Hurricanes Ian and Nicole Recovery Plan for Florida's Beach and Dune System

Florida Department of Environmental Protection

Office of Resilience and Coastal Protection

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III. Summary

I. Introduction

Overview

This Hurricanes Ian and Nicole Recovery Plan for Florida's Beach and Dune System (Recovery Plan or Plan) is considered by the Florida Department of Environmental Protection (DEP) to be a preliminary planning document for funding needs. Estimates contained in the Plan are based on in some cases limited information provided by local governments, their coastal engineering consultants, the Federal Emergency Management Administration (FEMA), the United States Army Corps of Engineers (USACE), and DEP staff. As surveys or new information is obtained, this Plan may be updated to include such information. Additionally, it is important that this Plan be flexible to allow project funding to be adjusted based on new information and conditions that exist at the time the work will be contracted. Detailed planning and engineering tasks will be conducted for each project to formulate the most cost-effective design.

During the 2022 hurricane season, the State of Florida was impacted by two hurricanes: major Hurricane Ian, and Hurricane Nicole.

Hurricane Ian made landfall on September 28, 2022, at approximately 3:00 pm Eastern Daylight Time, at Cayo Costa, Lee County, in southwest Florida as a strong Category 4 hurricane on the Saffir-Simpson hurricane intensity scale. Ian came ashore with maximum sustained winds of 150 mph, which was the fifth-strongest measured hurricane to strike the United States. Ian had a storm surge on Estero Island and southern Sanibel Island in excess of +13 feet NAVD, which approximated a 100-year return interval storm event. High water marks were measured between +12 to +18 feet in southern Lee County revealing the devastating effects of the storm waves above the storm surge. Hurricane Ian made landfall very near the same location as Category 4 Hurricane Charley in 2004. Following landfall, Ian crossed Florida on a northeasterly tract with hurricane force winds and extreme rainfall, which exceeded 21 inches near Orlando in Orange County. After reaching the Atlantic coast as a tropical storm and exiting Florida at Cape Canaveral, Ian strengthened to a Category 1 hurricane on September 30 and battered the northeast coast of Florida before turning northwestward and making landfall in South Carolina.

Hurricane Nicole formed as a subtropical cyclone on November 7, from a non-tropical area of low pressure near the Greater Antilles and transitioned into a tropical cyclone the next day. Nicole made landfall on November 9, on Great Abaco and on Grand Bahama in the Bahamas, where it strengthened into a Category 1 hurricane. On November 10, it made landfall in Florida, south of Vero Beach. Nicole then traversed the peninsula of Florida before emerging in the Gulf of Mexico and making landfall in Cedar Key as a low-end tropical storm. Nicole became only the third November hurricane on record to make landfall in Florida, along with the 1935 Yankee hurricane and Hurricane Kate in 1985. Nicole crossed the same region in Florida devastated six weeks earlier by Hurricane Ian and was the first hurricane to make landfall on Florida's east coast since Katrina in 2005. Despite being relatively weak, Nicole's large size produced widespread heavy rainfall and strong winds across Florida, knocking out power and inflicting damage in many areas. Additionally, days of strong onshore wind flow onto the east coast of Florida produced severe beach erosion, especially in St. Johns, Volusia, Flagler, and Brevard counties.

The recovery of the beach and dune system is vital for providing protection to upland development (including infrastructure) to restore economic opportunities for local governments and for restoring habitat of threatened and endangered species.

Summary of Assessments

Hurricane Ian

DEP hurricane damage assessment teams conducted the detailed damage assessments for the following counties: Collier, Lee, Charlotte, Sarasota, St. Johns, Flagler, and Volusia.

DEP employed Camera Copters, Inc., to fly oblique aerial videography along the southwest Florida coast between Anclote Key and Cape Romano. This data was particularly useful in evaluating the beach conditions throughout southwest Florida as well as developing the damage assessments for the inaccessible islands of Cayo Costa, North Captiva Island, Captiva Island, Sanibel Island, Lovers Key, and Keewaydin Island.

DEP staff assisted in sand loss assessments of both federal and non-federal beach restoration and nourishment projects within impacted areas and included the counties of: Pinellas, Manatee, Sarasota, Charlotte, Lee, Collier, Palm Beach, Martin, St. Lucie, Indian River, Brevard, Flagler, St. Johns, and Duval.

Additional data, information, and assistance was provided to DEP staff by various local governments and their consultants. Post-storm vertical aerial photography provided by the National Oceanic and Atmospheric Administration (NOAA) also greatly assisted the damage assessments of inaccessible islands for this report.

Hurricane Nicole

DEP hurricane damage assessment teams conducted the detailed damage assessments for the following counties: Duval, St. Johns, Flagler, and Volusia. Following Hurricane Nicole, DEP's Office of Resilience and Coastal Protection requested through the State's Emergency Operations Center to have the Civil Air Patrol fly the east coast of Florida to capture oblique aerial photography points of the coastal damages. This data was used to develop the damage assessments for Brevard through Martin counties.

DEP staff assisted in sand loss assessments of both federal and non-federal beach restoration and nourishment projects within impacted areas and included the counties of: Duval, St. Johns, Flagler, Brevard, Indian River, Martin, and Palm Beach counties. Additional data and information on beach conditions was provided to DEP staff by various local governments and their consultants.

Summary of Recovery Activities and Methods

This Plan focuses only on the beach and dune systems in Manatee, Sarasota, Charlotte, Lee, Collier, Broward, Palm Beach, Martin, St. Lucie, Indian River, Brevard, Volusia, Flagler, St. Johns, Duval, and Nassau counties that had moderate to major beach erosion. The report is organized by separating the Gulf of Mexico and Atlantic coastlines, then by county, then by project or project area. This Plan does not include replacement cost estimates associated with any upland structures, roads, piers, bridges, or coastal armoring.

The Plan works to coordinate recovery efforts with long-term maintenance strategies, using both regular program appropriations and emergency funding assistance provided by federal, state, and local sources to achieve the most efficient recovery of impacted beaches and dunes. For the purposes of this Plan, non-federal dollars are identified funds that would be requested for implementing this Recovery Plan via a special appropriation. Non-federal dollars

are comprised of the cost share on a given project born by the State of Florida [either by Florida Department of Emergency Management (DEM) or DEP] and the local sponsor of the project. Below are overviews of regular and post storm funding opportunities.

DEP

Funding opportunities for management of Florida's critically eroded beaches is administered by the Beach Management Funding Assistance (BMFA) Program.
The program provides and manages grants to local governments (up to 75 percent of project costs) for planning and implementing beach and inlet management projects on the Gulf of Mexico, Atlantic Ocean or Straits of Florida. The Recovery Plan takes into account the strategies of the DEP Strategic Beach Management Plan (SBMP), which is designed to identify long-term management strategies of the state's critically eroded beaches. Management activities conducted by local governments that are consistent with strategies identified in the SBMP are eligible for funding opportunities through the Local Government Funding Request (LGFR) process. The BMFA Program accepts funding requests on an annual basis from local governments and municipalities for beach and inlet management projects. **This Plan identifies funds needed in addition to those already allocated in agreements with local governments through the LGFR process.**

FEMA

FEMA administers a public assistance program to state and local governments to assist with storm recovery activities. A final cost determination is not available at this writing. For the purposes of this Plan, the assumed cost-share for projects receiving FEMA assistance is 75% FEMA, 25% state (DEM) and local. FEMA offers funding assistance under two program areas. A detailed guide to these programs can be found in the Public Assistance Program and Policy Guide.

Category B: Emergency Protective Measures can provide a small volume of sand to prevent flooding to developed upland properties. To qualify, a property (public or private development) must be threatened by a 5-year return interval storm event. Properties are evaluated on a case-by-case basis, with qualifying properties eligible to receive funding to construct a small berm or dune feature.

Category G: Permanent Work is intended to assist with the repair of public facilities. Qualifying non-federally authorized beach projects are eligible for replacement of the sand that was lost as a result of the storm.

USACE

The Shore Protection Program works directly with local governments to construct beach restoration projects for the primary purpose of protecting upland developed properties. After detailed feasibility studies, projects are individually authorized by Congress for construction and long-term maintenance. Authorized projects usually have an authorization period of fifty years, during which time periodic beach nourishment is conducted to maintain the designed storm protection values. Under the program, the federal government can fund the majority of the total project costs. The remaining non-federal cost is the responsibility of the local sponsor and the state of Florida as cost-sharing partners. As a result of storm impacts, an authorized constructed project is eligible for Flood Control and Coastal Emergency (FCCE) funds to rebuild the project.

II. Beach and Dune Recovery Strategies

The beach and dune recovery recommendations in this Plan include volumetric loss determinations and replacement cost estimates that are based on the best available information and strategies. DEP staff corresponded with federal, state, and local agencies involved with storm recovery activities. Cost estimates were developed with the assistance of local sponsors and through supporting documentation provided by engineering consultants. These recommendations were developed as a guide to develop a recovery plan, and if implemented, accelerate the natural recovery of impacted beach and dune systems.

Each proposed activity is presented by county with a listing of DEP Reference (R) monuments or specific project names and locations to identify project boundaries along the impacted shoreline. The storm recovery funds indicated are required in addition to any funding currently appropriated via the BMFA Program or requested in the LGFR process.

Gulf Coast Beaches

Manatee County

Manatee County Shore Protection Project, R-12 to R36

The Manatee County Shore Protection Project is a federally authorized project and is therefore eligible for FCCE recovery funds should significant impacts be realized by a storm event. Based on initial assessments the Project did not receive significant erosion due to either Hurricanes Ian or Nicole.

Recommend continued nourishment under normal management plan. **No non-federal dollars needed outside of normal management programs.**

Coquina Beach Nourishment Project, R-33 to R-41+305

The Coquina Beach Nourishment Project is managed by Manatee County. Based on pre/post beach width measurements and visual estimates of beach erosion, it is estimated there was approximately 2.5 cy per linear foot of sand lost along project area due to combined effects of Hurricane Ian and Hurricane Nicole, resulting in an estimated 19,500 cy of storm erosion (2.5 cy/ft * 7,800 ft = 19,500 cy).

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $2,517,350. Project may be FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$629,337.50.**

North End Longboat Key, R-42 to R-67

The north end of Longboat Key is comprehensively managed by the Town of Longboat Key in coordination with Manatee County. Based on initial assessments the Project did not receive significant erosion due to either Hurricanes Ian or Nicole.

Recommend continued nourishment under normal management plan. **No non-federal dollars needed outside of normal management programs.**

Sarasota County

Longboat Key Nourishment, R-1 to R-29

The Longboat Key Nourishment Project is comprehensively managed by the Town of Longboat Key in coordination with Manatee County and Sarasota County. Based on initial

assessments, the Project did not receive significant erosion due to either Hurricanes Ian or Nicole.

Recommend continued nourishment under normal management plan. **No non-federal dollars needed outside of normal management programs.**

Lido Key Storm Damage Reduction Project, R-35 to R-44

The Lido Key Storm Damage Reduction Project is a federally authorized project and is therefore eligible for FCCE recovery funds should significant impacts be realized by a storm event. Based on initial assessments, the project did not receive significant erosion due to either Hurricanes Ian or Nicole.

Recommend continued nourishment under normal management plan. **No non-federal dollars needed outside of normal management programs.**

South Siesta Key Beach Nourishment Project, R-64 to R-77

The South Siesta Key Beach Nourishment Project is managed by Sarasota County. Based on pre/post beach width measurements and visual estimates of beach erosion, it is estimated there was approximately 17,856 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost to replace lost volume is $1,678,464. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$419,616.00.**

Venice Beach, Sarasota County Shore Protection Project, R-116 to R-133

The Venice Beach Nourishment Project is a federally authorized shore protection project managed by the USACE and the City of Venice. The project is federally authorized and is eligible for FCCE recovery funds. Based on initial assessments the project will likely qualify for FCCE funds as a result of impacts from Hurricane Ian.

Recommend nourishment because of storm induced erosion. Project cost should be 100% covered under FCCE. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA, LGFR. **No non-federal dollars needed outside of normal management programs.**

Manasota Key Beach Restoration and Nourishment, R-173.4 Sarasota County to R-15.3 Charlotte County

The Manasota Key Beach Restoration and Nourishment Project is managed jointly by Sarasota County and Charlotte County. Based on pre/post beach width measurements and visual estimates of beach erosion, it is estimated there was approximately 36,400 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole in the Sarasota County portion of the project.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $3,421,600.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$855,400.00**

<u>Charlotte County</u>

Manasota Key Beach Restoration and Nourishment, R-173.4 Sarasota County to R-15.3 Charlotte County

The Manasota Key Beach Restoration and Nourishment Project is managed jointly by Sarasota County and Charlotte County. Based on pre/post beach width measurements and visual estimates of beach erosion, it is estimated there was approximately 67,920 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole in the Charlotte County portion of the project.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $6,384,480.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$1,596,120.00**

Charlotte County-Stump Pass-Knight Island, R-9 to R-40.5

The Charlotte County, Stump Pass-Knight Island Nourishment Project is managed by Charlotte County. The project utilizes Stump Pass as a source of sand for nourishment on Manasota Key (Stump Pass State Park), Knight Island, and Don Pedro Island. Based on pre and post storm surveys it is estimated that the gross losses of all beaches in the project area is 174,138 cubic yards.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost of $4,440,519.00. Project is FEMA assistance eligible. FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$1,110,129.75**.

<u>Lee County</u>

Gasparilla Island Shore Protection Project, R-10.5 to 24.5

The Gasparilla Island Shore Protection Project is a federally authorized project managed by the USACE and Lee County. As the project is federally authorized it is eligible for FCCE recovery funds. Based on initial assessments the project will likely qualify for FCCE funds based on impacts resulting from Hurricane Ian.

Recommend nourishment as a result of storm induced erosion. Project cost should be 100% covered under FCCE. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

Gasparilla Island State Park Nourishment Project, R-24 to R-26.5

The Gasparilla Island State Park Nourishment Project is managed by the Florida Park Service. The project is historically constructed in conjunction with the Gasparilla Island Shore Protection Project to save on dredge mobilization costs. The project has funding available for nourishment should the Gasparilla Island Shore Protection Project qualify for FCCE construction funding. **No non-federal dollars needed outside of ongoing management programs.**

Captiva Island, Lee County Shore Protection Project, R-83 to R-109

The Captiva Island, Lee County Shore Protection Project is a federally authorized project but managed by the Captiva Erosion Prevention District (CEPD). The project was last nourished in 2021/22, under the CEPD. Currently, there are uncertainties whether the project will remain federally designated and therefore may not qualify for FCCE funds. Further, because the project is still technically federally authorized it is likely not eligible for FEMA recovery funds. Therefore, DEP is proposing to anticipate 100% non-federal funds for nourishment of Captiva Island following the impacts of Hurricane Ian.

Based on initial surveys, it is estimated that project losses due to Hurricane Ian and Nicole are about 427,200 cubic yards of sand.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $13,243,200.00. Project is not FEMA Category G eligible.

100% state/local share is **$13,243,200.00.**

Sanibel North End Nourishment, R-110 to R-122

The North end of Sanibel Island is authorized for sand placement under the Captiva Island, Lee County Shore Protection Project's permit and under the Blind Pass Maintenance Dredging permit, but only to a southern terminus of R-118. Permit modifications may be necessary to authorize placement of sand to R-122 Based on initial surveys it is estimated that this area of shoreline lost approximately 212,000 cubic yards of sand due to Hurricane Ian and Nicole.

The project may be FEMA Category B eligible, but no determination has been made to date. Recommend nourishment of the beach and dune system using sand obtained from Blind Pass Channel. Anticipated available volume is 120,000 cubic yards.

Expected construction costs for nourishment is $3,180,000. Because of federal cost share uncertainties, recommend non-federal funds be provided for 100% of anticipated construction costs of **$3,180,000.**

Sanibel Island, R-122 to R-173.5

There are no engineered beaches on this segment of Sanibel Island eligible for FEMA Category G recovery. It is unclear if any reaches of shoreline will be eligible for FEMA Category B emergency sand placement. To assist Sanibel Island in restoring the beach and dune system, recommend non-federal funding for sand placement densities using a calculation of six (6) cubic yards per foot of shoreline from R-122 to R-173.5. This would equate to approximately 51,500 linear feet of shoreline and total 309,000 cubic yards of sand. Based on project and regional comparisons, it is estimated that cost per cubic yard of sand could be $77 per cubic yard. Sand placement location and densities can vary based on areas of greatest need between R-122 and R-173.5. Given this, it is recommended that the City of Sanibel or Lee County be provided a total of **$23,793,000.00** in non-federal dollars to restore the beach and dune systems of the island.

Estero Island Beach Restoration and Nourishment Project, R-174 to R-198 and R-203 toR-207

The Estero Island Beach Restoration and Nourishment Project is managed by the City of Ft. Meyers Beach. Based on pre/post beach surveys, it is estimated there was approximately 221,000 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole in the project area. Based on FEMA estimates, only 146,251 cubic yards of sand will be funded under Category G or B. There remains a deficit of 74,170 cubic yards.

Prior to Hurricane Ian this project was anticipated for construction in spring of 2023 and remains on schedule.

Recommend nourishment as scheduled and fund additional losses not funded under FEMA as 100% state share.

Based on anticipated construction costs, 74,170 cubic yards of sand will equate to approximately **$1,891,335.00.**

Lovers Key and Bonita Beach, Beach Nourishment Projects, R-214.5 to R-220.5 and R-226.5 to R-230

Lee County is the local sponsor for both beach fill segments. The county has a Management Agreement with DEP to maintain the beach on the Lovers Key State Park, and an

Interlocal Agreement with the City of Bonita Springs to maintain Bonita Beach. Based on pre and post storm surveys the losses resulting from Hurricanes Ian and Nicole is estimated at 52,600 cubic yards of sand. It is estimated that FEMA will fund 12,200 cubic yards of the total losses, which leaves 40,400 cubic yards remaining to be funded.

Prior to Hurricane Ian this project was anticipated for construction in summer of 2023 and remains on schedule.

Recommend nourishment as scheduled and fund additional losses not funded under FEMA as 100% state share.

Based on anticipated construction costs, 40,400 cubic yards of sand will equate to approximately **$1,104,132.00**

South Bonita Beach, R-230 to R-239.25

This is a stretch of previously unmanaged beach and contains no engineered beaches eligible for FEMA Category G funding. The City of Bonita Beach is seeking assistance in restoring dune losses on this section of beach.

Recommend dune restoration from R-230 to R-239.25, using six (6) cubic yards per foot of shoreline. This totals 55,500 cubic yards of sand. Based on project cost comparisons this would equate to $4,495,500.00. Due to uncertainties in federal funding, recommend 100% state share of **$4,495,500.00.**

Collier County

Barefoot Beach, R-1 to R-9

This is a stretch of previously unmanaged beach and contains no engineered beaches eligible for FEMA Category G funding. Collier County is seeking assistance in restoring dune losses on this section of beach.

Recommend dune restoration from R-1 to R-9, using six (6) cubic yards per foot of shoreline. This totals 54,000 cubic yards of sand. Based on project cost comparisons this would equate to $ $1,972,620.00. Due to uncertainties in federal funding, recommend 100% state share of $**1,972,620.00.**

Vanderbilt Beach, R-23 to R-30.5

Vanderbilt Beach is managed by Collier County and is incorporated in the greater Collier County Nourishment Project. Based on pre and post storm surveys it is estimated this segment of beach lost 2,021 cubic yards of sand.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $111,821.93. Project is FEMA assistance eligible. FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$27,955.48.**

Pelican Bay, R-30.5 to R-36

The Pelican Bay segment of Collier County is managed by Collier County and is incorporated in part in the greater Collier County Nourishment Project. Based on pre and post storm surveys it is estimated this segment of beach lost 19,253 cubic yards of sand and has areas in need of protective dunes.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $703,312.09. Project is FEMA assistance eligible. FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$175,828.02.**

Park Shore, R-43.5 to R-54.5

Park Shore Beach is managed by Collier County and is incorporated in the greater Collier County Nourishment Project. Based on pre and post storm surveys it is estimated this segment of beach lost 8,382 cubic yards of sand.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $463,776.06. Project is FEMA assistance eligible. FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$115,944.02.**

Naples, R-58 to R-79

This segment of shoreline is managed by Collier County and is incorporated in the greater Collier County Nourishment Project. Based on pre and post storm surveys it is estimated this segment of beach lost 31,696 cubic yards of sand.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $1,753,739.68. Project is FEMA assistance eligible. FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$438,434.92.**

South Naples, R-79 to R-89

This is a stretch of previously unmanaged beach and contains no engineered beaches eligible for FEMA Category G funding. Collier County is seeking assistance in restoring dune losses on this section of beach.

Recommend dune restoration from R-79 to R-89, using six (6) cubic yards per foot of shoreline. This totals 60,000 cubic yards of sand. Based on project cost comparisons this would equate to $2,191,800.00. Due to uncertainties in federal funding recommend 100% state share of **$2,191,800.00.**

South Marco Island Beach Nourishment Project, R-144 to G-4

The South Marco Island Beach Nourishment Project is managed by Collier County and is eligible for FEMA Category G funding. Based on pre and post storm surveys it is estimated this segment of beach lost 7,254 cubic yards of sand.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $401,363.82. FEMA non-federal cost share based on FEMA 75% and 25% state/local share is **$100,340.96.**

Atlantic Coast Beaches

<u>Nassau County</u>

Nassau County Shore Protection Project, R-12 to R-34

The Nassau County Shore Protection Project is a federally authorized project managed by the USACE. As the project is federally authorized it is eligible for FCCE recovery funds. Based on initial assessments it is uncertain if the project will qualify for FCCE funds based on impacts resulting from Hurricane Ian and/or Nicole.

Recommend nourishment due to storm induced erosion. Project cost should be 100% covered under FCCE. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

Middle Amelia Island, R-34 to R-59

This is a stretch of previously unmanaged beach and contains no engineered beaches eligible for FEMA Category G funding. Nassau County is seeking assistance in restoring dune losses on this section of beach.

Recommend dune restoration from R-34 to R-59. Based on a dune nourishment volume of approximately 72,000 cubic yards, constructions costs are estimated at $4,680,000.00. Project is likely FEMA Category B eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$1,170,000.00.**

South Amelia Island Beach Nourishment Project, R-59 to R-79

The South Amelia Island Beach Nourishment Project is managed by the South Amelia Island Shore Stabilization Association, Nassau County Board of County Commissioners, and by the Florida Park Service. Based on pre and post beach width measurements and visual estimates of beach erosion, it is estimated there was approximately 243,600cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $2,923,200.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$730,800.00**

Duval County

Duval County Shore Protection Project, R-31 to R-80

The Duval County Shore Protection Project is a federally authorized project managed by the USACE and the City of Jacksonville. However, the historically managed dunes from R-39 to R-80 are managed by the City of Jacksonville and are not a part of the federal authorization. As the beach berm portion of the project is federally authorized it is eligible for FCCE recovery funds. Based on initial assessments the project will likely qualify for FCCE funds as a result of impacts resulting from Hurricane Ian and/or Nicole. Based on pre and post storm surveys of the dune system it is estimated that 239,800 cubic yards of sand was lost due to hurricanes Ian and Nicole.

Recommend beach and dune nourishment because of storm induced erosion. Beach berm project cost should be 100% covered under FCCE. Recommend funds for coverage of nourishing non-federal dunes. Estimated construction cost of the restoring the dune losses is $8,632,800.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 90% and 10% state/local share is **$863,280.00.**

St. Johns County

St. Johns County Dunes Project, R-1 to R-46.4, R-67 to R-76, R-117 to R-122.37, R-151 to R-193.65, and R-197 to R-198.35

The St. Johns County dune segments are areas recently restored under FEMA Category B funds following severe beach and dune erosion by Hurricanes Matthew and Irma. Estimated losses from Hurricanes Ian and Nicole are 638,166 cubic yards of sand. Based on an average cost per cubic yard of sand at $50, the restoration of losses due to Hurricanes Ian and Nicole will be approximately $31,908,300.00.

Recommend dune nourishment to restore volumes lost due to storms. Project is FEMA Category B eligible. FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$7,977,075.00.**

South Ponte Vedra Beach Restoration Project, R-76 to R-103.5

The South Ponte Vedra Beach Restoration project was initially constructed by St. Johns County in 2021/22. Based on pre and post beach surveys, it is estimated there was approximately 171,199 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $6,163,164.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$1,540,791.00.**

South Ponte Vedra and Vilano Beach Coastal Storm Risk Management Project, R-102.5 to R-117.5

The South Ponte Vedra and Vilano Beach Coastal Storm Risk Management Project is a federally authorized project managed by the USACE. As the project is federally authorized it is eligible for FCCE recovery funds. However, the project was already anticipated for construction in 2023 under FCCE funds. Recommend proceeding with nourishment. **No non-federal dollars needed outside of normal management programs.**

St. Johns County Shore Protection Project, R-136.3 to R-150.6

Project is a federally authorized project managed by the USACE. As the project is federally authorized it is eligible for FCCE recovery funds. However, the project was already anticipated for construction in 2023 under FCCE funds. Recommend proceeding with nourishment. **No non-federal dollars needed outside of normal management programs.**

Summer Haven Dune and Beach Nourishment, R-200 to R-209

This area is authorized for sand placement under several permits or projects. This stretch of shoreline should be eligible for FEMA funds. However, due to numerous breaches of the beach and dune system during storm events, most recently during Hurricane Nicole, activities are ongoing at this location. Furthermore, there are several studies either in process now, or will be conducted soon, that will evaluate options for better management of this beach. **No non-federal dollars needed outside of normal management programs or existing appropriations at this time.**

<u>Flagler County</u>

North Flagler County Dunes, R-2.3 to R-11.8, R-15.9 to 24.3, and R-47.9 to R-65

The North Flagler County Dune Project is managed by Flagler County. Based on pre and post storm surveys, it is estimated there was approximately 564,570 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend dune nourishment to restore volumes lost due to storms. Estimated construction cost is $39,519,900.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$9,879,975.00.**

Flagler County- Remaining Unconstructed Beaches

There are no other engineered beaches in Flagler County eligible for FEMA Category G recovery. Flagler County holds a Joint Coastal Permit for beach restoration and nourishment between R-64.5 and R-80 (North Reach) and R-94 to R-101 (South Reach). However, this project has not been constructed to date. The USACE holds a Joint Coastal Permit for beach restoration and nourishment from R-80 to R-94. This project has not been constructed to date.

It is unclear if any reaches of shoreline will be eligible for FEMA Category B emergency sand placement. In order to assist Flagler County in restoring the beach and dune system, recommend non-federal funding for sand placement densities using a calculation of six (6) cubic yards per foot of shoreline covering the entire county, less above identified dune project. This would equate to approximately 60,000 linear feet of shoreline and total 360,000 cubic yards of sand. Based on project and regional comparisons, it is estimated that cost per cubic yard of sand could be $70 per cubic yard. Sand placement location and densities can vary based on areas of greatest need within the county. Given this, it is recommended that Flagler County be provided **$25,200,000.00** in non-federal dollars to restore the beach and dune systems of the County outside of the North County Dunes Project.

Volusia County

There are no engineered beaches in Volusia County eligible for FEMA Category G recovery. It is unclear if any reaches of shoreline will be eligible for FEMA Category B emergency sand placement. In order to assist Volusia County in restoring the beach and dune system, recommend non-federal funding for sand placement densities using a calculation of six (6) cubic yards per foot of shoreline covering the entire county, less state and federal property. This would equate to approximately 185,000 linear feet of shoreline and total 1,110,000 cubic yards of sand. Based on project and regional comparisons, it is estimated that cost per cubic yard of sand could be $70 per cubic yard. Sand placement location and densities can vary based on areas of greatest need within the county. Given this, it is recommended that Volusia County be provided a total of **$77,700,000.00** in non-federal dollars to restore the beach and dune systems of the County.

It is anticipated that initially a portion of the total $77.7 million should be used for dune placement where needed and able. Additional funds upfront should be applied to conducting a study, design, and permitting of a full-scale beach restoration project. 40% of $77.7 million = **$31,080,000**.

Phase 1 would fund initial dune placement activities above mean high water in areas of greatest need, and initiate design and permitting of a full-scale beach restoration project.

Phase 2 would fund the beach restoration project. 60% of $77.7 million= **$46,620,000**

Brevard County

Brevard County North Reach Beach Nourishment, R-1 to R-54.5

The Brevard County North Reach Beach Nourishment Project is managed by the USACE and Brevard County. As the project is federally authorized it is eligible for FCCE recovery funds.

Based on initial assessments the project will likely qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment because of storm induced erosion. Project cost should be 100% covered under FCCE. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

Brevard County Mid Reach Beach Nourishment, R-75.4 to R-118.3

The Brevard County Mid Reach Beach Nourishment Project is managed by the USACE and Brevard County. As the project is federally authorized it is eligible for FCCE recovery funds.

Based on initial assessments the project will likely qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment due to storm induced erosion. Project cost should be 100% covered under FCCE. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

Brevard County South Reach Beach Nourishment, R- 118.3 to R-141

The Brevard County South Reach Beach Nourishment Project is managed by the USACE and Brevard County. As the project is federally authorized it is eligible for FCCE recovery funds.

Based on initial assessments the project will likely qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment because of storm induced erosion. Project cost should be 100% covered under FCCE. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

Brevard County Dunes- South Beaches, R-141 to R-213

The Brevard County Dunes- South Beaches Project is managed by Brevard. Based on pre and post storm beach surveys, it is estimated there was approximately 381,610 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend dune nourishment to restore volumes lost due to storms. Estimated construction cost is $26,712,700.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$6,678,175.00**

Indian River County

Sectors 1 and 2 Beach, R-3.5 to R-17

The Sebastian Inlet District manages Sectors 1 and 2 beaches. Based on pre and post storm beach surveys, it is estimated there was approximately 60,000 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $2,760,000.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$690,000.00.**

Sector 3 Beach, R-20 to R-55

Indian River County manages Sector 3 beaches. Based on pre and post storm beach surveys, it is estimated there was approximately 246,000 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $10,627,200.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$2,656,800.00.**

Sector 4 Dunes, R-55 to R-70

This is a stretch of previously unmanaged beach and contains no engineered beaches eligible for FEMA Category G funding. Indian River County is seeking assistance in restoring dune losses on this section of beach.

Recommend dune restoration from R-55 to R-70. Based on a dune nourishment volume of approximately 220,000 cubic yards, constructions costs are estimated at $9,504,000.00. Project is likely FEMA Category B eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$2,376,000.00.**

Sector 5 beach, R-70 to R-86

Indian River County manages Sector 5 beaches. Based on pre and post storm beach surveys, it is estimated there was approximately 82,000 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $3,542,400.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$885,600.00.**

Sector 7 Beach, R-97 to R-108

Indian River County manages Sector 7 beaches. Based on pre and post storm beach surveys, it is estimated there was approximately 167,000 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $7,214,400.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$1,803,600.00.**

St. Lucie County

Ft. Pierce Shore Protection Project, R-34 to R-41

The Ft. Pierce Shore Protection Project is managed by the USACE and St. Lucie County. The project is federally authorized and is eligible for FCCE recovery funds.

Based on initial assessments it is uncertain if the project will qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment due to storm induced erosion as needed. Any project related costs on the local sponsor are eligible for cost share with the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

St. Lucie South Beach Nourishment, R-98 to R-116

The St. Lucie South Beach Nourishment Project is managed by the USACE and St. Lucie County. The project is federally authorized and is eligible for FCCE recovery funds.

Based on initial assessments it is uncertain if the project will qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment because of storm induced erosion as needed. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

Martin County

Martin County Shore Protection Project, R-1 to R-25

The project is federally authorized and is eligible for FCCE recovery funds.

Based on initial assessments it is uncertain if the project will qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment due to storm induced erosion as needed. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

MacArthur Dune Project, R-27 to R-34

This is a stretch of previously constructed but unmanaged beach and does not qualify as and engineered beach eligible for FEMA Category G funding. Martin County is seeking assistance in restoring dune losses on this section of beach under FEMA Category B funds.

Recommend dune restoration from R-27 to R-34. Based on a dune nourishment volume of approximately 66,000 cubic yards, constructions costs are estimated at $2,153,580.00. Project is likely FEMA Category B eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$538,395.00.**

Bathtub Beach and Sailfish Point Beach Nourishment Project, R-34.3 to R-40

The Bathtub Beach and Sailfish Point Beach Nourishment Project is managed by Martin County. Based on pre and post storm beach surveys, it is estimated there was approximately 53,920 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $3,281,571.20. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$820,392.80.**

Jupiter Island Beach Nourishment Project, R-73 to R-127.4

The Jupiter Island Beach Nourishment Project is managed by the Town of Jupiter Island. Based on pre and post storm beach surveys, it is estimated there was approximately 240,826 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost is $6,076,039.98. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$1,519,010.00.**

Palm Beach County

Coral Cove Dune Nourishment, R-1 to R-7.5

The Coral Cove Dune Nourishment Project is managed by Palm Beach County. Based on pre and post storm beach surveys, it is estimated there was approximately 42,160 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend dune nourishment to restore volumes lost due to storms. Estimated construction cost is $2,523,276.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$630,819.00.**

Jupiter Carlin Beach Nourishment Project, R-13 to R-19

The Jupiter Carlin Project is managed by the USACE and Palm Beach County. The project is federally authorized and is eligible for FCCE recovery funds.

Based on initial assessments it is uncertain if the project will qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment because of storm induced erosion as needed. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

South Jupiter Dune Project, R-19 to R-26

The South Jupiter Dune Nourishment Project is managed by Palm Beach County. Based on pre and post storm beach surveys, it is estimated there was approximately 22,076 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend dune nourishment to restore volumes lost due to storms. Estimated construction cost is $1,363,413.76. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$340,853.44.**

Juno Beach Nourishment Project, R-26 to R-38

The Juno Beach Nourishment Project is managed by Palm Beach County. Based on pre and post storm beach surveys, it is estimated there was approximately 142,222 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost to restore volume lost is $2,844,440.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$711,110.00.**

Singer Island Dune Project, R-60.5 to R-65.7

The Singer Island Dune Nourishment Project is managed by Palm Beach County. Based on pre and post storm beach surveys, it is estimated there was approximately 18,926 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend dune nourishment to restore volumes lost due to storms. Estimated construction cost is $1,208,046.58. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$302,011.65.**

Reach 2 Dune Project, R-80.35 to R-82.2

The Reach 2 Dune Nourishment Project is managed by the Town of Palm Beach. Based on pre and post storm beach surveys, it is estimated there was approximately 15,000 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend dune nourishment to restore volumes lost due to storms. Estimated construction cost is $900,000.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$225,000.00.**

Mid-Town Beach Nourishment Project, R-89 to R-94 and R-95 to R-102

The Mid-Town Beach Nourishment Project is managed by the USACE and the Town of Palm Beach. The project is federally authorized and is eligible for FCCE recovery funds.

Based on initial assessments it is uncertain if the project will qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment due to storm induced erosion as needed. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

Reach 7, Phipps Ocean Park Nourishment, R-116 to R-127.5

The Phipps Ocean Park Nourishment Project is managed by the Town of Palm Beach. Based on pre and post storm beach surveys, it is estimated there was approximately 78,000 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost to restore volume lost is $1,560,000.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$390,000.00.**

Reach 9, South Palm Beach Dune Nourishment, R-134 to R-138

The Reach 9 Dune Nourishment Project is managed by the Towns of Palm Beach and South Palm Beach. Based on pre and post storm beach surveys, it is estimated there was approximately 20,000 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend dune nourishment to restore volumes lost due to storms. Estimated construction cost is $1,276,600.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$319,150.00.**

Ocean Ridge Shore Protection Project, R-153.2 to R-159

The Ocean Ridge Shore Protection Project is managed by the USACE and Palm Beach County. The project is federally authorized and is eligible for FCCE recovery funds.

Based on initial assessments it is uncertain if the project will qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment as a result of storm induced erosion as needed. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

Delray Beach Nourishment Project, R-175.3 to R-188

The Delray Beach Nourishment Project is managed by the USACE and the City of Delray Beach. The project is federally authorized and is eligible for FCCE recovery funds.

Based on initial assessments it is uncertain if the project will qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment because of storm induced erosion as needed. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

North Boca Raton Beach Nourishment Project, R-205 to R-212.2

The North Boca Raton Beach Nourishment Project is managed by the USACE and the City of Boca Raton. The project is federally authorized and is eligible for FCCE recovery funds.

Based on initial assessments it is uncertain if the project will qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment because of storm induced erosion as needed. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

Central Boca Raton Beach Nourishment Project, R-216 to R-223

The Central Boca Raton Beach Nourishment Project is managed by the City of Boca Raton. Based on pre and post storm beach surveys, it is estimated there was approximately 46,170 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost to restore volume lost is $2,308,500.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$577,125.00.**

South Boca Raton Beach Nourishment Project, R-223.3 to R-227.9

The South Boca Raton Beach Nourishment Project is managed by the City of Boca Raton. Based on pre and post storm beach surveys, it is estimated there was approximately 61,452 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost to restore volume lost is $3,072,600.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is $**768,150.00.**

Broward County

Deerfield and Hillsboro Beach Nourishment Project, R-5 to R-12.4

The Deerfield and Hillsboro Beach Nourishment Project is managed cooperatively by the City of Deerfield Beach and the Town of Hillsboro Beach. Based on pre and post storm beach surveys, it is estimated there was approximately 60,100 cubic yards of sand lost to the combination of Hurricanes Ian and Nicole.

Recommend nourishment to restore volumes lost due to storms. Estimated construction cost to restore volume lost is $4,026,700.00. Project is FEMA Category G eligible.

FEMA eligible non-federal cost share based on FEMA 75% and 25% state/local share is **$1,006,675.00.**

Broward County Segment II, R-25 to R-41.3, R-51 to 53, and R-53 to R-72

The Broward County Segment II Nourishment Project is managed by the USACE and Broward County. The project is federally authorized and is eligible for FCCE recovery funds.

Based on initial assessments it is uncertain if the project will qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment because of storm induced erosion as needed. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

Broward County Segment III, R-85.7 to R-92, R-98.3 to R-128

The Broward County Segment III Nourishment Project is managed by the USACE and Broward County. The project is federally authorized and is eligible for FCCE recovery funds.

Based on initial assessments it is uncertain if the project will qualify for FCCE funds as a result of impacts from Hurricane Ian and/or Nicole.

Recommend nourishment because of storm induced erosion as needed. Any project related costs on the local sponsor are eligible for cost share with the DEP through the BMFA program, LGFR. **No non-federal dollars needed outside of normal management programs.**

III. Summary

In total, non-federal funds requested through this Recovery Plan totals **$205,471,198.53**. Areas without historical engineered and or managed beaches comprise approximately 68% of the total funds.

For beaches without prior engineered or managed beaches identified in this plan, initial restoration of the dune or beach should be on a phased approach. Dunes should be restored as an initial restorative and protective measure, and with as minimal regulatory authorizations as necessary. However, a more long-term management strategy should be identified. Detailed planning and engineering tasks may be needed for each new project area to formulate the most cost-effective design, construction, and future management strategies.

Existing projects make up the majority of projects requesting recovery funds through the Plan but make up only approximately 32% of the total funds requested. These projects are considered construction ready.

Of the 70 areas identified in the Plan, 22 are federally authorized shore protection projects and are eligible for FCCE. To date of this writing, the list of these projects qualifying for FCCE funds is not available.

The funds in the is Recovery Plan are requested outside of normal management programs.