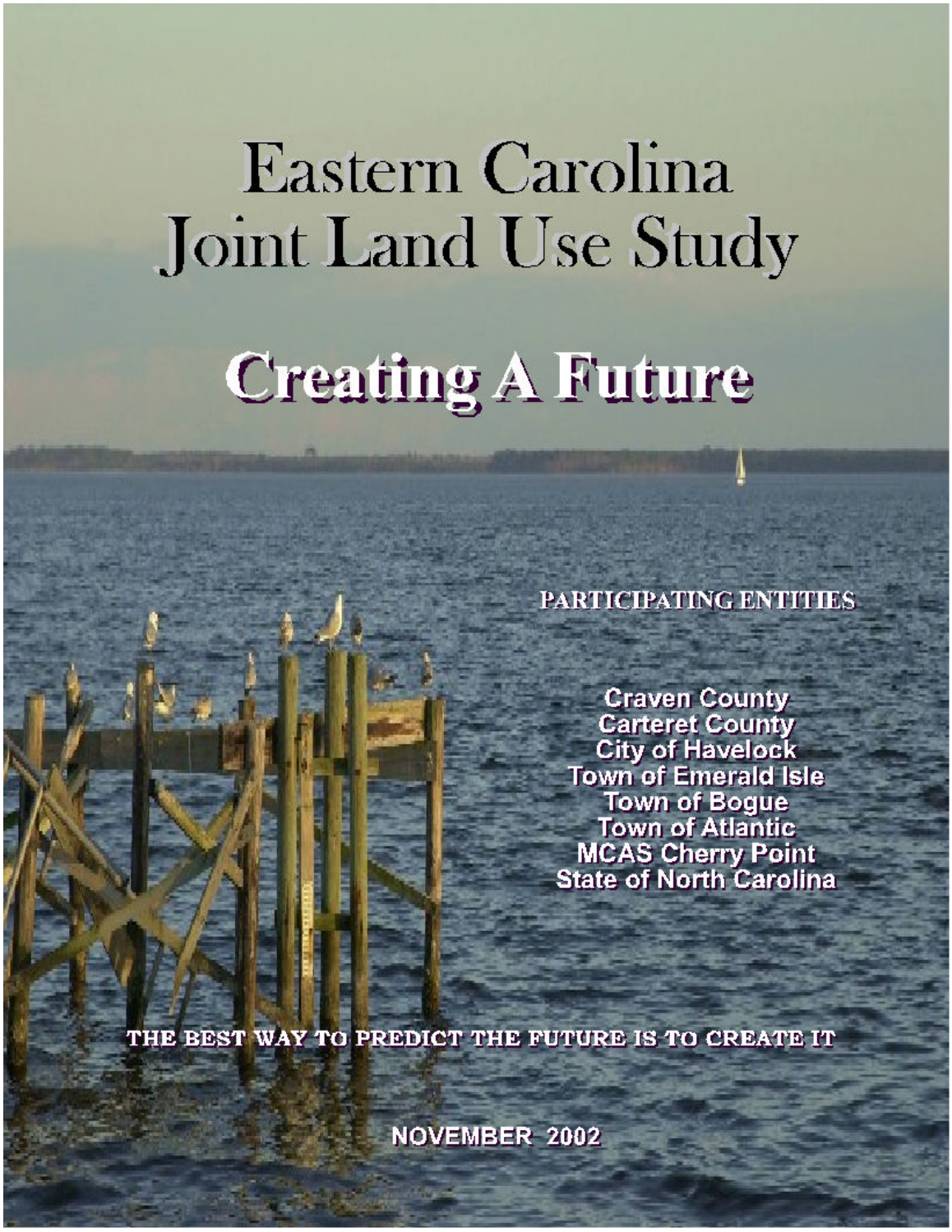

Eastern Carolina Joint Land Use Study

Creating A Future

PARTICIPATING ENTITIES

Craven County
Carteret County
City of Havelock
Town of Emerald Isle
Town of Bogue
Town of Atlantic
MCAS Cherry Point
State of North Carolina

THE BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT

NOVEMBER 2002

EASTERN CAROLINA JOINT LAND USE STUDY

This study was prepared under contract with Craven County, Carteret County, the City of Havelock, the Town of Emerald Isle, the Town of Bogue, and the State of North Carolina with financial support from the Office of Economic Adjustment and the Department of Defense.

PREPARED FOR

Craven County
Carteret County
City of Havelock
Town of Emerald Isle
Town of Bogue
Town of Atlantic
MCAS Cherry Point

PREPARED BY

Eastern Carolina Council
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November 2002

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Introduction

Throughout the United States, military installations and associated mission activities have had both positive and negative impacts on nearby communities. These facilities can be major economic engines by creating new jobs for residents as well as expanding monies for goods and services. However, many of the military operations can be disruptive to nearby residents because of high noise levels.

Most major military installations were originally located outside urban centers or in sparsely populated rural areas. However, incompatible land uses near bases, particularly residential development, have caused more and more people to be exposed to high noise levels and accident potential zones (APZ).

Cooperative planning by military and civilian communities can anticipate the potential for land development conflicts and avoid these problems. When people and communities are exposed to noise and accident potential, they often seek relief. This often places pressure on the military base to modify operations and procedures, which could have a significant negative impact on the overall mission of an installation. Ultimately, the change in operations could lead to total elimination of flight operations, and the closure of bases, which means millions of dollars lost in the local economy. In this scenario, both parties lose. However, if a comprehensive planning program involving both parties is created, a win-win situation can be created.

Some in the local communities have voiced concern over the noise levels that result from MCAS Cherry Point and MCALF Bogue operations. Subsequently, MCAS Cherry Point initiated discussion to examine joint land use planning with affected local governments.

Craven County, Carteret County, the City of Havelock, the Towns of Emerald Isle and Bogue, as well as the State of North Carolina, have all agreed to participate in the Eastern Carolina Joint Land Use Study (ECJLUS).

Protecting Operational Integrity v. Community Growth

In 1973, the United States Department of Defense (DoD) established the Air Installation Compatible Use Zones (AICUZ) program to promote community growth which is compatible with present and future military installation operations. The program examines existing land uses, growth projections and recommends compatible growth patterns based on noise contours, accident potential zones from current and projected aircraft activities for that facility.

Because the recommendations from the AICUZ studies are not binding on communities and may not be included in local area planning activities, some communities and installations have begun to work together to develop a Joint Land Use Study to help resolve the conflict that may occur between the base's mission objectives and local community growth patterns. The ECJLUS is a result of local communities in eastern North Carolina coming together to work with MCAS Cherry Point to establish land use guidelines and development regulations for the properties within the AICUZ footprint affected by MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic.

ECJLUS: Hitting Home

The ECJLUS has the following goals:

1. Protect the health, safety, and welfare of the civilian and military communities near MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic;

2. Identify appropriate regulatory and non-regulatory measures to ensure compatibility between local existing government and future land uses and Marine air and ground operations;

3. Increase communication and cooperation between MCAS Cherry Point, MCALF Bogue, Craven County, Carteret County, the City of Havelock, the Town of Emerald Isle, the Town of Bogue, the Town of Atlantic and the small nearby communities; and

4. Protect and promote the present and future operational capabilities of MCAS Cherry Point, MCALF Bogue and MCOLF Atlantic.

To achieve these goals, the following objectives have been met:

1. Establishment of a Policy Committee (PC) comprised of officials from each participating local government, MCAS Cherry Point, the State of North Carolina, Craven Regional Airport, and other appropriate agencies. The Policy Committee has reviewed and approved the specific planning methodologies and implementation strategies contained in this study.

2. Creation of a Technical Advisory Committee (TAC) comprised of professionals, managers, planners and citizens from each participating local government, MCAS Cherry Point, the State of North Carolina, and other relevant agencies. The Technical Advisory Committee provided technical expertise to the Policy Committee and helped develop and recommend specific methodologies and implementation strategies for the ECJLUS.

3. Projection of future development patterns within the study area and identification of potential points of conflict between land uses and air operations at MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic.

4. Evaluation of existing and proposed land use regulations within the study area to determine how conflicts between land use and air operations are currently addressed and identification of areas for improvement.

5. Identification of regulatory and non-regulatory measures to ensure compatibility between existing and future land uses and air operations.

Specific issues, which dictate the need for this Joint Land Use Study, include encroachment and potential conflict of land use in Havelock and unincorporated areas of Craven County. The need to limit high-density residential development in areas of Accident Potential and High Noise are important to ensure current and future operations at MCAS Cherry Point.

Although noise hazards are a concern in any community located adjacent to an installation, the overwhelming majority of residents of Havelock and areas surrounding the city seem to be very tolerant of the noise associated with operations at MCAS Cherry Point. No doubt, the fact that many of the Marines who work at MCAS Cherry Point live in or near the City of Havelock contributes to the more tolerant attitude. Despite this, it is important for the area to tailor development in order to have minimal impacts from noise. High-density residential development should not occur in high noise areas.

In areas impacted directly by operations at MCALF Bogue (Emerald Isle and Bogue), the issue of aircraft noise is more prevalent among the residents of these communities. Because the Auxiliary Landing Field is used primarily for AV-8B Harrier II training operations, the impact of noise has been more openly discussed by residents in public forums and the media.

In addition, Bogue and Emerald Isle, due to their proximity to the ocean, are facing more growth pressures than the areas adjacent to MCAS Cherry Point. The over-riding concern for potential land use conflicts deals more with density of development of existing parcels, with some concern for a few undeveloped parcels near MCALF Bogue. Encroachment to Bogue Field is prevented on one side by Bogue Sound, but development has already occurred in Accident Potential Zones on adjoining land areas of the field as well as across the Intracoastal Waterway in Emerald Isle.

At present, there are no fixed-wing operations at MCOLF Atlantic. However, many in the Atlantic community wanted the outlying landing field and surrounding land area to be included in the ECJLUS due to potential conflicts between private development and the potential increase in flight operations at the field.

The issues of encroachment, noise impact, and accident potential “hit home” in many communities in eastern North Carolina. Because of these concerns, the local governments in Craven County, Carteret County, the City of Havelock, the

Town of Emerald Isle, the Town of Bogue, and the Town of Atlantic have taken a proactive stance and agreed to undertake a Joint Land Use Study (JLUS) in cooperation with MCAS Cherry Point. The study is a locally-developed plan to guide development in our communities impacted by the military installation and its operations.

ECJLUS Recommendations Summary

1. Modify existing comprehensive plans and land use plans as well as implementation tools such as zoning ordinances, subdivision regulations, manufactured home park ordinances, building codes, and capital improvement plans to ensure compatibility with installation operations.
2. Enact regulations to guide growth in areas currently unprotected from uncontrolled growth. This includes expanding land use controls to incorporated and unincorporated areas adjacent to installations.
3. When possible, extend areas of extra-territorial jurisdictions (ETJs) and/or annex areas currently unprotected from uncontrolled growth.
4. Adopt and enact local policies promoting disclosure of safety and noise hazards prior to land transactions and development or sale of property.
5. Advocate for a change in North Carolina Statutes to require disclosure of safety and noise hazards in land records (zoning permits, deeds, etc.) and/or before any real estate sale, lease, or rent contract is finalized in defined areas around (military) airports.
6. Adopt noise attenuation requirements and recommendations for future development in high noise areas.
7. Produce maps for public distribution outlining areas of accident potential and high noise.
8. Develop and maintain a user-friendly web page available to the general public outlining areas of accident potential and high noise.
9. Educate lending institutions on appropriate mortgage lending in accident potential and high noise zones.
10. Support HUD lending restrictions on lending for development in accident potential and high noise zones.
11. Explore all available options for acquisition of critical properties (which could have significant encroachment potential) through fee simple purchase, restrictive use easements, and land exchanges.
12. Encourage uniform building codes modifications to mitigate noise for new structures built in high noise areas.

13. Develop a Capital Improvement Plan (CIP) to limit expansion of infrastructure to large, undeveloped areas, which are not currently served by public facilities, such as water, sewer, natural gas or surfaced roads, so that land within “impacted” areas would remain unserved.

14. Evaluate current and future Standard Operating Procedures (SOPs) of MCAS Cherry Point and MCALF Bogue to minimize adverse impacts on local communities.

15. Support MCAS Cherry Point in its efforts to work with local planning officials to examine the impact of noise through demonstration projects.

16. Enhance the current dialogue between MCAS Cherry Point, local government officials, and citizens of impacted communities.

17. Form a standing committee with local civilian membership to discuss air operations and review quarterly any noise concerns received by MCAS Cherry Point with t he goal of sharing information and informing the local communities of efforts to mitigate any negative impacts.

18. Ensure appropriate land use regulations, particularly zoning standards, are implemented along the proposed Havelock By-pass (NC 70) to minimize or prevent land uses that could negatively impact aircraft operations at MCAS Cherry Point.

19. Ensure appropriate land use regulations, particularly zoning standards, are implemented along NC 24, particularly adjacent to MCALF Bogue to minimize or prevent land uses that could negatively impact aircraft operations at MCALF Bogue.

20. Encourage public purchase of land for open space and compatible low density activities such as recreation.

21. Increase training and coordination of Emergency Response entities in the areas impacted by MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic.

22. Increase the frequency of the course rules briefing for locally based squadrons, particularly at MCALF Bogue.

23. Support state legislation to protect military installations from encroachment.

24. Continue to support and provide resources for the Crystal Coast Disaster Coalition.

25. Improve notification of additional planning guidelines in affected areas through proper signage.

26. Encourage the use of cutoff and semi-cutoff (shoebox) high sodium vapor lighting in the Accident Potential Zones.

27. Examine the feasibility of using other proposed outlying landing fields for Bogue Field aircraft operations.

28. Study the impact of altering the number of aircraft permitted in the Bogue Field, Field Carrier Landing Practice (FCLP) pattern.

29. Evaluate the feasibility of altering runway alignments at Bogue Field.

30. Update phone directories to clearly identify appropriate numbers to call for noise complaints/concerns.

31. Provide updated unclassified information on aircraft operations to websites for local communities.

32. Create a ECJLUS Implementation Committee (comprised of existing members of the Technical Advisory Committee) to monitor and guide implementation of Joint Land Use Study recommendations.

MARINE CORPS AIR STATION CHERRY POINT

History

In July of 1941 Congress appropriated almost $15 million for the construction and clearing of 8,000 acres of what would eventually become Cherry Point, the largest Marine Corps air station in the world.

Cunningham Air Field was officially commissioned on May 20, 1942 under the command of LtCol Thomas J. Cushman. Named for LtCol Alfred A. Cunningham, the first Marine aviator, the field was located on the Neuse River between Slocum and Hancock Creeks.

In 1942 the 3rd Marine Air Wing (MAW) first occupied the new facility. Later they were replaced with the 9th MAW, which was later deactivated and replaced by the current 2d MAW. The 2d MAW has participated in WWII, the Korean and Vietnam Conflicts, Operations Desert Shield and Desert Storm. Activity in Bosnia, Kosovo and Afghanistan can now be added to this list. In addition to providing aviation combat support to the 2d Marine Expeditionary Forces (II MEF), the men and women of the 2d MAW serve their country through their humanitarian efforts not only in the local community, but worldwide as well.

From the original 8,000 acres, MCAS Cherry Point has grown to where it now encompasses 13,169 acres. The self-contained air station has 15,973 acres, which are utilized off-site for various air crew training. There are four active runways. There are over 2,100 buildings on the property, which represent 10,895,736 square feet of space. There are 2,840 married housing units and 3,809 bachelor-housing units associated with Cherry Point. The plant is valued at $2 billion. The facility has nearly 8,000 marines and sailors stationed there and employs approximately 5,000 civilians.

There are 399 miles of streets at the air station along with 10 miles of railroad tracks. The self-contained facility has a water system with 26 wells which produce 6 million gallons of water per day and a sewerage treatment system which processes 3.5 million gallons per day. The station has a new potable water treatment and sanitary/industrial water system.

MCAS Cherry Point is located in Havelock, NC. There are four runways with a combined length of 32,000 feet, which are offset to form a rectangle centermat area. The primary runways are 14-32 and 05-23. (The runway numbers are determined by their headings in degrees on a compass). The touchdown areas of the runways are 1,000 feet long and contain approximately 3 million square yards of concrete. The Cherry Point runway system is so large that the Air Station serves as an alternate emergency landing site for the space shuttle that launches out of the Kennedy Space Center in Florida. Additionally, there are four Vertical Short Takeoff or Landing Harrier pads, two designated helicopter pads and helicopter landing areas at the Naval Aviation Depot (NADEP) and off the

airfield at MCAS Cherry Point. During 2001 there was approximately 105,000 air operations of all types of aircraft at MCAS Cherry Point.

There is a Tactical Air Command Control Center located at the field. The airfield provides immediate access to aerial training areas R-5306 and W-122. Takeoffs are made from the center of the airfield and landings are made toward the center of the airfield. All runways are 200 feet wide and have 125 foot wide asphalt shoulder paralleling each side.

The local flying area is a circle centered on MCAS Cherry Point with a radius of 200 miles. As a Class D Surface Area, MCAS Cherry Point extends from the surface to 2,500 feet above the elevation of the airport within a five statute mile radius from the geographical center of the airfield.

MCAS Cherry Point is an all weather master jet base that operates 24/7 (24 hours per day/7 days per week) to support 136 tactical aircraft. It is the home base for the Marine Wing Headquarters Squadron (MWHS-2), portions of the Marine Air Control Group (MACG-28), Marine Wing Support Group (MWSG-27), and the Marine Aircraft Group (MAG-14). MAG-14, a major tenant, is composed of a logistics squadron, four AV-8B Harrier Squadrons, two KC-130

Hercules Squadrons, four EA-6B Prowler Squadrons, and an unmanned Aerial Vehicle Squadron. The Harrier is a ground-attack jet with vertical takeoff and landing capabilities.

There are three tenant commands located at MCAS Cherry Point: 2d Marine Air Wing; the Naval Air Depot (NADEP); and Halyburton Naval Hospital.

MCAS Cherry Point is a six-time winner of the Commander-in-Chief's Installation Excellence Award. The Air Station is heavily involved in community service, civic development, and economic growth of the quad-county area.

Mission and Vision

Cherry Point's mission is to:

- Create, provide, and maintain an aviation support environment in which the Fleet Marine Force elements can successfully train Marines to win battles and preserve peace anywhere in the world.
- Operate and maintain facilities and assigned aircraft.
- Provide a full range of vital support services.
- Nurture the quality of life.
- Protect the natural environment.
- Conduct proactive community relations.
- Provide America with the best trained, best led, best supported armed forces capable of operating anytime and anywhere in the world to fight, win, and survive.

Cherry Point is entrusted to be the most efficient and innovative provider of aviation support facilities and services. Through the application of innovative business reform practices and the utilization of cutting edge technology, precious resources are being maximized while conserving assets. The goal is to become a world leader in environmental care by minimizing waste and recycling wherever possible. Cherry Point is committed to fulfilling its mission of support to all who utilize the facilities and services.
Cherry Point's vision is to be recognized as the most responsive, efficient and innovative provider of aviation support facilities and services in the Department of Defense.

Current Flying Activity and Pertinent Directives

It is the policy of the Commanding General to adhere to all Federal Aviation Administration (FAA) Regulations and the Office of the Chief of Naval Operations Instructions (OPNAVINST's) procedures regarding safe flight altitudes and noise abatement. MCAS Cherry Point and 2d MAW personnel are sensitive to the effects of noise on the base and surrounding communities and take all steps necessary to reduce aircraft noise. Procedures are in place to attain this goal, including but not limited to: no unauthorized overheads, low approaches or touch-and-go landings between 2400 and 0700 hours; restrictions on place, times, days, and percentages of high power run-ups; use of the "hush house" for AV-8 high power run-ups; and restricted operations (quiet hours) in local pattern.

Although aircraft overfly the City of Havelock, the Town of Minnesott Beach, Cedar Island Ferry Terminal as well as ferries on the Pamlico and Neuse Rivers, they are to avoid flying below 1000 feet within one nautical mile of Bayboro, 1500 feet within one nautical mile of Oriental, and 750 feet within 2 nautical miles of Ward Creek. Aircraft operating at BT-9 and conducting multiple runs are to avoid the towns of Hobucken and Lowland by 3 nautical miles when 3000 feet or below. Tactical jet aircraft are not authorized to perform practice approaches at the New Bern or Beaufort/Michael J. Smith Airport and are to avoid overflying these airports below 2000 feet within 3 nautical miles.

The public can report noise complaints to MCAS Cherry Point Airfield Operations. A 24-hour recorded noise complaint hotline number is provided as a public service. The Airfield Operations Officer is responsible for collecting, documenting, and researching noise complaints. Completed reports are forwarded to the Community Plans and Liaison (CP&L) Officer for review. The CP&L Officer is responsible for contacting complainants and providing researched information.

Pilots have specific reporting instructions with regard to incidents involving their mission which include weapons, people, property, maneuvers, or violations of flight regulations or the general prudential rules of flying. Planes taking off from MCAS Cherry Point are cautioned to avoid overflying the schools located to the left of the runway 23L extended centerline. Due to noise abatement restrictions,

runway 5R will not be the duty runway unless the wind is sustained at 10 knots or more. Field Carrier Landing Practice to runway 32L shall only be conducted after normal school hours. Marine Harrier pilots have been instructed not to overfly schools located between runways 14L, 05R, and 32L.

In order to safeguard the public, when a pilot decides to eject and still has control over his aircraft, he should guide it to BT-11, NKT 078/22 on a heading of 065 degrees.

Helicopter pilots have been instructed to exercise extreme caution after sunset because of the numerous unlit obstructions within a 5-mile radius of the field.

Economic Impact on the Community

Each year MCAS Cherry Point assesses its economic impact on the local community and publishes its findings. In the Economic Impact Fiscal Year 2002 Study, the data shows that Cherry Point has been and will remain a significant contributor to the region's economic growth. The payroll is expected to exceed $648 million. During Fiscal Year 2002, contracts awarded to North Carolina companies for construction, maintenance, and services are projected to exceed $30 million. Other Air Station services and support supplied by state and local businesses will exceed $125 million. Overall, it is estimated Cherry Point's total economic impact will exceed $1 billion. It is projected that more than $785 million will be spent in North Carolina, with approximately $680 million remaining in the quad-counties of Craven, Carteret, Pamlico and Jones.

The Marine Corps Community Services (MCCS) sustains programs that provide active duty military, retirees, family members, and other patrons with goods and services necessary to their health, comfort, and convenience. The income from MCCS Business Operations is used to enhance the Quality of Life initiatives and programs for the Marines, Sailors, and their families assigned to the station. In Fiscal Year 2002 it is projected that over $16 million will be spent in North Carolina.

MARINE CORPS AUXILIARY LANDING FIELD BOGUE (Carteret County)

General Description

Marine Corps Auxiliary Landing Field (MCALF) Bogue, NC is located approximately four miles east of Swansboro, NC. For Aircraft Firefighting and Rescue (ARFF) purposes it is considered predominately a category II airfield. However, because of its expeditionary surface, it is considered a category III airfield for FCLP and fixed wing operations. There are no hanger facilities or aircraft based at MCALF Bogue.

The airfield consists of one primary runway, 5/23 which is lighted and is 96 feet by a 4,010 feet AM-2 aluminum mat laid on a 150 feet by 4,010 feet asphalt strip. The deck size and markings are identical to the USS TARAWA. The deck lighting and simulated superstructures are to provide the same landing cues as the ship. Carrier deck lighting and marking are available at both ends of runway 5/23. The carrier deck simulates the USS America.

MCALF Bogue is maintained by the Marine Wing Support Group (MWSG-27) and is used by the 2d MAW aircraft to practice expeditionary airfield procedures. Air traffic control procedures for MCALF Bogue are governed by a letter of agreement between MCAS Cherry Point and 2d MAW.

Current Flying Activity and Pertinent Directives

According to the Air OPS Manual for Bogue Field, any unit which conducts air operations at MCALF Bogue submits a request to the 2d MAW in advance of the use. Most operations are conducted within the normal operating hours established for Bogue Field, but flights can be conducted before or after if justified.

All squadrons not locally based receive a course rules briefing prior to the beginning of any operations. Locally based is defined as squadrons stationed at Cherry Point (NKT) or New River (NCA). Locally based squadrons receive a course rules briefing annually.

MCALF Bogue Class D Surface Area (CDSA) is defined as that airspace within a five-statue mile radius from the geographical center of the airport extending upward from the surface to, and including, 2,500 feet above the airport. All aircraft operating within Bogue CDSA will be under the control of the Bogue tower. Current noise abatement instructions for Bogue Field state that on the downwind leg, aircraft utilizing 600 feet FCLP pattern will remain over the Intracoastal Waterway (ICW). If unable to remain over water, aircraft shall climb

to 1000 feet PRIOR to turning downwind over Emerald Isle. Pilots are not to perform water checks over populated areas. There are to be no more than two aircraft in the FCLP pattern at any given time. Additionally, jettisoning fuel over populated areas is to be avoided.

Rotary-wing aircraft approved for non-standard departures remain below 300 feet until clear of fixed wing traffic patterns, and do not fly over populated areas. Touch-and-go landings are not authorized for aircraft with live or hung ordnance. In the event of a missed approach, hook skip, or waveoff, Bogue Ground Control Approach (GCA) shall vector the aircraft around all heavily populated areas. **At all times pilots shall attempt not to fly over populated areas.**

Helicopter pilots have been instructed to avoid overflight of the Towns of Swansboro and Cape Carteret, the Star Hill Airport, the White Oak Elementary School or any populated area where their rotorwash and noise could create damage or constitute a noise.

Pilots practicing field carrier landings are cautioned to fly the indicated pattern as depicted due to noise abatement concerns. The normal pattern altitude to the Confined Area Landing (CAL) Site for the AV-8B Harriers is to remain over the Intracoastal Waterway and steer clear of Emerald Isle. Harrier pilots have been instructed not to overfly built-up areas and buildings. When departing Runway 23 from CAL, Harrier pilots are cautioned not to overfly the Town of Cape Carteret. The Air Operations Manual for MCALF Bogue instructs squadrons conducting flight operations aboard the field to review and exercise their own pre-mishap plans and drills to support their specific requirements. With regard to off-station mishaps (defined as those that occur beyond the boundaries of MCALF Bogue), the Air Operations Manual for MCALF Bogue assigns a response team to proceed to the scene.

MARINE CORPS OUTLYING LANDING FIELD ATLANTIC

History

The OLF Atlantic area consists of approximately 1,500 acres located between Barry Bay and the Core Sound. Access is by county road. Piney Island and OLF Atlantic are the predominant areas of the "Mid-Atlantic Electronic Warfare Range" (MAEWR). Air-to-ground exercises and chaff are permitted with restrictions. Various threat emitters are located on OLF Atlantic. Most threats are integrated with Tactical Aircrew Combat Training System (TACTS). This area contains numerous electronic warfare (EW) threat emitters and simulated targets for the No Drop Weapons Systems (NDWS) of TACTS. The OLF Atlantic area is available continuously

Mission

Marine Corps Outlying Landing Field Atlantic is home to defense contractors operating and maintaining the MAEWR. Vertical-Short Takeoff and Landing (VSTOL) operations are authorized with appropriate matting, but rarely occur.

The potential for future uses may be limited by high water tables and flooding in low-lying areas. Existing land uses in the vicinity of MCOLF Atlantic are primarily residential and agricultural/open space. Land uses in this area are expected to remain the same. Within the developed area of Atlantic some relatively dense residential sections exist, consisting of single-family dwellings. Other single-family units are scattered in strip-type developments along the main highways and adjacent to the waterways leading from Core Sound. There is also some permanent residential development along the sound itself.

Agricultural land uses are predominately small crop production areas. Most of the open land areas in the vicinity of the airfield are a mixture of coastal wetlands, lowland salt marshes, and wooded swamps and bogs.

At present, commercial activity in Atlantic serves primarily the needs of the residents. Some fishing industry exists, on a small scale, along the Core Sound coast. Projected land uses in the areas surrounding the MCOLF Atlantic could be expected to follow the existing patterns with little deviation.

Current Flying Activity and Pertinent Directives

The airfield is currently unacceptable for normal fixed wing operation due to deteriorating runway pavements. The few operations that occur at this landing field primarily involve the CH-53 helicopters from MCAS New River. It is

too far away from MCAS New River for the current helicopters to use it regularly. There are a total of 36 annual CH-53 fleet operations estimated at OLF Atlantic. Overall usage of the field by the CH-53 helicopters at night is approximately 22 percent.

ABOUT THE LOCAL AREA

Craven County

Craven County is home to a host of popular tourist destinations, including the Tryon Palace (the Colonial Capital of North Carolina) in New Bern, and is becoming a popular location for retirees, including those who have served in the military. The county is home to 91,436 people according to the Census 2000 population data. This represents an increase in population of 12% over the past ten years. According to state population projections for 2000-2010, Craven County will have a growth rate under 12%.

Craven County has a land area of 695 square miles. In the state economic distress ranking of counties for 2001-2002, Craven County ranks 55th out of 100. The median family income is $46,200, which ranks 49th out of 100 in the state. The county has a website (http://www.cravencounty.com/) where additional information about the county can be accessed.

Craven County does not have county-wide zoning, but has limited area zoning in the areas adjacent to Runway 32 at MCAS Cherry Point. Craven County is subject to the Coastal Area Management Act (CAMA), which requires examination of land uses and the Neuse Rules, which address water quality standards of the Neuse River.

The Marine Corps Air Station is physically located in the jurisdiction of the City of Havelock, however, some of land adjacent to the facility is located in unincorporated Craven County. The facility is bordered on three sides by bodies of water: Hancock Creek, Slocum Creek and the Neuse River.

City of Havelock

The City of Havelock was incorporated in 1959 and has a land area of 28.0 square miles. The city has 22,442 residents, making it the second most populated city in the county. The population of Havelock rose 13.9% during the last 10 years.

Havelock is considered to be a “military community” due to the large number of military personnel (active and retired) and their families who live there. According to the North Carolina Department of Commerce report, the Naval Aviation Depot (NADEP), which employs 3,682 people, is the region’s largest employer. A zoning program is enforced by the City of Havelock within the corporate limits and adjacent areas that are within the extraterritorial jurisdiction (ETJ). The city has a website (http://www.cityofhavelock.com/) where additional information about the city can be accessed.

Carteret County

Carteret County is home to a host of popular tourist destinations, including the Cape Lookout National Seashore, and is becoming a popular location for retirement, including those who have served in the military. Carteret County has 59,383 residents according to 2000 Census data. This represents an increase in population of 12% in the past 10 years. The county has a land area of 524 square miles. According to state population projections for 2000-2010, Carteret County should have a growth rate under 12%.

Marine Corps Auxiliary Landing Field Bogue and Outlying Landing Field Atlantic are located within Carteret County. Carteret County does not have county-wide zoning but has enacted land use restrictions and zoning controls in areas adjacent to MCALF Bogue. Carteret County is subject to the Coastal Area Management Act, which requires examination of land uses and the Neuse Rules, which address problems with water quality standards. In the state economic distress ranking of counties for 2001-2002, Carteret County ranks 61st out of 100. The median family income is $49,700, which ranks 36th out of 100 in the state. The county has a website (http://www.co.carteret.nc.us/) where additional information regarding the county can be accessed.

Town of Atlantic

The Town of Atlantic was incorporated by the North Carolina General Assembly many years ago. Although it was given official incorporation, the town no longer has an elected body nor does it provide services to its citizens. The community currently has no zoning.

Town of Bogue

The Town of Bogue now has 590 residents for an increase of 45% since its incorporation in 1995. There are no significant industries in the Town of Bogue. The Town of Bogue has an elected body who has enacted zoning ordinances to guide growth in the community.

Town of Emerald Isle

The Town of Emerald Isle was incorporated in 1957 and has a land area of 6.0 square miles. The town has a year-round population of approximately 3,500, and has grown 32.3% in the past ten years. Tourism is a big industry during the summer months at which time the population swells to 40,000 to 50,000 people. The town has an elected body and has enacted zoning regulations. The town has a website (http://www.emeraldisle-nc.org/) where additional information about the town can be accessed.

Compatibility with Local Civilian Airports

Tactical jet aircraft are not authorized to perform practice approaches at the Craven Regional/Craven County or Beaufort/Carteret County/Michael J. Smith Airports and are to avoid overflying these airports below 2000 feet within 3 nautical miles.

Michael J. Smith Airport

Michael J. Smith Field is a general aviation facility located in Carteret County. The airport is owned and operated by the Beaufort-Morehead City Airport Authority and provides service to Beaufort and Morehead City, as well as the outlying regions of Carteret County and the southernmost portions of Pamlico and Craven Counties. The airport, located within the Town of Beaufort, encompasses some 403 acres. Highway 70 and State Road (SR) 101 serve the airport.

Michael J. Smith Field is the third busiest general aviation non-towered airport in North Carolina. There are 86 aircraft permanently housed there. The airport has 70,000 operations per year (140 to 200 per day). The airport currently has 86 based aircraft and an estimated 52,500 operations per year.

The airport has some overlapping airspace with MCAS Cherry Point. Instrument Flight Rules (IFR) takeoffs and landings are controlled by Cherry Point.

Presently the Michael J. Smith Field is in the process of extending Runway 8-26 to 5,000 feet. The Environmental Assessment was completed in April 2002. The aviation activity anticipated for Michael J. Smith Field projects 98 based aircraft in the year 2002 and 113 based aircraft in the year 2012. Operations are projected to range from 70,460 in the year 2002 to 81,250 in 2012.

The airport has an air traffic control relationship with MCAS Cherry Point Radar Air Traffic Control Facility.

Craven Regional Airport

The Craven County Regional Airport located in New Bern, North Carolina is a commercial service and general aviation airport serving southeastern North Carolina and the Crystal Coast. The airport, encompassing over 670 acres, has two runways (one 6,000 feet and the other 4,000 feet in length). It is owned by Craven County and operated by an Airport Authority.

The air traffic control relationship between Marine Corps Air Station Cherry Point Radar Air Traffic Control Facility (Cherry Point RATCF) and Craven Regional Airport Control Tower (New Bern Tower) is excellent. Due to its close proximity to MCAS Cherry Point and available navigational aids, the Craven Regional Airport offers aircraft a landing facility in the event of an emergency. In addition, Craven Regional Airport is utilized by aircraft stationed at Marine Corps Air

Station New River on a regular basis, Tradewinds Aviation, the flight school located on the north side of the airfield, also uses Craven Regional Airport for training activities.

Cherry Point RATCF is the senior partner regarding the airspace surrounding the Craven Regional Airport *Class D airspace. New Bern Tower is responsible for air traffic control within the Class D airspace, which encompasses Craven Regional Airport. So as to control and coordinate the instrument traffic operating between the Cherry Point RATCF and New Bern Tower airspaces (flying from one airspace to the other, in and out), a formal Letter of Agreement was established.

As of October 2002, the New Bern Tower has been in operation for two years. Traffic is up 5% over the previous year. The annual air traffic operations for 2001 were 55,130. If the current trend continues, the following air traffic projections in operations should be expected.

YEAR	OPERATIONS
2002	Greater than 58,000
2003	Greater than 61,000
2004	Greater than 64,000
2005	Greater than 67,000

MCAS Cherry Point

The following is an excerpt from a MCAS Cherry Point operations manual: "Tactical jet aircraft are not authorized to perform practice approaches at the New Bern or Beaufort/Michael J. Smith Airport and are to avoid over-flying these airports below 2000 feet within 3 nautical miles."

OVERVIEW OF AICUZ MCAS CHERRY POINT

Introduction

In accordance with Department of Defense and Naval Operations Instructions, an Air Installation Compatible Use Zones Study was prepared in 1975 for MCAS Cherry Point, MCALF Bogue and MCOLF Atlantic. The intent of an AICUZ study is to guide compatible land use development by considering the effects of aircraft noise and accident potential. Periodically, installations are required to update AICUZ studies to reflect current operations. In May 2002, MCAS Cherry Point completed an update to the AICUZ, which provides valuable information to the Eastern Carolina Joint Land Use Study.

Safety-APZ's

The Code of Federal Regulations (CFR) is the document in which Air Installations Compatible Use Zones (AICUZ) information is published. Specifically 32 CFR Part 256 Sections 1-11sets forth the Department of Defense (DoD) policy on achieving compatible use of public and private lands in the vicinity of military airfields. It also defines required restrictions on the uses and heights of natural and man-made objects in the vicinity of air installations and the restrictions on land use to assure its compatibility with the characteristics of air installations operations. The regulation further goes on to describe the procedures by which the AICUZ may be defined and provides policy on the extent of Government interest in real property within these zones.

In general, the AICUZ for each military air installation shall consist of land areas:

1) upon which certain uses may obstruct the airspace or otherwise be hazardous to aircraft operations; and
2) which are exposed to the health, safety, or welfare hazards of aircraft operations.

The Accident Potential Zones (APZ) are "areas immediately beyond the ends of runways and along primary flight paths and are subject to more aircraft accidents than other areas." The Department of Defense asserts that the APZs are guidelines only and that "their strict application would result in increasing the safety of the general public, but would not provide complete protection against the effects of aircraft accidents. Such a degree of protection is probably impossible to achieve. Safety is a relative term and the objective should be the realization of the greatest degree of safety that can be reasonably attained."

There are several designations within the APZ. The Clear Zone is the area "immediately beyond the end of a runway, an area which possesses a high potential for accidents, and has traditionally been acquired by the government and kept clear of obstructions to flight. APZ 1 is the area beyond the Clear Zone which possesses significant potential for accidents and APZ 2 is an area beyond APZ 1 having measurable potential for accidents."

Noise

In addition to addressing safety concerns, the AICUZ also addresses the issue of noise. Since 1974, the DoD has been using the Day-Night Average Sound Level (Ldn) noise descriptor. As a minimum, contours for Ldn 65, 70, 75, and 80 are plotted on maps as part of AICUZ studies.

The use of Day-Night Average Sound Level has been criticized recently as not accurately representing community annoyance and land use compatibility with aircraft noise. Much of that criticism stems from a lack of understanding of the basis for the measurement or calculation of Ldn. One frequent criticism is based on the inherent feeling that people react more to single noise events and not as much to "meaningless" time-average sound levels.

As an example of how Ldn is calculated, consider a case in which only one aircraft overflight occurs in daytime during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The Day-Night Average Sound Level for this 24-hour period is 65.5 dB. Assume, as a second example, that ten such 30-second overflights occur in daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours, 55 minutes of the day. The Day-Night Average Sound Level for this 24-hour period is 75.4 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events. This is the basic concept of a time-averaged sound metric, and specifically the Day-Night Average Sound Level.

CFR 32 Part 256 states "As a first priority step, all reasonable, economical, and practical measures will be taken to reduce and/or control the generation of noise from flying and flying related activities. After all reasonable noise source control measures have been taken, there will usually remain significant land areas wherein the total noise exposure is such as to be incompatible with certain uses."

Compatible Land Use

In general, it is the DoD policy to work toward achieving compatibility between air installations and neighboring civilian communities by means of a compatible land use planning and control process conducted by the local community. Land use compatibility guidelines are specified for each Clear Zone, Accident Potential Zone, Noise Zone and combination of these as appropriate. The method of

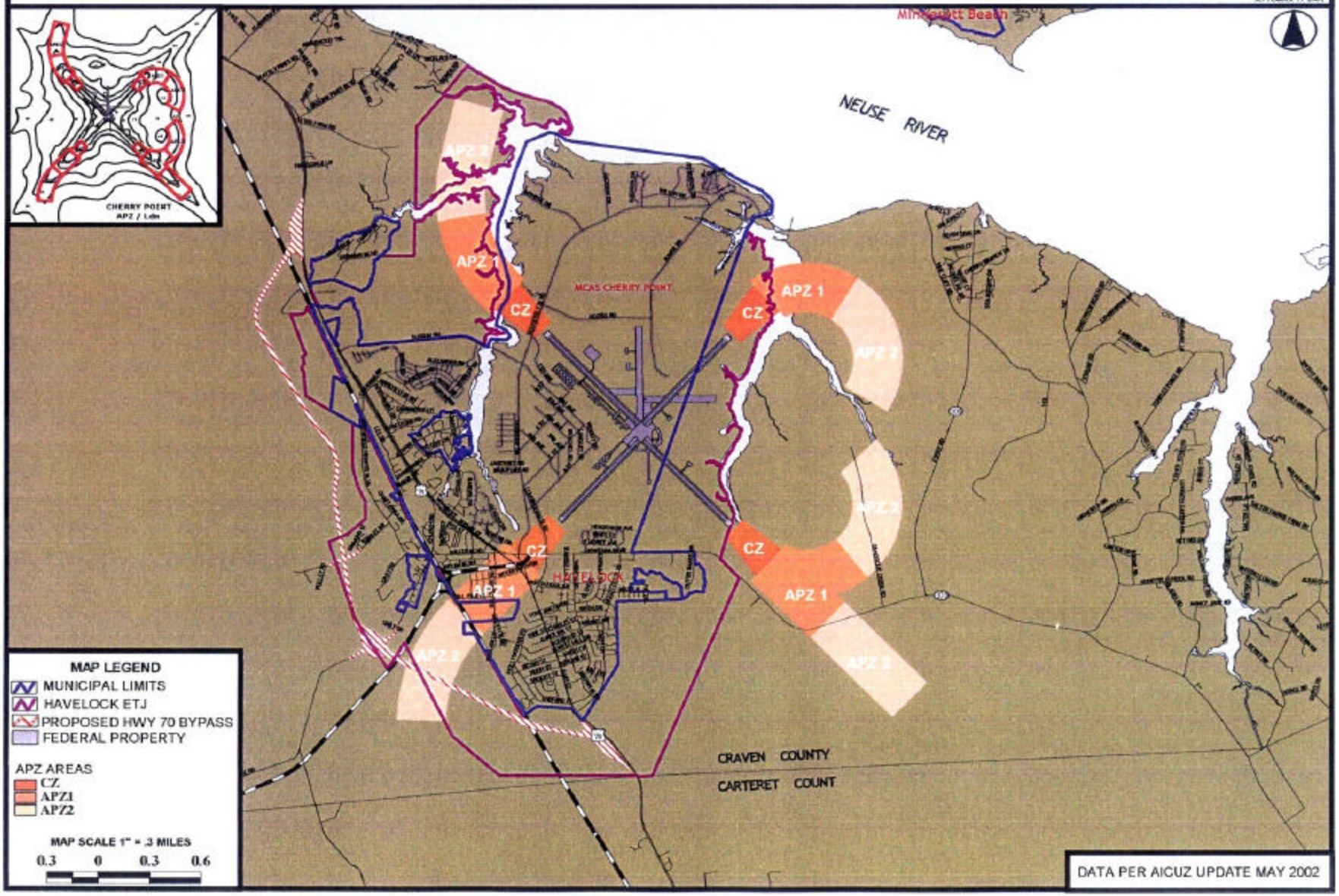
control and regulation of land usage within each zone will vary according to local conditions. In all instances the primary objective is to identify planning areas and reasonable land use guidelines which will be recommended to appropriate agencies who are in control of the planning functions for the affected areas.

Program

As the first priority action in developing an AICUZ program, full attention is given to safety and noise problems. In all planning, acquisition, and siting of noise generating items, such as engine test stands, full advantage is taken of available alleviating measures, such as remote sites or sound suppression equipment. The noise exposure of on-installation facilities and personnel are considered together with that off the installation. Renewed interest is placed on programs to inform local governments, citizens groups, and the general public of the requirements of flying activities.

EASTERN CAROLINA JOINT LAND USE STUDY

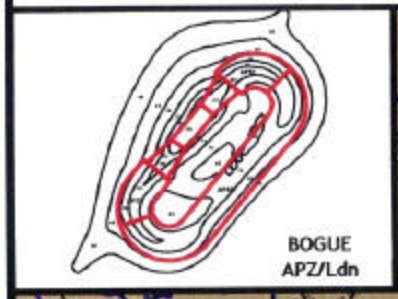
MARINE CORPS AIR STATION CHERRY POINT APZ AREAS



EASTERN CAROLINA JOINT LAND USE STUDY

MARINE CORPS AUXILIARY LANDING FIELD BOGUE - APZ AREAS

SEPTEMBER 17 2002



Bogue

APZ1

CZ

egar Point

Cape Carteret

BOGUE AUXILIARY
LANDING FIELD

CZ

BOGUE SOUND

APZ1

Emerald Isle

ATLANTIC OCEAN

MAP LEGEND

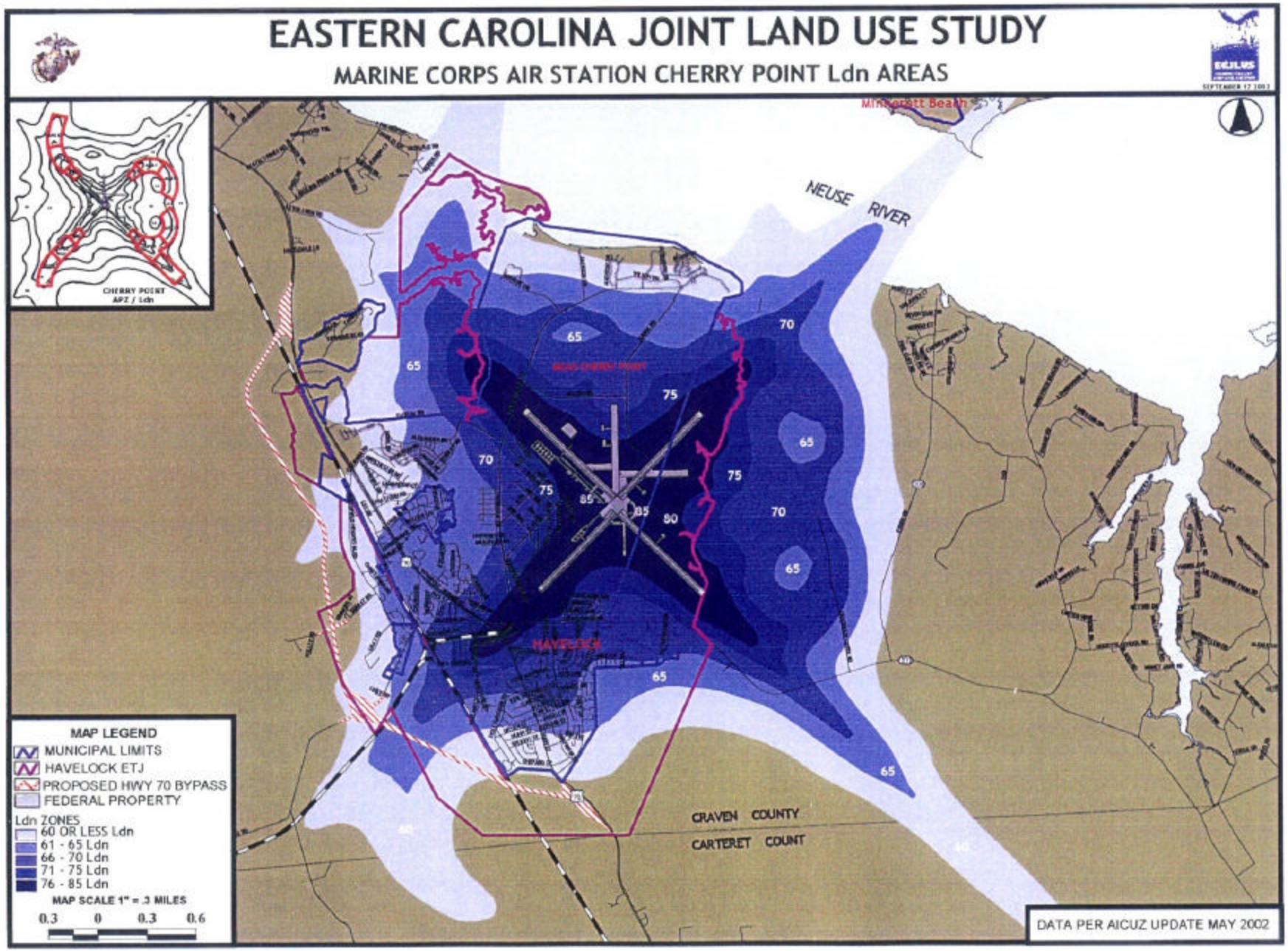
MUNICIPAL BOUNDARIES
BOGUE RUNWAY

APZ
CZ
APZ1
APZ2

MAP SCALE 1" = .3 MILES

0.3 0 0.3 0.6

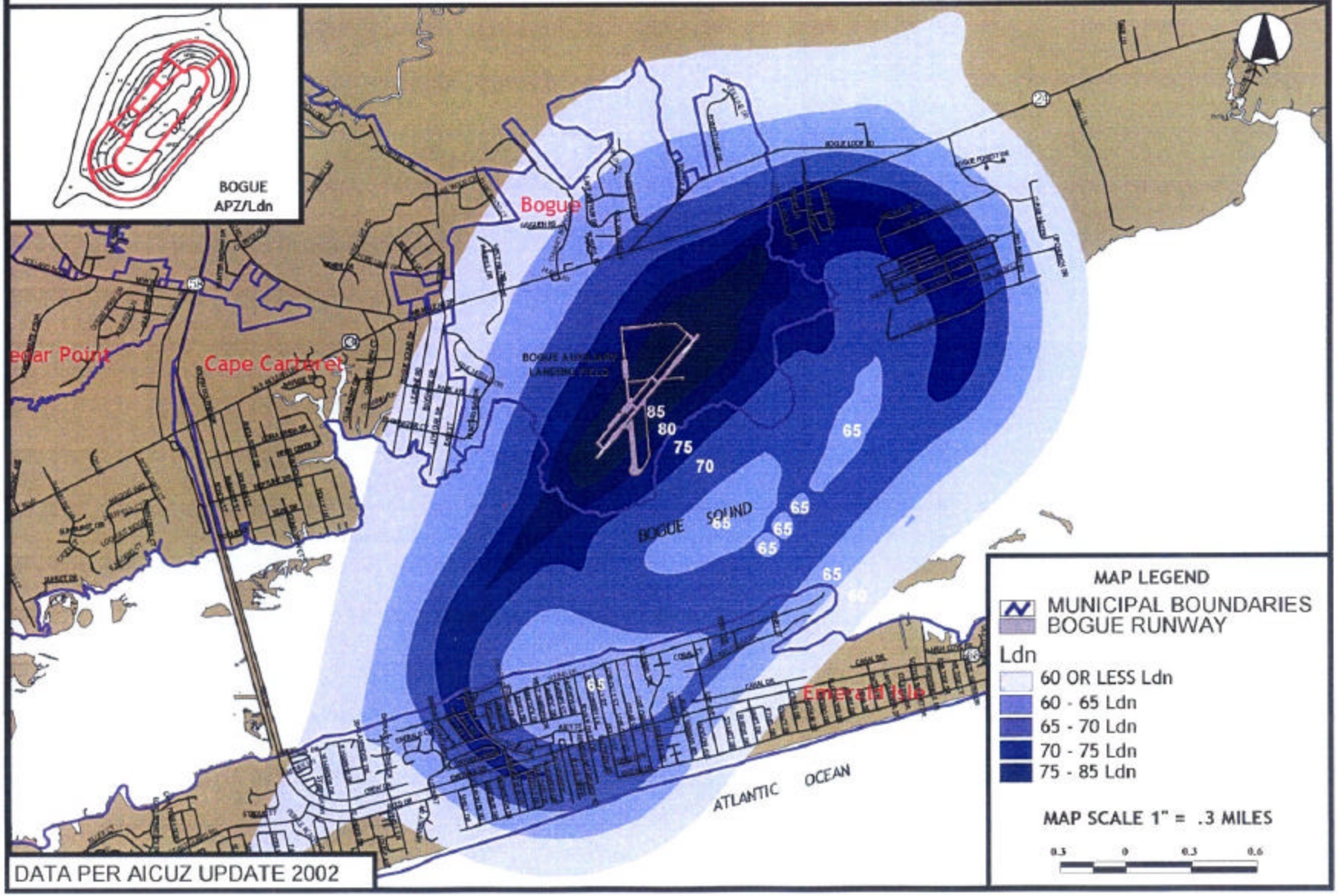
DATA PER AICUZ UPDATE 2002


EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AIR STATION CHERRY POINT Ldn AREAS
CHERRY POINT APZ / Ldn
NEUSE RIVER
MCAS CHERRY POINT
HAVELOCK
CRAVEN COUNTY
CARTERET COUNT
65
70
75
80
85
MAP LEGEND
MUNICIPAL LIMITS
HAVELOCK ETJ
PROPOSED HWY 70 BYPASS
FEDERAL PROPERTY
Ldn ZONES
60 OR LESS Ldn
61 - 65 Ldn
66 - 70 Ldn
71 - 75 Ldn
76 - 85 Ldn
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE MAY 2002

EASTERN CAROLINA JOINT LAND USE STUDY

MARINE CORPS AUXILIARY LANDING FIELD BOGUE - Ldn AREAS

SEPTEMBER 17 2002



OVERVIEW OF EASTERN CAROLINA JOINT LAND USE STUDY

Introduction

The guidelines for a Joint Land Use Study are addressed in the Catalog of Federal Domestic Assistance (CFDA) Section 12.610. The Department of Defense will provide funding to undertake Joint Land Use Studies if continued operations of the military installation in question have the potential to be impaired by the encroachment of the civilian community. In order to receive funding for the study it is required that there be "evidence that the proposed planning process and implementation of the study recommendations will prevent further encroachment on the military installation. Implementation is the responsibility of the participating government(s)."

In the fall of 2002, base leaders at MCAS Cherry Point recognized the need for a Joint Land Use Study and requested that the Department of Defense examine the possibility of providing funding for the study. A site visit was completed and a determination was made that potential encroachment issues did exist and preliminary funding from DoD was approved for the Eastern Carolina Joint Land Use Study.

Historic Overview of ECJLUS

The following is a timeline of the events of the ECJLUS.

- Fall 2000 – MCAS Cherry Point requested partial funding for a JLUS from the Office of Economic Adjustment.
- Fall 2000 – LtCol Barry Fetzer and Tyler Harris of the MCAS Cherry Point Community Plans and Liaison office, presented the ECJLUS concept to Carteret County, Craven County, the City of Havelock, the Town of Emerald Isle and the Town of Bogue.
- Fall/Early Winter 2000 – Resolutions of Support received from participating local governments.
- Winter 2000/2001 – Policy Committee and Technical Advisory Committee selected.
- December 2000 – First Policy Committee meeting held.
- January 2001 – Scope of Work presented by the TAC and approved by the Policy Committee.
- January 2001 – Eastern Carolina Council of Governments selected as the ECJLUS Project Sponsor.
- April 2001 – ECJLUS Press Conference to inform the media of the project, its goals and timelines.
- May 2001 – ECJLUS Public Information Meetings. Held in Havelock and Cape Carteret. Project Sponsor conducted public information sessions in

both locations, received and compiled feedback and answered questions. Media was also in attendance at both sessions.

- July 2001- Information meeting held with realtors, developers, Carteret and Craven Counties Registrar of Deeds and area real estate attorneys. The meetings were designed to inform them of the process and get feedback on recommendations and the effects of those recommendations on their respective businesses.
- Summer/Fall 2001/ Winter 2002 – ECJLUS TAC continues to develop project information and identify key issues to be included in the final report.
- February 2002 – MCOLF Atlantic and the Town of Atlantic, NC were approved by the ECJLUS Policy Committee for inclusion in the ECJLUS. Timeline for the ECJLUS was extended to August 2002.
- March 2002 – Public Information Meetings held in Atlantic, NC to inform residents of the ECJLUS process, its goals and timelines.
- May 2002 – Final Draft of the AICUZ for MCAS Cherry Point and MCALF Bogue is released to the public
- Summer 2002 – TAC continues to finalize recommendations for inclusion in the final ECJLUS report
- September 2002 – Presentation of Draft ECJLUS Report to the Policy Committee
- September 2002 – Press conference to present the Draft ECJLUS report to the media.
- October 2002 – ECJLUS public hearings, held in Emerald Isle and Havelock
- October 2002 – Policy Committee reviews comments received at the ECJLUS public hearings, determines any changes to be made to the final document and adopts final version of the ECJLUS Report.
- November 2002 – Final Copy of ECJLUS Report is presented to participating local governments.

Technical Advisory Committee Meetings

Technical Advisory Committee meetings were held on the following dates:

1/3/01	Havelock
1/19/01	Havelock
1/23/01	Havelock
2/21/01	Havelock
3/15/01	Havelock
4/9/01	Havelock
5/30/01	Bogue Field
8/13/01	Havelock
10/26/01	Havelock
1/29/02	ECC
2/11/01	Havelock
2/28/02	MCAS Cherry Point
3/14/02	MCAS Cherry Point

3/22/02	ECC
4/8/02	Emerald Isle
4/10/02	ECC
4/12/02	ECC
5/1/02	Newport
5/7/02	Newport
5/13/02	ECC
5/22/02	MCAS Cherry Point
6/3/02	Newport
7/9/02	Newport
8/14/02	ECC
8/29/02	ECC
9/9/02	ECC
9/17/02	Newport
10/25/02	ECC
10/29/02	Newport

Policy Committee Meetings

Policy committee meetings were held on the following dates:

12/19/00	Newport
1/30/01	Newport
3/28/01	Craven Regional Airport
5/30/01	Bogue Field
8/22/01	MCAS Cherry Point
11/4/01	Newport
2/13/02	Newport
5/7/02	Newport
6/3/02	Newport
7/9/02	Newport
9/17/02	Newport
10/8/02	Newport
10/29/02	Newport

Public Meetings

Public Meeting were held on the following dates:

5/2/01	Havelock City Hall
5/3/01	Cape Carteret Town Hall
3/7/02	Atlantic Methodist Church
3/28/02	Atlantic Elementary School
10/21/02	Havelock Town Hall
10/24/02	Emerald Isle Town Hall

Quarterly Reports

Quarterly reports were filed with the Office of Economic Adjustment for the following periods:

3/1/01 – 5/31/01
6/1/01 – 9/30/01
10/1/01 – 11/30/01
12/1/01 – 2/28/02
3/1/02 – 5/31/02
6/1/02 – 11/30/02

ECJLUS Website http://gis.eccog.org/jlus

The need for a website dedicated to the Eastern Carolina Joint Land Use Study was recognized early in the process by members of the ECJLUS Technical Advisory Committee. Geographic Information Systems maps with overlays of the Accident Potential Zones and the Noise Contours needed to be easily accessible to the general public, developers, realtors, and others. The website that was created is based on ArcIMS technology. Property data was obtained from Carteret and Craven counties and this information was merged with MCAS AICUZ data. Two different study areas were involved: MCAS Cherry Point and MCALF Bogue. Data sets were created for each separately. ArcIMS software enables a web user to access data using the property owners name, the property address or property number. The program also allows the user to zoom to a parcel in order to provide information regarding APZ, Noise Contour as well as the land use code. The website can be updated in a matter of seconds while a printed map may take hours or days to be altered, printed, and distributed to those who may need them.

The site contains help pages for those unaccustomed to using GIS information. The user is also able to print the maps and screens as needed.

This web page is hosted on ECC's map server, which is physically located at the main Sprint Telephone facility in New Bern, NC for ease of access to Sprint's T-100 lines. Also there is continuous 24/7 power supply that enables the site to be operational regardless of electrical outages.

PUBLIC PARTICIPATION & EDUCATION

Overview of Public Meetings

ECJLUS Public Participation and Education

The Eastern Carolina Council held several meetings to provide information to the public regarding the JLUS process, the goals of the ECJLUS and the timeline involved in the project. There were four groups who were involved in this segment of the project. They were:

- The media.
- The general public.
- Professionals that would be impacted by the recommendations. (Real Estate, Attorneys, etc.)
- Elected officials of the local jurisdictions involved in the project.

The following will provide a brief outline of each type of meeting/presentation that was made in this phase of the project work.

Media

A press conference was held on April 9, 2001 at the Havelock City Hall. A media guide was distributed. Those in attendance on behalf of the ECJLUS to speak with the press were:

- Mayor Derryl Garner of Newport, Chairman of the ECJLUS Policy Committee
- MajGen Tom Bratten, Commanding General, MCAS Cherry Point
- LtCol Barry Fetzer with the MCAS Cherry Point Community Plans and Liaison office
- Tyler Harris with the MCAS Cherry Point Community Plans and Liaison office
- Joe McKinney, Executive Director of the Eastern Carolina Council of Governments and ECJLUS Project Manager
- John Leigh, DoD Office of Economic Adjustment, Washington, D.C.

A brief overview of the ECJLUS was presented to the media followed by remarks from the participants and questions from the media. All electronic media serving the region involved in the ECJLUS were invited to participate.

Public Meetings

Public information meetings were conducted in the early stages of the ECJLUS work. These were held on the following dates in the following locations:

- May 2, 2001: Havelock City Hall
- May 3, 2001: Cape Carteret Town Hall
- March 7, 2002: Luncheon, Atlantic Methodist Church
- March 28, 2002: Atlantic Elementary School
- October 21, 2002: Public Hearing Havelock Town Hall
- October 24, 2002: Public Hearing Emerald Isle Town Hall

Each of the ECJLUS Public Information Meetings had an identical format. Copies of the ECJLUS Scope of Work, the ECJLUS brochure, and a public comment sheet were distributed. A public demonstration of the GIS technology utilized in developing the ECJLUS maps was provided. An overview of the ECJLUS process was given along with an explanation of the timeline. The goals of the ECJLUS were discussed. The public was advised prior to the completion of the project in the latter part of 2002, a public hearing would be held to allow the public to review the ECJLUS draft report and have an opportunity to make suggestions and or comments.

A video tape explaining the JLUS process was also shown. The meetings attracted between 50 to 75 attendees. The public was informed of the meetings via public notice in the newspapers serving the region comprising the ECJLUS and local flyers within the community of Atlantic. Staff members participating in these events were:

- Joe McKinney, Executive Director of the Eastern Carolina Council of Governments and ECJLUS Project Manager
- Steve Hines, Infrastructure Planner with the ECC and member of the ECJLUS Project Team
- Al Gillikin, GIS Coordinator with the ECC and member of the ECJLUS Project Team

In addition to staff, members of the Policy Committee and TAC as well as staff with the MCAS Cherry Point Community Plans and Liaison office were present. Each meeting lasted approximately two hours. Some of the public comments received were requests for the study to take into account the following issues:

- Public safety;
- Integrity of the AV-8B Harrier Jump Jet;
- Adjustment of the MCALF Bogue flight operation times; and
- Enforcement of the flight altitude limit over Emerald Isle and Bogue per FAA regulations.

All of these suggestions have been integrated in some manner into the ECJLUS work.

Professionals

The ECJLUS project team met with professionals in the fields of real estate, land development, construction, law and the Registrars of Deeds from Carteret and Craven Counties on two occasions. The first of these meetings occurred in July of 2001 and the second meeting took place in May of 2002.

During the first meeting, the discussion centered around the requirement and implementation of a disclosure statement which would identify property subject to areas of high noise and/or accident potential. In general the group seemed to support the concept of proper disclosure, but questions arose regarding the ability of local jurisdictions to enforce disclosure statement through a local ordinance. Several real estate professionals in attendance stated that their real estate agencies already require a disclosure statement as a part of the sales process. The developers and builders present did not seem to think that a disclosure statement would negatively affect their sales. The legal professionals present at the meeting indicated that they had concerns as to the enforceability of such an ordinance or under what authority could a local jurisdiction enact such an ordinance. Staff took this feedback into account as the potential recommendations were further developed. The second meeting allowed the opportunity for ECJLUS staff to present a formal disclosure statement recommendation. In addition, a recommendation to require sound attenuation construction practices in certain high noise areas was also discussed.

LOCAL AREA RECOMMENDATIONS

Disclosure

Importance of Noise Disclosure

Disclosure of aviation noise, as part of a mix of preventive techniques, can be a very important tool for state and local governments in informing and forewarning prospective buyers or tenants about the expected impacts of aviation noise on properties within noise impact areas**.** A better informed buyer will make better decisions. He may choose not to purchase the property, or ask for a lower price if he knows that he needs to expend funds to take certain mitigation steps. Lenders will be more hesitant to lend funds or require more safeguards. Once noise hazard maps have been published, buyers of property within these designated areas are generally not entitled to recover damages with respect to airport noise. Exceptions include a significant change in the type or frequency of aircraft operations, airport layout, flight patterns or increased night-time operations. The American Association of Airport Executives strongly believes that real estate disclosure must be pursued as a mandatory nationwide prerequisite for residential real estate sales of property located near airports. Mandatory disclosure would ensure that prospective homebuyers are knowledgeable about the airport operations and its potential impact on the community, subsequently reducing frustration and anti-airport cynicism by those who were not adequately informed prior to their purchase.

Criticism of Airports

In neighboring Virginia, the residents of the Cities of Virginia Beach and Chesapeake near the Oceana Naval Air Station and Fentress Air Field – an Outlying Landing Field (OLF) where pilots practice landings and take offs - are opposed to the increase of flights by military aircraft. The Virginia group has challenged the adequacy of a 1998 environmental impact statement that supported the location of additional aircraft at the base. Although their case went all the way to the 4th U.S. Circuit Court of Appeals in Richmond before being rejected, the organization – led by a retired navy captain - is still a vocal critic of the expanded air operations. This is only one example of the growing conflicts throughout the country between airport noise and the people living in the surrounding communities.

Current Status of Hazard Disclosure Requirements

Only three states have comprehensive hazard disclosure provisions in their statutes: California, Tennessee, and South Carolina. In California, the responsibility for disclosure is placed on the real estate agent representing the property being sold. In Tennessee, the owner of the property is responsible for

disclosing information about hazards. South Carolina's provision requires only that the purchasing contract include a disclosure statement.

Mandatory state statutes requiring noise disclosure around airports is even more limited. In Hawaii, a state law was passed mandating the seller of real estate to disclose any property that is within the 55 Ldn noise contour for an airport. In Arizona, a statute was passed that authorize airports to establish airport influence areas (AIA) around their airports. The statute authorized County Recorders to annotate property owner's deeds within the AIA that the property was located in an area under the influence of aviation activity from an airport.

Critique of North Carolina Real Estate Disclosure Act

In North Carolina information about property being purchased or leased is regulated by The Residential Property Disclosure Act. It regulates the transfer of residential real property consisting of not less than one nor more than four dwelling units, whether or not the transaction is with the assistance of a licensed real estate broker or salesperson. The property owner shall furnish a purchaser of residential property a disclosure statement that discloses the characteristics and conditions of the property of which the owner has knowledge.

However, There are several weaknesses:

- In 47E-4 (a) (1) and (2), the property owner may disclose information about the property or make no representation as to the characteristics and conditions of the real property or any improvements to the real property except as otherwise provided in the real estate contract, whether or not the owner should have known of them.

- In 47E-2 there are 11 exemptions. Eight address administrative issues such as transfers ordered by the court, or because of divorce proceedings, or when one family member gives property to another family member. However, there are three exemptions that can undermine the effectiveness of a disclosure statement. These exemptions include:
  (1) transfers involving the first sale of a dwelling never inhabited;
  (2) the lease with option to: Purchase contracts where the lessee occupies or intends to occupy the dwelling; and,
  (3) transfers between parties when both parties agree not to complete a residential property disclosure.

- Often the disclosure statement comes late in the real estate process when it is difficult to withdraw from the negotiating process. In 47E-5 the seller only has to deliver the disclosure statement no later than the time the purchaser makes an offer to purchase, exchange, or option the property, or exercises the option to purchase the property pursuant to a lease with an option to purchase.

Local Noise Disclosure Programs

Although hazard disclosure, or more specifically noise disclosure, has been mandated by only a few states, local political jurisdictions have implemented disclosure requirements at both civilian and military airports. In most cases, local jurisdictions have been comfortable creating airport overlay districts in their zoning ordinance to regulate incompatible uses in high noise areas as well as impose other mitigating measures such as increasing soundproofing requirements and noise disclosure. Mandatory disclosure of airport noise hazards has been implemented two ways: (1) requiring attachments to deeds and/or land use regulatory documents (i.e. building permits, site plans, subdivision plats etc); and, (2) including this information in real estate transactions (sales, leasing, and renting contracts). In North Carolina most communities with commercial and military airports have utilized the first option. In Virginia and South Carolina communities containing military airfields have utilized **both** approaches.

Recommendations

After studying planning programs that address compatibility between airport operations and surrounding land areas, particularly those communities that utilize real estate disclosure measures and attachments to land records to inform the public about potential hazards from high noise and safety levels from aircraft operations, the ECJLUS makes the following recommendations:

Local Participating Jurisdictions:

1. Endorse the disclosure statement form developed by the ECJLUS Technical Advisory Committee which addresses both accident potential and noise disclosure;

2. Require that the noise disclosure (65 Ldn) hazards be: (a) revealed to any person(s) owning, purchasing, leasing, or renting real estate; and/or (b) attach to land records (deeds, plats, etc.);

3. Seek assistance from ECC or other professionals by participating local jurisdictions to incorporate disclosure statement regulations into local ordinances;

4. Encourage participating local jurisdictions to join in a concerted lobbying effort to encourage the NC General Assembly to strengthen Chapter 47E of the NCGS to require mandatory disclosure of noise hazard in the NC Real Estate Disclosure Statement.

5. Participating local jurisdictions should erect municipal signage alerting citizens that they are entering an AICUZ area. These signs will be equivalent to ETJ signage.

Eastern Carolina Council:

6. Develop a brochure to explain the disclosure statement ordinance;

7. Conduct a public information meeting(s) on the new disclosure requirements.

The recommended disclosure statement format has been designed to be a single page that covers both noise and accident potential. It is recommended that the disclosure statement be required in the following circumstances:

- Building permits
- Certificates of Occupancy
- Final sub-division plats
- Purchases of property
- New home sales
- Existing home sales
- Sales by owner
- Sales by builder or developer
- Renters
- Manufactured Home Parks
- Resort properties

Sound Attenuation

Definitions

DNL Day - Night Sound Level:
An average of the cumulative measure of the noise exposure during a 24-hour day.

Exterior Wall Rating:
EWR is a single-number rating for exterior building elements (such as walls, windows, doors, etc.) and represents the effective sound transmission loss capability, in decibels, of each element. It differs from the STC rating in that it is based on aircraft noise rather than office noise spectra. For this reason, EWR is superior to STC for describing the sound-insulating properties of exterior wall elements exposed to aircraft noise. The EWR concept was developed by Wylie Laboratories and has been used extensively in studies of residential sound insulation. It is conceptually similar to the STC rating method. Like TL and STC, the higher the EWR value, the better the noise reduction.

Noise Reduction:
The quantitative measure of sound isolation between spaces is called Noise Reduction (NR). The NR between two spaces, such as from the exterior to the interior of a dwelling, depends on the TL of the various components in the separating wall, the area of the separating wall, and the acoustical absorption n

the receiving room. This value takes more into account than just the sound transmission characteristics of the wall material. Generally, values of NR are determined in one-third octave bands. A higher NR gives a lower noise level in the receiving room, indicating greater noise insulation.

Noise Level Reduction:
NLR is used to describe the reduction of environmental noise sources, such as aircraft. It is a single-number metric based on values of A-weighted noise reduction (NR). The greater the sound insulation in a wall, the lower the noise level in the receiving room, giving a higher NLR. The NLR is useful because it is a simpler metric to use than NR; one number is easier to apply than a set of numbers in one-third octave bands. However some building materials and components are more effective at reducing low-frequency noise than other materials or components. Since aircraft noise contains a lot of low frequency sound, it is important to ensure that insulating materials and components perform well at low frequencies. NLR is a good indicator of overall wall performance but may not be appropriate when designing modifications for aircraft noise reduction, especially if a good NLR value disguises poor low frequency insulation.

Sound Transmission Class:
Since working with a series of one-third octave TL measurements can be cumbersome, a single number descriptor based on the one-third octave values has been developed. This rating method is called the Sound Transmission Class (STC). Like TL, the higher the STC rating for a construction method or component, the higher the sound insulation. Originally, STC ratings were developed as a single-number descriptor for the TL of interior office walls for typical office noise and speech spectra. Now, they are used, often incorrectly, for exterior walls as well. Most acoustical materials and components are commonly specified in terms of their STC ratings.

Sound Transmission Loss:
This is the physical measure, which describes the sound insulation value of a built construction system or component. It is a measure, on a logarithmic scale, of the ratio of the acoustic sound power incident on the tested piece to the acoustic sound power transmitted through it. The TL is expressed in decibels (dB). Generally, TL is measured as a function of frequency in one-third octave frequency bands. The higher the sound insulation, the less sound will be transmitted, resulting in a higher TL value. Values of TL are determined in acoustical laboratories under controlled testing methods prescribed by the American Society of Testing and Materials (ASTM).

Sound Insulation Objectives

The goal for residential sound insulation is to reduce the dwelling interior noise levels due to aircraft operations. Total "soundproofing" of the dwelling, such that aircraft operations are inaudible, is economically infeasible. Modest improvements over the existing characteristics (i.e. less than 5 dB) may not

provide a noticeable improvement for the homeowner and hence are not cost effective. The ideal solution is to provide sound insulation, which lies between these two extremes.

Interior Noise Objectives

The DNL is the best predictor of overall long-term community reaction to noise from aircraft as well as other activities. Exterior noise exposure less than DNL 65 dB is normally considered compatible with residential land use. Noise exposure is normally incompatible above 65 dB unless stated noise reductions are achieved within the dwellings. A 25 dB NLR is required in the noise zone from 65 to 70 dB. From 70 to 75 dB, a 30 NLR is required. Above 75 dB, residential land use is generally deemed incompatible and should be discouraged.

Sometimes, the DNL noise reduction goal in habitable rooms is supplemented by a single-event noise level criterion. This Sound Exposure Level (SEL) reflects the annoyance associated with individual flyovers because of activity interference. The SEL goal is 65 dB in general living spaces and 60 dB in bedrooms and television viewing rooms. These criteria are only applied to homes within the DNL-defined noise impact area, not to homes outside the 65 dB DNL contour boundaries.

To use the SEL interior noise criteria, the outside noise exposure level is compared to the interior goal. For example, if the dwelling were between the SEL contour boundaries of 85 to 90 dB, then the required NLR to achieve 60 dB in a bedroom would be 30 dB. (The conservative upper bound of the noise zone is normally used to set NLR goals.)

Room Variations

The noise level of different rooms in a house depends on the absorption within the room, as well as on the noise entering from outside. Upholstered furniture, drapes, and carpeting absorb sound while hard surfaces do not. In addition, different categories of rooms vary on how predictable their sound environments are. Living rooms, for example, tend to be consistent from one house to another because they almost always have the same types of furnishings in them. Bedrooms vary because some are guest rooms with less furniture, and some have been converted to other uses. Kitchens tend to vary widely due to the use of different wall coverings, such as cabinets and appliances, or floor coverings, such as tile or carpet. These room variations act in addition to variation in exterior sound level and sound transmission through the outside wall.

Sound Insulation Concept

Sound Transmission

In order to effectively examine noise control measures for dwellings it is helpful to understand how sound travels from the exterior to the interior of the house. This happens in one of two basic ways: through the solid structural elements and directly through the air. Consider the sound transmission through a wall constructed with a brick exterior, stud framing, interior finish wall and absorbent material (insulation) in the cavity. The sound transmission starts with noise impinging on the wall exterior. Some of this sound energy will be reflected away and some will make the wall vibrate. The vibrating wall radiates sound into the airspace, which in turn sets the interior finish surface vibrating, with some energy lost in the airspace. This surface then radiates sound into the dwelling interior. Vibration energy also bypasses the air cavity by traveling through the studs and edge connections. Openings in the dwelling, which provide air infiltration paths through windows, vents, and leaks, allow sound to travel directly to the interior.

This is a very common, and often overlooked source of noise intrusion.

Flanking is a similar concept and usually refers to sound passing around a wall. Examples of common flanking paths include: air ducts, open ceiling or attic plenums, continuous sidewalls and floors, and joist and crawlspaces. The three different major paths for noise transmission into a dwelling are air infiltration through gaps and cracks, secondary elements such as windows and doors, and primary building elements such as walls and the roof.

Low-frequency sound is most efficiently transmitted through solid structural elements such as walls, roof, doors, and windows. High frequencies travel best through the air gaps. Within these broad categories, different building materials have different frequency responses to sound and varying abilities to insulate against sound.

Reducing Transmitted Sound

The amount of sound energy transmitted through a wall, roof or floor can be limited in several ways. First, all air infiltration gaps, openings, and possible flanking paths must be eliminated wherever possible. This is the single most important, but occasionally overlooked, step in noise reduction. This includes keeping windows and doors closed and putting baffles on open-air vents.

Some materials reflect more of the incident sound, converting less of it into vibration energy. The mass of the exterior and interior panels influences how much sound will pass through them. The more mass a structural element has the more energy it takes to set it into vibration, so adding weight to a wall or ceiling by attaching a gypsum board layer will make the assembly pass less sound. Then, absorption in the air cavity and resilient mounting of interior finish panels can further reduce the sound transmitted to the room. The primary approaches for improving sound isolation are:

1. Elimination of openings and flanking paths (when accessible).
2. Improvement of windows and doors.

3. Massive construction (build a wall 3 feet thick and 40 feet high around the whole house).
4. Isolation of panel elements through separation or resilient mounting.
5. Absorption.

Problem Areas

Sound intrusion problems are commonly caused by:

1. Building construction components and configurations not providing sufficient sound insulation.
2. Structural elements, such as windows, doors, walls, roofs and floors chosen and combined in an unbalanced way so that some parts are much weaker sound insulators than others.
3. Unintended openings or sound-flanking paths caused by deterioration or improper installation of construction elements.

Balanced Acoustical Design

The most important, or controlling, sound paths must be identified in order to know how to construct or modify a dwelling to meet a specified noise criteria. The ideal sound insulation design would achieve a condition where all the important sound paths transmit the same amount of acoustical energy. This eliminates any weak links in the building's insulation envelope and is commonly referred to as a balanced acoustical design.

In most cases, after leaks and gaps are sealed, the windows are the controlling sound paths. Replacing them with acoustical windows typically does more to improve the sound insulation performance than any other architectural modifications. Once this is done the other elements may become important in meeting specific noise reduction goals. Exterior doors often require improved sound insulation. Ceilings and walls, which face the exterior, may require modification as well, particularly in the higher DNL noise zone

New Versus Old

Dwellings can vary in their sound isolation performance. Generally, air infiltration, and therefore sound infiltration, around windows and doors tends to be worse for older dwellings. Inadequate or deteriorated weather-stripping and misaligned framing usually cause this. On the other hand, most older construction techniques and materials tend to be more massive than newer lighter-weight construction. As a result, many older buildings tend to perform better with regard to sound transmission through walls, roofs, and floors than do new houses. Homeowner modifications can also degrade the dwelling's sound insulation performance. Examples include home improvements such as skylights, whole-house attic fans, through-the-wall air conditioners, and solariums. In general, it is much more efficient, and cost effective, to take acoustic

performance into account when designing and building a home at the start. Remodeling an already built home is more costly and time consuming than anticipating and building for good sound insulation.

While homes, which are well insulated thermally, often perform well acoustically, thermal insulation is not always a good indicator of sound insulation. Many thermal windows, installed in new construction or added as a homeowner upgrade provide little sound insulation when compared to walls or acoustical windows and are frequently the weak link in the building envelope. However thermal treatments usually eliminate air infiltration and may serve to improve the acoustical performance of a dwelling. Thermal insulation batts are often useful in the wall cavities and attic spaces to absorb some sound.

The North Carolina State Building Code requires homes to meet certain R-Values for thermal performance. These requirements have changed through the years requiring higher R-Values in the more recent homes. The thickness or the density of the product normally determines the R-Value of the insulation. Older homes have less insulation and are subject to more noise infiltration. Currently, the Building Code requires R-13 in the walls, R-19 in the floors and R-30 in the ceilings.

Most homes today are constructed using double pane windows. Although the windows perform well thermally, they usually do not perform well acoustically. The panes are separated by approximately ½ inch of air space and thin panes of glazing are used. The thin panes of glazing allow for vibration and the vibrations are transmitted through the air space to the interior glazing and into the home.

Recommended Building Requirements

Recommended Building Requirements for a Minimum NLR of 25 dB

Compliance with the following standards shall be deemed to meet the requirements of the compatible use districts in which an NLR 25 is specified.

General:

a. Brick veneer, masonry blocks, or stucco exterior walls shall be constructed airtight. All joints shall be grouted or caulked airtight.
b. At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar.
c. Window and/or through-the-wall ventilation units shall not be used.
d. Through-the-wall/door mailboxes shall not be used.

Exterior Walls:

a. Exterior walls other than as described in this section shall have a laboratory sound transmission class rating of at least STC-39.
b. Masonry walls having a surface weight of at least 25 pounds per square foot do not require a furred (stud) interior wall. At least one surface of

concrete block walls shall be plastered or painted with heavy "bridging" paint.

c. Stud walls shall be at least 4" in nominal depth and shall be finished on the outside with siding-on-sheathing, stucco, or brick veneer.

(1) Interior surface of the exterior walls shall be of gypsum board or plaster at least 1/2" thick, installed on the studs.

(2) Continuous composition board, plywood, or gypsum board sheathing at least 1/2" thick shall cover the exterior side of the wall studs behind wood, or metal siding. Asphalt or wood shake shingles are acceptable in lieu of siding.

(3) Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.

(4) Insulation material at least 2" thick shall be installed continuously throughout the cavity space behind the exterior sheathing and between wall studs. Insulation shall be glass fiber or mineral wool.

Windows:

a. Windows other than as described in this section shall have a laboratory sound transmission class rating of at least STC-28.
b. Glass shall be at least 3/16" thick.
c. All operable windows shall be weather stripped and airtight when closed so as to conform to an air infiltration test not to exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM E-283-65-T.
d. Glass of fixed-sash windows shall be sealed in an airtight manner with a non-hardening sealant, or a soft elastomer gasket, or glazing tape.
e. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal Specifications: TT-S-00227, TT-S-00230, or TT-S-00153.
f. The total area of glass in both windows and doors in sleeping spaces shall not exceed 20% of the floor area.

Doors:

a. Doors, other than as described in this section shall have a laboratory sound transmission class rating of at least STC-28.
b. All exterior side-hinged doors shall be solid-core wood or insulated hollow metal at least 1-3/4" thick and shall be fully weather-stripped.
c. Exterior sliding doors shall be weather stripped with an efficient airtight gasket system. The glass in the sliding doors shall be at least 3/16" thick.
d. Glass in doors shall be sealed in an airtight non-hardening sealant, or in a soft elastomer gasket or glazing tape.

The perimeter of doorframes shall be sealed airtight to the exterior wall construction.

Roofs:

a. Combined roof and ceiling construction other than described in this section shall have a laboratory sound transmission class rating of at least STC-39.
b. With an attic or rafter space at least 6" deep, and with a ceiling below, the roof shall consist of closely butted 1/2" composition board, plywood, oriented strand board or gypsum board sheathing, topped by roofing as required.
c. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6", the roof construction shall have a surface weight of at least 25 pounds per square foot. Rafters, joists, or other framing may not be included in the surface weight calculation.
d. Window or dome skylights shall have a Laboratory sound transmission class rating of at least STC-28.

Ceilings:

a. Gypsum board or plaster ceilings at least 1/2" thick. Ceilings shall be substantially airtight, with a minimum number of penetrations.

b. Glass fiber or mineral wool insulation at least 2" thick shall be provided above the ceiling between joists.

Floors:

Openings to any crawl spaces below the floor of the lowest occupied rooms shall not exceed 2% of the floor area of the occupied rooms.

Ventilation:

a. A mechanical ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without the need to open any windows, doors, or other openings to the exterior.
b. Gravity vent openings in attic shall not exceed code minimum in number and size.
c. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with coated glass fiber 1" thick, and shall be at least 5 ft long with one 90 degree bend.
d. All vent ducts connecting the interior space to the outdoors, except domestic range exhaust ducts, shall contain at least a 5 ft. length of internal sound absorbing duct lining. Each duct shall be provided with a bend in the duct such that there is no direct line of sight through the duct from the venting cross section to the room-opening cross section.
e. Duct lining shall be coated glass fiber duct liner at least 1" thick.

f. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a baffle plate across the exterior termination, which allows proper ventilation. The dimensions of the baffle plate should extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be of the same material and thickness as the vent duct material.

g. Fireplaces shall be provided with well-fitted dampers.

Recommended Building Requirements for a Minimum NLR of 30 dB

Compliance with the following standards shall be deemed to meet the requirements of the compatible use districts in which an NLR 30 is specified.

General:

a. Brick veneer, masonry blocks, or stucco exterior walls shall be constructed airtight. All joints shall be grouted or caulked airtight.
b. At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar.
c. Window and/or through-the-wall ventilation units shall not be used.
d. Operational fireplaces shall not be used.
e. All sleeping spaces shall be provided with either a sound absorbing ceiling or a carpeted floor.
f. Through-the-wall/door mailboxes shall not be used.

Exterior Walls:

a. Exterior walls, other than as described below, shall have a laboratory sound transmission class rating of at least STC-44.
b. Masonry walls having a surface weight of at least 40 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered or painted with heavy "bridging" paint.
c. Stud walls shall be at least 4" in nominal depth and shall be finished on the outside with siding-on-sheathing, stucco, or brick veneer.

    (1) Interior surface of the exterior walls shall be of gypsum board or plaster at least 1/2" thick, installed on the studs. The gypsum board or plaster may be fastened rigidly to the studs if the exterior is brick veneer or stucco. If the exterior is siding-on-sheathing, the interior gypsum board or plaster must be fastened resiliently to the studs.
    (2) Continuous composition board, plywood or gypsum board sheathing shall cover the exterior side of the wall studs behind wood, or metal siding. The sheathing and facing shall weigh at least 4 pounds per square foot.

(3) Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.
(4) Insulation material at least 2” thick shall be installed continuously throughout the cavity space behind the exterior sheathing and between wall studs. Insulation shall be glass fiber or mineral wool.

Windows:

a. Windows, other than as described in this section, shall have a laboratory sound transmission class rating of at least STC-33.
b. Glass of double-glazed windows shall be at least 1/8" thick. Panes of glass shall be separated by a minimum 3/4" air space.
c. Double-glazed windows shall employ fixed sash or efficiently weather-stripped operable sash. The sash shall be rigid and weather-stripped with material that is compressed air tight when the window is closed so as to conform to an infiltration test not to exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM E-283-65-T.
d. Glass of fixed-sash windows shall be sealed in an airtight manner with a non-hardening sealant, or a soft elastomer gasket, or glazing tape.
e. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal Specifications: TT-S-00227, TT-S-00230, or TT-S-00153.
f. The total area of glass of both windows and exterior doors in sleeping spaces shall not exceed 20% of the floor area.

Doors:

a. Doors, other than as described in this section, shall have a laboratory sound transmission class rating of at least STC-33.
b. Double door construction is required for all door openings to the exterior. Openings fitted with side-hinged doors shall have one solid-core wood or insulated hollow metal core door at least 1-3/4" thick, separated by an airspace of at least 4" from another door, which can be a storm door. Both doors shall be tightly fitted and weather-stripped.
c. The glass of double-glazed sliding doors shall be separated by minimum 3/4" airspace. Each sliding frame shall be provided with an efficiently airtight weather stripping material.
d. Glass of all doors shall be at least 3/16" thick. Glass of double sliding doors shall not be equal in thickness.
e. The perimeter of doorframes shall be sealed airtight to the exterior wall construction.
f. Glass of doors shall be set and sealed in an airtight, non-hardening sealant, or a soft elastomer gasket, or glazing tape.

Roofs:

a. Combined roof and ceiling construction other than described in this section shall have laboratory sound transmission class rating of at least STC-44.

b. With an attic or rafter space at least 6" deep, and with a ceiling below, the roof shall consist of closely butted 1/2" composition board, plywood, oriented strand board or gypsum board sheathing topped by roofing as required.

c. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6", the roof construction shall have a surface weight of at least 40 pounds per square foot. Rafters, joists or other framing may not be included in the surface weight calculations.
d. Window or dome skylights shall have a laboratory sound transmission class rating of at least STC-33.

Ceilings:

a. Gypsum board or plaster ceilings at least 1/2" thick shall be provided
b. Glass fiber or mineral wool insulation at least 2" thick shall be provided above the ceiling between joists.

Floors:

a. The floor of the lowest occupied rooms shall be slab on fill, below grade, or over a fully enclosed basement. All door and window openings in the fully enclosed basement shall be tightly fitted.

Ventilation:

a. A mechanical ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without the need to open any windows, doors, or other openings to the exterior.
b. Gravity vent openings in attic snail not exceed code minimum in number and size. The openings shall be fitted with transfer ducts at least 3 ft in length containing internal sound absorbing duct lining. Each duct shall have a lined 90-degree bend in the duct such that the line of sight is interrupted from the exterior through the duct into the attic.
c. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with coated glass fiber 1" thick, and shall be at least 5 ft long with one 90 degree bend.
d. All vent ducts connecting the interior space to the outdoors, except domestic range exhaust ducts shall contain at least a 10 ft. length of internal sound absorbing duct lining. Each duct shall be provided with a lined 90-degree bend in the duct such that there is no direct line of sight through the duct from the venting cross section to the room opening cross section.
e. Duct lining shall be coated glass fiber duct.
f. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a baffle plate across the exterior termination, which allows proper ventilation. The dimensions of the baffle plate should

extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be made of the same material and thickness as the vent duct material.

g. Building heating units with flues or combustion air vents shall be located in a closet or room closed off from the occupied space by doors.
h. Doors between occupied space and mechanical equipment areas shall be solid core wood or 20 gauge steel hollow metal at least 1-3/4" thick and shall be fully weather-stripped.

Recommended Building Requirements for a Minimum NLR of 35 dB

Compliance with the following standards shall be deemed to meet the requirements of the compatible use districts in which an NLR 35 is specified.

General:

a. Brick veneer, masonry blocks or stucco exterior walls shall be constructed airtight. All joints shall be grouted or caulked airtight.
b. At the penetration of exterior walls by pipes, ducts or conduits, the space between the wall and pipes, ducts or conduits shall be caulked or filled with mortar.
c. Window and/or through-the-wall ventilation units shall not be used.
d. Operational vented fireplaces shall not be used.
e. All sleeping spaces shall be provided with either a sound absorbing ceiling or a carpeted floor.
f. Through-the-wall/door mailboxes shall not be used.
g. No glass or plastic skylight shall be used.

Exterior Walls:

a. Exterior walls other than as described below shall have a laboratory sound transmission class rating of at least STC-49.
b. Masonry walls having a surface weight of at least 75 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered or painted with heavy "bridging" paint.
c. Stud walls shall be at least 4" in nominal depth and shall be finished on the outside with siding-on-sheathing, stucco, or brick veneer.

(1) Interior surface of the exterior walls shall be of gypsum board or plaster at least 1/2" thick, installed on studs. The gypsum board or plaster may be fastened rigidly to the studs if the exterior is brick veneer. If the exterior is stucco or siding-on-sheathing, the interior gypsum board or plaster must be fastened resiliently to the studs.
(2) Continuous composition board, plywood or gypsum board sheathing shall cover the exterior side of the wall studs behind wood or metal siding. The sheathing and facing shall weigh at least 4 pounds per square foot.

(3) Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.
(4) Insulation material at least 3-1/2" thick shall be installed continuously through the cavity space behind the exterior sheathing and between wall studs. Insulation shall be glass fiber or mineral wool.

Windows:

a. Windows other than as described in this section shall have a laboratory sound transmission class rating of at least STC-38.
b. Glass of double-glazed windows shall be at least 1/8" thick. Panes of glass shall be separated by a minimum 3/4" air space and shall not be equal in thickness.
c. Glass of windows shall be sealed in an airtight manner with a non-hardening sealant, or a soft elastomer gasket or glazing tape.
d. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal Specifications: TT-S-00227, TT-S-00230, or TT-S-00153.
e. The total area of glass of both windows and exterior doors in sleeping spaces shall not exceed 20% of the floor area.

Doors:

a. Doors, other than as described in this section, shall have a laboratory sound transmission class rating of at least STC-38.
b. Double door construction is required for all door openings to the exterior. The door shall be side-hinged and shall be solid-core wood or insulated hollow metal, at least 1-3/4" thick, separated by a vestibule at least 3 ft in length. Both doors shall be tightly fitted and weather-stripped.
c. The perimeter of doorframes shall be sealed airtight to the exterior wall construction.

Roofs:

a. Combined roof and ceiling construction other than described in this section and Section 3-7 shall have a laboratory sound transmission class rating of at least STC-49.
b. With an attic or rafter space at least 6" deep, and with a ceiling below, the roof shall consist of closely butted 1/2" composition board, plywood, oriented strand board or gypsum board sheathing topped by roofing as required.
c. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6" the roof construction shall have a surface weight of at least 75 pounds per square foot. Rafters, joists or other framing may not be included in the surface weight calculation.

Ceilings:

a. Gypsum board or plaster ceilings at least 1/2" thick shall be provided where required by Paragraph 3-6. Ceilings shall be substantially airtight, with a minimum number of penetrations. The ceiling panels shall be mounted on resilient clips or channels. A non-hardening sealant shall be used to seal gaps between the ceiling and walls around the ceiling perimeter.
b. Glass fiber or mineral wool insulation at least 3 1/2" thick shall be provided above the ceiling between joists.

Floors:

a. The floors of the lowest occupied rooms shall be slab on fill or below grade.

Ventilation:

a. A mechanical ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without need to open any windows, doors, or other openings to the exterior.
b. Gravity vent openings in attic shall not exceed code minimum in number and size. The opening shall be fitted with transfer ducts at least 6 ft. in length containing internal sound absorbing duct lining. Each duct shall have a lined 90-degree bend in the duct such that there is no direct line of sight from the exterior through the duct into the attic.
c. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with 1" thick coated glass fiber, and shall be at least 10 ft long with one 90 degree bend.
d. All vent ducts connecting the interior space to the outdoors, excepting domestic range exhaust ducts, shall contain at least a 10 ft length of internal sound absorbing duct lining. Each duct shall be provided with a lined 90-degree bend in the duct such that there is no direct line of sight through the duct from the venting cross section to the room-opening cross section.
e. Duct lining shall be coated glass fiber duct liner at least 1" thick.
f. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a baffle plate across the exterior termination, which allows proper ventilation. The dimensions of the baffle plate should extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be of the same material and thickness as the vent duct material.
g. Building heating units with flues or combustion air vents shall be located in a closet or room closed off from the occupied space by doors.
h. Doors between occupied space and mechanical equipment areas shall be solid core wood or 20 gauge steel hollow metal at least 1-3/4" thick and shall be fully weather-stripped.

Methods for Exterior Wall Sound Insulation in New Homes

Typically, most wall construction consists of a 3.5-inch stud cavity with studs spaced 16 inches on center, ½-inch gypsum drywall on the interior, 7/16 structural sheathing on the exterior and either siding or brick veneer as the finish on the exterior. Consider using the construction techniques below:

1. Increase the wall stud cavity to 5.5-inches, spaced 24 inches on center. The increased depth of the stud cavity will allow for the installation of R-19 insulation.

2. When considering the type of insulation material, consider using cellulose insulation material. This material is of a higher density. The method of installation is a spray method that tends to completely fill the cavity without voids.

3. Prior to the installation of insulation material in the walls, seal all penetrations through the top and bottom plates. Remember if air can enter, so can sound. Seal all penetrations through the bottom plate with caulk. Seal all penetrations through the top plate with caulking materials meeting the requirements of ASTM E-136. Sealing the penetrations is a requirement of the North Carolina State Building Code.

4. Increase the thickness of the interior wall finish from ½-inch to 5/8-inch gypsum wallboard.

5. Caulk around all openings through the drywall such as receptacles, switches, plumbing drains, etc.

6. Increase the thickness of the exterior sheathing material to 5/8-inch or thicker material.

7. Consider using brick veneer instead of siding material for the exterior finish. Insure at least a one-inch air space between the brick veneer and the siding.

8. If siding is to be used, avoid using vinyl siding. Choose siding with a higher density such as Hardiplank, or wood siding. Install 30-pound felt between the siding and sheathing lapped 2 inches on horizontal joints and 6 inches on vertical joints.

9. If vinyl siding is a must, install ¼-thick fanfold insulation board between the siding and sheathing.

10. Avoid large openings or breaks in continuity in the walls, such as large windows.

11. Install bathroom vent and kitchen hood vents on the side of the home away from the flight track. Make sure that vent terminations have an automatic closure on the end. Always use metal pipe for the vent pipe.

Methods for Improving Attic and Ceiling Sound Insulation In New Homes

1. Consider using energy trusses. Energy trusses allow for the installation of ceiling insulation to a full depth along the plate lines at exterior walls.

2. Install baffles on attic vents where practical.

3. Install acoustically absorptive material to a thickness equal to R-38 to the attic space to reduce reverberant sound level buildup. Apply material evenly throughout the attic space, taking care to keep it away from eave vents and openings. Consider the use of cellulose insulation. This material fills the cavity without leaving voids in the material and is of a higher density than fiberglass.

4. Install 5/8-inch gypsum board as the interior ceiling finish.

5. Caulk around all penetrations through the ceiling membrane such as light fixtures.

6. Avoid the use of "can-type – recessed light" light fixtures.

7. Avoid the use of true exposed wood beams on the ceiling. This creates a continuous path for sound through the ceiling structure

8. Avoid the use of whole house exhaust fans in the ceiling.

Methods for Improving Floor Sound Insulation In New Homes

1. Install R-30 insulation batts between the joists. The North Carolina State Building Code requires R-19.

2. Seal all penetrations through the floor assembly such as Heating and Air Conditioning supplies; exhaust ducts such as down draft exhaust from dryers and ranges, etc.

3. Install foundation vents of the swing cover awning type instead of the horizontal slider type.

4. Consider a sealed crawlspace and insulate the foundation walls. If this method is chosen, caulk between the mudsill and the foundation.

Methods for Improving Window Sound Insulation in New Homes

1. The most effective method of reducing sound transmission by a window is by increasing thickness of the glass panes. Basically, thicker is better. Thicker glass tends to bend less, and therefore vibrates less when exposed to sound waves. Using 6mm glass combinations or laminated glass is the simplest, most cost effective method of reducing sound transmission.

2. When choosing windows for your new home remember windows are generally the weakest link in sound attenuation

3. Choose windows that are double-glazed with panes at least 3/16 inch thick. Windows shall be double glazed with panes at least three-sixteenths inch (3/16") thick. Panes of glass should be separated by a minimum one-half inch (1/2") airspace, and should not be equal in thickness.

4. Double glazed windows should employ fixed sash or efficiently weather-stripped, operable sash. The sash shall be rigid and weather-stripped with material that is compressed airtight when the window is closed.

5. Glass should be sealed in an airtight manner with a non-hardening sealant or a soft elastomer gasket or gasket tape.

6. The perimeter of the window frames should be sealed airtight to the exterior wall construction with a sealant. The usual installation of windows employs stuffing the void between the window and framing with fiberglass insulation. The use of a sealant on top of the insulation material acts as an air infiltration barrier. Insulation by itself is not a good air infiltration barrier. Remember, if air can pass through, so can sound.

7. Avoid large picture windows and sliding glass doors on sides of the dwelling, which face the flight track.

Methods for Improving Door Sound Insulation in New Homes

1. Double door construction should be considered for all hinged door openings to the exterior. Such doors should be side hinged and shall be solid core wood or insulated hollow metal at least one and three-fourths inch (1-3/4") thick separated by an airspace of at least three inches (3") from another door, storm door. Both doors shall be tightly fitted and weather-stripped.
2. All doors, shall be at least three-sixteenths (3/16") thick. Glass of double sliding doors shall not be of equal thickness.
3. The perimeter of doorframes shall be sealed airtight to the exterior wall construction (framing). Stuff the gap between the doorframe and the framing with insulation and seal with a non-hardening caulk. Remember, if air can pass through, so can sound.
4. Glass in doors should be sealed in an airtight non-hardening sealant or in a soft elastomer gasket or gasket tape.

Methods for Improving Sound Insulation in Existing Homes

The best time to consider sound attenuation is during the construction of new homes. Retrofitting an existing home for sound attenuation can be costly. If one is considering retrofitting for sound attenuation, it is best done during a planned renovation project. As mentioned earlier in this guide, windows are generally the weakest link in sound attenuation. Some of the simpler and easiest ways to attain sound attenuation is by a combination of the following:

1. Add insulation in the attic to an overall R-Value thickness of R-38.

2. Caulk around all penetrations through the interior finishes. (Receptacles, light fixtures, plumbing drains, etc.)

3. Install single pane storm windows over existing single pane windows.

4. Install weather-stripping on all doors.

5. Employ any of the methods described in Methods for Improving Sound Attenuation in New Homes as the project allows.

Methods of Noise and Vibration Control In Residential HVAC Systems

1. Mount the motor/fan at grade level on factory-supplied vibration isolators to minimize vibration transmitted to the house.

2. If fans or other pieces of equipment are located in the attic, use mounting bases and vibration isolators to reduce structure borne noise and vibration transmission.

3. Install flexible duct connectors to limit vibration transmitted to the ductwork or the dwelling structure.

4. Use standard sheet metal ductwork in attics and crawlspaces. Ductwork is exposed to higher levels of aircraft noise in these spaces. Do not use flexible ductwork in attic spaces since it does not have as good sound-insulating properties as standard sheet metal.

5. Supply grilles in rooms should be of the opposed-blade type and be designed for low noise.

6. A duct sound trap (muffler) should be installed just inside the fresh-air inlet opening. The sound trap will reduce any aircraft noise that passes through this opening and will eliminate the possibility of aircraft noise being transmitted via the duct path.

Public Safety

Throughout the public participation phase of the Eastern Carolina Joint Land Use Study, several comments were received from the general public regarding the ability of public safety personnel to respond in the event of an aircraft accident. In addition, questions were posed regarding adequate training of response personnel and the interaction and cooperation of MCAS Cherry Point (including MCALF Bogue and MCOLF Atlantic) and local emergency response agencies.

As a result, Technical Advisory Committee members examined the safety issues in relation to potential aircraft accidents and the ability to respond. It was agreed that appropriate training and interaction does currently exist between the military installation and local emergency response agencies. One factor which contributes to this is the fact that several of the military personnel stationed at MCAS Cherry Point also serve on the local fire and rescue departments in the communities where they reside.

Despite the conclusion that adequate response measures are currently in place, it is recommended that local government officials continue to support and provide funding to improve coordination of regional response and training for potential disasters. One such organization that has recently been created to accomplish this mission is the Crystal Coast Disaster Coalition. The group is comprised of local emergency response agencies, as well as MCAS Cherry Point, and was

created to examine appropriate response disasters as well as provide training opportunities for its members. The Crystal Coast Disaster Coalition has received support from the local governing bodies and from the leadership at MCAS Cherry Point. It is essential that the group be given the appropriate resources to accomplish this task.

One area in which the Crystal Coast Disaster Coalition is being utilized is the development of appropriate mutual aid agreements. The Technical Advisory Committee supports efforts to update existing agreements to provide a clear understanding of appropriate response in the event of an aircraft accident.

Lending Practices

Noise Regulation

Approvals of mortgage loans from the Federal Housing Administration (FHA) and the Veterans Administration (VA) are subject to the United States Department of Housing and Urban Development (HUD) regulations. The regulation sets forth a discretionary policy to withhold funds for housing projects when noise exposure is in excess of proscribed levels. Residential construction may be permitted within 65 Ldn contour, provided sound attenuation is accomplished. The added construction expense of sound attenuation, however, may make sitting in these noise exposure areas financially less attractive. Because the HUD policy is discretionary, variances may also be permitted, depending on regional interpretation and local conditions. HUD also has a policy (24 CFR 51D), which prohibits funding for projects in Clear Zones and Accident Potential Zones unless the project is compatible with the AICUZ.

HUD Restrictions

The Untied States Department of Housing and Urban Development has instituted a policy *"to foster the creation of controls and standards for community noise abatement and control by general purpose agencies of state and local governments…"*

Included among the various policies are:

1. A requirement that noise exposures and source of noise be given adequate consideration as an integral part of urban environments in connection with all HUD programs, which provide financial support to planning; and
2. A withholding of HUD assistance for the construction on new dwelling units on sites (which have or are projected to have unacceptable noise exposures), or are in Clear Zones or incompatible uses in APZ's; and
3. Encouragement of modernization efforts for existing buildings in noise environments; and
4. Grants and allowances to state and local governments to provide acoustical privacy in multi-family dwellings through building design and acoustical treatment.

Generally, external noise exposure within Noise Zone 3 is considered unacceptable and within Noise Zone 2 is normally unacceptable with respect to

new construction. HUD funds may also be available to encourage noise abatement planning and acoustical treatment for proposed and existing incompatible land uses with the AICUZ.

LAND USE

Land Use Compatibility

The crux of the Eastern Carolina Joint Land Use Study is to guide incompatible land uses away from the military facilities and training flight paths and to encourage compatible land uses in the immediate vicinity. This is desirable so that the Marine Corps Air Station Cherry Point and Auxiliary Landing Field Bogue can be assured that it will be able to continue its training operations at its present locations and so that the local community can be assured of its citizens safety and well being living in conjunction to the airfields.

From the community standpoint, the most noticeable aspect of the military's presence is aircraft noise. While there are things which can be done to mitigate this noise, land use planning can go a long way in helping to reduce its impact on the local community. Included in the planner's toolbox are a number of options regarding land use planning. Comprehensive Plans, Land Use Plans, Zoning Regulations and Ordinances, Subdivision Regulations, Mobile Home Park Regulations, Building Codes, Housing Codes, Capital Improvement Programs, Official Map Regulations, Infrastructure Planning, Growth Management Policies, Manufactured Home Park, Manufactured Home and Recreational Vehicle Park Ordinances are some examples of tools aimed at addressing compatibility issues.

This section provides guidance to land use planners, planning and zoning boards, owners, lessees, realtors, builders, developers and anyone else who might have an interest in minimizing encroachment. This guide identifies a wide variety of possible compatible land uses. It recognizes that county and municipal governments are responsible for land use planning and zoning regulation. It also recognizes that the US Marine Corps is responsible for land use and regulation of the property that is under its control, including airspace. Understanding the roles and responsibilities for land use compatibility planning and implementation is important in determining the responsibilities placed on each entity and individual involved.

This guide is just that—a guide. It is not intended to mandate land uses, but it merely provides a coherent thought process in the designations of land uses based on the Accident Potential Zone (APZ) and the Noise Level Zone in which a particular structure or parcel of land resides. The ECJLUS Technical Advisory Committee recommends that the Air Installations Compatible Use Zone (AICUZ) study be used as a starting point when examining compatible uses on a local level. What is suggested or recommended in the ECJLUS should be considered as an important, but not the single factor, when considering growth guidelines for local communities. The recommended use guidelines and maps are presented in this section. Suggested exceptions or specific local concerns for each jurisdiction have been addressed.

Carteret County

In the past, Carteret County has taken proactive steps to enact growth guidelines in the unincorporated areas around MCALF Bogue. The county should continue to monitor growth patterns in unincorporated areas in the vicinity of the auxiliary landing field. Special attention should be given to any undeveloped lands in the Accident Potential Zones to limit the number of persons (density) residing in the flight patterns.

Unfortunately, residential development has occurred in the Goose Creek and Hickory Shores area adjacent to MCALF Bogue. Because some of the development in that area is manufactured homes and travel park homes, the ability to sound attenuate with additional building materials is not financially feasible. As a result, the need for full disclosure prior to purchase or lease is even more important in this area.

While it may be impractical to change development standards in existing subdivisions, the county is urged to consider the density and types of use in any future development in the unincorporated areas in the vicinity of MCALF Bogue Field. Because of the proximity to the Atlantic Ocean and the constant threat of damaging storms, the need to plan for possible redevelopment is essential. Again, priority and focus should be given to areas directly impacted by the Accident Potential Zones.

At present, there are no known plans to increase operations at MCOLF Atlantic. The ECJLUS examined the possibility of using the Outlying Landing Field for aircraft training currently being done at MCAS Cherry Point and MCALF Bogue. Several factors were examined including support and distance from MCAS Cherry Point, costs, condition of facilities and runways, current uses, logistics, and needed manpower. It became clear that the obstacles faced in examining each of these factors was too great to recommend any changes in operations at MCOLF Atlantic.

Despite the lack of a recommendation on increased usage of MCOLF Atlantic, the Technical Advisory Committee does encourage Carteret County to examine land use guidelines in the area if the operations at the facility increase in the future. The possibility for encroachment exists in the areas surrounding MCOLF Atlantic.

Craven County

In 1989, Craven County adopted zoning regulations for some properties located adjacent to Runways 23 and 32, east of MCAS Cherry Point. As a result of the 2002 AICUZ Update, the county should expand their land use controls to reflect the changes. In 1989, a decision was made to use Highway 70 as a dividing line between zoned and un-zoned areas. However, with the advent of Geographic Information Systems technology, mapping exact properties affected by aircraft operations is much easier than in 1989. As such, the county should update its maps to be more site-specific with particular parcels. By doing so, the county can

guide growth on individual properties to more compatible locations. As such, it may be possible to allow for compatible development on parcels, which would otherwise be limited in its development.

While some of the larger undeveloped parcels within the study area are owned by the federal government and private conservation companies, the county should enact land use guidelines which take into account redevelopment of property. Despite the fact that current uses are compatible with military operation in the area, the potential still exists for future redevelopment of large tracts of land.

The 2002 AICUZ Update identified an area southwest of MCAS Cherry Point Runway 5, located in unincorporated Craven County, which is currently unprotected from development. The area lies outside of the City of Havelock's zoning jurisdiction and has a significant potential for development given the proposed location for the Highway 70 By-pass around Havelock. Immediate efforts should be made to guard against high-density development in this area.

It is recommended that the county either expand the 1989 planning regulations to include these properties in its zoning ordinances and maps or work with the City of Havelock to expand its Extraterritorial Jurisdiction (ETJ) to include the affected areas.

City of Havelock

The City of Havelock has adopted overlay districts as a part of its zoning ordinance to guide development in areas impacted by Accident Potential Zones. To date, no planning measures have been implemented to address noise zones identified through the AICUZ process. The city has language in its ordinances addressing disclosure statements as part of property sales located within the AICUZ footprint. However, implementation of disclosure statement policies has proven to be difficult.

As a local government entity, the City of Havelock has been very proactive in establishing proper development guidelines to minimize encroachment on MCAS Cherry Point. The city is encouraged to continue taking steps to address the potential for encroachment. Specifically, Havelock may want to include the land use codes for Accident Potential Zones and noise. The ECJLUS contains new mapping which combines both hazard characteristics (safety and noise) in a land use matrix with recommended compatible land uses.

It is anticipated that the recommended use of standard disclosure statements will make implementation of Havelock ordinances more easily enforceable. The city is encouraged to amend the necessary ordinances dealing with disclosure.

Construction of the proposed Highway 70 By-pass around Havelock presents an opportunity for growth in the community. Measures should be taken to ensure that compatible land uses are recommended in areas affected by both MCAS Cherry Point operations and the proposed by-pass. Specifically, the 2002 AICUZ Update

identified an area adjacent to the proposed by-pass, which is currently unprotected from development. The city is encouraged to work with Craven County to ensure protection of this area. This could include the extension of Extraterritorial Jurisdiction (ETJ) boundaries to "take in" an area near the southwest corner of MCAS Cherry Point off of Runway 5.

Town of Emerald Isle

Of the participating entities, the Town of Emerald Isle is the most developed community in the study area. It is estimated that 81% of all available land in Emerald Isle is currently developed. While Emerald Isle has zoning regulations currently in place, the ordinances do not include any references or requirements for proposed development to be compatible with the AICUZ recommendations.

Despite the fact that the community is heavily developed and direct encroachment to MCALF Bogue is limited due to Bogue Sound, Emerald Isle should consider the possibility of redevelopment when examining changes to its land use guidelines. Due to its proximity to the Atlantic Ocean and the threat of severe damage due to storms, the potential for redevelopment is significant.

Recognizing the potential for growth as a result to its location near the ocean, it may be impractical to adopt guidelines which would limit development to one to two dwelling units per acre. The town is encouraged to look at realistic approaches to guide development away from potential hazard areas. A more practical suggested may be to cluster units at three or four dwelling units per acre with the remaining land left in open space. It is important to look at lot coverages, as well as specific site locations for structures, as it relates to the AICUZ footprint. By doing so, a parcel that may have been incompatible for some types of development may be used for development purposes.

An area that should be closely examined by Emerald Isle officials is the properties located off Sound, Marina and Davis Drives. The 2002 AICUZ Update identifies some parcels in this area as being in Accident Potential Zone 1, which discourages any type of residential development. Because the area identified is so small in nature and because the actual APZ 1 boundary splits most parcels, it may be practical to consider these parcels part of APZ 2, which does allow for some types of residential development. It is recommended that Emerald Isle consider an AICUZ overlay district to assist in establishing land use guidelines in future zoning modifications. This would enable the town to consider safety and noise hazards when determining appropriate land uses.

Town of Bogue

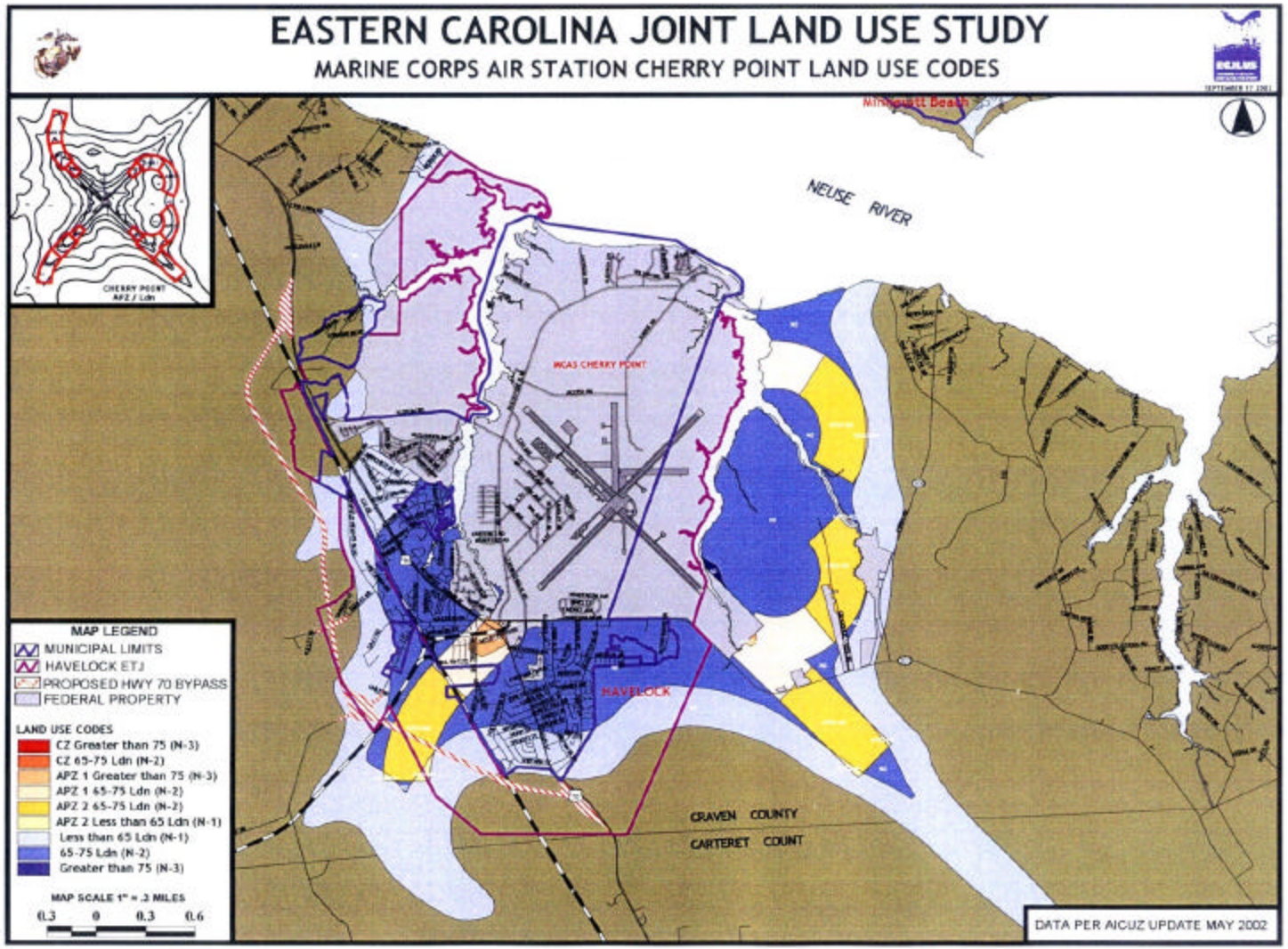
The Town of Bogue currently has a zoning ordinance in place which regulates land uses for properties adjacent to MCALF Bogue. Currently, the ordinance does not include references or requirements for proposed development to be compatible with AICUZ recommended land uses. The Town of Bogue may want to examine the developing overlay districts within its incorporated limits in order to

adequately address potential encroachment on MCALF Bogue. The ECJLUS contains recommended land use codes and new mapping which combine hazard characteristics (safety and noise) in a land use matrix with recommended compatible land uses. The new land use codes could be incorporated into the zoning ordinance adopted by the governing body.

One area which should be given special attention, due to its potential for growth, is the Goose Creek area. Currently, the town has this area zoned for residential purposes. While it may be impractical to change development standards in existing subdivisions, the town is urged to consider the density and types of use in any future development in the vicinity of MCALF Bogue.

Eastern Carolina Council's Role: Technical Assistance

As the Council of Governments for each of the local government entities participating in the Eastern Carolina Joint Land Use Study, the Eastern Carolina Council is available to provide the necessary technical assistance needed to implement any of the land use recommendations offered in the ECJLUS. The organization will work with the planning staffs of each of the local governments should they desire to further examine or implement any of the recommended land use suggestions.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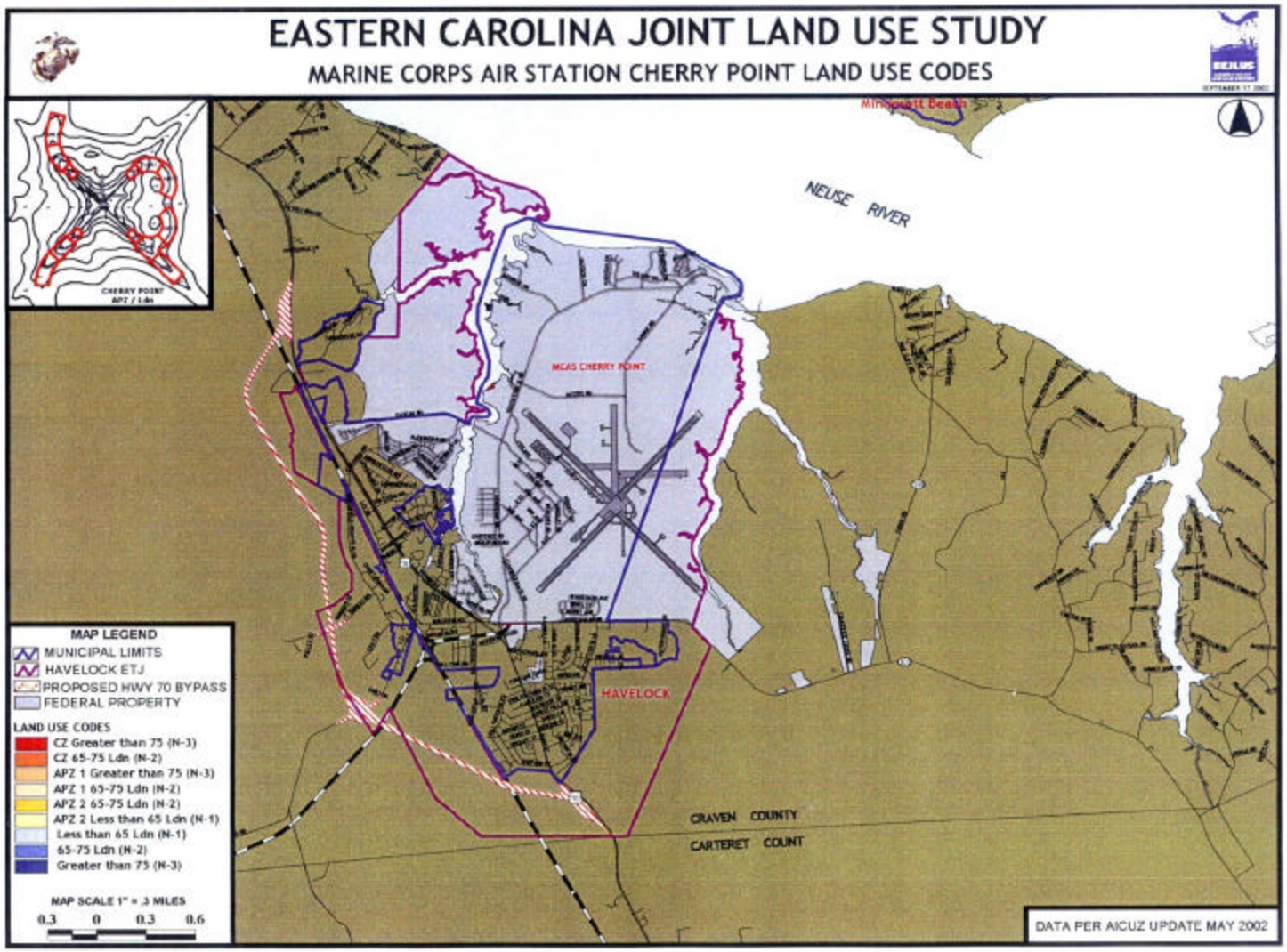
PROPOSED HWY 70 BYPASS
FEDERAL PROPERTY
LAND USE CODES
CZ Greater than 75 (N-3)
CZ 65-75 Ldn (N-2)
APZ 1 Greater than 75 (N-3)
APZ 1 65-75 Ldn (N-2)
APZ 2 65-75 Ldn (N-2)
APZ 2 Less than 65 Ldn (N-1)
Less than 65 Ldn (N-1)
65-75 Ldn (N-2)
Greater than 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE MAY 2002

CZ (Clear Zone)

Incompatible Land Uses	Compatible Land Uses
Single units: detached,	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (3)
Single units: semi-detached	Motor vehicle transportation, highway & street right-of-way (3)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Communications (3)
Mobile home parks or courts	Utilities (3)
Group quarters, residential hotels	Agriculture (except livestock) (16. 22)
Transient lodging	Forestry activities and related services (5)
Food & kindred products manufacturing	Fishing activities and related services (5)
Textile Mill products; manufacturing;	
Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing	
Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries.	
Chemicals and allied products	
Petroleum refining and related industries	
Rubber and misc. plastic products	
Stone, clay & glass products; primary metal industries, fabricated metal products	
Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks	
Cell towers, antennae, above ground transmission lines, landfills	
Wholesale trade; hardware, and farm equipment	
Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment	
Eating and Drinking establishments	
Finance, insurance, real estate, personal, professional.	
Cemeteries	
Business services	
Repair services	
Hospitals, nursing homes	
Other medical facilities	
Contractor Construction services	
Government Services	
Educational Services	
Cultural activities (including church)	
Nature exhibits	
Public Assembly	
Auditoriums, concert halls	
Outdoor music shell, amphitheaters	
Outdoor sports arenas, spectator sports	
Recreational activities (including golf courses, riding stables, water recreation)	
Parks	
Livestock farming and animal breeding	
Agriculture related activities	
Mining activities & related activities	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HAVELOCK
CRAVEN COUNTY
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MAP LEGEND
MUNICIPAL LIMITS
HAVELOCK ETJ
PROPOSED HWY 70 BYPASS
FEDERAL PROPERTY
LAND USE CODES
CZ Greater than 75 (N-3)
CZ 65-75 Ldn (N-2)
APZ 1 Greater than 75 (N-3)
APZ 1 65-75 Ldn (N-2)
APZ 2 65-75 Ldn (N-2)
APZ 2 Less than 65 Ldn (N-1)
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Greater than 75 (N-3)
MAP SCALE 1" = .3 MILES
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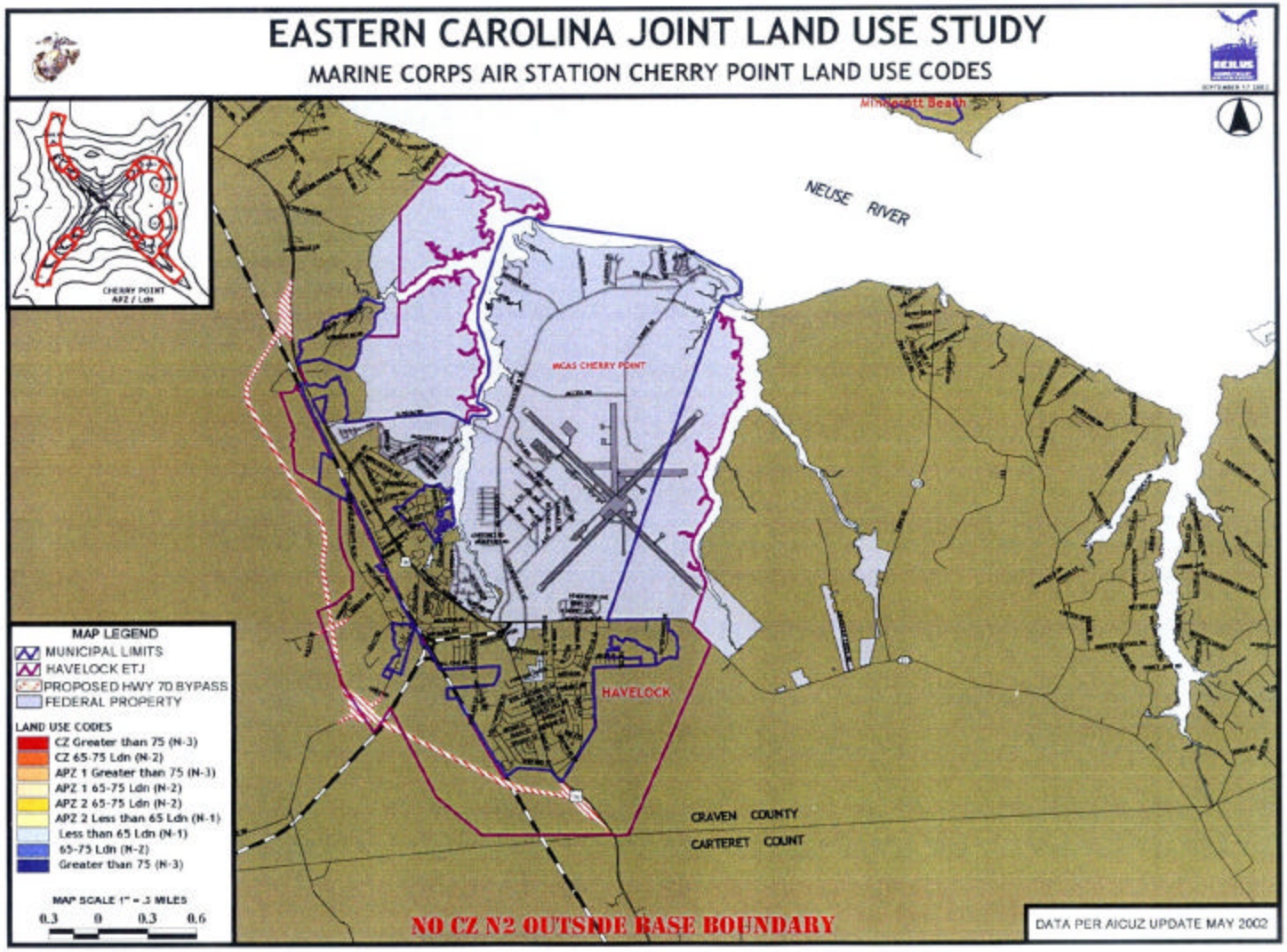
DATA PER AICUZ UPDATE MAY 2002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Less than 65 Ldn (N-1)
65-75 Ldn (N-2)
Greater than 75 (N-3)
MAP SCALE 1" = .3 MILES
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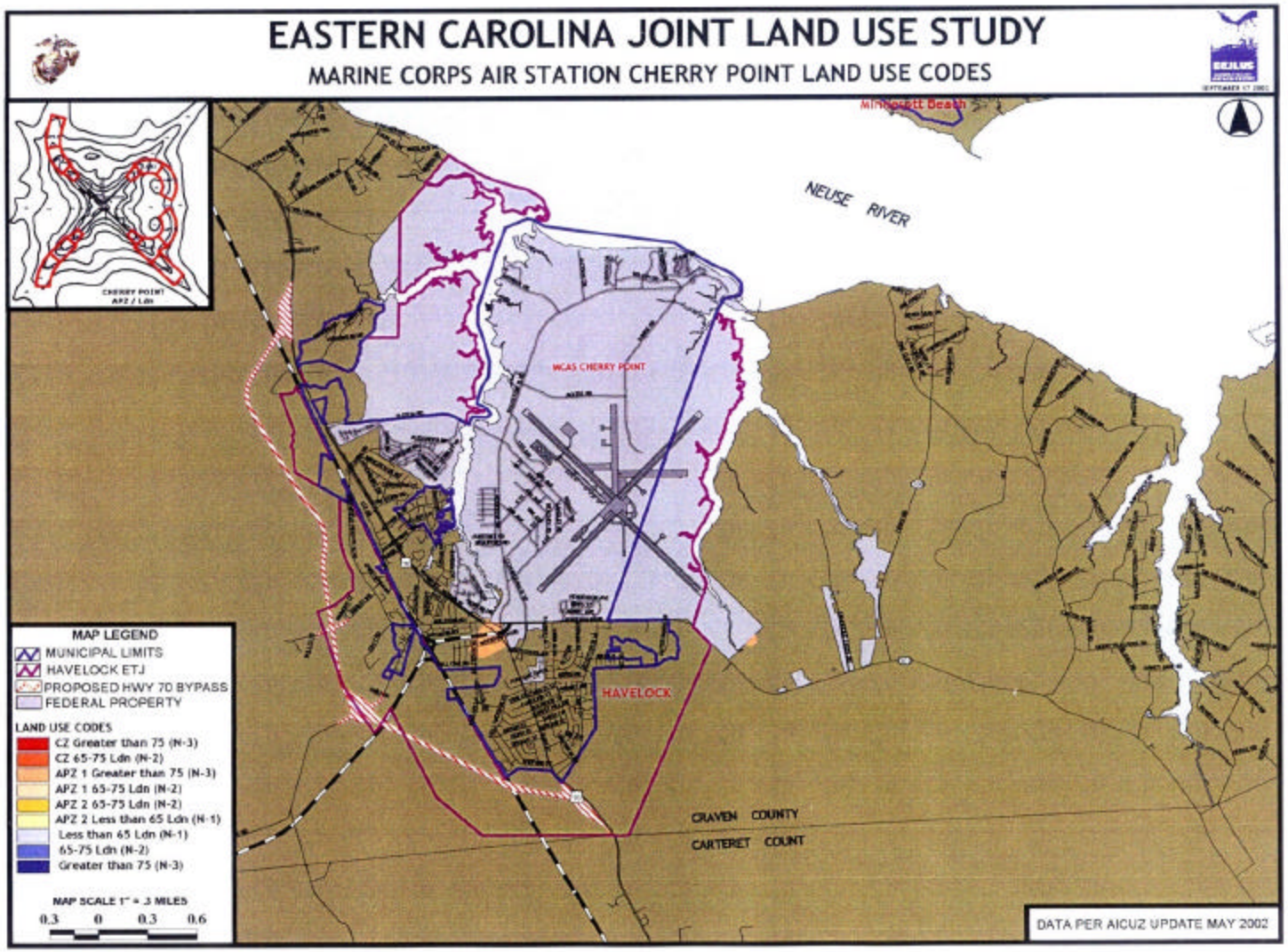
NO CZ N2 OUTSIDE BASE BOUNDARY
DATA PER AICUZ UPDATE MAY 2002

APZ 1, N-3

Incompatible Land Uses	Compatible Land Uses
Single units: detached,	Food & kindred products manufacturing (2)
Single units: semi-detached	Textile Mill products; manufacturing (2)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries. (2)
Mobile home parks or courts	Rubber and misc. plastic products (2)
Group quarters, residential hotels	Stone, clay & glass products; primary metal industries, fabricated metal products (2)
Transient lodging	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (4,23)
Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing	Motor vehicle transportation, highway & street right-of-way (23)
Chemicals and allied products	Communications (4, 23, 24)
Petroleum refining and related industries	Utilities (4,23, 24)
Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks	Wholesale trade; hardware, and farm equipment (2, 23,24)
Cell towers, antennae, above ground transmission lines, landfills	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment (2)
Eating and Drinking establishments	Cemeteries (7, 23)
Finance, insurance, real estate, personal, professional.	Business services (8, 23, 24)
Hospitals, nursing homes	Repair services (23)
Other medical facilities	Contractor Construction services (6, 23)
Government Services	Educational Services (2)
Cultural activities (including church)	Nature exhibits (2, 22, 23)
Public Assembly	Recreational activities (including golf courses, riding stables, water recreation) (8, 9, 10, 23)
Auditoriums, concert halls	Parks (8, 22, 23)
Outdoor music shell, amphitheaters	Agriculture (except livestock) (22)
Outdoor sports arenas, spectator sports	Livestock farming and animal breeding
	Agriculture related activities (5)
	Forestry activities and related services
	Fishing activities and related services (5)
	Mining activities & related activities (5, 23)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65-75 Ldn (N-2)
Greater than 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE MAY 2002

APZ 1, N-2

Incompatible Land Uses	Compatible Land Uses
Single units: detached,	Food & kindred products manufacturing (2)
Single units: semi-detached	Textile Mill products; manufacturing (2)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries. (2)
Mobile home parks or courts	Rubber and misc. plastic products (2)
Group quarters, residential hotels	Stone, clay & glass products; primary metal industries, fabricated metal products (2)
Transient lodging	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (4,23)
Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing	Motor vehicle transportation, highway & street right-of-way (23)
Chemicals and allied products	Communications (4, 23, 24)
Petroleum refining and related industries	Utilities (4,23, 24)
Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks	Wholesale trade; hardware, and farm equipment (2, 23,24)
Cell towers, antennae, above ground transmission lines, landfills	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment (2)
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Finance, insurance, real estate, personal, professional.	Business services (8, 23, 24)
Hospitals, nursing homes	Repair services (23)
Other medical facilities	Contractor Construction services (6, 23)
Government Services	Educational Services (2)
Cultural activities (including church)	Nature exhibits (2, 22, 23)
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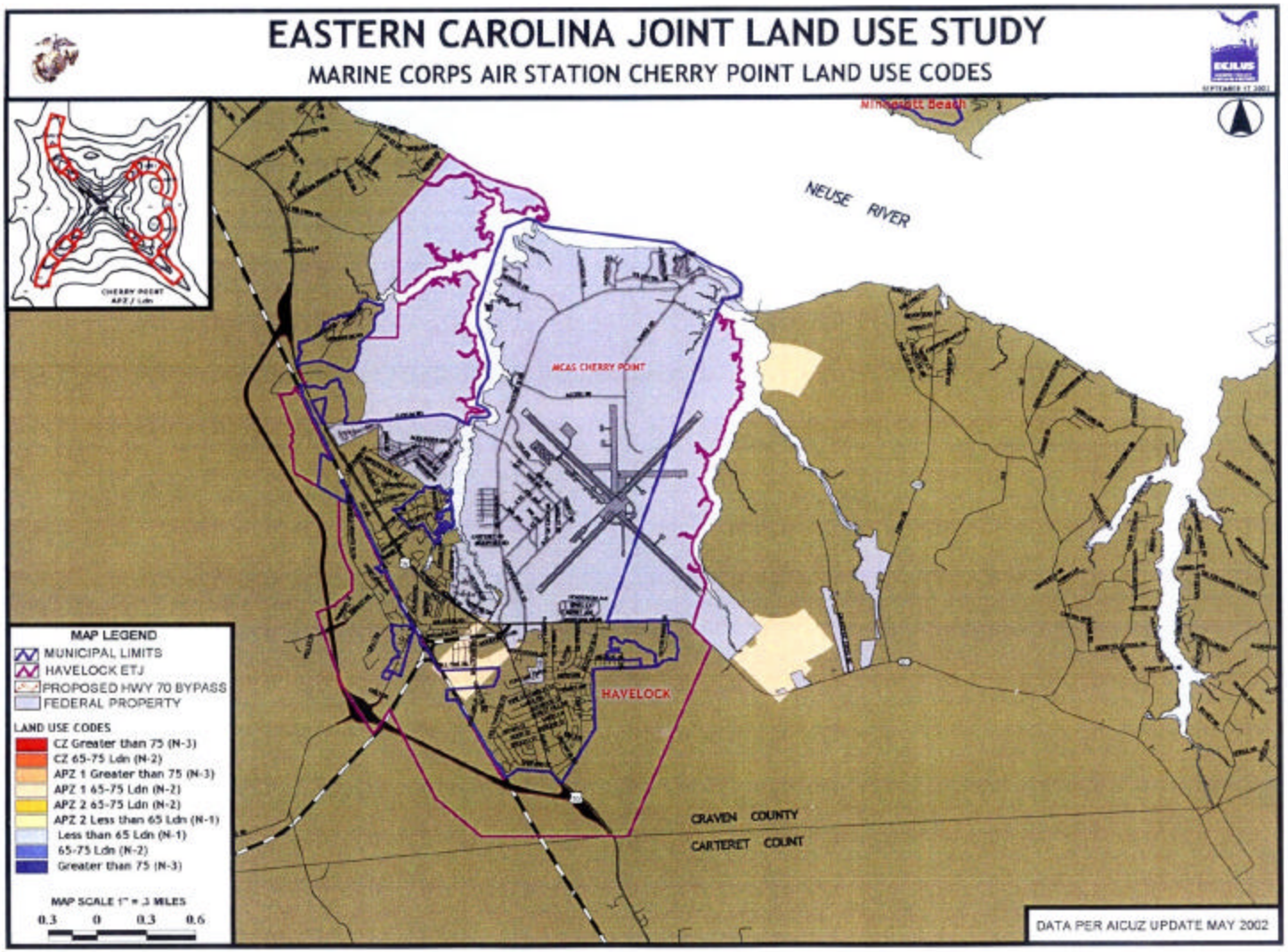
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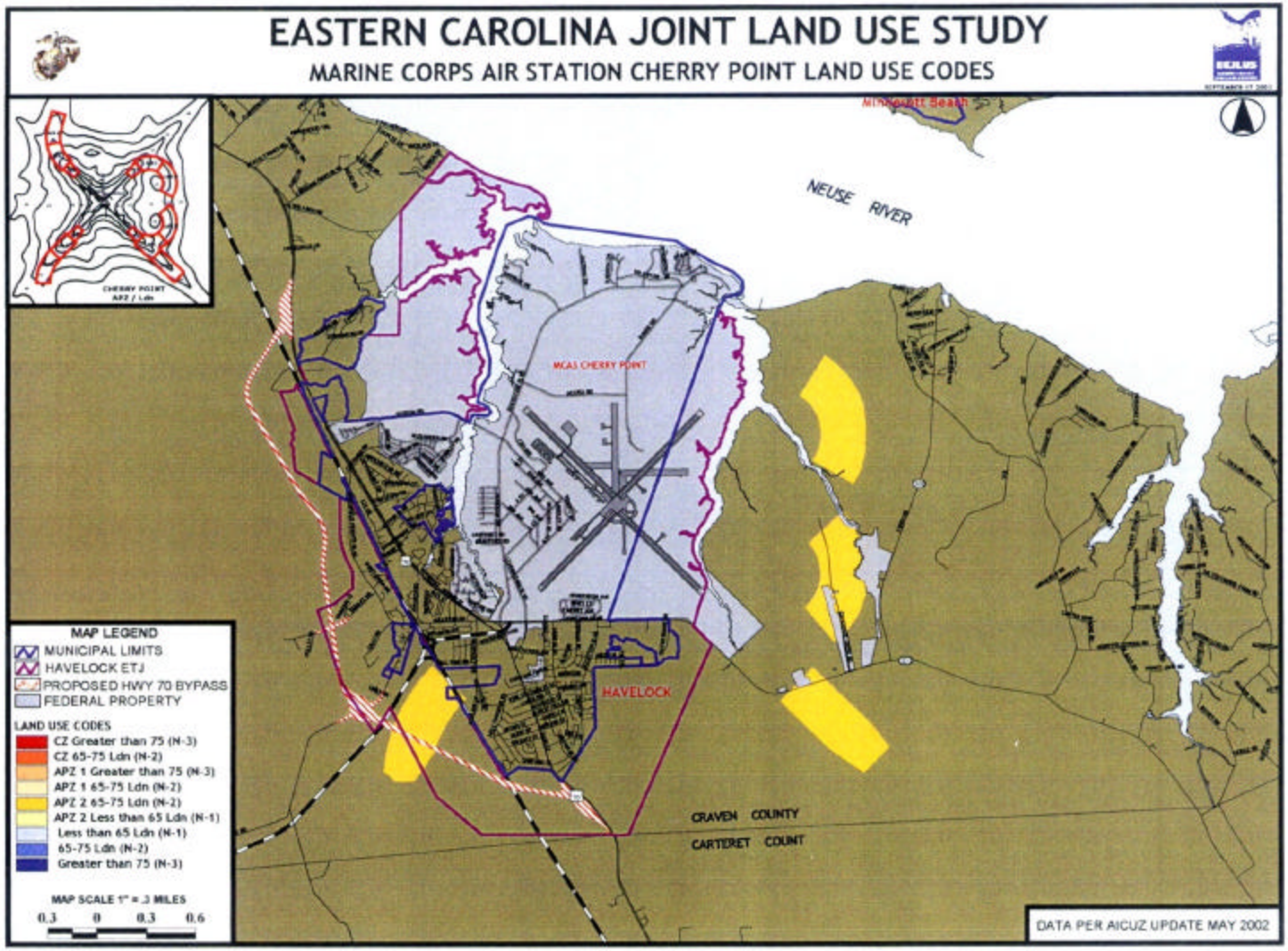
Less than 65 Ldn (N-1)
65-75 Ldn (N-2)
Greater than 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE MAY 2002

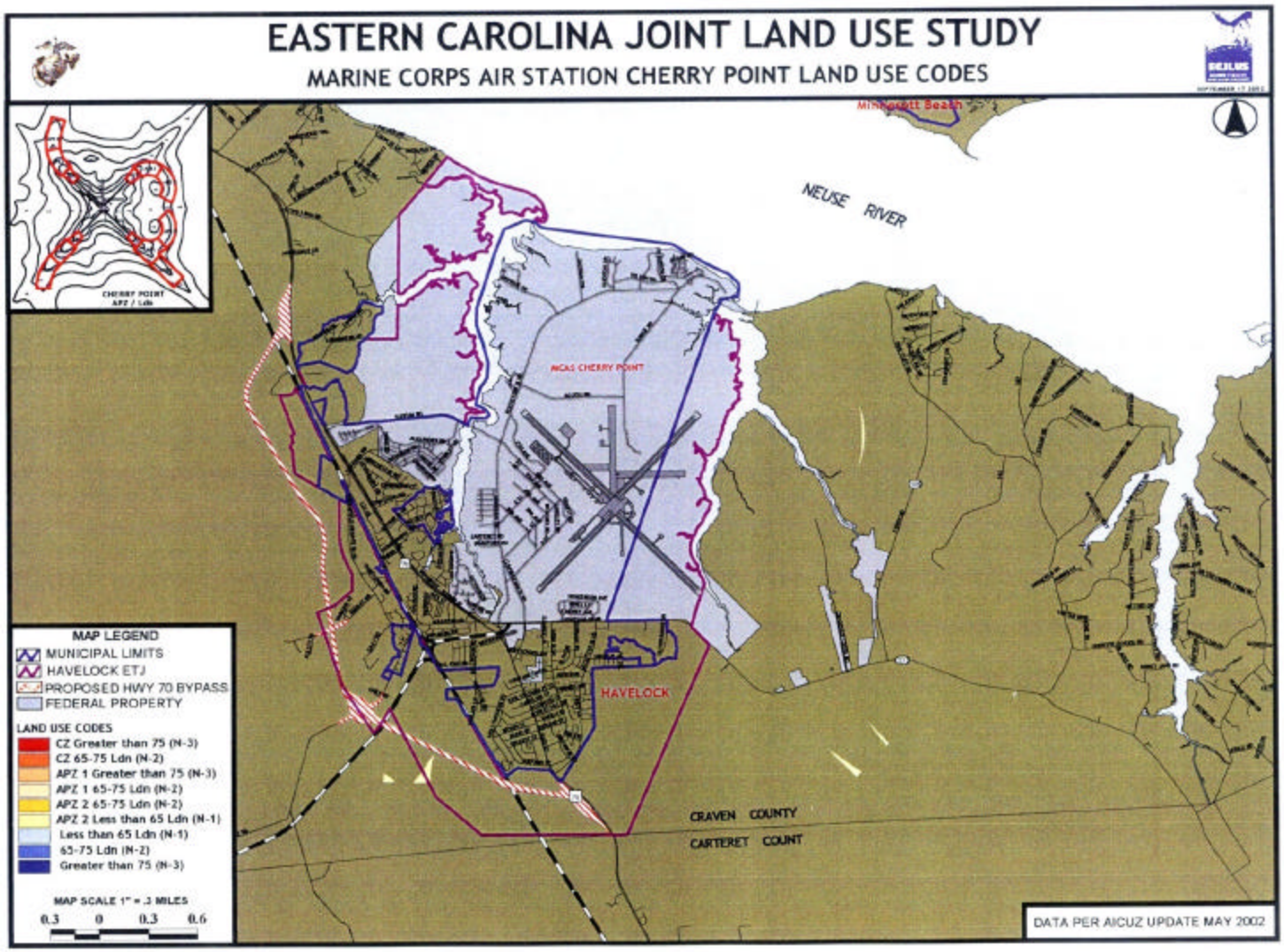
APZ 2, N-2

Incompatible Land Uses	Compatible Land Uses
Single units: semi-detached	Single units: detached (1, 23)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Food & kindred products manufacturing (12, 23, 24)
Mobile home parks or courts	Textile Mill products; manufacturing (23, 24)
Group quarters, residential hotels	Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing (23, 24)
Transient lodging	Lumber & w ood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries (23, 24)
Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks (2)	Chemicals and allied products (23, 24)
Hospitals, nursing homes	Petroleum refining and related industries (23, 24)
Other medical facilities	Rubber and misc. plastic products (23, 24)
Public Assembly	Stone, clay & glass products; primary metal industries, fabricated metal products (23, 24)
Auditoriums, concert halls	Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks (23)
Outdoor music shell, amphitheaters	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (23)
Outdoor sports arenas, spectator sports	Motor vehicle transportation, highway & street right-of-way (23)
	Communications (15, 23, 24)
	Utilities (23, 24)
	Cell towers, antennae, above ground transmission lines, landfills (22, 23, 24)
	Wholesale trade; hardware, and farm equipment (23, 24)
	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment (2, 23, 24)
	Eating and Drinking establishments (2, 23, 24)
	Finance, insurance, real estate, personal, professional. (6, 23, 24)
	Cemeteries (6, 23)
	Business services (8,23, 24)
	Repair services (23)
	Contractor Construction services (A-23)
	Government Services (6, 23, 24)
	Educational Services (2, 23, 24)
	Cultural activities (including church) (2)
	Nature exhibits (22, 23)
	Recreational activities (including golf courses, riding stables, water recreation) (23)
	Parks (8, 22, 23)
	Agriculture (except livestock) (22)
	Livestock farming and animal breeding
	Agriculture related activities
	Forestry activities and related services
	Fishing activities and related services
	Mining activities & related activities (23)


EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AIR STATION CHERRY POINT LAND USE CODES
NEUSE RIVER
MCAS CHERRY POINT
HAVELOCK
CRAVEN COUNTY
CARTERET COUNT
MAP LEGEND
MUNICIPAL LIMITS
HAVELOCK ETJ
PROPOSED HWY 70 BYPASS
FEDERAL PROPERTY
LAND USE CODES
CZ Greater than 75 (N-3)
CZ 65-75 Ldn (N-2)
APZ 1 Greater than 75 (N-3)
APZ 1 65-75 Ldn (N-2)
APZ 2 65-75 Ldn (N-2)
APZ 2 Less than 65 Ldn (N-1)
Less than 65 Ldn (N-1)
65-75 Ldn (N-2)
Greater than 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE MAY 2002

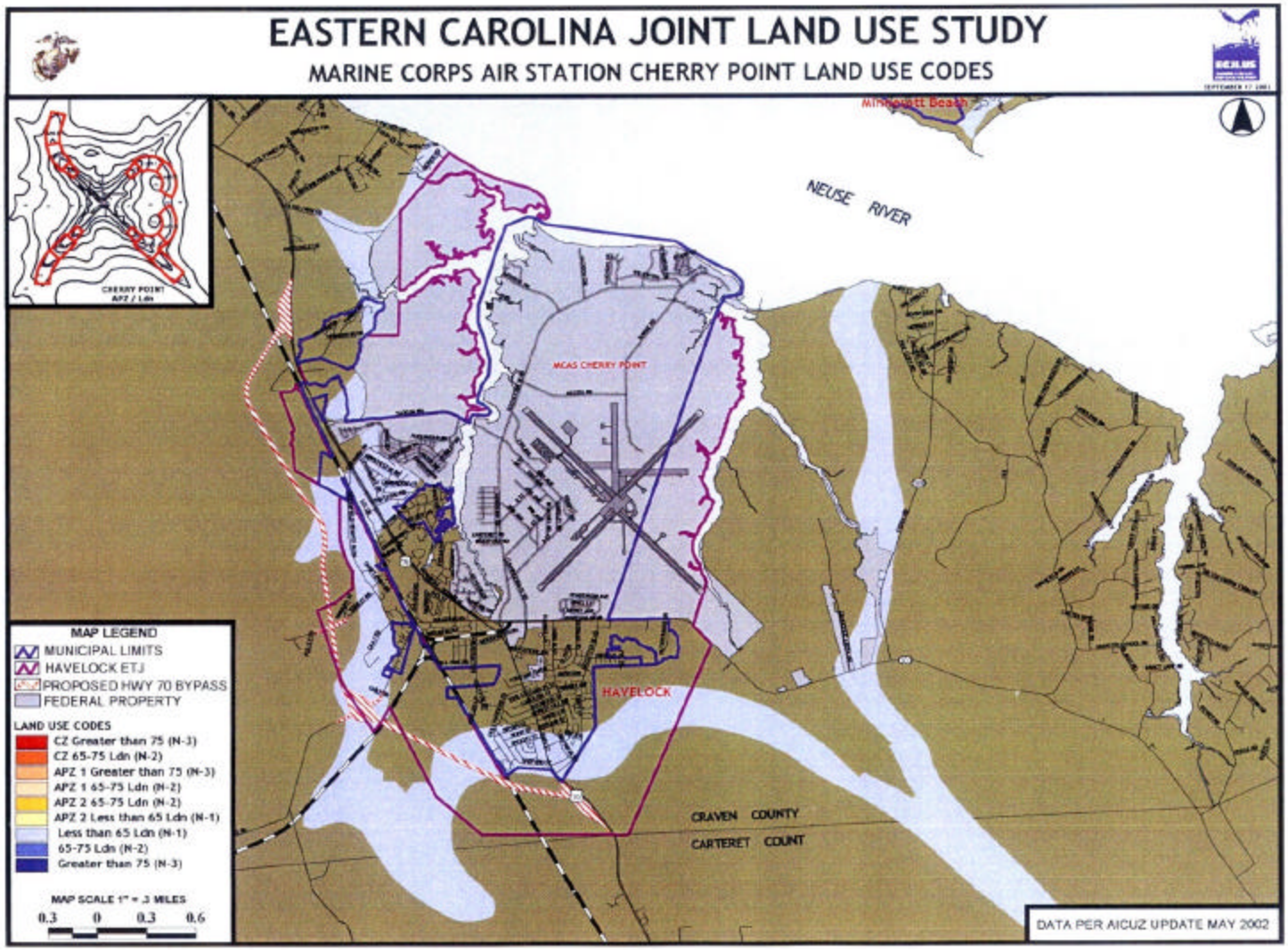
APZ 2, N-1

Incompatible Land Uses	Compatible Land Uses
Single units: semi-detached	Single units: detached (1)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Food & kindred products manufacturing
Mobile home parks or courts	Textile Mill products; manufacturing (13)
Group quarters, residential hotels	Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing (2)
Transient lodging	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries (12)
Hospitals, nursing homes	Chemicals and allied products (12)
Other medical facilities	Petroleum refining and related industries (12)
	Rubber and misc. plastic products (12)
Nature exhibits	Stone, clay & glass products; primary metal industries, fabricated metal products (12)
Public Assembly	Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks (2)
Auditoriums, concert halls	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking
Outdoor music shell, amphitheaters	Motor vehicle transportation, highway & street right-of-way
Outdoor sports arenas, spectator sports	Communications
	Utilities
	Cell towers, antennae, above ground transmission lines, landfills (22)
	Wholesale trade; hardware, and farm equipment (12)
	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment (A)
	Eating and Drinking establishments (A)
	Finance, insurance, real estate, personal, professional (6)
	Cemeteries(6)
	Business services(8)
	Repair services(12)
	Contractor Construction services
	Government Services (6)
	Educational Services (2)
	Cultural activities (including church) (2)
	Recreational activities (including golf courses, riding stables, water recreation)
	Parks (8)
	Agriculture (except livestock) (18, 22)
	Livestock farming and animal breeding (18)
	Agriculture related activities (18)
	Forestry activities and related services (18)
	Fishing activities and related services
	Mining activities & related activities


EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AIR STATION CHERRY POINT LAND USE CODES
NEUSE RIVER
MCAS CHERRY POINT
HAVELOCK
CRAVEN COUNTY
CARTERET COUNT
MAP LEGEND
MUNICIPAL LIMITS
HAVELOCK ETJ
PROPOSED HWY 70 BYPASS
FEDERAL PROPERTY
LAND USE CODES
CZ Greater than 75 (N-3)
CZ 65-75 Ldn (N-2)
APZ 1 Greater than 75 (N-3)
APZ 1 65-75 Ldn (N-2)
APZ 2 65-75 Ldn (N-2)
APZ 2 Less than 65 Ldn (N-1)
Less than 65 Ldn (N-1)
65-75 Ldn (N-2)
Greater than 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE MAY 2002

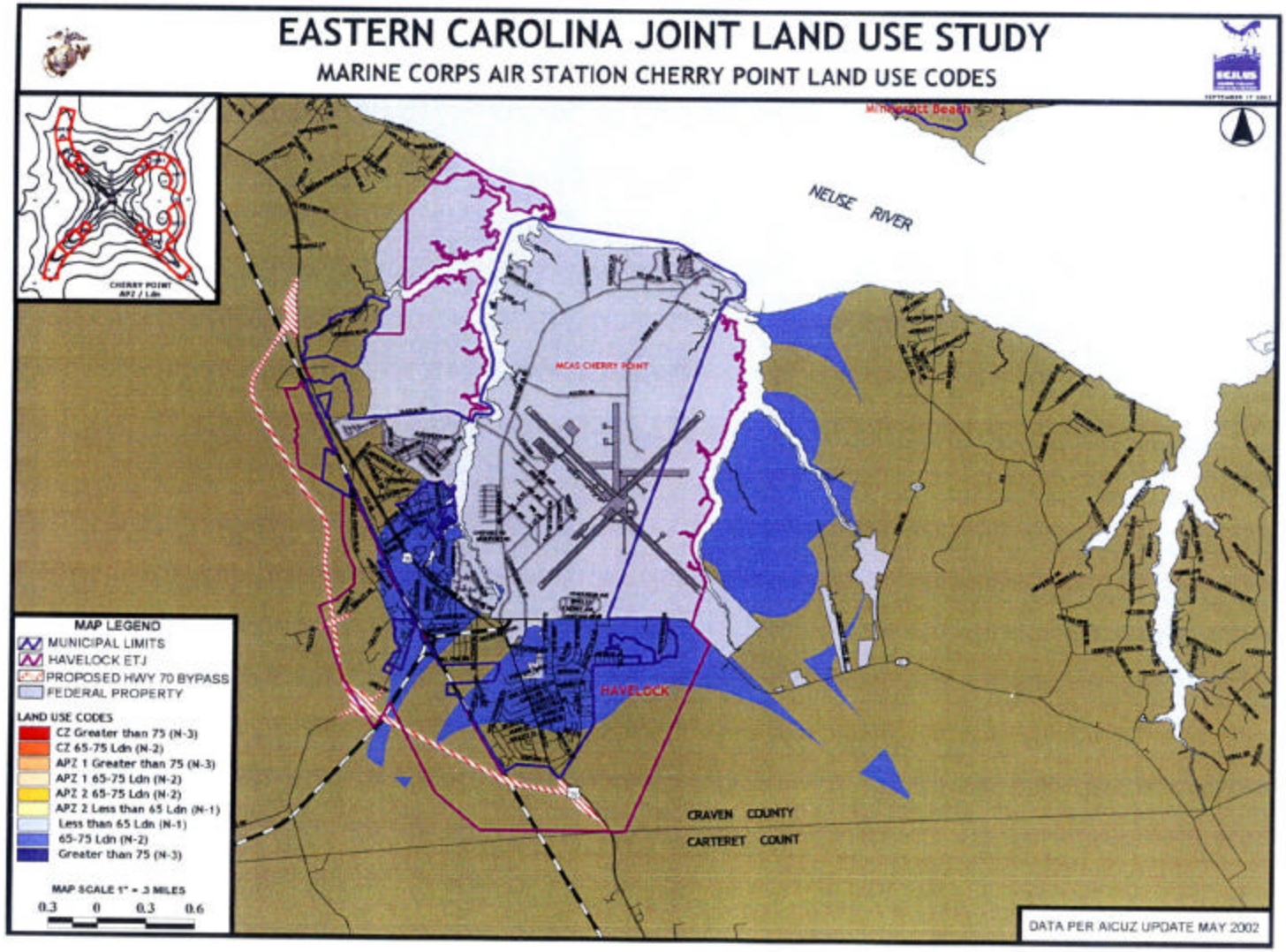
N-3

Incompatible Land Uses	Compatible Land Uses
Single units: detached,	Food & kindred products manufacturing (14, 23, 24)
Single units: semi-detached	Textile Mill products; manufacturing (14, 23,24)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing (14, 23, 24)
Mobile home parks or courts	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries (14, 23, 24)
Group quarters, residential hotels	Chemicals and allied products (14, 23, 24)
Transient lodging	Petroleum refining and related industries (14, 23, 24)
Communications	Rubber and misc. plastic products (14, 23, 24)
Cell towers, antennae, above ground transmission lines, landfills	Stone, clay & glass products; primary metal industries, fabricated metal products (14, 23, 24)
Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment	Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks (B)
Eating and Drinking establishments	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (14, 23)
Finance, insurance, real estate, personal, professional.	Motor vehicle transportation, highway & street right-of-way (14, 23)
Business services	Utilities (13, 23, 24)
Hospitals, nursing homes	Wholesale trade; hardware, and farm equipment (14, 23, 24)
Other medical facilities	Cemeteries (14, 23)
Contractor Construction services	Repair services (14, 23)
Government Services	Agriculture (except livestock) (20, 21, 22)
Educational Services	Livestock farming and animal breeding (20, 21)
Cultural activities (including church)	Forestry activities and related services (20, 21)
Nature exhibits	Fishing activities and related services
Public Assembly	Mining activities & related activities (23)
Auditoriums, concert halls	
Outdoor music shell, amphitheaters	
Outdoor sports arenas, spectator sports	
Recreational activities (including golf courses, riding stables, water recreation)	
Parks	
Agriculture related activities	


EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AIR STATION CHERRY POINT LAND USE CODES
NEUSE RIVER
MCAS CHERRY POINT
HAVELOCK
CRAVEN COUNTY
CARTERET COUNT
MAP LEGEND
MUNICIPAL LIMITS
HAVELOCK ETJ
PROPOSED HWY 70 BYPASS
FEDERAL PROPERTY
LAND USE CODES
CZ Greater than 75 (N-3)
CZ 65-75 Ldn (N-2)
APZ 1 Greater than 75 (N-3)
APZ 1 65-75 Ldn (N-2)
APZ 2 65-75 Ldn (N-2)
APZ 2 Less than 65 Ldn (N-1)
Less than 65 Ldn (N-1)
65-75 Ldn (N-2)
Greater than 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE MAY 2002

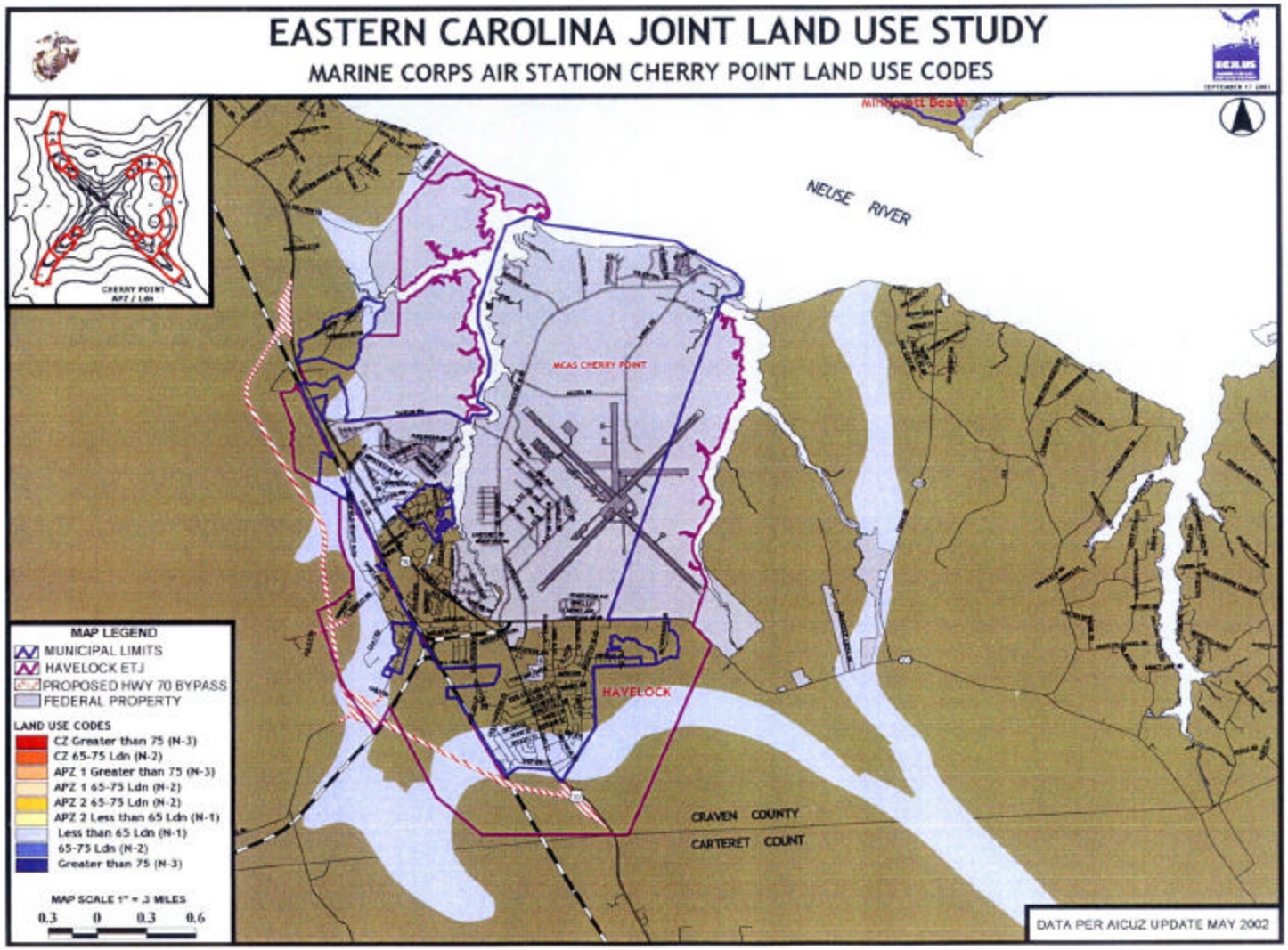
N-2

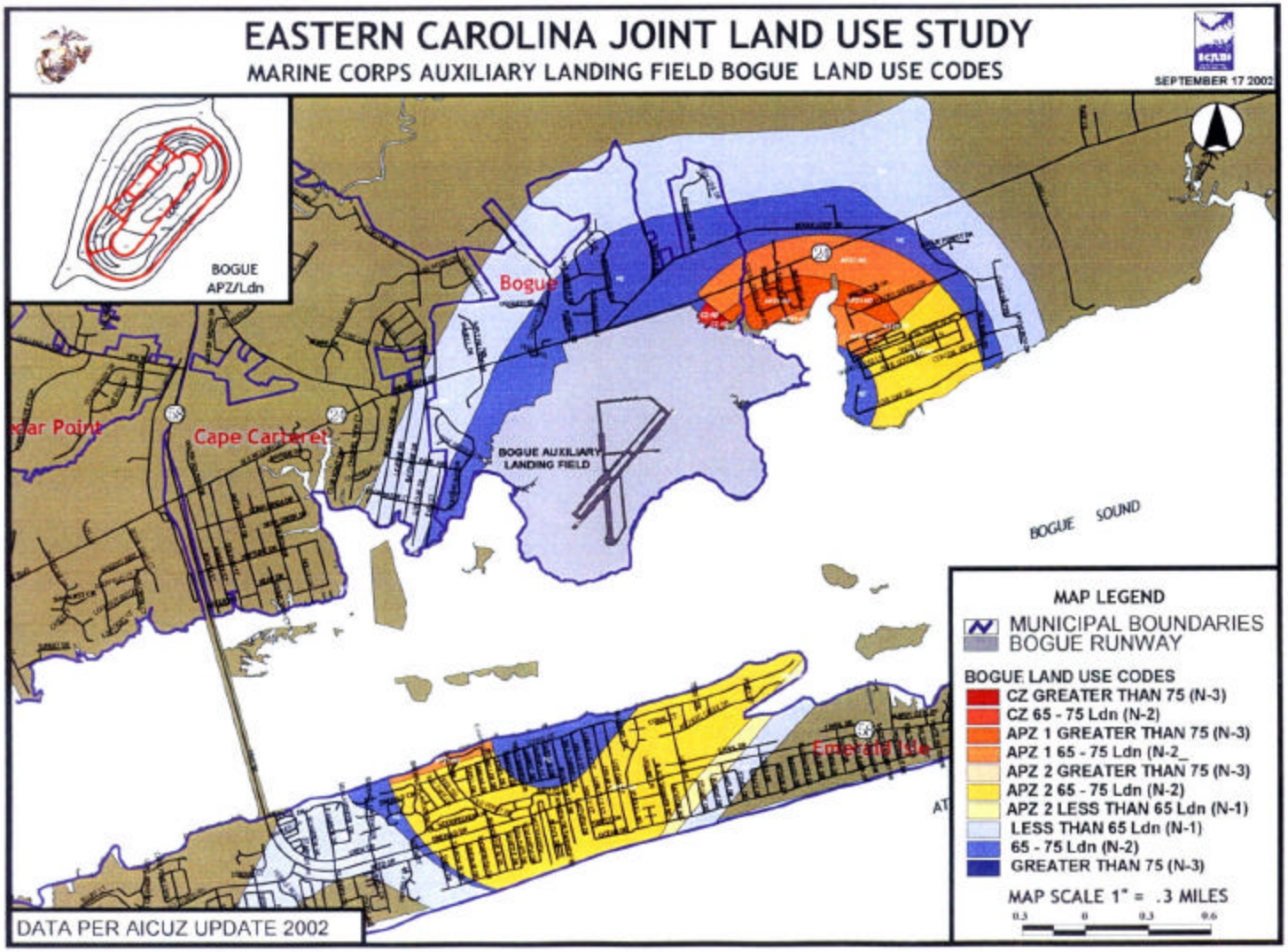
Incompatible Land Uses	Compatible Land Uses
Mobile home parks or courts	Single units: detached (11-A, 11-B)
Outdoor music shell, amphitheaters	Single units: semi-detached (11-A, 11-B)
	Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator (11-A, 11-B)
	Group quarters, residential hotels (11-A, 11-B, 24)
	Transient lodging (11-A, 11-B, 24)
	Food & kindred products manufacturing (13, 23, 24)
	Textile Mill products; manufacturing (12, 23, 24)
	Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing (12, 23, 24)
	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries (12, 23, 24)
	Chemicals and allied products (12, 23, 24)
	Petroleum refining and related industries (12, 23, 24)
	Rubber and misc. plastic products (12, 23, 24)
	Stone, clay & glass products; primary metal industries, fabricated metal products (12, 23, 24)
	Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks (A, 23, 24)
	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (12, 23)
	Motor vehicle transportation, highway & street right-of-way (12, 23)
	Communications (A, 15, 23, 24)
	Utilities (23, 24)
	Cell towers, antennae, above ground transmission lines, landfills (22, 23, 24)
	Wholesale trade; hardware, and farm equipment (12, 23, 24)
	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment (A, 23, 24)
	Eating and Drinking establishments (A, 23, 24)
	Finance, insurance, real estate, personal, professional (A, 23, 24)
	Cemeteries (12, 23)
	Business services (A, 23, 24)
	Repair services (12, 23)
	Hospitals, nursing homes (A, 23, 24)
	Other medical facilities (A, 23, 24)
	Contractor Construction services (A, 23, 24)
	Government Services (A, 23, 24)
	Educational Services (A, 23, 24)
	Cultural activities (including church) (A, 24*)
	Nature exhibits (22, 23*)
	Public Assembly (23, 24)
	Auditoriums, concert halls (23, 24)
	Outdoor sports arenas, spectator sports (17, 23, 24)
	Recreational activities (including golf courses, riding stables, water recreation) (23, 24*)
	Parks (22, 23*)
	Agriculture (except livestock) (18, 22)
	Livestock farming and animal breeding (18)
	Agriculture related activities (18)
	Forestry activities and related services (18)
	Fishing activities and related services
	Mining activities & related activities (23)


EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AIR STATION CHERRY POINT LAND USE CODES
NEUSE RIVER
MCAS CHERRY POINT
HAVELOCK
CRAVEN COUNTY
CARTERET COUNT
MAP LEGEND
MUNICIPAL LIMITS
HAVELOCK ETJ
PROPOSED HWY 70 BYPASS
FEDERAL PROPERTY
LAND USE CODES
CZ Greater than 75 (N-3)
CZ 65-75 Ldn (N-2)
APZ 1 Greater than 75 (N-3)
APZ 1 65-75 Ldn (N-2)
APZ 2 65-75 Ldn (N-2)
APZ 2 Less than 65 Ldn (N-1)
Less than 65 Ldn (N-1)
65-75 Ldn (N-2)
Greater than 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE MAY 2002

N-1

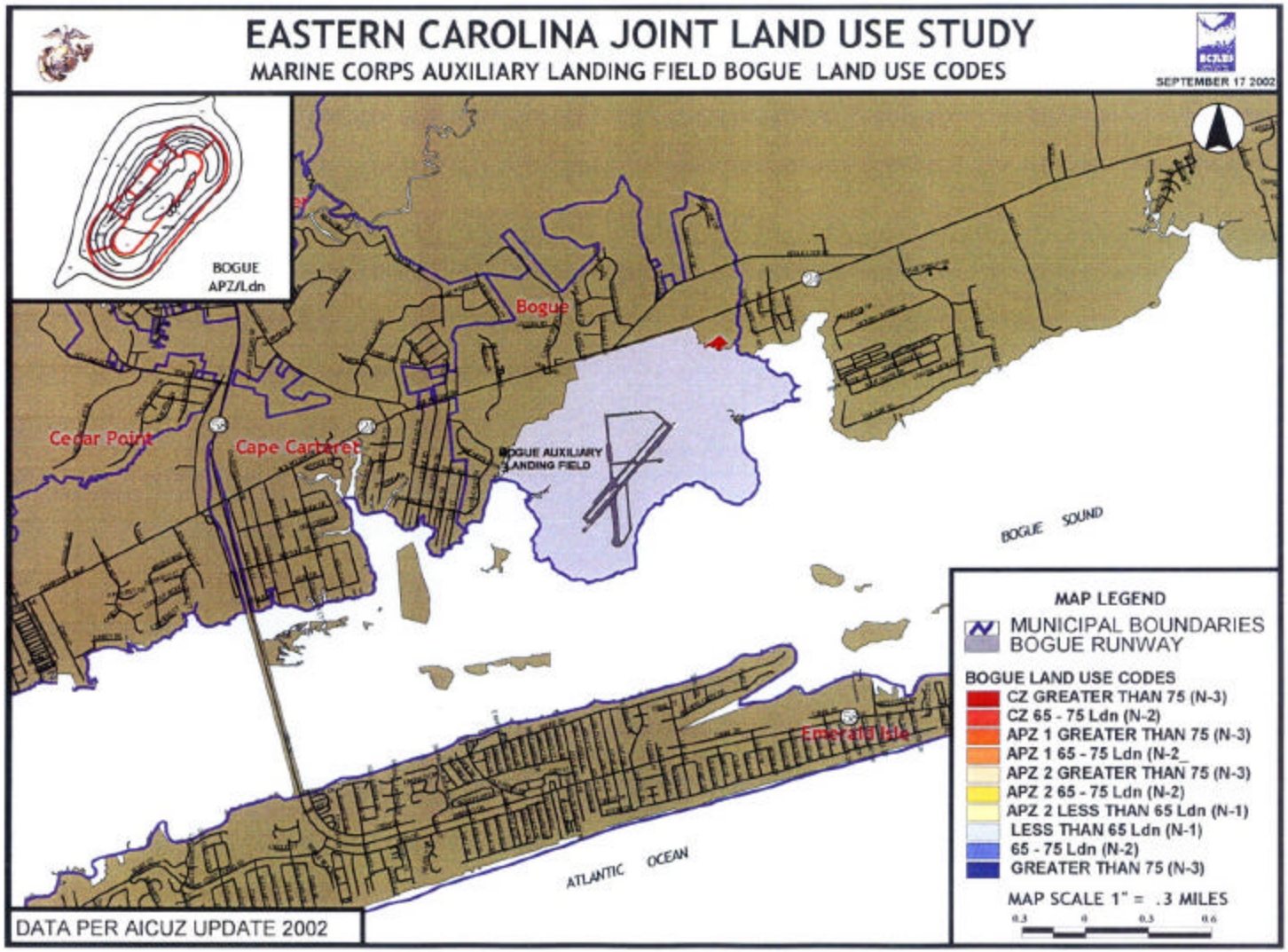
Incompatible Land Uses	Compatible Land Uses
Mobile home parks or courts	Single units: detached,
	Single units: semi-detached
	Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator
	Group quarters, residential hotels
	Transient lodging
	Food & kindred products manufacturing
	Textile Mill products; manufacturing;
	Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing
	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries.
	Chemicals and allied products
	Petroleum refining and related industries
	Rubber and misc. plastic products
	Stone, clay & glass products; primary metal industries, fabricated metal products
	Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks
	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking
	Motor vehicle transportation, highway & street right-of-way
	Communications
	Utilities
	Cell towers, antennae, above ground transmission lines, landfills (22)
	Wholesale trade; hardware, and farm equipment
	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment
	Eating and Drinking establishments
	Finance, insurance, real estate, personal, professional.
	Cemeteries
	Business services
	Repair services
	Hospitals, nursing homes
	Other medical facilities
	Contractor Construction services
	Government Services
	Educational Services
	Cultural activities (including church)
	Nature exhibits (22)
	Public Assembly
	Auditoriums, concert halls
	Outdoor music shell, amphitheaters
	Outdoor sports arenas, spectator sports
	Recreational activities (including golf courses, riding stables, water recreation)
	Parks (22)
	Agriculture (except livestock) (22)
	Livestock farming and animal breeding
	Agriculture related activities
	Forestry activities and related services
	Fishing activities and related services
	Mining activities & related activities


EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AIR STATION CHERRY POINT LAND USE CODES
NEUSE RIVER
MCAS CHERRY POINT
HAVELOCK
CRAVEN COUNTY
CARTERET COUNT
MAP LEGEND
MUNICIPAL LIMITS
HAVELOCK ETJ
PROPOSED HWY 70 BYPASS
FEDERAL PROPERTY
LAND USE CODES
CZ Greater than 75 (N-3)
CZ 65-75 Ldn (N-2)
APZ 1 Greater than 75 (N-3)
APZ 1 65-75 Ldn (N-2)
APZ 2 65-75 Ldn (N-2)
APZ 2 Less than 65 Ldn (N-1)
Less than 65 Ldn (N-1)
65-75 Ldn (N-2)
Greater than 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE MAY 2002


EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AUXILIARY LANDING FIELD BOGUE LAND USE CODES
SEPTEMBER 17 2002
BOGUE APZ/Ldn
Bogue
Cape Carteret
BOGUE AUXILIARY LANDING FIELD
BOGUE SOUND
Emerald Isle
MAP LEGEND
MUNICIPAL BOUNDARIES
BOGUE RUNWAY
BOGUE LAND USE CODES
CZ GREATER THAN 75 (N-3)
CZ 65 - 75 Ldn (N-2)
APZ 1 GREATER THAN 75 (N-3)
APZ 1 65 - 75 Ldn (N-2_
APZ 2 GREATER THAN 75 (N-3)
APZ 2 65 - 75 Ldn (N-2)
APZ 2 LESS THAN 65 Ldn (N-1)
LESS THAN 65 Ldn (N-1)
65 - 75 Ldn (N-2)
GREATER THAN 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE 2002

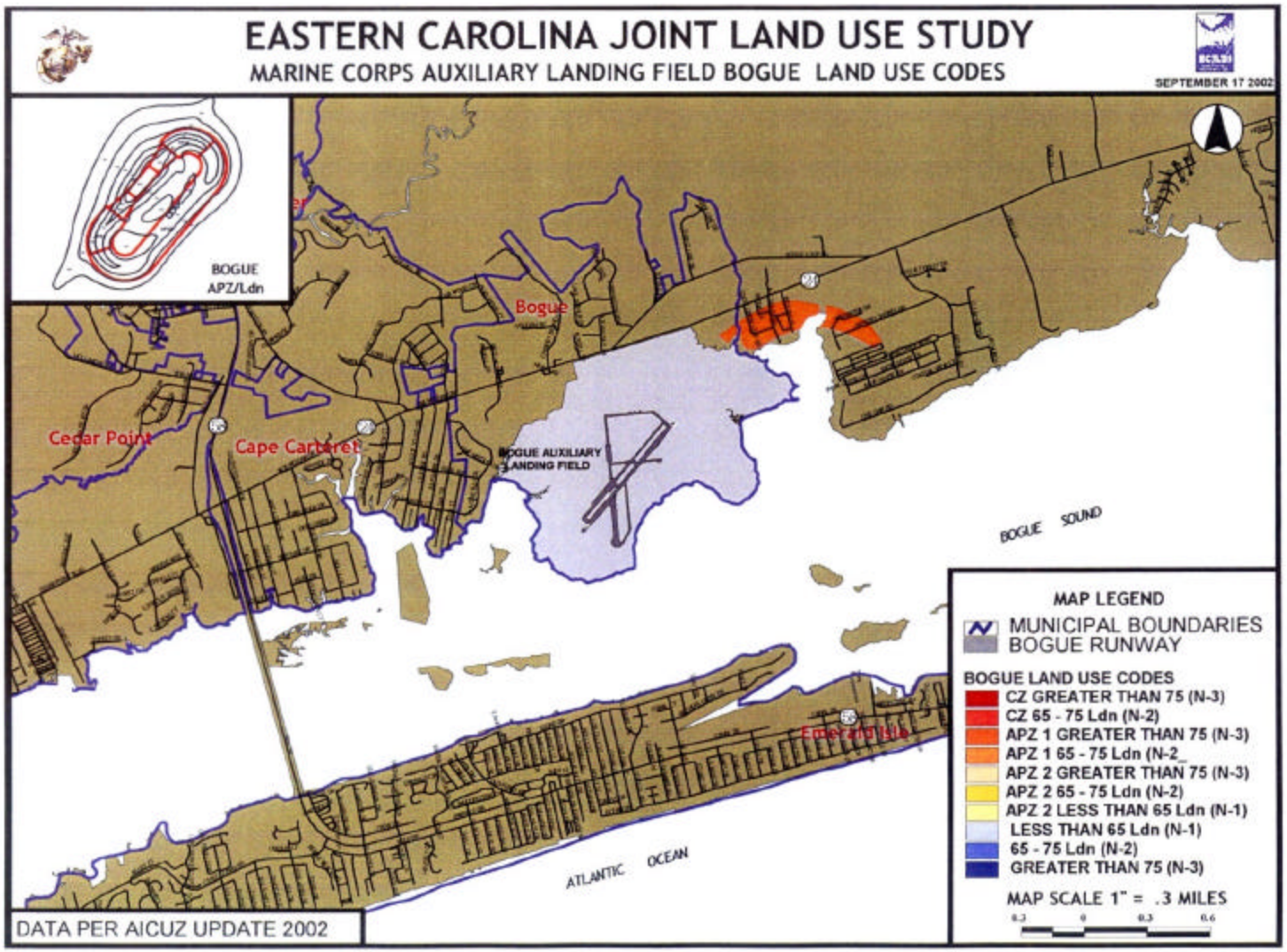
CZ (Clear Zone)

Incompatible Land Uses	Compatible Land Uses
Single units: detached,	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (3)
Single units: semi-detached	Motor vehicle transportation, highway & street right-of-way (3)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Communications (3)
Mobile home parks or courts	Utilities (3)
Group quarters, residential hotels	Agriculture (except livestock) (16. 22)
Transient lodging	Forestry activities and related services (5)
Food & kindred products manufacturing	Fishing activities and related services (5)
Textile Mill products; manufacturing;	
Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing	
Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries.	
Chemicals and allied products	
Petroleum refining and related industries	
Rubber and misc. plastic products	
Stone, clay & glass products; primary metal industries, fabricated metal products	
Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks	
Cell towers, antennae, above ground transmission lines, landfills	
Wholesale trade; hardware, and f arm equipment	
Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment	
Eating and Drinking establishments	
Finance, insurance, real estate, personal, professional.	
Cemeteries	
Business services	
Repair services	
Hospitals, nursing homes	
Other medical facilities	
Contractor Construction services	
Government Services	
Educational Services	
Cultural activities (including church)	
Nature exhibits	
Public Assembly	
Auditoriums, concert halls	
Outdoor music shell, amphitheaters	
Outdoor sports arenas, spectator sports	
Recreational activities (including golf courses, riding stables, water recreation)	
Parks	
Livestock farming and animal breeding	
Agriculture related activities	
Mining activities & related activities	


EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AUXILIARY LANDING FIELD BOGUE LAND USE CODES
SEPTEMBER 17 2002
BOGUE APZ/Ldn
Bogue
Cedar Point
Cape Carteret
BOGUE AUXILIARY LANDING FIELD
BOGUE SOUND
Emerald Isle
ATLANTIC OCEAN
DATA PER AICUZ UPDATE 2002
MAP LEGEND
MUNICIPAL BOUNDARIES
BOGUE RUNWAY
BOGUE LAND USE CODES
CZ GREATER THAN 75 (N-3)
CZ 65 - 75 Ldn (N-2)
APZ 1 GREATER THAN 75 (N-3)
APZ 1 65 - 75 Ldn (N-2_
APZ 2 GREATER THAN 75 (N-3)
APZ 2 65 - 75 Ldn (N-2)
APZ 2 LESS THAN 65 Ldn (N-1)
LESS THAN 65 Ldn (N-1)
65 - 75 Ldn (N-2)
GREATER THAN 75 (N-3)
MAP SCALE 1" = .3 MILES

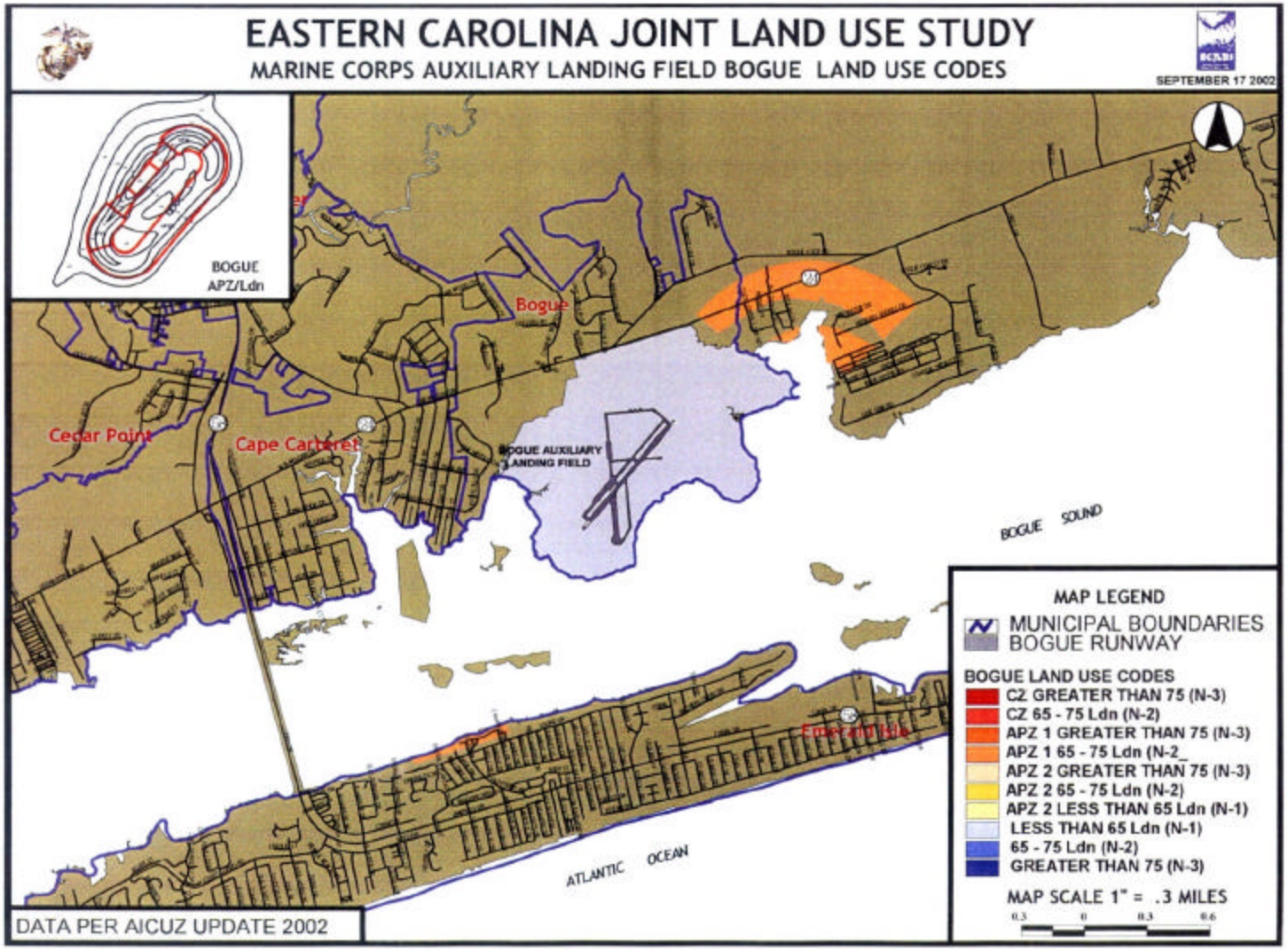
APZ 1, N-3

Incompatible Land Uses	Compatible Land Uses
Single units: detached,	Food & kindred products manufacturing (2)
Single units: semi-detached	Textile Mill products; manufacturing (2)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries. (2)
Mobile home parks or courts	Rubber and misc. plastic products (2)
Group quarters, residential hotels	Stone, clay & glass products; primary metal industries, fabricated metal products (2)
Transient lodging	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (4,23)
Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing	Motor vehicle transportation, highway & street right-of-way (23)
Chemicals and allied products	Communications (4, 23, 24)
Petroleum refining and related industries	Utilities (4,23, 24)
Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks	Wholesale trade; hardware, and farm equipment (2, 23,24)
Cell towers, antennae, above ground transmission lines, landfills	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment (2)
Eating and Drinking establishments	Cemeteries (7, 23)
Finance, insurance, real estate, personal, professional.	Business services (8, 23, 24)
Hospitals, nursing homes	Repair services (23)
Other medical facilities	Contractor Construction services (6, 23)
Government Services	Educational Services (2)
Cultural activities (including church)	Nature exhibits (2, 22, 23)
Public Assembly	Recreational activities (including golf courses, riding stables, water recreation) (8, 9, 10, 23)
Auditoriums, concert halls	Parks (8, 22, 23)
Outdoor music shell, amphitheaters	Agriculture (except livestock) (22)
Outdoor sports arenas, spectator sports	Livestock farming and animal breeding
	Agriculture related activities (5)
	Forestry activities and related services
	Fishing activities and related services (5)
	Mining activities & related activities (5, 23)


EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AUXILIARY LANDING FIELD BOGUE LAND USE CODES
SEPTEMBER 17 2002
BOGUE APZ/Ldn
Bogue
Cedar Point
Cape Carteret
BOGUE AUXILIARY LANDING FIELD
BOGUE SOUND
Emerald Isle
ATLANTIC OCEAN
DATA PER AICUZ UPDATE 2002
MAP LEGEND
MUNICIPAL BOUNDARIES
BOGUE RUNWAY
BOGUE LAND USE CODES
CZ GREATER THAN 75 (N-3)
CZ 65 - 75 Ldn (N-2)
APZ 1 GREATER THAN 75 (N-3)
APZ 1 65 - 75 Ldn (N-2_
APZ 2 GREATER THAN 75 (N-3)
APZ 2 65 - 75 Ldn (N-2)
APZ 2 LESS THAN 65 Ldn (N-1)
LESS THAN 65 Ldn (N-1)
65 - 75 Ldn (N-2)
GREATER THAN 75 (N-3)
MAP SCALE 1" = .3 MILES

APZ 1, N-2

Incompatible Land Uses	Compatible Land Uses
Single units: detached,	Food & kindred products manufacturing (2)
Single units: semi-detached	Textile Mill products; manufacturing (2)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries. (2)
Mobile home parks or courts	Rubber and misc. plastic products (2)
Group quarters, residential hotels	Stone, clay & glass products; primary metal industries, fabricated metal products (2)
Transient lodging	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (4,23)
Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing	Motor vehicle transportation, highway & street right-of-way (23)
Chemicals and allied products	Communications (4, 23, 24)
Petroleum refining and related industries	Utilities (4,23, 24)
Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks	Wholesale trade; hardware, and farm equipment (2, 23,24)
Cell towers, antennae, above ground transmission lines, landfills	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment (2)
Eating and Drinking establishments	Cemeteries (7, 23)
Finance, insurance, real estate, personal, professional.	Business services (8, 23, 24)
Hospitals, nursing homes	Repair services (23)
Other medical facilities	Contractor Construction services (6, 23)
Government Services	Educational Services (2)
Cultural activities (including church)	Nature exhibits (2, 22, 23)
Public Assembly	Recreational activities (including golf courses, riding stables, water recreation) (8, 9, 10, 23)
Auditoriums, concert halls	Parks (8, 22, 23)
Outdoor music shell, amphitheaters	Agriculture (except livestock) (22)
Outdoor sports arenas, spectator sports	Livestock farming and animal breeding
	Agriculture related activities (5)
	Forestry activities and related services
	Fishing activities and related services (5)
	Mining activities & related activities (5, 23)


EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AUXILIARY LANDING FIELD BOGUE LAND USE CODES
SEPTEMBER 17 2002
BOGUE APZ/Ldn
Bogue
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BOGUE AUXILIARY LANDING FIELD
BOGUE SOUND
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MAP LEGEND
MUNICIPAL BOUNDARIES
BOGUE RUNWAY
BOGUE LAND USE CODES
C2 GREATER THAN 75 (N-3)
CZ 65 - 75 Ldn (N-2)
APZ 1 GREATER THAN 75 (N-3)
APZ 1 65 - 75 Ldn (N-2_
APZ 2 GREATER THAN 75 (N-3)
APZ 2 65 - 75 Ldn (N-2)
APZ 2 LESS THAN 65 Ldn (N-1)
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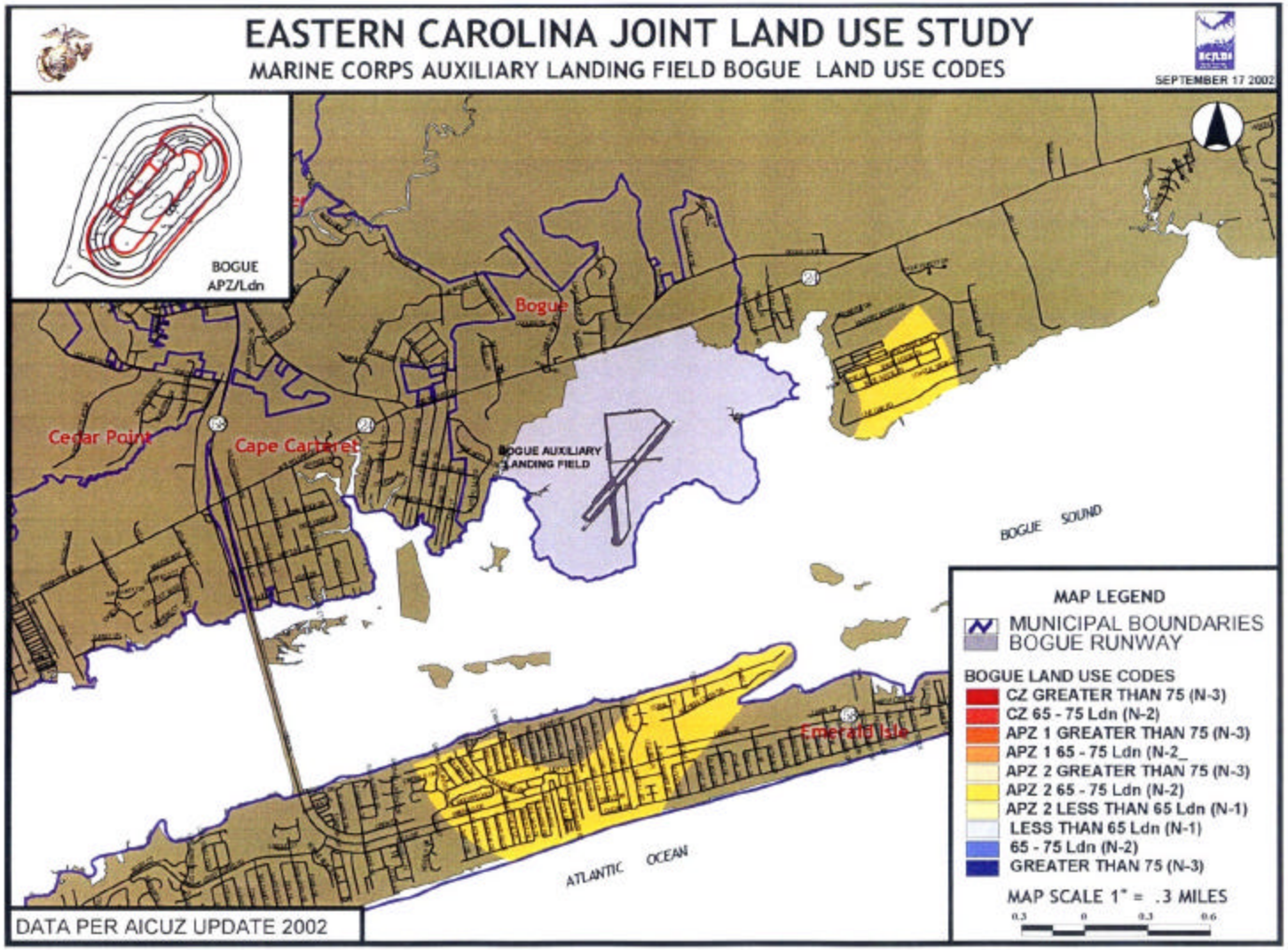
65 - 75 Ldn (N-2)
GREATER THAN 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
DATA PER AICUZ UPDATE 2002

APZ 2, N-2

Incompatible Land Uses	Compatible Land Uses
Single units: semi-detached	Single units: detached (1, 23)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Food & kindred products manufacturing (12, 23, 24)
Mobile home parks or courts	Textile Mill products; manufacturing (23, 24)
Group quarters, residential hotels	Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing (23, 24)
Transient lodging	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries (23, 24)
Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks (2)	Chemicals and allied products (23, 24)
Hospitals, nursing homes	Petroleum refining and related industries (23, 24)
Other medical facilities	Rubber and misc. plastic products (23, 24)
Public Assembly	Stone, clay & glass products; primary metal industries, fabricated metal products (23, 24)
Auditoriums, concert halls	Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks (23)
Outdoor music shell, amphitheaters	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (23)
Outdoor sports arenas, spectator sports	Motor vehicle transportation, highway & street right-of-way (23)
	Communications (15, 23, 24)
	Utilities (23, 24)
	Cell towers, antennae, above ground transmission lines, landfills (22, 23, 24)
	Wholesale trade; hardware, and farm equipment (23, 24)
	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment (2, 23, 24)
	Eating and Drinking establishments (2, 23, 24)
	Finance, insurance, real estate, personal, professional. (6, 23, 24)
	Cemeteries (6, 23)
	Business services (8,23, 24)
	Repair services (23)
	Contractor Construction services (A-23)
	Government Services (6, 23, 24)
	Educational Services (2, 23, 24)
	Cultural activities (including church) (2)
	Nature exhibits (22, 23)
	Recreational activities (including golf courses, riding stables, water recreation) (23)
	Parks (8, 22, 23)
	Agriculture (except livestock) (22)
	Livestock farming and animal breeding
	Agriculture related activities
	Forestry activities and related services
	Fishing activities and related services
	Mining activities & related activities (23)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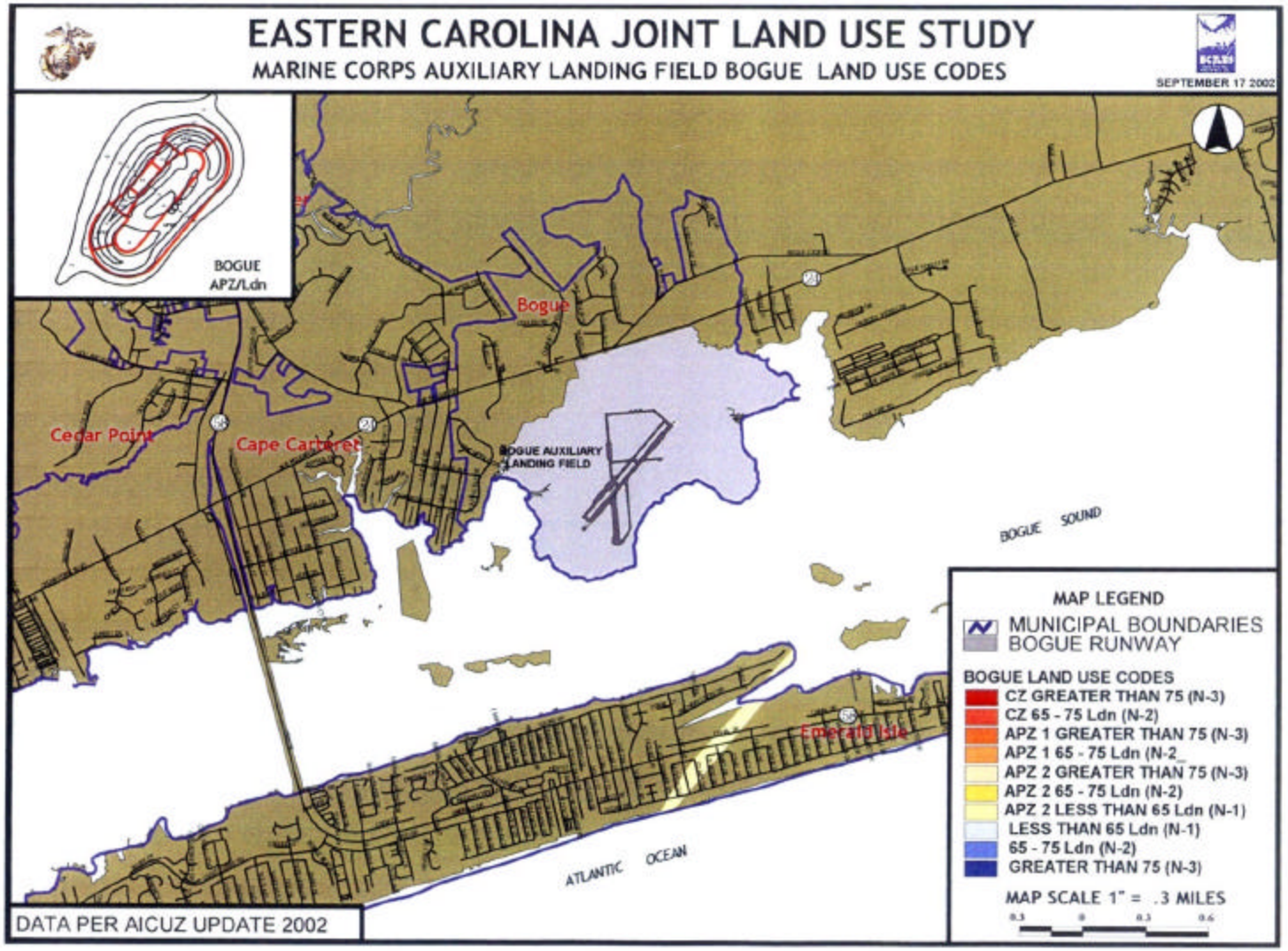
BOGUE LAND USE CODES
CZ GREATER THAN 75 (N-3)
CZ 65 - 75 Ldn (N-2)
APZ 1 GREATER THAN 75 (N-3)
APZ 1 65 - 75 Ldn (N-2_
APZ 2 GREATER THAN 75 (N-3)
APZ 2 65 - 75 Ldn (N-2)
APZ 2 LESS THAN 65 Ldn (N-1)
LESS THAN 65 Ldn (N-1)
65 - 75 Ldn (N-2)
GREATER THAN 75 (N-3)
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6

APZ 2, N-1

Incompatible Land Uses	Compatible Land Uses
Single units: semi-detached	Single units: detached (1)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Food & kindred products manufacturing
Mobile home parks or courts	Textile Mill products; manufacturing (13)
Group quarters, residential hotels	Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing (2)
Transient lodging	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries (12)
Hospitals, nursing homes	Chemicals and allied products (12)
Other medical facilities	Petroleum refining and related industries (12)
	Rubber and misc. plastic products (12)
Nature exhibits	Stone, clay & glass products; primary metal industries, fabricated metal products (12)
Public Assembly	Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks (2)
Auditoriums, concert halls	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking
Outdoor music shell, amphitheaters	Motor vehicle transportation, highway & street right-of-way
Outdoor sports arenas, spectator sports	Communications
	Utilities
	Cell towers, antennae, above ground transmission lines, landfills (22)
	Wholesale trade; hardware, and farm equipment (12)
	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment (A)
	Eating and Drinking establishments (A)
	Finance, insurance, real estate, personal, professional (6)
	Cemeteries(6)
	Business services(8)
	Repair services(12)
	Contractor Construction services
	Government Services (6)
	Educational Services (2)
	Cultural activities (including church) (2)
	Recreational activities (including golf courses, riding stables, water recreation)
	Parks (8)
	Agriculture (except livestock) (18, 22)
	Livestock farming and animal breeding (18)
	Agriculture related activities (18)
	Forestry activities and related services (18)
	Fishing activities and related services
	Mining activities & related activities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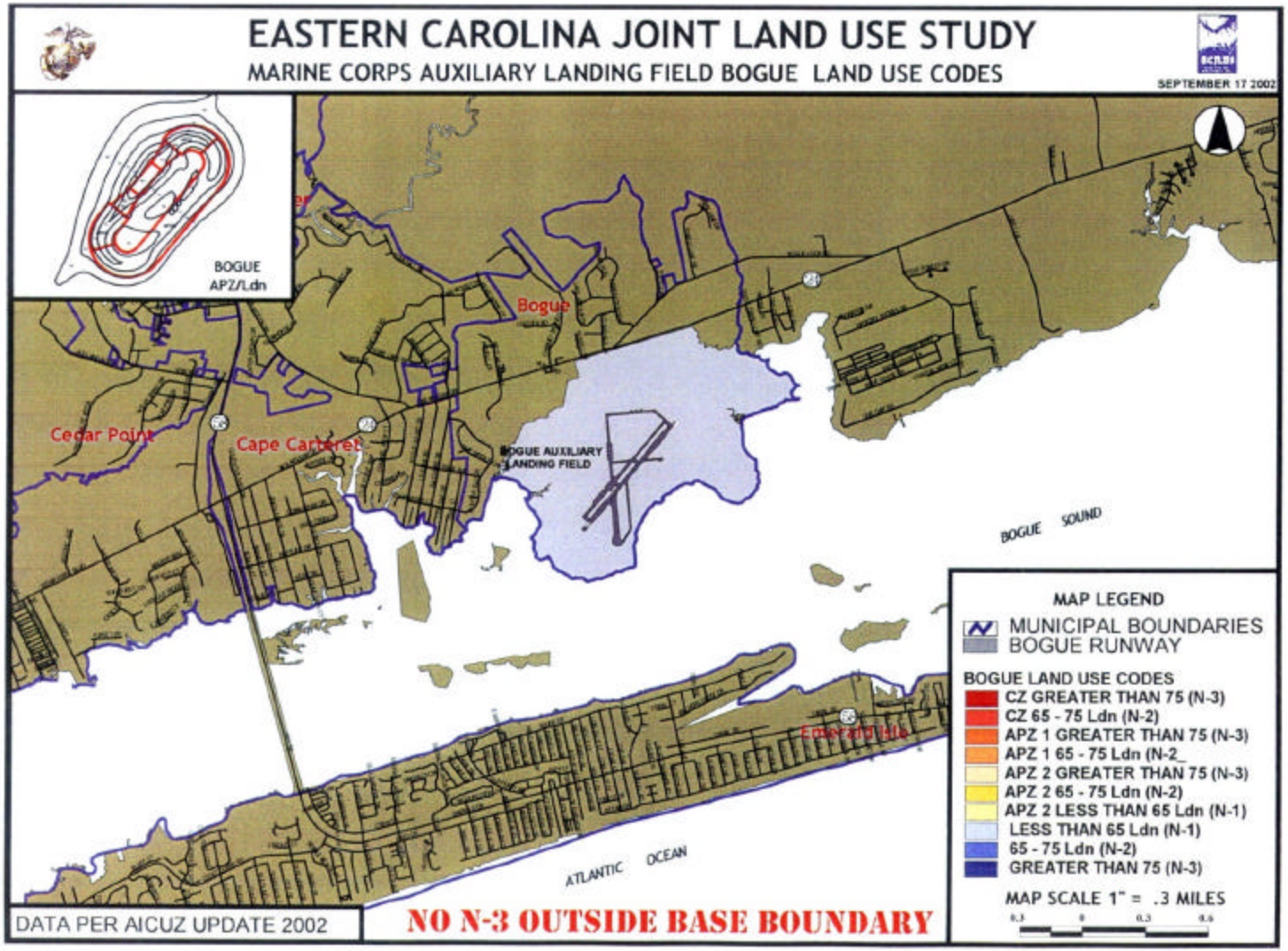
BOGUE LAND USE CODES
CZ GREATER THAN 75 (N-3)
CZ 65 - 75 Ldn (N-2)
APZ 1 GREATER THAN 75 (N-3)
APZ 1 65 - 75 Ldn (N-2_
APZ 2 GREATER THAN 75 (N-3)
APZ 2 65 - 75 Ldn (N-2)
APZ 2 LESS THAN 65 Ldn (N-1)
LESS THAN 65 Ldn (N-1)
65 - 75 Ldn (N-2)
GREATER THAN 75 (N-3)
MAP SCALE 1" = .3 MILES
DATA PER AICUZ UPDATE 2002

N-3

Incompatible Land Uses	Compatible Land Uses
Single units: detached,	Food & kindred products manufacturing (14, 23, 24)
Single units: semi-detached	Textile Mill products; manufacturing (14, 23,24)
Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator	Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing (14, 23, 24)
Mobile home parks or courts	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries (14, 23, 24)
Group quarters, residential hotels	Chemicals and allied products (14, 23, 24)
Transient lodging	Petroleum refining and related industries (14, 23, 24)
Communications	Rubber and misc. plastic products (14, 23, 24)
Cell towers, antennae, above ground transmission lines, landfills	Stone, clay & glass products; primary metal industries, fabricated metal products (14, 23, 24)
Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment	Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks (B)
Eating and Drinking establishments	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (14, 23)
Finance, insurance, real estate, personal, professional.	Motor vehicle transportation, highway & street right-of-way (14, 23)
Business services	Utilities (13, 23, 24)
Hospitals, nursing homes	Wholesale trade; hardware, and farm equipment (14, 23, 24)
Other medical facilities	Cemeteries (14, 23)
Contractor Construction services	Repair services (14, 23)
Government Services	Agriculture (except livestock) (20, 21, 22)
Educational Services	Livestock farming and animal breeding (20, 21)
Cultural activities (including church)	Forestry activities and related services (20, 21)
Nature exhibits	Fishing activities and related services
Public Assembly	Mining activities & related activities (23)
Auditoriums, concert halls	
Outdoor music shell, amphitheaters	
Outdoor sports arenas, spectator sports	
Recreational activities (including golf courses, riding stables, water recreation)	
Parks	
Agriculture related activities	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MARINE CORPS AUXILIARY LANDING FIELD BOGUE LAND USE CODES
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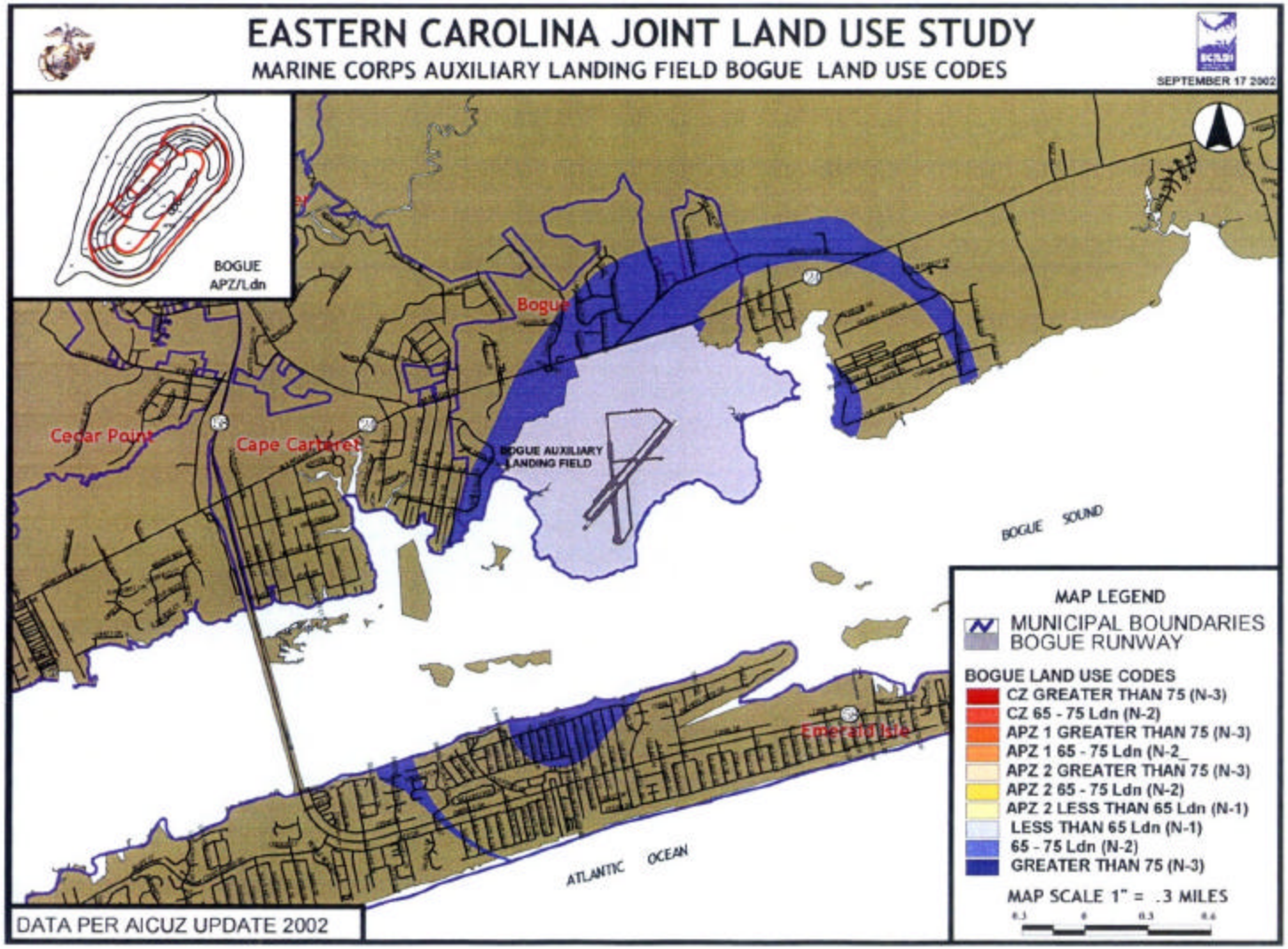
MAP LEGEND
MUNICIPAL BOUNDARIES
BOGUE RUNWAY
BOGUE LAND USE CODES
CZ GREATER THAN 75 (N-3)
CZ 65 - 75 Ldn (N-2)
APZ 1 GREATER THAN 75 (N-3)
APZ 1 65 - 75 Ldn (N-2_
APZ 2 GREATER THAN 75 (N-3)
APZ 2 65 - 75 Ldn (N-2)
APZ 2 LESS THAN 65 Ldn (N-1)
LESS THAN 65 Ldn (N-1)
65 - 75 Ldn (N-2)
GREATER THAN 75 (N-3)
MAP SCALE 1" = .3 MILES
DATA PER AICUZ UPDATE 2002
NO N-3 OUTSIDE BASE BOUNDARY

N-2

Incompatible Land Uses	Compatible Land Uses
Mobile home parks or courts	Single units: detached (11-A, 11-B)
Outdoor music shell, amphitheaters	Single units: semi-detached (11-A, 11-B)
	Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator (11-A, 11-B)
	Group quarters, residential hotels (11-A, 11-B, 24)
	Transient lodging (11-A, 11-B, 24)
	Food & kindred products manufacturing (13, 23, 24)
	Textile Mill products; manufacturing (12, 23, 24)
	Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing (12, 23, 24)
	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries (12, 23, 24)
	Chemicals and allied products (12, 23, 24)
	Petroleum refining and related industries (12, 23, 24)
	Rubber and misc. plastic products (12, 23, 24)
	Stone, clay & glass products; primary metal industries, fabricated metal products (12, 23, 24)
	Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks (A, 23, 24)
	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking (12, 23)
	Motor vehicle transportation, highway & street right-of-way (12, 23)
	Communications (A, 15, 23, 24)
	Utilities (23, 24)
	Cell towers, antennae, above ground transmission lines, landfills (22, 23, 24)
	Wholesale trade; hardware, and farm equipment (12, 23, 24)
	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment (A, 23, 24)
	Eating and Drinking establishments (A, 23, 24)
	Finance, insurance, real estate, personal, professional (A, 23, 24)
	Cemeteries (12, 23)
	Business services (A, 23, 24)
	Repair services (12, 23)
	Hospitals, nursing homes (A, 23, 24)
	Other medical facilities (A, 23, 24)
	Contractor Construction services (A, 23, 24)
	Government Services (A, 23, 24)
	Educational Services (A, 23, 24)
	Cultural activities (including church) (A, 24*)
	Nature exhibits (22, 23*)
	Public Assembly (23, 24)
	Auditoriums, concert halls (23, 24)
	Outdoor sports arenas, spectator sports (17, 23, 24)
	Recreational activities (including golf courses, riding stables, water recreation) (23, 24*)
	Parks (22, 23*)
	Agriculture (except livestock) (18, 22)
	Livestock farming and animal breeding (18)
	Agriculture related activities (18)
	Forestry activities and related services (18)
	Fishing activities and related services
	Mining activities & related activities (23)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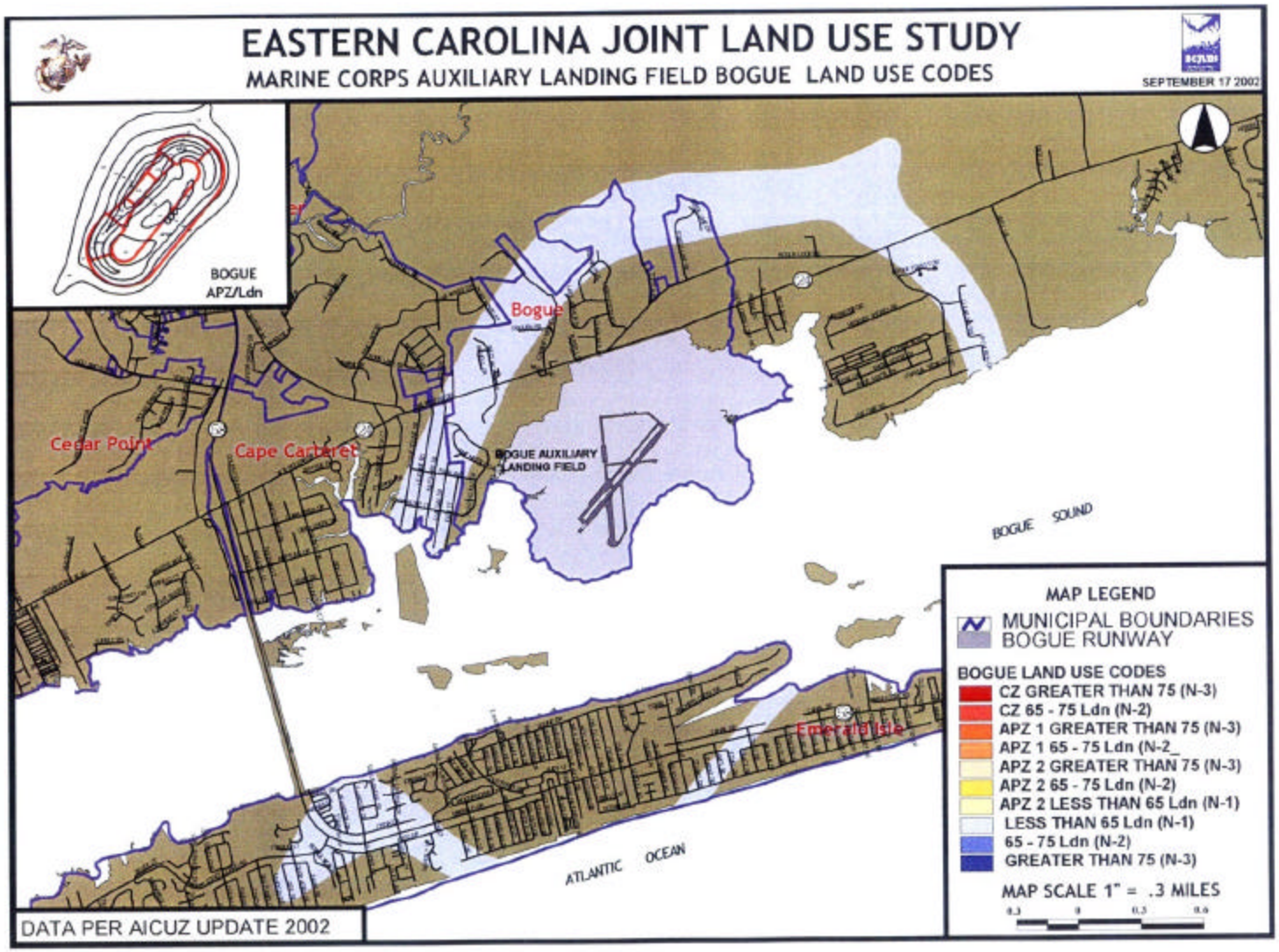
CZ GREATER THAN 75 (N-3)
CZ 65 - 75 Ldn (N-2)
APZ 1 GREATER THAN 75 (N-3)
APZ 1 65 - 75 Ldn (N-2_
APZ 2 GREATER THAN 75 (N-3)
APZ 2 65 - 75 Ldn (N-2)
APZ 2 LESS THAN 65 Ldn (N-1)
LESS THAN 65 Ldn (N-1)
65 - 75 Ldn (N-2)
GREATER THAN 75 (N-3)
MAP SCALE 1" = .3 MILES

N-1

Incompatible Land Uses	Compatible Land Uses
Mobile home parks or courts	Single units: detached,
	Single units: semi-detached
	Single units: attached row; two units side by side; two units one above another, apartments walk up; apartments elevator
	Group quarters, residential hotels
	Transient lodging
	Food & kindred products manufacturing
	Textile Mill products; manufacturing;
	Apparel & other finished products made from fabrics, leather, & similar materials; manufacturing
	Lumber & wood products; furniture & fixtures; Paper & allied products; printing, publishing and allied industries.
	Chemicals and allied products
	Petroleum refining and related industries
	Rubber and misc. plastic products
	Stone, clay & glass products; primary metal industries, fabricated metal products
	Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks
	Railroad, rapid rail & street railroad transportation, aircraft transportation, marine craft transportation, automobile parking
	Motor vehicle transportation, highway & street right-of-way
	Communications
	Utilities
	Cell towers, antennae, above ground transmission lines, landfills (22)
	Wholesale trade; hardware, and farm equipment
	Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment
	Eating and Drinking establishments
	Finance, insurance, real estate, personal, professional.
	Cemeteries
	Business services
	Repair services
	Hospitals, nursing homes
	Other medical facilities
	Contractor Construction services
	Government Services
	Educational Services
	Cultural activities (including church)
	Nature exhibits (22)
	Public Assembly
	Auditoriums, concert halls
	Outdoor music shell, amphitheaters
	Outdoor sports arenas, spectator sports
	Recreational activities (including golf courses, riding stables, water recreation)
	Parks (22)
	Agriculture (except livestock) (22)
	Livestock farming and animal breeding
	Agriculture related activities
	Forestry activities and related services
	Fishing activities and related services
	Mining activities & related activities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APZ 1 GREATER THAN 75 (N-3)
APZ 1 65 - 75 Ldn (N-2_
APZ 2 GREATER THAN 75 (N-3)
APZ 2 65 - 75 Ldn (N-2)
APZ 2 LESS THAN 65 Ldn (N-1)
LESS THAN 65 Ldn (N-1)
65 - 75 Ldn (N-2)
GREATER THAN 75 (N-3)
MAP SCALE 1" = .3 MILES
DATA PER AICUZ UPDATE 2002

MILITARY OPERATIONS
RECOMMENDATIONS

RECOMMENDATIONS FOR MCAS CHERRY POINT

One aspect of a Joint Land Use Study that demonstrates the partnership forged by the military installation and local governments is the base's willingness to examine methods of operation as it relates to community impacts.

Following is a list of recommendations offered to MCAS Cherry Point to evaluate as part of the ECJLUS process:

1. Form a standing committee with local civilian membership to discuss air operations and review quarterly any noise concerns received by MCAS Cherry Point with the goal of sharing information and informing the local communities of efforts to mitigate the noise.

2. Alter the number of aircraft permitted in the Bogue Field FCLP pattern. The current number permitted is two aircraft in the pattern at one time. One unintended consequence of limiting the number of aircraft in the pattern three years ago was to lengthen the overall time aircraft are required to be in the pattern in order to complete their required number of landings. By increasing the number permitted in the pattern to a number deemed safe by the Landing Signal Officer (LSO) and Bogue Field operations personnel, the required training may be completed sooner. While the actual number of aircraft landings flown will remain constant, the overall period of aircraft noise will be decreased.

3. Update the phone numbers listed in local phone books for reaching MCAS Cherry Point base operations personnel with noise complaints/concerns about aircraft operations. In many cases, numbers currently provided in local phone books are not answered, are incorrect, or are difficult to locate in the phone books.

4. Provide updated information on the website of local communities regarding aircraft operations (information about the AV-8B including general safety information), why we must fly FCLPs at night, and the telephone numbers to call if citizens are concerned about flight operations.

5. Continually re-examine facility and force lay down, both for current capabilities as well as future capabilities and platforms.

6. Evaluate current and future Standard Operating Procedures of MCAS Cherry Point and MCALF Bogue to minimize adverse impacts on local communities.

7. Examine the feasibility of using other proposed outlying landing fields for Bogue Field aircraft operations.

8. Evaluate the feasibility of altering runway alignments at Bogue Field.

9. Examine light hazards: types of lights, shoebox lights, high pressure sodium lights.

10. Examine Ldn and link to decibels.

PAST EFFORTS OF MCAS CHERRY POINT

The military has proven to be a good neighbor throughout the history of MCAS Cherry Point's existence in eastern North Carolina. This is evidenced through noise abatement efforts, land use controls over federal lands outside the fence line of MCAS Cherry Point and its outlying fields and ranges. In addition, MCAS Cherry Point has modified aircraft operations in order to maintain good community relations where it did not undermine their mission. These past efforts to minimize the adverse impact of military operations on communities surrounding MCAS Cherry Point and its outlying fields and ranges are detailed below:

1. The establishment and enforcement of noise abatement procedures at MCAS Cherry Point and MCALF Bogue Field (Bogue Field's noise abatement procedures being strengthened as recent as three years ago).

2. Establishment of a noise complaint system that responds to all noise complaints with an internal investigation and follow up to persons making a report..

3. Completion of updated Air Installation Compatible Use Zones Studies at the cost of $211,000 (+/-), which establishes noise and accident potential zones around MCAS Cherry Point, MCALF Bogue Field and MCAS New River for use by local communities in their land use and strategic planning.

4. Initiation of, and participation in, the ECJLUS, which requires partnering with local counties and municipalities around MCAS Cherry Point, MCOLF Atlantic, and MCALF Bogue Field in developing appropriate measures to mitigate adverse impacts of military operations and protect the operational viability of the military bases.

5. Partnering with local communities in the Crystal Coast Disaster Coalition to enhance joint training and response to natural disasters and aircraft mishaps.

RECOMMENDATIONS AND STRATEGIES

Recommendations and Assignments

- Modify existing comprehensive plans and land use plans as well as implementation tools such as zoning ordinances, subdivision regulations, manufactured home park ordinances, building codes, and capital improvement plans to ensure compatibility with installation operations.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue

- Enact regulations to guide growth in areas currently unprotected from uncontrolled growth. This includes expanding land use controls to incorporated and unincorporated areas adjacent to installations.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue

- When possible, extend areas of extra-territorial jurisdictions (ETJs) and/or annex areas currently unprotected from uncontrolled growth.
  Assigned to: Craven County, City of Havelock,

- Adopt and enact local policies promoting disclosure of safety and noise hazards prior to land transactions and development or sale of property.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue

- Advocate for a change in North Carolina Statutes to require disclosure of safety and noise hazards in land records (zoning permits, deeds, etc.) and/or before any real estate sale, lease, or rent contract is finalized in defined areas around (military) airports.
  Assigned to: ECJLUS Implementation Committee

- Adopt noise attenuation requirements and recommendations for future development in high noise areas.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue

- Produce maps for public distribution outlying areas of accident potential and high noise.
  Assigned to: ECJLUS Implementation Committee

- Develop and maintain a user-friendly webpage available to the general public outlining areas of accident potential and high noise.
  Assigned to: Eastern Carolina Council

- Educate lending institutions on appropriate mortgage lending in accident potential and high noise zones.
  Assigned to: ECJLUS Implementation Committee

- Support HUD lending restrictions on lending for development in accident potential and high noise zones.

Assigned to: ECJLUS Implementation Committee

- Explore all available options for acquisition of critical properties (which could have significant encroachment potential) through fee simple purchase, restrictive use easements, and land exchanges.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue, MCAS Cherry Point

- Encourage uniform building code modifications to mitigate noise for new structures built in high noise areas.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue

- Develop a Capital Improvement Plan (CIP) to limit expansion of infrastructure to large, undeveloped areas, which are not currently served by public facilities, such as water, sewer, natural gas or surfaced roads, so that land within "impacted" areas would remain unserved.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue

- Evaluate current and future Standard Operating Procedures of MCAS Cherry Point and MCALF Bogue to minimize adverse impacts on local communities.
  Assigned to: MCAS Cherry Point

- Support MCAS Cherry Point in its efforts to work with local planning officials to examine the impact of noise through demonstration projects.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue, MCAS Cherry Point, Eastern Carolina Council

- Enhance the current process of dialog between MCAS Cherry Point, local government officials, and citizens of impacted communities.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue, MCAS Cherry Point

- Form a standing committee with local civilian membership to discuss air operations and review quarterly any noise concerns received by MCAS Cherry Point with the goal of sharing information and informing the local communities of efforts to mitigate any negative impacts.
  Assigned to: MCAS Cherry Point

- Ensure appropriate land use regulations, particularly zoning standards, are implemented along the proposed Havelock By-pass (NC 70) to minimize any conflicts. The potential exists for increased land use along this corridor, which could have an impact on installation operations.
  Assigned to: Craven County, City of Havelock, Eastern Carolina Council

- Ensure appropriate land use regulations, particularly zoning standards, are implemented along Highway 24 (adjacent to MCALF Bogue). The potential exists for increased land use along this corridor, which could have an impact on operations at MCALF Bogue.
  Assigned to: Carteret County, Town of Emerald Isle, Town of Bogue

- Encourage and support purchase of land for open space and compatible low-density activities such as recreation.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue, MCAS Cherry Point

- Increase training and coordination of Emergency Response entities in the areas impacted by MCAS Cherry Point, MCALF Bogue, and MCOLF Atlantic.
  Assigned to: MCAS Cherry Point

- Increase the frequency of the course rules briefing for locally based squadrons, particularly at MCALF Bogue.
  Assigned to: MCAS Cherry Point

- Support state legislation to protect military installations form encroachment.
  Assigned to: ECJLUS Implementation Committee

- Continue to support and provide resources for the Crystal Coast Disaster Coalition.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue, MCAS Cherry Point, Eastern Carolina Council

- Encourage the use of cutoff and semi-cutoff (shoebox) high sodium vapor lighting in the Accident Potential Zones.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue, MCAS Cherry Point

- Improve notification of additional planning guidelines in affected areas through proper signage.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue,

- Examine the feasibility of using other proposed outlying landing fields for Bogue Field aircraft operations.
  Assigned to: MCAS Cherry Point

- Study the impact of altering the number of aircraft permitted in the Bogue Field, Field Carrier Landing Practice (FCLP) pattern.
  Assigned to: MCAS Cherry Point

- Evaluate the feasibility of altering runway alignment of Bogue Field.
  Assigned to: MCAS Cherry Point

- Update phone directories to clearly identify appropriate numbers to call for noise complaints/concerns.
  Assigned to: MCAS Cherry Point

- Provide updated information on aircraft operations to websites for local communities.
  Assigned to: MCAS Cherry Point

- Create a ECJLUS Implementation Committee (comprised of existing members of the Technical Advisory Committee) to monitor and guide implementation of ECJLUS recommendations.
  Assigned to: Carteret County, Craven County, City of Havelock, Town of Emerald Isle, Town of Bogue, MCAS Cherry Point, Eastern Carolina Council

FUTURE PLANNING & COORDINATION

On-going Monitoring of Recommendations

The ECJLUS represents an extensive amount of work involving countless hours on the part of paid staff, local elected officials and the community.

As a blueprint for action, the suggestions made are intended to be implemented by those who participated in this planning process.

Both the military and the local community have vested interests in the successful co-existence of the marine aviation facilities and the surrounding communities. As such, it would be prudent for all parties to continue the planning process that resulted in this plan. In order to continue the forward momentum, it is recommended that the existing Technical Advisory Committee will serve as the group responsible for monitoring the progress of the implementation of these recommendations. The Technical Advisory Committee will continue with the same make up as before with appointments being made based on position held (for paid staff) or appointments made (for local elected officials/community representatives). The group will be renamed the "ECJLUS Implementation Committee."

The primary role of the ECJLUS Implementation Committee is to foster communication and to plan for orderly growth of the affected communities while protecting the needs of the military training operations.

The ECJLUS Implementation Committee will meet at least quarterly to review the progress being made against the recommendations of the ECJLUS and to make further recommendations based on new developments. This committee will be aided and guided by the staff of the Eastern Carolina Council. The ECJLUS Implementation Committee will help to identify impediments to the implementation of the recommendations and will work toward breaking down existing barriers to success. This is the venue where inter-jurisdictional issues will be addressed and mitigated. It is hoped that this effort will create new paradigms for the positive co-existence of the military and civilian communities in Carteret and Craven Counties.

APPENDICES

A: Resolutions

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C: Land Use Compatibility Key

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I: Maps

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APPENDIX: A

RESOLUTIONS

- Carteret County
- Craven County
- City of Havelock
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- Town of Bogue
- Marine Corps Air Station Cherry Point

APPENDIX: B

LAND USE COMPATIBILITY GUIDELINES

Accident Potential Zones

APZs are divided into three (3) types along primary flight paths.

- *Clear Zone (CZ)* is an area which possesses a high potential for accidents.
- *APZ1* is an area normally beyond the Clear Zone which possesses a significant potential for accidents.
- *APZ2* is an area normally beyond the APZ1 which has a measurable potential for accidents.

Noise Zones

Noise Zones are hereby established as follows:

Airport Noise Zone	**Ldn Values**	
1	less than 65	Potential Noise Zone
2	65-74	Moderate Noise Zone
3	greater than 75	High Noise Zone

For the purposes of understanding the Land Use Compatibility Guidelines Table, the following zones are hereby established:

Designation	Description
• CZ	Clear Zone
• APZ1 and N-3	Accident Potential Zone 1 and High Noise Zone
• APZ1 and N-2	Accident Potential Zone 1 and Moderate Noise Zone
• APZ2 and N-2	Accident Potential Zone 2 and Moderate Noise Zone
• APZ2 and N-1	Accident Potential Zone 2 and Potential Noise Zone
• N-3	High Noise Zone
• N-2	Moderate Noise Zone
• N-1	Potential Noise Zone

APPENDIX: C

LAND USE COMPATIBILTY KEY

NLR - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

A, B, or C - Land use and related structures generally compatible; measures to achieve NLR for A (Ldn less than 65*),* B(Ldn 65-74), C(Ldn greater than 75*),* need to be incorporated into the design and construction of structures.

A* , B* , and C* - Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.

*- The designation of these uses as "compatible" in this zone reflects individual federal agencies' and program considerations of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

NOTES:

1. Suggested maximum density of 1-2 dwelling units per acre, possibly increased under a Planned Unit Development (PUD) where maximum lot coverage is less than 20 percent.

2. Within each land use category, uses exist where further deliberating by local authorities may be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible use in any accident potential zone (CZ, APZ I, or APZ II).

3. The placing of structures, buildings, or above-ground utility lines in the clear zone is subject to severe restrictions. In a majority of the clear zones, these items are prohibited.

4. No passenger terminals and no major above-ground transmission lines in APZ I

5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.

6. Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.

7. Excludes chapels.

8. Facilities must be low intensity.

9. Clubhouse not recommended.

10. Areas for gatherings of people are not recommended.

11.

A. Although local conditions may require residential use, it is discouraged in N-2 and strongly discouraged in N-3. The absence of viable alternative development options should be determined and an evaluation indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones should be conducted prior to approvals.

B. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) for N-2 and N-3 should be incorporated into building codes and considered in individual approvals.

C. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.

12. Measures to achieve the same NLR as required for facilities in N-2 zone must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

13. Measures to achieve the same NLR as required for facilities in N-3 zone must be incorporated into the design and construction of portions of these buildings where the public us received, office areas, noise sensitive areas or where the normal noise level is low.

14. Measures to achieve the same NLR as required for facilities in N-3 zone must he incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

15. If noise sensitive, use indicated NLR if not, the use is compatible.

16. No buildings.

17. Land use is compatible provided special sound reinforcement systems are installed.

18. Residential buildings require the same NLR as required for facilities in N-2 zone.

19. Residential buildings require the same NLR as required for facilities in N-3 zone.

20. Residential buildings are not permitted.

21. Land use is not recommended. If the community decides the use is necessary, hearing protection devices should be worn by personnel.

22. Activities, structures, or crops that attract birds should be avoided.

23. Lighting of any sort located in an N-3 or N-2 zone should not be such that it disorients or confuses pilots.

24. Tall structures in an N-3 or N-2 zone should be avoided.

25. Construction cranes in an N-3 or N-2 zone may adversely impact flight safety and should be avoided whenever possible. Should such a crane be necessary in N-3 or N-2 zone, its use should be coordinated through the MCAS Cherry Point Community Plans and Liaison Office.

APPENDIX: D

LAND USE COMPATIBILTY TABLE

RESIDENTIAL

Land Use	CZ	APZ 1 N-3	APZ 1 N-2	APZ 2 N-2	APZ 2 N-1	N-3	N-2	N-1
Single units: detached	N	N	N	Y-1, 23	Y-1	N	11A,11B	Y
Single units: semi-detached	N	N	N	N	N	N	11A,11B	Y
Single units: attached row; two units side by side; two units one above the other; apartments walk up; apartments elevator	N	N	N	N	N	N	11A 11B	Y
Mobile home parks or courts	N	N	N	N	N	N	N	N
Group quarters, residential hotels	N	N	N	N	N	N	11A,24 11B,24	Y
Transient lodging	N	N	N	N	N	N	11A,24 11B,24	Y

INDUSTRIAL MANUFACTURING

Land Use	CZ	APZ 1 N-3	APZ 1 N-2	APZ 2 N-2	APZ 2 N-1	N-3	N-2	N-1
Food & kindred products; manufacturing	N	Y-2	Y-2	Y-12, 23,24	Y	Y-14, 23,24	Y-13, 23,24	Y
Textile Mill products; manufacturing	N	Y-2	Y-2	Y-23,24	Y-13	Y-14, 23,24	Y-12, 23,24	Y
Apparel & other finished products made from fabrics, leather & similar materials; manufacturing	N	N	N	Y-2	Y-2	Y-14, 23,24	Y-12, 23,24	Y
Lumber & wood products; furniture & fixtures; paper & allied products; printing, publishing and allied industries	N	Y-2	Y-2	Y-23,24	Y-12	Y-14, 23,24	Y-12, 23,24	Y
Chemicals and allied products	N	N	N	Y-23,24	Y-12	Y-14, 23,24	Y-12, 23,24	Y
Petroleum refining and related industries	N	N	N	Y-23,24	Y-12	Y-14, 23,24	Y-12, 23,24	Y
Rubber and miscellaneous plastic products	N	Y-2	Y-2	Y-23,24	Y-12	Y-14, 23,24	Y-12, 23,24	Y
Stone, clay 7 glass products' primary metal industries, fabricated metal products	N	Y-2	Y-2	Y-23,24	Y-12	Y-14, 23,24	Y-12, 23,24	Y
Professional, scientific & controlling instruments, photographic & optical goods; watches & clocks	N	N	N	N-2	N-2	N/B	Y/A-23,24	Y

TRANSPORTATION, COMMUNICATIONS & UTILITIES

Land Use	CZ	APZ 1 N-3	APZ 1 N-2	APZ 2 N-2	APZ 2 N-1	N-3	N-2	N-1
Railroad, rapid rail & street railroad transportation, marine craft transportation, automobile parking	Y-3	Y-4,23	Y-4,23	Y-23	Y	Y-14, 23	Y-12,23	Y
Motor vehicle transportation, highway & street right-of-way	Y-3	Y-23	Y-23	Y-23	Y	Y-14,23	Y-12,23	Y
Communications	Y-3	Y-4, 23,24	Y-4 ,23,24	A-15, 23,24	Y	N	A-15, 23-24	Y
Utilities	Y-3	Y-4, 23,24	Y-4, 23-24	Y-23,24	Y	Y-13 23,24	Y-23,24	Y
Cell towers, antennae, above ground transmission lines, landfills	N	N	N	Y-22, 23,24	Y-22	N	Y-22,23,24	Y-22

COMMERCIAL / TRADE

Land Use	CZ	APZ 1 N-3	APZ 1 N-2	APZ 2 N-2	APZ 2 N-1	N-3	N-2	N-1
Wholesale trade' hardware, and farm equipment	N	Y-2, 23,24	Y-2, 23,24	Y-23,24	Y-12	Y-14, 23,24	Y-12, 23,24	Y
Retail trade-general merchandise; food, automotive, marine craft, aircraft & accessories; furniture, home furnishings & equipment	N	Y-2	Y-2	Y-2, 23,24	A	N	A-23,24	Y
Eating & drinking establishments	N	N	N	Y-2, 23,24	A	N	A-23,24	Y

PERSONAL & BUSINESS SERVICES

Land Use	CZ	APZ 1 N-3	APZ 1 N-2	APZ 2 N-2	APZ 2 N-1	N-3	N-2	N-1
Finance, insurance, real estate, personal, professional	N	N	N	Y-6,23,24	Y-6	N	A-23,24	Y
Cemeteries	N	Y-7,23	Y-7,23	Y-6,23	Y-6	Y-14 21,23	Y-12, 23	Y
Business services	N	Y-8,23,24	Y-8,23,24	Y-8,23,24	Y-8	N	A-23,24	Y
Repair services	N	Y-23	Y-23	Y-23	Y-12	Y-14,23	Y-12,23	Y
Hospitals, nursing homes	N	N	N	N	N	N	A-23,24*	Y
Other medical facilities	N	N	N	N	N	N	A-23,24*	Y
Contractor Construction services	N	Y-6,23	Y-6,23	A-23	Y	N	A-23,24	Y
Government services	N	N	N	Y-6,23,24	Y-6	N	A-23,24*	Y
Educational services	N	Y-2	Y-2	Y-2,23,24	Y-2	N	A-23,24	Y

CULTURAL, ENTERTAINMENT & RECREATION

Land Use	CZ	APZ 1 N-3	APZ 1 N-2	APZ 2 N-2	APZ 2 N-1	N-3	N-2	N-1
Cultural activities (including church)	N	N	N	Y-2	Y-2	N	A-24*	Y
Nature Exhibits	N	Y-2, 22,23	Y-2, 22,23	Y-22,23	N	N	Y-22,23*	Y-22
Public Assembly	N	N	N	N	N	N	Y-23,24	Y
Auditoriums, concert halls	N	N	N	N	N	N	A-23,24	Y
Outdoor music shell, ampitheaters	N	N	N	N	N	N	N	Y
Outdoor sports arenas, spectator sports	N	N	N	N	N	N	Y-17, 23,24	Y
Recreational activities (including golf courses, riding stables, water recreation)	N	Y-8,9,10,23	Y-8,9,10,23	Y-23	Y*	N	Y-23,24*	Y
Parks	N	Y-8,22,23	Y-8,22,23	Y-8,22,23	Y-8	N	Y-22,23*	Y-22

RESOURCES, PRODUCTION & EXTRACTION

Land Use	CZ	APZ 1 N-3	APZ 1 N-2	APZ 2 N-2	APZ 2 N-1	N-3	N-2	N-1
Agriculture (except livestock)	Y-16,22	Y-22	Y-22	Y-22	Y-18,22	Y-20,21,22	Y-18,22	Y-22
Livestock farming and animal breeding	N	Y	Y	Y	Y-18	Y-20,21	Y-18	Y
Agricultural related activities	N	Y-5	Y-5	Y	Y-18	N	Y-18	Y
Forestry activities and related services	Y-5	Y	Y	Y	Y-18	Y-20,21	Y-18	Y
Fishing activities and related services	Y-5	Y-5	Y-5	Y	Y	Y	Y	Y
Mining activities and related activities	N	Y-5,23	Y-5,23	Y-23	Y	Y-23	Y-23	Y

APPENDIX: E

FAA OBSTRUCTION TO NAVIGABLE AIRSPACE CRITERIA (FAR PART 77)

OBJECTS AFFECTING NAVIGABLE AIRSPACE

Federal Aviation Regulation Part 77

Federal Regulation 49 CFR Part 77 establishes standards and notification requirements for objects affecting navigable airspace. This notification serves as the basis for:

- Evaluating the effect of the construction or alteration on operating procedures
- Determining the potential hazardous effect of the proposed construction on air navigation
- Identifying mitigating measures to enhance safe air navigation
- Charting of new objects.

Notification allows the FAA to identify potential aeronautical hazards in advance thus preventing or minimizing the adverse impacts to the safe and efficient use of navigable airspace

WHO MUST FILE?

§ 77.13 - Any person/organization who intends to sponsor any of the following construction or alterations must notify the Administrator of the FAA

- **Any construction or alteration exceeding 200 ft above ground level**
- **Any construction or alteration**
  - within 20,000 ft of a public use or military airport which exceeds a 100:1 surface from any point on the runway
  - within 10,000 ft of a public use or military airport which exceeds a 50:1 surface from any point on the runway
  - within 5,000 ft of a public use heliport which exceeds a 25:1 surface
- **Any highway, railroad or other traverse way whose prescribed adjusted height would exceed that above noted standards**
- **When requested by the FAA**
- **Any construction or alteration located on a public use airport or heliport regardless of height or location**

Persons failing to comply with the provisions of FAR Part 77 are subject to Civil Penalty under Section 902 of the Federal Aviation Act of 1958, as amended and pursuant to 49 U.S.C. Section 46301(a).

ON-AIRPORT CONSTRUCTION VERSUS OFF-AIRPORT CONSTRUCTION

Proposals that are subject to the above must file whether the proposed modification in on or off of airport property. On Airport evaluations are administered by the FAA Airports Division with coordinated assistance from Flight Procedures, Airway Facilities and Air Traffic Divisions. Off-Airport evaluations are administered by the FAA Air Traffic Division.

AIRPORT OWNERS AND OPERATORS
Airports that have received federal funds have an obligation through grant assurances to identify and mitigate hazards to navigable airspace at their airport.

Construction or alteration of objects on or around airports can have an adverse impact to operations at your airport:

- Construction of objects may result in an increase to approach minimums to your runways.
- The location of constructed objects may impact runway protection zones, safety areas, object free areas and obstacle free zones.
- The transmitting frequency of the proposed facility could impact the proper operation of navigational aide facilities at your airport

In considering the vested interest airport owners have in the airport infrastructure, it is prudent for owners to protect the airspace around the airport.

PERMANENT VERSUS TEMPORARY MODIFICATIONS
All modifications, whether permanent or temporary, are subject to the notice requirement outlines above. Airport owners/operators should assure that all such improvements are properly evaluated by the FAA prior to commencement of the work. Listed below are some typical examples of permanent and temporary alterations. These lists shall not be construed as all inclusive of such alterations that require notification.

Examples of Permanent Construction or Alterations

Buildings/Structures	Towers
Radio Antennas	Roadways
Elevated Signs	Fences
Light Fixtures	Storage Tanks
AWOS/ASOS	NAVAID Facilities (Including FAA)
NWS Facilities	Power & Cable Lines

Examples of Temporary Construction or Alterations

Cranes	Batch Plants
Drilling Rigs	Staging Areas
Stock Piles	Construction Equipment
Temporary Lights	Staging Areas
Haul Routes	

FORM OF NOTIFICATION
§ 77.17 - Individuals/Organizations proposing construction or alterations must submit FAA form 7460-1, *Notice of Proposed Construction or Alteration* including pertinent information about the alteration and appropriate attachments showing the type and location of the alteration. Information needed for the FAA review includes the following:

- **Scaled drawing showing location of alteration in relation to nearest runways. This may be a marked up-ALP or Terminal Area sheet.**
- Perpendicular distance of the proposed alteration to the nearest runway centerlines.
- Distance along centerline (acutual or extended) from runway end to the perpendicular intercept point
- Ground Elevation at the site of the proposed alteration
- Height of the proposed alteration including antennas or other appurtenances
- Accurate geodetic coordinates conforming to NAD 83
- Sketches, drawings, etc. showing the type of construction or alteration being proposed

NOTIFICATION TIMING AND SUBMITTAL
Pursuant to § 77.17(a)(1) , notification shall be submitted 30 days prior construction. Given the time required to conduct an aeronautical study, a 60 day notification is recommended to accommodate the review process and issuance of a determination letter.

On-airport proposals within the FAA Central Regiona should be sent to the following address:

FAA Airports Division
Attn: Cheryl Dobson
901 Locust St.
Kansas City, MO 64106

Proposals for non-Federal facilities (e.g. AWOS) within the FAA Central Region shall be sent to:

FAA
John Scott, ACE -471
901 Locust St.
Kansas City, MO 64106

For locations outside of the FAA Central Region, please refer to the FAA Points of Contact webpage.

FAA DETERMINATION
Once the FAA as completed an aeronautical study, a determination is made regarding the impact to air navigation. One of three responses is typically issued:

No Objection - The subject construction did not exceed obstruction standards and marking/lighting is not required.

Conditional Determination - The proposed construction/alteration would be acceptable contingent upon implementing mitigating measures (Marking & Lighting, etc.)

Objectionable - The proposed construction/alteration is determined to be a hazard and is thus objectionable. The reasons for this determination are outlined to the proponent.

Please note that if at any time during the aeronautical study, the proposed alteration is determined to be a hazard, the study is halted with no further consideration and an objectionable determination is issued.

APPENDIX: F

HARRIER STATUS OVERVIEW

Due to concerns regarding the performance of the AV-8B Harrier, the Commandant of the Marine Corps founded the Harrier Review Panel (HaRP) in 1997. Its charter was to examine the status of the Harrier and to produce recommendations to improve the performance and safety of the platform. Following the Harrier Review Panel's (HaRP) First Annual Report in September of 1998, Headquarters Marine Corps promulgated a detailed implementation plan to all Harrier and relevant support activities outlining the USMC intent for each of the sixty HaRP recommendations. The Commandant took an active role in securing additional funding for the most immediate HaRP actions.

Although the bulk of HaRP funding was not available until FiscalYear 2000 (October 1999), there was immediate and substantial activity on all fronts. The Panel met twice to review progress (May '99 and March '00), and decided to delay the second report (initially intended to be an annual document) because most major HaRP initiatives would not have time to mature until the effects of FY 00 funding could be felt.

The highest visibility issues were engine related, but virtually all were culminations of previously identified trends. Headquarters Marine Corps and the Naval Air Systems Command adopted an extremely conservative policy for Harrier flight operations, frequently grounding all affected aircraft any time an incident occurred until a complete analysis of causal factors could be conducted and risk mitigation measures put into place. The Commandant also initiated a one-year moratorium on AV-8B deployments to facilitate recovery by ensuring the most efficient utilization of limited available assets. The cumulative actions of everyone involved resulted in an FY 00 mishap rate of 9.05 per 100,000 flight hours, the third best in the program's history. The FY 01 Harrier mishap rate was 3.83, the best ever posted by the aircraft and less than half the 10.24 rate of FY 97, the year CMC formed the HaRP. Although too early to declare victory, FY 01 substantiates CMC's stated goal of halving the Harrier mishap rate as realistically achievable.

Most near-term actions have now been completed to the intent of the HaRP. The program has fielded the ground segment of the Engine Monitoring System (EMS), Engine Vibration Test Sets (VTS) and other diagnostic tools. It increased the emphasis on engineering changes and substantially improved support system capability to proactively manage the engine. Other improvements in Foreign Object Damage programs, maintenance training, contractor maintenance support, the ejection seat and the tactical systems have all enhanced AV-8B safety and capability.

The entire Harrier community is working to institutionalize the HaRP recommendations to sustain the near-term success. Substantial improvements occurring in several areas of special HaRP interest will help ensure the long-term continuation of current upward trends. The largest and most promising effort is NAVAIR's development of an Engine

Life Management Plan to systematically identify and address all technical and operational issues related to the F408 engine.

In summary, much has been accomplished since the first HaRP report. Very impressive successes have been achieved that show the Harrier is viable, its problems solvable. Much remains to be done to make initial gains in safety and readiness enduring. The Panel continues to believe that steadfast attention to and completion of the HaRP recommendations will achieve CMC's safety and effectiveness goals for the remainder of the AV-8B's service life.

APPENDIX: G

NOISE COMPLAINTS

NOISE COMPLAINTS

Location (Vicinity)	1997	1998	1999	2000	2001
Cherry Point	7	36	40	31	20
Bogue Field	7	27	24	25	18

APPENDIX: H

ACRONYMS (Commonly Used Acronyms In The ECJLUS Report)

AESO	Aircraft Environmental Support Office
AGL	Above Ground Level
AICUZ	Air Installations Compatible Use Zone
APZ	Accident Potential Zone
ATC	Air Traffic Control
BASH	Bird Aircraft Strike Hazard
BRAC	Base Realignment and Closure
CCA	Carrier –Controlled Approaches
COMCABEAST	Commander Marine Corps Air Bases East
CP&L	Community Plans and Liaison Office
CIP	Capital Improvement Plan
C/L	Center Line
CZ	Clear Zone
DNL	Day-Night Average Sound Level
dBA	A weighted decibel
DOD	Department of Defense
DON	Department of the Navy
EA	Environmental Assessment
ECC	Eastern Carolina Council of Governments
ECJLUS	Eastern Carolina Joint Land Use Study
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FCLP	Field Carrier Landing Practice
FL	Flight Level
GCA	Ground Controlled Approach
HUD	Department of Housing and Urban Development
IFR	Instrument Flight Rules
ILS	Instrument Landing System
JLUS	Joint Land Use Study
Ldn	Symbol for DNL
LSO	Landing Signal Office
LH	Left Hand
MAEWR	Mid-Atlantic Electronic Warfare Range
MAG	Marine Air Group
MAW	Marine Air Wing
MCALF	Marine Corps Auxiliary Landing Field
MCAS	Marine Corps Air Station
MCOLF	Marine Corps Outlying Landing Field
MOA	Military Operating Area
MSL	Mean Sea Level

MTR	Military Training Route
NADEP	Naval Aviation Depot
NAVAIRSYSCOM	Naval Air Systems Command
NM	Nautical Miles
NOISEMAP	DOD Noise Model
OEA	Office of Economic Adjustment
OPNAVINST	Office of the Chief of Naval Operations Instructions
PAR	Precision Approach Radar
RATCF	Radar Air Traffic Control Facility
RH	Right Hand
R/W	Runway
SEL	Sound Exposure Level
TACTS	Tactical Aircrew Combat Training System
T&G	Touch and Go
TACAN	Tactical Air Navigation
UAV	Unmanned Air Vehicles
USAF	United States Air Force
USMC	United States Marine Corps
USN	United States Navy
VFR	Visual Flight Rules
V/STOL	Vertical/Short Take-off and Landing

APPENDIX: I

MAPS

- **MCAS Cherry Point Area Map**
- **MCALF Bogue Area Map**
- **MCOLF Atlantic Area Map**
- **Current Zoning Map Havelock**
- **Current Zoning Map Emerald Isle**
- **Current Zoning Map Bogue**
- **Current Zoning Map Craven County**
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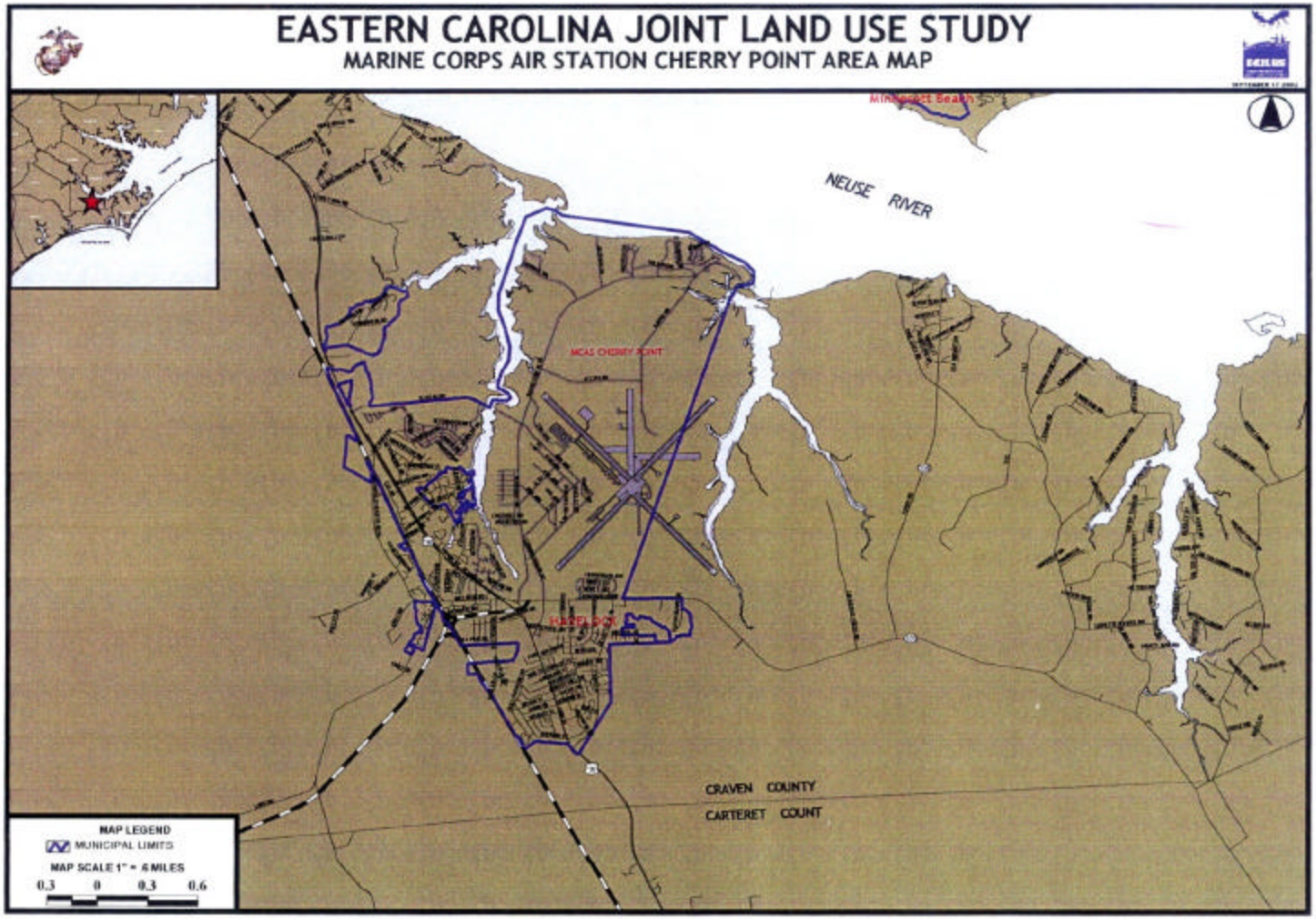
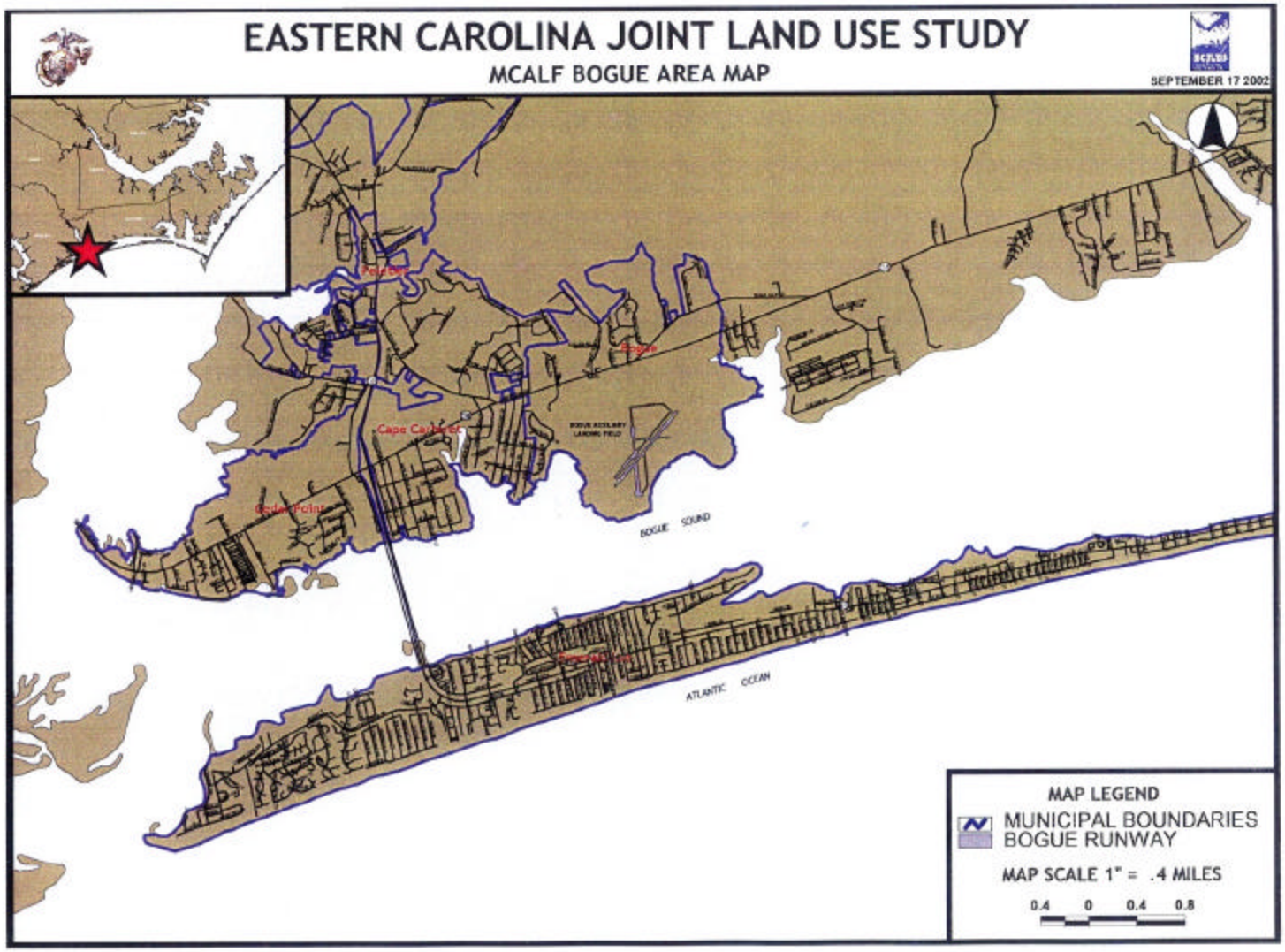
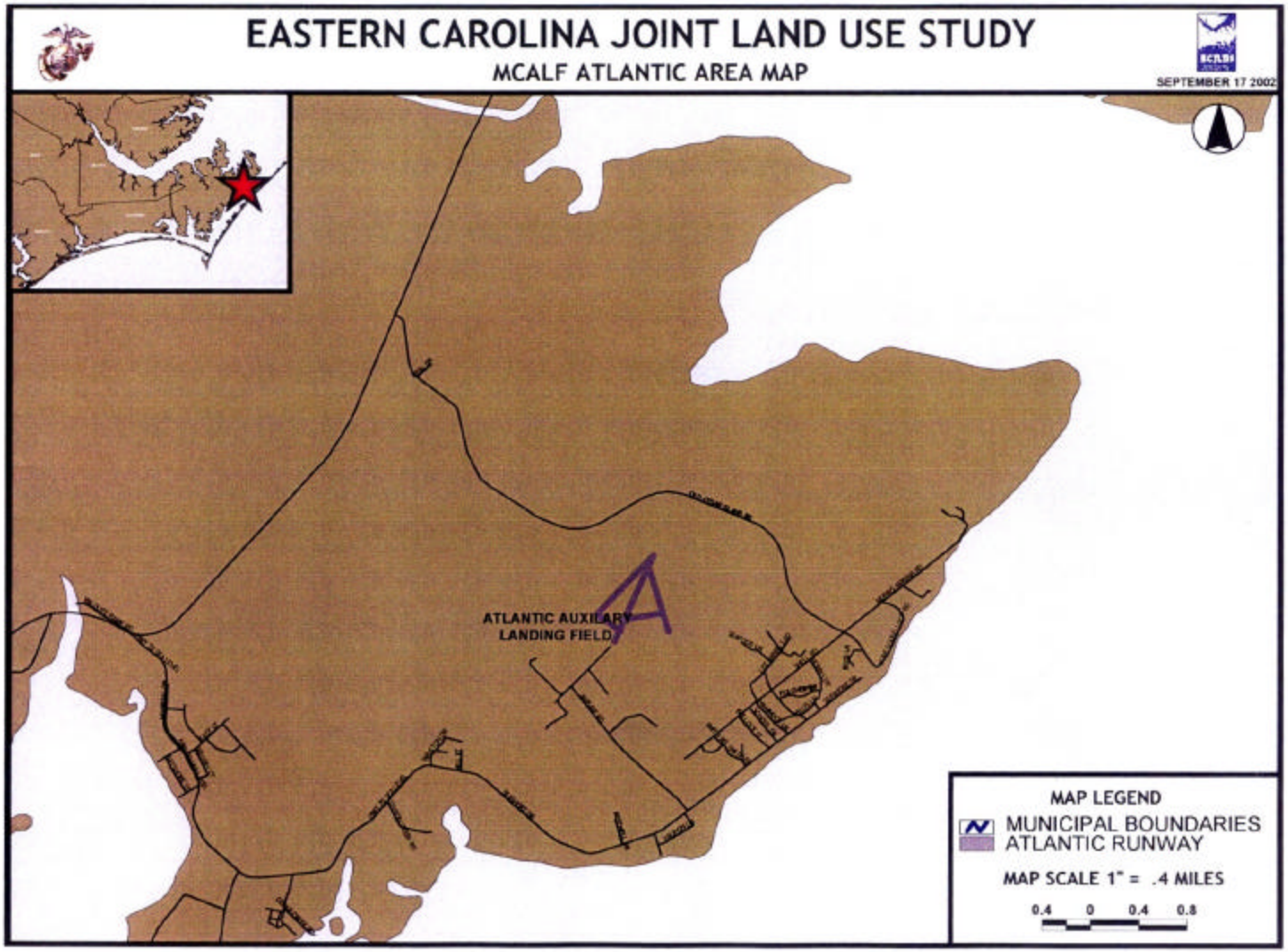
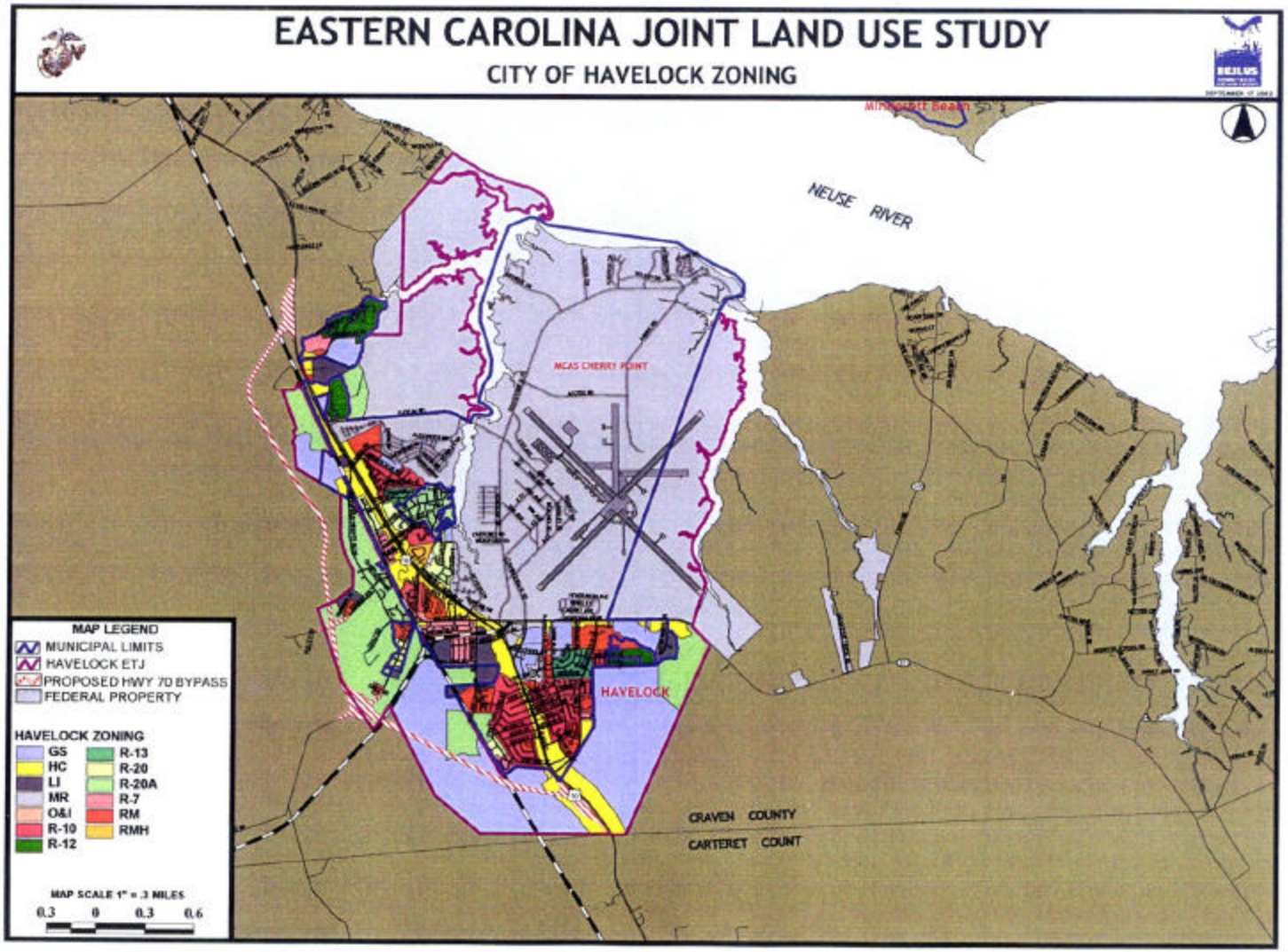
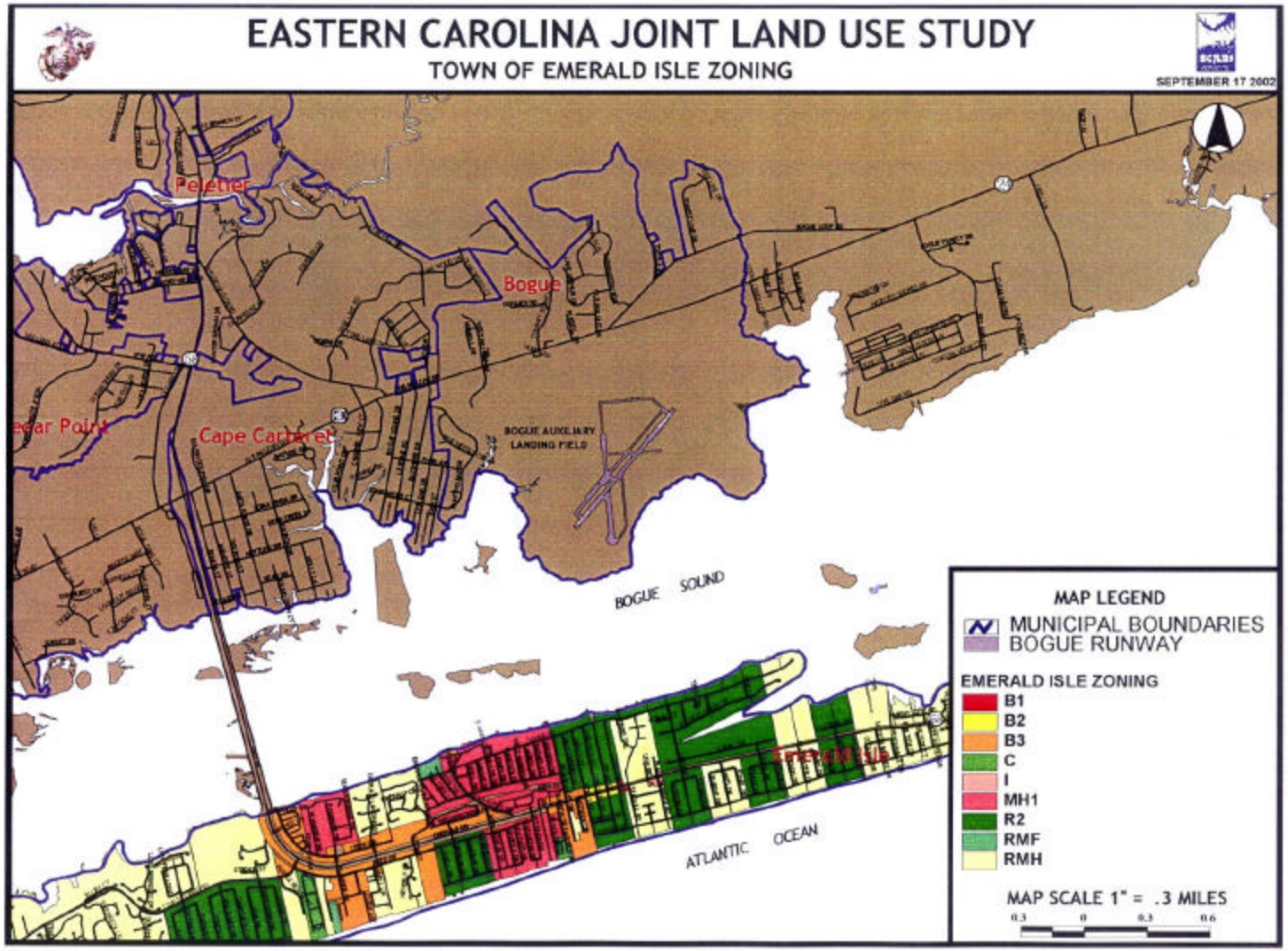
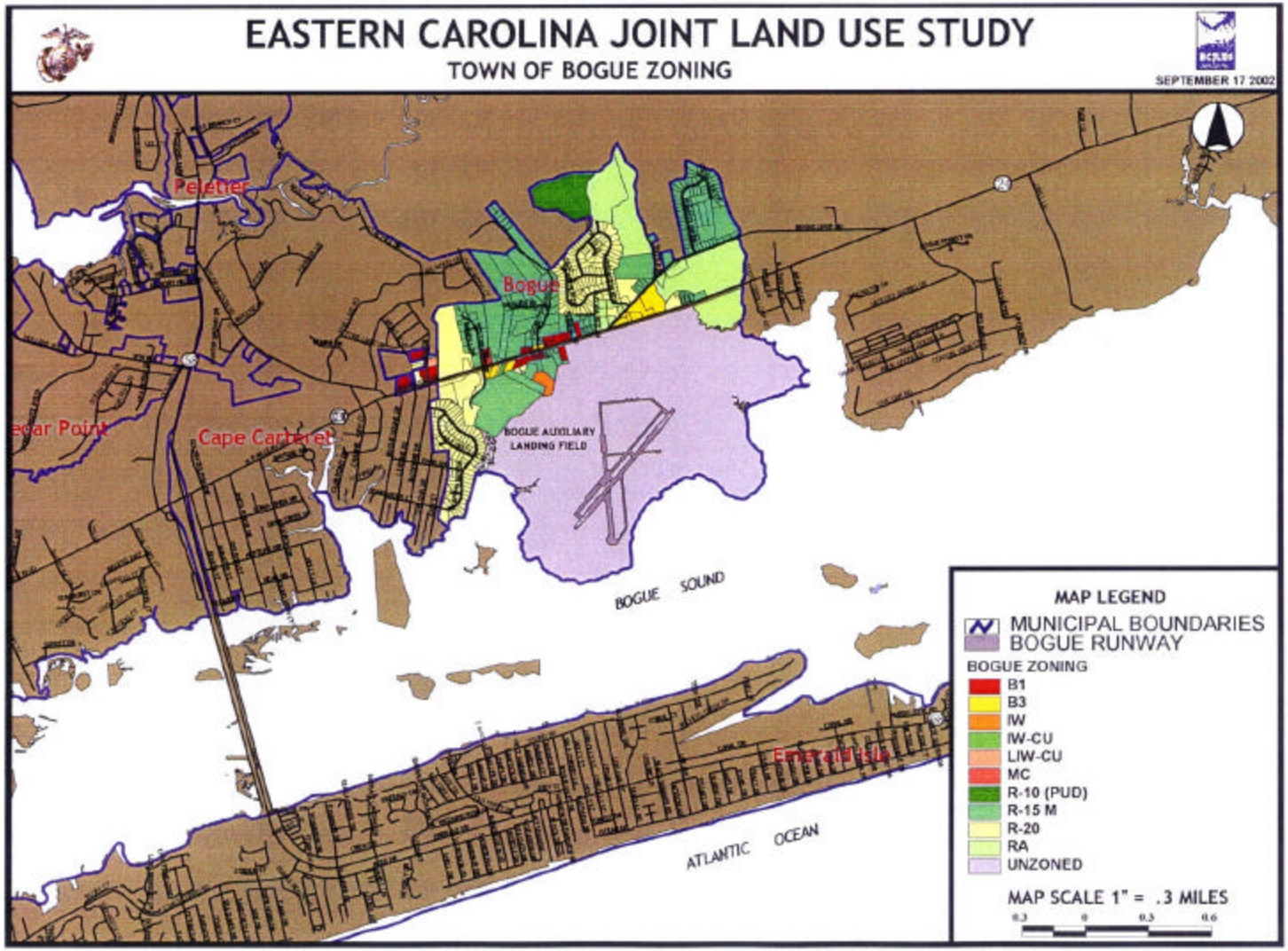

EASTERN CAROLINA JOINT LAND USE STUDY
MARINE CORPS AIR STATION CHERRY POINT AREA MAP
NEUSE RIVER
MCAS CHERRY POINT
HAVELOCK
CRAVEN COUNTY
CARTERET COUNT
MAP LEGEND
MUNICIPAL LIMITS
MAP SCALE 1" = 6 MILES
0.3 0 0.3 0.6

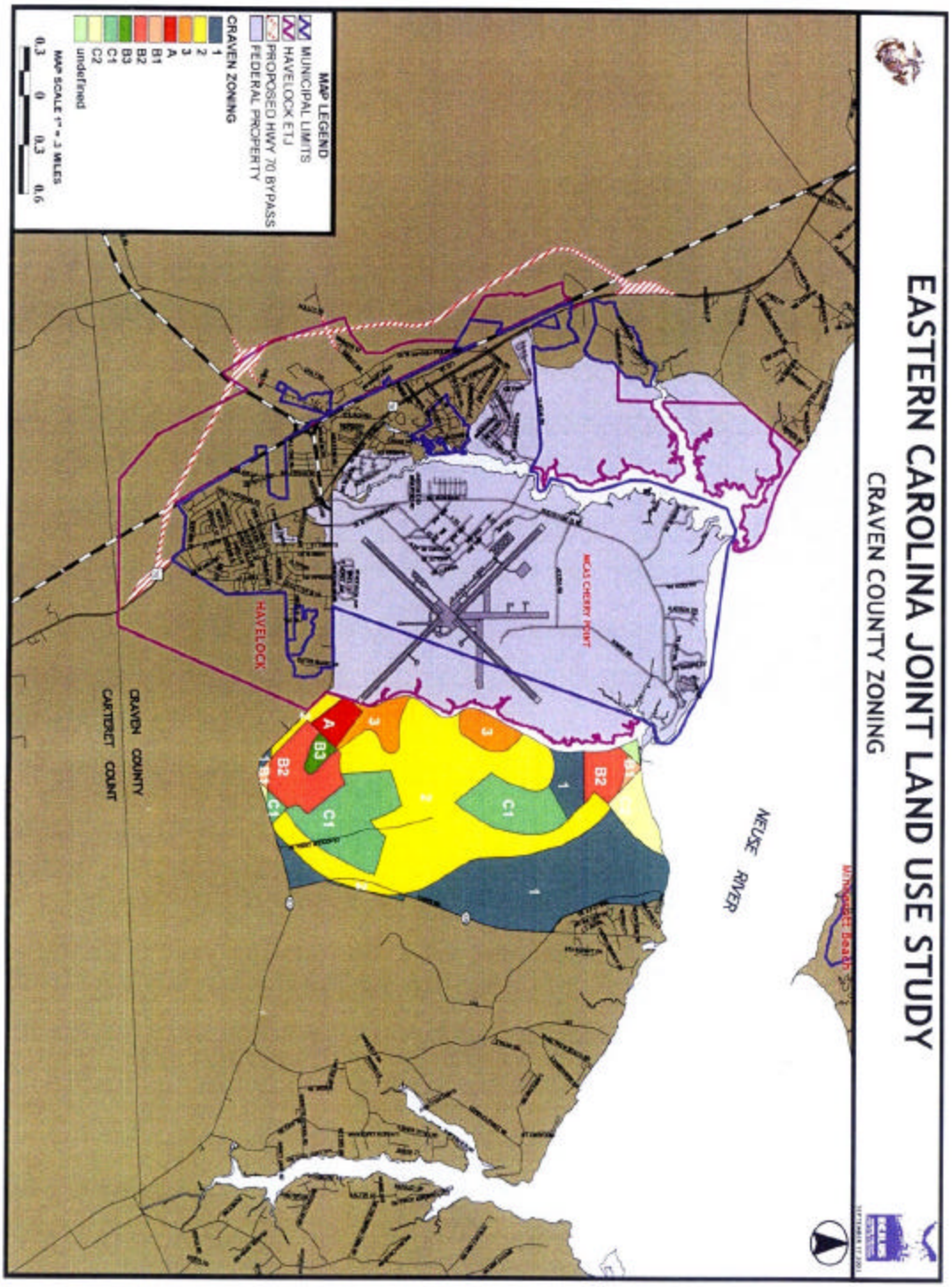

EASTERN CAROLINA JOINT LAND USE STUDY
MCALF BOGUE AREA MAP
SEPTEMBER 17 2002
Peletier
Cape Carteret
Bogue
Bogue Point
BOGUE SOUND
ATLANTIC OCEAN
MAP LEGEND
MUNICIPAL BOUNDARIES
BOGUE RUNWAY
MAP SCALE 1" = .4 MILES
0.4 0 0.4 0.8

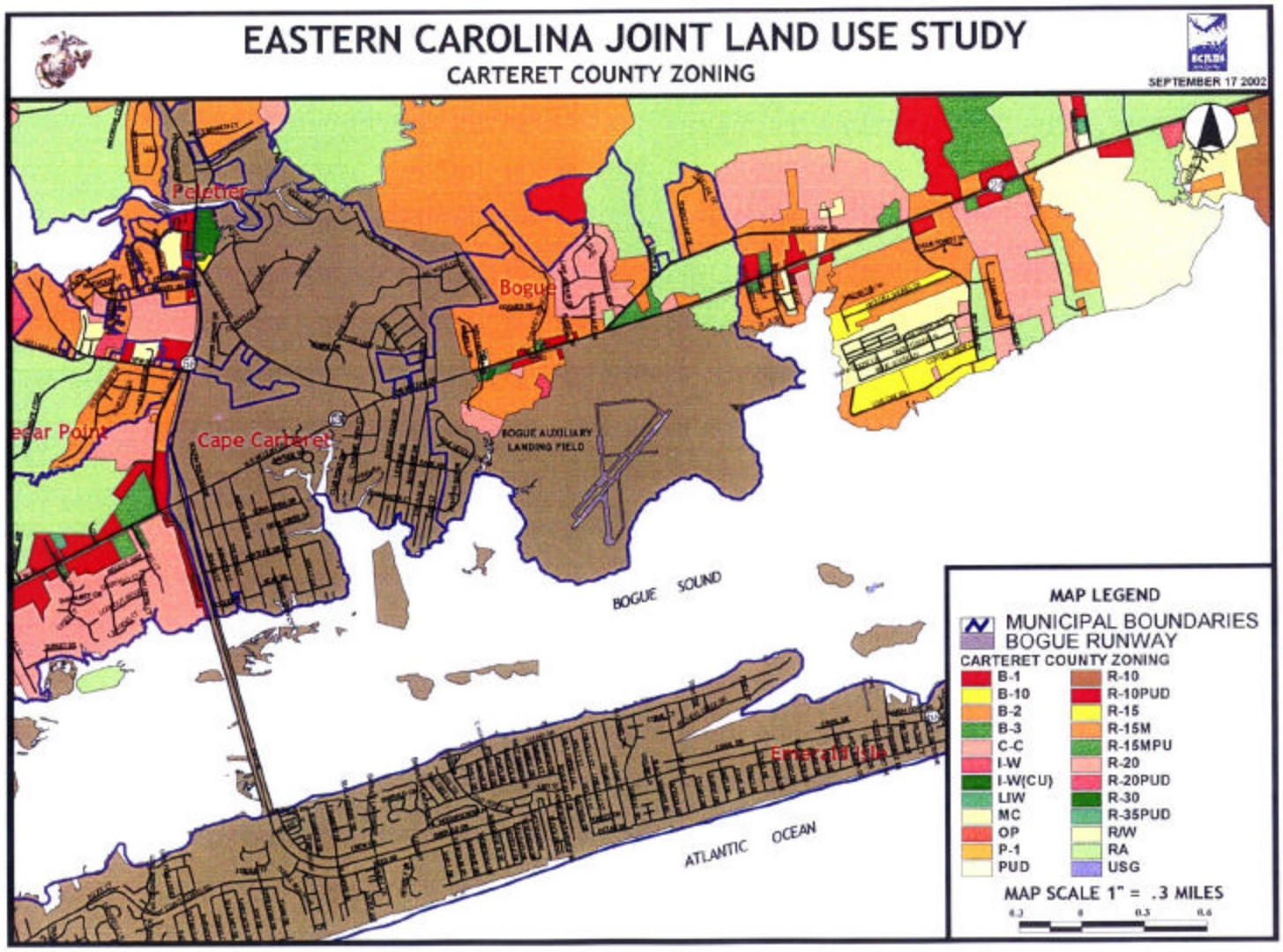

EASTERN CAROLINA JOINT LAND USE STUDY
MCALF ATLANTIC AREA MAP
SEPTEMBER 17 2002
ATLANTIC AUXILARY LANDING FIELD
MAP LEGEND
MUNICIPAL BOUNDARIES
ATLANTIC RUNWAY
MAP SCALE 1" = .4 MILES
0.4 0 0.4 0.8

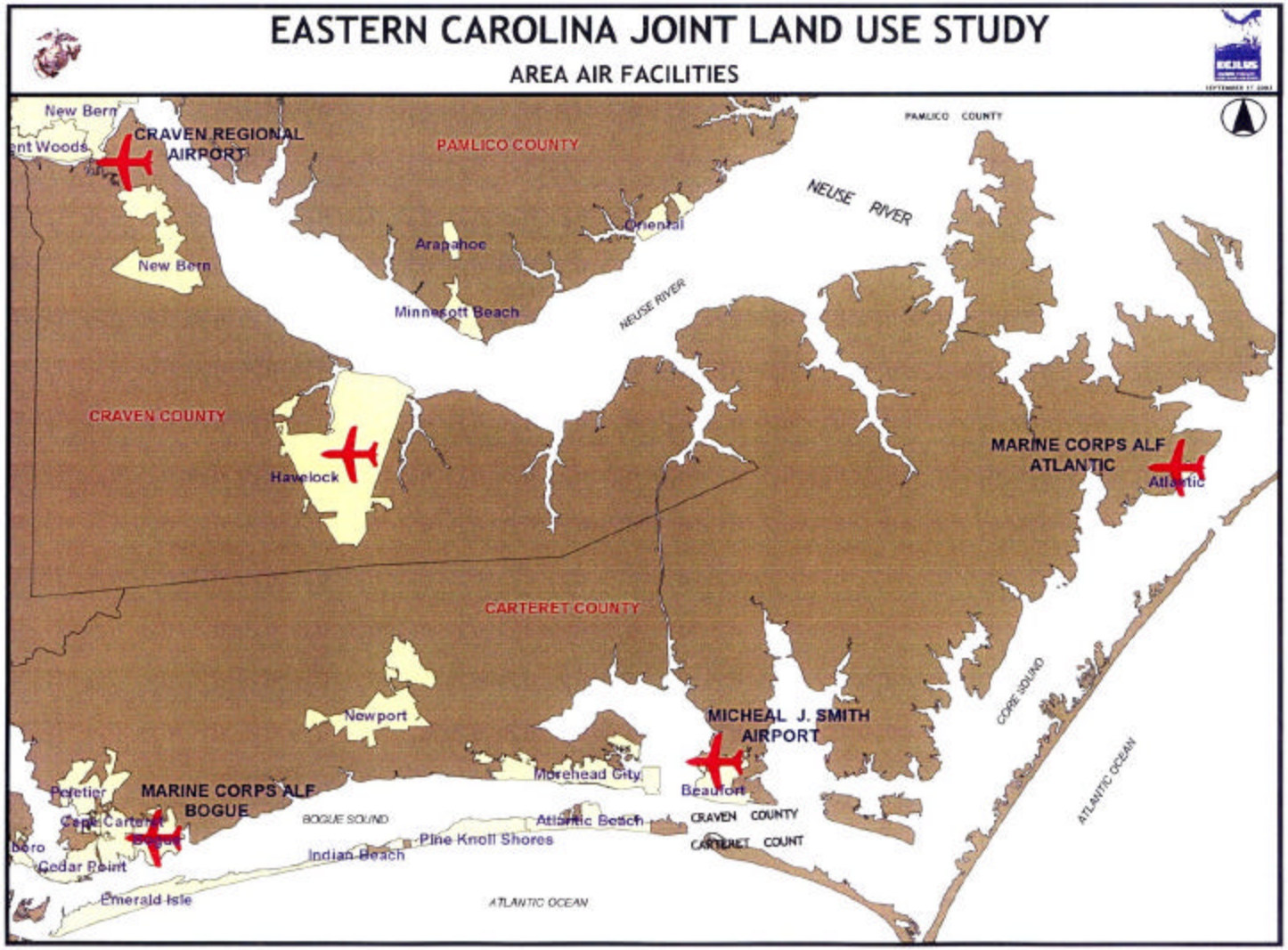

EASTERN CAROLINA JOINT LAND USE STUDY
CITY OF HAVELOCK ZONING
NEUSE RIVER
MCAS CHERRY POINT
HAVELOCK
CRAVEN COUNTY
CARTERET COUNT
MAP LEGEND
MUNICIPAL LIMITS
HAVELOCK ETJ
PROPOSED HWY 70 BYPASS
FEDERAL PROPERTY
HAVELOCK ZONING
GS
HC
LI
MR
O&I
R-10
R-12
R-13
R-20
R-20A
R-7
RM
RMH
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6


EASTERN CAROLINA JOINT LAND USE STUDY
TOWN OF EMERALD ISLE ZONING
SEPTEMBER 17 2002
Peletier
Bogue
Cape Carteret
BOGUE AUXILIARY LANDING FIELD
BOGUE SOUND
ATLANTIC OCEAN
Emerald Isle
MAP LEGEND
MUNICIPAL BOUNDARIES
BOGUE RUNWAY
EMERALD ISLE ZONING
B1
B2
B3
C
I
MH1
R2
RMF
RMH
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6


EASTERN CAROLINA JOINT LAND USE STUDY
TOWN OF BOGUE ZONING
SEPTEMBER 17 2002
Peletier
Bogue
Cape Carteret
BOGUE AUXILIARY LANDING FIELD
BOGUE SOUND
ATLANTIC OCEAN
MAP LEGEND
MUNICIPAL BOUNDARIES
BOGUE RUNWAY
BOGUE ZONING
B1
B3
IW
IW-CU
LIW-CU
MC
R-10 (PUD)
R-15 M
R-20
RA
UNZONED
MAP SCALE 1" = .3 MILES


EASTERN CAROLINA JOINT LAND USE STUDY
CRAVEN COUNTY ZONING
MAP LEGEND
MUNICIPAL LIMITS
HAVELOCK ETJ
PROPOSED HWY 70 BYPASS
FEDERAL PROPERTY
CRAVEN ZONING
1
2
3
A
B1
B2
B3
C1
C2
undefined
MAP SCALE 1" = .3 MILES
0.3 0 0.3 0.6
MCAS CHERRY POINT
HAVELOCK
NEUSE RIVER
CRAVEN COUNTY
CARTERET COUNT


EASTERN CAROLINA JOINT LAND USE STUDY
CARTERET COUNTY ZONING
SEPTEMBER 17 2002
Peletier
Bogue
Cape Carteret
BOGUE AUXILIARY LANDING FIELD
BOGUE SOUND
ATLANTIC OCEAN
MAP LEGEND
MUNICIPAL BOUNDARIES
BOGUE RUNWAY
CARTERET COUNTY ZONING
B-1
B-10
B-2
B-3
C-C
I-W
I-W(CU)
LIW
MC
OP
P-1
PUD
R-10
R-10PUD
R-15
R-15M
R-15MPU
R-20
R-20PUD
R-30
R-35PUD
R/W
RA
USG
MAP SCALE 1" = .3 MILES


EASTERN CAROLINA JOINT LAND USE STUDY
AREA AIR FACILITIES
CRAVEN REGIONAL AIRPORT
PAMLICO COUNTY
NEUSE RIVER
Oriental
Arapahoe
New Bern
Minnesott Beach
CRAVEN COUNTY
Havelock
MARINE CORPS ALF ATLANTIC
Atlantic
CARTERET COUNTY
Newport
MICHEAL J. SMITH AIRPORT
Morehead City
Beaufort
MARINE CORPS ALF BOGUE
Peletier
Cape Carteret
Bogue
Cedar Point
Emerald Isle
Indian Beach
Pine Knoll Shores
Atlantic Beach
BOGUE SOUND
CRAVEN COUNTY
CARTERET COUNT
CORE SOUND
ATLANTIC OCEAN

ACKNOWLEDGMENTS

There were many authors and reviewers of this report and their contributions were invaluable to the production of this final document. The following is a list of the major contributors to this project:

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Additionally there were many members of the general public whose comments helped in developing recommendations for this study.

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