lawns
- Increased chicken houses in the region
- Increasing impervious surfaces and flooding.
- Projected population growth and additional requests for state permits to draw water from the Cape Fear Basin

4.4 AIR QUALITY

Air Quality for the region is regulated by provisions of the Clean Air Act and Clean Air Act Amendments as implemented by the United States Environmental Protection Agency (EPA) and through the North Carolina Department of Environmental Quality (NC DEQ) air quality monitoring program. The Clean Air Act standards for Fort Bragg are also implemented through Army Regulation 200-1 and Fort Bragg Regulation 200-1.2. Fort Bragg falls under the jurisdiction of the air programs administered by EPA Region 4 (Atlanta) and NC DEQ Fayetteville Region. Fort Bragg's air quality program ensures that the installation's air emission sources comply with all applicable federal, state, and local air regulations.

In October 2015, EPA revised the primary and secondary National Ambient Air Quality Standards (NAAQS) for ozone to 70

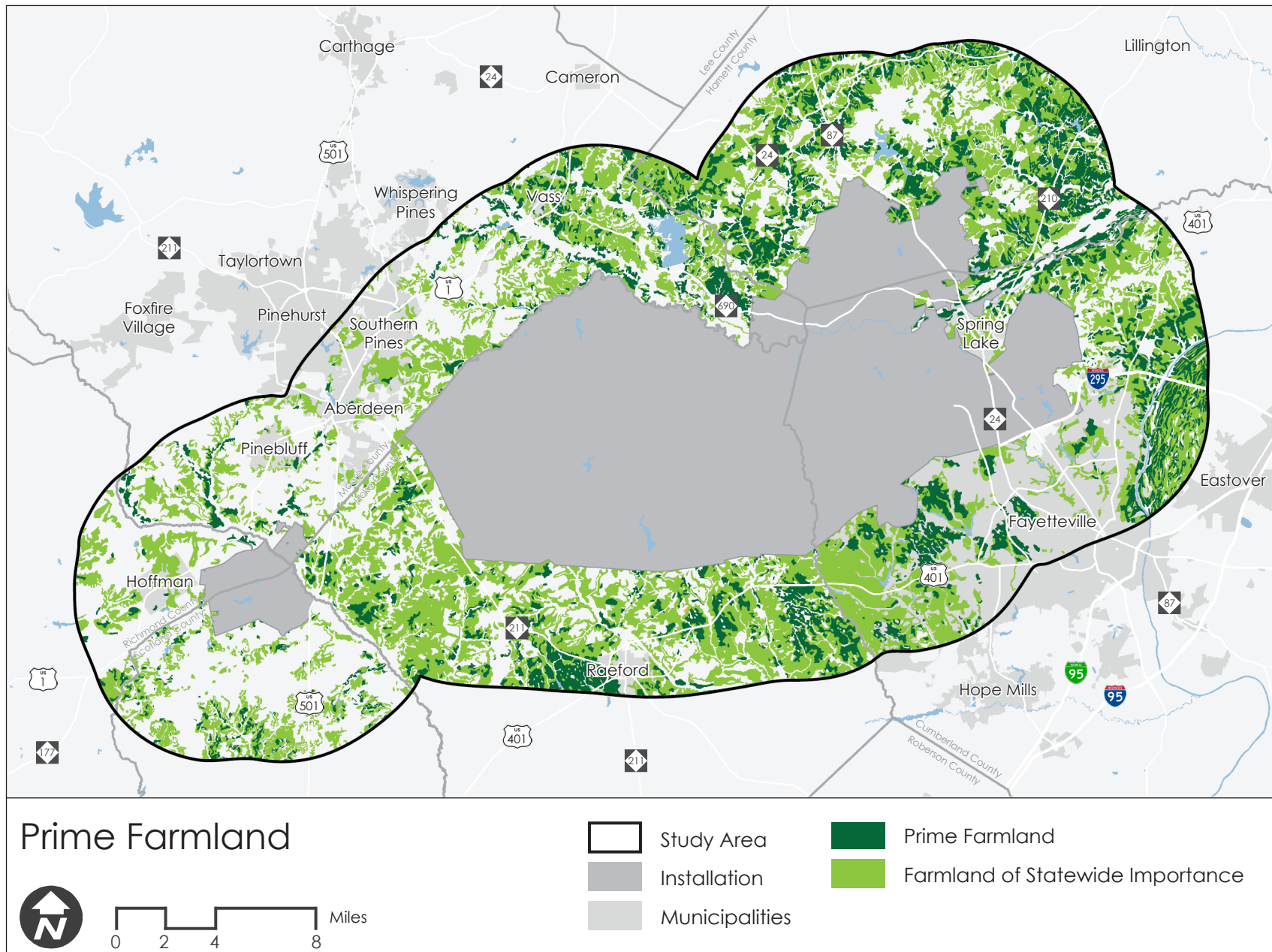
parts per billion (ppb). Under newly-published standards, the maximum permitted concentration is 70 ppb and is currently classified as "attainment" areas under the NAAQS. If the data shows an average higher than the 70 ppb standard, an area may be designated as "Non-Attainment" for ozone and a plan must be developed to return to compliance. All areas of the state qualify as meeting national air quality standards established by EPA for the protection of public health and the environment.

4.5 PRIME FARMLAND

As displayed on Map 4.9, a significant amount of farmland is present in the Fort Bragg region and adjacent to Fort Bragg, which, if farmed, is typically a very compatible land use for military training. Opportunities exist to continue working with the State of North Carolina and to leverage the Eastern NC Sentinel Landscape program on the preservation of farmland where property owners have an interest in continuing to farm. The State is committed to agricultural development and the preservation of farmland. To that end, the NC General Assembly established the Agricultural Development and Farmland Preservation Trust Fund to help achieve the following goals and outcomes (www.ncadfp.org):

- Establish the transferable structure and processes necessary to link working lands, natural resource

▼ MAP 4.9 PRIME FARMLAND



management, and national defense

- Sustain the military's testing and training mission footprint including installation buffers as well as associated ranges and transit routes
- Engage private landowners to determine preferences, coupled with appropriate partners-- enable delivery of programs and technical assistance to keep farms in farming and forests in forestry
- Work with federal, state, local, nonprofit and other private entities to promote initiatives that keep the region economically vibrant while protecting the rural character and natural/open spaces
- Promote off-base habitat conservation in order to ease military land training restrictions and promote species recovery

4.6 NATURAL FACTORS AND CLIMATE EFFECTS

The 2015 Report to Congress on Sustainable Ranges lists changes in natural factors and climate effects on Army facilities and its mission as a critical sustainability issue. Specific effects include the challenge to maintain the status of endangered species due to habitat transition or modification, the potential listing of species that are currently at-risk, and potential implications for Endangered Species Act (ESA) and Clean Air Act (CAA) compliance when conducting controlled burns.

CURRENT SITUATION

Empirical data shows certain local climate trends and associated impacts that have already been identified:

- The 2001-2010 decade was the warmest on record for North Carolina;
- The trend of average summer monthly temperatures in the City of Fayetteville has increased by nearly two degrees Fahrenheit since 1950; and
- The Cape Fear River monthly average flow has decreased significantly between 1982 and 2013.

Due to long-term concerns for the military and the community, two customized local studies have been completed to help enhance climate resiliency. A report of Climate Change Impacts on Fort Bragg was completed by the US Army Corps of Engineers (USACOE) in 2013. This report provided a customized Fort Bragg overview of climate projections from the Intergovernmental Panel on Climate Change (IPCC), and potential impacts to mission sustainment and resources necessary to adapt to climate change over time. Additionally, Sustainable Sandhills, a nongovernmental organization, developed a Climate Resiliency Plan for Cumberland County in 2016 for which the Fort Bragg Public Works was a core group member of the planning team. This plan identifies a nexus of interests among multiple stakeholders for responding to climate challenges. Some of the plan's recommendations include: (1) integrate

climate resilience into planning and natural area conservation efforts; (2) protect future water quality and quantity; (3) shift development patterns to sustainable community design; and (4) establish and maintain a monitoring, evaluation and adaptive risk management process.

FUTURE SITUATION

Consensus prediction modeling of climate future scenarios for Fort Bragg through the remainder of the 21st century is that temperature will rise about 3 degrees Celsius and that precipitation will increase and spread into what is now considered the dry winter period.

Projected increases in temperature and precipitation are expected to increase risks for fire hazards, flooding, and storm events. Increased temperatures and changing precipitation patterns may cause more frequent drought conditions to occur. Increased frequency of stronger storms raises the potential for hazards, emergencies, damage to infrastructure, and damage or destruction of red-cockaded woodpecker clusters. Habitat migration is likely to occur, as longleaf pine and loblolly pine ranges are likely to expand northward and provide more suitable habitat for red-cockaded woodpecker throughout the region. Opportunities for invasive species propagation are likely to increase, causing more resource and management requirements.

NATURAL FACTORS AND CLIMATE EFFECTS CHALLENGES

These challenges will affect military and community stakeholders in the following ways:

- Increased risks to people, infrastructure, and natural resources are likely to occur due to higher potential for fire and more frequent strong storm events;
- Longleaf and Loblolly Pine may become more common, providing increases in on-base and off-base habitat for RCW and other species;
- Increased heat may restrict military training days;
- Increased precipitation and storm events may cause challenges/restrictions on vehicle movements and potential limits on military airborne training;
- Natural resource managers may have significantly increased management requirements, including the need for more controlled burns, more attention and funding for threatened and endangered species challenges, and more resources needed to prevent negative impacts from invasive species propagation; and
- Changes in precipitation patterns and increased heat may cause stress on water quality and quantity.

NATURAL FACTORS AND CLIMATE EFFECTS SUMMARY

Current conditions for changing natural factors and climate effects illustrate a low threat for Fort Bragg due to a negligible impact on readiness and mission capability. However, future

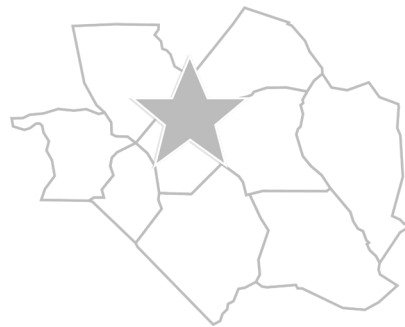
impacts provide a high threat based on climate projections that may cause critical impacts to military and community readiness. For the military, these impacts may reduce or eliminate the ability to train effectively by reducing training days and requiring difficult workarounds. Impacts can also increase environmental challenges leading to significant installation requirements for red-cockaded woodpecker management, invasive species management, and other stresses on installation resources. Threatened and endangered species management requirements have the potential to create large avoidance areas for training. Understanding the long-term impacts of changing natural factors and climate effects on habitats can help the military plan most effectively to sustain mission operations. In addition, these changes may provide increased stress for many other challenges the installation, including air, water, and interrelated challenges like urban growth.

ENVIRONMENTAL REFERENCES:

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- Environmental Protection Agency, "40 CFR Part 50, 51, 52, et Al.: National Ambient Air Quality Standards for Ozone; Final Rule," Federal Register 80, no. 206 (n.d.).
- N.C. Division of Air Quality, "Air Quality Trends in North Carolina," July 2016.
- Headquarters Department of the Army, "Environmental Protection and Enhancement."
- Directorate of Public Works, Environmental Division, Fort Bragg, North Carolina, "Draft Integrated Natural Resources Management Plan 2017-2021: Fort Bragg and Camp Mackall North Carolina," 2016.
- Aaron Moody et al., "Mapping Habitat Connectivity for Multiple Rare, Threatened, and Endangered Species on and Around Military Installations," May 2011, <https://www.serdp-estcp.org/content/download/12283/147853/file/RC-1471-FR.pdf>.
- Directorate of Public Works, Environmental Division, Fort Bragg, North Carolina, "Draft Integrated Natural Resources Management Plan 2017-2021: Fort Bragg and Camp Mackall North Carolina."
- Mid-Carolina Council of Governments, "Request for Proposals for a Joint Land Use Study - Fort Bragg Military Reservation, NC," July 18, 2016.
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- US Army Corps of Engineers Engineer Research and Development Center, Climate Change Impacts on Fort Bragg, NC, October 2013.

FORT BRAGG
SECTION FIVE

FORT BRAGG JOINT LAND USE STUDY



5.1 OVERVIEW

After the Iraq invasion in 2003, the focus of the United States Army was fighting and winning the Counter Insurgency (COIN) fight in Iraq and Afghanistan and other regions around the globe. This shift in focus caused doctrine and training to change to meet the threat. The effect of this at home station posts like Fort Bragg was a decrease in large unit (company and larger) combined arms maneuver live fire training exercises and mass brigade airborne operations. Furthermore, the number and size of airborne training operations on Fort Bragg decreased somewhat from pre-2003 time periods. All this means less noise, less dust, less vibrations, etc. to cause civilian areas around the post concern or angst.

Today, In the Middle East, South Asia, and beyond, ISIL and other radical groups still present a significant threat to regional stability and United States National Interests. COIN remains a continual challenge given these threats so the Army must sustain the capability to prosecute COIN operations. This means, in simplistic terms, operations by small units from squad (9 Soldiers) level to company level (135 Soldiers). These kinds of training and operations at home stations in preparing to deploy to a COIN environment tend to cause less noise, light, and vibrations due to the nature of the training.

The Soldiers, the XVIII Airborne Corps units and other Special Operating Forces stationed at Fort Bragg are critical to the

COIN fight and will remain so into the foreseeable future. However, with Russia and North Korea trying to reestablish stronger positions in their regions and in the world spot light, our Army cannot solely focus on one type of war. "As a global power with global responsibilities, The Army must maintain capabilities to execute an entire range of military operations, from humanitarian assistance, to fighting guerrillas and terrorists, to conducting cyber operations, to engaging nation states in conventional and hybrid warfare."(ref 1)

In accordance with the Chief of Staff, Army's Readiness Guidance Calendar Year 2016-17, "The ability to conduct decisive action in support of Unified Land Operations to deter, deny, compel, and/or defeat the threat of hybrid warfare posed by nation-states represent the most demanding challenge and is the benchmark by which the Army's Readiness will be measured moving forward".(ref1)

"Unified land operations is the Army's warfighting doctrine. It is based on the central idea that Army units seize, retain, and exploit the initiative to gain a position of relative advantage over the enemy. This is accomplished through simultaneous combination of offensive, defensive, and stability operations that set conditions for favorable conflict resolution. The Army's two core competencies—combined arms maneuver and wide area security—provide the means for balancing the application of Army warfighting functions

within the tactical actions and tasks inherent in offensive, defensive, and stability operations."(ref3)

"Decisive action is the continuous, simultaneous combinations of offensive, defensive, and stability or defense support of civil authorities tasks (ADRP 3-0). The purpose of decisive action is to ensure that all major aspects of an operation are accounted for and that operations consider offensive, defensive, and stability or defense support of civil authorities tasks as inherent tasks in all operations. Decisive action ensures that operations fully account for the impact of civilians on operations and their required support in an area of operations. Decisive action also ensures that operations dominated by stability tasks do not overlook the inherent danger in all operations by considering the need for offensive and defensive tasks."(ref3)

As in the COIN environment, the soldiers and the XVIII Airborne Corps units and other Special Operating Forces stationed at Fort Bragg, with their rapid deployment capabilities, are a critical component in the Army's warfighting doctrine of unified land operations in the Decisive Action environment. So with the advent of this new doctrine, it is logical to expect an increase in large unit formation training such as battalion and brigade level airborne operations and combined arms live fire exercises in addition to the already on-going small unit live-fire exercises.

This in turn will most likely increase the noise, light, dust, vibration levels in and around Fort Bragg.

5.1.1 MISSION

Fort Bragg is the home of the Army's Airborne and Special Operations Forces. It is the Army's flagship power projection platform providing world-class support for training, readiness, deployment and sustainment to America's airborne and special operations forces.

Fort Bragg has five basic peacetime missions:

- Provide the people, infrastructure, and services to train, sustain, mobilize, and rapidly deploy America's forces; while enhancing the environment, security, and well-being of the greater Fort Bragg community;
- Provide a home station and deployment facility for assigned units, including XVIII Airborne Corps, 82d Airborne Division, and U.S. Army Special Operations Command (USASOC) units;
- Support the training of Reserve Component forces;
- Serve as a major Power Projection Platform for mobilization training and the equipment and worldwide deployment of U.S. armed forces in military and nonmilitary contingencies; and,
- Train XVIII Airborne Corps forces and other assigned forces to deploy worldwide and fight and win using airborne warfare.

5.1.2 UNITS

Fort Bragg is the host installation for the U.S. Army's Forces Command (FORSCOM) and Reserve Command (USARC) headquarters elements, as well as the Army's only airborne corps headquarters, the XVIII Airborne Corps, and the Army's largest support command, the 1st Sustainment Command (Theater). Other command level headquarters at Fort Bragg include the U.S. Army Special Operation (USASOC), U.S. Joint Special Operations (JSOC), U.S. Army Special Forces (USASF), and U.S. Army Civil Affairs and Psychological Operations (USACAPOC) commands. It is the largest U.S. military installation in terms of population with approximately 53,700 troops and another 14,000 civilians who work on post. The post supports a population of roughly 260,000, including military families, contractors, retirees and others. The Fort Bragg footprint covers approximately 163,000 acres (254 square miles), of which 146,000 is acreage dedicated for training lands.(ref6) Each of the major units stationed at Fort Bragg are briefly described below.

US ARMY FORCES COMMAND (FORSCOM)

FORSCOM trains and prepares a combat ready, globally responsive Total Force that is well led, disciplined, trained, and expeditionary in order to build and sustain readiness to meet Combatant Command requirements.

UNITED STATES ARMY RESERVE COMMAND (USARC)

USARC provides trained, equipped and ready soldiers, leaders, and units to meet America's requirements at home and abroad.

JOINT SPECIAL OPERATIONS COMMAND (JSOC)

The Joint Special Operations Command (JSOC) is a sub-unified command of the US Special Operations Command (USSOCOM). It is charged to study special operations requirements and techniques, ensure interoperability and equipment standardization, plan and conduct special operations exercises and training, and develop joint special operations tactics.

UNITED STATES ARMY SPECIAL OPERATIONS COMMAND (USASOC)

USASOC commands both active-duty and Army Reserve special operations forces. The command also provides oversight of Army National Guard special operations forces' readiness, organization, training and employment in coordination with the National Guard Bureau and state adjutants general. USASOC controls seven major subordinate elements, which in turn train and maintain forces for deployment by USSOCOM to combatant command theaters worldwide. USASOC has four major subordinate commands that include 1st Special Forces Command (Airborne) (Provisional), U.S. Army John F. Kennedy Special Warfare Center and School and U.S. Army Special Operations Aviation Command, all located at Fort Bragg, N.C. Located elsewhere is the 75th Ranger Regiment at Fort Benning, GA.

XVIII AIRBORNE CORPS

XVIII Airborne Corps rapidly deploys ready Army forces anywhere in the world by air, land or sea, entering forcibly if necessary, to shape, deter, fight and win. The Corps headquarters provides mission command as an Army, Joint or Combined Task Force headquarters. Its subordinate units include: In addition to the XVIII Airborne Corps Headquarters Battalion and the 82nd Airborne Division, major Corps and Corps support units assigned to Fort Bragg include: 18th Fires (Field Artillery); 18th Aviation; and, 108th Air Defense Artillery brigades. Corps combat support and support brigades include: 20th Engineer; 16th Military Police; 525th Military Intelligence; 525th Battlefield Surveillance; 44th Medical; and, 35th Signal brigades. Other Corps support units at Fort Bragg include the 18th Air Support Operations, Corps Finance, and, Corps Personnel groups, as well as the 192nd Explosive Ordnance Disposal (EOD) and 50th Expeditionary Signal battalions.

82D AIRBORNE DIVISION

The mission of the 82nd Airborne Division is to, within 18 hours of notification, strategically deploy, conduct forcible entry parachute assault and secure key objectives for follow-on military operations in support of U.S. national interests. The 82nd Airborne Division is an active airborne infantry division of the United States Army specializing in joint forcible entry operations. Based at Fort Bragg, North Carolina, the 82nd Airborne Division is the primary fighting arm of the XVIII Airborne Corps.

1ST SUSTAINMENT COMMAND (THEATER)

The 1st Sustainment Command (Theater), formerly the 1st Corps Support Command (COSCOM), provides joint command and control of logistics and forces in support of combat operations across the full spectrum of conflict; redeployment of rotating forces; and sustainment of operating forces in U.S. Central Command's area of responsibility.

U.S. ARMY CIVIL AFFAIRS AND PSYCHOLOGICAL OPERATIONS COMMAND (AIRBORNE)

The U.S. Army Civil Affairs & Psychological Operations Command (Airborne) is a two-star headquarters providing Army and Joint Forces commanders 82 percent of the Department of Defense (DoD) civil affairs forces and 83 percent of the DoD's psychological operations forces. Civil Affairs, Psychological Operations, and Information Operations Soldiers combine regional and trans-regional expertise, political-military awareness and cross-cultural communication skills to conduct and support civil-military operations for conventional and special operations forces.

3.1.4 OTHER TENANTS

Pope Army Air Field (AAF), formerly Pope Air Force Base (AFB), is now home to the 43rd Air Mobility Operations Group, an active Air Force unit that provides support to XVIII Airborne Corps, 82nd Airborne Division, and USASOC training and combat operations. U.S. Marine Corps (USMC), U.S. Army Reserve and U.S. Army

National Guard personnel routinely train at the installation. The USMCs' 10th Regiment has five field artillery battalions based at Camp Lejeune, North Carolina. These artillery units, along with accompanying USMC service and support units typically train at Fort Bragg for two-to-four weeks in the spring and two-to-four weeks in the fall each year. U.S. Army Reserve Component (RC) forces typically conduct two-week active duty training exercises, as well as multiple monthly field exercises, at Fort Bragg each year. Numerous Army Reserve, Army National Guard and Air National Guard units utilize Fort Bragg training lands and other facilities throughout the year. On average, 66 USARC units, composed of about 7,600 total personnel, conduct Annual Training (AT) exercises at Fort Bragg. Various RC units conduct intensive monthly training exercises most weekends of the year. Over the course of a given fiscal year, some 250 units, composed of about 35,000 total personnel, train on the installation during such weekend exercises.

Along with the typical range of wheeled or tracked vehicles (Caterpillar D7/D9, FMTV/LMTV, HEMTT, HMMWV, M9 ACE, M35, M939, M113 APC, M142 HIMARS, LSV, M1117 ASV, MIM-104 Patriot, MRAP, Stryker) routinely used on Fort Bragg by various tenant units, RC units train with a range of heavy tracked vehicles, including: M1 Abrams main battle tanks/M1 variants; M88 Recovery Vehicles; M2 and M3 Bradley Fighting Vehicles; M-109 self-propelled howitzers; and, M270 Multiple Launch Rocket System (MLRS) vehicles. Most of these systems

are deployed by the 30th Heavy Separate Brigade (HSB). The 30th HSB is composed of one armor, two infantry, and three maneuver battalions. The brigade also integrates field artillery, engineer and support battalions, as well as a cavalry troop, a military intelligence company, and an air defense battery. Fort Bragg is also a mobilization station. Since the start of the Overseas Contingency Operation, formerly Global War on Terror (GWOT) operations, thousands of service members have mobilized at Fort Bragg. The yearly mobilization load has been approximately 5,000–7,000 personnel. The training of these personnel typically involves weapons qualification, small unit tactics and convoy operations.(ref7)

5.2 FORT BRAGG MISSION / TRAINING FOOTPRINT

5.2.1 OVERVIEW OF CURRENT TRAINING

Training to sustain readiness is Fort Bragg's most important activity. The three major types of training conducted on Fort Bragg are maneuvers, airborne operations and live-fire exercises. Operational Readiness training progresses from individual and platoon training to extensive brigade-size operations. Annual ARTEPs (Army Training and Evaluation Program), CALFEXs (Combined Arms Live Fire Exercises), and FIREXs (artillery firing exercises) are the primary training vehicles for the 82nd Airborne Division and XVIII Airborne Corps units and for Air Force units conducting close air support training. Effective training reflects actual combat conditions, and training maneuvers

must be as realistic and on the same scale as battlefield conditions. Typical infantry activities involved in unit training include ground movements, air operations, weapons firing, and the development of bivouac and defensive positions. Each unit will participate in one or two field training exercises (FTXs) in preparation for an annual ARTEP. In addition, each infantry battalion conducts a CALFEX each year. An FTX can be expected to cover 25,000 to 35,000 acres for a minimum of three days. Each brigade conducts an exercise annually to test on a large scale, the ability of the unit in airborne, airmobile, ground tactics, and coordinated live-fire assaults. These exercises are supported by weapons normally available to the commander, to include air defense artillery, helicopter gunships, and fixed wing close air support.(ref6)

5.2.2 OVERVIEW OF TRAINING AREAS, RANGES, FACILITIES AND CAPABILITIES

RANGE AND TRAINING AREAS

The primary purpose of Fort Bragg and Camp Mackall is to support military training. The majority of Fort Bragg lands consist of Range and Training Areas. Geographically, Range and Training Areas are divided into the following five major areas from east to west: 1) the North Eastern Area (NEA) (separated from other training areas by the Main Cantonment area (MCA) 2) the Greenbelt Area 3) the Northern Training Area (NTA) [including the Overhills tract], 4) the primary maneuver training

area (encompassing Fort Bragg proper west from the Greenbelt and Cantonment area), and 5) Camp Mackall (See Map 5.1). (ref6)

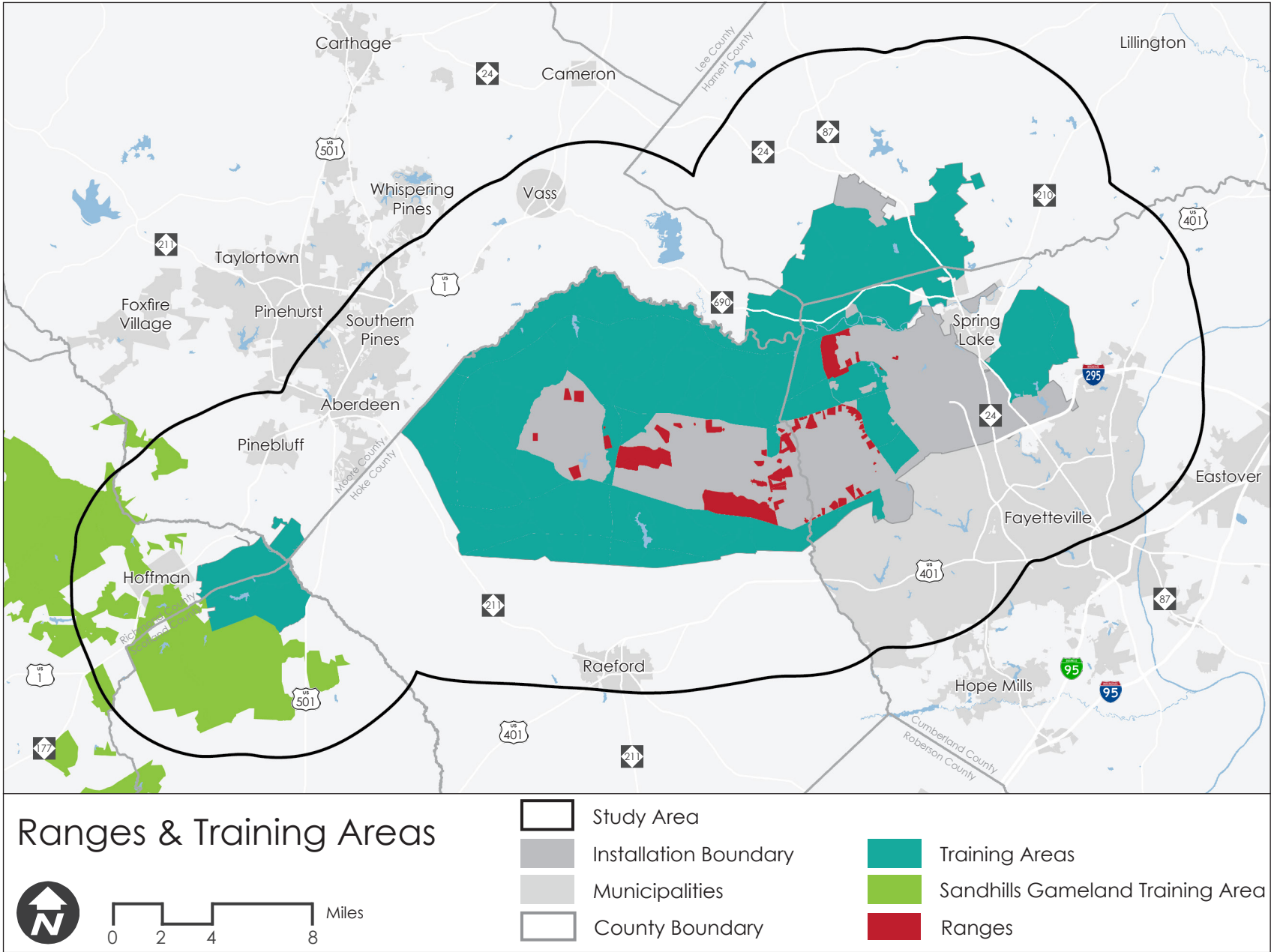
PRIMARY MANEUVER TRAINING AREAS

Excluding airfields, impact areas, and special restricted areas: the Primary Maneuver Training Area occupies 54,378 acres. The Primary Maneuver Training Area surrounds impact areas and is the only portion of the installation that can support brigade-sized maneuver training or mechanized forces.

Most types of non-live-fire training exercises can occur in any part of the Primary Maneuver Training Area. Indirect live-fire, combat arms training, and mechanized training, can only be conducted within an area bound by the following paved roads: Manchester Road, MacRidge Road, Lamont Road, King Road, and Plank Road. Forward observers and signal units traditionally select high elevation sites such as Gaddy's Mountain (Observation Point (OP)-11), Johnson's Mountain (OP-14), Blues Mountain (OP-17), and Finlayson Mountain.

Fixed operations, such as service support exercises, are often located in peripheral training areas to the outside of Manchester Road, King Road, and Plank Road. The northern portion contains two training areas (2,459 acres) that are dedicated to the 82d Airborne Division Pre-Ranger Course. A large field ammunition supply point is also located to the south of Plank Road and to

▼ MAP 5.1 TITLE



the east of Mott Lake. Communications-electronics (COMMEL) sites are also located along Plank Road to the east of Mott Lake. Training exercises conducted at some of the larger ponds and lakes include water purification, helicopter rescue, and SCUBA team training.

NORTHEAST TRAINING AREA

The northern half of the 7,362-acre NEA, located east of NC Highway 87/210, is used by the XVIII Airborne Corps Non-Commissioned Officer (NCO) Academy for land navigation, patrolling, and light infantry tactics training. The southern portion is used by small units for similar uses and as a close-in training area for Corps Support Command (COSCOM) service and service support unit activities. Since the area is near off-installation residential communities and Simmons Army Airfield, it is closed to large weaponry and extensive aircraft operations. Simmons Army Airfield is located immediately south of the North East Area (NEA). Airfield facilities support aviation activities involving general airfield operations and unit operations and training. Facilities include runways, taxi-ways, cargo loading areas, aircraft hangars, and aircraft maintenance facilities. Simmons Army Airfield and its associated facilities occupy a total of 630 acres.

NORTHERN TRAINING AREA

The 23,313-acre Northern Training Area is located north of the

Lower Little River. The Army initially purchased 12,733 acres of land in 1986. The area has been used primarily for light infantry maneuvers and has not been subjected to intensive heavy or tracked vehicle use. Since most of the area is directly beneath the air control zone of Pope Army Airfield, large weapon firing and extensive Army aircraft activity do not occur on the NTA. The 1997 purchase of the adjoining Overhills tract added 10,580 acres of training land to the training area.

RANGE AND IMPACT AREAS

Ranges and impact areas (see Maps 5.1 and 5.2) occupy approximately 33,040 acres in the central, interior portion of Fort Bragg. These areas include the ground and airspace that are used for weapons firing and associated live-fire maneuver training. Impact areas receive fired or launched ordnance from various weapon systems; as well as the resulting fragments, debris, and components. In accordance with Army regulations, the hazardous nature of munitions that are fired within and into these areas dictates that they be classified as "High Hazard Impact Areas." Access to High Hazard Impact Areas is limited and strictly controlled due to the extreme hazard of unexploded ordnance (duds). Impact areas receive over 60,000 rounds of artillery fire annually (Nakata Planning Group and Rust Environment and Infrastructure 1995). Bombing and the use of forward-firing weapons by high-performance aircraft are conducted in all impact areas. When the surface

danger zone for a particular weapon exceeds the normal limits of an impact area, the units station road guards to incorporate additional land. (ref6)

MANCHESTER IMPACT AREA

The Manchester impact area (2,790 acres) is located adjacent to the northeastern portion of the Primary Maneuver Training Area. Ranges 1 through 25 are located around the periphery of this impact area. Weapons that are fired into this impact area include small arms (rifle, shotgun, and pistol), grenade launchers, and sub-caliber light anti-tank. The northern portion of the Manchester impact area contains a nuclear, biological, and chemical (NBC) weapons demonstration area for flame-field expedients and chemical munitions. This impact area also supports non-military land uses by providing ranges for skeet and trap shooting and rifle and pistol practice. The northeastern portion of this area has recently been developed for activities that support deployment (e.g., parachute rigging facilities).

MACRIDGE IMPACT AREA

The MacRidge impact area (10,436 acres) is located in the east-central portion of the Primary Maneuver Training Area and contains the largest number of ranges. The peripheral portions of this impact area are ringed with rifle marksmanship training and qualification ranges; small arms ranges; mortar, artillery, and tank firing positions, and two explosive demolition areas. The MacRidge impact area provides areas for squad, platoon,

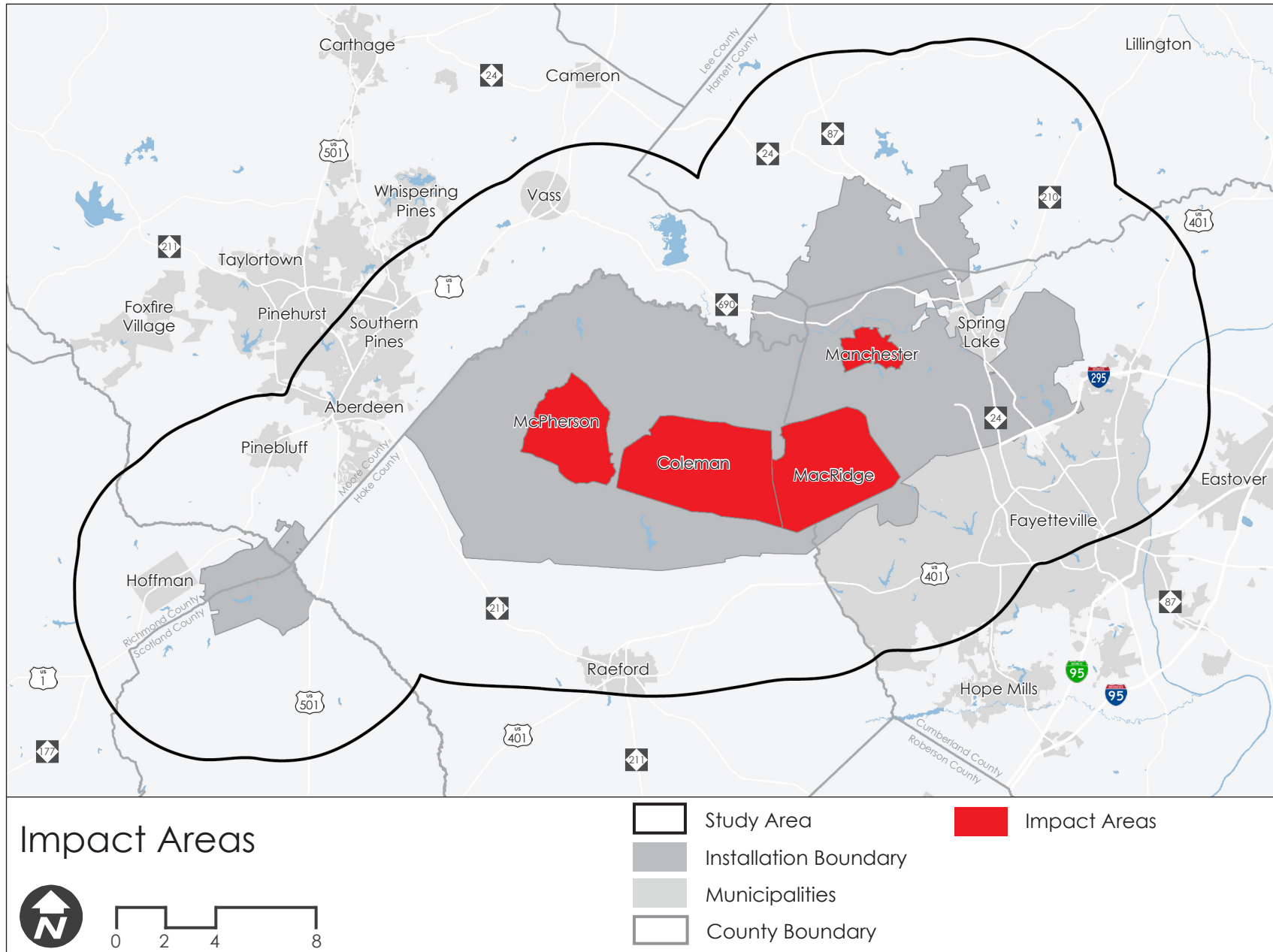
and rifle company live-fire and maneuver exercises, as well as some live-fire components of readiness evaluations. The western portion of the impact area contains two observation points (OP7 and OP9) that provide areas for mortar fire and visual observation of large targets within the impact area. The northeast portion of this impact area has special purpose ranges operated by John F. Kennedy Special Warfare Center and School (JFKSWCS). Potential noise impacts associated with proximity to the Cantonment area limit the extensive use of this impact area for indirect fire or demolitions. (ref6)

COLEMAN IMPACT AREA

The Coleman impact area (13,143 acres) is located near the center of the Primary Maneuver Training Area and is the largest impact area on the installation. In addition to ranges for individual soldier skills training, this impact area has numerous ranges that support collective task training. Weapons that are used range from small arms and hand grenades to the 203 mm howitzer, as well as bombing, strafing, and missile launching from Air Force aircraft. (ref6)

With an area of over 1,200 acres, the Multi-Purpose Range Complex (MPRC, Range 63) in the southeastern portion of the Coleman impact area is one of the largest ranges on the installation. The MPRC is capable of supporting all training requirements for a rifle company, a combat support company, and a tank platoon. This range is used for small-unit maneuver,

▼ MAP 5.2 IMPACT AREAS



convoy ambush, and heavy weapons firing from M1 Abrams tanks and Bradley Fighting Vehicles. Military units up to battalion-size may maneuver around and through the area during live-fire exercises, live-fire portions of ARTEPs, and airmobile and joint combined arms capabilities exercises. The western portion of the Coleman impact area contains three additional large ranges. (ref6)

Ranges 78 and 79 are used for aerial gunnery, anti-armor, and convoy ambush training. Range 77, a light infantry movement-to-contact/assault on a fortified position facility, is located in the northwest portion of the Coleman impact area. Range 77 provides Joint Readiness Training Center (JRTC) requirements for evaluating readiness of a platoon for deliberate attack. All of these ranges have fixed and moving targets.

The northern side of this impact area contains a 360° "shoot-house", a third-world village replica, and other specialized live-fire training facilities. Coleman also has a demolition training area and several observation posts for observing training and mortar firing.

MCPHERSON IMPACT/DANGER AREA

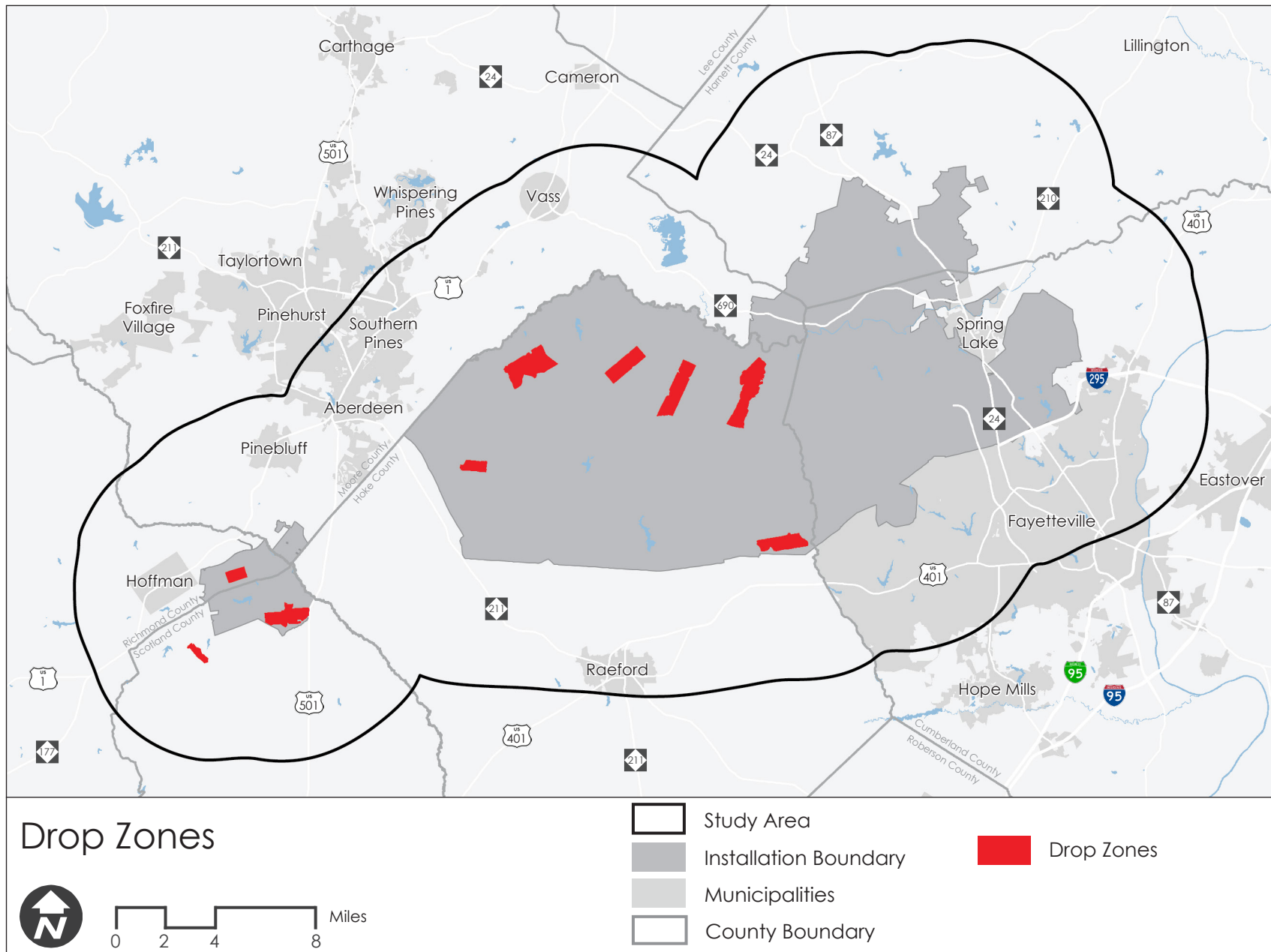
The McPherson impact area (6,671 acres) occupies an irregularly-shaped area in the westernmost portion of the installation. Weapons are limited due to the shape of the area,

but activities are similar to those listed for the Coleman impact area, excluding direct fire artillery, tank firing, and the use of Stinger missiles. Compared to the other impact areas, there are few ranges around the periphery of the McPherson impact area. There is a movement-to-contact range in the southern portion, a fortified position (trench system) for assault in the northern portion, and a platoon/squad live-fire/convoy ambush range in the eastern portion of this impact area. In addition, there are three major observation points around the periphery of this impact area. The McPherson impact area is used for combined arms live-fire exercises, light and heavy mortars, light and heavy artillery, and air-delivered weapons that include bombs up to 750 pounds. (ref6)

PARACHUTE DROP ZONES (DZ)

DZs are cleared areas that are used to support parachute and air landing operations. There are six large DZs and a number of smaller DZs on Fort Bragg, and one large DZ on Camp Mackall. (see Map 5.3). Major DZs include Sicily (1,208 acres), Normandy (868 acres), Salerno (605 acres), Holland (1,171 acres), St. Mere Eglise (662 acres), and Luzon (660 acres) (Nakata Planning Group and Rust Environment and Infrastructure 1995). There are 31 smaller field LZs and PZs located across the installation, which are also used to support airborne and air assault operations. Because of their relatively high elevations and unrestricted views of the horizon, major DZs are occasionally used as artillery

▼ MAP 5.3 DROP ZONES



firing positions (AFPs). As the only large, open areas on the installation, DZs are also used for High Mobility Artillery Rocket System (HIMARS), armor and anti-armor defense training, and other training events that require a desert-like landscape. (ref6)

CAMP MACKALL

Camp Mackall (7,935 acres) contains Mackall Army Airfield, which is in relatively good condition. The airfield is used for Army rotary wing and Air Force airlift, and air-mobile training. In addition, engineers practice runway repair on one of the airfield runways. The southern portion of Camp Mackall contains a parachute DZ. A Special Operations mission support facility; consisting of prefabricated, metal buildings; occupies a portion of the World War II warehouse portion of the Cantonment area. Due to the small size of Camp Mackall, no live-fire training, with the exception of a small shotgun course for Special Operations Forces, is conducted. Camp Mackall is heavily used by aviation units and Special Forces, and supports Draft Integrated Natural Resources Management Plan Fort Bragg and Camp Mackall, North Carolina 92 activities associated with large training exercises (Nakata Planning Group and Rust Environment and Infrastructure 1995). (ref6) Camp Mackall is also host to the newly constructed Gray Eagle hangar and vehicle maintenance shop, both completed in 2016.

GREENBELT AREA

Training areas in the Greenbelt Area are used for close-in

training; especially by the 82nd Airborne Division, 18th Field Artillery Brigade, 35th Signal Brigade, and USASOC. Training facilities in these areas include a landing zone, land navigation course, a CS gas chamber, and a medical simulation training center. In addition, the Greenbelt serves as an important air space corridor for Simmons Army Air field, as it provides an undeveloped airspace corridor for low altitude aircraft overflights. (ref6)

EXTRATERRITORIAL LANDS

The high volume of training at Fort Bragg requires extensive land areas. Despite its size, Fort Bragg cannot accommodate all of the required training activities within its boundaries. As a result, training frequently is conducted outside Fort Bragg proper. Other land holdings and areas used by Fort Bragg include the Sandhills Game Land; portions of the Uwharrie, Nantahala, Pisgah, and Croatan National Forests; and privately-owned lands that are leased to the Army for training (Nakata Planning Group and Rust Environment and Infrastructure 1995). (ref6)

SANDHILLS GAME LANDS

The 63,500-acre Sandhills Game Land is located to the south, west, and north of Camp Mackall. Lands that comprise Camp Mackall and the Sandhills Game Land originally formed a wildlife management area that was established by Executive Order in September 1940. Camp Mackall was subsequently established by a letter from the Secretary of the Interior to the

Secretary of War (dated 22 April 1943), which released 65,389 acres for use as a training area for airborne combat units. After World War II, control of the majority of land area reverted to the Secretary of the Interior, and in 1949, the Sandhills Game Land was deeded to the State of North Carolina. However, the Army has retained maneuver and firing rights and continues to conduct training on the land. The Army has limited maneuver rights on some privately-owned lands that adjoin the Sandhills Game Land, as well as rights on some private lands in the area between Camp Mackall and Fort Bragg.

Fort Bragg uses this area on a regular basis to support light infantry maneuver exercises and Special Operations Forces training. Little use of heavy or tracked vehicles occur in this area, and firing with live ammunition is not allowed. Rotor wing facilities are the only cleared training sites in this primarily forested area. The Army supports conservation efforts of the North Carolina Wildlife Resources Commission (NCWRC) and Fort Bragg has provided services such as mapping and marking of endangered species sites. Troops training in the Sandhills Game Land are required to abide by NCWRC conservation measures for the protection of threatened and endangered species and Fort Bragg Regulation 350-6 (Installation Range Regulation). (ref6)

5.2.3 OVERVIEW OF AVIATION TRAINING INFRASTRUCTURE

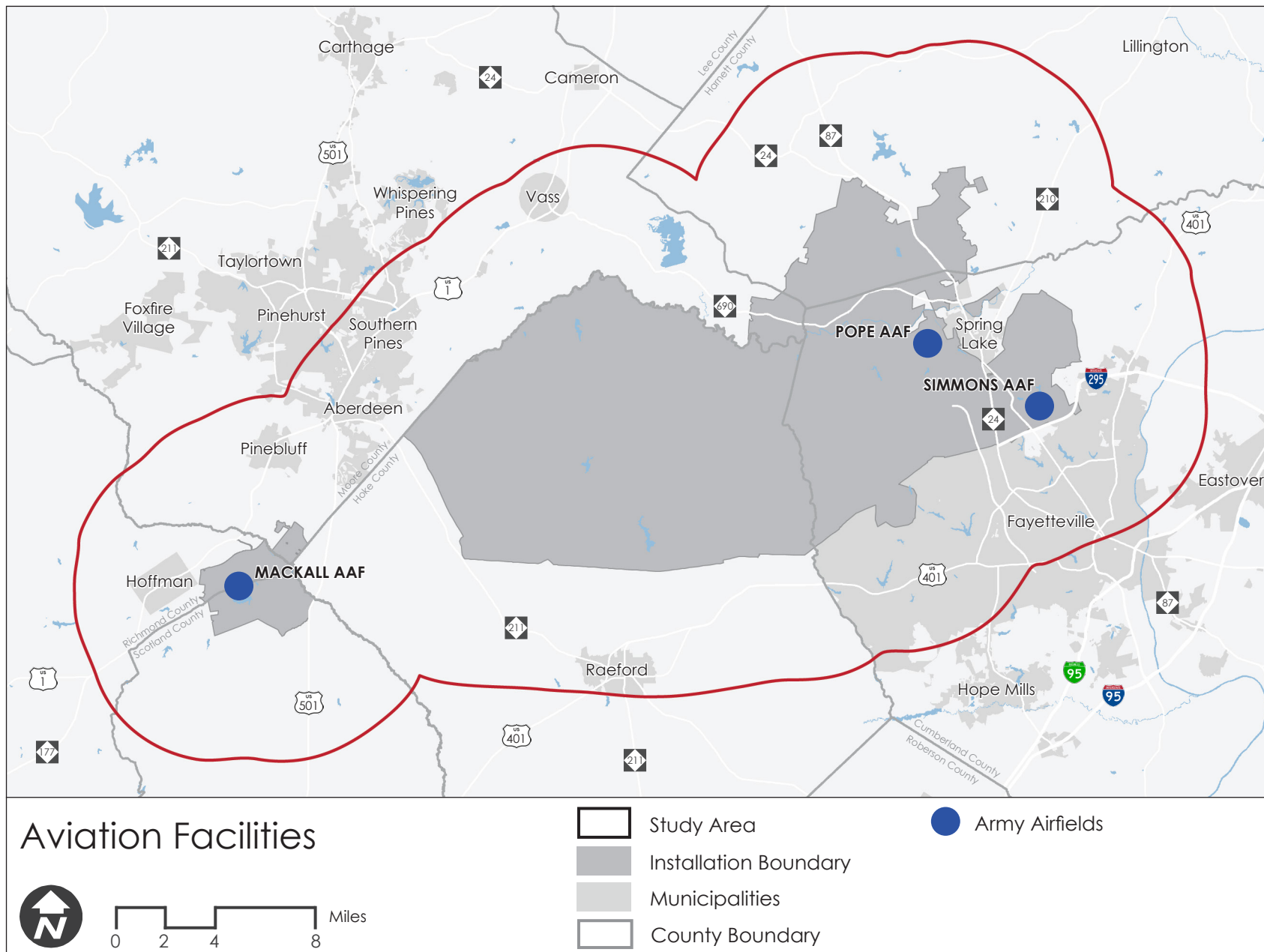
Fort Bragg hosts three major aviation facilities (see Map

5.4) that support the training and operational mission of the installation and its tenant units. Combat units on Fort Bragg are heavily reliant on these assets, given their unique capabilities and mission. This reliance extends to both ongoing airborne qualification / training to ensure unit readiness, as well as airlift support for the 82nd Airborne Division's Global Response Force mission commitment. Fort Bragg's aviation facilities also host tenant combat aviation assets, including the 82nd Combat Aviation Brigade, support Reserve Component training and mobilization, and support inter-service joint training exercises. A variety of other training infrastructure supports aviation activities at Fort Bragg, including special use airspace, low level fixed wing aviation routes, rotary wing flight corridors, and a dedicated UAS transit corridor.

AIRFIELDS

Pope Army Airfield (formerly Pope Air Force Base) is the largest of the three primary aviation facilities on Fort Bragg. The airfield has a 7,501 foot runway that accommodates most fixed-wing aircraft in the USAF inventory. The airfield provides primary support for airborne training of Fort Bragg's combat units, and is the point of embarkation for the 82nd Airborne Division's Global Response mission. Green Ramp on Pope Field is a critical component of the 82nd Airborne Division's rapid deployment mission; providing immediate aerial deployment capability for the Division Ready Force.

▼ MAP 5.4 AVIATION FACILITIES



The two other primary airfields at Fort Bragg are Simmons Army Airfield, which hosts the 82nd Combat Aviation Brigade, and serves as the installation's primary rotary wing aviation facility. Mackall Army Airfield, located at Camp Mackall, has two runways that can accommodate a wide variety of manned fixed wing aircraft. The airfield also has a new dedicated UAS airfield, which is used primarily to support MQ-1C Gray Eagle UAS operations.

SPECIAL USE AIRSPACE

In order to maintain a safe aerial navigation environment, there are a number of "special use airspace" areas designated around the region (see Map 5.5). These include several military operations areas (MOAs), the Albemarle Alert Area, Nap-of-Earth (NOE) flight areas, and Maintenance Test Flight areas. MOAs and alert areas serve to warn civilian aviators that military operations may take place in these areas, and although not off-limits to civilian aircraft, it is recommended that they avoid them during operational periods. These, along with the NOE flight areas, are also intended to accommodate low altitude flight operations to permit realistic combat aviation training. The Maintenance Test Flight Areas are designated above areas of the region which are sparsely populated to lessen the degree of risk to the civilian population in the event of an incident.

LOW ALTITUDE FLIGHT ROUTES

In order to facilitate the orderly transit of rotary wing aircraft

between airfields and training areas on Fort Bragg, the installation has designated a series of low altitude flight corridors. While generally located over the post, there are several legs that fall over civilian areas. There is also a series of low altitude aviation routes for fixed wing aircraft that are participating in airdrop operations. These routes channel inbound and out bound traffic to and from the drop zones on the installation, and help to manage air traffic in the airspace around the installation. The rotary wing flight corridors and low level aviation routes are shown in Map 5.6. A second map, (Map 5.7) superimposes the aviation routes on Fort Bragg's drop zones.

UNMANNED AERIAL SYSTEMS FLIGHT CORRIDOR

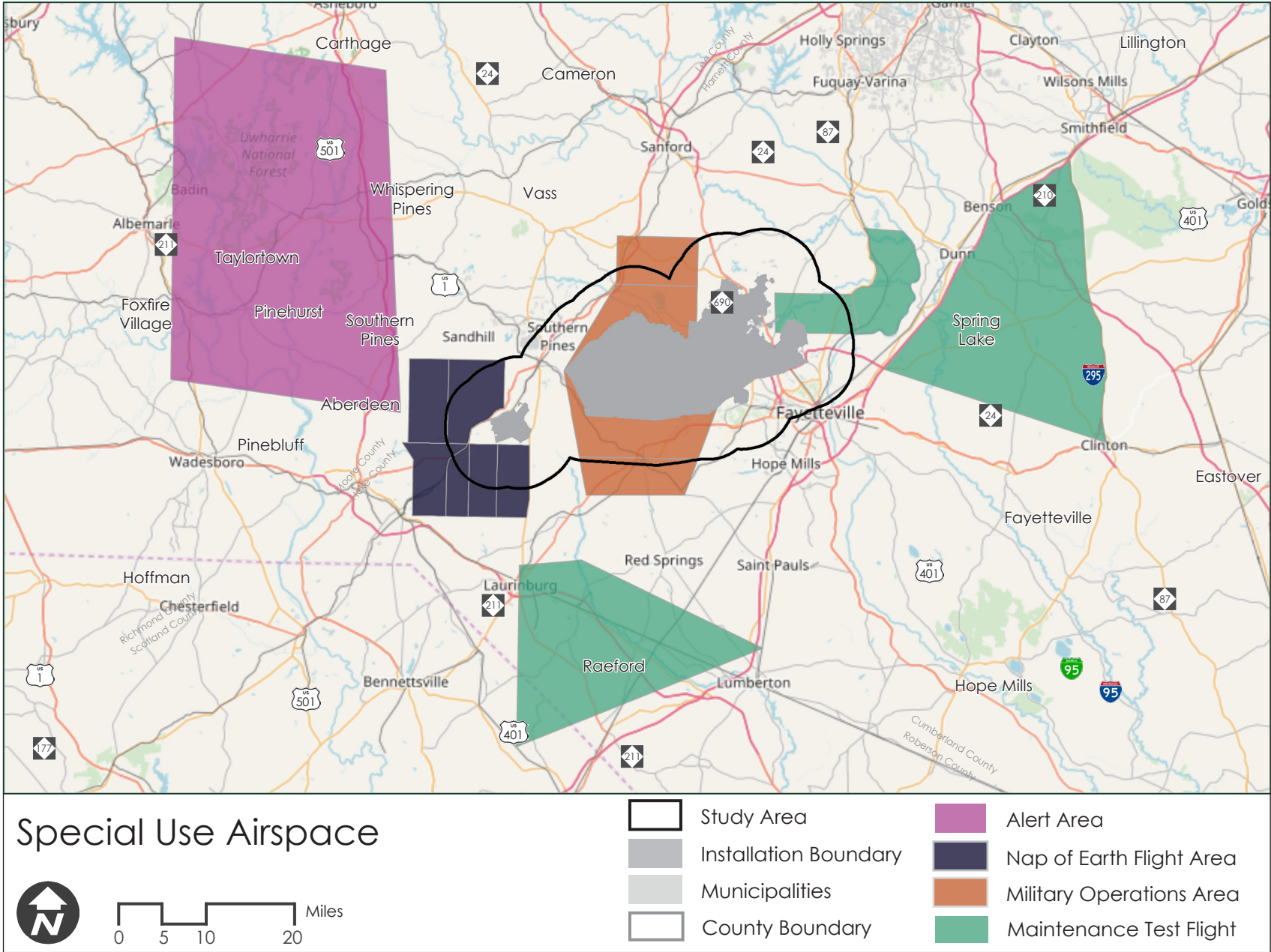
As mentioned previously, Camp Mackall hosts a dedicated UAS runway, and the installation's MQ-1C Gray Eagle UAS unit operates from there. UAS flights from Mackall to the restricted training airspace above Fort Bragg are restricted to a fairly narrow flight corridor (see Map 5.8) that was selected due to the significant amount of protected undeveloped land and low civilian population density along the route. The use of such a corridor is required due to operational restrictions imposed on military UAS flights over civilian areas.

5.3 MISSION TRENDS AND CONSTRAINTS

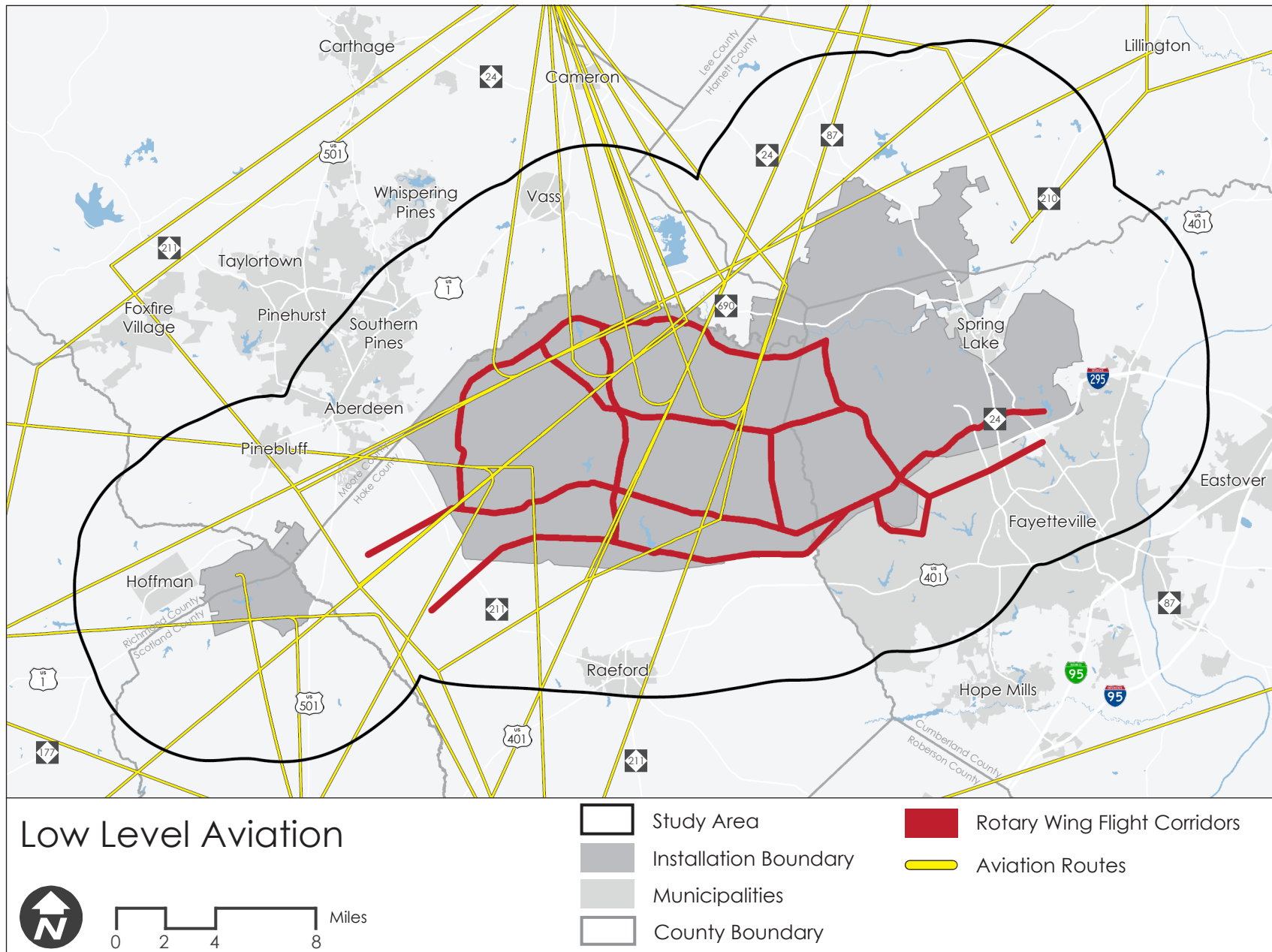
5.3.1 CONSTRAINTS ON TRAINING / OPERATIONS

There is a documented shortage of training lands available on

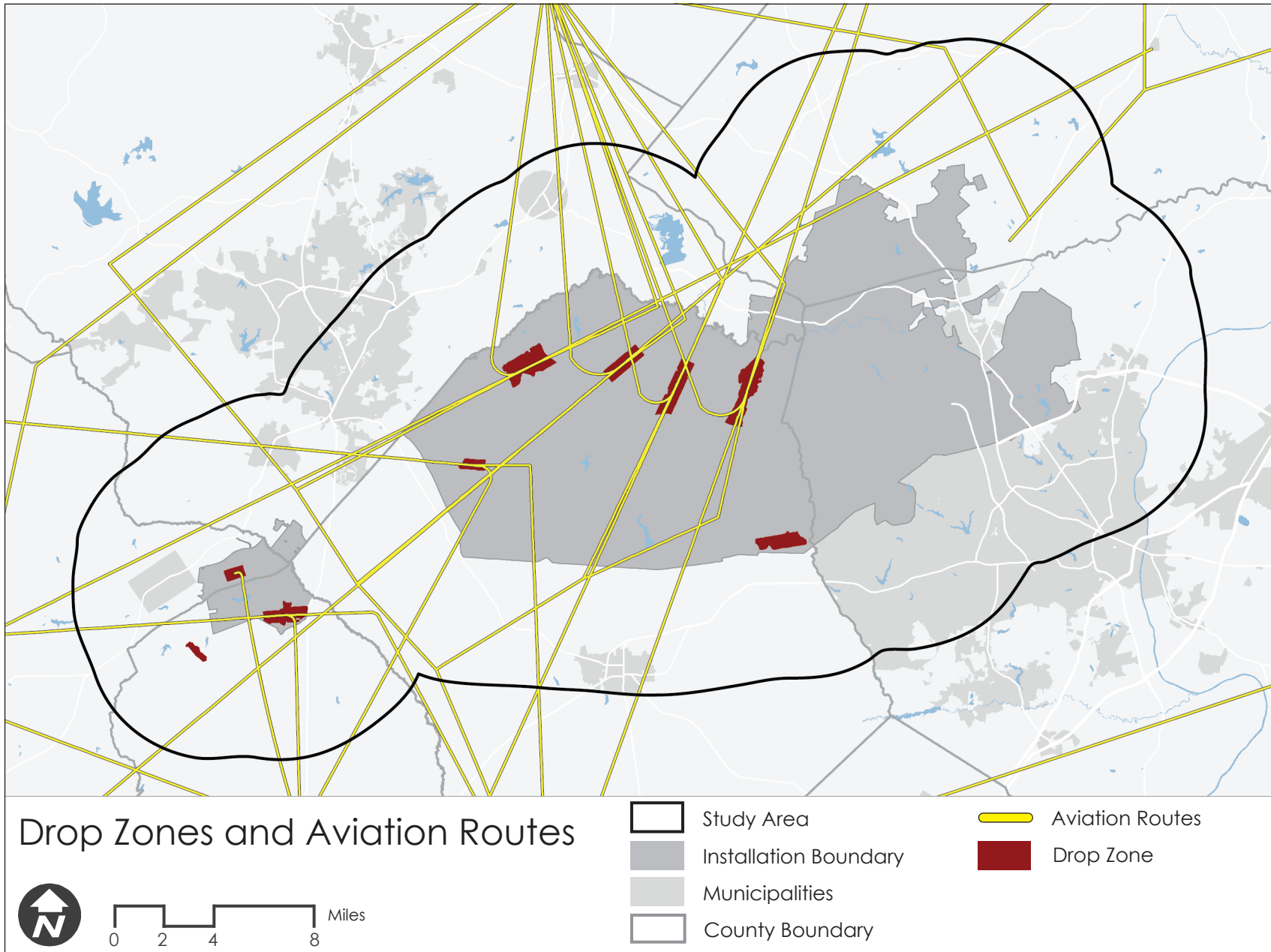
▼ MAP 5.5 SPECIAL USE AIRSPACE



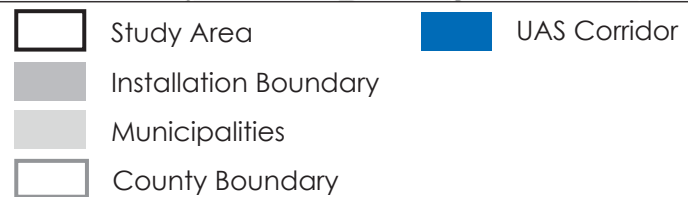
▼ MAP 5.6 LOW LEVEL AVIATION TRAINING ROUTES / FLIGHT CORRIDORS



▼ MAP 5.7 LOW LEVEL AVIATION ROUTES / DROP ZONES



Unmanned Aerial Systems Corridor



Fort Bragg. This deficiency is exacerbated by the fact that the troop strength increased substantially because of modularity and Base Realignment and Closure (BRAC) and the institutional load continues to increase steadily as the Army increases the Special Operation's Forces.(ref4)

Army Range Requirement Model (ARRM) data dictates that there is a 24 (23.73) range facility deficit, and though there is room for some of these facilities to be constructed, water management and endangered species concerns, along with unexploded ordnance (UXO) costs, make that a costly endeavor.(ref4)

The abundance of live fire facilities barely supports the tactical training mission of tenant units. Institutional training is largely conducted by the USAJFKSWCS and is adequately supported by existing ranges for the present, but because of substantial increases in student loads and the installation troop strength; future training areas and opportunities are not guaranteed.(ref4)

Shortfalls in training land requirements exist because of troop strength as indicated by ARRM, but there is some loss of training area because of protected natural resources and their distribution.(ref4)

The bottom line for FY 2017 is that airspace is becoming more restricted with the introduction of multiple UAS events and the

stationing of the Gray Eagle UAV. Frequency management is not yet a concern, however, it may become a concern overtime as the Gray Eagle operations are evaluated.(ref4)

ARRM dictates that Fort Bragg has significant deficiencies in Automated Multipurpose Machine-gun ranges and Automated Infantry Squad Battle Courses.(ref4)

Airspace continues to be a major challenge on Fort Bragg. Due to the size of the restricted area and with the urban development and population build up around the reservation, additional restrictions hamper full utilization of R-5311. Altitude limits and reduced usable flight areas are restrictions which could result from Gary Eagle risk analysis, as well as noise abatement because of population build-up, that potentially limits available range locations for larger weapons systems. As units continue to transform, acquire new equipment, and practice new training techniques, airspace management is rising to the forefront of the challenges that Fort Bragg is addressing. Current airborne operations conflicts at Fort Bragg are exacerbated by the fact the units are acquiring additional Small Unmanned Aerial Systems (SUAS) and Tactical Unmanned Aerial Vehicles (TUAV) that also need to be incorporated into the airspace. With the increase of aerial systems that must operate on frequency spectrums, the potential for frequency problems also impacts the available airspace these systems can operate within. All these issues dictate that airspace management and oversight

becomes increasingly important to fully maximize the airspace. (ref4)

5.3.2 TRENDS / ANTICIPATED CHANGES IN TRAINING MISSION

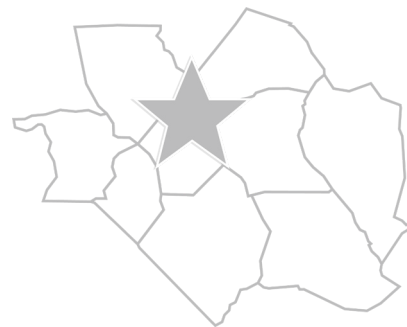
Transition to Objective-T means tough, realistic training remains the cornerstone of building unit readiness. The FORSCOM Commander's training guidance directs all operational units to execute level 1 deployment readiness exercises (DRE) semi-annually and level 2 DREs annually. Command emphasis to improve combined arms maneuver training continues. "For FY17, commanders add an additional focus: cavalry conducting reconnaissance and security operations. Major collective training events must integrate cavalry conducting reconnaissance and security tasks over extended distances involving complicated Sustainment (to include medical support), Fires, and Mission Command tactics, techniques and procedures within complex operational environments (OE) against larger, near-peer, hybrid threats. Like many other competencies, this one has diminished in lieu of other missions (COIN) over the last fifteen years. We need to focus leader attention to maximize this critical component of combined arms maneuver".(ref2)

Over the last few years, the Army heavily weighted training to fight and win in a Decisive Action Training Environment (DATE).

This focus, clearly shows an improvement in home station live fire training and FORSCOM Command training guidance continues to encourage commanders to emphasize the focus on this important training event. This focus will most likely cause a continued increase in combined arms live fire maneuver training on Fort Bragg with an expected increase in levels of noise, dust, vibration, etc. Fort Bragg suffers from a shortage of available training lands as a result of command emphasis to ensure environmental concerns and directives are met while Army growth and troop expansion continues on Fort Bragg.

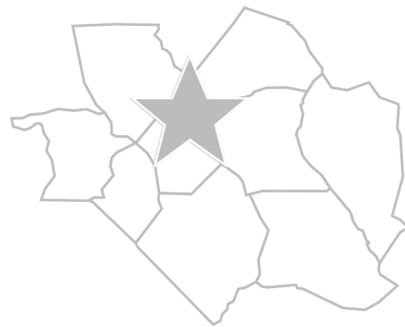
References:

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2. Memorandum for Commanders, Major Subordinate Commands/Units Reporting Directly to Forces Command; Army National Guard (ARNG) Bureau; Office of the Chief, Army Reserve; and Army Service Component Commands (ASCC), Subject: FORSCOM Command Training Guidance (CTG)-Fiscal Year (FY) 2017, dated June 16 2016
3. ADP 1-01 Doctrine Primer, dated Sep 2014
4. Fort Bragg Range Control Master Plan
5. Fort Bragg and Camp MacKall Integrated Cultural Resources Management Plan Fiscal Years 2012-2016
6. Fort Bragg and Camp Mackall Integrated Resources Management Plan 2017-2021 (DRAFT)
7. Draft Environmental Impact Statement, To Determine the Level of Training on the Overhills Tract, Fort Bragg, Cumberland and Harnett Counties, North Carolina, January 2005



LAND USE
COMPATIBILITY FACTORS
SECTION SIX

FORT BRAGG JOINT LAND USE STUDY



LAND USE COMPATIBILITY FACTORS

6.1 OVERVIEW

The assessment of the degree of compatibility between civilian land uses and military training operations is the core of the Joint Land Use Study. By analyzing the current state of compatibility, the installation and communities can better understand the degree of risk associated with both the current and future potential for incompatible civilian development in areas subject to military training impacts. By identifying the degree of compatibility risk, Fort Bragg's community partners can make well informed decisions about the nature and extent of any mitigation measures that may be appropriate to employ to reduce the risk from incompatible development or use of land.

Environmental protection and military training capability have been tightly linked at Fort Bragg for decades, with a particular focus on maintaining habitat, both on and off of the installation, for the red-cockaded woodpecker. Given the strong linkages between environmental protection and military readiness, these factors are woven into the overall land use compatibility assessment and recommendations for compatible growth.

6.2 COMPATIBILITY FACTORS

The primary factors that this study examines are the measurable impacts associated with noise related to weapons training and aircraft overflight, along with aviation safety hazards, including aircraft accident potential, obstructions to aerial navigation, and emerging issues related to unmanned aerial systems

(UAS). As noted previously, this study also seeks to continue to integrate environmental protection concerns into the overall discussion of compatibility factors, with a particular emphasis on wildlife habitat protection.

6.2.1 TRAINING NOISE

OVERVIEW

Land use compatibility with activities that generate high noise levels is generally measured along a continuum of intensity of the land use and noise, with inversely proportional impacts and susceptibility to high noise levels based on the intensity of the use. For instance, a single family home, among the lowest intensity “developed” land uses, is also one of the most susceptible to high noise levels when such development extends into areas subject to high noise levels. Conversely, a manufacturing use developed in a similar high noise area would likely be much more compatible given the greater intensity of the use.

In addition to the specific type of land use, the density of development plays a major role in determining noise compatibility. Permitting dense concentrations of residential dwellings (such as smaller lots or multi-family developments) extending into high noise areas exposes a larger population to the potential noise impact. In areas where it is feasible, restricting certain types of noise sensitive uses, such as churches, schools and daycares from a high noise area can help to

mitigate noise impacts on an affected community. While high noise levels can pose a safety issue with a prolonged exposure, the most common issue with noise compatibility is the degree of annoyance experienced by people who reside, work or recreate in the areas subject to these military training impacts. To aide in assessing the degree of potential concern from civilian land uses, the military has developed a standardized set of tools that make recommendations on the appropriate types of land use for certain noise environments. They also assess the risk of complaints for certain types of noise that may be more

sporadic or have a greater degree of perceptibly because of the frequency at which the sound waves travel.

For informational purposes, a table showing the relation of certain A-weighted decibel levels (used for aviation noise) to common noises and the effect that exposure to such noise levels has on humans is shown in Figure 6.1 below. These, along with a range of other factors have gone into the development of compatible use recommendations for high noise environments.

▼ FIGURE 6.1 COMPARABLE NOISE LEVELS

SOUND SOURCE	dBA	EFFECT
Jet Engines (Near)	140	
Jet Takeoff (100-200 Feet)	130	Threshold of pain (125 dBA)
Thunderclap (Near)	120	Threshold of sensation (120 dBA)
Chain Saw	110	
Jet Fly-over (1000 Feet)	103	
Garbage Truck/Cement Mixer/ Farm Tractor	100	Regular exposure for 1 minute or more risks permanent hearing loss
Lawnmower, Food Blender	85-90	Level at which hearing loss begins (8 hour exposure)
TV	70-90	
Diesel Truck (40 Mph, 50 Feet)	84	
Garbage Disposal	80	Annoyance; constant exposure may cause hearing loss
Vacuum Cleaner, Hair Dryer	70	Intrusive, interference with conversation
Normal Conversation	50-65	Comfortable
Refrigerator	40	
Whisper	30	Very quiet
Rustling Leaves	20	Just audible
Normal Breathing	10	
	0	Threshold of normal hearing

A simple example of this type of compatibility guidance, derived from the original Federal Inter-agency Committee on Urban Noise, which has been widely used in land use compatibility planning for over 3 decades, is shown in Figure 6.2. This reinforces the inverse correlation between noise compatibility and the general intensity of use. In this case, “intensity” means both the relative intensity of the specific use and the potential for the use or development pattern to concentrate large numbers of people in a manner that extends into an area with high noise potential.

▼ FIGURE 6.2 EXAMPLE LAND USE COMPATIBILITY GUIDELINES FOR A-WEIGHTED NOISE LEVELS

LAND USE	Noise Level			
	65 TO 70 DB	70 TO 75 DB	75 TO 80 DB	80 TO 85 DB
Households	Y	Y	N	N
Manufacturing	Y	Y	Y	Y
Retail – General	Y	Y	Y	N
Restaurants	Y	Y	Y	N
Personal Services	Y	Y	Y	N
Hospitals	Y	Y	N	N
Government	Y	Y	Y	N
Education	Y	Y	N	N
Public Assembly	Y	N	N	N
Parks	Y	Y	N	N
Agriculture	Y	Y	Y	Y

Source: FICUN 1980

LARGE CALIBER WEAPONS NOISE

Impulsive noise, such as artillery fire and noise from demolition training, while loud, often is either sporadic in nature, or a singular event. As there is no long term exposure to the noise, the military developed guidance on the expected degree of complaint activity, expressed as the “risk of complaint,” from households or businesses that re constructed in areas subject to impulsive noise events. The degree of risk of complaint along with the peak noise level and estimated perceptibly are shown in Figure 6.3. While not expressed as such in the guidance, the degree of complaint risk for impulsive noise tends to track closely with the degree of compatibility for other high noise level measures.

▼ FIGURE 6.3 IMPULSIVE NOISE COMPLAINT RISK

PERCEPTIBILITY	DB PK15	RISK OF COMPLAINTS
May or may not be Audible	<115	Low
Noticeable, Distinct	115 - 130	Moderate
Very Loud, May Startle	>130	High

The peak noise levels from these single event impulsive noise levels are expressed as X dB PK15. The "PK15" identifier qualifies the peak noise level as being the level of noise that would only be exceeded 15% of the time. Approaching the PK15 decibel threshold typically occurs under noise-conductive weather conditions, such as low ceilings and heavy cloud cover, which can reflect sound waves and intensify the perceived noise level at greater distances than would otherwise be observed under less noise conducive conditions.

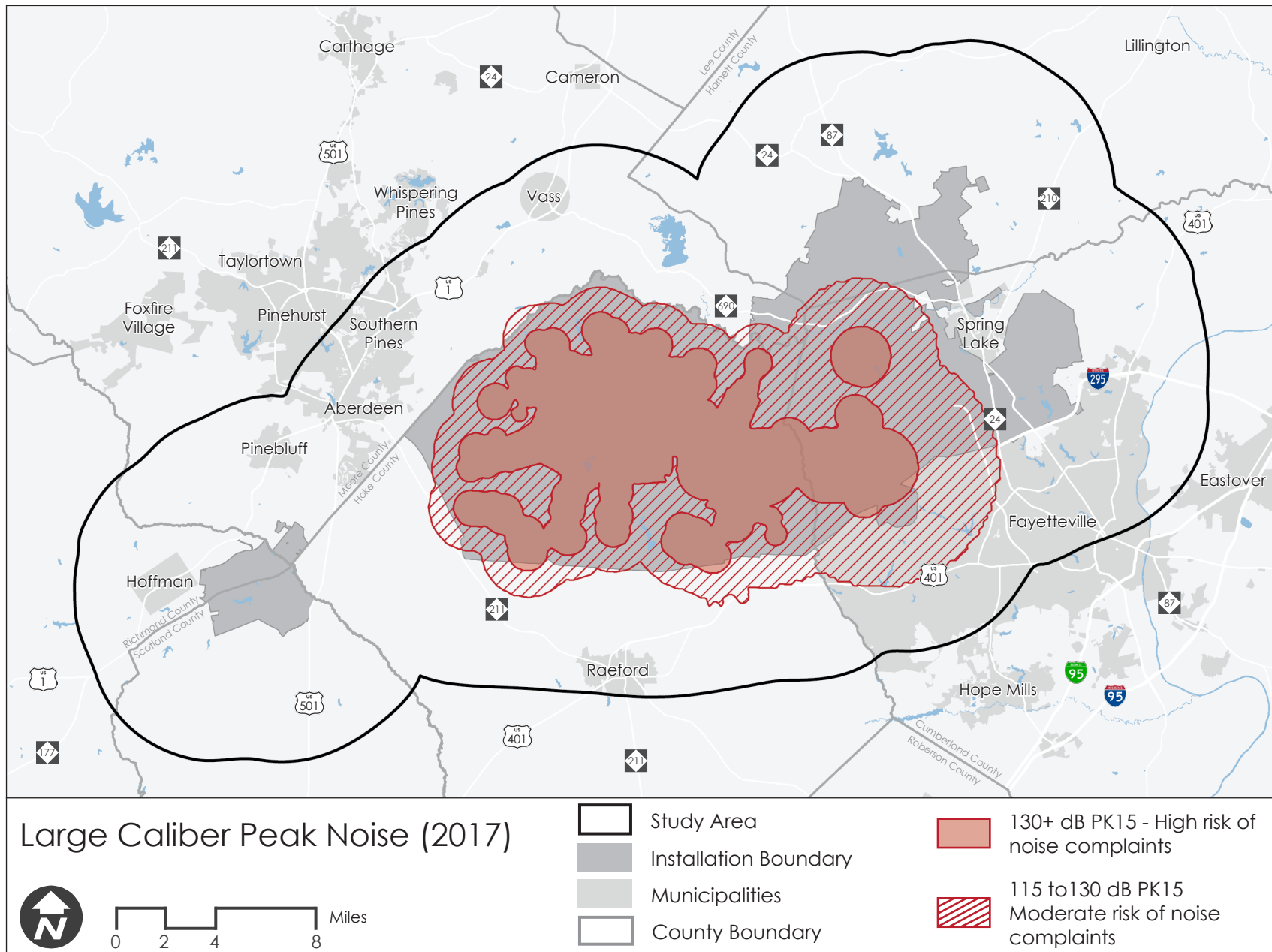
In Fort Bragg's most recent noise study (2017), the models predicted that very little single event impulsive noise exceeding 130 dB PK15 (high complaint risk) would travel off of the installation during normal weather conditions (see Map 6.1). These high complaint risk areas are located primarily around either side of the former ammunition storage area, as well two small areas along the southern boundary of the installation in Hoke County. The data does indicate, however, that the extent of the moderate complaint risk noise level (115-130 dB PK15) extends significantly off-post into Fayetteville along the installation's southeastern boundary, and to a lesser extent, it spills off-post at several points along the installation's southern and southwestern boundary in Hoke County. Two other small areas with 115-130 dB peak noise levels are found along the northwestern and northern installation boundary, respectively, in Moore County. These areas are relatively small compared to the other off-post moderate complaint risk areas.

In addition to the peak noise modeling, the 2017 noise study also modeled the average annual noise exposure levels from large caliber weapons noise. This measure of noise, known as a CDNL, takes into account historic ammunition expenditures as an input into the model, and penalizes night-time firing with an additional 10 dB penalty, thereby weighting night fires more heavily than daytime fires.

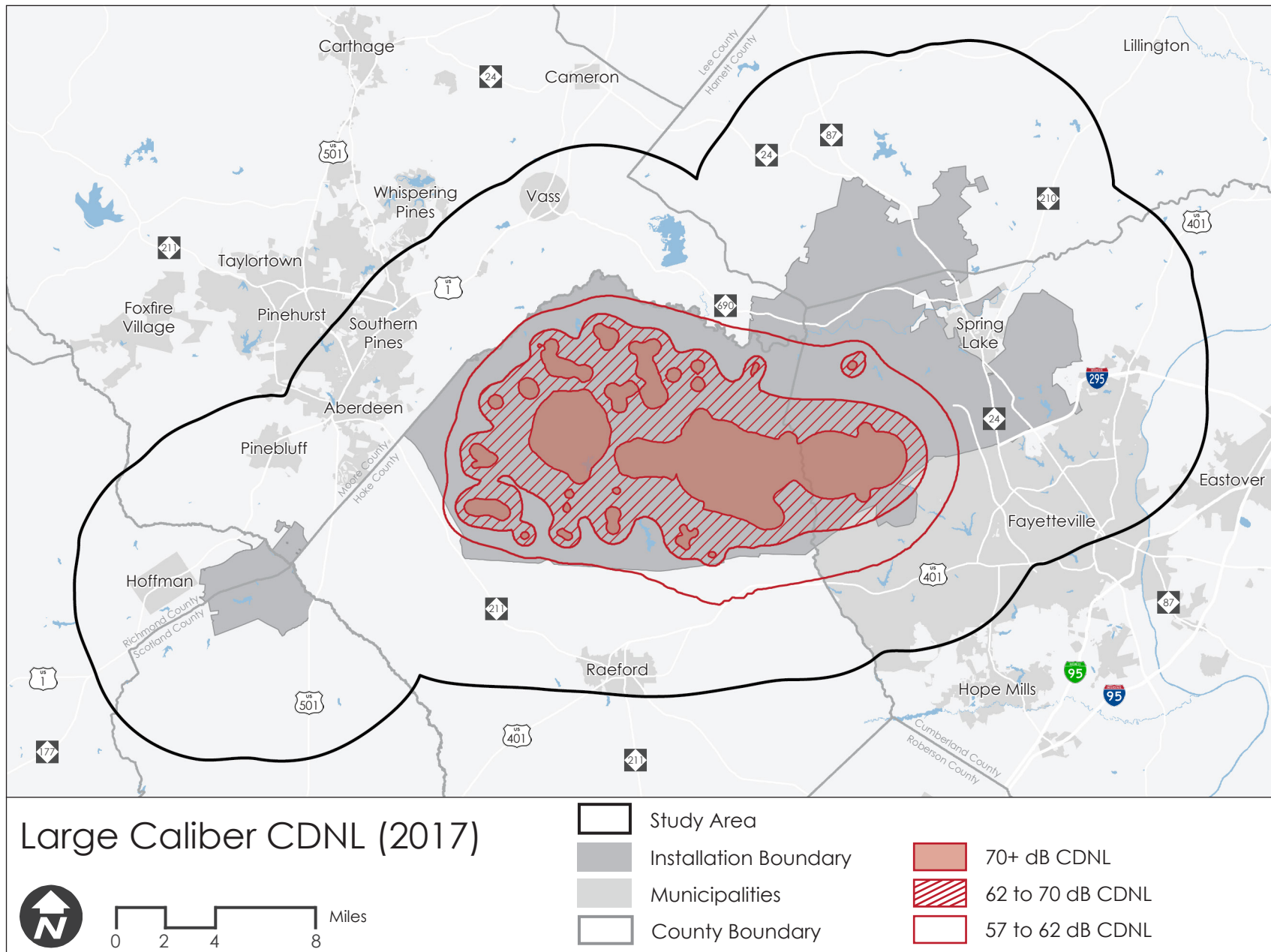
The CDNL noise contours developed in the 2017 Fort Bragg noise study are shown in Map 6.2. Contours were developed for the 57 dB, 62 dB and 70+ dB average annual noise levels. Compatibility concerns generally become evident when annual average noise levels exceed 62 dB, with more serious compatibility concerns for noise levels above 70 dB CDNL. The noise contour between 57 dB and 62 dB is known as the "Land Use Planning Zone (LUPZ)". The LUPZ is generally an "awareness area" that is used to identify areas that could be exposed to higher noise levels in the future.

As Map 6.2 shows, no areas exceeding 70 dB CDNL currently fall outside of the installation boundary, while there are only two small areas of noise in excess of 62 dB CDNL that fall off-post, both of which are adjacent to the former ammunition storage site in Fayetteville along the installation's southern boundary. The LUPZ (57 - 62 dB CDNL) extends off-post, wrapping around the installation's southern boundary from just west of the All American Freeway to eastern Hoke County, north of Raeford.

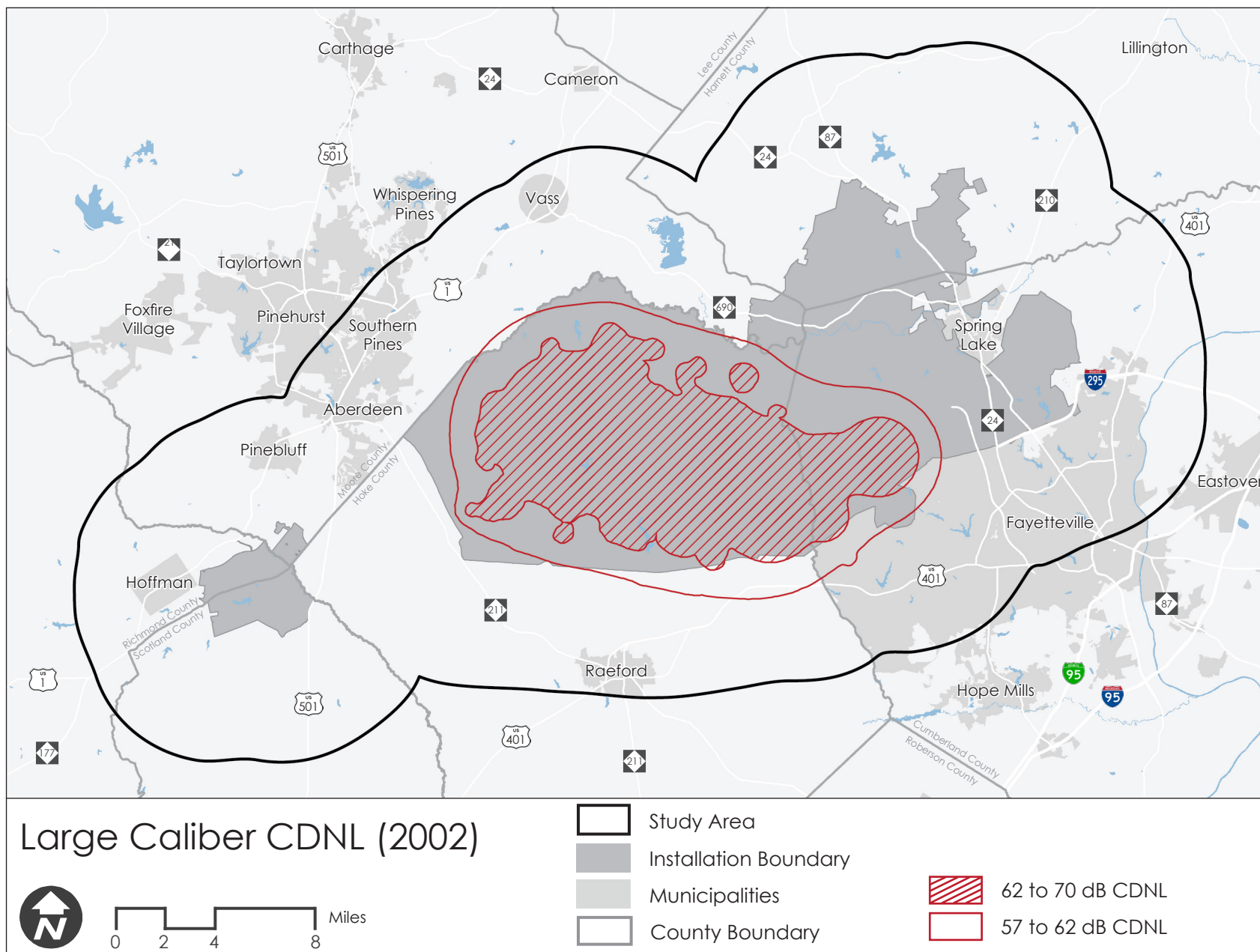
▼ MAP 6.1 NOISE ZONES: SINGLE EVENT IMPULSIVE LEVELS (PK15)



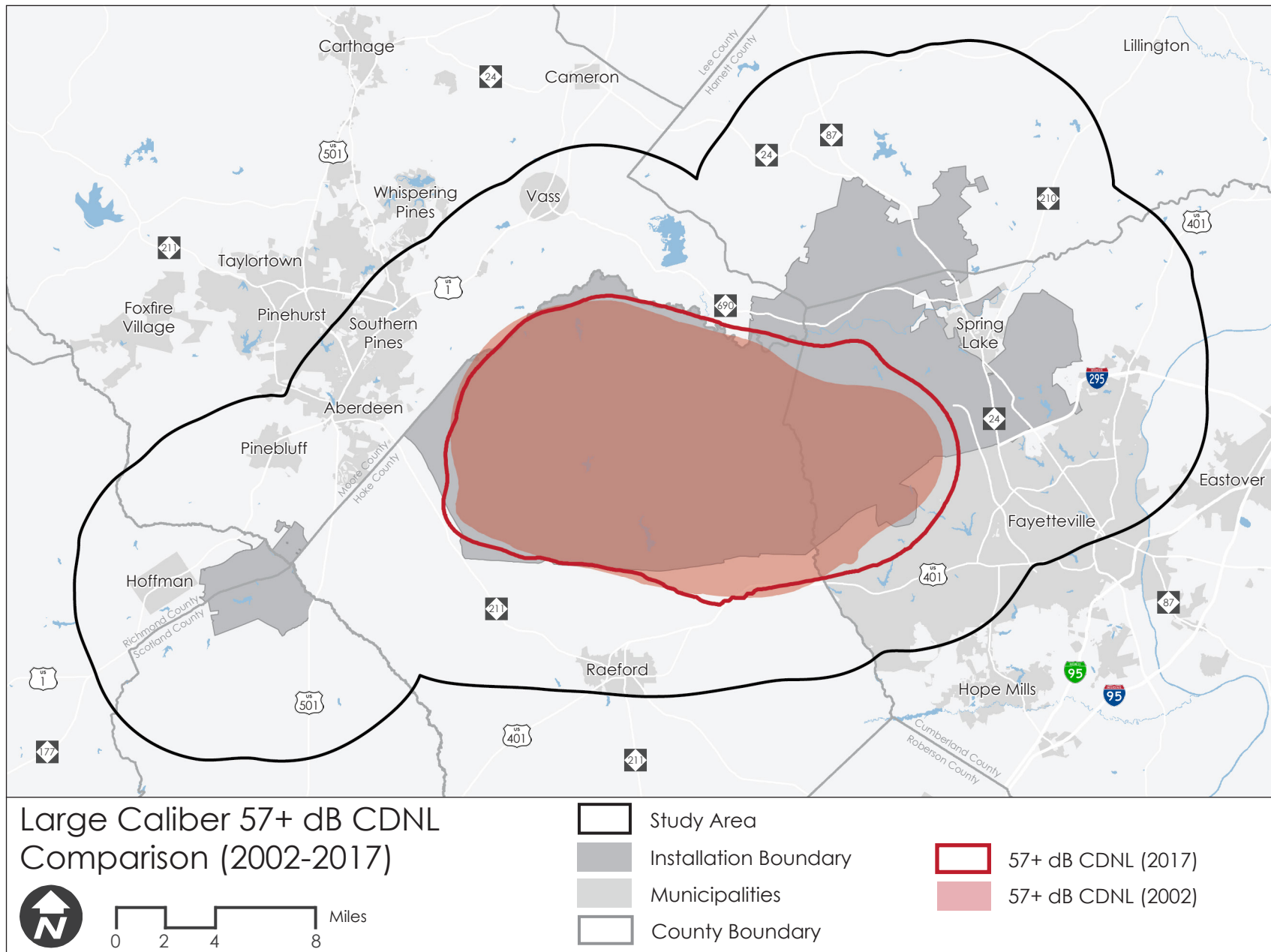
▼ MAP 6.2 NOISE ZONES: 2017 LARGE CALIBER WEAPONS CDNL



▼ MAP 6.3 NOISE ZONES: LARGE CALIBER CDNL (2002)



▼ MAP 6.4 NOISE ZONES: LARGE CALIBER WEAPONS (57+ dB CDNL 2002, 2017 COMPARISON)



For comparison purposes, this study also includes the large caliber CDNL noise contours from the 2002 noise study. This noise data was used in the development of the last two Joint Land Use Studies for Fort Bragg. The 2002 data, displayed in Map 6.3, only identifies the 57 - 62 dB CDNL and 62+ dB CDNL, noise contours. A comparison of the outer extent of the LUPZ (57 - 62 dB DNL) noise contours is shown in Map 6.4. The comparison of the two data points shows that the extent of the contours is relatively similar in terms of the area exposed to 57+ dB CDNL noise levels. The most significant changes in the off-post areas subject to this noise level are along the southeastern boundary of the installation, where the 2017 noise study contour now extends about 1 mile further into Fayetteville than it did in the 2002 noise model.

SMALL CALIBER WEAPONS NOISE

The 2017 noise study also measured peak noise levels generated by weapons fire at Fort Bragg's numerous small arms ranges. Although many of these ranges are located in fairly close proximity to the installation boundary, noise levels that cause compatibility concerns for noise sensitive land uses generally do not fall off of the post, according to the most recent noise model. Noise from small arms weapons firing is measured as a peak noise level, with no weighing or time penalty. The level at which noise compatibility concerns begin is 87 dB, with more significant concerns above 104 dB.

The 2017 noise study identified two locations (see Map 6.5)

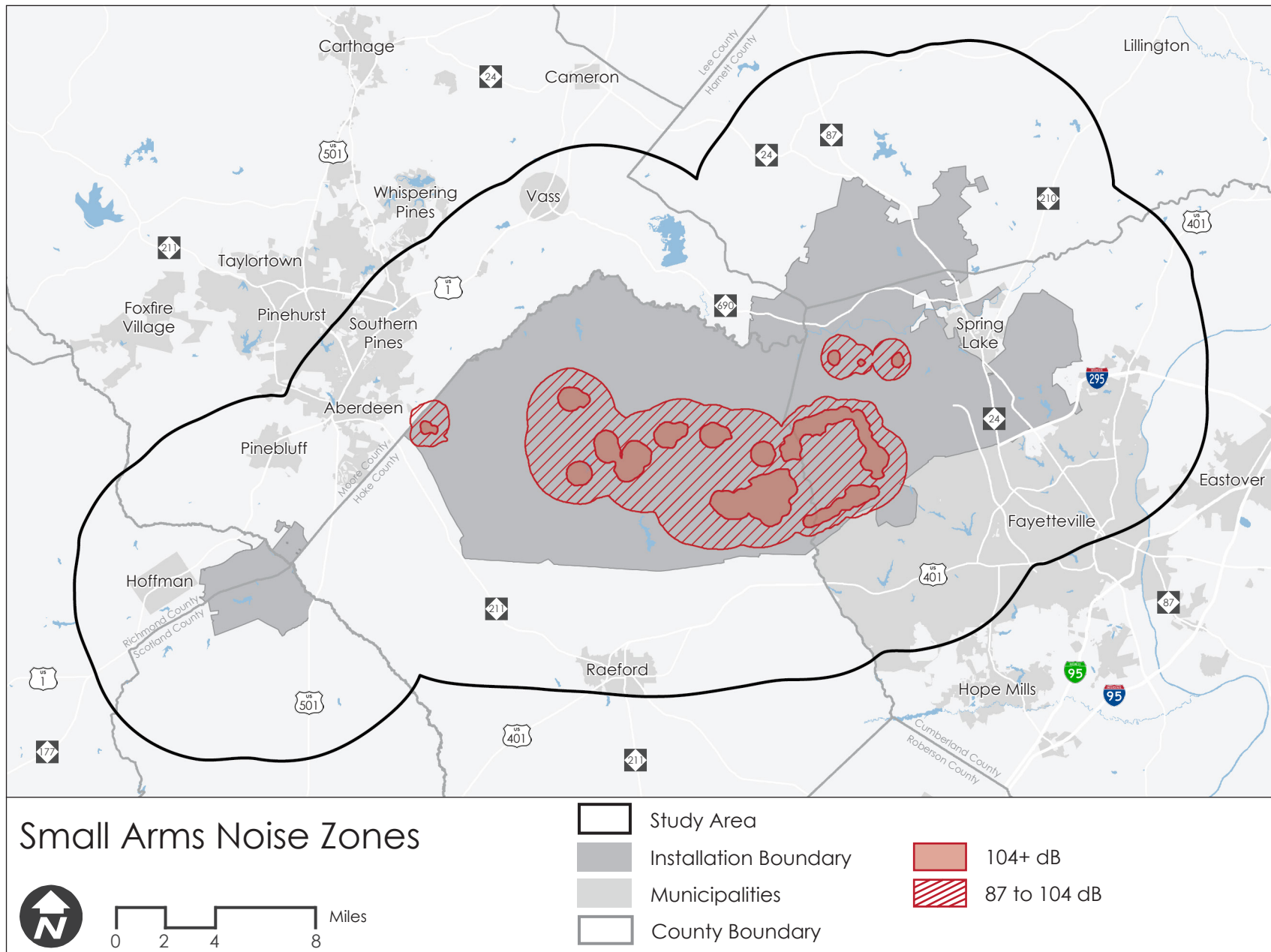
where noise in excess of 87 dB from small arms ranges extends off of the installation. The first of these is in Fayetteville around the former ammunition storage site, and the other is found just east of Aberdeen in Moore County along Fort Bragg's northwestern boundary.

The 2017 noise study also modeled the noise level potential for new ranges that have been programmed for development on the installation. The modeled future small arms noise environment is shown in Map 6.6. The results of this model indicate that with the new ranges coming online, there will not be any additional off-post noise impact that exceeds the 87 dB threshold for compatibility concern, although the western extension of the 87-104 dB contour would extend to the western edge of the installation, just north of where 87+ dB noise contours currently leave the installation.

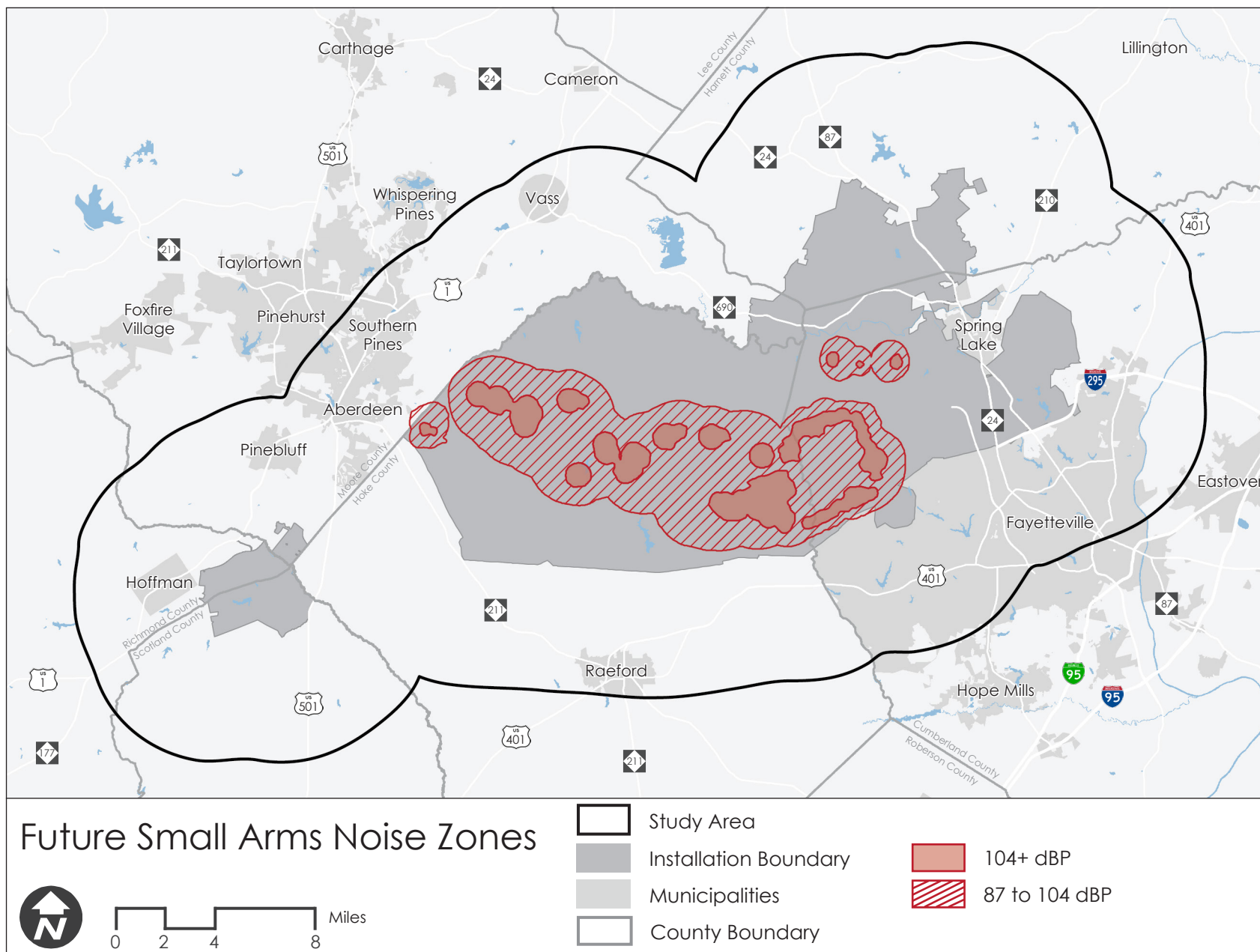
AVIATION NOISE

Noise levels connected with aviation activities at Fort Bragg are associated with a variety of sources and aircraft types. The most significant of these is the concentrated aircraft noise associated with takeoffs and landings at the installations three airfields. Noise contours for these airfields were developed as part of the 2017 noise study, and are shown in Map 6.7. Noise from aircraft operations is measured as an "A" weighted day-night annual average, or ADNL. Like the CDNL, that is associated with the lower frequency large caliber weapons noise, it is penalized 10 dB for operations that occur during nighttime hours.

▼ MAP 6.5 SMALL ARMS NOISE ZONES



▼ MAP 6.6 SMALL ARMS NOISE ZONES (FUTURE)



Noise compatibility concerns for aircraft begin at the 65 dB ADNL threshold, and become more serious when they exceed 75 dB ADNL. The 2017 noise study also included a 60-65 dB ADNL noise contour, which functions much like the LUPZ associated with large caliber weapons noise. The 2017 noise study identified only several small areas where noise in excess of 65 dB ADNL extends outside of the installation boundary. The first of these is a small area that extends into Spring Lake a short distance from the northeastern end of the runway at Pope AAF. At Mackall AAF, there are three small areas where 65 - 75 dB ADNL noise contours extend off-post from the ends of the runways - including the northern and southern ends of runway 4/22 and the western end of runway 11/29. No noise in excess of even the low 60 dB ADNL threshold extends off-post from Simmons AAF, while at Pope AAF, 60 - 65 dB ADNL noise contours extend between 2 to 3 miles northeast of the runway. The 60 - 65 dB ADNL noise contour at Mackall AAF extends almost completely around the western, southern and eastern sides of Camp Mackall, as well, as north of runway 4/22.

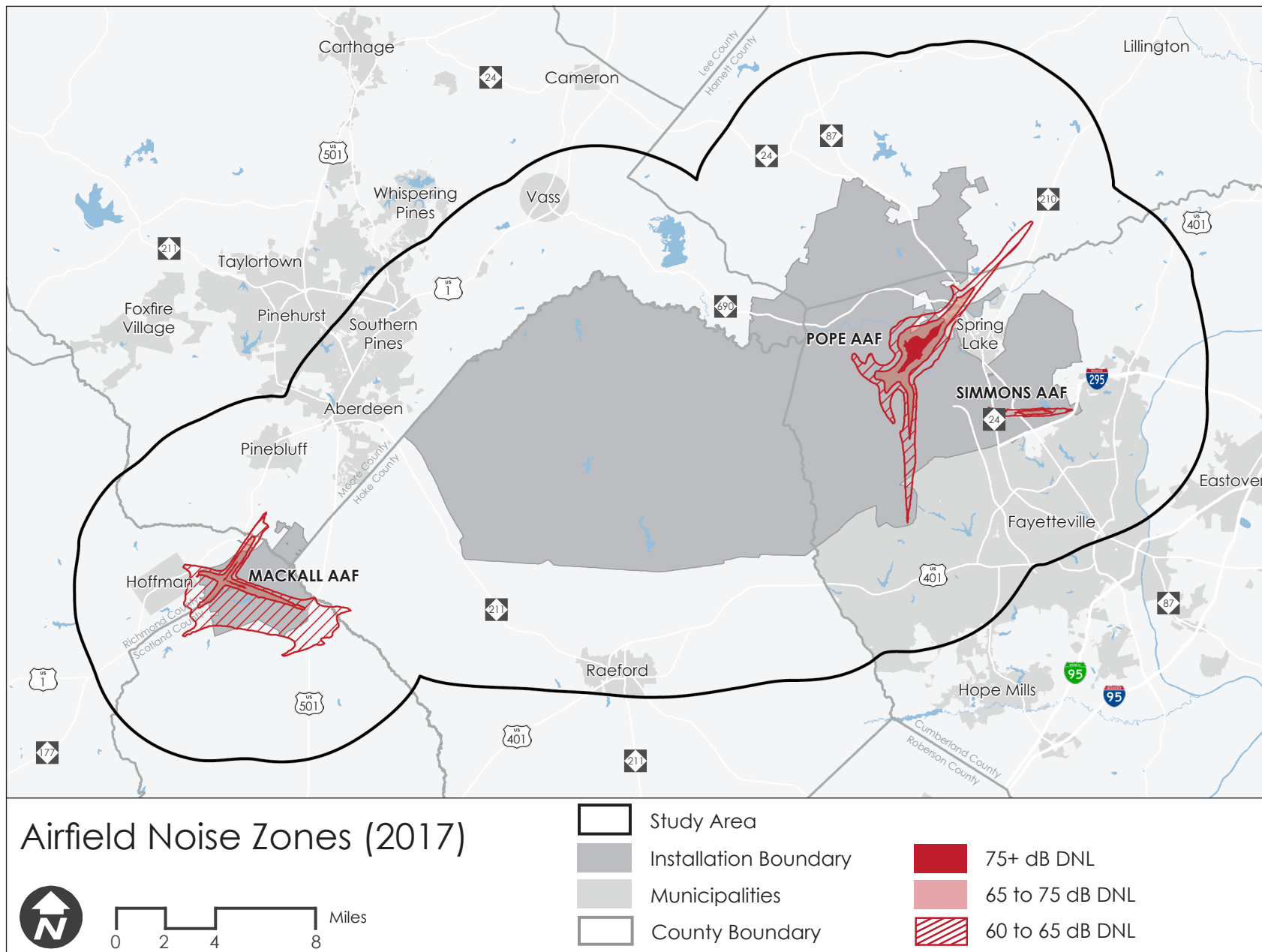
The 2002 noise study provided aviation noise contours for Pope AAF (then Pope AFB) and Simmons AAF, but not Mackall AAF. The 2002 noise contours, displayed in Map 6.8, show that the noise environment at Pope AAF is similar now with regard to 65+ dB ADNL noise levels, but that the 60-65 dB noise contour has expanded greatly. At Simmons AAF, on the other hand, it appears that the noise environment today is generally more favorable, with no noise above 60 dB ADNL extending off-post.

Of course, with no past reference point, it is not possible to identify any change in the situation at Mackall AAF.

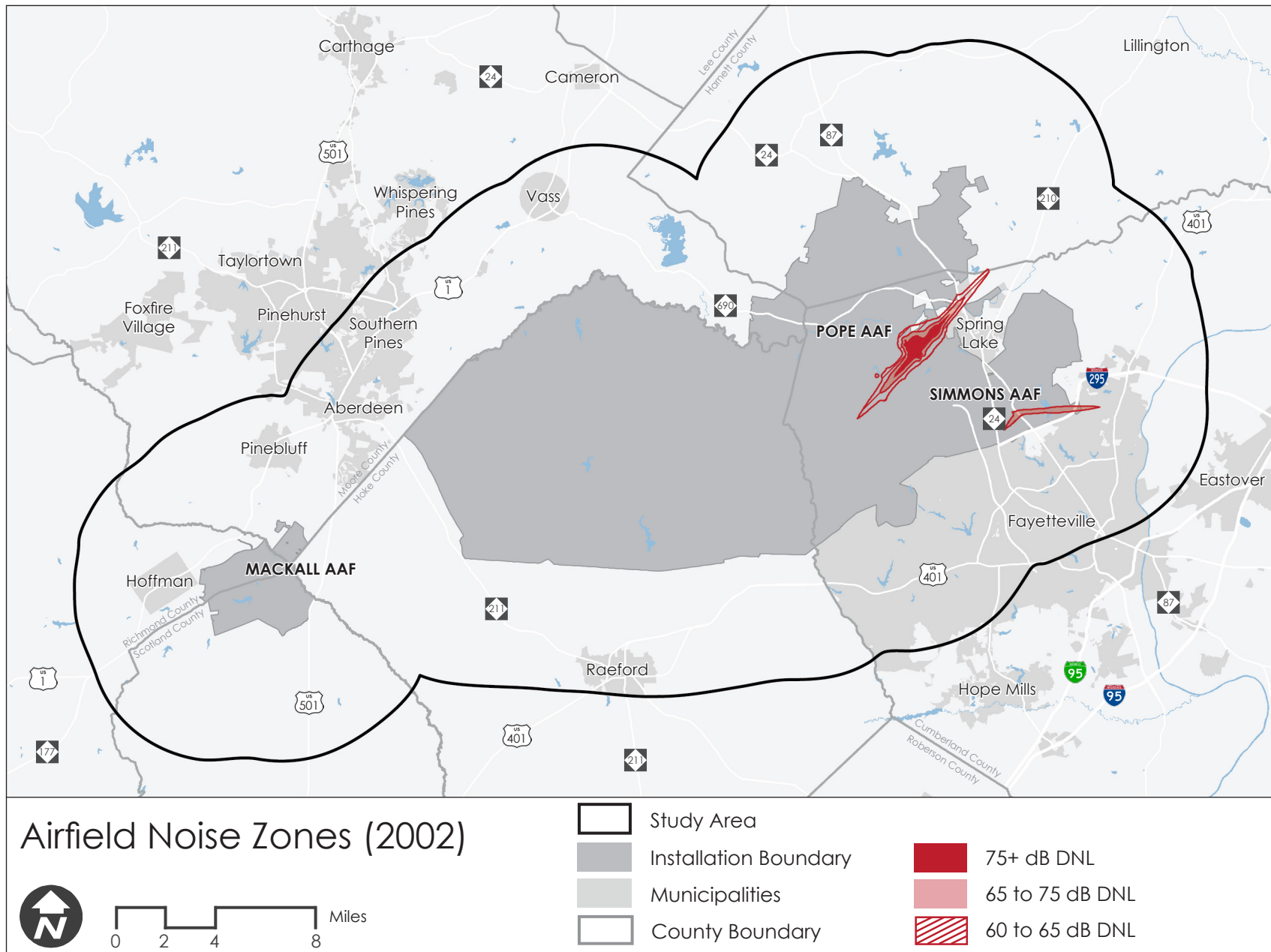
Aviation related noise is also generated by low flying aircraft during aviation training operations, particularly airdrop missions. The 2017 noise study contemplated the issue of low altitude aircraft overflight. However, due to the relative lack of frequency of operations (especially when compared to an airfield) noise contours were not able to be generated for the fixed wing aviation routes and rotary wing corridors in the noise modeling program. Additional guidance was provided to help develop recommendations for compatible growth in the areas that are in close proximity to these low altitude flight routes (see Map 5.6 in Section 5).

Tables 6.1 and 6.3 (reproduced from the 2017 Fort Bragg noise study) provide information on the expected noise levels generated by certain fixed and rotary wing aircraft. Fixed wing aircraft statistics are given for the aircraft in their typical airdrop flight configurations and for rotary wing aircraft in their typical low altitude flight configurations. Table 6.2 (also from the 2017 Fort Bragg noise study) shows the results of background studies that were conducted to establish the percentage of the population that would be “highly annoyed” and thus more likely to make a noise complaint, when exposed to various noise levels associated with aviation operations.

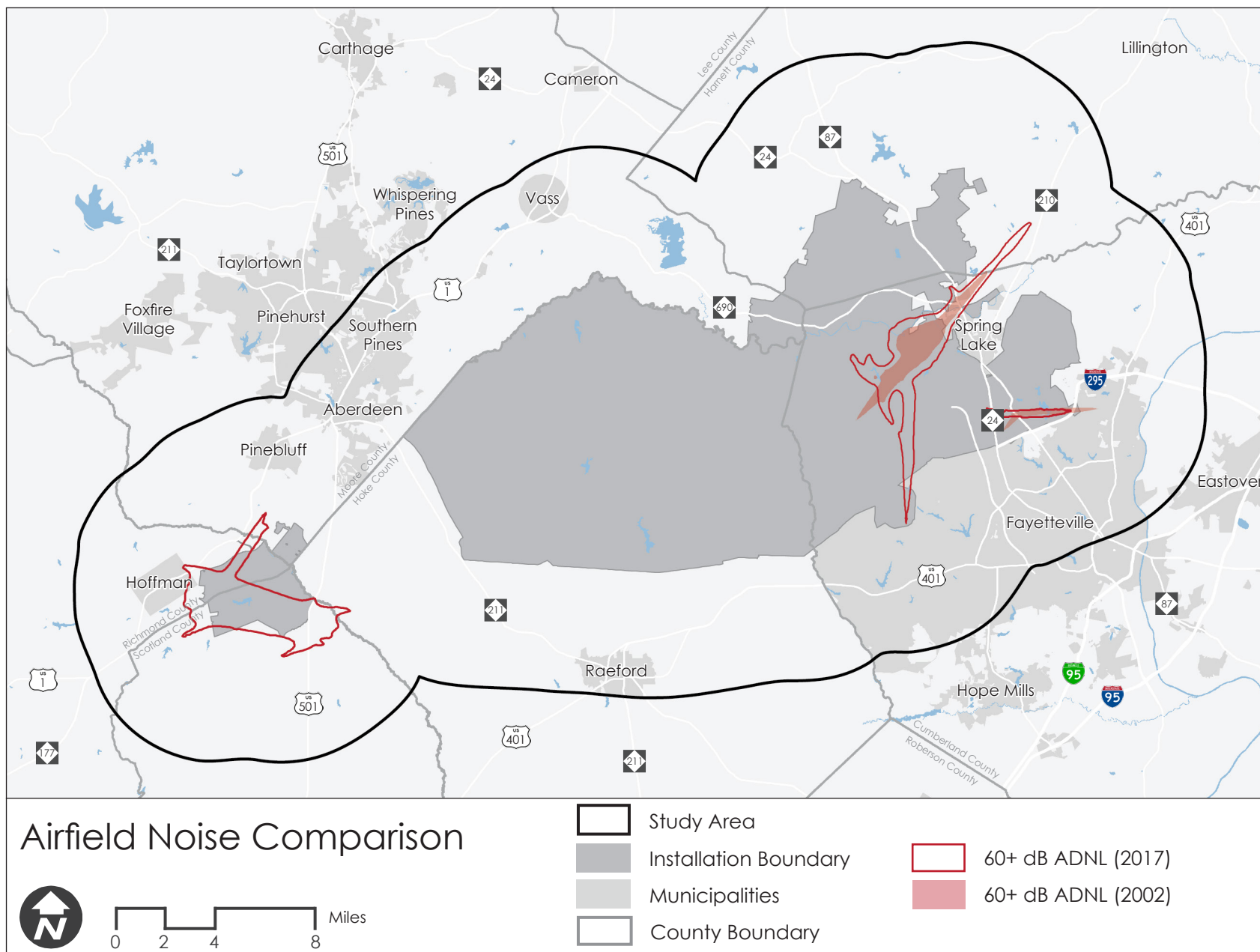
▼ MAP 6.7 AVIATION NOISE ZONES (2017)



▼ MAP 6.8 AVIATION NOISE ZONES (2002)



▼ MAP 6.9 AVIATION NOISE ZONE COMPARISON, 2002-2017



▼ TABLE 6.1 MAXIMUM A-WEIGHTED SOUND LEVELS FOR FIXED-WING AIRCRAFT

SLANT DISTANCE (FEET)	MAXIMUM SOUND LEVEL, dBA		
	C-130 970 C TIT 170 kts	C-17 92% NC 175 kts	C-12 90% RPM 160 Kts
500	92	99	79
1,000	85	91	73
1,500	80	86	69
2,000	77	81	67
2,500	75	78	65
5,000	66	75	57

▼ TABLE 6.2 PERCENTAGE OF POPULATION HIGHLY ANNOYED FROM AIRCRAFT NOISE

NOISE LEVEL, dBA	PERCENT HIGHLY ANNOYED
90	35%
85	28%
80	20%
75	13%
70	5%

▼ TABLE 6.3 MAXIMUM A-WEIGHTED SOUND LEVELS FOR ROTARY-WING AIRCRAFT

SLANT DISTANCE (FEET)	MAXIMUM SOUND LEVEL, dBA			
	AH-64 70 KIAS	CH-47 LIGHT 130 KIAS	CH-47 HEAVY 120 KIAS	UH-60 70 KIAS
200	90	101	98	86
500	82	93	89	77
800	77	89	85	73
1,000	75	87	83	71
1,200	73	85	81	69
1,500	71	83	79	67
2,000	68	80	76	64
2,500	65	78	74	61

▼ TABLE 6.4 PERCENTAGE OF POPULATION HIGHLY ANNOYED FROM AIRCRAFT NOISE

NOISE LEVEL, dBA	PERCENT HIGHLY ANNOYED
90	35%
85	28%
80	20%
75	13%
70	5%

6.2.2 AIRCRAFT ACCIDENT POTENTIAL

The various military services promulgate recommendations for assessing compatible use in areas subject to increased levels of aircraft accident potential. The goal is to help communities understand how to prevent incompatible civilian land uses in these areas. A generalized example of accident potential zone compatibility guidance is shown in Figure 6.4.

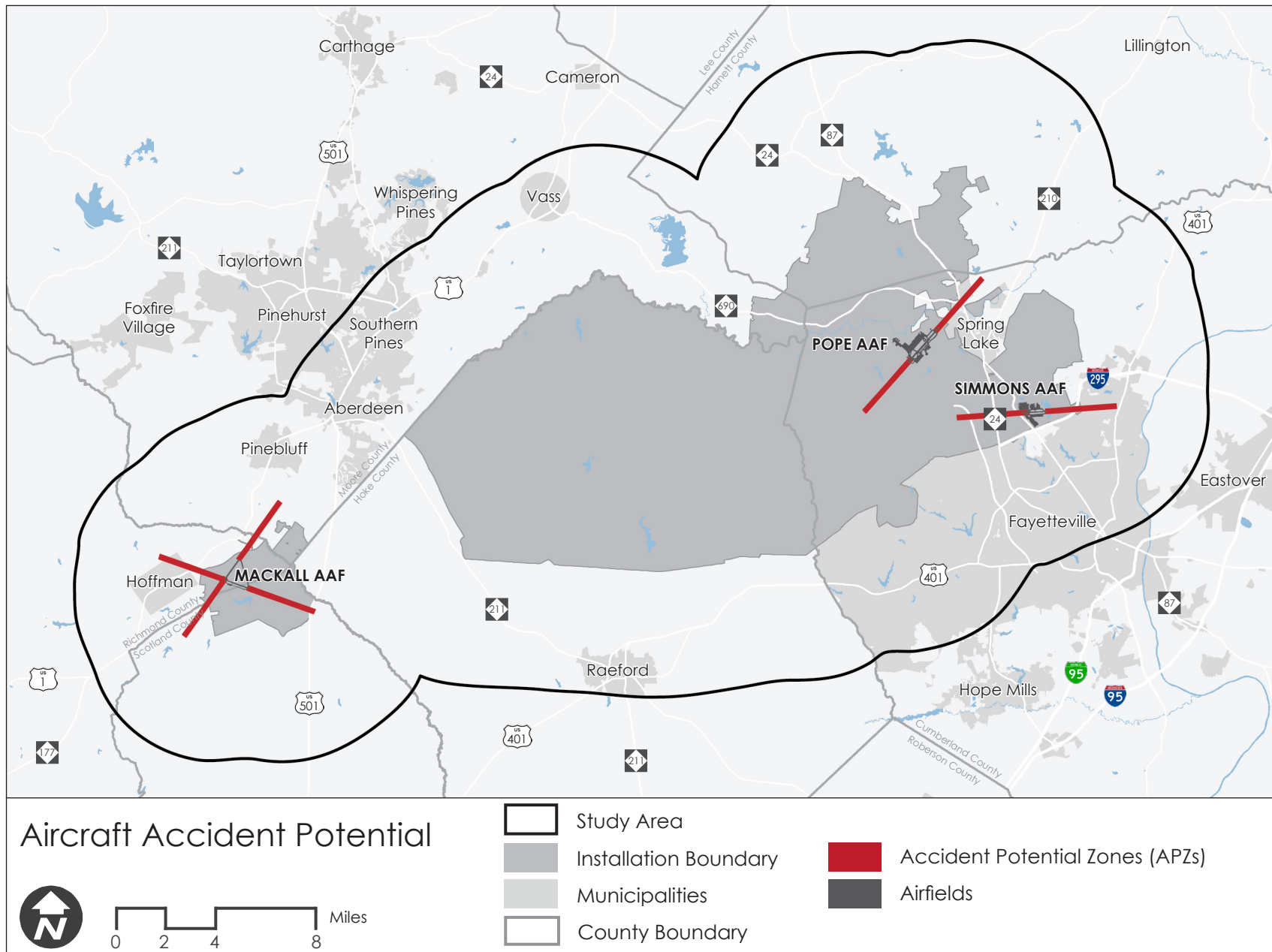
Accident potential zones are generally divided into three categories, the Clear Zone, the Accident Potential Zone 1 (APZ 1) and the Accident Potential Zone 2 (APZ 2). The Clear Zone is the area closest to the runway, and is the location of the greatest risk for aircraft accidents. As such, land uses, other than agriculture, open space, and certain transportation or utility uses, are typically prohibited (when enforced through a local government zoning ordinance based on the military compatible use guidance). Extension of incompatible development into these areas is often seen as the greatest threat to military flight operations. Beyond the clear zone, Accident Potential Zone 1 (APZ I) has many of the same recommendations for compatible land uses as the Clear Zone. However, it begins to include some low intensity land uses, including single family dwellings (with conditions on development density). Accident Potential Zone 2 (APZ II) has the fewest number of recommended land use restrictions, but still encourages the prohibition of certain sensitive land uses into these areas. It recommends maintaining low density residential development to limit the exposure of the population in case of an accident.

▼ FIGURE 6.4 LAND USE COMPATIBILITY GUIDELINES FOR AIRCRAFT ACCIDENT POTENTIAL ZONES

LAND USE	CLEAR ZONE	APZ I	APZ II
Single Family Unit	N	Y	Y
Multifamily Dwellings	N	N	N
Manufacturing	N	N	Y
Trans, Comm and Utilities	Y	Y	Y
General Retail	N	N	Y
Restaurants	N	N	Y
Personal Services	N	N	Y
Other Services	N	N	Y
Government Services	N	N	Y
Educational Services	N	N	N
Cultural Activities	N	N	N
Medical Services	N	N	N
Churches	N	N	N
Playgrounds	N	N	Y
Regional Parks	N	Y	Y
Assembly Areas	N	N	N
Other Outdoor Recreation	N	Y	Y
Agriculture	Y	Y	Y
Livestock Farming	N	Y	Y
Forestry Activities	N	Y	Y
Permanent Open Space	Y	Y	Y

Source: U.S. Air Force AICUZ Planning Guidance

▼ MAP 6.10 AIRCRAFT ACCIDENT POTENTIAL ZONES



The Fort Bragg accident potential zones are shown in Map 6.10. At Pope AAF, accident potential zones associated with the northern end of the runway extend off-post into Spring Lake and beyond, with practically all of APZ 1 and APZ 2 situated off-post. The Clear Zone at the northern end of the runway, however, is entirely on Fort Bragg. At Simmons AAF, a small portion of APZ 1 and all of APZ 2 extend off of the installation into the community. As is the case at Pope AAF, the CZ at this end of the runway is entirely on-post. Mackall AAF has a significant portion of the accident potential zones associated with runways 4/22 and 11/29 falling outside of the installation boundary. With regard to runway 4/22, a small portion of the northern CZ, along with all of APZ 1 and APZ 2 fall outside the installation, as do a small portion of APZ 1 and all of APZ 2 at the southern end of the runway. The eastern end of runway 11/29 has only a small portion of its APZ falling off-post. However, the western end of the runway, around half of APZ 1 and all of APZ 2 are outside of the installation boundary.

6.2.3 OBSTRUCTIONS TO AERIAL NAVIGATION

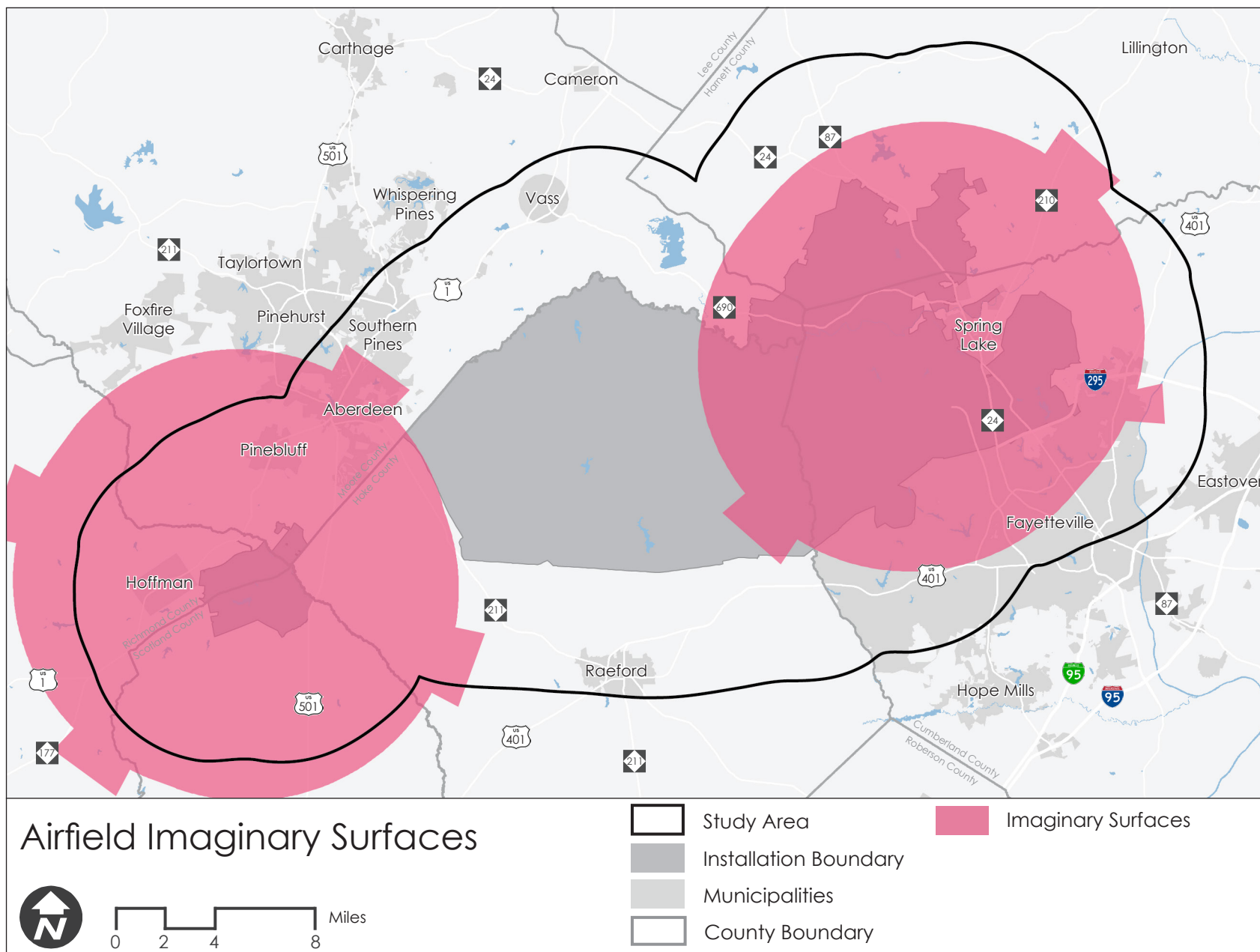
In addition to the airfield aviation safety issues related to aircraft accident potential, tall structures, such as water towers, broadcast antennae, and telecommunications towers, pose a potential compatibility concern when sited in areas where low altitude aircraft operations take place. At Fort Bragg, given the heavy dependence on aviation assets as part of the training mission, the proliferation of tall structures that impede safe aerial navigation could cause a significant degradation in training capability. The

areas of greatest concern, include land within low level aviation routes and flight corridors (see Map 5.5 in Section 5), MOAs with low floor altitudes and NOE flight area (see Map 5.5 in Section 5), as well as the Part 77 imaginary surfaces associated with the three airfields on Fort Bragg (see Map 6.11).

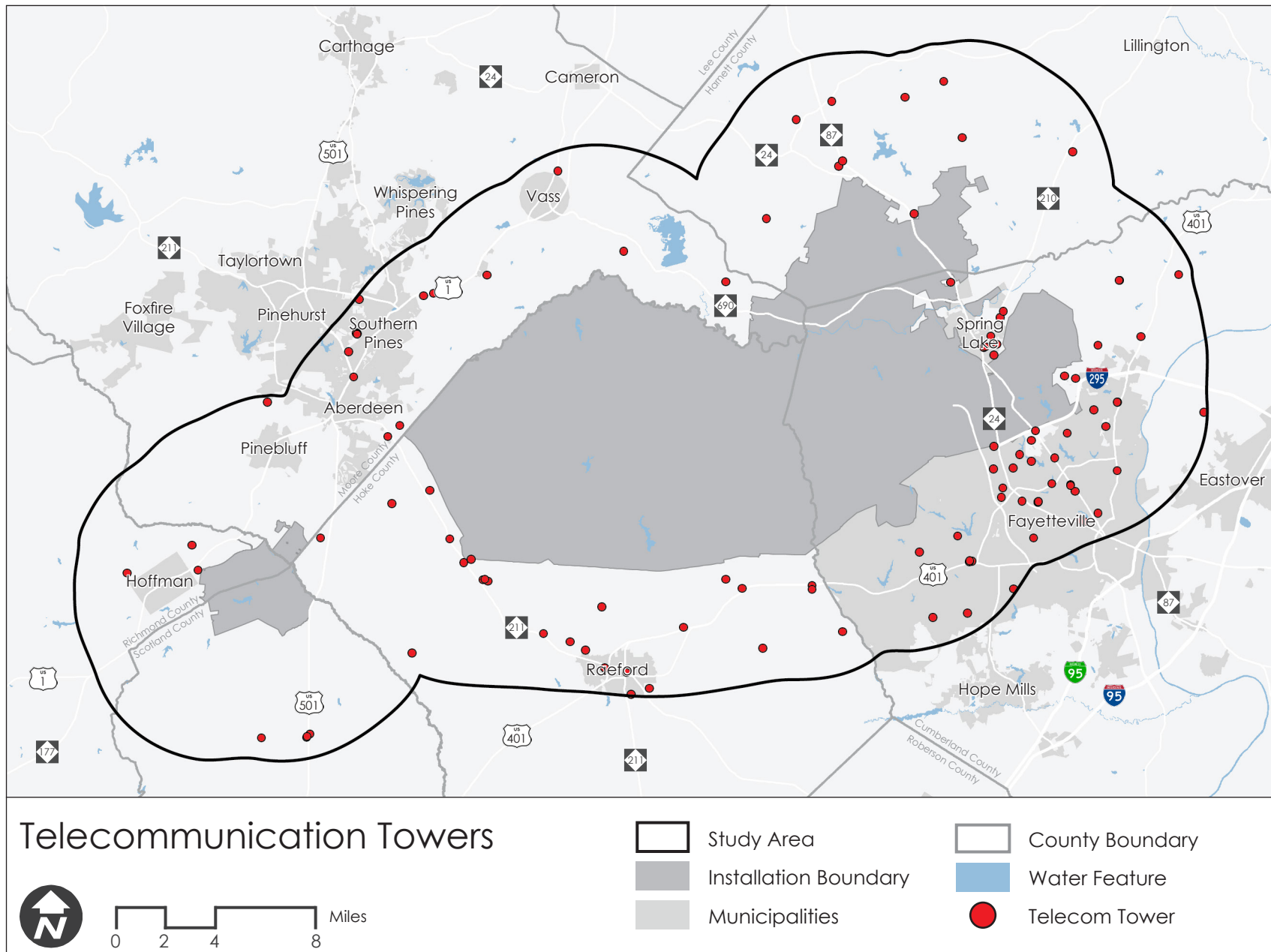
Of these areas of concern, perhaps the imaginary surfaces are currently afforded the most protection, given the requirement for tall structures to be submitted to the FAA's obstruction evaluation division (OE/AAA). OE/AAA makes determinations as to whether a proposed structure constitutes a hazard to aerial navigation. However, it does not have any power to prohibit the erection of a potential obstruction, as that power is reserved for state and local governments. Unfortunately, tall structures in proximity to MOAs, NOE flight areas, aviation routes and air corridors may trigger reviews only if FAA determines a potential hazard in coordination with the military users of that airspace. However, it is dependent on direct coordination with the installation.

The map in Figure 6.12 shows the location of telecommunication towers, extracted from the FCC Antenna Structure Registry, that are located in close proximity to Fort Bragg, and therefore, the airspace that is used by military aircraft. The presence of a tall structure in proximity to military airspace does not automatically constitute a hazard. Other factors such as height, the floor altitude of the route, the distance between other tall structures, etc. can influence whether a structure is an obstruction to navigation.

▼ MAP 6.11 AIRFIELD IMAGINARY SURFACES



▼ MAP 6.12 TELECOMMUNICATION TOWERS



6.2.4 ENVIRONMENTAL COMPATIBILITY

The environmental factors discussed in Section 4 contribute directly to the overall land use compatibility situation at Fort Bragg. The installation has a long history of working closely with environmental agencies, conservation groups, property owners, local governments, and others to develop and implement policies and programs to promote a sustainable environment both on and off of the installation. Among the most visible and well known examples of how environmental issues that occur off-post can affect training activities on-post is the long-running effort to preserve habitat for, and support the recovery of, the endangered red-cockaded woodpecker. Due to habitat loss in the region, Fort Bragg was faced with severe training restrictions in the past, as the installation became the habitat of last resort in the region for the RCW. In response, Fort Bragg developed partnerships to support the bird's recovery, including significant efforts on and off the installation to preserve and manage Longleaf Pine forests for habitat. These long-running efforts led to the removal of training restrictions as the RCW population in the region recovered.

With an eye toward such past examples from Fort Bragg and other military installations around the country, a critical component of the ongoing compatible growth partnership in the region will be to ensure that environmental compatibility is taken as seriously as, and integrated with, compatible growth plans and regulations related to direct military training impacts. Chief among these will be to maintain support for the preservation of the Longleaf Pine ecosystem to maintain RCW habitat, the preservation of RCW

foraging areas, and, generally, preserving and protecting those areas that have high biodiversity and wildlife habitat ratings, as well as the natural areas that connect them, allowing wildlife to move between areas of critical habitat.

Preserving air and water quality, supporting efforts to preserve working lands (farms and sustainable forestry operations), preserving wetlands, and mitigating natural hazards, such as flooding, will also serve to support the overall environmental health of the region. In turn, this will help to sustain the military training mission, and ensure the long term viability of Fort Bragg, when coupled with other compatible growth efforts.

6.3 PROTECTING COMPATIBILITY

In order to preserve the current level of land use compatibility in the region and ensure the long term sustainment of Fort Bragg's military training mission, it is recommended that the region update the compatibility protection rating map that has been in use for the last decade. Included as a recommendation in Section 8, this updated map includes recently available data, and is based on emerging trends regarding military training needs and environmental concerns. In order to simplify and streamline the compatible growth recommendations that regional land use reviews are based on, the JLUS process has resulted in a new set of criteria that classify land within the 5 mile study area as being either "critical" or "important" to protect, based on the relative value or necessity of the military training or environmental issue addressed in the criteria.

6.3.1 COMPATIBLE USE PROTECTION RATING

The components listed below comprise the criteria that were used to identify the lands that have been determined to be either “critical” or “important” to protect to ensure the compatible growth of the region, with regard to both military training and environmental factors that influence military readiness. The results of the compatible use protection analysis are shown on Map 6.13.

“CRITICAL” COMPATIBLE USE PROTECTION COMPONENTS

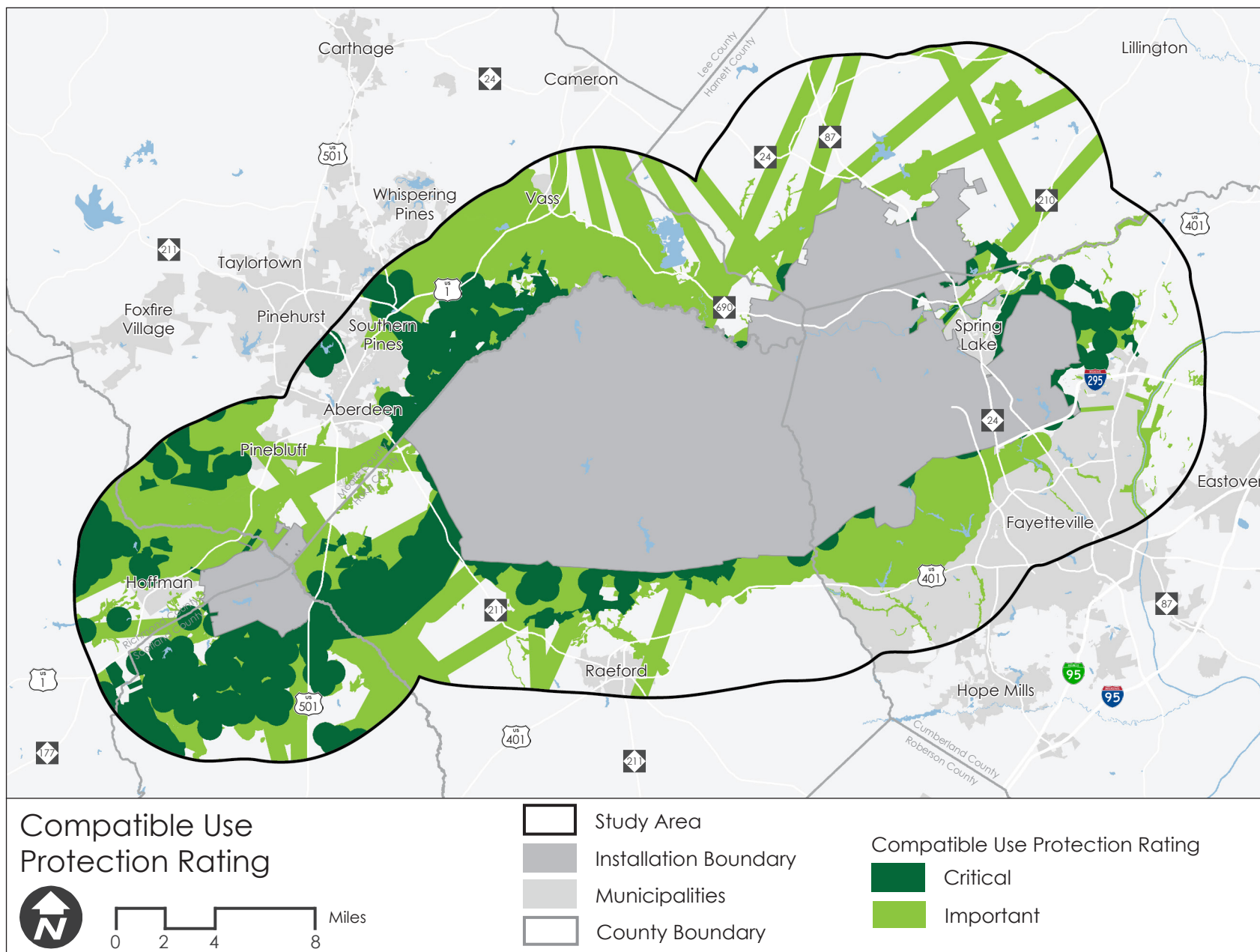
- 130+ dB PK15 Large Caliber Noise Contour
- 70+ dB CDNL Large Caliber Noise Contour
- 104+ dB Small Arms Noise Contour
- 75+ dB ADNL Aviation Noise Contour
- Clear Zones
- Accident Potential Zone 1
- Land located under the UAS Corridor
- Wildlife Habitat Connector Areas
- Red-cockaded Woodpecker Active Foraging Areas

As noted previously, it is intended that these criteria be utilized moving forward to guide the review of land use and development proposals in the region for compatibility with Fort Bragg's ongoing mission (see recommendation CG-1 in Section 8). It will be important to review, maintain, and update these components over time, and, to adjust the criteria from time to time, as circumstances warrant, to ensure its ongoing relevance,

“IMPORTANT” COMPATIBLE USE PROTECTION COMPONENTS

- 115+ dB PK15 Large Caliber Noise Contour
- 62+ dB CDNL Large Caliber Noise Contour
- 87+ dB Small Arms Noise Contour
- 65+ dB ADNL Aviation Noise Contour
- Accident Potential Zone 2
- Land located under Air Corridors and Aviation Routes
- Biodiversity / Wildlife Habitat Rating of 7+
- Within High Quality / Outstanding Resource Waters Area

▼ MAP 6.13 COMPATIBLE USE PROTECTION RATING MAP

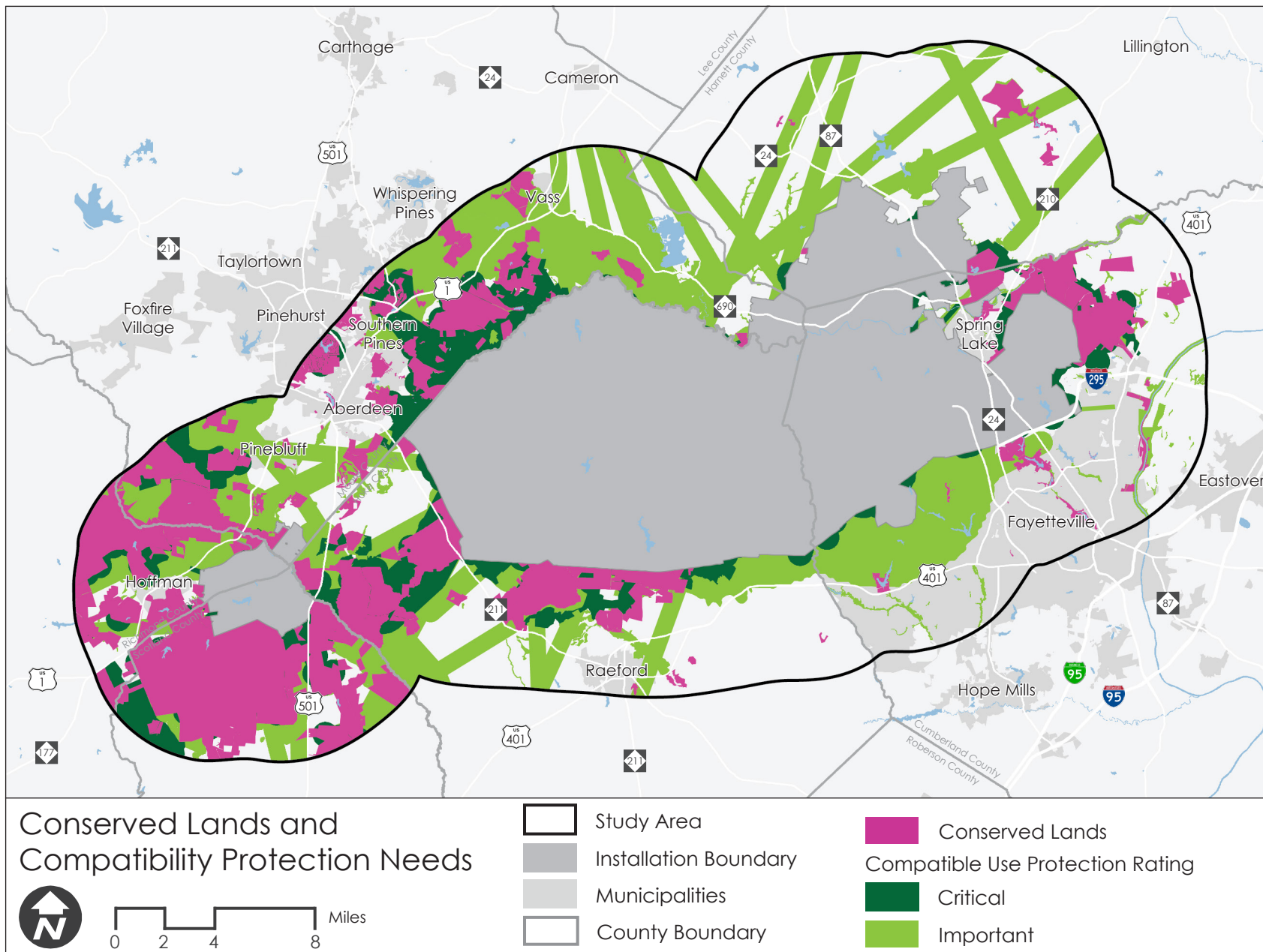


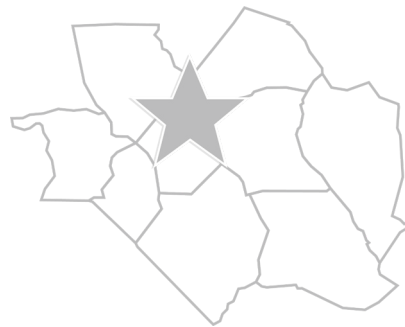
6.3.2 CONSERVED LANDS AND PROTECTION NEEDS

As mentioned previously, the Joint Land Use Study process is not new to the Fort Bragg Region. Since the completion of the first JLUS in 1991, subsequent studies have been completed resulting in implementation successes that have been recognized nationally. In particular, the 2003 JLUS process was well timed with many regional sustainability efforts, including initiatives by Fort Bragg to become a national leader in sustainability. As a result, the many local governments, Fort Bragg and other regional partners have worked collaboratively for nearly three decades to help sustain the military training mission at Fort Bragg, while protecting the civilian population and protecting the Longleaf Pine Ecosystem.

The 2003 JLUS identified land around the installation that was deemed to be either “critical” or “important” to Fort Bragg’s training mission. Since that time, much of this land (over 30,000 acres to date) has been protected through land and easement acquisition programs. As the military training mission has evolved, so have the land resources that are either critical or important to protect. Map 6.13 identifies the lands that, as of 2018, are now designated as either “critical” or “important” to protect in support of sustaining the training mission at Fort Bragg, while Map 6.14 shows those same lands with the addition of the land that has already been protected in the region. Although, much work is still needed, many of these land and easement acquisitions have helped the region reach recovery status with the red-cockaded woodpecker.

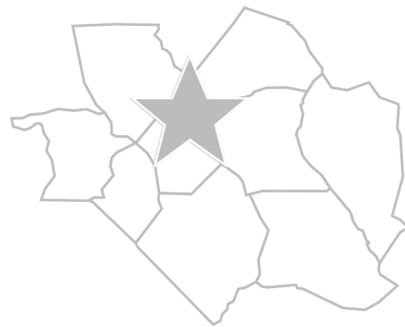
▼ MAP 6.14 CONSERVED LANDS AND COMPATIBILITY PROTECTION NEEDS MAP





COMPATIBLE
GROWTH FRAMEWORK
SECTION SEVEN

FORT BRAGG JOINT LAND USE STUDY



COMPATIBLE GROWTH FRAMEWORK

A number of tools are available to help establish a framework for compatible growth. Each community may consider a wide range of voluntary to regulatory approaches for implementation as they determine appropriate. This section of the report includes a review of the Federal, State and Local compatibility programs and tools that are applicable.

7.1 FEDERAL PROGRAMS

The following federal programs augment efforts to maintain land use compatibility around Fort Bragg and other Army installations around the country. These programs are currently available to or already are being put into action by the Fort Bragg community.

7.1.1 ARMY COMPATIBLE USE BUFFER (ACUB) PROGRAM

U.S. Code Title 10 § 2684a. authorizes the DoD to enter into agreements with local governments and private organizations to limit incompatible development or use of land near a military installation, or to preserve natural habitat in order to minimize or prevent environmental restrictions that could affect military training, testing, or operations. The Army implements this authority through the Army Compatible Use Buffer (ACUB) program. Lands protected through the ACUB program are not acquired by the Army; instead, a partnering organization acquires interest in or fee simple title to the land.

The ACUB program grew out of efforts at Fort Bragg in the mid-1990s to protect habitat for the endangered red-cockaded

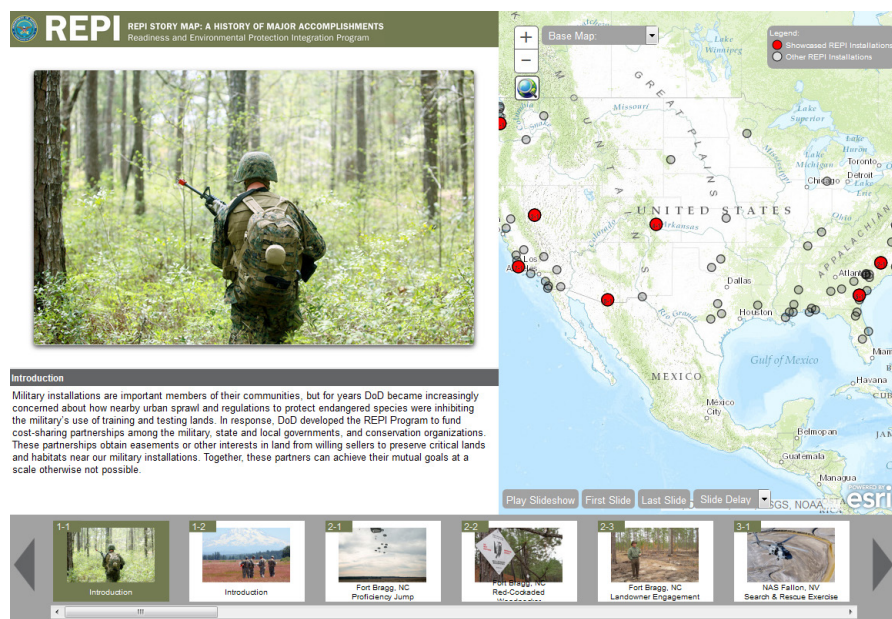
woodpecker (RCW), while maintaining military training capability. With the largest contiguous area of RCW habitat in the region, Fort Bragg was subject to training restrictions aimed at reducing impacts on the RCW population. The Army partnered with the Nature Conservancy to work with landowners willing to encumber their property in perpetuity with conservation easements, protecting critical RCW habitat and reducing training restrictions on lands at Fort Bragg. The success of this effort led to the creation of the statute noted above, and ultimately the Army's ACUB program. "The ACUB program at Fort Bragg has reduced training restrictions, protected critical areas on the installation's southern boundary, enhanced connectivity in the northeast training area, and buffered a new special forces training facility on Camp Mackall" (Army Compatible Use Buffer Program Year End Summary, FY 2012).

7.1.2 READINESS AND ENVIRONMENTAL PROTECTION INTEGRATION (REPI) PROGRAM

Established in 2003, the DoD's Readiness and Environmental Protection Integration (REPI) Program helps maintain military readiness by addressing incompatible urban development

near military installations, primarily through buffer partnerships. Partnerships are established through voluntary agreements between the military, state and local governments, and environmental conservation organizations. The REPI Program offers funding to acquire easements from willing landowners in order to preserve existing compatible land uses and wildlife habitat on lands around military installations. The REPI Program has “protected over 464,000 acres of land in 89 locations in 30 states,” including projects at Fort Bragg. (Source: http://www.repi.mil/Portals/44/Documents/Resources/REPI_FactSheet_EncroachmentPartnerships_032917.pdf?ver=2017-03-31-111658-547)

▼ IMAGE 7.1 REPI STORY MAP (REPIMAP.ORG)



In 2017, the Eastern North Carolina Sentinel Landscapes Partnership, which includes Fort Bragg, was awarded a 2017 REPI Challenge grant of \$9.2 million to support conservation efforts around military training areas and airspace. Leveraging the award with over \$10 million in partner contributions, the Partnership will use the funds “to protect more than 17,000 acres of farms and forests that are integral to mitigating DoD’s installation encroachment and airspace concerns in the area” through conservation easements and other management programs. (Source: https://repi.dod.afpims.mil/Portals/44/Documents/REPI_Challenge/2017REPIChallenge.pdf)

In the fall of 2017, the Town of Emerald Isle, North Carolina, received \$1.5 million in REPI funding to purchase a nearly 30-acre tract of land located in the flight path of Marine Corps Auxiliary Landing Field Bogue. The Town worked with Marine Corps Air Station Cherry Point and The Conservation Fund of North Carolina to secure the funding and acquire the property.

7.1.3 UNITED STATES DEPARTMENT OF AGRICULTURE (USDA) PARTNERSHIPS

AGRICULTURAL CONSERVATION EASEMENT PROGRAM (ACEP)

The Natural Resources Conservation Service (NRCS), a division of the United States Department of Agriculture (USDA), administers the Agricultural Conservation Easement Program (ACEP). Authorized by the 2014 Farm Bill, this program replaced the

Farm and Ranch Lands Protection Program and the Grassland Reserve Program. The ACEP helps protect agricultural lands, wetlands, and forestlands by providing financial and technical assistance to landowners, state and local governments, American Indian tribes, and non-governmental organizations. In FY2018, NRCS plans to invest \$250 million in the ACEP. (Source: <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/releases/?cid=nrcseprd1365223>)

The ACEP has three components:

- Agricultural Land Easements;
- Healthy Forests Reserve Program; and
- Wetlands Reserve Enhancement Partnership.

AGRICULTURAL LAND EASEMENTS (ALE)

The NRCS provides up to 50% of the market value of Agricultural Land Easements (ALE) that protect working agricultural lands and other lands with conservation value. Where grasslands with special environmental significance are protected, up to 75% of the easement's market value may be provided.

HEALTHY FORESTS RESERVE PROGRAM (HFRP)

The Healthy Forests Reserve Program (HFRP) protects private forestlands through easements, 30-year contracts, and 10-year cost-share agreements. The three main objectives of the HFRP are to promote the recovery of endangered and threatened species, improve

biodiversity, and enhance carbon sequestration. Twelve states currently offer funding through the HFRP; however, North Carolina does not.

WETLANDS RESERVE ENHANCEMENT PARTNERSHIP (WREP)

The Wetlands Reserve Enhancement Partnership (WREP) assists in the protection, enhancement, and/or restoration of high priority wetlands. High priority wetlands are those offering critical habitat for migratory birds and other wildlife.

SENTINEL LANDSCAPES PARTNERSHIP

The Sentinel Landscapes Partnership, established in 2013, is a collaborative effort between the USDA, DoD, and United States Department of the Interior (DOI). The partnership is intended to leverage resources in locations where the priorities of these three agencies overlap. The Partnership defines Sentinel Landscapes as “working or natural lands important to the Nation’s defense mission – places where preserving the working and rural character of key landscapes strengthens the economies of farms, ranches, and forests; conserves habitat and natural resources; and protects vital test and training missions conducted on those military installations that anchor such landscapes.” (Source: <http://sentinellandscapes.org/about/>)

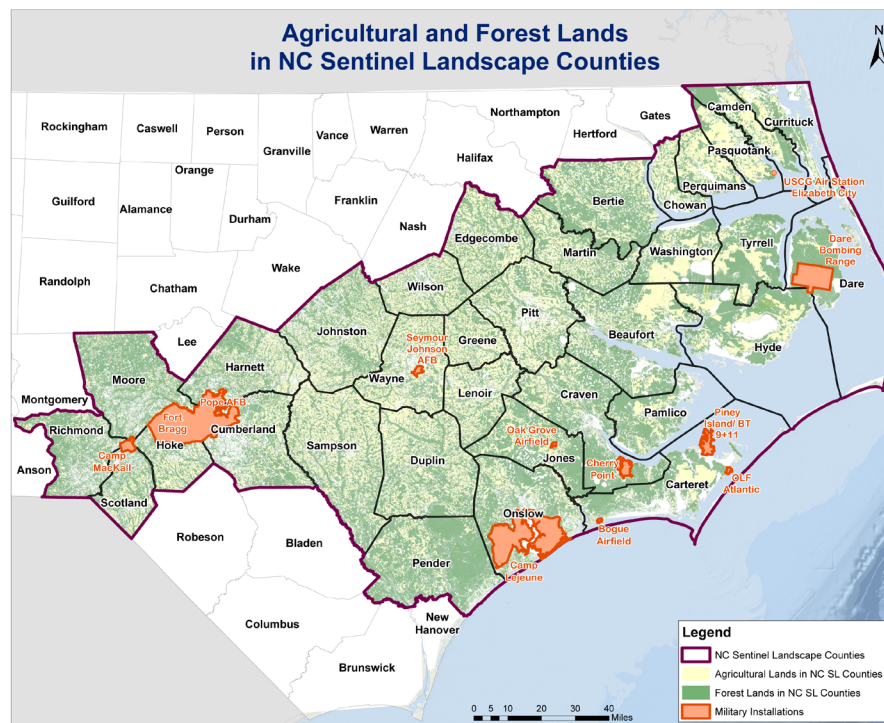
While the Sentinel Landscapes Partnership is not a grant

program per se, designation of a Sentinel Landscape may increase the likelihood of success in obtaining funding from a partner agency (i.e., USDA, DoD, DOI) or other program. Of the seven designated Sentinel Landscapes, all include well over a dozen local, state, and federal partners working to advance shared goals of resource conservation and maintenance of military readiness.

In North Carolina, the primary sentinel landscape effort is the Eastern North Carolina Sentinel Landscapes Partnership, which is a joint effort between the Army, Marine Corps, Air Force, other federal agencies, state agencies, local governments, and nonprofit organizations who are working to protect natural, rural, and agricultural lands important to the nation's defense mission in 33 North Carolina counties. The Partnership recognizes the importance of collaboration and coordination between the State's two largest industries, agriculture and defense. Fort Bragg is one of the military partners, along with Seymour Johnson Air Force Base, Dare County Bombing Range, Marine Corps Base Camp Lejeune, Marine Corps Air Station New River, and Marine Corps Air Station Cherry Point. As noted in the REPI section above, the Partnership was awarded a \$9.2 million REPI Challenge grant in 2017.

The focus of the partnership is the purchase of conservation easements throughout the NC Agriculture Development and Farmland Preservation (ADFP) Trust Fund. The primary goals of the ADFP Trust Fund and its many partners are to:

▼ IMAGE 7.2 NORTH CAROLINA SENTINEL LANDSCAPE COUNTIES



- Establish the transferable structure and processes necessary to link working lands, natural resource management, and national defense
- Sustain the military's testing and training mission footprint including installation buffers as well as associated ranges and transit routes
- Engage private landowners to determine preferences, coupled with appropriate partners--enable delivery of programs and technical assistance to keep farms in farming and forests in forestry

- Work with federal, state, local, nonprofit and other private entities to promote initiatives that keep the region economically vibrant while protecting the rural character and natural/open spaces
- Promote off-base habitat conservation in order to ease military land training restrictions and promote species recovery

7.1.4 UNITED STATES FOREST SERVICE FOREST LEGACY PROGRAM (FLP)

The United States Forest Service (USFS) forest Legacy Program (FLP) encourages voluntary protection of privately owned forestlands. The FLP provides grants to State agencies, and this funding is utilized to acquire conservation easements on or provide for the fee simple purchase of environmentally important forests under threat of development or conversion to non-forest uses.

7.1.5 ARMY-COMMUNITY PARTNERSHIP PROGRAM (ACPP)

The Army Community Partnership Program (ACPP) brings together civic and Army leaders to identify potential areas of mutual benefit and value, and develop initiatives to achieve such benefits. The program is intended to foster new partnerships at the local level, tailored to the unique needs of the community and characteristics of the local military installation. Through the Office of the Assistant Chief of Staff for Installation Management, the ACPP can include the emerging

tool of “Intergovernmental Support Agreements,” which rely on public-private partnerships to maintain mission readiness in a time of significant budget constraint.

The ACPP promotes coordination at the local level through implementation of initiatives such as:

- Cooperative EMS training;
- Shared disaster recovery resources;
- Water and wastewater treatment; and
- Workforce training and certification.

The cooperative initiatives developed through the ACPP provide mutual financial benefits and, perhaps more importantly, strengthen relationships between a military installation and the surrounding community.

▼ IMAGE 7.3 FORT BRAGG LIVE-FIRE EXERCISE (FEBRUARY 2018)



7.1.6 INTEGRATED NATURAL RESOURCE MANAGEMENT PLANS

Department of Defense installations use 5-year Integrated Natural Resource Management Plans (INRMPs) to manage natural resources present on the installation, based on legal and stewardship requirements. Fort Bragg's INRMP provides the mechanism for the post to both carry out its training mission and to implement ecosystem management principles to the maximum extent practical. Importantly, the INRMP is Fort Bragg's guidance for maintaining compliance with the Army's obligations under the Endangered Species Act (16 U.S.C. 1531), the Clean Water Act (33 U.S.C. 1344), and the protection of wetlands (Ex. Order 11990). Under the Endangered Species Act of 1973, specifically, the Army is required to assist in the recovery of all listed threatened and endangered species under an Army installation's authority. At the time of this writing, Fort Bragg was finalizing its most recent INRMP.

7.1.7 INTEGRATED CULTURAL RESOURCE MANAGEMENT PLANS

An Integrated Cultural Resource Management Plan (ICRMP) is a 5-year plan that implements the DoD's Cultural Resources Management Program. An ICRMP identifies potential conflicts between the military mission and cultural resources and necessary compliance actions to ensure mission-essential properties remain ready for use. Fort Bragg completed its most recent ICRMP in 2012.

7.1.8 OPERATIONAL NOISE MANAGEMENT PLANS

The Operational Noise Program assists Army installations in matters related to noise stemming from Army and National Guard operations. Operational Noise Management Plans (ONMPs) test and describe Army training facility noise impacts and, since 1999, more than 80 ONMPs have been developed for Army installations and National Guard training sites.

7.1.9 WILDLIFE/BIRD AIRCRAFT STRIKE HAZARD (WASH/BASH) PLANS

The DoD created the Wildlife/Bird Aircraft Strike Hazard (WASH/BASH) prevention program in response to concerns with safety and property damage. An estimated 3,000 strikes involving military aircraft occur each year, resulting in over \$75 million in property damage (DoD Partners in Flight website, <http://www.dodpif.org/groups/bash.php>).

A WASH/BASH Plan specifies procedures to minimize hazards, including through education, operational changes, land management practices, and wildlife eradication using, for example, bioacoustic devices or pyrotechnics. WASH/BASH Plans are a component of a military installation's Integrated Natural Resources Management Plan, and Fort Bragg's INRMP includes goals and objectives related to wildlife/bird hazards.

Simmons/Mackall Airfield is part of the Airfield Operations Manual, Annex O, dated September 2015, which includes

information related to wildlife hazards. Pope Army Airfield's BASH Reduction Program requirements are set out in Pope Army Airfield Instruction 91-212, dated November 2017.

7.1.10 INSTALLATION COMPATIBLE USE ZONE (ICUZ) STUDIES

The Installation Compatible Use Zone (ICUZ) Program implements Army policy to minimize impacts on the community while sustaining the military training and operational mission. An ICUZ study is a foundational document for future planning efforts, such as a JLUS. It uses sound modeling to identify noise contours associated with military training. Using this information, the ICUZ study recommends the most appropriate land uses for maintaining compatibility between military operations and the adjacent community. Fort Bragg completed its most recent ICUZ study in September 2017.

7.1.11 MID-AIR COLLISION AVOIDANCE (MACA) PROGRAM

The Air Force's Mid-Air Collision Avoidance (MACA) Program is a public education and outreach program developed to promote flying safety and to minimize the potential for mid-air collisions and near-collisions in the vicinity of military installations. Like other installations, Pope Field publishes a pamphlet describing special use airspace, local (military) aircraft, and safety tips. The pamphlet also includes maps of the local flying area and arrival/departure routes. See: <http://www.pope.af.mil/Portals/138/documents/Pope%20MACA%202017.pdf?ver=2017-04-04-075834-027>

7.1.12 MILITARY AVIATION AND INSTALLATION ASSURANCE CLEARINGHOUSE

Development of energy infrastructure has the potential to create hazards to military aircraft and training and testing activities, including glint, glare, radar and electromagnetic interference. Tall structures also create potential hazards to aircraft flying at lower altitudes.

Recognizing the need for a coordinated evaluation process, Congress directed, in 2011, the establishment of the DoD Siting Clearinghouse to assess proposed energy projects, including wind turbines, solar power towers, and electrical transmission lines, and to analyze their potential impact on the military mission. This review process provides the DoD an opportunity to identify ways to prevent, minimize, or mitigate potential adverse impacts before the Secretary of Transportation takes final action on an energy developer's application.

Signed into law in December 2017, the National Defense Authorization Act for Fiscal Year 2018 included significant amendments to the Clearinghouse process, including a requirement to provide notice to the governor of the state in which a proposed energy project is located. The Clearinghouse is now known as the "Military Aviation and Installation Assurance Clearinghouse." At the time the JLUS was finalized, the changes to the Clearinghouse review process had not been fully implemented.

The FAA maintains an obstruction evaluation website, which includes a DoD Preliminary Screening Tool. This mapping system provides preliminary feedback on potential impacts to long-range radar and military operations. See: <https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showLongRangeRadarToolForm>

7.1.13 FEDERAL AVIATION ADMINISTRATION RULES FOR UNMANNED AIRCRAFT SYSTEMS

In 2017, the Federal Aviation Administration (FAA) began using its existing authority under 14 CFR § 99.7 to address national security concerns with the use of unmanned aircraft systems (UAS, or “drones”) over 133 military facilities, including Fort Bragg. This marks the first time the FAA has implemented airspace restrictions specifically for UAS. Effective April 14, 2017, the rules restrict (24 hours per day/7 days per week) UAS flights up to 400 feet within the lateral boundaries of the 133 installations. There are only a few exceptions to the flight restrictions, and all must be coordinated with the installation. The Town of Spring Lake currently uses drones for municipal functions, and coordinates with Fort Bragg officials to avoid potential conflicts.

The FAA provides an online interactive map of the specific location of the restricted UAS flight areas and contact information for the installation: <https://uas-faa.opendata.arcgis.com>.

▼ IMAGE 7.4 PRIVATE USE OF UNMANNED AIRCRAFT SYSTEMS (DRONES)



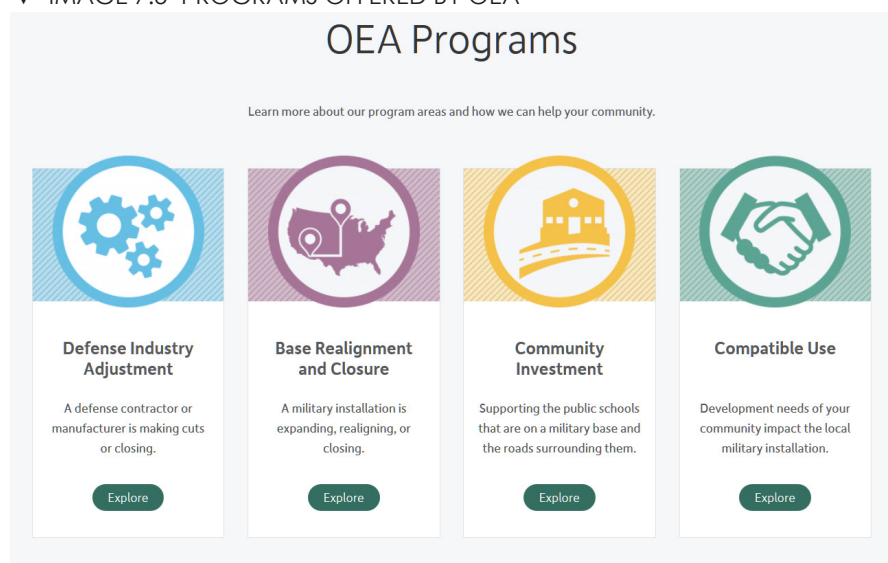
7.1.14 DOD OFFICE OF ECONOMIC ADJUSTMENT GRANT PROGRAMS

The DoD Office of Economic Adjustment (OEA) offers several financial assistance programs to assist state and local governments in responding to Defense industry actions, such as BRAC or changes in Defense contracting, or to assist with compatible land use planning in the vicinity of a military installation. Joint Land Use Studies and certain subsequent implementation efforts are often funded, in part, with OEA grants.

The OEA recently awarded a \$2 million grant to N.C. State University's Industry Expansion Solutions and the Department

of Military and Veterans Affairs for a pilot project to assist businesses impacted by cuts in Defense spending. The project will help the businesses diversify and move into new markets. One of the deliverables is a supply chain mapping program, with a goal to identify imported products that could instead be locally produced.

▼ IMAGE 7.5 PROGRAMS OFFERED BY OEA



7.2 STATE PROGRAMS

The State of North Carolina has been proactive in establishing statutory and programmatic support for the sustainability of its military installations. The statutes are described in detail in the previous section. The following section, on the other hand, describes the extent to which these state programs currently are in place in Fort Bragg or which the JLUS Policy Committee

determined would be appropriate for support of military functions locally in the future.

7.2.1 AGRICULTURAL DEVELOPMENT AND FARMLAND PRESERVATION TRUST FUND GRANTS

Established by the General Assembly in 2005, the Agricultural Development and Farmland Preservation (ADFP) Trust Fund works to support the farming, forestry, and horticulture industries in North Carolina. The Trust Fund recognizes the compatibility between agricultural and military land uses and supports the purchase



of agricultural conservation easements in the vicinity of military installations. ADFP Trust Fund grants are awarded on an annual basis and have matching requirements based on the type of project and participating organizations. For military-related conservation easements, the ADFP Trust Fund gives preference to requests providing at least a 1:1 match. As discussed previously, the award of the 2017 REPI challenge has provided additional funding and focus for conservation efforts throughout the 33 counties that are part of the Eastern North Carolina Sentinel Landscapes.

7.2.2 CLEAN WATER MANAGEMENT TRUST FUND GRANTS

Established by the General Assembly in 1996, the Clean Water Management Trust Fund (CWMTF) focuses on protection and restoration of the State's land and water resources. Pursuant to N.C.G.S. § 143B-135.234, CWMTF funds may be used to provide buffers around military installations and as matching funds for REPI grants (refer to the Federal Compatibility Programs and Tools section).

In 2017, the CWMTF awarded nearly \$23 million in grant funding, including just over \$3 million for acquisition projects related to military buffers. Approximately \$356,000 of the funding for military-related buffers was provided for projects located in Scotland County (one of the JLUS Jurisdictions). In 2016, more than \$1.8 million in grant funding was provided to organizations in the JLUS Study Area for the purpose of establishing military buffers.

7.2.3 NORTH CAROLINA DAM SAFETY PROGRAMS

Recent major storm events have caused dams on the east coast to either be breached or to at least highlight the risk of property damage in the event of a breach. In the vicinity of Fort Bragg, the Woodlake dam was damaged by Hurricane Matthew in 2016 and later breached by the state to avoid further damage downstream. A complete failure of dams like this could threaten Fort Bragg training areas, including in this case, the Green Ramp Ammunition Supply Point. The North

Carolina Department of Environmental Quality (DEQ) maintains a Dam Safety Program to prevent loss of life, personal injury, and property damage from dam failures. DEQ's Land Quality Section conducts inspections, evaluates dam construction permit applications, handles dam emergencies, and enforces state laws. The state's program is implemented pursuant to the "Dam Safety Law of 1967," § 143-215.23, et seq., N.C.G.S., and N.C. Code provisions Title 15A, Subchapter 2K.

7.2.4 NORTH CAROLINA MILITARY AFFAIRS COMMISSION

The North Carolina Military Affairs Commission was established within the NC Department of Military and Veterans Affairs by N.C.G.S. §§ 143B-1310 through 143B-1314. The Commission provides recommendations to the Governor, General Assembly, and other State agencies on ways to maintain and increase the role of North Carolina military installations in national defense and the State's economy. The Commission is expressly authorized to assist military installations in a variety of ways, including supporting the Army's Compatible Use Buffer Program, described in detail in the Federal Compatibility Programs and Tools section.



7.2.5 NORTH CAROLINA STATE UNIVERSITY GRADUATE CERTIFICATE IN MILITARY LAND SUSTAINABILITY

North Carolina State University offers a Graduate Certificate in Military Land Sustainability through its College of Natural Resources and Department of Forestry and Environmental Resources. This distance education program is intended “to develop professionals who can wisely manage natural resources on and around military bases to preserve natural resources and to maintain military readiness” (<https://online-distance.ncsu.edu/program/graduate-certificate-in-military-land-sustainability/>).

7.3 REGIONAL PROGRAMS

The Fort Bragg community already includes a number of long-established regional agencies – public and non-profit – that operate, at least in part, to support and sustain Fort Bragg.

7.3.1 FORT BRAGG REGIONAL LAND USE ADVISORY COMMISSION

The Regional Land Use Advisory Commission (RLUAC) is a non-profit 501(C)3 membership based organization located in the Sandhills of North Carolina consisting of twenty-three units of local government: eight counties and fifteen municipalities. The twenty-seven year old organization was the first regional group established in the country to coordinate land use decisions between the military and the local governments. Today, the primary mission of RLUAC is to balance the following

three key objectives through facilitating regional planning and development reviews, communication and coordination:

- Protect the civilian population from military impacts;
- Protect the Longleaf Pine Ecosystem; and
- Protect the military training mission from incompatible development.

The Regional Land Use Advisory Commission coordinates compatible land use activities through the Fort Bragg region, reviewing land use requests on behalf of Fort Bragg and overseeing the Joint Land Use Study and implementation efforts. The Mid-Carolina Council of Governments provides administrative support to the commission, assisting with financial management and mailings for quarterly meetings.

▼ IMAGE 7.6 RLUAC QUARTERLY MEETING (FEBRUARY 2017)



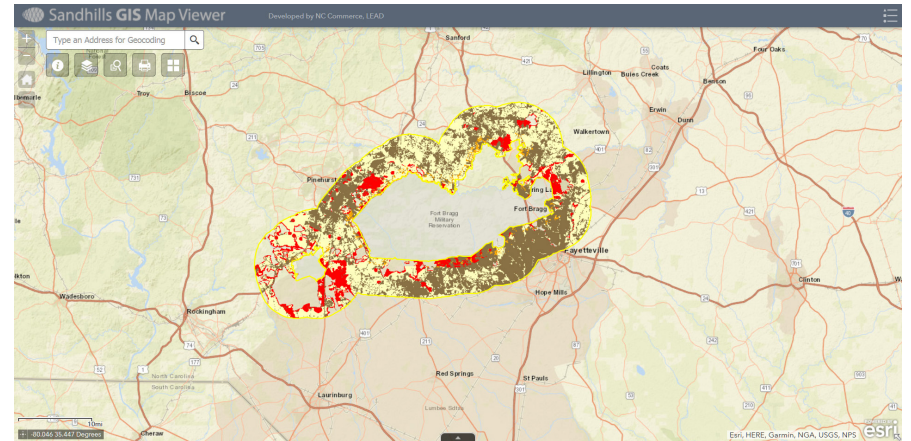
Specifically related to compatible land use, in 2007 Fort Bragg entered into a contractual agreement with RLUAC to review and make recommendations concerning the appropriateness of new subdivisions, telecom towers and zoning changes proposed for property located within five miles of its boundaries.

Fort Bragg's contract with RLUAC stems from a 2004 mandate by the North Carolina General Assembly (Session Law 2004-75 -- NCGS Chapter 153A-323 & 160A-364) and its updated version adopted in 2013 (Session Law 2013-59) that requires local governments to notify the commanders of military bases regarding any proposed subdivisions, telecom towers, windmills or zoning changes located within five miles of the military boundaries.

With the ability of RLUAC to access detailed property parcel information from its extensive Geographic Information System (GIS) database, it is possible for it to suggest whether the affected properties are most suitable for "urban development", "low-density urban development", or that it is "important to conserve" and "critically important to conserve" due to negative military impacts or environmental concerns.

The GIS database is currently available, at no cost, for anyone interested in learning more about the best uses of property located anywhere within the eight counties surrounding Fort Bragg. The address for this website is www.sandhillsgis.com.

▼ IMAGE 7.7 SANDHILLS GIS MAP VIEWER SCREENSHOT



Since initiating the land use review service at the beginning of 2008 through July 16, 2018, RLUAC has reviewed and made recommendations concerning 1,300 cases --78 cases in 2008, 91 cases in 2009, 102 cases in 2010, 127 cases in 2011, 153 cases in 2012, 116 cases in 2013, 188 cases in 2014, 120 cases in 2015, 123 cases in 2016, 182 cases in 2017 and 108 cases for the first six months of 2018.

7.3.2 SUSTAINABLE SANDHILLS

In 2000, Fort Bragg leadership took a proactive stand to ensure the long-term viability of the installation. By mid-2002, the installation's newly formed Sustainable Fort Bragg (SFB) program had succeeded in identifying its environmental footprint, and based on that information, developed goals centered on air, water, energy, education, and construction to reduce that footprint.

Realizing that environmental impacts don't stop at the installation boundary, Fort Bragg and the NC Department of Environment and Natural Resources convened stakeholders from the surrounding communities to propose the idea of a new partnership - the Sustainable Sandhills initiative. In February 2003, a Steering Committee was established in order to keep the momentum going and take the necessary steps to turn the idea into a plan. The Steering committee decided that four conditions must be met in order to have a sustainable society:

- Don't rely on nonrenewable resources;
- Don't systematically increase synthetic products that don't biodegrade;
- Don't degrade nature's services (trees that create oxygen, wetlands that provide habitat and filter water); and
- Make sure everyone's basic needs are met.

Since 2003, the initiative has evolved into an independent 501(c)(3) nonprofit organization, governed by a volunteer Board of Directors. In 2005, it expanded to eight counties by adding Lee and Montgomery counties to the original six counties: Cumberland, Hoke, Harnett, Moore, Richmond, and Scotland. In 2016, the Sustainable Sandhills Board voted to include Robeson County as its ninth county.

7.3.3 NORTH CAROLINA SANDHILLS CONSERVATION PARTNERSHIP

The NCSCP was formed in 2000 with the specific intent to facilitate collaboration between various federal, state and non-profit conservation groups for the purpose of conserving the vanishing longleaf pine ecosystem and recovering the endangered red-cockaded woodpecker in the North Carolina



Sandhills. The current Steering Committee members represent the U.S. Fish and Wildlife Service, U.S. Army at Fort Bragg, U.S. Army Environmental Command, North Carolina Office of Conservation, Planning, and Community Affairs, North Carolina Wildlife Resources Commission, North Carolina Division of Parks and Recreation, North Carolina Forest Service, The Nature Conservancy, Sandhills Area Land Trust and the Sandhills Ecological Institute. The NCSCP continues to seek input from over 18 stakeholder organizations as it develops a landscape-level strategic conservation plan for the Sandhills. County and municipal viewpoints about conservation issues have been provided through the Fort Bragg Regional Land Use Advisory Commission.

7.4 NORTH CAROLINA LAND USE STATUTES

The following is an overview of the statutory authority available to the JLUS jurisdictions under the North Carolina General Statutes. The research focused on those authorities most relevant to the powers cities and counties would likely exercise related to military planning and implementation of the eventual JLUS recommendations.

7.4.1 OVERVIEW OF MUNICIPAL LAND USE AUTHORITIES

MUNICIPAL ZONING

Corporate powers of municipalities (cities, towns, and villages, all collectively referred to as “cities”) in North Carolina are set forth in Chapter 160-A, Article 2, of the North Carolina General Statutes (N.C.G.S.). Article 2 vests cities with all those rights of

▼ IMAGE 7.8 NORTH CAROLINA GENERAL ASSEMBLY BUILDING



a corporation and authorizes the powers and functions of city government to be exercised by a city council. Article 4 requires the city clerk to maintain, at all times, an official copy of a map and/or written description of the city's boundaries. This Article also sets forth certain requirements for those cities divided into electoral districts for purposes of electing city council members. Article 4A addresses annexation and provides methods for both voluntary and involuntary annexation. Additionally, the General Assembly is vested, by the State constitution, with the power to expand a city's corporate limits (North Carolina Constitution, Article VII, Section 1).

N.C.G.S. CHAPTER 160A, ARTICLE 19, PART 1

Chapter 160A, Article 19, of the General Statutes authorizes municipalities in North Carolina to regulate planning and development activities within their corporate limits. Part 1 of the statute authorizes a municipality to exercise the powers specified in Chapter 160A within an extraterritorial jurisdiction area (ETJ) extending not more than one mile beyond the municipality's corporate limits. Depending on the population of the municipality, its ETJ may be extended up to three miles beyond its corporate limits. Establishment of an ETJ requires approval of the board of commissioners of the county in which the ETJ is located. Municipalities may not exercise powers in an ETJ that are not also exercised elsewhere in the municipality. Section 160A-362 requires proportional representation of ETJ residents on a city's planning board and board of adjustment. Section 160A-364 sets forth requirements for adopting,

amending, or repealing ordinances, including a requirement to notify military installation commanders when any of the following changes are proposed within five (5) miles of the installation:

1. Changes to the zoning map;
2. Changes affecting permitted uses of land;
3. Changes related to telecommunication towers or windmills;
4. Changes to proposed new major subdivision preliminary plats; and
5. Increases by more than 50% in the total land area of an approved subdivision.

N.C.G.S. CHAPTER 160A, ARTICLE 19, PART 2

Part 2, Subdivision Regulation, provides a city the authority to regulate subdivision of land within its jurisdiction but does not require cities to adopt such regulations.

N.C.G.S. CHAPTER 160A, ARTICLE 19, PART 3

Part 3 authorizes cities to adopt zoning for the purpose of promoting the public health, safety, morals, or general welfare of the community. The statute authorizes use of a unified development ordinance (UDO) or separate ordinances. Areas of zoning powers include:

1. height, number of stories, and size of buildings and other structures;
2. the percentage of a lot that may be occupied;
3. the size of yards, courts, and other open spaces;

4. population density; and
5. the location and use of buildings, structures, and land.

Section § 160A-381(c) authorizes cities to establish boards of adjustment, but prohibits the board from allowing changes to permitted uses through the variance process, although special use permits or conditional use permits are authorized, in accordance with standards specified in a city's zoning ordinance.

Section 160A-381(e) authorizes cities to institute temporary moratoria on any development approval, only for the purpose of "developing and adopting new or amended plans or ordinances as to residential uses."

Section 160A-381 (h) prohibits cities from regulating building design elements as they relate to one- and two-family dwellings. The statute includes certain exemptions, such as design regulations related to flood protection requirements.

The statute sets forth provisions regarding zoning districts in § 160A-382. Cities are provided broad latitude to divide their jurisdictions into districts of varying purposes.

Section 160A-383 establishes the scope of city zoning authority. Cities do not have to adopt zoning regulations, but those choosing to zone must do so in accordance with an adopted comprehensive plan. This section also sets forth the public purposes for which zoning regulations may be enacted.

The General Assembly recognizes the ability of manufactured housing to meet affordable housing needs. As such, a city may not adopt regulations prohibiting manufactured homes from its entire zoning jurisdiction. N.C.G.S. § 160A-383.1. Cities are, however, authorized to regulate appearance and dimensional standards.

Agricultural uses are generally compatible with military operations, and North Carolina cities are authorized to encourage the continuation of such uses through special zoning regulations.

Section 160A-383.2 authorizes cities to adopt zoning regulations providing “flexibility to farming operations” located in a voluntary agricultural district. The statute identifies specific provisions cities may address, including on-farm sales, pick-your-own operations, road signs, agritourism, and other activities incidental to farming. Pursuant to § 106-738 (b), the purpose of voluntary agricultural districts is to “increase identity and pride in the agricultural community and its way of life and to increase protection from nuisance suits and other negative impacts on properly managed farms.”

Sections 160A-384 and 160A-385 address procedural requirements concerning public notice and public comment. These requirements are in addition to those set forth in § 160A-364.

In § 160A-385.1, the General Assembly provides for the establishment of vested rights following approval by a city of a site-specific development plan. The statute recognizes that legally vested rights ensure reasonable certainty in the land use planning process and serve the public interest, and so establishes rights of a landowner for up to five years following certain development approvals. At the time of this writing, House Bill 507 (H507) was pending before the General Assembly. This bill proposes a number of changes to the city statutes pertaining to vested rights. H507 is discussed in more detail in the Pending North Carolina Legislation section.

Cities are required by § 160A-387 to create planning boards to serve in an advisory capacity to the city council. Planning boards are authorized to hold public hearings on zoning amendments, and subsequently provide non-binding recommendations to the city council.

N.C.G.S. CHAPTER 160A, ARTICLE 19, PART 3D

Part 3D, Development Agreements, authorizes city governments to enter into development agreements with developers, with limitations and provisions similar to those authorized for North Carolina counties, which are discussed above.

N.C.G.S. CHAPTER 160A, ARTICLE 19, PART 8

Part 8 establishes additional powers of cities in North Carolina. Section 160A-456 authorizes cities to participate in community development activities and programs, just as with N.C. counties.

Cities are authorized by §§ 160A-458 and 160A-459 to implement regulations concerning erosion, sedimentation, and stormwater control in accordance with N.C.G.S. 113A, Article 4, Sedimentation Pollution Control Act of 1973. This Article defines “land-disturbing activities” as any use of land resulting in a change to “the natural or topography and that may cause or contribute to sedimentation.” N.C.G.S. § 113A-52(6).

7.4.2 OVERVIEW OF COUNTY LAND USE AUTHORITIES

Corporate powers of counties in North Carolina are set forth in Chapter 153-A, Article 2, of the North Carolina General Statutes (N.C.G.S.). In addition, Article 6, Section 153A-121(a) authorizes a county, by ordinance, to “define, regulate, prohibit, or abate acts, omissions, or conditions detrimental to the health, safety, or welfare of its citizens and the peace and dignity of the county; and may define and abate nuisances.”

N.C.G.S. CHAPTER 153A, ARTICLE 18, PART 1

North Carolina counties are authorized by Chapter 153-A, Article 18, of the N.C.G.S. to conduct land use planning and regulate development. Part 1, General Provisions, addresses several aspects of planning relevant to the JLUS, including:

1. Territorial jurisdiction (the ability to exercise powers throughout the county);
2. Permit choice;
3. Establishment of planning boards;

4. Supplemental powers related to contracts, funds, grants, and services related to financial or other planning assistance;
5. Procedures for adopting, amending, or repealing ordinances;
6. Ordinance enforcement; and
7. Authority to regulate building setbacks (also addressed in § 153A-340).

§ 153A-323 sets forth requirements for adopting, amending, or repealing ordinances, including a requirement to notify military installation commanders when any of the following changes are proposed within five (5) miles of the installation:

1. Changes to the zoning map;
2. Changes affecting permitted uses of land;
3. Changes related to telecommunication towers or windmills;
4. Changes to proposed new major subdivision preliminary plats; and
5. Increases by more than 50% in the total land area of an approved subdivision.

N.C.G.S. CHAPTER 153A, ARTICLE 18, PART 2

Part 2, Subdivision Regulation, provides a county the authority to regulate subdivision of land within its jurisdiction. This part does not require counties to regulate subdivisions, but sets forth certain requirements for those choosing to regulate.

N.C.G.S. CHAPTER 153A, ARTICLE 18, PART 3

Part 3, Zoning, authorizes a county to adopt zoning and development regulation ordinances for the purpose of “promoting health, safety, morals, or the general welfare.” N.C.G.S. § 153A-340. The statute authorizes use of a unified development ordinance (UDO) or separate ordinances. Areas of zoning powers include:

1. height, number of stories, and size of buildings and other structures;
2. the percentage of a lot that may be occupied;
3. the size of yards, courts, and other open spaces;
4. population density; and
5. the location and use of buildings, structures, and land for trade, industry, residence, or other purposes.

The use of bona fide farms may be regulated only as provided in § 153A-340(b). This section allows a county to adopt zoning regulations governing swine farms over a certain size, but expressly provides such farms cannot be prohibited throughout the entire zoning jurisdiction. Counties are not, however, preempted from regulating use of farm property for non-farm use.

Section 153A-340(c) authorizes counties to establish boards of adjustment, but prohibits the board from allowing changes to permitted uses through the variance process. This section does, however, authorize use of special use permits or conditional use

permits in accordance with standards specified in the zoning ordinance of a particular jurisdiction.

Section 153A-340(h) authorizes counties to institute temporary moratoria on any development approval, only for the purpose of “developing and adopting new or amended plans or ordinances as to residential uses.”

Section 153A-340(j) preempts counties from prohibiting detached single-family residential uses on lots greater than ten (10) acres in size located in a zoning district where more than 50% of the land is in agricultural or silvicultural use. This does not apply in commercial or industrial zoning districts allowing a wide variety of commercial or industrial uses. This section expressly prohibits counties from requiring lots greater than ten (10) acres in size to have frontage on a street or to be served by public utilities in order to be used for detached single-family residential purposes.

Section 153A-340(l) exempts one- and two-family dwellings from zoning requirements related to building design elements with exceptions provided in certain circumstances, such as when the dwelling is located in a designated historic district. “Building design elements” are defined as exterior building color; type or style of exterior cladding material; style or materials of roof structure or porches; exterior nonstructural ornamentation; location or architectural styling of windows and doors, including

garage doors; the number and type of rooms; and the interior layout of rooms.

Section 153A-341 establishes the scope of county zoning authority. While the state statute does not require counties to enact zoning regulations, it does require any zoning regulation enacted to be in accordance with a comprehensive plan. Therefore, in any recommended zoning amendment, the planning board must consider the consistency of the proposed change with the comprehensive plan and any other relevant, adopted plan. This section also sets forth the public purposes for which zoning regulations may be enacted, including "to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; to lessen congestion in the streets; to secure safety from fire, panic, and dangers; and to facilitate the efficient and adequate provision of transportation, water, sewerage, schools, parks, and other public requirements." N.C.G.S. § 153A-341.

Section 153A-341.1 adopts, by reference, the provisions of § 160A-383.1, which addresses manufactured housing. A county shall not prohibit manufactured housing throughout its zoning jurisdiction, but may adopt standards regulating appearance and dimensional standards. Any applicable regulations must be designed to protect property values; neighborhood character; and public health, safety, and welfare.

Section 153A-344 authorizes a county to establish a planning board, whose role is to prepare or review zoning ordinances and amendments thereto, including zoning map amendments. A recommendation from the planning board is required prior to final action on a zoning ordinance by the governing authority; however, the governing body is not bound by the recommendation of the planning board.

Section 153A-344.1 establishes regulations concerning vested rights. The statute recognizes legally vested rights ensure reasonable certainty in the land use planning process and serve the public interest, and so establishes provisions for the rights of a landowner following certain county development approvals. At the time of the JLUS, House Bill 507 (H507) was pending before the General Assembly. This bill proposes a number of changes to the county statutes pertaining to vested rights, and is discussed in more detail in the Pending North Carolina Legislation section.

N.C.G.S. CHAPTER 153A, ARTICLE 18, PART 3A

Part 3A, Development Agreements, authorizes county governments to enter into development agreements with property owners. These agreements are useful planning and zoning tools, as they provide predictability to local residents, elected officials, and landowners/developers.

N.C.G.S. CHAPTER 153A, ARTICLE 18, PART 5

Part 5, Community Development, authorizes counties to “engage in, to accept federal and State grants and loans for, and to appropriate and expend funds for community development programs and activities.” N.C.G.S. § 153A-376(a).

N.C.G.S. CHAPTER 153A, ARTICLE 19

Article 19 authorizes creation of regional planning commissions and regional planning and economic development commissions. These “joint commissions” can include two or more cities, counties, or a combination of city(ies) and county(ies).

N.C.G.S. CHAPTER 153A, ARTICLE 23

N.C.G.S. § 153A-445 provides that counties may take certain actions authorized under N.C.G.S. Chapter 160A, which provides statutory authority for planning and zoning to cities. This section expressly authorizes counties to take action under Chapter 160A, Article 20, Part 1. – Joint Exercise of Powers, and Chapter 160A, Article 20, Part 2. – Regional Councils of Governments.

Chapter 160A, Article 20, Part 1 authorizes units of local government to enter into contracts or agreements with each other and establish joint agencies. The statute requires certain provisions to be contained within a contract or agreement, and allows such agreements to involve any power or function of local government authorized by North Carolina law.

Chapter 160A, Article 20, Part 2 authorizes any two or more local governments to establish a regional council of governments. The concurrent resolutions adopted by the local governments are considered the “charter” of the regional council of government, and the statute specifies the required content of such charter. Regional councils of government are similar in purpose and function to regional planning commissions.

Code §§ 212.004, .0045, and .0046 limit cities’ authority to regulate certain subdivisions of land.

7.4.3 MILITARY-RELATED STATUTES

Indicating the widespread support for the military in the state, the North Carolina General Statutes include a number of statutes related to the military. This section includes a discussion of those statutes relevant to the JLUS and its subsequent implementation.

MILITARY LANDS PROTECTION ACT OF 2013

The North Carolina General Statutes establish the Military Lands Protection Act of 2013 in §§ 143-151.70 through 143-151.77. Under these provisions, no county or city may authorize construction of a “tall building or structure” (those 200 feet or more in height) within the five (5) mile area surrounding a major military installation without approval from the State Construction Office. The statute includes Fort Bragg and Pope Field in its definition of major military installation. Also, cities and counties may not authorize provision of utility services for a building or structure constructed in violation of the Act.

The statute expressly exempts certain structures, including wind energy facilities (due to the extensive siting requirements contained in § 143-215.115 et seq.), temporary telecommunications towers erected after declared disaster, and structures listed either individually or as contributing resources within a National Register of Historic Places historic district.

PERMITTING OF WIND ENERGY FACILITIES

N.C.G.S. §§ 143-215.115 through 143-215.126 sets forth extensive requirements concerning permitting of wind energy facilities. The Department of Environmental Quality (DEQ) is charged with administering these requirements. This statute requires analysis of the potential impact on military and natural resources (including endangered and threatened species) very early in the application process and annual coordination between the DEQ and major military installations in the state.

COORDINATION BETWEEN COUNTIES AND MILITARY INSTALLATIONS CONCERNING LAND USE CHANGES

N.C.G.S. § 153A-323(b) requires coordination between counties and the military regarding land use proposals impacting property located within five (5) miles of the perimeter boundary of a military installation. Counties must provide written notice to the base commander (or his/her designee) when any of the following types of changes are proposed:

1. Changes to the zoning map;
2. Changes affecting permitted uses of land;

3. Changes related to telecommunication towers or windmills;
4. Changes to proposed new major subdivision preliminary plats; and

Increases by more than 50% in the total land area of an approved subdivision.

COORDINATION BETWEEN CITIES AND MILITARY INSTALLATIONS CONCERNING LAND USE CHANGES

N.C.G.S. § 160A-364(b) includes the same language as § 153A-323(b) regarding coordination with the military. Pursuant to § 160A-364(b), cities are also required to provide written notice to the base commander (or his/her designee) when the specified types of land use changes are proposed within five (5) miles of the installation.

NEW NORTH CAROLINA LEGISLATION (2017-2018 SESSION)

The North Carolina General Assembly ratified several laws, described below, relevant to the JLUS and subsequent implementation efforts during its 2017-2018 Legislative Session.

Session Law 2017-64 (Senate Bill 63)

This law amends the existing statute related to the Military Affairs Commission, requiring the Commission to adopt a strategic plan “to enhance North Carolina military installations and their missions.” The strategic plan must be updated every four years, and the Military Affairs Commission is required to annually report to the Legislature the State’s progress on meeting the objectives

of the plan. For further details on the role of the Commission, refer to the State Compatibility Programs and Tools section of this chapter.

Session Law 2017-159 (House Bill 310)

This law amends N.C.G.S. §160A, Article 19, Part 3E. Wireless Telecommunications Facilities., by adding provisions related to the regulation of small cell wireless facilities in city rights-of-way. The law provides findings that small wireless facilities are most effectively deployed in public rights-of-way, provides parameters for the permitting of such facilities, and authorizes cities to charge fees for the use of city rights-of-way and city-owned utility poles (for collocation). Small cell facilities are generally more compatible with military training and operations than typical telecommunication towers, which often exceed 200 feet in height and can present obstructions to aircraft.

Session Law 2017-192 (House Bill 589)

In 2017, the North Carolina General Assembly passed Session Law 2017-92, “an act to reform North Carolina’s approach to integration of renewable electricity generation through amendments of laws related to energy policy and to enact the Distributed Resources Access Act.” Session Law 2017-92 amends a number of statutes related to renewable energy; of particular relevance to the JLUS is the law’s moratorium on the issuance of permits for wind energy facilities through the end of 2018.

The purpose of the moratorium is to provide the General Assembly time “to study the extent and scope of military operations in the State...and to consider the impact of future wind energy facilities and energy infrastructure on military operations, training, and readiness.” The moratorium applies to new wind energy facilities and expansion of existing facilities.

The North Carolina Governor issued Executive Order No. 11 (EO11) in July 2017, directing State agencies to continue recruiting wind energy facility and expansion projects and promoting wind energy throughout the state. EO11 also directs the Department of Environmental Quality to conduct a feasibility study related to renewable energy projects on State-owned land.

7.5 LOCAL GOVERNMENT PLANS AND ORDINANCES

As part of the study, the Technical and Policy Committees reviewed existing local government legislation and comprehensive plans in order to fully understand how land use compatibility between civilian land uses and operations at Fort Bragg are currently addressed by the local jurisdictions in the JLUS Study Area (the “JLUS Jurisdictions”). This effort has included, for each participating city and county, a review of local codes, zoning regulations, subdivision ordinances, and comprehensive plans.

7.5.1 OVERVIEW

Table 7.1, “Overview of Local Legislation and Comprehensive Plans,” summarizes the extent to which or whether each

local government has addressed military compatibility in their comprehensive plans or regulatory codes. The following sections detail the information summarized in Table 7.1.

First, it should be noted, Fort Bragg and its surrounding local governments have a long history of coordinating on land use matters as they have arisen. In addition, the culture in this area reflects Fort Bragg's long-standing presence in the community and the community's awareness of its importance to the community and dedication to its sustainability. Many active and retired military personnel remain involved in community activities and civic organizations. Second, the review of existing plans and regulations indicated that several tools other defense communities have used to ensure ongoing mission sustainment may also be of benefit to this community for the purpose of protecting and sustaining Fort Bragg's mission.

In sum, none of the JLUS Jurisdictions' codes expressly prohibit land uses that could be incompatible with military operations at Fort Bragg, though the City of Fayetteville's Noise-Accident Potential Overlay District discourages residential uses and public gathering places in proximity to airports and military installations, and Hoke County limits structure height in its Flight Path Overlay District near Fort Bragg and Camp Mackall. However, steps have been taken to promote compatibility. For example, most jurisdictions regulate outdoor lighting in some way, with the typical purpose to reduce glare and spillover from non-residential or multi-family residential properties onto adjacent,

particularly single-family residential, properties. Half of the jurisdictions have an airport zoning or overlay district in which lighting must not negatively affect aircraft pilots. In addition, ten of the jurisdictions have adopted military installation notice provisions concerning land use changes as required by North Carolina General Statutes (N.C.G.S.) Section 153A-323 (counties) and Section 160A-364 (cities); and two jurisdictions, Moore County and the City of Fayetteville, have adopted tall structure coordination requirements in accordance with N.C.G.S. 143-151.70 et seq.

A number of the jurisdictions require notice on plans or plats concerning certain property characteristics, but Harnett County is the only jurisdiction with a notice requirement concerning a property's proximity to a military installation.

More than half of the JLUS Jurisdictions address Fort Bragg and/or Camp Mackall in their comprehensive plans; some simply provide background information, while others provide land use policies concerning coordination and compatibility with the military installations.

The Joint Land Use Study Update provides an opportunity to explore measures for achieving even better coordination, formalizing existing protocols, and solidifying the protection of Fort Bragg's operations and presence into the future. That objective guides the JLUS process, of course, and has informed this overview of local legislation and plans.

7.5.2 COUNTIES

The six counties surrounding Fort Bragg have each adopted zoning ordinances, subdivision regulations, and comprehensive plans (except Scotland County, which has not adopted a comprehensive plan). Harnett and Moore Counties have adopted Unified Development Ordinances (UDOs), which combine zoning and subdivision regulations into a single consolidated land use and development code. With the exception of Moore and Hoke Counties, all county codes establish an airport zoning district. Only Harnett and Hoke Counties have adopted a military zoning district; neither limit land uses in the vicinity of the military installation, but Hoke County limits structure height in its Flight Path Overlay District. The details of the counties' existing plans and codes as they address or potentially could address Fort Bragg land use compatibility are set forth on the following pages.

CUMBERLAND COUNTY

Comprehensive Plan

In 2009, Cumberland County adopted a Land Use Policies Plan containing general policies applicable throughout the County. This plan supersedes the previous comprehensive plan, the "Cumberland County 2010 Land Use Plan," prepared in 1996. An ongoing project of the Cumberland County Joint Planning Board is to complete detailed land use plans for specific geographic areas of the County. These detailed plans include the Eastover Study Area Detailed Land Use Plan, Southwest Cumberland Land Use Plan, and Spring Lake Area Detailed Land Use Plan. The detailed land use plans include policies

applicable to both the unincorporated areas of the County and the municipalities located within the particular geographic area.

The Eastover Study Area Detailed Land Use Plan provides background information on Fort Bragg, but does not contain related recommendations or policies.

The policies contained in the Southwest Cumberland Land Use Plan apply to Hope Mills and unincorporated areas in the southwestern portion of the County. This plan provides background information on Fort Bragg, and notes the Hope Mills Fire Department has reciprocal agreements with local fire departments, including Fort Bragg.

The Spring Lake Area Detailed Land Use Plan provides background information on Fort Bragg, and includes discussion of potential land use compatibility issues between Spring Lake and Pope Field (then known as Pope Air Force Base) due to the location of portions of Pope's Accident Potential Zones within the Town of Spring Lake.

These three detailed land use plans are discussed in more detail in the Cities section of this chapter.

Cumberland County's Land Use Policies Plan groups residential development into five categories based on density. Each category has specific location criteria intended to guide land use decisions. The plan specifies that high and medium density

residential development must not be located in any critical area as defined by the Fort Bragg Small Area Study and Fayetteville Airport Plan. Low and suburban density residential must not be located in any critical area as defined by the Fort Bragg Small Area Study, but the plan notes rural density residential could be located in such critical areas. See Cumberland County Land Use Policies Plan, Residential Development, pages 3 through 5.

In addition, the 2030 Growth Vision Plan, which includes Cumberland County, Fayetteville, Hope Mills, Eastover, Spring Lake, and other municipalities in the County, sets forth County-wide policies concerning growth and development. The policies in this plan should be considered with those set forth in the Land Use Policies Plan, as well as the area-specific land use plans. The 2030 Growth Vision Plan is discussed in greater detail in the Fayetteville Comprehensive Plan section, as it serves as the City's adopted comprehensive plan.

Zoning, Subdivision, and Other Regulations

Airport-Related Regulations

Cumberland County has adopted an Airport Overlay District (AOD); however the AOD only applies to development in the vicinity of the Fayetteville Regional Airport and does not address land uses near Fort Bragg, Pope Field, or Simmons Army Airfield. Though the AOD does not expressly prohibit incompatible uses, it directs staff and decision-makers to give "considerable weight" to certain factors when formulating recommendations/rulings associated with the municipal airport. These factors include consistency with the 2023 Off-Airport

Land Use Plan, consistency with uses and densities specified in the AOD Ordinance for the various Airport Impact Zones and any recommendation from the Fayetteville Regional Airport Director regarding incompatible uses. The Ordinance also:

1. Restricts height in the transitional surfaces/zones;
2. Requires site plans and plats to include notice of a property's location in the AOD and of potential noise impacts on the property;
3. Provides general lighting provisions;
4. Does not reference Fort Bragg or military operations.

See Cumberland County Zoning Ordinance, Article VIII.I. Overlay Districts, Section 8.101. Airport Overlay District (AOD).

Military-Related Regulations

In accordance with North Carolina General Statutes (N.C.G.S.) 153A-323, the Cumberland County Zoning Ordinance requires notification to the base commander should the County receive a request that would change or affect permitted uses in the five-mile radius of Fort Bragg. See Cumberland County Zoning Ordinance, Article XV Amendments, Section 1501. Submission of Amendments and Changes, D. Notice to Military Bases.

Cumberland County's Subdivision Ordinance includes optional provisions intended to preserve habitat and forage areas for the protected red-cockaded woodpecker in the defined Fort Bragg Special Interest Area (areas located within one-half mile of the military reservation). The County and other agencies, including the U.S. Fish and Wildlife Service, will assist

a developer/subdivider in identifying areas where trees should be maintained. The developer is not obligated, however, to comply with the recommendations. See Cumberland County Subdivision Ordinance, Article XXIII, Improvement and Design Standards, Section 2302. Area-Specific Standards, C. Fort Bragg Special Interest Area.

Other Regulations

Along with the subdivision streets disclosure statement required by N.C. G.S. 136-102.6 and the typical water/sewer availability disclosure statement, the Cumberland County Subdivision Ordinance requires a Farmland Protection Area disclosure statement on all final plats for development located within a designated Rural Area. This disclosure notifies prospective landowners that a property could be subject to agriculture-related impacts. See Cumberland County Subdivision Ordinance, Article XV, Final Approval, Section 2504. Disclosures Required.

HARNETT COUNTY

Comprehensive Plan

Harnett County's Comprehensive Growth Plan 2015 addresses the presence of Fort Bragg and its significance in matters related to land use throughout. See e.g., Grow Harnett County, Comprehensive Growth Plan 2015, §§ 1, 2, 3, and 4.

Chapter 3 of the Growth Plan, which includes the Future Land Use Plan, expressly recognizes that focusing growth near

existing towns and planned activity centers results in reduced impact on military operations on Fort Bragg as measured by impacts to Critical to Conserve Lands and within noise zones. Chapter 3 (p. 24) also establishes "Military Corridor Buffer" as a Future Land Use Category, which is comprised of Critical and Important to Conserve Lands, as identified by the Fort Bragg JLUS, within one mile of the base and parcels greater than fifty acres within one-half mile of Fort Bragg. The Military Corridor Buffer is designated on the Future Land Use Map. The Plan includes a goal to "promote compatible uses in areas adjacent to Fort Bragg" (Goal LU-6, p. 34), with a corresponding policy to coordinate with the federal government and the Regional Land Use Advisory Commission (RLUAC) to ensure development in or near the Military Corridor Buffer is compatible with Fort Bragg operations (Policy LU-6.1, p. 34).

Chapter 4 of the Growth Plan, titled Recommendations, sets forth Harnett County's goal to promote compatible uses in areas adjacent to Fort Bragg and the Harnett Regional Jetport (Airport) (Goal LU-6, p. 28). The plan sets forth policies for coordination with both the military and the RLUAC and promotion of compatible land uses (Goal LU-6, p. 34).

The 2015 State of the County report, included as an appendix to the Comprehensive Growth Plan, recognizes the continued recovery of the red-cockaded woodpecker and the longleaf pine ecosystem as critical to maintaining training operations on Fort Bragg. See Grow Harnett County, Comprehensive Growth Plan 2015, Chapter 6, Appendix, State of the County, p.16.

▼ TABLE 7.1 OVERVIEW OF LOCAL LEGISLATION AND COMPREHENSIVE PLANS

Jurisdictions	Zoning					Subdivisions		Comprehensive Plans	
	Jurisdictional Zoning	Non-Military Airport Overlay Zoning District	Military Overlay Zoning District	Military Zoning Land Use Limitations ¹	Renewable Energy ²	Jurisdictional Subdivision Regulations	Military-Related Subdivision Regulations ¹	Jurisdictional Planning	Military-Related Plan Policies ³
Counties									
Cumberland	Yes	Yes	No	No	No	Yes	No ¹⁰	Yes	Limitations
Harnett	Yes	Yes	Yes	No	Yes	Yes (UDO)	No	Yes	"Background, General, Limitations"
Hoke	Yes	No	Yes	Height only	No	Yes	No	Yes	Background, General
Moore	Yes	No	No	No	Yes	Yes (UDO)	No	Yes	Background
Richmond	Yes	Yes	No	No	Yes	Yes	No	Yes	No
Scotland	Yes	Yes	No	No	No	Yes	No	No	No
Cities									
Aberdeen	Yes	No	No	No	Yes	Yes (UDO)	No	Yes	No ¹²
Eastover	Yes ¹³	Yes ¹³	No ¹³	No ¹³	No ¹³	Yes ¹³	No ¹³	Yes	Background
Fayetteville	Yes	Yes ¹⁴	Yes	No ¹⁵	Yes	Yes (UDO)	No	Yes	Background, General
Hoffman	Yes	No	No	No	No	Only for property in Watershed Overlay Districts	No	No	No
Hope Mills	Yes	Yes	No	No	No	Yes	No	Yes	Background
Pinebluff	Yes	No	No	No	Yes	Yes (UDO)	No	Yes	No
Pinehurst	Yes	No	No	No	Yes	Yes (UDO)	No	Yes	No
Raeford	Yes	No	No	No	No	Yes (UDO)	No	Yes	Background, General
Southern Pines	Yes	Yes	No	No	Yes	Yes (UDO)	No	Yes	Background, General
Spring Lake	Yes	No	No	No	No	Yes	No	Yes	Background, General
Vass	Yes	No	No	No	Yes	Yes	No	Yes	Background
Whispering Pines	Yes	No	No	No	Yes	Yes (UDO)	No	Yes	No

Notes:

UDO =Unified Development Ordinance (combined zoning and subdivision regulations)

1 Whether regulations have been adopted which prohibit land uses incompatible with military operations at Fort Bragg.

2 Any regulations related to renewable energy (solar, wind, geothermal), other than the statutory Wind Energy Facility Coordination Protocol addressed under "N.C. Military Statutes" column.

3 Describes the extent to which the Plan addresses Fort Bragg's presence; whether as "Background" data only; "General" land use policies/coordination; or "Limitations" on land use to encourage/require compatibility with Fort Bragg.

4 Whether a formal mechanism for coordinating with Fort Bragg on land use matters has been adopted through zoning, subdivision, intergovernmental/joint powers agreement, or other (pursuant to N.C.G.S. 153A-323 & 160A-364).

5 Whether a formal mechanism for coordinating with Fort Bragg on Tall Structures has been adopted through zoning or subdivision regulations (pursuant to N.C.G.S. 143-151.70 et seq.).

6 Whether a formal mechanism for coordinating with Fort Bragg on Siting of Wind Energy Facilities has been adopted through zoning or subdivision regulations (pursuant to N.C.G.S. 143-215.115 et seq.).

7 Whether adopted zoning or subdivision regulations address outdoor lighting characteristics.

8 Whether adopted zoning or subdivision regulations address noise attenuation techniques.

▼ TABLE 7.1 (CONTINUED) OVERVIEW OF LOCAL LEGISLATION AND COMPREHENSIVE PLANS

Jurisdictions	NC Military Statutes			Other				
	Formal Land Use Coordination Protocol ⁴	Tall Structures Coordination Protocol ⁵	Wind Energy Facility Coordination Protocol ⁶	Extraterritorial Jurisdiction (per N.C.G.S. 160A-360)	Outdoor Lighting Regulated ⁷	Noise Attenuation Standards ⁸	Disclosures Required ⁹	"Airport Committee (or similar)"
Counties								
Cumberland	Yes	No	No	n/a	Yes	No	Yes	No
Harnett	Yes	No	No, but requires notice for all located w/in ¹⁰ miles of military installation.	n/a	Yes	No	Yes ¹¹	Yes
Hoke	Yes	No	No	n/a	Yes	No	No	No
Moore	Yes	Yes	No	n/a	Only for certain uses	No	Yes (streets only)	No
Richmond	No	No	No	n/a	No	No	Yes (streets only)	No
Scotland	No	No	No	n/a	No	No	No	No
Cities								
Aberdeen	Yes	No	No	Yes	Yes	No	Yes (streets only)	No
Eastover	Yes ¹³	No ¹³	No ¹³	No ¹³	Yes ¹³	No ¹³	Yes ¹³	No ¹³
Fayetteville	Yes	Yes	No	No	Yes	No	Yes	No
Hoffman	No	No	No	No	No	No	No	No
Hope Mills	Yes (for changes to permitted uses only)	No	No	No	Yes	No	Yes	No
Pinebluff	No	No	No	Yes	Yes	No	No	No
Pinehurst	No	No	No	Yes	Yes	No	No	No
Raeford	No	No	No	Yes	Yes	No	No	No
Southern Pines	No	No	No	Yes	Yes ¹⁶	No	Yes (streets only)	No
Spring Lake	Yes (Special Use Permits only)	No	No	No	Yes	No	No	No
Vass	Yes	No	No	Yes	Yes	No	No	No
Whispering Pines	No	No	No	Yes	Yes	No	No	No

Notes (continued):

9 Whether zoning or subdivision regulations require disclosures (e.g., real estate transactions, notes on plats) of certain property characteristics or location, N.C.G.S. 136-102.6 requires disclosure of subdivision street maintenance responsibility.

10 Cumberland County's Subdivision Ordinance includes optional provisions intended to preserve habitat and forage areas for the protected red-cockaded Woodpecker in the defined Fort Bragg Special Interest Area.

11 Harnett County is the only jurisdiction requiring military-related disclosures.

12 Aberdeen is in the process of updating its Comprehensive Plan; the draft includes a Military subchapter, with recommendations pertaining to coordination with Fort Bragg on land use matters.

13 Eastover uses Cumberland County Zoning and Subdivision Regulations.

14 Fayetteville has two airport overlay zoning districts - the Airport Overlay (APO) District (Fayetteville Regional Airport only); and the Noise-Accident Potential Overlay (NPO) District (relates to both airports and military installations).

15 Fayetteville's zoning ordinance discourages, but does not expressly prohibit, residential uses and public gathering places in Noise-Accident Potential Overlay (NPO) District.

16 Southern Pines is the only jurisdiction in which a stated purpose of its outdoor lighting regulations is to protect ongoing operations at Fort Bragg.

Zoning, Subdivision, and Other Regulations

Airport-Related Regulations

Though not applicable to Fort Bragg or its Army airfields, Harnett County's Unified Development Ordinance (UDO) establishes "Airport Zones," which prohibit uses that would "create electrical interference with navigational signals or radio communication between the airport and aircraft, make it difficult for pilots to distinguish between airport lights and others, result in glare in the eyes of pilots using the airport, impair visibility in the vicinity of the airport, create bird strike hazards, or otherwise in any way endanger or interfere with the landing, takeoff, or maneuvering of aircraft intending to use the airport." These Airport Zones are not zoning districts, but include all lands located in the approach surfaces, transitional surfaces, horizontal surfaces, and conical surfaces as they apply to Harnett County Airport. See Unified Development Ordinance of Harnett County, North Carolina, Article IX. Airport Height Control, Section 1.0 General, 1.2 Use Restrictions.

For all development-related plans and plats for property located in an Airport Zone, Harnett County requires inclusion of a statement on the plan or plat noting the property's location in the Airport Zone(s) and that the property is subject to height requirements for such zones. See Unified Development Ordinance of Harnett County, North Carolina, Article IX. Airport Height Control, Section 4.0 Permits, 4.6 Airport Zone Disclosure Statement.

Within designated Airport Zones, the County's sign regulations prohibit outdoor advertising signs (defined as anything designed, intended, or used to advertise to or inform the public about a subject unrelated to the premises upon which the sign is located). See Unified Development Ordinance of Harnett County, North Carolina, Article VII. Development Design Guidelines, Section 10.0 Sign Requirements, 10.10 Outdoor Advertising Signs.

Applications for variances from the requirements of the Airport Height Control District must be provided to the Harnett County Airport prior to consideration by the Board of Adjustment. Input from the Airport is especially important in the Board's deliberations, as the effect of a variance on airport safety and operations is best addressed by airport officials. See Unified Development Ordinance of Harnett County, North Carolina, Article XII. Amendments, Hearing Procedures, Appeals, & Variances, Section 5.0 Variances, 5.5 Airport Height Control Variance Procedures.

Harnett County is the only JLUS Jurisdiction to have a standing Airport Committee, charged with advising County Commissioners on matters involving Harnett County Airport. The UDO requires the Airport Committee to have an opportunity to make a recommendation regarding changes to any regulations of the Airport Height Control District. See Unified Development Ordinance of Harnett County, North Carolina, Article XII. Amendments, Hearing Procedures, Appeals, &

Variances, Section 2.0 Amendments, 2.4 Amendments to Airport Height Control Regulations.

Military-Related Regulations

Harnett County's Unified Development Ordinance includes a Military Corridor Overlay District (MCO), intended to ensure land use compatibility between local military installations and nearby properties. The MCO comprises all lands within five miles of the base boundary. Land use compatibility is encouraged, though not required. Permitted and conditional uses within the MCO are the same as those of the underlying zoning district. The MCO sets forth the requirement, in compliance with N.C.G.S. 153A-323, for notice to the affected military installation for certain land use related applications. This section of the UDO also sets forth a requirement for notice on subdivision plats of a property's location in the MCO and that the property may be affected by potential adverse effects of military operations. See Unified Development Ordinance of Harnett County, North Carolina, Article IV. Zoning & Overlay Districts, Section 4.0 Military Corridor Overlay District – MCO.

Although Harnett County's UDO does not specifically include the statutory requirements concerning notice and coordination for siting of new wind energy facilities located outside the MCO, it does require general notice to military installations for all proposed wind energy facilities within ten miles of the base. N.C.G.S. 153A-323 requires notice to a military installation for “changes relating to...windmills” located within five miles of the installation. The statute includes specific timeframes for

notification and comment, but Harnett County's UDO does not. See Unified Development Ordinance of Harnett County, North Carolina, Article V. Use Regulations, Section 8.0 Industrial Uses, 8.1.3 Wind Energy Facility.

HOKE COUNTY

Comprehensive Plan

The Hoke County Land Use Plan 2005 sets forth a goal to protect property rights and preserve property values. As part of this goal, a specific objective is to encourage dialogue with Fort Bragg. Associated implementation strategies include establishing a military affairs committee for Hoke County and Fort Bragg and identifying areas of mutual interest requiring additional dialogue to develop growth scenarios that can meet both the needs of the military and those of the County. Although this committee has not been established, Hoke County Planning Department staff indicates the relationship between Hoke County and RLUAC has grown stronger since 2005, essentially satisfying the goal to create a communication link with Fort Bragg on planning-related matters. See Hoke County Land Use Plan 2005, Section II: Goals and Objectives, Goal I., Objective 3.

Hoke County is comprised of seven townships plus the Fort Bragg Military Reservation, which occupies over 35% of the County's land area. Fort Bragg covers approximately 160,000 acres, over half of which is located in Hoke County. The vast majority of the Reservation land is utilized solely for training purposes, and a large portion of these training lands are located in Hoke County.

The Hoke County Planning Jurisdiction consists of lands outside both the boundary of Fort Bragg and the planning/zoning jurisdiction of the City of Raeford, which is the only incorporated municipality in the County. As of 2005, slightly over 97% of the land in the County's Planning Jurisdiction was zoned Residential-Agricultural-20, a district requiring a minimum lot size of 20,000 square feet. Much of this area is located immediately adjacent to Fort Bragg. See Hoke County Land Use Plan Appendix A, Inventory and Analysis of Existing Conditions, pp. A-5 and A-37.

Zoning, Subdivision, and Other Regulations

Military-Related Regulations

In order to ensure compatibility between air operations associated with Fort Bragg and Camp Mackall and land uses on properties near the installation, Hoke County has established a Flight Path Overlay District (FPOD). The only limitation of the FPOD, however, is a maximum structure height of 100 feet. See Hoke County Zoning Ordinance, Chapter 2 Zoning District Regulations, Section 2.12 Flight Path Overlay District (FPOD).

In accordance with N.C. G.S. 153A-323, Hoke County requires the Planning Board to notify the Regional Land Use Advisory Commission (RLUAC) of any proposed amendment(s) that would change or affect permitted land uses within five miles of the Fort Bragg perimeter boundary. See Hoke County Zoning Ordinance, Chapter 11 Review Process and Procedures, Section 11.8.3 Planning Board Action, Section 11.8.3.2 Zoning Map Additional Notification.

Hoke County's Subdivision Design Standards require "due consideration" to be given to a property's proximity to Fort Bragg; however, no specific requirements are promulgated. See Hoke County Subdivision Ordinance, Article III. Subdivision Design Standards, Section 3.1 General.

MOORE COUNTY

Comprehensive Plan

Moore County's 2013 Land Use Plan provides a detailed overview of training operations at Fort Bragg, the 2008 Joint Land Use Study, and the statutory requirement for notice to military installations. See Our Land Our Home 2013 Land Use Plan for Moore County, Our People and Cultural Resources, p. 32.

The plan also recognizes the economic benefit provided by Fort Bragg to the County, in terms of resident servicemen and women (both active and retired) as well as opportunities for defense-related companies to locate in Moore County. It also notes the unique skill set and background of retired military members and recognizes their ability to become leaders in the local community. See Our Land Our Home 2013 Land Use Plan for Moore County, Our Economy and Infrastructure, p. 51.

Zoning, Subdivision, and Other Regulations

Airport- and Military-Related Regulations

Moore County has not adopted military or airport zoning districts. The County does, however, require notice to Fort Bragg

of proposed amendments affecting permitted land uses within five miles of the perimeter boundary of the base, in accordance with N.C. G.S. 153A-323 and consistent with its 2013 Land Use Plan. See Moore County Unified Development Ordinance, Chapter 10 Text Amendments & General Use Rezoning, Section 10.3 Notice of Public Hearings, 10.3 D. Fort Bragg Notification, and Chapter 11 Conditional Rezoning, Section 11.3 Notice of Public Hearings, 11.3 D. Fort Bragg Notification.

The UDO section pertaining to building and structure height limits states the County may not authorize construction of any tall building or structure within five miles of a major military installation without endorsement from the State Construction Office, in accordance with N.C.G.S. 143-151.75. This section also limits height in Airport Zones to 50 feet unless the Moore County Airport Authority approves a permit; however, the term "Airport Zone" is not defined. Moore County Planning Department staff clarified that "Airport Zone" is not a zoning district, but instead refers to the approach, transitional, horizontal, and conical surfaces associated with the Moore County Airport. This section further limits height to 35 feet in all areas within 1,000 feet of any aircraft landing field unless otherwise allowed by the Moore County Board of Adjustments with a finding that it would not constitute a menace to safety. See Moore County Unified Development Ordinance, Chapter 7 General Development Standards, Section 7.9 Height.

RICHMOND COUNTY

Comprehensive Plan

Richmond County's Strategic Land Use Plan, adopted in 2000,

does not address Fort Bragg or contain military-related policies. However, more recently, the County adopted the Richmond County Working Lands Protection Plan, which extensively addresses Fort Bragg and the opportunities for agricultural uses to help protect the installation from encroachment of incompatible land uses. See Strategic Land Use Plan, Richmond County, North Carolina, July 2000. See Richmond County Working Lands Protection Program, May 2010.

Zoning, Subdivision, and Other Regulations

Airport-Related Regulations

The Richmond County Zoning Ordinance incorporates, by reference, the Richmond County Airport Hazard Zoning Area established in 1999 and amended in 2002. The Airport Hazard Zoning Area is intended "to regulate development, growth, or construction of objects that may become hazards to air traffic utilizing the Rockingham-Hamlet Airport and that would endanger the lives and property of users of the airport and of occupants of land in its vicinity." See Richmond County Airport Hazard Zoning Ordinance, Section I – Title and Purpose.

Section III of the Airport Hazard Zoning Ordinance establishes general use restrictions: "no use may be made of land or water within any zone established by this Ordinance in such a manner as to create electrical interference with navigational signals or radio communication between the airport and aircraft, make it difficult for pilots to distinguish between airport lights and others, result in glare in the eyes of pilots using the airport, impair visibility in the vicinity of the airport, create bird strike

hazards, or otherwise in any way endanger or interfere with the landing, takeoff, or maneuvering of aircraft intending to use the airport." See Richmond County Airport Hazard Zoning Ordinance, Section III – Use Restrictions.

The primary function of the Airport Hazard Zoning Ordinance is to restrict height in the approach, transitional, horizontal, and conical surfaces/zones associated with the Rockingham-Hamlet Airport. These height restrictions do not apply to Camp Mackall.

See Richmond County Airport Hazard Zoning Ordinance, Section VIII – Airport Zone Height Limitation.

SCOTLAND COUNTY

Comprehensive Plan

Scotland County does not have an adopted comprehensive plan at this time.

Zoning, Subdivision, and Other Regulations

Airport-Related Regulations

The Scotland County Zoning Ordinance establishes an Airport Overlay District (AO), the primary purpose of which is to promote public safety by limiting height in the approach, transitional, horizontal, and conical surfaces/zones. The Ordinance establishes the same general use provisions as in Richmond County: "no use may be made of land or water within any zone established by this Ordinance in such a manner as to create electrical interference with navigational signals or radio communication between the airport and aircraft, make

it difficult for pilots to distinguish between airport lights and others, result in glare in the eyes of pilots using the airport, impair visibility in the vicinity of the airport, create bird strike hazards, or otherwise in any way endanger or interfere with the landing, takeoff, or maneuvering of aircraft intending to use the airport." These height and general use restrictions do not apply to Camp Mackall. See Scotland County Zoning Ordinance, Section 5. Zoning Overlay Districts Established., 5.3 Airport Overlay District (AO).

7.5.3 CITIES

Most of the twelve cities in the JLUS Study Area have adopted zoning ordinances, subdivision regulations, and comprehensive plans. The Town of Hoffman does not have a comprehensive plan, but does have a zoning ordinance. All cities regulate, some more extensively than others, outdoor lighting. Half of the cities have incorporated into their ordinances the statutory requirement for notice to military installations of certain land use proposals within five miles of the installation, though two cities incorporate the notice provisions for only one type of land use decision (rather than the five enumerated in the current version of N.C.G.S. 160A-364).

ABERDEEN

Comprehensive Plan

The Aberdeen 2030 Comprehensive Land Development Plan, adopted in 2005, does not address Fort Bragg or contain military-related policies. However, in September 2011, the Town adopted the Pedestrian Transportation Plan, intended

to provide guidance for infrastructure improvements along with policies and programs to encourage alternative modes of transportation. This plan references the regional growth plan developed to address mission growth at Fort Bragg and notes the Pedestrian Plan aligns with certain transportation goals contained in the regional growth plan. The plan also notes the importance of regional connectivity, and recommends a multi-use greenway to connect to the All American Trail at Fort Bragg. See Aberdeen Pedestrian Transportation Plan, Chapter 1 – Introduction, Chapter 2 – Existing Conditions, and Chapter 3 – Recommendations.

The Town of Aberdeen is in the process of updating its comprehensive plan. The draft 2040 Comprehensive Land Use Plan – Data, Analysis, and Process currently includes a subchapter on the military, including Fort Bragg and Camp Mackall. This section includes discussion of land use compatibility, and includes a policy recommendation to improve coordination between the Town and Fort Bragg by inviting a military representative to participate in an internal development review process or serve as an ex-officio member of the Planning Board.

Zoning, Subdivision, and Other Regulations

Airport-Related Regulations

The Aberdeen Unified Development Ordinance (UDO) does not include military- or airport-related zoning districts. It does, however, limit building height to fifty feet in “the area regulated

by the Moore County Airport Height Restriction Ordinance, unless and not until a permit authorizing such structure has been issued by the Moore County Airport Authority.” As noted in the Counties section above, Moore County limits height in Airport Zones, which are not zoning districts but are the approach, transitional, horizontal, and conical surfaces associated with the Moore County Airport. See Aberdeen Unified Development Ordinance, Article XII Density and Dimensional Regulations, § 152-188. Building Height Limitations.

Military-Related Regulations

In accordance with N.C. G.S. 160A-364, the Aberdeen UDO requires notice to military bases of the following land use related changes:

1. Changes to proposed new major subdivision preliminary plats;
2. Any increases in the size of an approved subdivision by more than 50% of the subdivision's total land area; (See Aberdeen Unified Development Ordinance, Article IV – Permits and Final Plat Approval, Part 2. Major and Minor Subdivisions., § 152-76. Regulation of Subdivisions.)
3. Changes related to telecommunications towers; (See Aberdeen Unified Development Ordinance, Article XI – Overlay Districts and Supplementary Use Regulations, Part 2. Supplementary Use Regulations., § 152-163.23.1. Wireless Telecommunications Facilities.)
4. Changes related to windmills; and (See Aberdeen

Unified Development Ordinance, Article XI – Overlay Districts and Supplementary Use Regulations, Part 2. Supplementary Use Regulations., § 152-163.30 Windmills.)

5. UDO or zoning map amendments. (See Aberdeen Unified Development Ordinance, Article XX – Amendments, Part 1. General Use District Rezoning and Text Amendments., § 152-323 Hearing Required; Notice.)

This section (§ 152-323 Hearing Required; Notice.) includes, verbatim, the statutory language found in the current version of N.C.G.S § 160A-364 (b), which requires a jurisdiction to provide notice in conjunction with the following changes:

1. Changes to the zoning map;
2. Changes that affect the permitted uses of land;
3. Changes relating to telecommunications towers or windmills;
4. Changes to proposed new major subdivision plats; and
5. An increase in the size of an approved subdivision by more than fifty percent (50%) of the subdivision's total land area including developed and undeveloped land.

EASTOVER

Comprehensive Plan

The Eastover Study Area Detailed Land Use Plan, prepared by the Cumberland County Joint Planning Board in 2000, was essentially a component of the Cumberland County 2010 Land Use Plan (prepared in 1996). The Cumberland County Plan

was general in nature, providing overall goals and guidelines for development in the County, with recommendations for preparation of more specific plans for certain geographic areas. The Eastover Plan, one of these more specific plans, provides background information on Fort Bragg, but does not contain specific recommendations or policies related to the installation.

However, the Cumberland County Land Use Policies Plan, adopted in 2009, supersedes both the Cumberland County 2010 Land Use Plan and the Eastover Study Area Detailed Land Use Plan, and applies to the unincorporated areas of the County as well as all jurisdictions that are members of the Joint Planning Board, which Eastover is.

As previously noted, Cumberland County's Plan groups residential development into five categories based on density. Each category has specific location criteria intended to guide land use decisions. The plan specifies high and medium density residential must not be located in any critical area as defined by the Fort Bragg Small Area Study. Low and suburban density residential must not be located in any critical area as defined by the Fort Bragg Small Area Study, but the plan notes rural density residential could be located in such critical areas. The Fort Bragg Small Area Study policies apply to lands located within one mile of the installation boundary; as such, these policies do not apply in Eastover.

Refer also to the discussion of the 2030 Growth Vision Plan in the Fayetteville Comprehensive Plan section. The 2030 Growth Vision Plan includes Cumberland County, Fayetteville, Hope Mills, Eastover, Spring Lake, and other municipalities in the County. It includes county-wide policies related to growth and development, as well as policies specific to the various jurisdictions within the County, such as creating a park and recreation master plan for Eastover; however, none of the policies specific to Eastover are related to the military.

Zoning, Subdivision, and Other Regulations

The Town of Eastover was incorporated in 2007. It has not adopted a land development ordinance, so development is subject to Cumberland County's zoning and subdivision regulations. The Eastover Town Council has adopted certain zoning provisions, such as the Eastover Commercial Core Overlay District, which supplement the County regulations and apply only to properties located within the Town.

Military-Related Regulations

Eastover zoning regulations require notice to Fort Bragg for any proposals to change or that would affect permitted uses within five miles of the installation, in accordance with the North Carolina General Statutes. See Cumberland County Zoning Ordinance, Article XV Amendments, Section 1501. Submission of Amendments and Changes, D. Notice to Military Bases.

Although a developer/subdivider is not obligated to comply with the recommendations, optional provisions related to protection

of red-cockaded woodpecker habitat in the defined Fort Bragg Special Interest Area are included in Eastover's subdivision regulations. Developers/subdividers may obtain assistance from U.S. Fish & Wildlife Service and others in identifying areas where trees should be maintained. See Cumberland County Subdivision Ordinance, Article XXIII, Improvement and Design Standards, Section 2302. Area-Specific Standards, C. Fort Bragg Special Interest Area.

FAYETTEVILLE

Comprehensive Plan

The 2030 Growth Vision Plan, completed in 2008, serves as the City of Fayetteville's adopted comprehensive plan. It was prepared by a 20-person "Growth Vision Task Force," comprised of representatives appointed by the governing bodies of each local government in Cumberland County, with support from local government staff and a professional planning consultant.

The plan includes policies applicable within the City of Fayetteville, as well as Cumberland County and the other municipalities in the county. There are two portions of the plan: Growth Factors Analysis, which provides background and demographic information; and Policies and Actions, which sets forth policy statements and implementation measures.

The Growth Factors Analysis includes a "Military Influence" section (p. 23) addressing the impacts of Fort Bragg and Pope Field (known as Pope Air Force Base at the time the analysis was drafted) on the surrounding area. It includes discussion of

the 2005 Base Realignment and Closure (BRAC) process, which was underway as the Plan was being drafted, and notes the potential for significant changes in the community as a result. The plan further notes some of its statistics prepared prior to the BRAC process, such as school projections, are now considered conservative estimates in light of the population increases expected as a result of the 2005 BRAC process.

The plan recognizes constraints to the military mission (p. 26), which include the presence of the red-cockaded woodpecker and the proximity of incompatible development. In its "Opportunities for Cooperative Planning" section (p. 27), the plan references Sustainable Sandhills, as well as RLUAC and its role in promoting the military mission.

Finally, the Military Influence section identifies state statutes enacted in 2004 that relate to the military, including the requirement for notice to military installations concerning zoning actions within five miles of the base.

See 2030 Growth Vision Plan, Growth Factors Analysis, Military Influence.

Remaining portions of the Growth Factors Analysis discuss existing infrastructure, including transportation, schools, parks and recreation, and water/sewer infrastructure; and provide projections for future infrastructure needs. Fort Bragg is included in each discussion.

The Policies and Actions portion of the Plan is intended to provide guidance to the local governments and other decision-makers. Fort Bragg, it notes, should consider the Growth Vision Plan policies in the development of the base; it also notes local governments should give consideration to the plans and policies of Fort Bragg (see Introduction, page 5).

The Plan includes the following policies and actions specifically related to Fort Bragg:

- Policy Area 2: Well-Managed Growth and Development, Policies for Vision 2, Policy 2.10
 - Local governments shall encourage patterns of development and community growth that respect the training and operational mission of the military, while also allowing for reasonable, appropriate uses of properties near Fort Bragg.
- Policy Area 3: Infrastructure That Keeps Pace, Policies for Vision 3, Policies 3.8 and 3.10
 - New infrastructure shall not be placed in areas where it would encourage development incompatible with the mission of the Fort Bragg/Pope military complex, thereby jeopardizing this important economic driver in the region. (Policy 3.8)
 - Fort Bragg shall be included in all major infrastructure planning locally. This will be especially important as Fort Bragg and surrounding local communities seek mutually beneficial opportunities to enhance services. (Policy 3.10)

- Policy Area 4: A Balanced Transportation System, Actions for Vision 4, Action 4.1
 - Re-examine the regional transportation plan in light of the impending dramatic growth of Fort Bragg due to BRAC and Army Modular Force. (The latest information on growth includes a net increase of 7,064 military, an associated 12,716 family member, 1,795 civilians and another 351 contract employees. For the past 26 years, Fort Bragg has been essentially a stable population with no growth.)
- Policy Area 6: Expanded Parks and Recreation, Policies for Vision 6, Policy 6.9
 - The co-location and joint development of park facilities in cooperation with institutions such as colleges, public schools, the military, other federal, state and local government agencies, as well as private and non-profit interests, shall be supported.
- Policy Area 6: Expanded Parks and Recreation, Actions for Vision 6, Action 6.6
 - Continue to leverage State dollars from a special program designed to protect military installations from incompatible development (House Bill 1264). [Note: This House Bill was introduced and ratified during the 2003-2004 legislative session. It authorizes use of special indebtedness for specific Parks Projects, one of which is "acquisition by conservation easement of fee simple up to 17,000 acres near North Carolina military bases in order to prevent encroachment by incompatible development."]
- Policy Area 12: Vibrant Downtown Areas, Actions for Vision 12, Action 12.7
 - Participate in the Fort Bragg-Fayetteville Heritage Partnership Initiative. (Fayetteville was among seven military communities selected to receive technical assistance under the Army-Community Heritage Partnership. The program is designed to develop preservation-based economic development strategies to increase the vitality of the community's historic downtown commercial district.)
- Policy Area 16: Intergovernmental Cooperation and Efficiency, Actions for Vision 16, Action 16.5
 - Continue the progress made in recent years with regard to improved planning coordination between Fort Bragg and Cumberland County.
- Policy Area 16: Intergovernmental Cooperation and Efficiency
 - In general, this section sets forth a vision for continued coordination amongst the local governments in Cumberland County, including the military. The sixteen policies and actions listed in this section reinforce the vision, with one action specifically relating to Fort Bragg as noted above.

Though not directly related to Fort Bragg, also worth noting is Policy 4.10 in the Plan, which does relate to the local municipal airport. This policy supports opportunities to enhance air passenger service at Fayetteville Regional Airport. Land uses such as industrial development, warehousing, and distribution are the preferred development activities on lands near the Fayetteville Regional Airport that could be influenced by airport impacts (e.g. noise and safety issues). See Growth Vision Plan, Policy Area 4: A Balanced Transportation System, Policies for Vision 4, Policy 4.10.

Since adoption of the Growth Vision Plan, the City of Fayetteville has been involved in the development of several other planning and policy documents intended to guide future growth and investment in the City and Cumberland County.

In 2012, the Fayetteville-Cumberland County Chamber of Commerce prepared A Blueprint for Success: A Holistic Economic Development Strategy for Fayetteville and Cumberland County, NC. The report recommends certain target industries best suited for the City and County, including Department of Defense Critical Contract Support. Diverse economic development opportunities exist within this industry, including data processing, specialized scientific and technical consulting, and administrative services.

See A Blueprint for Success: A Holistic Economic Development Strategy for Fayetteville and Cumberland County, NC, Section

6: Optimal Targets for Fayetteville and Cumberland County, NC.

Suitable locations for new businesses are critical, of course, to successful economic development. In Fayetteville, Bragg Boulevard presents opportunities for development and redevelopment to accommodate a variety of uses, including office and flex space, which is important for the Department of Defense Critical Contract Support industry cluster.

Bragg Boulevard is a major transportation artery connecting downtown Fayetteville with Fort Bragg, a key economic driver in the region. With assistance of a consultant, the City of Fayetteville and the Fort Bragg Regional Alliance prepared the Bragg Boulevard Corridor Plan to establish a long-range vision for the corridor, benefiting both the community and the military base.

The Bragg Boulevard Corridor Plan analyzes existing conditions, including land use, zoning, development trends, and socioeconomic data; presents three alternative concepts developed through engagement with a steering committee, the public, elected officials, business community, and other stakeholders; and recommends a preferred concept and specific implementation actions to achieve the community's goals. Options for travel by transit, bicycle, or foot currently are limited along Bragg Boulevard, and the implementation actions are intended to create a vibrant multimodal corridor.

The plan notes recent progress on development of a “Military Business Park” along the corridor near Fort Bragg, planned to contain facilities for offices and research-related uses supportive of the military. See Bragg Boulevard Corridor Plan; 3.0 Existing Land Use, Economic, and Community Conditions; Development Patterns; Industrial/Office Areas/Sites.

A 16-member Steering Committee guided development of the plan, completed in July 2012, and included a representative from Fort Bragg. Recommendations include a multi-modal center in downtown Fayetteville, recently constructed near the Airborne and Special Operations Museum. See Bragg Boulevard Corridor Plan, Figure 6-2: Activity Centers Concept.

Also with an eye towards economic development, the City updated its Downtown Renaissance Plan in 2013. The plan envisions a partnership between Fort Bragg and the City to increase economic development opportunities in the downtown core. This ties in well with the Economic Development Strategy and Bragg Boulevard Corridor Plan discussed above. See Downtown Renaissance Plan Update, Chapter 1 – Downtown Vision, Relationships.

To further develop its vision of a revitalized downtown, the City of Fayetteville and the Downtown Alliance requested assistance from an Urban Land Institute Technical Assistance Panel (TAP) in identifying critical actions. The 2015 TAP Report recognizes Fort Bragg's role in the area's, and particularly

downtown's, economy, and suggests coordination between Fort Bragg and local universities to begin building a downtown “entrepreneurial ecosystem.” See Downtown Fayetteville ULI Technical Assistance Panel, Observations & Recommendations, No. 4.

Zoning, Subdivision, and Other Regulations

Airport- and Military-Related Regulations

The City of Fayetteville is the only municipality in the JLUS Study Area with a specifically designated military overlay zoning district. The City is also the only municipality, and one of only two JLUS Jurisdictions that incorporates the statutory requirements for notice to military installations prior to construction of “tall structures” (those greater than 200 feet in height).

The UDO establishes the Military/Airport (MA) District. This zoning district is intended to apply to military installations under exclusive Federal authority and to the City's regional airport. No dimensional standards apply, though the ordinance encourages military facilities adjacent to a single-family residential zoning district to provide a setback at least equal to that required in the residential district. This section includes the requirement to notify Fort Bragg regarding land use applications within five miles of the installation. See City of Fayetteville Code of Ordinances, Chapter 30 - UDO, Article 30-3: Zoning Districts, Section 30-3.C. Special Base Zoning Districts, Subsection 30-3.C.4. Military/Airport (MA) District.

UDO Section 30-3.H.5. establishes the Noise-Accident Potential Overlay (NPO) District, which is intended to reduce population density in the vicinity of airports and military installations. The NPO includes only four development standards, all of which are recommended but not required:

1. Because of accident hazard potential, residential use in this zone should not be allowed without strong demonstration of need to utilize this area for residential use. If allowed, it should be limited to the minimum necessary area, and not exceed one dwelling unit per five acres. Additional considerations should be given to modify the NLR levels based on peak noise levels. Such criteria, however, will not eliminate outdoor environmental noise levels.
2. Clubhouses and other structures for gatherings should not be allowed. Passive recreation uses that do not congregate people are allowed.
3. The identified noise reduction level (20, 25, 30 or 35) applies to those portions of structures where the public is received.
4. Uses are compatible if they do not result in a gathering of individuals in an area that would result in an average density of greater than 25 persons per acre per hour during a 24-hour period, not to exceed 50 persons per acre at any time.

With respect to the municipal airport, the stated purpose of the Airport Overlay (APO) District established by UDO Section 30-3.H.6. is to protect "public health, safety, and welfare in the vicinity of the Fayetteville Regional Airport by minimizing exposure to and giving public notice of probable high noise levels and accident hazards generated by the airport operations and to encourage future development that is compatible with the continued operation of the airport and the economic well being of the City." The APO does not address impacts created by or affecting Fort Bragg.

Although the APO does not specifically limit land uses, it requires consideration of land use compatibility by the City Manager, Zoning Commission, and City Council when formulating recommendations or decisions concerning a proposed rezoning. Permitted uses within the requested zoning district should be compatible with the 2023 Off-Airport Land Use Plan. The ordinance notes proposed rezoning of property located in the APO that would allow a use or uses incompatible with airport operations should not be favorably considered unless the Fayetteville Regional Airport Director provides a favorable recommendation.

As further protection for the airport and air traffic, the APO limits height to that established by the Federal Aviation Administration and states exterior lighting for all uses in the APO may not pose a danger to aircraft operations. The APO also recognizes the importance of public awareness of the airport and its potential

impacts by requiring inclusion, on all site plans, subdivision plans, and final plats, of a notice regarding a property's location in the overlay district. See City of Fayetteville Code of Ordinances, Chapter 30 - UDO, Article 30-3: Zoning Districts, Section 30-3.H. Overlay Zoning Districts, Subsection 30-3.H.6. Airport Overlay (APO) District.

Military-Related Regulations

The City of Fayetteville's UDO establishes nine Business Base Zoning Districts, "established for the general purpose of ensuring there are lands in the City that provide a wide range of office, retail, service, industrial, and related uses to meet household and business needs..." Seven more specific purposes are enumerated, including strengthening the City's economic base, preserving the unique character and historic resources of the downtown, and supporting military activities occurring in the vicinity. See City of Fayetteville Code of Ordinances, Chapter 30 - UDO, Article 30-3: Zoning Districts, Section 30-3.E. Business Base Zoning Districts.

In consideration of special security needs related to government and military-related uses and activities, the UDO includes an exemption to its fence and wall regulations allowing certain uses to submit a Security Plan providing for fences and/or walls taller than otherwise allowed, the use of barbed wire atop the wall or fence, and/or the use of "K-4" fencing. The Security Plan must be approved by the City Manager. See City of Fayetteville Code of Ordinances, Chapter 30 - UDO, Article 30-

5: Development Standards, Section 30-5.D. Fences and Walls, Subsection 30-5.D.5. Exemptions.

The UDO also includes military-related statutory requirements related to notice of certain land use decisions. The UDO includes a general statement specifying all notice required under the ordinance must comply with the North Carolina General Statutes, but also specifically requires notice to Fort Bragg of proposed land use cases and certain subdivisions located within five miles of the installation (in accordance with N.C.G.S. 160A-364). See City of Fayetteville Code of Ordinances, Chapter 30 - UDO, Article 30-2: Administration, Section 30-2.B. Common Review Procedure, Subsection 30-2.B.12. Public Notification.

The subdivision regulations contained within the UDO reiterate the requirement for notice to Fort Bragg of new major subdivisions or increases in size (by more than 50%) of an approved subdivision, in accordance with the current version of N.C.G.S. 160A-364. See City of Fayetteville Code of Ordinances, Chapter 30 - UDO, Article 30-6: Subdivisions, Section 30-6.A. Subdivision Standards, Subsection 30-6.A.2. Applicability.

Also, in accordance with the Military Lands Protection Act of 2013 (N.C.G.S. 143-151.70 through 143-151.77), the UDO requires approval by the State Building Code Council of establishment of or changes to any structure over 200 feet in height located within five miles of Fort Bragg or Pope Field. See City of Fayetteville Code of Ordinances, Chapter 30 - UDO, Article 30-

4: Use Standards, Section 30-4.A. Use Table, Subsection 30-4.A.1. Explanation of Use Table Structure.

HOFFMAN

Comprehensive Plan

The Town of Hoffman does not have an adopted comprehensive plan at this time.

Zoning, Subdivision, and Other Regulations

Although the Town of Hoffman is located in close proximity to Camp Mackall, the Town's Zoning Ordinance does not establish a military or airport zoning district. The Zoning Ordinance was adopted in 1993; as such, it does not include the formal military coordination requirements set forth by N.C.G.S. 160A-364.

While the Hoffman Zoning Ordinance includes general standards related to outdoor lighting, such as that associated with signage and public spaces (sidewalks, common areas, etc.), it does not include specific standards designed to eliminate glare and light trespass.

The Town regulates subdivisions only for property located in the WSII and WSIII Water Supply Watershed Overlay Districts. See Town of Hoffman Zoning Ordinance, Section 8 Zoning Districts and Regulations, 8.10 WSII and WSIII Water Supply Watershed Overlay Districts

HOPE MILLS

Comprehensive Plan

The Southwest Cumberland Land Use Plan, prepared by the Cumberland County Joint Planning Board in May 2013, includes the Town of Hope Mills. The Plan provides a bit of background information on Fort Bragg, particularly with regard to increases in both population and development in recent years. The Plan notes the Hope Mills Fire Department has reciprocal agreements with other local fire departments, including Fort Bragg. See Southwest Cumberland Land Use Plan, Built Environment, page 42.

The Plan's Transportation Goal includes development of a multi-modal transportation system that includes a connection from the Southwest Cumberland area to Fort Bragg and the City of Fayetteville. Objective #19 is to initiate planning for a light rail connector in the region, and to include planning for "high intensity development areas that makes such a system efficient and economically sustainable." See Southwest Cumberland Land Use Plan, Goals & Objectives, Transportation Goal, Objective 19.

The Plan addresses the impacts of Fayetteville Regional Airport on the Town of Hope Mills (see pp. 93-94). Various parts of the eastern and southern portions of the Town are affected by the airport's Conical Surface Zone, Approach Zone 2, or Transitional Zone. Transportation Objective #20 is to protect the areas around Fayetteville Regional Airport from encroachment

to accommodate potential airport expansion in the future. See Southwest Cumberland Land Use Plan, Infrastructure, Fayetteville Regional Airport; and Southwest Cumberland Land Use Plan, Goals & Objectives, Transportation Goal, Objective 20.

The Southwest Cumberland Land Use Plan includes a brief discussion of the Hope Mills AOD-Airport Overlay District, designed to protect public health, safety, and welfare in the vicinity of the airport. The AOD is discussed in more detail in the Hope Mills Zoning, Subdivision, and Other Regulations section below. See Southwest Cumberland Land Use Plan, Built Environment, Hope Mills Existing Zoning, Overlay Districts.

The Plan sets forth “Plan Actions” needed for implementation, and includes actions specifically related to protecting the integrity of Fayetteville Regional Airport’s operation and expansion potential. The Plan recognizes the economic impact of the Airport. It also references the 2023 Off-Airport Land Use Plan, and recommends land uses in proximity to the Airport be compatible with this plan. It further recommends coordination between local governments and the Airport Director. See Southwest Cumberland Land Use Plan, Plan Actions, Protect the Integrity of Fayetteville Regional Airport Operation and Expansion Potential.

Refer also to the discussion of the 2030 Growth Vision Plan in the Fayetteville Comprehensive Plan section. The 2030 Growth Vision Plan includes Cumberland County, Fayetteville, Hope

Mills, Eastover, Spring Lake, and other municipalities in the County. It includes county-wide policies related to growth and development, as well as policies specific to the various jurisdictions within the County. Specific policies related to Hope Mills involve lake restoration and parks and recreation, but none relate to the military.

Zoning, Subdivision, and Other Regulations

Airport-Related Regulations

The Town’s Zoning Ordinance establishes the AOD, Airport Overlay District. This district is nearly identical to the City of Fayetteville’s APO, Airport Overlay District, and does not apply to Fort Bragg.

As with Fayetteville’s APO, the stated purpose of Hope Mills’ AOD is to protect “public health, safety, and welfare in the vicinity of the Fayetteville Regional Airport by minimizing exposure to and giving public notice of probable high noise levels and accident hazards generated by the airport operations and to encourage future development that is compatible with the continued operation of the airport and the economic well being of the town.” See Town of Hope Mills Zoning Ordinance, Article III Zoning Districts, Sec. 102A-302. Zone characteristics, (g) Overlay districts.

Although the AOD does not specifically limit land uses, it requires consideration of land use compatibility by the Town staff, Planning Board, and Board of Commissioners when formulating

recommendations or rulings concerning a proposed rezoning. Permitted uses within the requested zoning district should be compatible with the 2023 Off-Airport Land Use Plan. The ordinance notes proposed rezoning of property located in the Airport Impact Zones should not be favorably considered unless the request is consistent with the land uses and densities listed in the ordinance. For example, residential development should be prohibited in Airport Impact Zones 1, 2, and 5. The ordinance further notes, for any proposed rezoning to a district that would allow a use inconsistent with airport operations, the rezoning should not be favorably considered unless the Fayetteville Regional Airport Director provides a favorable recommendation.

The AOD limits height in the vicinity of the Fayetteville Regional Airport to that established by the Federal Aviation Administration. It also requires exterior lighting for all uses in the AOD to comply with the Town's lighting regulations promulgated in Sec. 102A-1202(m) of the Zoning Ordinance. Both provisions specifically relate to air traffic safety.

Finally, the AOD requires inclusion, on all site plans and preliminary and final plats, of a notice regarding a property's location in the overlay district and the potential for occupants to experience noise impacts associated with the Fayetteville Regional Airport. See Town of Hope Mills Zoning Ordinance, Article IX Overlay Districts, Sec. 102A-902. Airport overlay district (AOD).

The Town's Mixed Use Development – Conditional Zoning District (MXD-CUD) requires development in this district to meet any height requirements established by airports and the Federal Aviation Administration; however, those properties in the Town zoned MXD-CUD do not appear to be located in close proximity to the Fayetteville Regional Airport. See Town of Hope Mills Zoning Ordinance, Article VI Mixed Use Development – Conditional Zoning District, Sec. 102A-604. Development performance standards., (c) Development standards.

Military-Related Regulations

The Town of Hope Mills Zoning Ordinance requires requests for amendments changing or affecting the use of land within five miles from the military installations to be provided to the base commanders. This requirement also is referenced in the section pertaining to special use permits. However, very little land located in the Town of Hope Mills is located within five miles of Fort Bragg, though this amount could increase should the Town annex additional property near the intersections of Bingham Drive and Fisher and Cumberland Roads. See Town of Hope Mills Zoning Ordinance, Article XVI Amendments, Sec. 102A-1601. Submission of amendments and changes, (d) Notice to military bases; and Sec. 102A-1706. Special use permits.

Other Regulations

In addition to the notice on plans and plats regarding street ownership and maintenance responsibility (public or private) required by the North Carolina General Statutes, the Town

of Hope Mills Subdivision Ordinance requires notices on final plats when the land is located in a Farmland Protection Area. See Town of Hope Mills Subdivision Ordinance, Article VI Final Approval, Sec. 86A-604. Disclosures required.

PINEBLUFF

Comprehensive Plan

The Town of Pinebluff Land Use Plan, adopted in May 2008, does not address nearby military installations; however, neither Camp Mackall nor Fort Bragg share a border with property located in Pinebluff.

Zoning, Subdivision, and Other Regulations

The Pinebluff Unified Development Ordinance (UDO) regulates land use and development in the Town, but does not establish military or airport zoning districts. Pinebluff is roughly in the vicinity of Camp Mackall, but does not share any borders. The Town regulates telecommunication towers, but the UDO does not include the state statutory requirements for military coordination in relation to tall structures. See Town of Pinebluff Unified Development Ordinance, Article XI Supplementary Use Regulations, Part I. General Provisions, § 168 Communication Towers

The UDO references several other statutory requirements concerning zoning and subdivision, so the Town likely adopted the UDO prior to enactment of the statutory requirements concerning military coordination.

PINEHURST

Comprehensive Plan

The Village of Pinehurst is extensively involved in comprehensive and long-range planning. The Village has a Comprehensive Long-Range Plan, comprised of a “Strategic Element” and an “Implementation Element”; a Comprehensive Bicycle Plan; a Comprehensive Pedestrian Plan; and a Comprehensive Parks and Recreation Master Plan. The Village also developed its NewCore Master Plan in an effort to guide development on a 19-acre infill site near the Village Center. None of these plans address nearby military installations; however, neither Camp Mackall nor Fort Bragg share a border with property located in the Village of Pinehurst.

Zoning, Subdivision, and Other Regulations

The Pinehurst Development Ordinance does not contain provisions pertaining to airport or military zoning districts, though it does provide exterior lighting requirements for both residential and non-residential uses. See Pinehurst Development Ordinance, Chapter 9, Design and Development Standards and Processes, Section 9.8 Exterior Lighting Standards.

RAEFORD

Comprehensive Plan

The City of Raeford 2030 Land Use Plan, adopted in September 2008, provides background information on Fort Bragg and the 2008 JLUS. Section 5 of the Plan recommends consideration of housing opportunities related to the Base Realignment and

Closure (BRAC) process and subsequent increase in Fort Bragg personnel. See City of Raeford 2030 Land Use Plan, Section Five: Goals and Implementation Strategies, 2.f.

Section 5 of the Plan also recommends identification of military-related businesses that could locate in the Raeford area, and incorporation of Fort Bragg review of rezoning and planning changes into ordinance updates. See City of Raeford 2030 Land Use Plan, Section Five: Goals and Implementation Strategies, 4.b. and 8.f.

Zoning, Subdivision, and Other Regulations

Section 1.5 of the Raeford Unified Development Ordinance (UDO) identifies the purpose and intent of the regulations, which include the prevention of “encroachment of incompatible land uses into areas that may compromise the military mission of Fort Bragg.” However, the UDO does not provide specific military or airport-related regulations. See Raeford Unified Development Ordinance, Article 1 – General Provisions, Section 1.5 Purpose and Intent.

The UDO notes all public notices required by the Ordinance must comply with N.C.G.S. 160A-364, though it does not specifically reference the requirement to notify Fort Bragg regarding land use changes and subdivisions within five miles of the installation. Nearly all land in the City of Raeford is located within five miles of Fort Bragg, and City staff confirmed notice is provided to RLUAC for the land use decisions specified in the

statute. See Raeford Unified Development Ordinance, Article 3 – Review and Approval Procedures, Section 3.1 Common Review Procedures, Subsection 3.1.10. Public Notification.

The UDO regulates exterior lighting for attached residential, institutional, commercial, and industrial uses. See Raeford Unified Development Ordinance, Article 8 – General Development Standards, Section 8.3 Outdoor Lighting.

SOUTHERN PINES

Comprehensive Plan

In 2016, Southern Pines adopted its Comprehensive Long-Range Plan, which supersedes the previous plan adopted in 2010. The Plan provides background info on Fort Bragg, RLUAC, the 2003 and 2008 joint land use studies, and other related studies. While the Plan does not contain specific policies related to Fort Bragg, it does note any JLUS recommendations specific to Southern Pines and its planning area should be incorporated into all long-range plan updates. See Southern Pines Comprehensive Long-Range Plan, Appendix B: Background, Southern Pines Background Planning Documents, page B-17.

Zoning, Subdivision, and Other Regulations

Airport-Related Regulations

The Unified Development Ordinance of Southern Pines (UDO) establishes an Airport Hazard Overlay District (AHO) intended to protect Moore County Airport, but not Fort Bragg or Camp Mackall, from encroachment of incompatible land uses. The

AHO limits height in the Approach Zone, and prohibits certain uses, such as residences and places of public assembly, in the Clear Zone associated with the County Airport. The AHO also contains language similar to that in other jurisdictions surveyed regarding general land use restrictions (prohibiting uses that would create electrical interference, result in glare, create bird strike hazards, etc.). See Unified Development Ordinance of Southern Pines, Chapter 3. Zoning, Section 3.6.7. AHO – Airport Hazard Overlay.

Military-Related Regulations

Southern Pines' UDO also regulates exterior lighting through its Lighting Code, an expressly stated purpose of which is to protect ongoing operations at Fort Bragg. Southern Pines is the only JLUS Jurisdiction to consider the impact of exterior lighting on military operations. See Unified Development Ordinance of Southern Pines, Chapter 4. Development and Design Standards, Section 4.8. Lighting.

While the Town's Long-Range Plan recognizes that RLUAC reviews land use proposals within five miles of the military installation, the Southern Pines UDO does not provide for the coordination required by N.C.G.S. 160A-364. Nonetheless, Town Planning staff confirmed all land use proposals are provided to RLUAC for review and comment.

SPRING LAKE

Comprehensive Plan

The Spring Lake Area Detailed Land Use Plan, prepared by the Cumberland County Joint Planning Board in 2002, was essentially a component of the Cumberland County 2010 Land Use Plan (prepared in 1996). Comprehensive planning in Cumberland County involves a general land use plan, applicable to the entire county and its municipalities, as well as area-specific plans for certain geographic areas of the county. Although the 2010 Land Use Plan is superseded by the 2009 Cumberland County Land Use Policies Plan, the 2002 Spring Lake Area Plan is the most current area-specific plan for this portion of the county.

The Spring Lake Area Detailed Land Use Plan provides background information on Fort Bragg. It also notes, due to the location within the Town of portions of the Accident Potential Zones associated with Pope Field, potential land use compatibility issues between the Town and Pope Field. The Plan provides a map of Pope Field's Accident Potential Zones (see Spring Lake Area Detailed Land Use Plan, Map 13, page 41), and recognizes the limitations on development in the Town as a result of its proximity to Pope Field and Fort Bragg. (Note that the Plan was prepared prior to the 2005 BRAC process, and so refers to Pope Field as Pope Air Force Base. Pope was absorbed into Fort Bragg as a result of the 2005 BRAC and is now named Pope Field.)

The Recommendations section (beginning on page 55) includes a transportation-related recommendation to support the long-term potential for light rail transit service connecting the Spring Lake area to Fort Bragg, Pope Field, the City of Fayetteville, and Cross Creek Mall. Due to its location, Spring Lake experiences a great deal of military-related traffic congestion.

Refer also to the discussion of the 2030 Growth Vision Plan in the Fayetteville Comprehensive Plan section. The 2030 Growth Vision Plan includes Cumberland County, Fayetteville, Hope Mills, Eastover, Spring Lake, and other municipalities in the County. Along with county-wide policies, the plan sets forth policies specifically related to the various municipalities. Policies related to Spring Lake include a recommendation for development of a park and recreation master plan and expansion of an existing park; however, none of the policies relate to the military or Pope Field.

Zoning, Subdivision, and Other Regulations

Airport- and Military-Related Regulations

Despite the presence in the Town of portions of the Pope Field Accident Potential Zones, the Spring Lake Zoning Code does not limit land uses in proximity to the military installation, although the Mixed Use Development-Conditional Use District would require development in this district to meet any height requirements established by the military, airports, and/or the Federal Aviation Administration. However, at this time, no lands within the Town have been zoned Mixed Use Development-

Conditional Use. See Spring Lake Code of Ordinances, Chapter 42 – Zoning, Article VI. Conditional Use Districts and Permits, Sec. 42-139. Mixed Use Development-Conditional Use District

In Spring Lake's Central Business District, building height is limited to the lesser of 36 feet or two stories, unless otherwise specifically approved by the board of aldermen upon a determination that a taller building would not pose an obstruction to air traffic. See Spring Lake Code of Ordinances, Chapter 42 – Zoning, Article VI. Conditional Use Districts and Permits, Sec. 42-174. Specifications for the CB Central Business District

Finally, the Spring Lake Zoning Code requires notice to the military installations only for Special Use Permit applications affecting the use of property located within five miles of the installation. While this meets the geographic scope requirement of N.C.G.S 160A-364, the state statute also requires notice for any land use proposal or rezoning affecting permitted uses within the five mile area. The Subdivision Code does not reference the notice required by N.C.G.S 160A-364. See Spring Lake Code of Ordinances, Chapter 42 – Zoning, Article XIII. Administration and Enforcement, Sec. 42-361. Special use permits

VASS

Comprehensive Plan

The Town of Vass Land Use Development Plan (2010 Update) includes minor references to Fort Bragg and Pope Field as the installations relate to past and projected population increases.

See Town of Vass Land Use Development Plan (2010 Update), Chapter III: Demographics, Population Growth (page 10) and Constant-Shared Population Projection (page 11).

Zoning, Subdivision, and Other Regulations

Military-Related Regulations

The Vass Zoning Ordinance incorporates the military notice requirements established by N.C.G.S. 160A-364, but has not incorporated the other statutory notice requirements for tall structures and wind energy facility siting. See Town of Vass Zoning Ordinance, Article I, Legal Provisions, Section 1.15 Military Notification

WHISPERING PINES

Comprehensive Plan

The Village of Whispering Pines Land Use Plan, adopted in December 2015, references the proximity of Fort Bragg to the Village (less than ten miles away). See Village of Whispering Pines Land Use Plan, Introduction, Village History and Regional Context.

The Plan sets forth a goal to “maintain open and regular communications with other entities who can impact the residents of Whispering Pines.” Ostensibly, due to its proximity to the Village, this includes Fort Bragg. See Village of Whispering Pines Land Use Plan; Goals, Objectives, and Strategies; 6. Intergovernmental Coordination & Cooperation.

The Village adopted in 2012, and revised in 2016, a Recreation & Open Space Master Plan, emphasizing the importance to its residents of maintaining active and passive open space and preserving the community's natural and cultural heritage. This plan attributes some of the Village's population growth, particularly growth in young families, to employment increases related to Fort Bragg. This demographic (young families) requires different recreational facilities than the retiree population, which historically has been the typical household type in the Village.

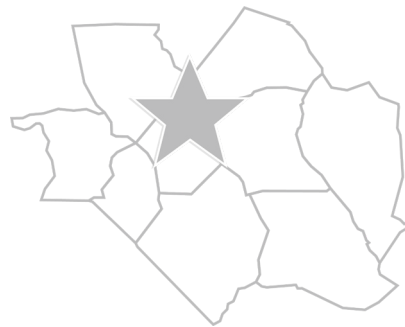
Zoning, Subdivision, and Other Regulations

Airport-Related Regulations

The Whispering Pines Land Development Ordinance establishes an Airport District, in which the principal use of land is an airport and related facilities. Development standards are set by the Moore County Airport Authority and the Federal Aviation Administration. The Moore County Airport is located along the southeastern edge of the Village and the parcels comprising the airport property are the only parcels within the Village's Airport District. See Village of Whispering Pines Land Development Ordinance, Chapter 5: Zoning Districts, Section 5.3.9 AP – Airport District.

RECOMMENDATIONS **SECTION EIGHT**

FORT BRAGG JOINT LAND USE STUDY



RECOMMENDATIONS

This section provides recommendations that, if implemented, will help to ensure the long-term sustainability of the operational, testing and training mission at Fort Bragg as the region's communities continue to grow and prosper.

8.1 OVERVIEW

In order to achieve the goals established at the beginning of the Joint Land Use Study process, a comprehensive list of recommendations was prepared for the consideration of, and voluntary implementation by, local governments in the region. Each community will determine how it will move forward with the study's recommendations based on their particular needs and local compatibility factors. In support of the recommendations, Section 8.3 outlines an implementation plan with community-specific strategies to provide guidance on how the recommendations can be implemented by the study partners.

8.2 RECOMMENDATIONS

A broad range of recommendations were developed for consideration by local governments in the region. The recommendations were organized into four categories as outlined below.

- Regional coordination (RC)
- Compatible Growth (CG)
- Environmental (E)
- Fort Bragg (FB)

8.2.1 REGIONAL COORDINATION (RC)

RC-1: ENHANCE RLUAC'S ORGANIZATIONAL STRENGTHS AND RESPECTED REGIONAL LEADERSHIP ROLE THROUGH THE DEVELOPMENT AND IMPLEMENTATION OF A LONG TERM STRATEGIC PLAN TO GUIDE THE ORGANIZATION'S GROWTH, FORMALIZING ITS ROLE IN PROVIDING LAND USE COORDINATION SERVICES IN COORDINATION WITH FORT BRAGG, BROADENING ITS PUBLIC OUTREACH EFFORTS, AND BUILDING UPON THE LONG-TERM PARTNERSHIPS IT HAS FORGED WITH GOVERNMENTAL AND NONPROFIT AGENCIES THAT SHARE ITS CORE MISSION.

Justification: RLUAC is a strong, guiding force that has led the way in developing and implementing policies and programs that support the sustainment of the military training mission at Fort Bragg. In order to sustain the significant momentum that it has developed through its role in coordinating a broad range of partners to support this mission, RLUAC should examine its organizational structure, mission statement, and strategic goals to ensure that they provide a clear path forward for the organization to continue its leadership role and build upon the successes that have made it the lead agency for civil-military cooperation in the region.

To solidify itself in this role RLUAC should work with Fort Bragg to bring formality to its long-term role as the reviewing agency for statutory land use proposals on behalf of the installation. It should also work towards broadening its public outreach efforts

and become a more visible and vocal advocate in the region on behalf of Fort Bragg and its member communities with regard to compatible growth issues. Finally, RLUAC should also seek to strengthen its existing partnerships with other governmental and nonprofit agencies that have joined it in its mission, as well as seeking new partnerships that will broaden its base of support in the community and provide it with new allies in support of its mission. Combined, these items will help to ensure the long-term viability and relevancy of RLUAC, and enhance its position as the lead agency in the region supporting Fort Bragg.

8.2.2 COMPATIBLE GROWTH (CG)

CG-1: IMPLEMENT UPDATED COMPATIBILITY / CONSERVATION RATING CRITERIA FOR USE IN RLUAC LAND USE REVIEWS.

Justification: The compatibility and conservation rating criteria that were previously developed for use in land use reviews by RLUAC are based on data that are now approximately 10 years old. Ensuring the accuracy, usefulness and currency of the criteria is critical to maintaining the credibility of RLUAC's recommendations to local governments in support of sustaining the viability of the military mission at Fort Bragg. These factors are also a key input into the decision-making process regarding the targeting of funds for the acquisition of land and development rights in areas that are subject to military training impacts or

which have an environmental nexus with Fort Bragg's ability to train.

It is recommended that RLUAC adopt new rating criteria, as detailed below, and incorporate the new criteria into its land use reviews. Furthermore, it is proposed that RLUAC cease the use of rating criteria that identify land as being "Suitable for Urban Development," "Suitable for Low Density Development" and "Rural" and focus instead only on those lands that are identified as being either "Critical" or "Important" to protect due to military training impacts and/or environmental features present on the property that have a nexus with Fort Bragg's mission.

Compatibility evaluation criteria for "CRITICAL" areas:

- 130+ dB PK15 Large Caliber Noise Contour
- 70+ dB CDNL Large Caliber Noise Contour
- 104+ dB Small Arms Noise Contour
- 75+ dB ADNL Aviation Noise Contour
- Clear Zones
- Accident Potential Zone 1
- Land located under the UAS Corridor
- Wildlife Habitat Connector Areas
- Red-cockaded Woodpecker Active Foraging Areas

Compatibility evaluation criteria for “IMPORTANT” areas:

- 115+ dB PK15 Large Caliber Noise Contour
- 62+ dB CDNL Large Caliber Noise Contour
- 87+ dB Small Arms Noise Contour
- 65+ dB ADNL Aviation Noise Contour
- Accident Potential Zone 2
- Land located under Air Corridors and Aviation Routes
- Biodiversity / Wildlife Habitat Rating of 7+
- Within High Quality / Outstanding Resource Waters Area

CG-2: PERFORM REGULAR REVIEWS AND UPDATES TO THE AREAS OF COMPATIBILITY CONCERN IN COORDINATION WITH FORT BRAGG.

Justification: The areas of compatibility concern around the installation are subject to change based on modifications to training doctrine, weapons systems, force structure, and a range of other factors, including changing environmental conditions. Maintaining an accurate and up-to-date map of these areas of compatibility concern will increase the effectiveness of RLUAC in its mission to promote compatible growth and sustain the military training mission on Fort Bragg.

CG-3: ENHANCE THE LAND USE REVIEW COMMUNICATIONS TO LOCAL GOVERNMENTS TO PROVIDE MORE IN-DEPTH INFORMATION REGARDING THE BASIS FOR RLUAC'S RECOMMENDATION AND EMPHASIZING THE ADVISORY NATURE OF THE RECOMMENDATION.

Justification: When a local government notifies RLUAC of a pending land use case, the application is reviewed and a recommendation is made to the local government regarding the compatibility of the proposed action with military training impacts and environmental concerns. Building upon its current communications protocol, it is recommended that RLUAC broaden the information provided to local governments in its communication of the result of its compatibility analysis, particularly when recommending that a pending action be denied or modified. Furthermore, it is recommended that RLUAC restate the statutory basis for the review and clearly communicate the advisory nature of the recommendation. This will help to both clarify the reasoning behind its recommendations, as well as clarify RLUAC's role in providing the analysis and opinion to local governments.

CG-4: DEVELOP AND IMPLEMENT AN ONLINE LAND USE CASE MANAGEMENT SYSTEM TO STREAMLINE THE WORKFLOW OF RECEIVING, REVIEWING, PROVIDING RECOMMENDATION ON, AND TRACKING LAND USE CASES.

Justification: Since it began receiving statutorily mandated land use reviews on behalf of Fort Bragg, RLUAC has been relying on a system of email communication with local governments to receive land use cases and provide recommendations. While this system is working, the total volume of cases, at times, can be significant. Implementing an online case management

system will help to streamline the workflow by allowing local governments to generate land use notification to RLUAC directly, and in a common format. It is envisioned that the case management system will be incorporated into a new RLUAC website, and local governments will have the ability to enter a set of common information regarding the case, as well as upload supporting documents directly into the system. In turn, the system will generate case numbers, organize and store the information, and allow RLUAC to generate a direct communication regarding the case back to the entity that submitted it. With regard to managing the workflow, the tool should have an automated notification system to provide reminders to RLUAC regarding deadlines, as well as generate follow-up communications to local governments to remind them to provide information on the final disposition and status of cases when RLUAC recommends a denial or modification of the submitted action. This status tracking component of the case management system will allow RLUAC to better understand how its recommendations are being utilized by local governments and provide it with a better base of information about emerging compatibility concerns in the region.

CG-5: IMPLEMENT A PLAN TO REGULARLY UPDATE COMPATIBILITY AND CONSERVATION DATA ON THE SANDHILLSGIS.COM MAPPING PLATFORM.

Justification: The SandhillsGIS.com online mapping platform is a critical tool that supports RLUAC's mission. In order to enhance the effectiveness of this tool, it is recommended that a plan be developed and implemented that establishes a regular schedule for updating the compatibility and conservation data that forms the core of the database and informs RLUAC's compatible growth recommendations. This will help to ensure that the recommendations that RLUAC provides to local governments are based on the most accurate and up-to-date data available, thereby enhancing the credibility of the recommendations.

CG-6: WORK WITH OTHER MILITARY COMMUNITIES IN NORTH CAROLINA, THE NC DEPARTMENT OF MILITARY AND VETERANS AFFAIRS, AND LEGISLATIVE REPRESENTATIVES FROM MILITARY COMMUNITIES TO UPDATE AND STRENGTHEN MILITARY LAND USE COORDINATION STATUTES.

Justification: In 2004, the NC General Assembly enacted SL 2004-75, which created NCGS 160A-364(b) and 153A-323(b). These statutes, related to zoning changes within 5 miles of a military installation, required that local governments provide notice to the installation of pending zoning actions and take any comments or analysis into consideration when making a final decision on the pending action. The statute was further modified in 2013 by SL 2013-59 to specifically require notification for the following items:

- Changes to the zoning map;
- Changes that affect the permitted uses of land;
- Changes relating to telecommunications towers or windmills;
- Changes to proposed new major subdivision preliminary plats; and
- An increase in the size of an approved subdivision by more than fifty percent (50%) of the subdivision's total land area including developed and undeveloped land

The first two items listed in the statute are quite clear in their intent, and should be preserved in their current form. With regard to the remaining listed items, it is not explicitly clear what the intent is, or what action a local government might take in response to a comment recommending against taking a certain action due to the lack of discretion afforded in typical subdivision ordinances. For instance, a "change" related to a telecommunication tower or windmill could be interpreted to mean an amendment to the text of the ordinance regarding the manner in which they are permitted. It is assumed, however, that the original intent of this language was to actually require notification to a military installation when a tall structure which may interfere with aerial navigation is submitted for permitting to a local government. Without explicit clarity in the statute, this is up to interpretation by each entity responsible for making such notification.

As previously mentioned, the requirements to submit "changes" related to certain land subdivision activity is both unclear in its intent and unclear as to the action that it assumes might be taken in response to a comment expressing concern about the proposed action. With regard to the intent of the language related to "changes to proposed new major subdivision preliminary plats" it is not clear what the specific trigger would be. The submittal of a preliminary plat is not, by definition, a "change." Once submitted for review, it is quite common for a preliminary plat to undergo a number of design iterations as it is reviewed. It is not assumed, however, that there would be interest in providing notification for each of the potentially large number of design iterations of a proposed plat, but not any interest in providing notification of the original submittal. Based on this, we believe that the intent of the statute was to ensure that a military installation is provided notice of the submittal of an application for a major subdivision preliminary plat, and as such, the statute should be modified to explicitly state this.

Based on the preceding analysis, the final point on the list of required notifications is apparently redundant, in that the "increase" in the size of a subdivision would require the modification of the preliminary plat to add land, or in the case of a subdivision which has been approved and platted, would require the filing of a new preliminary plat, as it is redundant, and potentially confusing,

Matters related to the permitting of tall structures and the approval of subdivisions is also frequently a matter of administering the ordinance, and not, as the statute assumes, a legislative or discretionary matter which will be heard by the governing body during a public hearing. As ministerial actions, when that is the case, any comment received from the military installation by the local government would theoretically carry little weight given the mandate to make a decision based on the standards of the ordinance. Clarification on these matters should be incorporated into the statute to ensure that the expectations of each party in this process are well understood.

The list of items requiring notification should also be expanded to require other leading indicators of potential development activity be communicated to military installations. Zoning, subdivision, and permitting notifications are indicators of the final stages of the development process, and while important, do not provide the kind of fore-notice that would significantly enhance civil-military land use coordination. To achieve better long-range coordination on these matters, it is recommended that the statutes be amended to require notifications for annexations, utility extensions, large scale clear cutting, and major transportation projects within the 5-mile boundary area. These leading indicators of future development are the more appropriate stage for the military to provide comments and raise concerns about potential incompatible growth patterns as opposed to the point in the process where significant

expenditures, inducing land acquisition and infrastructure investments have already occurred.

As a final component of this recommendation, it is proposed that the statutes be updated to require the adoption of military land use compatibility statements when making legislative zoning decisions within the statutory notification area. Local governments are already required to adopt statements regarding the consistency of the proposed actions with their comprehensive plans, and it is envisioned that these military land use compatibility statements would follow the same general form. In the interim, it is recommended that RLUAC work with its local government partners to incorporate this policy into their local ordinances and begin implementing it voluntarily to enhance awareness about military land use compatibility issues.

CG-7: WORK WITH OTHER MILITARY COMMUNITIES IN NORTH CAROLINA, THE NC REAL ESTATE COMMISSION, LOCAL REAL ESTATE ADVOCACY TRADE GROUPS AND LEGISLATIVE REPRESENTATIVES FROM MILITARY COMMUNITIES TO UPDATE REAL PROPERTY DISCLOSURE REQUIREMENTS.

Justification: Sellers of real property in North Carolina are required to disclose a variety of factors related to their property when it is offered for sale. As a result of past JLUS recommendations, the NC Real Estate Commission adopted a rule modifying the residential real property disclosure form to

include a required disclosure of impacts from “military” sources on the same line in the disclosure that other “nuisance” type impacts are disclosed. Disclosure of military related impacts during real estate transactions is an important feature of the full spectrum of land use compatibility tools – with this one oriented toward enhancing public awareness about potential compatibility issues. The disclosure, however, is subject to some weaknesses which we feel that can be eliminated through legislative mandate to the NC Real Estate Commission.

The primary concern with the status quo is that the military impact disclosure was adopted as an administrative action of the NC Real Estate Commission, and there is no statutory mandate for the residential real property disclosure form to include such disclosure. There is precedent in NCGS 47E for the mandate of certain disclosure, and we recommend that legislation be sought to include military impacts in the mandate. Furthermore, we recommend that such mandate require that the military impact disclosure be a separate item on the list of required disclosures to better distinguish it from other impacts. It is also recommended that the nature of the specific impact be disclosed to ensure that the buyer is aware of the discreet compatibility concern, i.e. noise, aircraft accident potential or other impact.

CG-8: INCLUDE THE PRESENCE OF MILITARY TRAINING / OPERATIONAL IMPACTS AS PART OF THE OFFICIAL REAL PROPERTY ASSESSMENT RECORDS MAINTAINED BY THE TAX ASSESSOR IN EACH COUNTY.

Justification: To enhance the effectiveness of the real property disclosure rule, and to heighten public awareness in general, it is recommended that RLUAC work jointly with county tax assessors in the region to identify impacted properties, make notations in the official record to that effect, and update this data on a regular basis to reflect changes in areas of impact.

CG-9: LOCAL GOVERNMENTS SHOULD INCORPORATE MILITARY TRAINING IMPACTS, COMPATIBILITY FACTORS, AND CRITICAL ENVIRONMENTAL DATA INTO COMPREHENSIVE PLANS.

Justification: Comprehensive plans form the foundation of land use policy for local governments. The inclusion of the type and location of military training impacts, compatibility recommendations associated with those impacts, and environmental features that are critical to maintaining military readiness will help to ensure that compatible growth policies, in the form of land use regulation, the future land use map, and capital improvement plans are informed by these factors. Since each community in the region is on a different cycle with regard to planned updates to their comprehensive plans, it is recommended that RLUAC seek funding to prepare supplements containing this information so that each local

government can adopt them as appendices to their current plans in the interim. Once a local government cycles into a plan update, then it can incorporate this information into the body of its updated plan and utilize the information to develop policies that will help it grow compatibility and support the sustainability of Fort Bragg's mission.

CG-10: ADOPT MILITARY COORDINATION OVERLAYS TO ENSURE THAT REQUIRED COORDINATION OCCURS WITHIN THE STATUTORY AREA.

Justification: Most of the communities in the Fort Bragg region have excellent compliance records with the statutory notification requirements for land use actions in the 5-mile area around the installation (NCGS 160A-364(b) / 153A-323(b)). Ensuring that all required notifications are provided to RLUAC to review on behalf of Fort Bragg, however, can be a challenge, particularly in smaller communities, or when staff changes occur and new personnel are not familiar with the requirements. The adoption of a military coordination zoning overlay in each community that corresponds to the statutory boundary (and potentially areas of compatibility concern related to aviation training) will help to ensure that notification occurs for the items required by statute. This is not envisioned as a land use restriction, but rather as a triggering mechanism to help ensure statutory compliance in support of maintaining land use compatibility in the region and sustaining Fort Bragg's mission.

CG-11: ADOPT COMPATIBLE USE OVERLAYS – PARTICULARLY FOR FIXED COMPATIBILITY/SAFETY CONCERNS: APZ, IMAGINARY SURFACES

Justification: At the discretion of each local government in the region, they are encouraged to adopt compatible use regulations to address the discrete types of military land use compatibility issues that are present in their communities. The most effective of these regulations would address land use compatibility issues related to fixed sources of impact, with a particular emphasis on military aviation facilities. Examples of the types of zoning overlay districts that local governments might adopt, include aircraft accident potential zone overlay districts, airfield imaginary surface overlay districts, and low-level flight corridor overlay districts. It is recommended that RLUAC seek funding to provide technical assistance to local governments to adopt such ordinances, as desired.

CG-12: IMPROVE QUALITY AND AVAILABILITY OF LOCAL LAND USE AND INFRASTRUCTURE DATA (GIS)

Justification: The GIS data that is maintained by local governments in the Fort Bragg region is of varying quality and currency. At the county level, parcel data is typically of a high quality and up-to-date. Other data, such as zoning district data files, are sometimes lacking in their currency, and therefore may not be reflective of current conditions. Spatial data

related to future land use plans, water and sewer utilities, and similar information is often not available, again particularly in the smaller communities in the region. It is recommended that RLUAC and its regional partners seek funding and technical partnerships to assist local governments that lack the capability to develop and maintain such data. This will, in turn, help RLUAC to maintain better situational awareness of the policies, plans, and infrastructure that influence growth decisions, help to inform future compatible growth studies, and enhance capabilities for performing land use reviews.

CG-13: WORK WITH LOCAL GOVERNMENTS IN THE REGION TO IMPLEMENT THE RECOMMENDATIONS OF THE 2007 LIGHT POLLUTION STUDY.

Justification: In 2007, RLUAC prepared a light pollution study for the Fort Bragg region, which identified high levels of ambient night lighting in the region associated with urban growth patterns. Night training is an important component of the military training mission, and the degradation of the dark sky environment in the region threatens the military's ability to train in the manner that it fights. In addition to background lighting in the night sky, direct glare created by high intensity lighting in both rural and urban areas can impede the use of night vision devices by aviators, and potentially can interfere with their ability to safely navigate at night. The light pollution study recommended that local governments in the region adopt outdoor lighting

regulations to, first, prevent the further degradation of the nighttime training environment, and eventually, reduce the night lighting footprint of civilian communities in the region. It is recommended that RLUAC seek funding to provide technical assistance to local governments who wish to adopt outdoor lighting regulations in furtherance of the findings of the study.

CG-14: ADOPT ORDINANCES FOR THE REGULATION AND PLACEMENT OF SMALL WIRELESS ANTENNA WITHIN MUNICIPAL RIGHTS-OF-WAY, INCLUDING PUBLIC SAFETY CRITERIA, AND ENCOURAGE NC DEPARTMENT OF TRANSPORTATION (NCDOT) TO ENACT SIMILAR REGULATIONS IN ITS ADMINISTRATIVE RULES FOR NCDOT RIGHTS-OF-WAY.

Justification: In 2017, the North Carolina General Assembly enacted SL 2017-159, which permits greater access to both state and municipal rights-of-way for the erection of "small cell" wireless telecommunications antennae. This expanded authority allows for the erection of new poles, and the modification of existing utility poles, up to a maximum height of 50 feet. While this is a relatively low altitude compared to the typical altitude, there are areas where a 50 foot tall obstruction could pose a hazard to aviation operations, particularly in proximity to military airfields, landing zones, and nap-of-earth training routes.

It is therefore recommended that each local government in the region enact a police power ordinance, as permitted by

statute, that addresses both the placement of such facilities in municipal rights-of-way as well as provides a public safety standard that can be used to deny the placement / modification of poles where such might pose a hazard to aerial navigation. Many of the rights-of-way of potential concern are under the control of NCDOT, and therefore RLUAC should work with that agency to ensure that it has similar standards in place, and is coordinating with RLUAC / Fort Bragg to ensure that the placement of such structures in its rights-of-way do not pose a hazard to aviation operations.

CG-15: EXPAND COMPATIBILITY REVIEWS TO INCLUDE MILITARY AIRSPACE AND TRAINING ROUTES OUTSIDE OF THE 5-MILE STATUTORY REVIEW AREA.

Justification: RLUAC has traditionally focused its mission on the area within the 5-mile statutory notification area around Fort Bragg due to the concentration of military training and operational impacts and environmental concerns in this area. Areas of potential compatibility concern, however, extend well beyond this 5-mile area, with particular regard to aviation related compatibility concerns. Military operations areas (MOAs), maintenance test flight areas, nap-of-earth (NOE) flight training areas, and the aviation routes for traffic to and from the drop zones on Fort Bragg all extend outside of this 5-mile boundary. Preserving Fort Bragg's aviation training capabilities is critical to the long-term sustainability of the installation's

mission. Therefore, it is recommended that RLUAC extend its compatibility analyses and monitoring outside of the statutory 5-mile notification area for identified MOAs, flight training areas, and aviation routes.

While the FAA Obstruction Evaluation / Airport Airspace Analysis Division (OE/AAA) is theoretically coordinating with Fort Bragg on proposals to erect tall structures in these areas, not all of the proposals will either qualify for submission to OE/AAA because of their height, or may not reach the point of contact (POC) on Fort Bragg for review. Providing this monitoring and evaluation service will enhance the capability of Fort Bragg to maintain situational awareness and provide feedback when potential obstructions to aerial navigation are proposed in these critical areas. This will require both proactive monitoring of submissions to the OE/AAA in these areas of concern, and, if possible, additional coordination with the communities which have land use regulatory authority in these areas of concern to ensure that permit applications are forwarded to RLUAC.

CG-16: ENHANCE PUBLIC OUTREACH AND AWARENESS REGARDING COMPATIBILITY ISSUES RELATED TO MILITARY TRAINING AND OPERATIONAL IMPACTS.

Justification: The enactment of regulations and the preservation of land are only two components of a multi-faceted approach that is necessary to ensuring the long-term sustainability of Fort

Bragg's training mission. Public awareness about the nature, location, and cause of military training impacts helps to reinforce the need for, and importance of, regional efforts to maintain a compatible land use environment. In general, providing public outreach and awareness regarding these critical issues, should be increased throughout the region. Examples of additional actions that might be considered, in addition with other ongoing public awareness efforts include, developing a static signage program to notify the public of the presence of military training activity, such as noise and low flying aircraft, as well as coordinating public outreach efforts to regional organizations that deal with land use and development issues, such as homebuilders, developers, and the real estate community.

8.2.3 ENVIRONMENTAL (E)

E-1: CONTINUE SUPPORT FOR THE PROTECTION OF THREATENED AND ENDANGERED SPECIES THAT MAY IMPACT MILITARY READINESS THROUGH THE SUCCESSFUL PROGRAMS AND PARTNERSHIPS THAT HAVE BEEN DEVELOPED TO PRESERVE THE MILITARY TRAINING MISSION AND CONSERVE CRITICAL ECOSYSTEMS AS UNDISTURBED HABITAT.

Justification: The Fort Bragg region has a long history of successfully working together, in partnership with the military, as well as other federal and state agencies, and nonprofit conservation organizations, to preserve and protect critical habitat for threatened and endangered species that have

a nexus with the military training mission at Fort Bragg. Of particular note is the highly successful, now decades long effort, to preserve the longleaf pine ecosystem in the region as habitat for the endangered red-cockaded woodpecker.

Continuing these efforts is critical to the long-term sustainability of Fort Bragg's mission, since the degradation of habitat in areas outside of the installation could lead to a determination that Fort Bragg would have to increase its protection of any species that is facing threats in the region. This could, in turn, restrict training – including locations, times of year, and the types of training that occur.

The partnerships and funding mechanisms that have been developed to acquire land, conservation easements, and development rights should be continued, with a specific focus on working with Fort Bragg to identify lands that are critical to preserve the long-term sustainability of its mission. RLUAC should serve as a hub in this larger partnership, including working with Sustainable Sandhills, the Sandhills Conservation Partnership, the EPA, the US Fish and Wildlife Service, NC Wildlife Resources, the Eastern NC Sentinel Landscape Program, USDA, NC Agriculture and other entities that share a conservation mission that shares a nexus with the sustainability of the training mission at Fort Bragg.

Local governments can assist with efforts to protect critical habitat by developing ordinances that require a grading permit or other similar permit prior to land being cleared in their jurisdiction. During the grading permit review process, conservation partners can identify critical habitat areas that may need to be conserved. This proactive approach will provide opportunities for conservation partners to discuss programs and conservation opportunities with property owners and developers.

E-2: SUPPORT THE DEVELOPMENT OF RESILIENT ENERGY SOURCES THAT ARE COMPATIBLE WITH MILITARY TRAINING REQUIREMENTS.

Justification: DoD Instruction 4170.11 enacts policies that require military installations to seek resilient energy resources to support the energy requirements necessary to fulfill their missions. Resilient energy resources include a range of energy generation and storage solutions, including renewable / alternative energy facilities. The acceptance of additional generating, transmission or storage capacity in the region could be a component of the Army fulfilling this requirement for Fort Bragg. Local governments should anticipate the possibility that new energy facilities may be developed to meet the installation's energy needs, and should work with RLUAC and Fort Bragg to ensure that such facilities are sited in such a manner as to not create negative impacts on civilian communities in the region, or to interfere with the military training mission at Fort Bragg.

E-3: DEVELOP A REGIONAL CLIMATE RESILIENCY PLAN BASED ON THE CUMBERLAND COUNTY MODEL TO INFORM LOCAL AND MULTI-JURISDICTIONAL SCALE DECISION-MAKING IN THE FORT BRAGG AREA.

Justification: In 2016, Cumberland County, in association with the City of Fayetteville and Sustainable Sandhills, developed a climate resiliency plan that examined vulnerabilities in the county and proposed strategic actions to enhance the resilience of the communities to climate induced hazards. Water resources, natural ecosystems, and other factors that could affect military readiness, either directly or indirectly, are vulnerable to the potential negative effects of changing climatic conditions. Preparing the region's communities by assessing their unique vulnerabilities and developing implementation recommendations to make them more resilient if change occurs will help the region deal with an uncertain climate future. With collaborative planning for the potential negative impacts of modified climatic conditions, the region's communities can better support the resiliency of Fort Bragg with collaborative actions that include responses to potential training mission vulnerabilities. Working together will ensure that these issues that transcend the region are not overly burdensome to the military.

E-4: SUPPORT REGIONAL EFFORTS TO ENSURE THE ADEQUATE SUPPLY AND QUALITY OF DRINKING WATER SOURCE.

Justification: Population growth in the region, as well as other factors such as inter-basin transfers or the introduction of pollutants through stormwater runoff and other development related sources, can impact both the quantity and quality of drinking water resources that are available to support both the region's civilian communities as well as the military. Ensuring that the region has an adequate, clean and sustainable supply of drinking water resources to draw from, including both ground and surface waters, will help to ensure the region's continued growth and the sustainability of Fort Bragg and its mission. The region's communities should work together, and with Fort Bragg and other federal and state agencies, as well as nonprofit conservation organizations, to safeguard drinking water supplies from environmental degradation. Potable water providers should also work together to ensure not only the long-term viability of their own water resources, but also work across the region to ensure that each of their partner communities are in a position to support and sustain each other, as well as Fort Bragg in the event of the temporary or long-term degradation of supply sources for potable water. In turn, this will enhance the region's resiliency to both human induced and natural events that might disrupt potable water supplies.

E-5: INCORPORATE GREEN GROWTH TOOLBOX DATA INTO LOCAL PLANS TO INFORM LAND USE AND GROWTH DECISIONS.

Justification: The NC Wildlife Resource Commission's Green Growth Toolbox is a significant resource for local government planners. The data layers contained in the GGT provide insight into the unique environmental features in each community and identifies land and water resources, as well as wildlife habitat that are critical components of the Sandhills ecosystem. The incorporation of this data into local land use plans and other policy documents will help to ensure that environmental considerations are taken into account when dealing with development related matters. This, in turn, will help to preserve environmental features in the region that have a nexus with military readiness.

8.2.4 FORT BRAGG (FB)

FB-1: MAINTAIN AN ACTIVE ROLE IN THE REGIONAL LAND USE ADVISORY COMMISSION.

Justification: Fort Bragg has been a key member of the Regional Land Use Advisory Commission since its inception. This regional organization provides Fort Bragg with a broad ranging public forum that reaches across community lines and provides the installation's leadership team with direct and regular contacts with local government officials, who, in turn, help to shape

policies in the region that help to sustain Fort Bragg. Active participation in RLUAC by Fort Bragg's leadership team will help to sustain these vital community connections and provide opportunities for the installation to bring matters of concern to policymakers in a collaborative and supportive environment.

FB-2: FORMALIZE AN AGREEMENT FOR LAND USE REVIEWS / COORDINATION WITH AND THROUGH RLUAC.

Justification: Fort Bragg has long relied on RLUAC to provide professional support to the installation in reviewing, providing analysis, and making recommendations to the statutorily mandated land use reviews that local governments are required to send to the installation. This ongoing arrangement was, at one time, the subject of a formal agreement, which has since lapsed. Formalizing this arrangement will help to support RLUAC's credibility in the region as the official provider of responses to land use reviews, while also ensuring that Fort Bragg is able to continue to provide timely, accurate and regionally supported responses when land use reviews are requested by local governments.

FB-3: CONDUCT REGULAR UPDATES TO THE FORT BRAGG ICUZ STUDY.

Justification: The Installation Compatible Use Zone Study program is a critical tool in Fort Bragg's efforts to maintain land use compatibility around the installation. As a key component

of the compatibility criteria that RLUAC utilizes to provide land use reviews for local governments on behalf of Fort Bragg, it is important for the information regarding areas of compatibility concern to be as up-to-date as possible and correspond directly to the installation's mission. It is therefore recommended that Fort Bragg establish a regular schedule, in combination with other triggering criteria (for example, the fielding of new weapons systems) that inform the future timing of updates to its ICUZ document.

FB-4: CONTINUE TO PARTICIPATE IN THE NC SANDHILLS CONSERVATION PARTNERSHIP.

Justification: Formed in 2000 with a mission to protect, enhance and restore the Sandhills ecosystem, the NC Sandhills Conservation Partnership has been a significant component of the recovery of the red-cockaded woodpecker population in the Fort Bragg region, and continues to play a significant role in preserving and protecting lands that have a critical nexus with Fort Bragg's training mission. Fort Bragg's ongoing participation in this organization is key to its long-term success, as it serves as a focus for the organization's mission.

FB-5: MAINTAIN A COMMITMENT TO PRESERVE AND PROTECT THE LONGLEAF PINE ECOSYSTEM.

Justification: Fort Bragg has maintained a commitment to

protecting the Longleaf Pine Ecosystem for many years. The success of maintaining a contiguous stretch of longleaf pine forest has provided suitable habitat for red-cockaded woodpeckers expanding the population across the installation. In consultation with the US Fish and Wildlife Service, Fort Bragg diligently manages development in the cantonment area to prevent fragmentation of the special emphasis area referred to as the Greenbelt. Additionally, Fort Bragg works closely with the NC Sandhills Conservation Partnership to preserve and protect land that will provide the opportunity to genetically connect the Fort Bragg red-cockaded woodpecker population to the Camp Mackall red-cockaded woodpecker population.

FB-6: CONTINUE EFFORTS THROUGH REGIONAL, STATE AND FEDERAL PARTNERS TO ENCUMBER LAND AND DEVELOPMENT RIGHTS IN AREAS THAT WILL HELP TO SUSTAIN THE MILITARY TRAINING MISSION AND THE LONGLEAF PINE ECOSYSTEM.

Justification: Through the Army Compatible Use Buffer program, Fort Bragg has successfully developed partnerships with nonprofit conservation organizations (through the NCSCP), state agencies, and other federal entities to leverage financial resources to acquire land and conservation easements that help to support the sustainability of its mission. These partnerships often leverage funding from the Readiness and Environmental Protection Integration program to acquire habitat, farmland, or open space in areas that have military training impacts

or environmental features that could degrade the mission, if developed. Fort Bragg is encouraged to continue using these successful programs and engaging with its regional partners to identify, seek funding and acquire land and easements that are critical to training requirements and environmental initiatives.

FB-7: REVIEW CURRENT NOISE COMPLAINT ACCEPTANCE AND RESOLUTION PROCEDURES, UPDATE AS NECESSARY, AND IMPLEMENT IN A MANNER THAT ENSURES CONSISTENCY.

Justification: The JLUS identified a number of different entities on Fort Bragg that received and sought resolution of complaints related to military training activities. The disparate and informal procedures in place across these entities with regard to such complaints can lead to a lack of full awareness of the location, nature and scale of training related noise issues in the civilian communities around the installation. Fort Bragg is encouraged to reinforce and centralize its noise complaint resolution program to ensure that it has a centralized database of all noise related complaints. This, in turn, will help the installation environmental noise management agency better respond to emerging noise issues in the civilian communities, and thereby enhance the sustainability of its training mission.

8.3 IMPLEMENTATION

Implementation strategies with both regional and community-specific actions were developed as a means to provide direct guidance on how the recommendations can be implemented by the study partners. The recommendations outlined in Section 8.2 are compiled into an implementation matrix in this section to be used as a quick and easy reference for local government officials, state and federal partners, and other parties involved in the implementation of the Joint Land Use Study. The implementation matrix identifies resources, time frames and responsible parties for each implementation strategy, to help stakeholders understand the most effective approach to implementing the strategies. The following are descriptions of each of the categories:

Recommendation Category – The major category was derived through the research of current conditions and input from stakeholders. They provide the overall context for the basis of the recommendations.

Recommendations – The recommendations are more specific strategies categorized according to the key area it supports.

Time frame – Represents the time frame in which each action step should be addressed. Generally, shorter time frames infer a higher priority. Time frames are indicated in the matrix as short-term, mid-term, or long-term. Below is a description of each time frame.

- Short-term - should be completed in the first 12 months
- Mid-term - should be achieved in 1 to 3 years
- Long-term - should be achieved in 3 to 5 years

Resources – Resources are primarily related to monetary cost to complete the implementation strategies. The tables uses the “\$” symbol to represent monetary ranges. Actual resources could cost more or less depending on the assistance or consultant selected. The ranges are as follows:

- \$ - Less than \$10,000
- \$\$ - \$10,000-\$50,000
- \$\$\$ - \$50,000-\$100,000
- \$\$\$\$ - More than \$100,000
- Policy – Not outside of normal annual budget expenditures

Partners – This category identifies partners associated with the Fort Bragg region that play a key role in implementing each recommendation. This category also includes the Office of Economic Adjustment, the State of North Carolina and the inclusion of a consultant or other outside party that may be necessary to help implement and achieve certain recommendations. The partner abbreviations utilized in the plan matrix are as follows:

- RLUAC = Regional Land Use Advisory Commission
- LG = Local Government MC - Military Community Partners
- FB = Fort Bragg
- ORP - Other Regional Partners
- OEA = Office of Economic Adjustment (Technical Assistance and Funding Resource)
- MCP = Military Community Partners
- NC = State of North Carolina

8.4 IMPLEMENTATION TABLE

1. REGIONAL COORDINATION				
#	Recommendation	Time frame	Resources	Partners
RC1	Enhance RLUAC's organizational strengths and respected regional leadership role through the development and implementation of a long term strategic plan to guide the organization's growth, formalizing its role in providing land use coordination services in coordination with Fort Bragg, broadening its public outreach efforts, and building upon the long-term partnerships it has forged with governmental and nonprofit agencies that share its core mission.	Short-term	\$	RLUAC

2. COMPATIBLE GROWTH				
#	Recommendation	Time frame	Resources	Partners
CG1	Implement updated compatibility / conservation rating criteria for use in RLUAC land use reviews.	Short-term	Policy	RLUAC, LG, FB, ORP
CG2	Perform regular reviews and updates to the areas of compatibility concern in coordination with Fort Bragg.	Ongoing	Policy	RLUAC, LG, FB, ORP
CG3	Enhance the land use review communications to local governments to provide more in-depth information regarding the basis for RLUAC's recommendation and emphasizing the advisory nature of the recommendation.	Short-term	Policy	RLUAC, FB, ORP
CG4	Develop and implement an online land use case management system to streamline the workflow of receiving, reviewing, providing recommendation on, and tracking land use cases.	Short-term	\$\$\$	RLUAC, LG, OEA
CG5	Implement a plan to regularly update compatibility and conservation data on the SandhillsGIS.com mapping platform.	Ongoing	\$	RLUAC, LG, FB, ORP, NC
CG6	Work with other military communities in North Carolina, the NC Department of Military and Veterans Affairs, and legislative representatives from military communities to update and strengthen military land use coordination statutes.	Mid-term	Policy	RLUAC, LG, NC, MCP
CG7	Work with other military communities in North Carolina, the NC Real Estate Commission, local real estate advocacy trade groups and legislative representatives from military communities to update real property disclosure requirements.	Mid-term	Policy	RLUAC, LG, NC, MCP
CG8	Include the presence of military training / operational impacts as part of the official real property assessment records maintained by the tax assessor in each county.	Mid-term	\$	LG, RLUAC, FB

2. COMPATIBLE GROWTH (CONTINUED)				
#	Recommendation	Time frame	Resources	Partners
CG9	Local governments should incorporate military training impacts, compatibility factors, and critical environmental data into comprehensive plans.	Short-term	\$\$\$-Policy	LG, RLUAC
CG10	Adopt military coordination overlays to ensure that required coordination occurs within the statutory area.	Short-term	\$\$\$-Policy	LG, RLUAC
CG11	Adopt compatible use overlays – particularly for fixed compatibility/safety concerns: APZ, Imaginary Surfaces	Short-term	\$\$\$-Policy	LG, RLUAC
CG12	Improve quality and availability of local land use and infrastructure data (GIS)	Short-term	\$\$	LG, RLUAC
CG13	Work with local governments in the region to implement the recommendations of the 2007 Light Pollution Study.	Mid-term	\$\$-Policy	LG, RLUAC
CG14	Adopt ordinances for the regulation and placement of small wireless antenna within municipal rights-of-way, including public safety criteria, and encourage NC Department of Transportation (NCDOT) to enact similar regulations in its administrative rules for NCDOT rights-of-way.	Mid-term	\$\$-Policy	LG, RLUAC, NC
CG15	Expand compatibility reviews to include military airspace and training routes outside of the 5-mile statutory review area.	Long-term	\$\$	LG, RLUAC, FB, ORP, NC
CG16	Enhance public outreach and awareness regarding compatibility issues related to military training and operational impacts.	Mid-term	\$\$	LG, FB, RLUAC

3. ENVIRONMENTAL (E)				
#	Recommendation	Time frame	Resources	Partners
E1	Continue support for the protection of threatened and endangered species that may impact military readiness through the successful programs and partnerships that have been developed to preserve the military training mission and conserve critical ecosystems as undisturbed habitat.	Ongoing	Policy	RLUAC, FB, LG, ORP, NC
E2	Support the development of resilient energy sources that are compatible with military training requirements.	Ongoing	Policy	RLUAC, ORP, LG, FB, NC
E3	Develop a Regional Climate Resiliency Plan based on the Cumberland County model to inform local and multi-jurisdictional scale decision-making in the Fort Bragg area.	Mid-term	\$\$\$	LG, RLUAC, FB, ORP
E4	Support regional efforts to ensure the adequate supply and quality of drinking water source.	Ongoing	Policy	RLUAC, LG, FB, ORP
E5	Incorporate the NC Wildlife Resource Commission's Green Growth Toolbox data into local plans to inform land use and growth decisions.	Ongoing	Policy-\$	LG, RLUAC, ORP

4. FORT BRAGG (FB)				
#	Recommendation	Time frame	Resources	Partners
FB1	Maintain an active role in the Regional Land Use Advisory Commission.	Ongoing	Policy	FB, RLUAC
FB2	Formalize an agreement for land use reviews / coordination with and through RLUAC.	Short-term	Policy	FB, RLUAC
FB3	Conduct regular updates to the Fort Bragg ICUZ study.	Ongoing	Policy	FB
FB4	Continue to participate in the NC Sandhills Conservation Partnership.	Ongoing	Policy	FB, ORP
FB5	Maintain a commitment to preserve and protect the longleaf pine ecosystem.	Ongoing	Policy	FB
FB6	Continue efforts through regional, state and federal partners to encumber land and development rights in areas that will help to sustain the military training mission and the Longleaf Pine ecosystem.	Ongoing	Policy-\$\$\$\$	FB, ORP, NC, RLUAC, LG
FB7	Review current noise complaint acceptance and resolution procedures, update as necessary, and implement in a manner that ensures consistency.	Short-term	Policy	FB

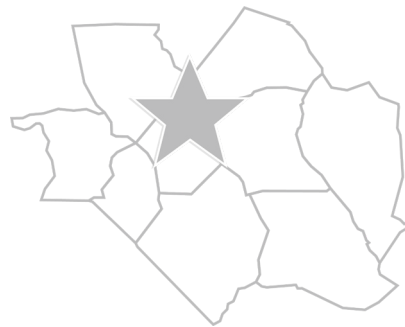
8.5 IMPLEMENTATION PRIORITIES

Implementation priorities with both regional and community-specific actions were identified from the comprehensive list of recommendations from the study. The priorities listed below should be considered for implementation over the next two years. The identified priorities will require additional funding and assistance from OEA.

1. Updates to Sandhills GIS Database - One of the primary tools utilized by the region for evaluating compatible use is the Sandhills GIS database. It is very important for this data based to be updated with the revised compatibility / conservation rating criteria for use in RLUAC land use reviews.
2. RLUAC website update - As part of implementing CG-4, the RLUAC website needs to be update to enable user friendly access to information concerning land use compatibility in the region. The current website should be updated in a manner to work seamlessly with the new case management and tracking system.
3. RLUAC case management and tracking system - Along with updating the RLUAC website, the new case management and tracking system will be developed concurrently to help implement CG-4.
4. Local government JLUS comprehensive plan supplements - A tailored set of comprehensive plan supplements will be prepared for each jurisdiction in the study area to aid in the implementation of CG-9.
5. Local government compatible use ordinance toolbox - In addition to the comprehensive plan supplements, it is important to develop a toolbox of specific ordinance updates for each jurisdiction that can be easily integrated into the zoning and subdivision regulations of each jurisdiction. This toolbox will implement CG-10, CG-11 and CG-14.
6. Local government GIS data assistance - While most local governments in the study area have developed comprehensive GIS databases and layers, some jurisdictions have not yet fully developed digital zoning layers and other similar digital data layers. The implementation of this goal (CG-12) is important to the overall evaluation and updating of land use

compatibility in the region over time. Existing gaps in the digital data make it more challenging to monitor changes in land use patterns over time.

7. Comprehensive plan assistance to local governments - As with the digital data capacity throughout the region, there are some jurisdictions that need technical assistance in preparing a comprehensive plan for their community, which will help ensure that the recommendations of the JLUS are implemented over time in all jurisdictions. This priority helps implement CG-9.
8. NC Wildlife Resource Commission's Green Growth Toolbox – local government implementation - Many local governments need assistance with incorporating the green growth toolbox data into their local databases and evaluation systems to help implement CG-1.



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