

Strategic Beach Management Plan
Panhandle Gulf Coast Region

Division of Water Resource Management
Florida Department of Environmental Protection

June 2015



Construction of the Pensacola Beach Nourishment Project, 2003. Photo courtesy of Olsen Associates, Inc.

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WESTERN BARRIERS

There are 67.8 miles of beaches in the **Western Barriers** subregion, which extends from the Florida-Alabama state line in Escambia County to the Okaloosa-Walton County line, as shown on Figure 1. There are a total of 25.3 miles of critically eroded beaches in this subregion (14.7 miles in Escambia County, 4.1 miles in Santa Rosa County, and 6.5 miles in Okaloosa County), of which 16.4 miles have been restored.

Erosion is attributed to tropical storms, hurricanes, and the effects of the inlets including Pensacola Pass and East Pass (Choctawhatchee Bay Entrance). The most erosive storms in recent years were Hurricane Frederic (1979), Hurricane Elena and Tropical Storm Juan (1985), Hurricanes Erin and Opal (1995), Hurricane Georges (1998), Tropical Storm Isidore (2002), Hurricane Ivan (2004), Hurricanes Dennis (2005), Hurricane Katrina (2005), Hurricane Rita (2005), Tropical Storm Ida (2009), Hurricane Gustav (2008), Tropical Storm Debby (2012) and Hurricane Isaac (2012).

In 1995, Hurricane Opal caused extensive erosion throughout northwest Florida. Using federal and state disaster funds, a program of assisted recovery of the beach and dune system was conducted where upland developed property was left vulnerable to storms. Sand was trucked from upland borrow sites, placed in an alongshore berm configuration, and stabilized with wood slat sand fence and plantings of sea oats. However, the beach and dunes had not fully recovered when Hurricane Georges impacted the area in 1998, causing additional damage that required a second phase of assisted recovery of the most eroded developed areas.

In 2004, Hurricane Ivan caused extensive erosion throughout northwest Florida. In Escambia County, this erosion was even more severe than that caused by Opal. In 2005, Hurricanes Dennis, Katrina, and Rita exacerbated erosion conditions throughout northwest Florida. As is described below, recovery efforts similar to those implemented after Opal have been completed.

STRATEGIES FOR INLETS AND CRITICALLY ERODED BEACHES

PERDIDO KEY, ESCAMBIA COUNTY, R1-R34

This is a 6.5 mile segment of critically eroded beach on Perdido Key. Assisted recovery of the beach and dune system was conducted following Hurricanes Opal, Georges, Ivan, and Dennis. Following the effects of the 2004 hurricane season, emergency protective berms were constructed using funds from

FEMA. A dune restoration project to supplement these emergency protective berms with additional sand and vegetation was performed in 2005-2006. A feasibility study to determine the appropriate beach management strategy for this area was initiated in 2005 and completed in 2006, along with a sand search study. The feasibility study recommended beach restoration. The **Perdido Key Beach - Dune Restoration Project** proposes to place approximately 1.25 million cubic yards (mcy) of beach quality material in three different segments from an offshore borrow site and is expected to begin construction in 2015/2016. The first segment is 2.4 miles long (R1-R12.5) and will construct a dune restoration project with vegetation that will provide critical habitat for the Perdido Key beach mouse. The second segment is 1.1 mile long (R12.5-R19) and will construct a protective berm within the Perdido Key State Park. The third segment is three miles long (R19-R34) and will construct both a beach and dune restoration project. As a separate component, the Perdido Key Dune Restoration Project is listed as an early restoration project in the Deepwater Horizon Oil Spill: Programmatic and Phase III Early Restoration Plan and Early Restoration Programmatic Environmental Impact Statement and was selected by the *Deepwater Horizon* Natural Resource Damage Assessment (NRDA) Trustees for implementation. The Perdido Key Dune Restoration project will restore dune vegetation to approximately 20 acres of beach dune habitat.

Strategy: Beach and/or dune restoration, and maintenance of the project through monitoring and nourishment.

PENSACOLA PASS, ESCAMBIA COUNTY, R67-R68

Pensacola Pass, separating Perdido Key and Santa Rosa Island, includes the federal **Pensacola Harbor Navigation Project** and provides access to the Pensacola Naval Air Station, the Port of Pensacola, and the federal Gulf Intracoastal Waterway. In 1881, the authorized channel was dredged to a depth of -24 ft (MLW). It was incrementally deepened to -35 ft (MLW) by 1958. Maintenance dredged material was placed in an offshore disposal site. In 1959, the navigation channel was widened and deepened to -37 ft MLW, with placement of the dredged material on Santa Rosa Island. Subsequently, maintenance dredged material was placed in an offshore disposal site and once on Perdido Key (1985).

While the federally authorized dimensions of the channel are presently set at -35 ft by 500 ft, the channel was widened and deepened to -48 ft to accommodate a Navy aircraft carrier in 1991. The dredged material was placed on Perdido Key. The channel has filled at a rate of approximately 300,000 cubic yards (cy) annually, but was still at a depth of -40 ft in 1997. Periodic maintenance dredging has

been completed, most recently in 2002, with material being placed in nearshore areas. In 2006, a beneficial use plan was developed by Escambia County and the Florida Department of Environmental Protection (FDEP) for the material dredged from Pensacola Pass. The plan included an evaluation of the adjacent shorelines, sediment quality, and sediment placement alternatives. The U.S. Army Corps of Engineers (USACE) developed a plan in August of 2013 with a similar beneficial use program. The USACE plans to perform maintenance dredging for the U.S. Navy to a depth of - 48 ft when federal funding is available. The strategy listed below is based in part on an inlet management study that was completed in 1999 and the need for more current data and plan. Pensacola Pass was dredged in the winter of 2011/ 2012 placing approximately 520,000 cy on the eastern most portion of Perdido Key within the Gulf Islands National Seashore.

Strategy: Update the sediment budget and adopt an inlet management plan.

PENSACOLA BEACH, ESCAMBIA COUNTY, R107-R151

This is an 8.2 mile segment of critically eroded beach at Pensacola Beach on Santa Rosa Island. Assisted recovery of the beach and dune system was conducted following Hurricanes Opal and Georges. Initial construction of the **Pensacola Beach Restoration Project** (R107–R151) was completed in September 2003 using 4.2 million cy of sand from a borrow site located about 3.5 miles offshore. The project length spanned the full 8.2 miles with an average post-construction beach width of 191 ft. The project design consists of a beach berm elevation of +8 ft to +6 ft NAVD 88 that is Gulfward at 1:15 into the water to protect the existing dune, upland development and is a marine turtle friendly design. The project was designed for an 8 year nourishment interval.

This area was severely impacted by Hurricane Ivan in 2004 and further impacted by Hurricanes Dennis and Katrina in 2005. The 8.2 mile beach nourishment project was completed February 2006, with dune restoration completed in April 2006 that included vegetation. Approximately 2,909,300 cy of fill material (2,348,000 cy by dredge and 561,300 cy of recovered storm overwash material) was placed between FDEP reference monuments R107 and R151. FEMA cost shared in these efforts. The Pensacola Dune Restoration Project that consisted of planting dune vegetation and sand fencing for 4.2 miles beginning 7.5 miles east of Pensacola Pass in 2012, was an early restoration project listed in the Deepwater Horizon Oil Spill Phase I Early Restoration Plan and Environmental Assessment and was selected by the *Deepwater Horizon* NRDA Trustees for implementation. The next full beach nourishment is planned for 2015.

Strategy: Maintain the project through monitoring and nourishment.

NAVARRE BEACH, SANTA ROSA COUNTY, R192.5-R213.5

This is a 4.1 mile segment of critically eroded shoreline at Navarre Beach on Santa Rosa Island. Assisted-recovery of the beach and dune system was conducted following Hurricanes Opal and Georges. This area was severely impacted by Hurricane Ivan in 2004 and further impacted by Hurricanes Dennis and Katrina in 2005.

Initial construction of the **Navarre Beach Restoration Project (R191+500'-R214 -225')** began in late March 2006 and was completed in November 2006. The initial sand placement included approximately 3.4 million cy to construct the beach and dune. The project also included a dune feature that consisted of additional sand and dune vegetation. The borrow area is located about 4 miles offshore. The project included replacement of emergency protective berms that were funded by FEMA.

A small truck haul project in April of 2010 was constructed to partially address spreading losses on the west end of the project site. The project design did not include a typical fill taper when no construction easement was granted for placement of the taper by the adjacent Gulf Islands National Seashore. The 2010 interim truck haul project repaired a portion of the dune which was damaged by Hurricanes Gustav and Ike in 2008, by placement of approximately 11,881 cy of beach quality material from an upland borrow site.

With permitting completed, the next full nourishment is planned for 2015/2016 and is expected to place approximately 1,600,000 cy of material from an offshore borrow site. FEMA will cost share on this beach nourishment project in response to damages sustained during Tropical Storm Debby and Hurricane Isaac.

Strategy: Maintain the project through monitoring and nourishment.

OKALOOSA ISLAND, OKALOOSA COUNTY, R1-R15

This is a 2.8 mile segment of critically eroded beach on Santa Rosa Island near the community of Ft Walton Beach. Assisted recovery of the beach and dune system was conducted following Hurricanes Opal and Georges. Following the effects of the 2004 hurricane season, emergency protective berms were constructed using funds from FEMA. A dune feature was constructed in May 2005 to supplement the emergency protective berms with additional sand and vegetation. A feasibility study from 2007 was

accelerated following the 2004/ 2005 storms, and the County and Eglin Air Force Base developed a cooperative plan for beach restoration. FDEP issued a Joint Coastal Permit (JCP) in February 2012 for construction of a restoration project using sand from an offshore borrow site located approximately 1.25 miles offshore of Santa Rosa Island and 2 miles west of East Pass. Following issuance of the Joint Coastal Permit, the Okaloosa County Board of County Commissioners voted to withdraw their participation and the project was not constructed. Okaloosa County is currently installing native dune vegetation and sand fencing to protect remaining dunes.

Strategy: Construct beach restoration project; maintain through nourishment and monitoring.

EAST PASS (CHOCTAWHATCHEE BAY ENTRANCE), OKALOOSA COUNTY, R17

East Pass is the historical natural tidal connection between the Gulf of Mexico and Choctawhatchee Bay, and lies between Santa Rosa Island and Moreno Point at the City of Destin. **East Pass** is periodically dredged to maintain the federal navigation project. Initial dredging of the navigation channel was completed in 1969 with two jetties. Maintenance dredging of the channel has been conducted about every 18 months. The material dredged from the channel near the seaward ends of the jetty is placed within the surf zone west of the inlet. The material dredged from the inlet throat has been placed at several locations, including a scour hole near the spur on the east jetty, within protective sand dikes along the east and west jetties, on Norriego Point, and on the beach at Eglin Air Force Base. In May 2006, approximately 50,000 cy of maintenance dredged beach quality material were truck hauled to the adjacent Holiday Isle beach (R17-R22). Material dredged from the ebb shoal has been used as a borrow source for surrounding projects in Destin, Eglin Air Force Base, and Walton County. In the past, the placement plan was based in part upon the East Pass Inlet Management Study Implementation Plan, which was completed in 1999 by Taylor Engineering.

FDEP adopted the East Pass Inlet Management Study Implementation Plan on June 8, 2000. This plan was based upon recommendations and supporting data compiled in the study report, *Inlet Management Plan for East Pass to Choctawhatchee Bay* (Taylor Engineering, Inc., 1999). The 2000 inlet management plan which specified that all inlet dredge material be placed west of the inlet, did not provide for balancing the inlet sediment budget or extending the life of proximate beach restoration projects. The plan was not consistent with Section 161.142, Florida Statutes (adopted in 2008), because it did not ensure that the inlet dredge material was placed on adjacent eroding beaches. For these

reasons, a new study cost-shared between the City of Destin and FDEP was conducted to develop an updated sediment budget in 2010.

The Eglin Air Force Base Beach Restoration Project adjacent to East Pass was completed in June 2010 by placing 729,570 cy of fill material with-in Reach 3 (V604.5-V611.5).

FDEP adopted the [East Pass Inlet Management Implementation Plan](#) on July 24, 2013. With adoption of the new inlet management plan, all future inlet management activities shall be consistent with the four strategies found in the updated inlet management plan.

Strategy: Implement a comprehensive beach and inlet hydrographic monitoring program; modify the current inlet sand transfer protocol to permit the placement of inlet dredge material along the Gulf beaches both to the east and to the west of the inlet; complete the stabilization of Norriego Point; investigate availability and feasibility of supplemental inlet sediment excavation.

NORRIEGO POINT, OKALOOSA COUNTY

This is a 0.8-mile segment of critically eroded inlet shoreline of East Pass. Bulkheads armor the southern portion of this shoreline and the undeveloped land on the north end has been maintained by the placement of material dredged from the navigation channel. Several T-groins were installed by private interests in 2004 to stabilize the shoreline on Norriego Point. The City of Destin has received a Joint Coastal Permit (2013) to stabilize Norriego Point. Beach compatible sand was placed at Norriego Point in 2014. The proposed stabilization project includes repair and extension of the existing T-groins, construction of 2 additional T-groins, construction of approximately 500 linear feet of harbor side seawall, construction of approximately 400 ft of northwest end seawall and placement of beach compatible sand to create a dune feature with dune vegetation. The Norriego Point Restoration and Recreation Project is an early restoration project that is listed in the Deepwater Horizon Oil Spill: Programmatic and Phase III Early Restoration Plan and Early Restoration Programmatic Environmental Impact Statement and was selected by the *Deepwater Horizon* NRDA Trustees for implementation. Structures are planned for construction in 2015 to stabilize the north end of Norriego Point.

Strategy: Complete the Norriego Point stabilization project pursuant to the JCP permit as authorized by FDEP, and as called for in the adopted East Pass Inlet Management Plan (2013).

WEST DESTIN, OKALOOSA COUNTY, R17-R25.5

Following the 2005 hurricane season, the western 1.6 miles of Destin was designated as a critically eroded beach. In 2006, 50,000 cy of East Pass channel maintenance dredge material were placed between R17 and R22. A feasibility study that includes this area was completed in April 2003 and a sand search was completed in 2007 to identify a suitable source of beach quality material. As a result of severe erosion caused by Tropical Storm Ida, the West Destin Emergency Beach Nourishment Project was constructed in September, 2010. Approximately 138,437 cy of fill material was placed between FDEP reference monuments R17.2 and R19.8. Fill was obtained from an offshore borrow site.

The Western Destin Beach Restoration Project was completed February, 2013. The project includes two segments with a total fill placement of 634,292 cy. The west segment extends from the East Pass east jetty eastward to R20.7 with a fill placement of 487,003 cy. The West Destin Emergency Beach Nourishment Project area was located within this segment of the restoration project. The restoration project's eastern segment extends from the west property line of Sandpiper Cove near R23.5 to R25.5 with a fill placement of 147,289 cy. There is a 2,900-foot gap between the segments, which includes 18 single-family lots and three condominiums. The monitoring control area includes the gap between fill segments and 4,900 ft east of the project.

Strategy: Maintain the project through nourishment and monitoring.

DESTIN, OKALOOSA COUNTY, R39-R50

This is a 2.1 mile segment of critically eroded beach east of Henderson Beach State Park in Destin. This segment is contiguous to another segment of critically eroded beach in western Walton County. Assisted recovery of the beach and dune system was conducted following Hurricanes Opal and Georges. Following the impact of Hurricane Ivan (2004) and Hurricane Dennis (2005), emergency protective berms were constructed in 2006 using funds from FEMA. A dune restoration project was constructed in 2006 to supplement the emergency protective berms with additional sand and vegetation.

A portion of the **Destin-Western Walton Beach Restoration Project** was constructed in 2006 and completed in 2007 using sand from the ebb shoal of East Pass. The expected nourishment interval of the project is 8 years. The project has a total length of 6.9 miles and extends from R39 in Okaloosa County through R23 in Walton County. The beach berm design is 210 ft wide. Approximately 1,900,000 cy of sand were placed in the Walton County segment of the project and 950,000 cy in the Destin segment.

Strategy: Maintain the project through nourishment and monitoring.

REGIONAL STRATEGIES FOR BEACH AND INLET MANAGEMENT

SPONSORS AND FUNDING

This subregion contains the governmental entities of [Escambia](#), [Santa Rosa](#), and [Okaloosa](#) Counties; the Santa Rosa Island Authority (Pensacola Beach); the City of Destin; [FDEP's Division of Recreation and Parks](#); the [USACE](#); the U.S. Department of the Interior; and the U.S. Air Force (Eglin Air Force Base). Participants with FDEP as local sponsors of beach management projects include Santa Rosa and Okaloosa Counties, the [Santa Rosa Island Authority](#), and the [City of Destin](#). Property on Santa Rosa Island is leased from the federal government and is subject to leaseholder agreements. The Gulf Islands National Seashore, managed by the National Park Service, occupies a large portion of Perdido Key and Santa Rosa Island. FDEP's Division of Recreation and Parks manages coastal property at Perdido Key State Park and Henderson Beach State Park. The U.S. Department of the Interior manages the Gulf Islands National Seashore and the U.S. Air Force is responsible for coastal property within Eglin Air Force Base. Project cost estimates and schedules may be found in [FDEP's Beach Management Funding Assistance Program](#).

The Restoration Projects listed below are early restoration projects selected by the *Deepwater Horizon* Oil Spill [Natural Resource Damage Assessment \(NRDA\) Trustees](#) for implementation.

- Perdido Key Dune Restoration, (Phase III)
- Pensacola Dune Restoration, (Phase I)
- Norriego Point Restoration and Recreation Project, (Phase III)

PROJECT COORDINATION

Regionalization is the funding and coordination of multiple nourishment and inlet management activities to take advantage of identifiable cost savings through economies of scale, reduced equipment mobilization and demobilization costs, and elimination of duplicative administrative tasks. The Destin – Western Walton Beach Restoration Project is an example of project coordination. Future opportunities include:

1. Placement of beach quality sand on adjacent beaches from maintenance of Pensacola Pass.
2. Placement of beach quality sand on adjacent beaches from maintenance of East Pass.

3. Combining nourishment projects in the subregion.

ENVIRONMENTAL PROTECTION

The protection of marine turtles, beach mice and shorebirds and their habitat are primary environmental concerns within this subregion. The endangered Gulf sturgeon is also an environmental concern at Pensacola Pass and East Pass. The timing of construction activities has been restricted during the marine turtle nesting season of May 1 through October 31, though exceptions have been approved by the US Fish and Wildlife Service. Project design and method of construction are restricted to avoid or minimize adverse impacts to the federally and state-listed species and their habitats. The [Fort Pickens Aquatic Preserve](#) is located within the boundaries of the [Gulf Islands National Seashore](#) on eastern Perdido Key and western Santa Rosa Island. Projects located within and near the aquatic preserve boundaries require additional protection, including more stringent water quality standards than in non-aquatic preserve waters, during permitting and construction to ensure preservation of the existing conditions. This area of coastline along Perdido Key and Santa Rosa Island have been impacted by tar balls from the Deepwater Horizon oil spill of 2010.

SAND SOURCES

Offshore sand sources sufficient to meet the expected needs of future projects in this subregion over the next 15 years have not been identified. Some upland dredged material storage sites adjacent to the Intracoastal Waterway may contain potentially usable beach quality sand. Most of these upland sites are located in Bay and Gulf Counties and would have to be transported by barge or truck. It is recommended by the FDEP that an offshore sand search be conducted for this subregion for the purpose of beach nourishment. For additional information on sand sources, FDEP manages a database named the [Regional Offshore Sand Source Inventory \(ROSSI\)](#).

INNOVATIVE PROJECTS

A porous (net) groin system was installed as an experiment on a segment of beach on Eglin Air Force Base in November 2001. A third party peer review of the results of this test program indicated that this system did not meet the performance expectations and was not cost effective.

ADDITIONAL INFORMATION

The introduction at the beginning of the state’s Strategic Beach Management Plan provides additional information including overviews of:

- The principles followed to help guide the state’s management strategies
- The miles of critically eroded beaches under active management
- Statewide sand source studies
- Statewide monitoring programs
- Innovative technologies examined
- Basic suggestions for emergency response plans

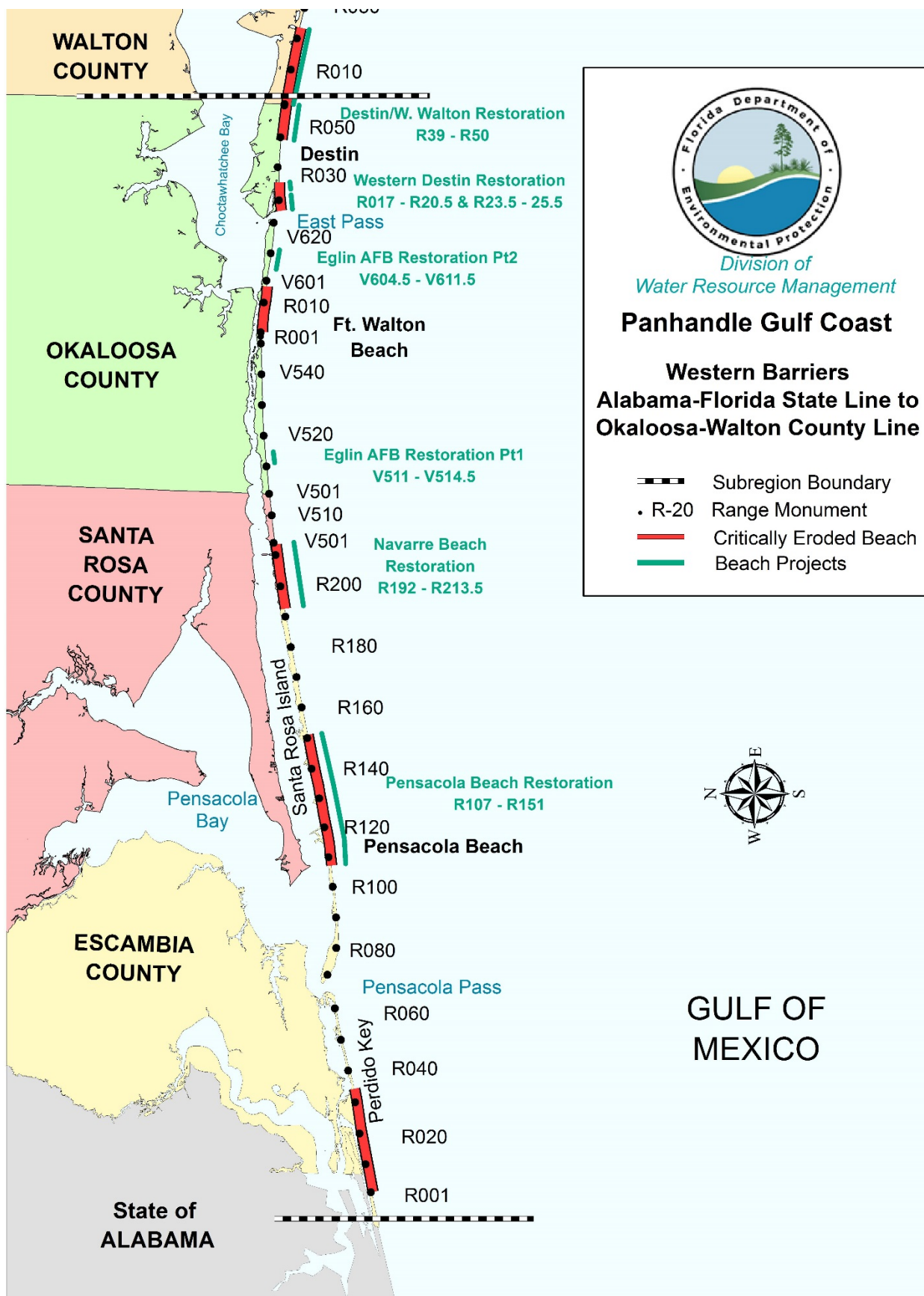


Figure 1. The Western Barriers subregion of the Panhandle region of Florida.

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PLEISTOCENE MAINLAND

There are 25.6 miles of beaches in the **Pleistocene Mainland** subregion, which extends from the Okaloosa-Walton County line east to the Walton-Bay County line as shown on Figure 2. There are 14.3 miles of critically eroded beaches in this subregion, of which 5 miles have been restored and maintained.

Erosion is attributed primarily to tropical storms and hurricanes. The most erosive storms in recent years were Hurricane Eloise (1975), Hurricane Opal (1995), Hurricane Georges (1998), Tropical Storm Isidore (2002), Hurricane Ivan (2004), and Hurricanes Dennis and Katrina (2005).

In 1995, Hurricane Opal caused extensive erosion throughout the northwest Florida coast. Using federal and state disaster funds, a program of assisted recovery of the beach and dune system was conducted where upland developed property was left vulnerable to storms. Sand was trucked from upland borrow sites, placed in an alongshore berm configuration, and stabilized with wood slat sand fence and plantings of sea oats. However, the beach and dunes had not fully recovered when Hurricane Georges impacted the area in 1998 causing additional damage that required a second phase of assisted recovery of the most eroded developed areas.

Tropical Storm Isidore (2002) and Hurricane Ivan (2004) caused additional extensive erosion throughout Walton County's beaches and dunes. In 2005, Hurricanes Dennis, Katrina, and Rita exacerbated erosion conditions throughout Northwest Florida.

STRATEGIES FOR INLETS AND CRITICALLY ERODED BEACHES

AREA WIDE STUDIES AND PROJECTS

The USACE initiated a county-wide federal feasibility study in 2004 to determine the appropriate beach management strategy. This work was supplemented by Walton County and FDEP, and Walton County completed a state and local feasibility study in 2006. The USACE reviewed the draft study by the Civil Works Review Board in December 2012. The project reached a major milestone in July of 2013 with completion and approval of the feasibility study. Since then, the **Walton County Hurricane and Storm Damage Reduction Project** was authorized by Congress in 2014. Within the authorized project template, there are five designated critically eroded areas in Walton County that total 18.8 miles. The preliminary engineering and design (PED) is scheduled to be completed in January, 2015 and construction is planned for 2015/2016.

Area wide strategy: Facilitate completion of the federal design and permitting activities; construct beach restoration project; and perform a coastal geomorphology study of the coastal lakes and peat formations for implications in future beach management measures.

WESTERN WALTON COUNTY (REACH 1), R1-R23.6

This is a 5.2 mile segment of critically eroded beach that includes unincorporated Miramar Beach, Tang-O-Mar Beach, Gulf Pines, Sandestin, and Four Mile Village. This segment adjoins a segment of critically eroded beach in Okaloosa County. This segment is the first reach of the **Walton County Hurricane and Storm Damage Reduction Project**. Assisted recovery of the beach and dune system within the most eroded developed areas was conducted following Hurricanes Opal and Georges. Following Hurricane Ivan in 2004, emergency protective berms were constructed using funds from FEMA; a dune restoration project was also completed in 2005 to supplement the emergency protective berms with additional sand and vegetation. A state and local feasibility study for beach restoration throughout Walton County has been completed and the **Walton County Beach Restoration Project (R1-R22.8)** was completed in January 2007 using 1,900,000 cy of sand obtained from the ebb shoal of East Pass. Construction of the restoration project is scheduled for 2015/ 2016 as a component of the Walton County Hurricane and Storm Damage Reduction Project.

Strategy: Maintain the project through nourishment and monitoring.

C30A CORRIDOR BEACHES, WALTON COUNTY (REACHES 2 -5), R41-R127.4

Beach Highlands to Blue Mountain Beach (Reach 2) is a 4.5 mile segment of critically eroded beach (R41-R64) that includes unincorporated Beach Highlands, Dune Allen Beach, and Blue Mountain Beach that is part of the **Walton County Hurricane and Storm Damage Reduction Project (5 Reaches)**.

The segment between R54.5 and R58 is designated critical for the design integrity of the Walton County Hurricane and Storm Damage Reduction Project. The east end between R63 and R64 is designated critical for the construction of a dune taper only for the design integrity of the Walton County Hurricane and Storm Damage Reduction Project. Assisted recovery of the beach and dune system within the most eroded developed areas was conducted following Hurricanes Opal and Georges. Following the impact of Hurricane Ivan, emergency protective berms were constructed using funds from FEMA; a dune restoration project was also completed in 2005 to supplement the emergency protective berms with additional sand and vegetation.

Gulf Trace to Grayton Beach (Reach 3) is a 1.0 mile segment of critically eroded beach (R67-R72) that includes unincorporated Gulf Trace and a 0.1 mile segment of Grayton Beach where development is threatened by erosion. An additional 1,900-foot gap between the threatened areas, which contains undeveloped park lands, has been added for continuity of management of the coastal system following federal project authorization. Additionally, two segments (300 ft to the west and 500 ft to the east), where no development exists seaward of the Coastal Construction Control Line (CCCL), has been added for continuity of management of the coastal system following federal project authorization. Assisted recovery of the beach and dune system within the most eroded developed areas was conducted following Hurricanes Opal and Georges. This area was also heavily impacted by Hurricane Ivan in 2004.

WaterColor to Deer Lake (Reach 4) is a 3.9 mile segment of designated critically eroded beach (R78-R98) that includes unincorporated Seagrove Beach. Critical erosion along 3.1-miles of Seagrove Beach (R82-R98) threatens development. Along the western 4,000 ft, the developments of Water Color, with all of its development behind the CCCL, and Seaside, with most of its development behind the CCCL, have been added to the Seagrove Beach segment for continuity of management of the coastal system following federal project authorization. Assisted recovery of the beach and dune system within the most eroded developed areas was conducted following Hurricanes Opal and Georges. This area was also heavily impacted by Hurricane Ivan in 2004.

Seacrest Beach to Inlet Beach (Reach 5) is a 4.2 mile segment of designated critically eroded beach (R105.5-R127.4) that includes unincorporated Seacrest Beach, a 1.8-mile segment (R105.5-R114.7) where development is threatened by erosion of the bluff. To the east at Inlet Beach is a 1.0-mile segment (R122-R127) that includes a portion where development is threatened by erosion between R122 and R124 and another portion between R124 and R127 that was designated critical for the design integrity of the beach restoration project. Between R114.7 and R122 is a 1.4-mile gap between threatened areas where nearly all of the development is completely landward of the CCCL. This area and a 400-foot segment at the east end where there is currently no development seaward of the CCCL, were added for continuity of management of the coastal system following federal project authorization.

Assisted recovery of the beach and dune system within the most eroded developed areas was conducted following Hurricanes Opal and Georges. Following the impact of Hurricane Ivan in 2004, emergency

protective berms were constructed using funds from FEMA; a dune restoration project was also completed in 2005 to supplement the emergency protective berms with additional sand and vegetation. The portion of beach between R114.7 and R122 and between R124 and R127.4 were designated critical for the continuity of management of the Walton County Hurricane and Storm Damage Reduction Project.

Strategy: Facilitate completion of the federal design and permitting activities for the Walton County Hurricane and Storm Damage Reduction Project; construct a beach restoration project with appropriately designed dune tapers to allow continuance of outlet flows at coastal dune lakes. Maintain project through nourishment and monitoring.

REGIONAL STRATEGIES FOR BEACH AND INLET MANAGEMENT

SPONSORS AND FUNDING

This subregion contains the governmental entities of [Walton County](#) and the [USACE](#), which are both participants with FDEP as sponsors of beach management projects. [FDEP's Division of Recreation and Parks](#) manages coastal property at Topsail Hill Preserve State Park, Deer Lake State Park, and Grayton Beach State Park. Project cost estimates and schedules may be found in [FDEP's Beach Management Funding Assistance Program](#) - Long Range Budget Plan. The Restoration of Florida's [Coastal Dune Lakes](#) Project was selected for implementation in 2014 by the [National Fish and Wildlife Foundation \(NFWF\)](#).

PROJECT COORDINATION

Regionalization is the funding and coordination of multiple nourishment and inlet management activities to take advantage of identifiable cost savings through economies of scale, reduced equipment mobilization and demobilization costs, and elimination of duplicative administrative tasks. Opportunities in this subregion include coupling the contracting of beach and dune nourishment in Okaloosa County, including Destin, and Walton County in order to reduce equipment mobilization costs.

ENVIRONMENTAL PROTECTION

The protection of marine turtles, beach mice and shorebirds and their habitat are primary environmental concerns within this subregion. Beach nourishment activities must mitigate the potential for closure or

redirection of the freshwater lake flushing outlets to avoid potential flooding and scour of upland property, dune erosion and impacts to water quality in the lakes. The timing of construction activities has been restricted during the marine turtle nesting season of May 1 through October 31. Project design and method of construction are restricted to avoid or minimize adverse impacts to the federally and state-listed species and their habitats.

SAND SOURCES

Offshore sand sources sufficient to meet the expected needs of future projects in this subregion over the next 50 years have been identified. Some upland dredged material storage sites adjacent to the Intracoastal Waterway may contain potentially usable beach quality sand. Most of these upland sites are located in Bay and Gulf Counties and would have to be transported by barge or truck. For additional information on sand sources, FDEP manages a database named the [Regional Offshore Sand Source Inventory \(ROSSI\)](#).

INNOVATIVE PROJECTS

A porous (net) groin system was installed as an experiment on Inlet Beach in November 2004 in an attempt to restore the beach. The groins were removed at the end of April 2005. Independent performance evaluation determined that the project was a failure in accordance with the expected performance of the project (Wang, 2006).

ADDITIONAL INFORMATION

The introduction at the beginning of the state's Strategic Beach Management Plan provides additional information including overviews of:

- The principals followed to help guide the state's management strategies
- The miles of critically eroded beaches under active management
- Statewide sand source studies
- Statewide monitoring programs
- Innovative technologies examined
- Basic suggestions for emergency response plans

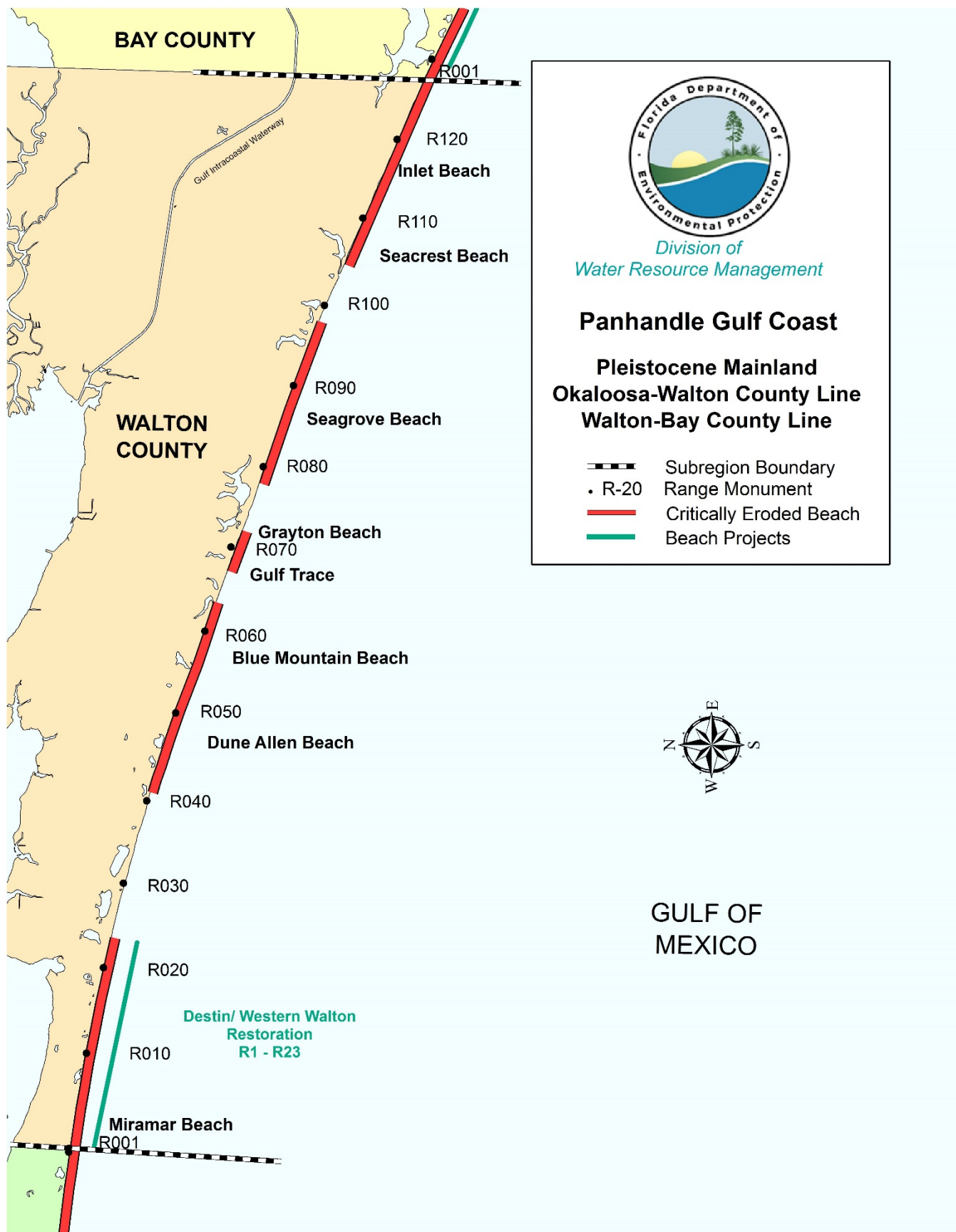


Figure 2. Pleistocene Mainland subregion of the Panhandle region of Florida.

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ST. ANDREWS REACH

There are 19.8 miles of beaches in the **St. Andrews Reach** subregion, which extends from the Walton - Bay County line (R00A) to Shell Island just east of St. Andrews Inlet (R105) in Bay County, as shown on Figure 3. There are 18.6 miles of critically eroded beaches in this subregion, of which 18.6 have been restored and maintained.

Erosion is attributed to tropical storms, hurricanes and the effects of St. Andrews Inlet. The most erosive storms in recent years were Hurricane Eloise (1975), Hurricane Kate (1985), Hurricane Opal (1995), Hurricanes Earl and Georges (1998), Hurricane Ivan (2004), and Hurricanes Dennis and Katrina (2005).

In 1995, Hurricane Opal caused extensive erosion throughout the coast of northwest Florida. Opal severely impacted the Panama City beaches, eroding an estimated 2.9 million cy of sand above mean high water. The emergency program of assisted recovery of the beach and dune system using federal and state disaster funds was not conducted in this area. Instead, design and construction of a beach and dune restoration project was accelerated using state and local funds to build the federally authorized project on a reimbursement basis. Post-storm repair of the beach and dunes of St. Andrews State Park and along Spyglass Drive used maintenance dredged material from St. Andrews Inlet. The beach restoration project was under construction when Hurricanes Earl and Georges impacted the area in September, 1998. Additional fill sand was needed to compensate for erosion losses in the western part of the project area that was not yet restored. The restored beaches in the eastern part of the project performed well and did not require additional sand.

Hurricanes Ivan (2004) and Dennis (2005) caused storm tide and erosion conditions comparable to those of Opal. A reported 2.5 million cy of sand were eroded in the project area above the -20 ft contour due to Ivan. Post 2005 hurricane season surveys of the project show erosion losses of 2.96 million cy above the -18 ft contour. Most of this loss is attributed to Dennis and some (possibly as much as 20 percent) may be attributed to Hurricane Katrina.

STRATEGIES FOR INLETS AND CRITICALLY ERODED BEACHES

PANAMA CITY BEACHES, BAY COUNTY, R1-R97

This is an 18.6 mile segment of critically eroded beach, which includes the Panama City Beaches and St. Andrews State Park. The federal **Panama City Beaches Shore Protection Project** (R0.5-R92) extends from just east of the Walton-Bay County line eastward to the boundary of St. Andrews State Park, and the project history for this segment of shoreline is described in Table 1. The project is authorized until 2048, with the Pinnacle Port and Carillon Beach portion authorized until 2061. Beach restoration was completed in 1999 along 17.7 miles of beach between R1 and the pier at St. Andrews State Park (R93) using 9,115,000 cy of sand obtained from multiple offshore borrow areas. The project was constructed on a federal reimbursement basis. The planned interval between beach nourishment events is 5 years. As a result of the erosion caused by Hurricane Ivan, the scheduled nourishment of the Panama City Beaches Shore Protection Project was accelerated and construction was completed by the Corps with emergency funds in March 2006. The project involved placement of approximately 3,265,000 cy of sand along a 16.7 mile project shoreline between R4.5 and R92, using sand from seven offshore borrow areas. A dune restoration project involving the placement of approximately 17,000 cy of truck-hauled sand, obtained from an approved upland source, along a one mile segment of Carillon Beach and Pinnacle Port (R1-R5) was completed in May 2006 using state, local and FEMA funds.

The initial federal restoration of Pinnacle Port and Carillon Beach project was completed in December, 2011, using 453,260 cy of sand from two offshore borrow areas, located approximately 3.5 miles offshore of Panama City Beach. The Western Reach, or Reach B (R5.5 – R29) was nourished with 636,234 cy. The Eastern Reach, Reach C (R81-R92) was nourished with 281,142 cy of material. The total volume for this 2011 beach nourishment project was 1,370,000 cy. Bay County received a new State permit in 2013 for the shore protection project and is scheduled to construct again in 2016/17.

Table 1. Panama City Beaches Shore Protection Project History.

Year	Volume (CY)	Sand Source	Placement Location	Length (Mi.)
1999	9,115,000	Borrow Sites I, II, III, V, VI, VII and VIII	R1-R93	17.7 miles
2006	3,265,000	Borrow Sites I, III, VII, IX, 5c and 10	R5-R93	16.7 miles
2006	17,000	Upland	R1-R5	1.0 mile
2011	1,370,000	Borrow Sites 02 and 03	R0.5-R5, R5.5-R29, R81-R92	1 mile, 4.5 miles, 2.0 miles

Strategy: Maintain the project through monitoring and nourishment.

ST. ANDREWS INLET, BAY COUNTY, R97-R98

St. Andrews Inlet includes the federal **Panama City Harbor Navigation Project** that is periodically maintained for navigation to the Port of Panama City. Beach compatible dredge material is deposited on beach and littoral areas along St. Andrews State Park and the Gator Lake beach placement area. The inlet was cut through the coastal barrier in 1934 and jetties were constructed. Maintenance dredging has been conducted every 18 to 24 months. Dredged material has been placed on the downdrift beach west of the inlet in 1972, 1982, and for all maintenance events since 1984. Previously, dredged material was placed in an offshore disposal area, which was later used as a borrow area for the beach restoration project completed in 1999. A harbor deepening project was conducted in 2000; this material was placed in nearshore areas along the Gulf beach of St. Andrews State Park.

Maintenance dredged material has also been placed along the west inlet shoreline to protect the state park shoreline at Gator Lake. Additionally, material dredged from the federal navigation channel in Grand Lagoon has been placed on the state park inlet shoreline at Gator Lake. An inlet management study was completed in 2000. This area includes a 0.2-mile segment of critically eroded inlet shoreline on the west side of St. Andrews Inlet fronting Gator Lake. A harbor deepening project was conducted in 2000; this material was placed in nearshore areas along the Gulf beach of St. Andrews State Park. A feasibility study was conducted of management alternatives for stabilizing the west inlet shoreline that would meet the Florida Park Service's objectives for land use while enabling the bypassing of more

dredged material to downdrift Gulf beaches. The study recommended construction of four detached segmented breakwaters as a means to provide protection to the shoreline fronting Gator Lake and construction is expected in February 2015. The four proposed 100 foot long stone mound breakwaters will be spaced 50 ft apart, have crest widths of 5 ft, and crest elevations of +4 ft Mean Low Lower Water (MLLW). The Florida Park Service is also considering construction of a terminal groin to prevent sand from migrating back into the Grand Lagoon channel. Construction for the terminal groin is planned for 2015/ 2016. Maintenance dredging occurred in 2015, with 47,000 cy of material placed at Gator Lake and 130,000 cy of material placed at the State Park Gulf beach.

Strategy: Bypass beach compatible material from maintenance dredging to the downdrift shoreline west of the inlet; continue to maintain the west inlet shoreline protecting Gator Lake with placement of dredged material from the inlet interior channel; construct breakwaters and terminal groin to limit the need for placing material at the Gator Lake shoreline in the future; conduct a comprehensive inlet monitoring program of topographic and bathymetric surveys to validate or refine the sediment budget.

REGIONAL STRATEGIES FOR BEACH AND INLET MANAGEMENT

SPONSORS AND FUNDING

This subregion contains the governmental entities of [Bay County](#), the city of Panama City Beach and the [USACE](#). The [Bay County Tourist Development Council](#) is the local sponsor of the federal beach restoration project. [FDEP's Division of Recreation and Parks](#) manages coastal property at St. Andrews State Park. Project cost estimates and schedules may be found in [FDEP's Beach Management Funding Assistance Program](#) - Long Range Budget Plan.

PROJECT COORDINATION

Regionalization is the funding and coordination of multiple nourishment and inlet management activities to take advantage of identifiable cost savings through economies of scale, reduced equipment mobilization and demobilization costs, and elimination of duplicative administrative tasks. Opportunities in this subregion include coordinating the maintenance of the eastern end of the restoration project with the maintenance dredging of the Panama City Harbor Navigation Project and the federal Grand Lagoon navigational channel.

ENVIRONMENTAL PROTECTION

The protection of marine turtles, beach mice, Gulf sturgeon, seagrasses, and shorebirds and their habitat are primary environmental concerns within this subregion. The timing of construction activities has been restricted during the marine turtle nesting season of May 1 through October 31. Project design and method of construction are restricted to avoid or minimize adverse impacts to the federally and state-listed species and their habitats. St. Andrews State Park and Inlet are located within the boundaries of the [St. Andrews State Park Aquatic Preserve](#). Projects located within and near the aquatic preserve boundaries require additional protection, including stricter water quality standards than in non-aquatic preserve waters, during permitting and construction to ensure preservation of the existing conditions.

SAND SOURCES

Bay County fully investigated and identified a new sand source offshore from Shell Island. The borrow area contains approximately 3.5 million cy of sand for the federal shore protection project.

Approximately 3 million cy are available in borrow areas O2, O3, 5c, 11, and S-1. These borrow areas have been previously approved or fully investigated for permitting. Bay County obtained a new multi-use beach nourishment permit in 2013 for these borrow areas in order to complete both regularly scheduled and emergency storm loss and/or hot spot nourishment project(s) over the next 15 years.

Offshore sand sources sufficient to meet the expected needs of future projects in this subregion over the next 15 years have been identified. Some upland dredged material storage sites adjacent to the Intracoastal Waterway may contain potentially usable beach quality sand. Most of these upland sites are located in Bay and Gulf Counties and would have to be transported by barge or truck. For additional information on sand sources, FDEP manages a database named the [Regional Offshore Sand Source Inventory \(ROSSI\)](#).

ADDITIONAL INFORMATION

The introduction at the beginning of the state's Strategic Beach Management Plan provides additional information including overviews of:

- The principals followed to help guide the state's management strategies
- The miles of critically eroded beaches under active management
- Statewide sand source studies

- Statewide monitoring programs
- Innovative technologies examined
- Basic suggestions for emergency response plans

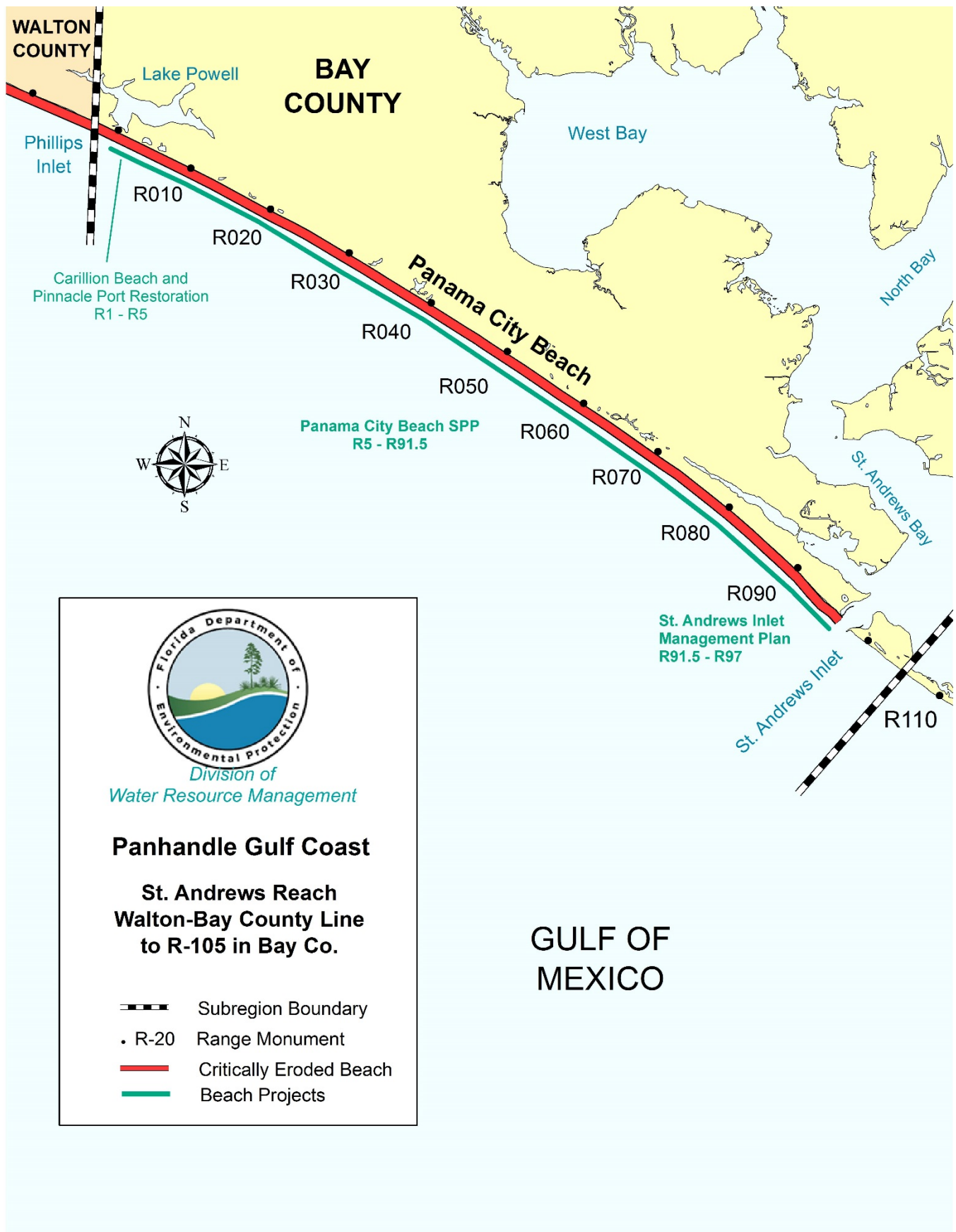


Figure 3. The St. Andrews Reach subregion of the Panhandle region of Florida.

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MIDDLE BARRIERS

There are 29.5 miles of beaches in the **Middle Barriers** subregion, which extends from east of St. Andrews Inlet (R105) in Bay County eastward through the Gulf fronting mainland beaches (R31) in Gulf County, as shown on Figure 4. There are a total of 0.9 mile of critically eroded beaches in this subregion, none of which have been restored and maintained.

Erosion is attributed to tropical storms, hurricanes, and the effect of the inlets including St. Andrews inlet, St. Andrews Sound East Entrance (East Pass or Old Pass), Eloise Inlet, and Mexico Beach Inlet. The most erosive storms in recent years were Hurricane Eloise (1975), Hurricanes Elena and Kate (1985), Hurricane Opal (1995), Hurricane Earl (1998), Hurricane Ivan (2004), and Hurricane Dennis (2005).

In 1995, Hurricane Opal caused extensive erosion throughout the coast of northwest Florida, including all the beaches of the Middle Barriers subregion. Using federal and state disaster funds, a program of assisted recovery of the beach and dune system was conducted in Mexico Beach where upland developed property was left vulnerable to storms. Sand was trucked from upland borrow sites, placed in an alongshore berm configuration, and stabilized with wood slat sand fence and plantings of sea oats. However, the beach and dunes had not fully recovered when Hurricane Earl made landfall in this subregion and impacted the area in 1998 causing additional damage that required a second phase of assisted recovery of the most eroded developed areas.

Hurricanes Ivan (2004) and Dennis (2005) inflicted severe beach and dune erosion with substantial sand overwash along Shell Island and the Crooked Island barrier complex. Ivan also caused seven breaches in the Crooked Island complex; all but one breach closed prior to Dennis. Following Dennis, the entrance to Mexico Beach Inlet was completely shoaled and essentially closed.

STRATEGIES FOR INLETS AND CRITICALLY ERODED BEACHES

ELOISE INLET, BAY COUNTY

Crooked Island was breached in 1975 by Hurricane Eloise. The inlet was hydraulically stable and grew to its current size.

MEXICO BEACH INLET, BAY COUNTY

In response to recommendations from the feasibility study of 2008, the City proposed a modified bypassing protocol to truck bypassed material from stock piles at the two discharge points and place the material along the designated critical erosion area to the east; however, the City withdrew the application. The estimated gross quantity of beach sand reaching the updrift boundary of the west inlet jetty or inlet channel is 86,700 cy. An inlet management plan has not been adopted and no bypassing objective has been established; however, a target annual bypassing quantity of 32,400 cy has been adopted with the authorized bypassing project for the City.

Strategy: Continue the authorized sand bypassing project by excavating sand from the beach west of the inlet, from the ebb shoal at the inlet entrance, and from the channel within the inlet, and by transferring the material to the downdrift shoreline east of the inlet through the authorized discharge points.

Continue to monitor the dredge records of the authorized bypassing project to achieve a target annual bypassing quantity of 32,400 cy. Replace, sand-tighten, and extend the east jetty to a point comparable with the west jetty.

MEXICO BEACH, BAY COUNTY, R132-R137.8

This is a 0.9 mile segment of critically eroded beach within the City of Mexico Beach located nearly a mile east of Mexico Beach Inlet. Assisted recovery of the beach and dune system within the most eroded developed areas was conducted following Hurricanes Opal, Earl, Ivan, and Dennis. Following the impact of Ivan, emergency protective berms were constructed using funds from FEMA. A feasibility study sponsored by FDEP and the City of Mexico Beach was conducted in 2008. This study recommended increasing the sand bypassing at the inlet, constructing a beach restoration project in the critical erosion area, and modifying the bypassing protocol following an additional feasibility investigation. Additional nourishment and protective measures are needed including the construction of a beach berm, sand fence, vegetative plantings, and a truck haul bypass system that would utilize some of the sand bypass excavated material from west of the inlet on Crooked Island and haul it via truck to the critically eroded area. The truck haul bypass system was recommended by FDEP. The City submitted an application for the truck haul project to FDEP in March of 2010. However, the City did not have the funding to complete the permitting requirements. The permit application was withdrawn in May of 2012.

Strategy: Modify the inlet sand bypassing protocol to implement a truck haul beach nourishment project; install sand fencing and dune vegetation. Coordinate with the Port of Port St. Joe and Mobile District of the USACE to obtain future beach quality maintenance dredge material from the federal navigation channel in St. Joseph Bay.

REGIONAL STRATEGIES FOR BEACH AND INLET MANAGEMENT

SPONSORS AND FUNDING

This subregion contains the governmental entities of [Bay County](#), [Gulf County](#), the [City of Mexico Beach](#) and the [USACE](#). A part of Shell Island is included in the St. Andrews State Park. Tyndall Air Force Base includes part of Shell Island, the entire Crooked Island complex, and the mainland coast to Mexico Beach Inlet. Project cost estimates and schedules may be found in [FDEP's Beach Management Funding Assistance Program](#) - Long Range Budget Plan.

PROJECT COORDINATION

Regionalization is the funding and coordination of multiple nourishment and inlet management activities to take advantage of identifiable cost savings through economies of scale, reduced equipment mobilization and demobilization costs, and elimination of duplicative administrative tasks. An opportunity to obtain beach quality sand should be investigated when the federal navigational channel leading to Port St. Joe needs maintenance dredging.

ENVIRONMENTAL PROTECTION

The protection of marine turtles, beach mice, Gulf sturgeon and shorebirds and their habitat are primary environmental concerns within this subregion. The timing of construction activities has not been restricted during the marine turtle nesting season of May 1 through October 31. Project design and method of construction are restricted to avoid or minimize adverse impacts to the federally and state listed species and their habitats.

SAND SOURCES

Sand sources sufficient to meet the expected needs of future projects in this subregion over the next 15 years have not been identified. Sand sources are available in and outside of the federal channel. Some upland dredged material storage sites adjacent to the Intracoastal Waterway also contain small quantities

of usable beach quality sand. Most of this material is located in Bay and Gulf Counties and would have to be transported by barge or truck. For additional information on sand sources, FDEP manages a database titled the [Regional Offshore Sand Source Inventory \(ROSSI\)](#).

ADDITIONAL INFORMATION

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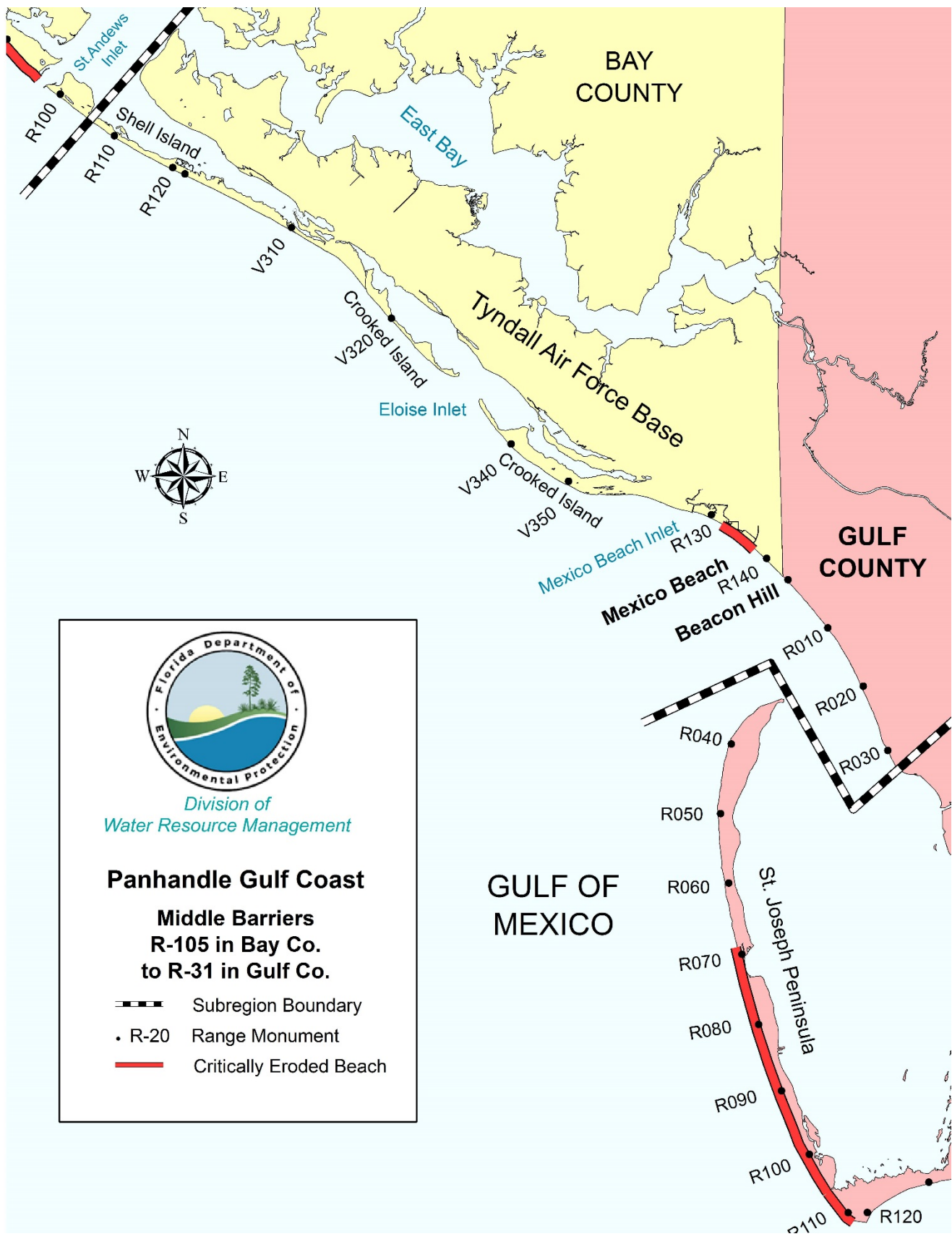


Figure 4. The Middle Barriers subregion of the Panhandle region of Florida.

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SAN BLAS REALIGNMENT

There are 21.2 miles of beaches in the **San Blas Realignment** subregion, which extends from the entrance to St. Joseph Bay and along St. Joseph Peninsula and Cape San Blas to R141 near Money Bayou in Gulf County, as shown on Figure 5. There are 8.3 miles of critically eroded beaches in this subregion, of which 7.3 miles have been restored. Erosion is attributed to tropical storms and hurricanes, and to natural geomorphic changes caused by the pattern of littoral transport of sand in this area.

The most erosive storms in recent years were Hurricane Eloise (1975), Hurricanes Elena and Kate (1985), Tropical Storm Beryl (1994), Hurricane Opal (1995), Hurricane Earl (1998), Tropical Storm Helene (2000), Tropical Storm Isidore (2002), Tropical Storm Bonnie and Hurricane Ivan (2004), Tropical Storm Arlene (2005), Hurricanes Dennis and Katrina (2005) and Hurricane Gustav (2008).

In October 1995, Hurricane Opal caused extensive erosion throughout northwest Florida. Using federal and state disaster funds, a program of assisted recovery of the beach and dune system was conducted to provide temporary storm protection to upland developed property left vulnerable to storms. Sand was trucked from upland borrow sites, placed in an alongshore berm configuration, and stabilized with wood slat sand fence and plantings of sea oats. However, the beach and dunes had not fully recovered when Hurricane Georges impacted the area in 1998 causing additional damage that required a second phase of assisted recovery of the most eroded developed areas.

In 2004, Hurricane Ivan caused significant erosion in this subregion. In 2005, Hurricanes Dennis, Katrina, and Rita exacerbated erosion conditions throughout northwest Florida. As is described below, recovery efforts similar to those implemented after Opal are planned and underway in each area.

STRATEGIES FOR INLETS AND CRITICALLY ERODED BEACHES

ST. JOSEPH BAY ENTRANCE CHANNEL, GULF COUNTY

The St. Joseph Bay Entrance Channel is part of the federal **Port St. Joe Harbor Navigation Project**. The project was completed to the authorized channel depth of -37 ft MLW in 1962. Maintenance dredged material was placed in open water sites in the bay or Gulf, except in 1970, 1973, and 1986, when dredged material was placed on the north end or Gulf shoreline of St. Joseph Peninsula. The authorized channel depth has not been maintained since 1986.

Strategy: Place all beach compatible navigation channel dredged material on adjacent eroding beaches pursuant to Section 161.142, F.S. The nearest critically eroded beaches are Mexico Beach and St. Joseph Peninsula.

ST. JOSEPH PENINSULA, GULF COUNTY, R69-R106

This is a 7.2 mile segment of critically eroded beach along the shoreline of St. Joseph Peninsula. Assisted recovery of the beach and dune system within the most eroded developed areas was conducted following Hurricanes Opal and Earl. Following the 2004 hurricane season, emergency protective berms were constructed using funds from FEMA; a dune restoration project was also completed in 2005 to supplement the emergency protective berms with additional sand and vegetation. A sand source investigation and feasibility study for this area were completed in 2006. In 2009 Gulf County completed construction of the **St. Joseph Peninsula Beach Restoration Project** from R67 to R105.5 using 3,600,000 cy of sand from an offshore sand source. The next nourishment is planned for 2016. A feasibility study is being conducted to evaluate the use of shore-protection structures to reduce sand losses at the eroding south end of the project.

Strategy: Maintain the project through monitoring and nourishment. Complete the feasibility study of constructing structures at the southern end of the project to reduce the erosion rate and increase the performance of the beach fill project. Evaluate the feasibility of transferring beach quality sand dredged from the Port St. Joe federal navigation channel to the south end of the project.

CAPE SAN BLAS, GULF COUNTY, R106-R111.5

This is a 1.1 mile segment of critically eroded beach along Cape San Blas that includes the Stump Hole area. A segment of County Road 30E at Stump Hole was destroyed by Hurricane Opal. A non-conforming rock mound structure was constructed to protect the reconstructed access road; this was overtopped and the road was damaged during Hurricane Earl (1998). The rock mound structure was also damaged by Hurricane Ivan (2004) and Dennis (2005). Following the effects of the 2004 hurricane season, emergency protective berms were constructed using funds from FEMA; a dune restoration project was also completed in 2005 to supplement the emergency protective berms with additional sand and vegetation. Following the impact of each hurricane, Eglin AFB removed damaged and threatened buildings. Eglin AFB has now abandoned all facilities and infrastructure threatened by erosion. In addition, the Cape San Blas lighthouse was relocated inland to the City of Port St. Joe.

In 2012 and 2013, a 1,550-foot long boulder mound structure designed for up to a 50-year storm event was constructed by Gulf County to protect County Road C30E at Stump Hole (R105-R107) between St. Joseph Peninsula and Cape San Blas.

Strategy: Monitor.

REGIONAL STRATEGIES FOR BEACH AND INLET MANAGEMENT

SPONSORS AND FUNDING

This subregion contains the governmental entities of [Gulf County](#), [Florida Department of Transportation](#) and the [USACE](#). In addition, the northern portion of St. Joseph Peninsula is a state park managed by the [FDEP's Division of Recreation and Parks](#) and the Cape San Blas area is U.S. Air Force property. Project cost estimates and schedules may be found in [FDEP's Beach Management Funding Assistance Program](#) - Long Range Budget Plan.

PROJECT COORDINATION

Regionalization is the funding and coordination of multiple nourishment and inlet management activities to take advantage of identifiable cost savings through economies of scale, reduced equipment mobilization and demobilization costs, and elimination of duplicative administrative tasks. An opportunity for regionalization using beach compatible sand may occur if the federal navigational channel is maintenance dredged in the future.

ENVIRONMENTAL PROTECTION

The protection of marine turtles, beach mice, Gulf sturgeon and shorebirds and their habitat are primary environmental concerns within this subregion. The Cape San Blas beach has been designated as critical habitat for the threatened Piping Plover by the United States Fish and Wildlife Service. The timing of post-storm recovery activities was restricted during the marine turtle nesting season of May 1 through October 31. Project design and method of construction may be restricted to avoid or minimize adverse impacts to the listed species and their habitat. The [St. Joseph Bay Aquatic Preserve](#) is located near many of the critically eroded areas listed in this subregion. Projects located within and near the aquatic preserve boundaries require additional protection, including more stringent water quality standards than in non-aquatic preserve waters, during permitting and construction to ensure preservation of the existing conditions.

SAND SOURCES

As of this time, offshore sand sources are not sufficient to meet the needs of the next beach nourishment have been identified in 2016 or for future projects beyond the next 15 years. Offshore sand sources sufficient to meet the expected needs of future projects beyond the next nourishment of this subregion for the next 15 years have not been identified. Conduct offshore sand searches for the next nourishment and future needs of the beach nourishment projects. Evaluate the feasibility of transferring beach quality sand dredged from the Port St. Joe federal navigation channel to the south end of the project or an identified offshore borrow area. Continue to coordinate with Gulf County, Port St. Joe Port Authority and the USACE on joint venture opportunities in the beneficial use of dredge material for beach nourishment. For additional information on sand sources, FDEP manages a database named the [Regional Offshore Sand Source Inventory \(ROSSI\)](#).

ADDITIONAL INFORMATION

The introduction at the beginning of the state’s Strategic Beach Management Plan provides additional information including overviews of:

- The principals followed to help guide the state’s management strategies
- The miles of critically eroded beaches under active management
- Statewide sand source studies
- Statewide monitoring programs
- Innovative technologies examined
- Basic suggestions for emergency response plans

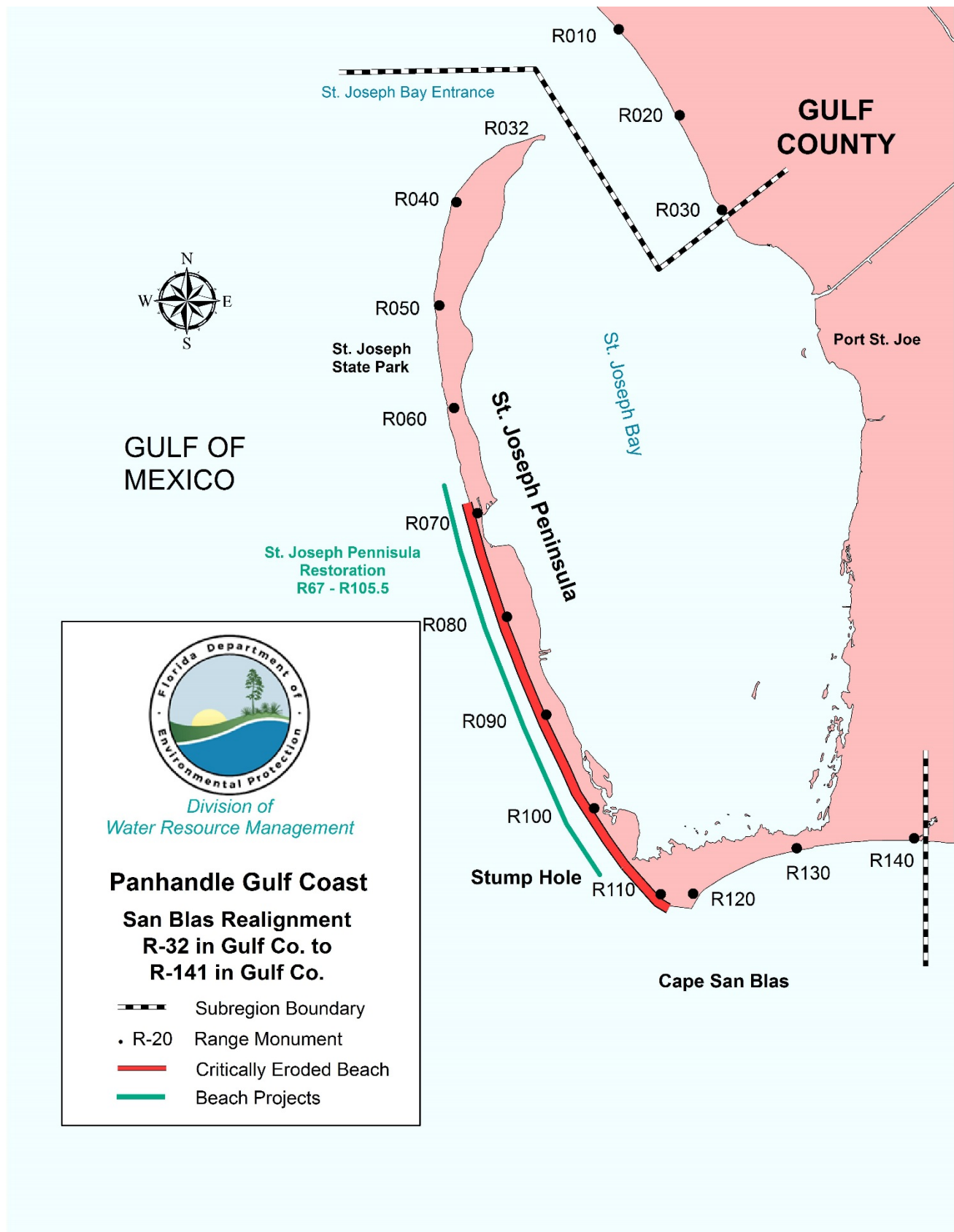


Figure 5. The San Blas Realignment subregion of the Panhandle region of Florida.

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APALACHICOLA BARRIERS

There are 51 miles of beaches in the **Apalachicola Barriers** subregion, which extends from R141 near Money Bayou in Gulf County to Turkey Point in Franklin County, as shown on Figure 6. There are 11.1 miles of critically eroded beaches in this subregion, none of which have been restored.

Erosion is attributed to tropical storms, hurricanes and the effects of inlets including Indian Pass, West Pass, Sikes Cut and East Pass. Erosion is also attributable to natural geomorphic changes caused by the pattern of littoral transport of sand in this subregion. The most erosive storms in recent years were Hurricane Agnes (1972), Hurricanes Elena and Kate (1985), an extratropical storm in October 1992, Tropical Storm Beryl (1994), Hurricane Opal (1995), Hurricane Earl (1998), Hurricane Dennis (2005) and Hurricane Gustav (2008).

In 1995, Hurricane Opal caused extensive erosion throughout northwest Florida, but only had a distant fringe impact on this subregion. In 2005, Hurricane Dennis caused major beach and dune erosion throughout this subregion, resulting in 7.4 additional miles of beach being designated as critically eroded. During the spring and summer of 2006, dunes were restored along 4.2 miles of St. George Island State Park shoreline (R106-R128.5).

STRATEGIES FOR INLETS AND CRITICALLY ERODED BEACHES

INDIAN PASS, GULF COUNTY, R160-VI

Indian Pass is a natural inlet between Indian Peninsula and St. Vincent Island. The inlet is historically stable.

ST. VINCENT ISLAND, FRANKLIN COUNTY, V34-V39

This is a 0.9 mile segment of critically eroded beach on eastern St. Vincent Island near Sambur Slough. This segment is in the St. Vincent National Wildlife Refuge managed by the U.S. Fish and Wildlife Service. The beach has been substantially lost as the shoreline has eroded into the maritime forest.

Strategy: Monitor with vertically controlled aerial photography.

WEST PASS, FRANKLIN COUNTY, V42-R1

West Pass, between St. Vincent Island and Cape St. George, was occasionally maintenance dredged between 1900 and 1948 with offshore disposal. Maintenance dredging was discontinued when Sikes Cut was constructed in 1954.

CAPE ST. GEORGE, FRANKLIN COUNTY, R18.5-R22.5

This is a 0.6 mile segment of critically eroded beach on Cape St. George, managed by FDEP's Florida Coastal Office as part of the Apalachicola Bay National Estuarine Research Reserve. The historic pre-Civil War lighthouse built in 1852 was in the nearshore after Hurricane Dennis (2005); however, with the increased scour from Dennis and subsequent minor storms, the lighthouse finally toppled into the Gulf of Mexico on October 21, 2005. The lighthouse was subsequently rebuilt on St. George Island in 2008 at the county park near R84. Also threatened is marine turtle habitat just west (R18-R21) of the former lighthouse site where the beach has eroded and become narrow.

Strategy: Monitor with vertically controlled aerial photography and physical surveys.

BOB SIKES CUT, FRANKLIN COUNTY, R51-52

Bob Sikes Cut, a federally owned inlet with a federally maintained navigation channel extending from Apalachicola to the Gulf of Mexico, was dredged by local interests in 1954. The **Apalachicola Bay Navigation Project** was authorized by Congress in 1952 and included opening the new inlet. The new inlet was named Bob Sikes Cut on May 10, 1955, by the Florida Senate after the late U.S. Congressman. Due to rapid shoaling, in the entrance channel, two granite jetties were constructed in 1956, extending approximately 500 ft into the Gulf beyond the beach. Between 1958 and 1975, 691,940 cy of material was dredged (approximately 40,000 cy/yr.); however, the quantity of beach placement is unknown. Since 1975, maintenance dredging of Bob Sikes Cut has occurred on an infrequent basis with dredged material placed on the inlet shorelines and within a nearshore disposal site or on the beach west of the inlet. Hurricane Dennis (2005) severely impacted the inlet through shoaling and by breaching the east and west jetties from their connecting shorelines. These same breaches occurred during Hurricanes Elena and Kate in 1985. During an emergency project, the Corps dredged the inlet and used the material to close the breaches in 2005. In 2006 a similar emergency project was completed to maintain the navigable depth. FDEP has not adopted an inlet management plan for Bob Sikes Cut.

Strategy: Bypass all beach quality maintenance dredged material to the west.

ST. GEORGE ISLAND, FRANKLIN COUNTY, R106-R128.5

This is a 4.5 mile segment of critically eroded beach along the eastern Gulf shoreline of St. George Island within the state park. Assisted recovery of the dune system within the most eroded areas was conducted following Hurricanes Elena, Kate, Opal, and Earl. In 1986 and 1996, the park road was reconstructed following damages caused by Hurricanes Elena and Kate (1985) and Opal (1995). Following Opal, a portion of the roadway (from R110-R127.6) was relocated 200 to 400 ft landward, where access around wetland areas was available. Hurricane Dennis (2005) severely impacted St. George Island State Park, resulting in the entire developed segment of the park shoreline being designated critically eroded. From July 2005 through the summer of 2006, park restoration proceeded including repairing the roads and beach accesses, reconstructing a barrier dune system seaward of the road, and reconstructing park buildings further inland from the beach. In September, 2008, Hurricane Gustav inflicted major beach and dune erosion between R114 (East Slough) and R129 (Sugar Hill) causing a retreat of 45 to 75 ft of the vegetation line and a loss of 100-150,000 cy of material from the beach berm and dune.

Strategy: Conduct dune restoration when necessary following storms; monitor with vertically controlled aerial photography and physical surveys.

EAST PASS, FRANKLIN COUNTY, R149-151

East Pass is a two mile wide natural inlet between St. George Island and Dog Island. The federal **Carrabelle Harbor Navigation Project** passes through East Pass close to the west end of Dog Island. The authorized channel has not been dredged because natural prevailing depths are adequate for vessels currently using Carrabelle Harbor.

DOG ISLAND, FRANKLIN COUNTY, R168-R187.2

This is a 3.6 mile segment of critically eroded beach along the eastern Gulf shoreline of Dog Island. Dog Island has been severely eroded by all the major storms affecting Franklin County. In 2005, Hurricane Dennis severely impacted Dog Island, resulting in 2.3 additional miles of beach being designated as critically eroded.

Strategy: Monitor with vertically controlled aerial photography and physical surveys.

REGIONAL STRATEGIES FOR BEACH AND INLET MANAGEMENT

SPONSORS AND FUNDING

This subregion contains the governmental entities of [Gulf County](#), [Franklin County](#), and the [USACE](#). [St. Vincent Island](#) is a national wildlife refuge, Little St. George Island is a state preserve, and the eastern portion of [St. George Island](#) is a state park. Project cost estimates and schedules may be found in [FDEP's Beach Management Funding Assistance Program](#) - Long Range Budget Plan.

PROJECT COORDINATION

Regionalization is the funding and coordination of multiple nourishment and inlet management activities to take advantage of identifiable cost savings through economies of scale, reduced equipment mobilization and demobilization costs, and elimination of duplicative administrative tasks. Opportunities in this subregion include this area being an appropriate candidate for placement of sand transferred from dredged material management areas on the Apalachicola River.

ENVIRONMENTAL PROTECTION

The protection of marine turtles, seagrass, Gulf sturgeon and shorebirds and their habitat are primary environmental concerns within this subregion. The timing of post-storm recovery activities was restricted during the marine turtle nesting season of May 1 through October 31. Project design and method of construction are restricted to avoid or minimize adverse impacts to the state and federally listed species and their habitats. The [St. Joseph Bay Aquatic Preserve](#), the [Apalachicola Bay Aquatic Preserve](#) and [Apalachicola National Estuarine Research Reserve](#) are located near many of the critically eroded areas listed in this subregion. Projects located within and near the aquatic preserve boundaries require additional protection, including stricter water quality standards than in non-aquatic preserve waters, during permitting and construction to ensure preservation of the existing conditions.

SAND SOURCES

Conduct sand searches for storm recovery work. For additional information on sand sources, FDEP manages a database named the [Regional Offshore Sand Source Inventory \(ROSSI\)](#).

ADDITIONAL INFORMATION

The introduction at the beginning of the state’s Strategic Beach Management Plan provides additional information including overviews of:

- The principals followed to help guide the state’s management strategies
- The miles of critically eroded beaches under active management
- Statewide sand source studies
- Statewide monitoring programs
- Innovative technologies examined
- Basic suggestions for emergency response plans

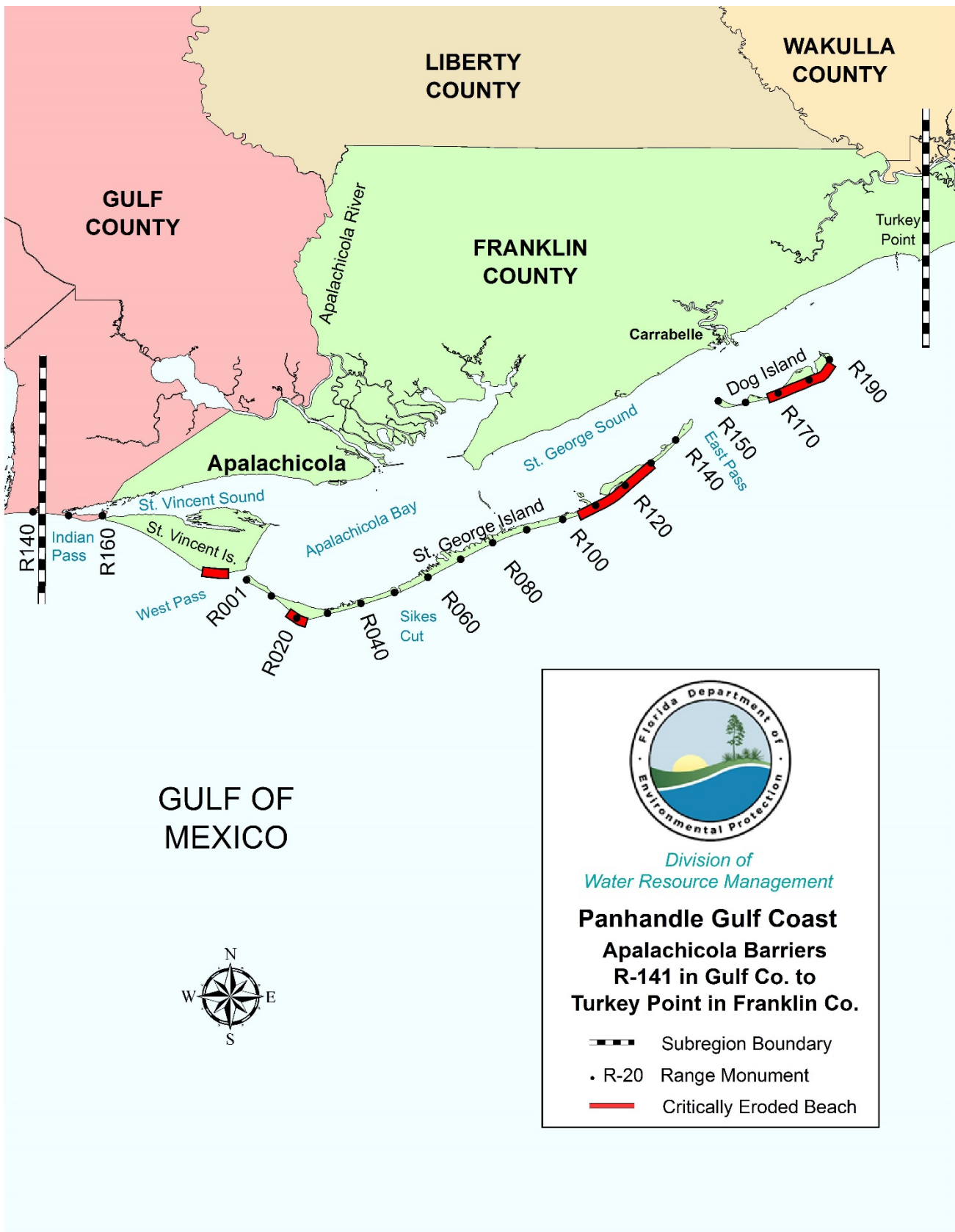


Figure 6. The Apalachicola Barriers subregion of the Panhandle region of Florida.

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OCHLOCKONEE BARRIERS

There are 22.1 miles of beaches in the **Ochlockonee Barriers** subregion, which extends from Turkey Point in Franklin County to the St. Marks River in Wakulla County, as shown on Figure 7. There are a total of 4.1 miles of critically eroded beaches in this subregion (2.8 miles in Franklin County and 1.3 miles in Wakulla County), none of which have been restored.

Erosion is attributed to tropical storms, hurricanes, and natural geomorphic changes caused by the pattern of littoral transport of sand in this subregion. The most erosive storms in recent years were Hurricane Agnes (1972), Hurricanes Elena and Kate (1985), an extratropical storm in October 1992, Tropical Storm Beryl (1994), Hurricanes Allison and Opal (1995), Hurricane Earl (1998), Hurricane Dennis (2005), and Tropical Storm Debby (2012).

STRATEGIES FOR INLETS AND CRITICALLY ERODED BEACHES

AREA WIDE PROJECTS

In 1963, construction of a federal navigation channel from Panacea Harbor through Dickerson Bay to Apalachee Bay was completed. The channel has required infrequent maintenance dredging. The federal **St. Marks River Navigation Project** provides a channel from Apalachee Bay to a turning basin at St. Marks. The channel was last dredged in 1994.

ALLIGATOR POINT (SOUTHWEST CAPE), FRANKLIN COUNTY, R210-R216

This is a 1.1 mile segment of critically eroded beach on the east end of Alligator Point between the Southwest Cape and Lighthouse Point on St. James Island. Extensive armoring has been constructed seaward of the private properties and County Road 370. This area was severely impacted by Hurricanes Elena and Kate in 1985, destroying coastal protection structures. Following these storms, the revetment protecting County Road 370 was constructed using federal and state disaster funds. Tropical Storm Beryl in 1994 caused further damage, resulting in emergency repairs and a revetment extension. Hurricane Earl caused further damage in 1998. Hurricane Dennis caused severe erosion and damage in this area in 2005, resulting in the abandonment of the road between R212 and R213.

Disaster recovery funds were used to sponsor a feasibility study of beach erosion control alternatives for Alligator Point and Lighthouse Point in 2000. The recommendations of this study included the placement of beach fill and construction of T-groins. Franklin County initiated project design and

conducted a sand search in 2006 to place approximately 1.7 million cy of material at Alligator Point and Lighthouse Point. The proposed **Alligator Point Beach Restoration Project** included a dune feature with a height of +13 ft and a berm +5 ft (NAVD) and 80 to 240 ft wide from R210 to R225. The project was authorized by the FDEP; however, the county withdrew its support for the project in response to local interests.

Strategy: Conduct a reevaluation report for the beach restoration project; monitor.

LIGHTHOUSE POINT, FRANKLIN COUNTY, R220-R222

The southeast end of St. James Island is critically eroded extending north from Lighthouse Point for 0.4 mile threatening residential development. Hurricanes Elena and Kate (1985) caused substantial damage and erosion, resulting in the inland relocation of County Road 370 between R222 and R225. With the inland relocation of the road, this segment was delisted as no longer being critical. The authorized Alligator Point Beach Restoration Project would have included the remaining critically eroded beach north of Lighthouse Point; however, the county withdrew its support in response to local interests. Most of the threatened properties in this segment have recently been armored with bulkheads.

Strategy: Emergency nourishment by truck haul placement following major storms. Monitor through vertically controlled aerial photography and physical surveys.

MASHES SANDS COUNTY PARK, WAKULLA COUNTY

Mashes Sands is an approximately 2-mile long natural barrier beach that is truncated by two tidal inlets that connect Gulf waters to natural lagoons and wetlands. South of the inlet on the east shoreline of Mashes Sands is a 0.3 mile segment of critically eroded beach along the Mashes County Park shoreline located adjacent to the entrance to Ochlockonee Bay. North of the inlet, noncritical erosion continues for approximately 0.4 miles, and the remaining beach is accretional.

A feasibility study was completed in 2008 that recommended a limited beach restoration project using sand trucked in from inland sources or from a shoaled canal entrance on Ochlockonee Bay. Terminal groin construction by the county has substantially resolved the canal shoaling problem. The county has not obtained funding to initiate a beach restoration project.

Strategy: Implement the recommendations of the feasibility study to conduct a small scale beach restoration project using sand from upland borrow sources or from maintenance dredging of an adjoining canal entrance in accordance with the feasibility study; monitor.

SHELL POINT, WAKULLA COUNTY

This is a 1.0 mile segment of critically eroded beach on Shell Point. Hurricane Kate in 1985 severely damaged this area, resulting in extensive armoring (rock revetments and bulkheads) being constructed. Hurricane Dennis in 2005 also severely impacted this area. A feasibility study was completed in 2008. The Shell Point Beach Nourishment Project is an early restoration project that is listed in the Deepwater Horizon Oil Spill: Programmatic and Phase III Early Restoration Plan and Early Restoration Programmatic Environmental Impact Statement and was selected by the *Deepwater Horizon* NRDA Trustees for implementation. The project will place approximately 15,000 cy of sand on the beach.

Strategy: Conduct a small scale beach nourishment project of the public beach area using sand from upland borrow sources in accordance with the feasibility study; monitor.

REGIONAL STRATEGIES FOR BEACH AND INLET MANAGEMENT

SPONSORS AND FUNDING

This subregion contains the governmental entities of [Franklin County](#), [Wakulla County](#) and the [USACE](#). In addition, Bald Point State Park is managed by [FDEP's Division of Recreation and Parks](#), and the [St. Marks National Wildlife Refuge](#) is managed by the U.S. Department of the Interior. Project cost estimates and schedules may be found in [FDEP's Beach Management Funding Assistance Program](#) - Long Range Budget Plan. The Shell Point Beach Nourishment Project is an early restoration project selected by the [NRDA Trustees](#) for implementation.

PROJECT COORDINATION

Regionalization is the funding and coordination of multiple nourishment and inlet management activities to take advantage of identifiable cost savings through economies of scale, reduced equipment mobilization and demobilization costs, and elimination of duplicative administrative tasks. At this time, no significant opportunities for coordinating projects in this subregion have been identified.

ENVIRONMENTAL PROTECTION

The protection of marine turtles, seagrasses, Gulf sturgeon and shorebirds and their habitat are primary environmental concerns within this subregion. The timing of post-storm recovery activities was not restricted during the marine turtle nesting season of May 1 through October 31. Project design and method of construction are restricted to avoid or minimize adverse impacts to the state and federally listed species and their habitat. The [Alligator Harbor Aquatic Preserve](#) is located in the vicinity of this subregion. Projects located within and near the aquatic preserve boundaries require additional protection, including more stringent water quality standards than in non-aquatic preserve waters, during permitting and construction to ensure preservation of the existing conditions.

SAND SOURCES

Sufficient sand sources have been identified for the Alligator Point Beach Restoration Project. In the future, sand searches should be performed for storm recovery work. For additional information on sand sources, FDEP manages a database named the [Regional Offshore Sand Source Inventory \(ROSSI\)](#).

ADDITIONAL INFORMATION

The introduction at the beginning of the state's Strategic Beach Management Plan provides additional information including overviews of:

- The principals followed to help guide the state's management strategies
- The miles of critically eroded beaches under active management
- Statewide sand source studies
- Statewide monitoring programs
- Innovative technologies examined
- Basic suggestions for emergency response plans

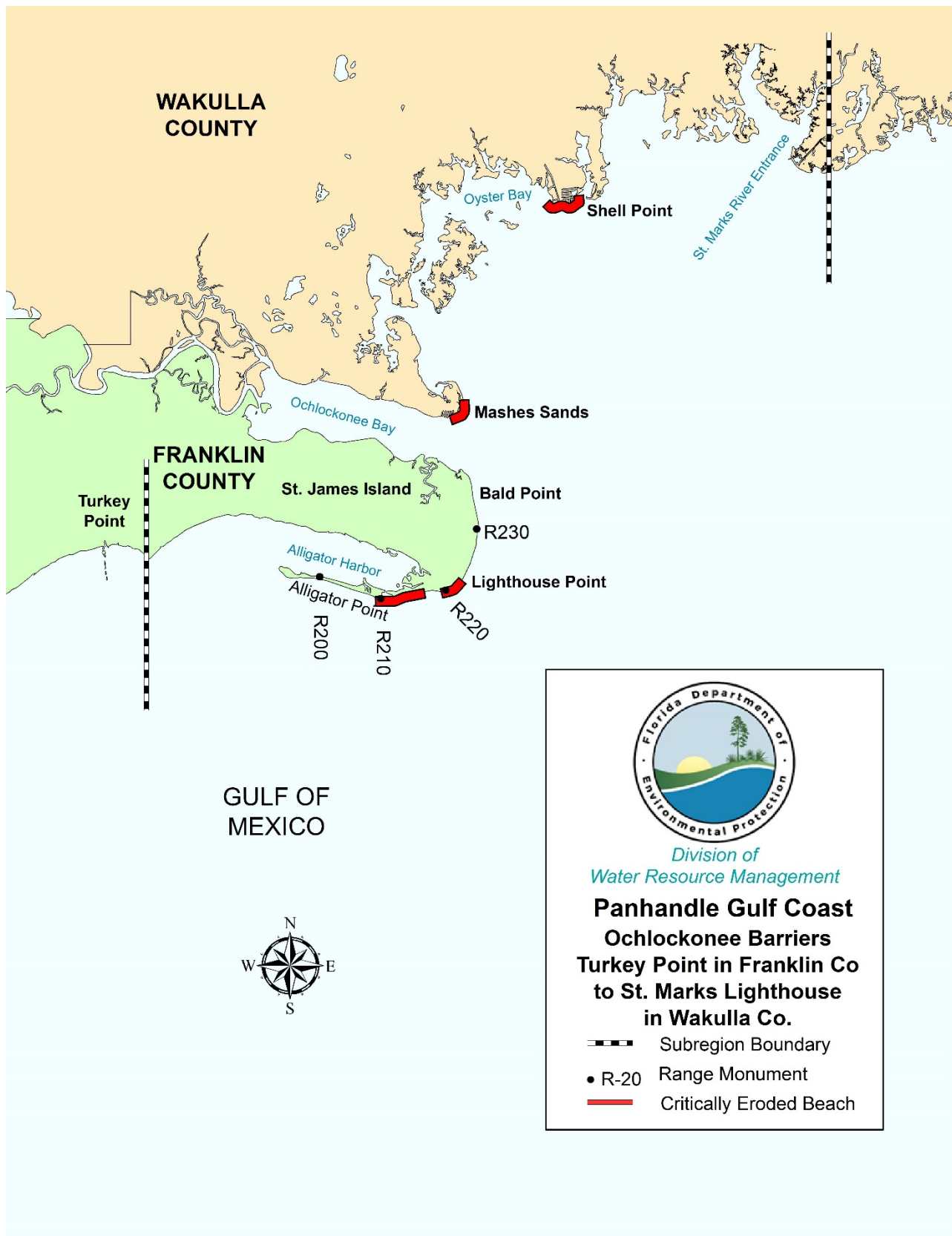


Figure 7. The Ochlockonee Barriers subregion of the Panhandle region of Florida.

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