

Draft
Environmental Impact Statement

Bogue Banks Master Beach Nourishment Plan



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Abstract: The Draft Environmental Impact Statement was prepared in response to Carteret County's proposal, in conjunction with the Towns of Atlantic Beach, Pine Knoll Shores, Indian Beach, and Emerald Isle, to implement a long-term shoreline management plan to protect their oceanfront and inlet shorelines for the barrier island of Bogue Banks.

For more information and comments, contact Mr. Mickey Sugg, United States Army Corps of Engineers, Regulatory Division, 68 Darlington Avenue, Wilmington, North Carolina 28403, phone (910) 251-4811, facsimile (910) 251-4025 or via e-mail: mickey.t.sugg@usace.army.mil .

EXECUTIVE SUMMARY

The Wilmington District, United States Army Corps of Engineers (USACE) Regulatory Division program is evaluating a request from Carteret County (County) for Department of the Army authorization pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act to implement a comprehensive, long-term beach and inlet management plan for the protection of approximately (~) 25 miles of shoreline on Bogue Banks. Concurrently, the Bureau of Ocean Energy and Management (BOEM) is evaluating a request from the Applicant for lease authorization pursuant to the Outer Continental Shelf Lands Act [43 U.S.C. 1337(k)(2)] to use outer continental shelf sand resources as a component of the proposed action. In the case of the Applicant's proposed action, the USACE and BOEM have determined that an Environmental Impact Statement (EIS) is required based on the broad temporal and spatial scale of the proposed action (i.e., a 50-year project encompassing ~25 miles of coastline), the ecological significance and sensitive nature of the affected coastal resources (barrier island, tidal inlet, and marine/estuarine), and the potential for adverse effects on a number of federally listed threatened and endangered species and critical habitats.

The Bogue Banks shoreline has been managed in some capacity for over 35 years by federal projects administered by the USACE Civil Works program and by non-federal projects implemented by the County, and/or local municipalities. Since 1978, roughly 11 Mcy of sand have been placed upon the beaches of Bogue at a total cost of approximately \$95 million. Past management efforts have largely consisted of stand-alone projects that were undertaken to address site-specific erosional problems. This stand-alone approach has limited the efficiency and effectiveness of past and current efforts by the County and island municipalities to implement shore protection projects and maintain the beaches of Bogue Banks. In order to address ongoing shoreline erosion in a more effective manner, the County and municipalities are proposing to combine their shore protection efforts under a more efficient comprehensive beach and inlet management program known as the Bogue Banks Master Beach Nourishment Plan. The purpose of the proposed action is to establish and implement a comprehensive, long-term, non-federal beach and inlet management program that will restore and maintain the beaches of Bogue Banks; provide shore protection for residential structures, infrastructure, and recreational assets; and preserve the local tourism-based economy. The USACE Civil Work's investigation of a long-term federal Coastal Storm Damaged Reduction (CSDR) project for Bogue Banks has been ongoing for nearly 30 years. As federal funding for shore protection projects has declined, the future of a long-term federal CSDR project for Bogue Banks has grown increasingly uncertain. The proposed action will address the ongoing trend of declining federal shore protection funding by establishing a non-federal management program under the autonomous control of the County and the island municipalities.

This Draft EIS objectively evaluates the environmental effects of the proposed action and a range of reasonable alternatives that address the purpose and need for action. This Draft EIS discloses the short- and long-term direct, indirect, and cumulative effects of each alternative and presents detailed information on the County's stated purpose and need for action, the alternatives development process, the environment potentially affected by the alternatives, and

mitigation measures that were incorporated to avoid or minimize adverse effects. Public and agency scoping for this Draft EIS was initiated at the beginning of the National Environmental Policy Act process through the solicitation of written public comments, a public scoping meeting, and the formation of an interagency-stakeholder review team. All of the input received through scoping was considered and integrated into this Draft EIS. This Draft EIS will provide another major opportunity for public participation through the Draft EIS public review and comment period.

The alternatives screening and evaluation process identified five alternatives as warranting full evaluation in this EIS; including two no action (Alternatives 1 and 2) and three action alternatives (Alternatives 3, 4, and 5). Pursuant to Council of Environmental Quality regulations, no action can be defined as the continuation of current management (i.e., Alternative 1) and/or as a without project scenario involving no federally permitted management activity (Alternative 2). Alternatives 3, 4, and 5 represent alternate long-term management scenarios for maintaining the beaches of Bogue Banks over the next 50 years. Management elements that are common to the Alternatives 3, 4, and 5 include recurring nourishment of the approximately ten miles of beaches along Pine Knoll Shores, Indian Beach/Salter Path, and eastern Emerald Isle; and the acquisition of beach fill from offshore borrow sites, Atlantic Intracoastal Waterway (AIWW) disposal islands, and upland sand mines. The three action alternatives differ in their approaches to management of the remaining approximately eight miles of beaches along central and western Emerald Isle. Alternative 4, consisting of beach nourishment and non-structural Bogue Inlet management, is the Applicant's preferred alternative. The proposed borrow sources would include specific reaches of the Morehead City Harbor (MCH) federal navigation channels, the AIWW Bogue Inlet crossing, the former and current MCH Offshore Dredge Material Disposal Site facilities, the Area Y borrow site offshore of Emerald Isle, Bogue Inlet, AIWW disposal islands, and upland sand mines.

This EIS contains the following information:

- Chapter 1, Introduction – Explains the purpose of the development of an EIS, describes agency and public coordination efforts, issues and concerns elicited by the development of the EIS and discusses applicable laws, rules and regulations.
- Chapter 2, Purpose and Need – Identifies purpose and need for the proposed action and discusses how the shoreline along Bogue Banks has been managed in the past.
- Chapter 3, Project Alternatives – Describes the alternatives development process and provides a detailed description of each alternative that was carried forward for full analysis.
- Chapter 4, Affected Environment – Identifies existing resources which occur in the permit area.
- Chapter 5, Environmental Consequences – Evaluates the direct, indirect, and cumulative effects of the alternatives and discusses the anticipated changes to the existing environment.
- Chapter 6, Avoidance and Minimization – Discusses mitigation measures that were included to avoid, minimize, rectify, or compensate for adverse environmental effects.

Major Conclusions

Ongoing erosion has threatened many of the resources along the oceanfront of Bogue Banks and western shoulder of Bogue Inlet and the municipalities on the island have taken several measures in the past to reduce the risk of loss, or damage, to those resources. In evaluating options for a longer-term and a more comprehensive approach to protect the oceanfront and inlet shorelines, the County is seeking federal and state permits to allow for the implementation of Bogue Banks MBNP as their preferred alternative. This proposed 50-year plan would be the instrument to protect the shoreline whereby actions, locations, volumes, and schedules would be included in a comprehensive multi-decadal county permit rather than several individual beach municipality authorizations.

Issues to be Resolved

It is anticipated that state and federal agencies, along with the public, will provide comments to this Draft EIS and on the County's preferred alternative. Additional consultation will be conducted with the National Marine Fisheries Service Protected Resources Division and the United States Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act; and the National Marine Fisheries Services Habitat Conservation Division pursuant to the Magnuson-Stevens Fishery Conservation and Management Act. On-going coordination with the North Carolina Division of Coastal Management will continue.

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LIST OF ACRONYMS

~	Approximately
°	Degree
µPa	Micropascal
%	Percent
ACHP	Advisory Council on Historic Preservation
AEC	Areas of Environmental Concern
AIWW	Atlantic Intracoastal Waterway
ASMFC	Atlantic States Marine Fishery Commission
BA	Biological Assessment
BFE	Base Flood Elevation
BP	Before Present
BO	Biological Opinion
BOEM	Bureau of Ocean Energy Management
C	Centigrade
C1	Category 1
C2	Category 2
CAMA	Coastal Area Management Act
CCPCUA	Central Coastal Plain Capacity Use Area
CEQ	Council on Environmental Quality
CDF	Confined Disposal Facilities
CFR	Code of Federal Register
CM	Centimeters
CM ²	Centimeters Squared
CO	Carbon Monoxide
CORMP	Coastal Ocean Research and Monitoring Program
CPE	Coastal Planning & Engineering
CRC	Coastal Resources Commission
CSDR	Coastal Storm Damage Reduction
CSE	Coastal Science & Engineering
CSRM	Coastal Storm Risk Management
CWA	Clean Water Act
CY	Cubic Yards
CY/FT	Cubic Yards per Foot
CY/YR	Cubic Yard per Year
CZMA	Coastal Zone Management Act
DA	Department of the Army
dB	Decibels
DC&A	Dial Cordy and Associates Inc.
DEIS	Draft Environmental Impact Statement
DMMP	Dredged Material Management Plan
DO	Dissolved Oxygen

DPS	Distinct Population Segment
DQM	Dredging Quality Management
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EM	Engineering Manual
EPA	Environmental Protection Agency
ESA	Endangered Species Act
F	Fahrenheit
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMC	Fisheries Management Council
FMP	Fisheries Management Plan
FONSI	Finding of No Significant Impact
FT	Feet
FWCA	Fish and Wildlife Coordination Act
GI	General Investigation
GIS	Geographic Information System
GPD	Gallons per Day
GS	General Statute
HF	High-frequency
HQW	High Quality Waters
HTRW	Hazardous, Toxic, and Radiological Wastes
HZ	Hertz
IOP	Interim Operation Plan
KHZ	Kilohertz
KM	Kilometer
KW	Kilowatt
LEDPA	Least Environmentally Damaging Practicable Alternative
LF	Low-Frequency
LOP	Level of Protection
LUP	Land Use Plans
LWSP	Local Water Supply Plan
m	Meters
M	Million
M ²	Meters Squared
M&N	Moffat and Nichol
MBNP	Bogue Banks Master Beach Nourishment Plan
MBTA	Migratory Bird Treaty Act
MCH	Morehead City Harbor
MCY	Million Cubic Yards
MF	Mid-frequency
mg/l	Milligram per liter

MGD	Million Gallons per Day
MHW	Mean High Water
MHHW	Mean Higher High Water
MiSA	Micropolitan Statistical Area
MLW	Mean Low Water
MLLW	Mean Lower Low Water
MM	Millimeter
MMPA	Marine Mammal Protection Act
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NAAQS	National Ambient Air Quality Standards
NAI	Normandeu Associates, Inc.
NAVD	North American Vertical Datum
NC	North Carolina
NCAC	North Carolina Administrative Code
NCCPRA	North Carolina Coastal Policy Reform Act
NCDA	North Carolina Department of Administration
NCDAQ	North Carolina Division of Air Quality
NCDCM	North Carolina Division of Coastal Management
NCDEMLR	North Carolina Division of Energy, Mineral and Land Resources
NCDENR	North Carolina Department of Environment and Natural Resources
NCDLR	North Carolina Division of Land Resources
NCDMF	North Carolina Division of Marine Fisheries
NCDOT	North Carolina Department of Transportation
NCDWQ	North Carolina Division of Water Quality
NCDWR	North Carolina Division of Water Resources
NCFMP	North Carolina Flood Mapping Program
NCNHP	North Carolina Natural Heritage Program
NCSPA	North Carolina State Port Authority
NCWRC	North Carolina Wildlife Resources Commission
NED	National Economic Development
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NIMA	National Insurance and Mitigation Administration
NM	Nautical Miles
NMFS	National Marine Fisheries Service
NO	Nitrogen Oxide
NOAA	National Oceanic and Atmospheric Administration
NOA	Notice of Availability
NOI	Notice of Intent
NOS	National Ocean Service
NPS	National Park Service
NRHP	National Register of Historic Places
NTU	Nephelometric Turbidity Units

OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Lands Act
ODMDS	Morehead City Harbor Ocean Dredged Material Disposal Site
OMP	Office of Marine Programs
ORW	Outstanding Resource Waters
OSHA	Occupational Safety and Health Administration
PCE	Primary Constituent Elements
PK	Peak Sound Level
PL	Public Law
PM	Particulate Matter
PM ₁₀	Particulate Matter 10 microns or less
PN	Public Notice
PNA	Primary Nursery Area
POM	Port of Morehead City
POW	Port of Wilmington
PPT	Parts per Thousand
PRT	Project Review Team
PSU	Practical Salinity Units
PTS	Permanent Threshold Shift
RHA	Rivers and Harbors Act
RMS	Root Mean Square
ROD	Record of Decision
ROT	Room Occupancy and Tourism Tax
SAFMC	South Atlantic Fishery Management Council
SAV	Submerged Aquatic Vegetation
SEAMAP-SA	Southeast Area Monitoring and Assessment Program
SEL _{CUM}	Cumulative Sound Exposure Level
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Office
SL	State Law
SMMP	Site Monitoring and Management Plan
SPCA	Sediment Pollution Control Act
SPL	Sound Pressure Level
SPO	Carteret County Shore Protection Office
SO ₂	Sulfur Dioxide.
SR	State Road
TAR	Tidewater Atlantic Research, Inc.
TSS	Total Suspended Solids
UAB	Underwater Archaeology Branch
US	United States
USACE	United States Army Corps of Engineers, Wilmington District
USC	United States Code
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency

USFWS United States Fish and Wildlife Service
USMC United States Marine Corps
VOC Volatile Organic Compounds
WRDA Water Resource Development Act

Table 1. List of Preparers

Name Affiliation	Discipline	Contribution	Role	Education	Years of Experience
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Eric Reusch <i>USACE Wilmington District – Regulatory Division</i>	Field Office Chief	Review DEIS for compliance with NEPA	EIS Reviewer and NEPA Compliance	B.A. Geography	11
Carl Pruitt <i>USACE Wilmington District – Regulatory Division</i>	Legal Counsel	Review DEIS for compliance with NEPA	EIS Reviewer and NEPA Compliance	JD School of Law; B.A.	13
Deena Hansen <i>BOEM Marine Minerals Program</i>	Project Coordinator	Review DEIS for compliance with NEPA	EIS Reviewer and NEPA Compliance	M.S. Marine Science; B.S. Biological Sciences	4
Jennifer Bucatari <i>BOEM Office of Environmental Programs</i>	Oceanography	Subject Matter Review of DEIS	EIS Reviewer and NEPA Compliance	Ph.D. Biology; B.S. Marine Biology	11
Steve Dial <i>Dial Cordy and Associates</i>	Marine Biology	QA/QC Review	Third Party Contractor – QA/QC	M.S. Marine Biology; B.S. Biological Science	30
Dawn York <i>Dial Cordy and Associates</i>	Coastal Biology	EIS Author/Project Manager	Third Party Contractor - Project Manager	M.S. Marine Science; B.S. Biological Science	14
Rahlf Ingle <i>Dial Cordy and Associates</i>	Senior Biologist	EIS Technical Lead Author (Alternative Analysis, Affected Environment, Environmental Consequences)	Third Party Contractor – Technical Lead	M.S. Botany; B.S. Biological Sciences	22
Mike Rice <i>Dial Cordy and Associates</i>	GIS Analyst	Biotic Community Habitat Analysis and Alternative Impacts	Third Party Contractor – Impacts Analyst	M.S. Forested Wetland Ecology; B.S. Forest Management	19

Name Affiliation	Discipline	Contribution	Role	Education	Years of Experience
Maria Waddell <i>Dial Cordy and Associates</i>	Administrative Support	Technical Editor	Third Party Contractor – Technical Editor	B.A. Business Administration	13
Johnny Martin, PE <i>Moffatt & Nichol</i>	Coastal Engineering	Alternatives Analysis/Coastal Design & Engineering/Numerical Modeling	Coastal Design & Engineering Assessment and Modeling	M.S. Civil Engineering (Coastal/Water Resources); B.S. Civil Engineering	23
Nicole VanderBeke, PE <i>Moffatt & Nichol</i>	Coastal Engineering	Alternatives Analysis/Engineering/Modeling	Coastal Design & Engineering Assessment and Modeling	B.S. Civil Engineering	11
Brian Joyner, PE <i>Moffatt & Nichol</i>	Coastal Modeling	Modeling/Alternatives Analysis	Coastal Engineering Assessment and Modeling	M.S. Civil Engineering with Coastal Concentration; B.S. Environmental Engineering	19
Brandon Grant, EI <i>Moffatt & Nichol</i>	Coastal Modeling	Modeling/Alternatives Analysis	Coastal Engineering Assessment and Modeling	M.S. Civil Engineering (Coastal); B.S. Civil Engineering	4