

MITIGATION PLAN

Dare County

Proposed Relocation of NC 12  
From Four Miles South of Oregon Inlet  
to Six Miles South of Oregon Inlet

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State Project No. 6.051029

TIP No. R-3113.

Dare County  
Proposed Relocation of NC 12 From Four Miles South of  
Oregon Inlet to Six Miles South of Oregon Inlet State  
Project No. 6.051029, TIP No. R-3113.

Introduction

The North Carolina Department of Transportation proposes to relocate approximately 3.3 miles of NC 12 in Dare County to a location approximately 350 feet west of its present alignment. The proposed project begins approximately 3.5 miles south of the southern end of the Bonner Bridge over Oregon Inlet and continues southward, ending approximately 2000 feet south of the Pea Island National Wildlife Refuge maintenance facility.

This portion of NC 12 is in need of relocation due to severe overwash from the Atlantic Ocean. The frequency and severity of these overwash events has accelerated in recent years. The frequent periods of overwash has required almost continual maintenance of the highway, and continued overwash could wash out the highway completely, severing the only highway link from populated areas of Hatteras Island to the Dare County mainland. Therefore, the purpose of the proposed relocation project is to provide a safer and more reliable transportation route and reduce annual expenditures related to maintenance of the facility over the next 15 years.

The proposed improvements consist of relocating NC 12 for a distance of 3.3 miles. The relocated roadway will be located approximately 350 feet west of its present location, and will consist of a two-lane roadway, 22-foot travelway, and eight-foot shoulders. Four feet of each eight-foot shoulder will be paved to accommodate pedestrians and bicyclists and to provide a safe recovery zone for vehicular traffic.

Affected Environment

Grainfield (Man-Dominated) Community

5.3 acres of man-dominated grainfield habitat will be impacted by the proposed project. The grainfield occurs west of NC 12 along the eastern edge of the middle impoundment. The grainfield is regularly maintained by the USFWS as a forage point for migrating Canada geese (Branta canadensis) and snow geese (Chen caerulescens). Other avian species also frequently forage at these fields.

Low Shrub/Grassland Community

This community type is a mosaic of habitats situated between dunes and the marsh. Some areas bordering the dune

community are dominated by smooth cordgrass (Spartina alterniflora), while sections bordering marsh pockets may have pockets of black needlerush (Juncus roemerianus) scattered throughout. The bulk of this community is dominated by a mixture of smooth cordgrass, broomstraw (Andropogon sp.), seaside pennywort (Hydrocotyle bonariensis), bulrush (Scirpus americanus), goldenrod, blackberry (Rubus sp.), wax myrtle (Myrica cerifera), silverling (Baccharis halimifolia), yaupon (Ilex vomitoria) and winged sumac (Rhus copallina). This community type provides habitat for a large number of birds and animals. 7.0 acres of this habitat type will be impacted by the proposed project.

### Mitigation Sequencing

The proposed project will require environmental permit authorization from: 1) the N.C. Division of Coastal Management (NCDCM), which administers the Coastal Area Management Act (CAMA), 2) The U.S. Army Corps of Engineers (COE), which administers Section 404 of the Clean Water Act, and 3) The N.C. Division of Environmental Management (NCDEM), which administers Section 401 of the Clean Water Act.

In areas where a CAMA permit will be required, it is required that "Proposals to mitigate losses of coastal resources shall be considered only for those projects shown to be in the public interest, as defined by the standards in 15A NCAC 7M.0703, and only after all reasonable means of avoiding or minimizing such losses have been exhausted" (15A NCAC 7M.0701(b)). Furthermore, on February 6, 1990, the Department of the Army (DOA) and U.S. Environmental Protection Agency (EPA) signed a Memorandum of Agreement (MOA) establishing procedures to determine the type and level of mitigation necessary to comply with the Clean Water Act Section 404(b)(1) Guidelines. This MOA provides for first avoiding impacts to waters and wetlands through the selection of the least damaging, practical alternative, then taking appropriate and practical steps to minimize impacts on waters and wetlands. The third criteria of this step-down procedure is to compensate for any remaining unavoidable wetland impacts to the extent appropriate and practical. With this information in mind, NCDOT offers the following evidence of our efforts at wetland impact avoidance and minimization.

### Avoidance

The extent of the wetlands in the area and the overriding public need to relocate this section of NC 12 for safety reasons do not allow for total avoidance of wetlands. However, all studied alignments, including the chosen alignment, were developed in coordination with the U.S. Fish and Wildlife Service. The chosen alignments reflect an effort to provide adequate setback from the active beach while

balancing the amount of disruption to wetlands and Refuge facilities and operations. Furthermore, the preferred alignment has been shifted approximately 30 feet to the east near station 155 to ensure that no impacts occur to a Coastal Wetland Area of Environmental Concern (AEC).

#### Minimization

As was stated above, the preferred alignment reflects an effort to provide adequate setback from the active beach while balancing the amount of disruption to wetlands and Refuge facilities and operations. The chosen alignment has the second lowest anticipated impact to wetlands. The alignment with the lowest wetland impact was not chosen because this alternative would have led to what the U.S. Fish and Wildlife Service considered an unacceptable disruption to the Refuge maintenance facility.

Impact minimization has also been achieved by reducing travelway widths. Current NCDOT design standards recommend a 24-foot travelway for roadways such as NC 12. However, a lesser travelway width of 22 feet is considered appropriate for this project. The use of the 22-foot travelway will reduce the project footprint and reduce impacts to the natural environment.

#### Mitigation

In the past, extensive searches for mitigation sites for other highway projects in the area have taken place, generally with little if any success. In that the impacts are to be on Refuge land, NCDOT has turned to the Pea Island National Wildlife Refuge in an attempt to locate potential mitigation sites on Refuge property. As a result of this request, the Refuge has offered two sites for potential compensatory mitigation usage. Furthermore, the USFWS, as a condition of their Special Use Permit (SUP) authorizing NCDOT work on Service lands, is expected to require that the Department utilize these sites to mitigate for Refuge functions and values lost due to the roadway relocation.

The proposed project will lead to unavoidable impacts to 12.3 acres of wetland habitat. Of this 12.3 acres, 5.3 acres is accounted for by impacts to the jurisdictional, man-dominated "grain field" at the northern end of the project. The remaining 7.0 acres of impact is predominantly comprised of low shrub/grassland. The N.C. Division of Environmental Management has indicated that the impacted wetlands associated with this project have minimal water quality and water storage functions (see enclosed August 3, 1994 correspondence).

#### Mitigation of Grainfield (Man-Dominated) Community Impacts

5.3 acres of this habitat type will be impacted between stations 42+00 and 89+50. The Division of Environmental Management has indicated that this wetland community type

possesses minimal water quality and flood storage values in the project area. The impact area predominantly functions as a forage point for migrating Canada geese, snow geese, and other avian species. The area, which requires frequent maintenance by the Refuge, is frequently grazed clear by the birds. Because of this grazing, the area is largely bare, and consequently serves little wildlife function for much of the year.

As was stated above, the N.C. Division of Environmental Management has indicated that the impacted wetlands associated with this project have minimal water quality and water storage functions. Therefore, the purpose of the proposed mitigation at this site is to replace the wildlife foraging value lost due to project-related construction. To mitigate for the lost wildlife functions of the impacted grainfield, NCDOT proposes to plant Coastal Bermuda grass in the grainfield area east of stations 44+00 to 89+40 (see Figure 1). The area to be planted will begin at the eastern right of way limit of the proposed roadway, and extend to the eastern right of way limit of the existing roadway. The existing roadway pavement will be removed. Because the pavement was originally placed on natural ground elevation, removal of the existing pavement should closely approximate original natural ground elevation through this area.

This proposal will allow for the creation of  $\approx 4.38$  acres (42' average roadway width x 4540' roadway length) in the area underneath the existing roadbed, and an enhancement of  $\approx 18.8$  acres between the existing and proposed roadbeds.

Coastal Bermuda grass is proposed for planting in this area because this perennial is very salt tolerant and will perform well on the poor sandy soils present at this site<sup>1</sup>. Sprigs will be planted on two foot centers. Appropriate fertilization will be carried out by NCDOT's Roadside Environmental Unit.

A successful planting of this grass will provide permanent ground cover for avian species, small mammals and amphibians. The establishment of a permanent coastal Bermuda grass field will also greatly reduce the maintenance requirements of the Refuge. While Coastal Bermuda grass may not provide as high a quality of food for foraging birds as the annual grains now planted each year, this grass should persist for a longer period of time. As was stated above, the existing grainfields may be rapidly grazed bare by foraging. A permanent cover of coastal Bermuda grass should allow for longer periods where grazing and foraging may take place, thus enhancing the foraging and refuge values of this habitat.

No grading of this site is proposed. The entire site will be disked immediately prior to planting to break up the existing soil. Because the existing grainfield has been

determined by the Corps of Engineers to be jurisdictional wetland habitat, adequate wetland hydrology is assumed to exist at this site. Therefore, hydrological monitoring wells are not deemed necessary at this location. The enclosed monitoring plan should provide for adequate documentation of the success of this mitigation effort.

Because a portion of this mitigation area can not be planted until the new roadway is constructed and the old roadbed is removed, the Department proposes planting the entire grainfield area the next planting season after new roadway construction is completed.

#### Mitigation of Low Shrub/Grassland Community Impacts

7.0 acres of this habitat type will be impacted by the proposed project involving several sites throughout the project area. This community primarily serves as habitat for a large number of birds and animals.

The N.C. Division of Environmental Management has indicated that the impacted wetlands associated with this project have minimal water quality and water storage functions. Therefore, the purpose of the proposed mitigation at this site is to replace the wildlife foraging and habitat values lost due to project-related construction. To offset the lost wildlife functions of the impacted areas, the Department proposes to utilize an area provided by the Pea Island National Wildlife Refuge.

This area is approximately 3.5 miles south of the Pea Island Refuge maintenance facility, immediately west of highway NC 12. This site, which is ±70 acres in size, possesses both low shrub/grassland habitat and sand/overwash habitat (see Figure 2). The vegetation present in the wetland areas are similar to those listed in the low shrub/grassland community description. Much of the sand/overwash areas do not exhibit any vegetation. Where vegetation does exist in sand/overwash areas, the vegetation predominantly resembles that of the low shrub/grassland habitat type described above.

The predominantly barren sand/overwash areas do not possess significant wildlife habitat or foraging values. It is within these areas that NCDOT proposes to mitigate for wildlife functions and values lost due to the impact on 7.0 acres of low shrub/grassland habitat.

The Pea Island National Wildlife Refuge has stipulated that jurisdictional wetland areas within the mitigation study area may not be adversely impacted by NCDOT's mitigation effort. Therefore, the Department has initiated studies in the proposed project area to determine which areas are or are not 404 jurisdictional wetlands. NCDOT biologists flagged

wetland areas in July. These wetland determinations have been confirmed by the Corps of Engineers.

The wetland boundaries were located using a global positioning system (GPS) and a wetland boundary map produced. This map was then overlaid on an aerial photograph of the mitigation site. Copies of this mapping will be provided under separate cover. Based upon this mapping, approximately 30 acres of non-wetland area exists. However, it is anticipated that not all of the non-jurisdictional areas will be utilized for wetland mitigation. Some areas may be left as upland "islands" to serve as nesting and roosting habitat, which should further enhance the wetland mitigation effort<sup>2</sup>.

The selection of areas within the large site to be utilized for compensatory mitigation will be determined based on coordination between NCDOT, USFWS, the Division of Coastal Management and the U.S. Army Corps of Engineers. When the mitigation areas are chosen, adjacent wetland areas will be selected and target mitigation elevations determined from within these existing wetlands. A grading plan, including grading tolerances, will then be determined for the mitigation areas. Any excavated material will either be utilized as roadway construction borrow, or will be deposited within the Refuge under the direction of Refuge personnel. Appropriate wet grassland species, such as panicgrass, American threesquare and several varieties of bulrush will be planted on two-foot centers. These species are considered appropriate when waterfowl habitat is a targeted mitigation function<sup>2</sup>. Final selection of planting species will be determined based upon a biotic community survey as well as coordination with the environmental review agencies.

According to the Soil Conservation Service Soil Survey for Dare County (1992), the soil type of the mitigation area is predominantly Corolla fine sand. This soil is a nearly level, gently sloping, moderately well drained to somewhat poorly drained soil in troughs and on flats on the outer banks. The seasonal high water table is 1.5 to 3.0 feet below the surface. The soil is subject to occasional flooding during periods of strong wide tides, hurricanes, and sound side flooding. This soil type supports most native vegetation. The seasonal wetness and flooding limit the suitability of development and commercial agriculture. The average annual precipitation in Dare County is 52.6 inches.

Given the relatively shallow depth to the seasonal high water table, the amount of precipitation, occasional soundside flooding and proximity to adjacent wetland communities, it is anticipated that, if properly graded, adequate wetland hydrology can be established for the mitigation areas. Following grading of the selected areas, hydrological monitoring wells will be placed within this mitigation site to document success or failure in achieving the hydrological

success criteria. The number and location of the wells will be determined in coordination with the Corps of Engineers. The wells will be constructed in accordance with WRP Technical Note HY-IA-3.1:Installing Monitoring Wells/Piezometers in Wetlands. Figure 3 shows standard shallow monitoring well construction.

Although a final determination has yet to be made on the size of the area(s) to be graded and planted, the areas available will allow for more than sufficient mitigation to offset the lost wildlife functions of the impacted low shrub/grassland community.

Both the grain field and low shrub/grassland mitigation sites will remain under the management of the Pea Island National Wildlife Refuge following documentation of achievement of mitigation success criteria.

## References

- 1 Graetz, K.E. 1973. Seacoast Plants of the Carolinas for Conservation and Beautification. USDA Soil Conservation Service and University of North Carolina Sea Grant Program. Raleigh, North Carolina.
- 2 U.S. Department of Agriculture - Soil Conservation Service (USDA-SCS). 1992. Engineering Field Handbook, Part 650, Chapter 13 -Wetland Restoration, Enhancement or Creation.

## MONITORING PLAN

### I. Monitoring Timeframe

Mitigation sites will be inspected at the following times.

- A. Prior to planting
- B. At completion of planting
- C. During August-September of each growing season until success criteria (>50% plantings living for at least 3 years) has been met.

### II. Data to be Obtained at Specific Inspection Times

#### A. Prior to planting

1. Check for proper plant species and for acceptable plant quality
2. Coordinate hydrologic sampling with U.S. Army Corps of Engineers\*

\* Hydrological sampling will take place periodically throughout the growing seasons until adequate hydrological conditions are met. Hydrological sampling will not be conducted at the "grainfield" mitigation area.

#### B. At completion of planting

1. Check for proper planting methods
2. Check for proper plant spacing (2' O.C.)
3. Check for proper species composition
4. Present to Corps of Engineers an "as built" plan drawing of the area, including final elevations, species compositions including numbers, well and sample plot locations. Elevations will be reported based on three transect lines per site, with elevations taken every 100' along these transects. The lines will run along the long axis of the mitigation site. A discussion of the planting design, including what species were planted, the species mix and numbers planted will be also be included. The report will be provided within 30 days of completion of planting.

- C. During August-September of each growing season until success criteria (>50% plants living for at least 3 years) has been met.

1. Determine number of plants per acre. Plant counts will be determined through the use of 15' square sample plots. Sample plots will be placed in areas representative of the entire site or communities within the entire site. No more than 10 plots per mitigation site is proposed. The location of these plots will be coordinated with the Corps of Engineers prior to planting.
2. Take photographs

Note: Information from monitorings will be submitted to the Corps of Engineers by November 1 of each year.

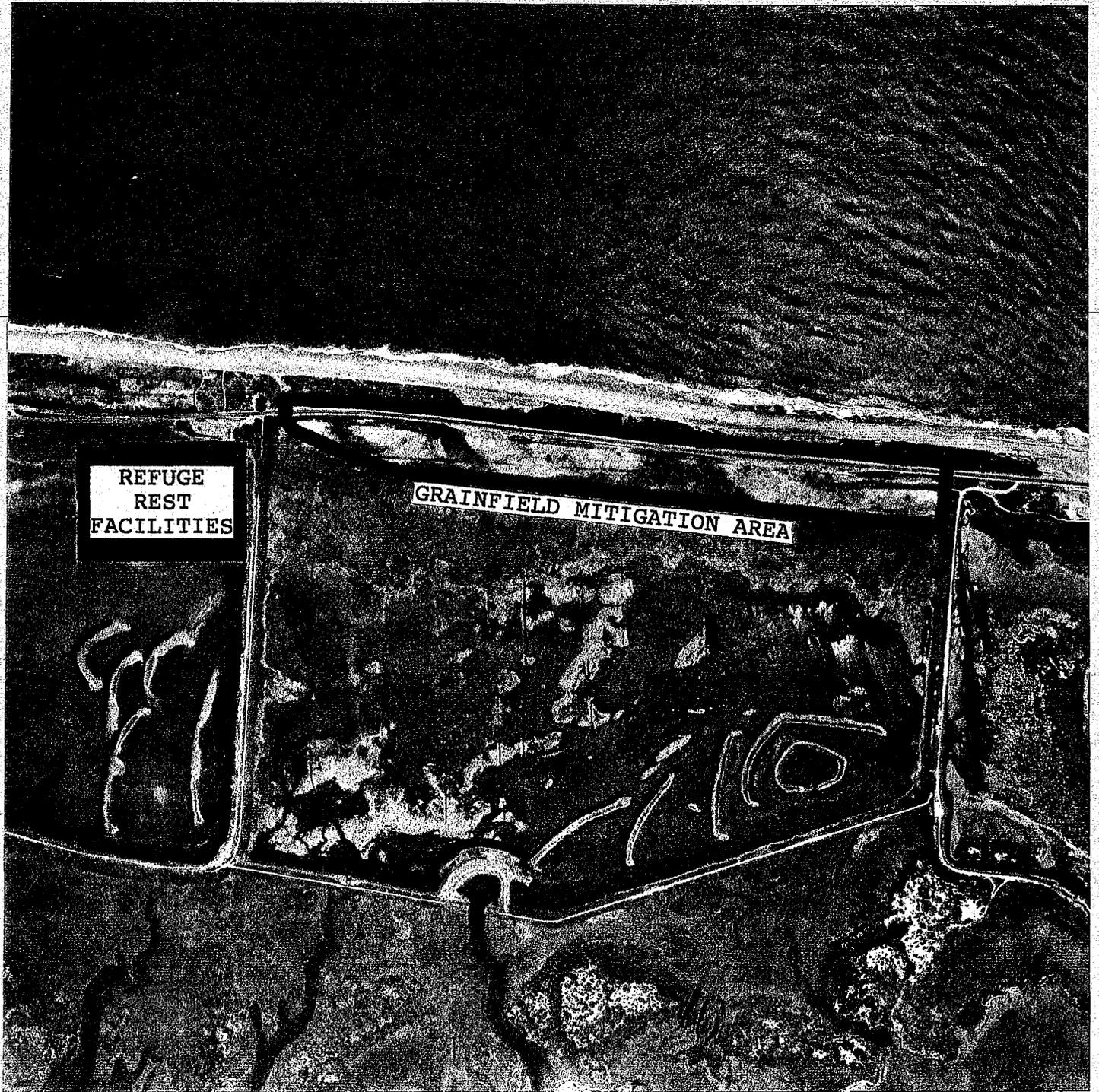
### III. Evaluation and Recourse Action

- A.
  1. Acceptable survival rate of a minimum of >50 per acre at each post planting monitoring event - no action
  2. Below acceptable survival rate at any monitoring event (recourse options)
    - a. Replant (supplemental or complete)
    - b. Discuss corrective measures with environmental review agencies
    - c. Reevaluate feasibility
- B.
  1. Adequate hydrological conditions (soil saturation to within 12 inches of the surface for at least 12.5% of the growing season) - no action
  2. Inadequate hydrological conditions (recourse options)
    - a. Discuss corrective measures with technical sources and environmental review agencies
    - b. Reevaluate feasibility

Figure 1

"Grain-Field" Mitigation Site

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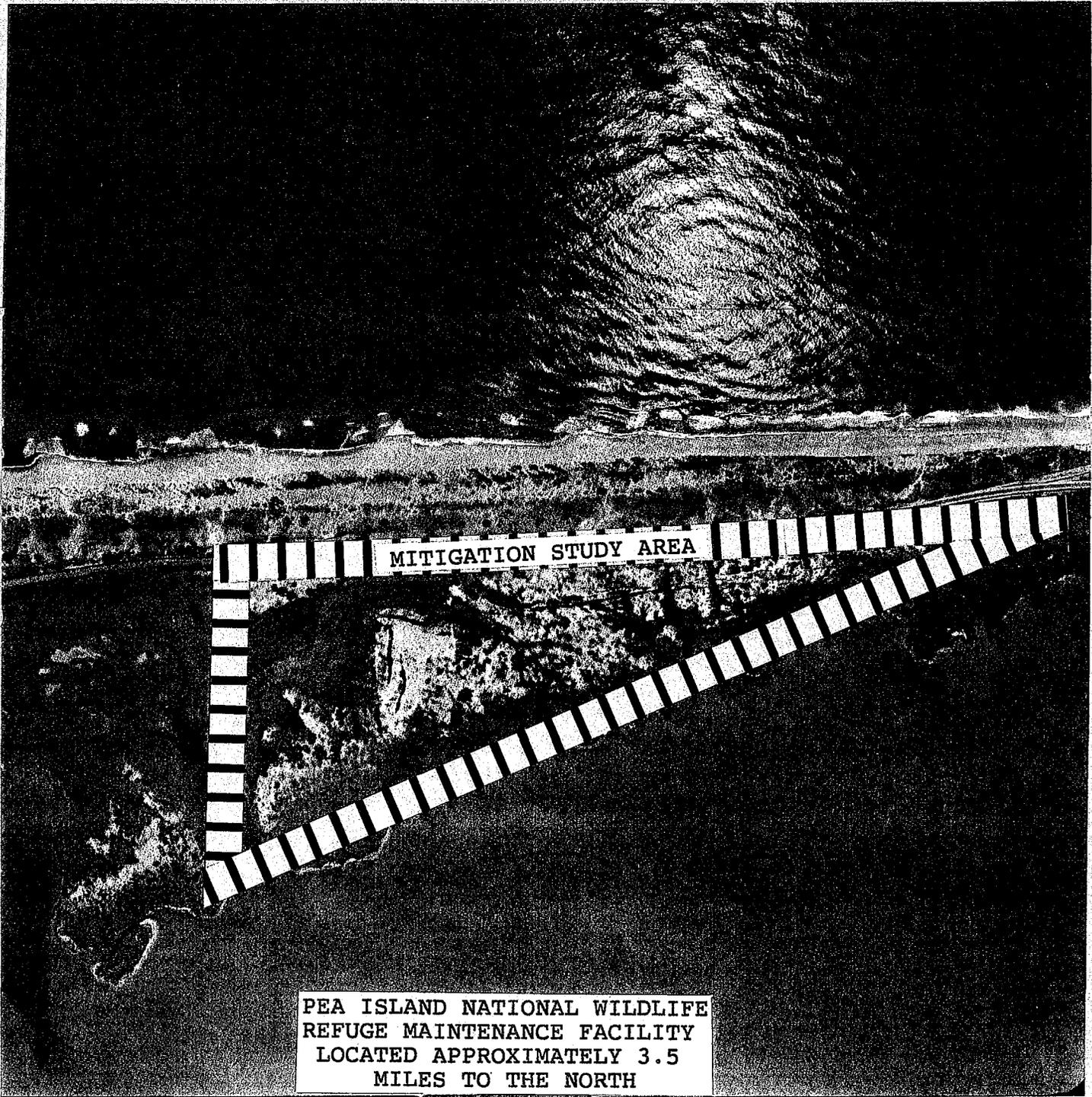


REFUGE  
REST  
FACILITIES

GRAINFIELD MITIGATION AREA

**Figure 2**

**Low Shrub/Grassland Mitigation Area**



MITIGATION STUDY AREA

PEA ISLAND NATIONAL WILDLIFE  
REFUGE MAINTENANCE FACILITY  
LOCATED APPROXIMATELY 3.5  
MILES TO THE NORTH

**Figure 3**

**Standard Shallow Monitoring  
Well**

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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT, JR.  
GOVERNOR

DIVISION OF HIGHWAYS  
P.O. BOX 25201, RALEIGH, N.C. 27611-5201

R. SAMUEL HUNT III  
SECRETARY

September 23, 1994

Mirlo Investment Corporation  
Route 1, Box 866  
Manteo, N.C. 27954

Dear Sirs:

SUBJECT: Dare County, proposed relocation of NC 12 from four miles south of Oregon Inlet to six miles south of Oregon Inlet, State Project No. 6.051029, TIP No.

The North Carolina Department of Transportation is proposing to relocate a 3.3 mile section of NC 12, beginning four miles south of Oregon Inlet.

A permit from the N.C. Division of Coastal Management (DCM) is required for this work. This permit is being obtained by the North Carolina Department of Transportation. In that your property is adjacent to the site where this permit is required, a copy of the permit application is being provided for your review; however, no action is required on your part.

If you have any questions, please contact your appropriate CAMA representative, or call Mr. Doug Huggett, NCDOT, at (919) 733-3141.

Sincerely,

A handwritten signature in black ink, appearing to read "B.J. O'Quinn".

B.J. O'Quinn, P.E.  
Assistant Branch Manager  
Planning and Environmental Branch





STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT, JR.  
GOVERNOR

DIVISION OF HIGHWAYS  
P.O. BOX 25201, RALEIGH, N.C. 27611-5201

R. SAMUEL HUNT III  
SECRETARY

September 23, 1994

Mirlo Beach Homeowners Association  
Route 1, Box 866  
Manteo, N.C. 27954

Dear Sirs:

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B.J. O'Quinn, P.E.  
Assistant Branch Manager  
Planning and Environmental Branch





STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT, JR.  
GOVERNOR

DIVISION OF HIGHWAYS  
P.O. BOX 25201, RALEIGH, N.C. 27611-5201

R. SAMUEL HUNT III  
SECRETARY

September 23, 1994

Cape Hatteras National Seashore  
Route 1, Box 675  
Manteo, N.C. 27954

Dear Sirs:

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B.J. O'Quinn, P.E.  
Assistant Branch Manager  
Planning and Environmental Branch



P 013 217 942

P 013 217 943

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P.O., State and ZIP Code <b>Raleigh NC 27611</b>	
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Special Delivery Fee	
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P.O., State and ZIP Code <b>Elizabeth City NC 27909</b>	
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TOTAL Postage & Fees	\$
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