BEFORE THE OFFICE OF STATE ADMINISTRATIVE HEARINGS
STATE OF GEORGIA

ONE HUNDRED MILES,	:	
Petitioner,	:	
	:	
v.	:	**Docket No.:**
	:	**OSAH-BNR-SP-1630908-60-Miller**
SHORE PROTECTION COMMITTEE,	:	
Respondent,	:	
	:	
and	:	
	:	
SEA ISLAND ACQUISITION, LLC,	:	
Intervenor-Respondent.	:	

ALTAMAHA RIVERKEEPER, INC., and	:	
SURFRIDER FOUNDATION,	:	
Petitioners,	:	
	:	
v.	:	**Docket No.:**
	:	**OSAH-BNR-SP-1630912-60-Miller**
SHORE PROTECTION COMMITTEE,	:	
Respondent,	:	
	:	
and	:	
	:	
SEA ISLAND ACQUISITION, LLC,	:	
Intervenor-Respondent.	:	

FINAL DECISION

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I. SUMMARY OF PROCEEDINGS

This matter is a consolidated appeal by Petitioners One Hundred Miles ("OHM"), Altamaha Riverkeeper, Inc. ("ARK"), and Surfrider Foundation (Surfrider") (collectively "Petitioners") challenging the issuance of Shore Protection Act Permit No. 438 ("Permit") to Sea Island Acquisition, LLC ("Sea Island" or "Intervenor"). The Permit, which was issued by the Shore Protection Committee ("Committee" or "Respondent") on December 11, 2015, authorizes Sea Island to construct and maintain a rock groin, accompanied by beach nourishment and dune construction, in a project area near the southern end of Sea Island in Glynn County, Georgia.

Although the Petitioners filed two separate Petitions for Hearing,[1] both Petitions present essentially identical claims alleging that the Committee issued the Permit to Sea Island in violation of the Shore Protection Act, O.C.G.A. § 12-5-230 *et seq*. Specifically, both Petitions contend that the issuance of the Permit

(1) violates O.C.G.A. § 12-5-239(c)(3)(B), in that the proposed project fails to minimize the effects to sand-sharing mechanisms; and

(2) violates O.C.G.A. § 12-5-239(c)(3)(C), in that there is a reasonable or viable alternative to the construction of a groin.

(3) violates O.C.G.A. § 12-5-239(i), in that the proposed project is not in the public interest, for three reasons:

  (a) because the proposed project will create an unreasonably harmful, increased alteration of the function of the sand-sharing system;

[1] OHM filed an Amended Petition on March 7, 2016.

(b) because the proposed project will unreasonably interfere with the conservation of marine life, wildlife, and other resources; and

(c) because the proposed project will unreasonably interfere with reasonable access by and recreational use and enjoyment of public properties impacted by the project;

A fourth claim raised in the Petitions was dismissed prior to the hearing, by Order dated April 7, 2016.

A four-day evidentiary hearing took place in Brunswick, Georgia, from May 9 through 12, 2016, and the parties presented their closing arguments in Atlanta, Georgia, on July 13, 2016.[2] After consideration of the evidence and legal arguments, and for the reasons stated below, the Committee's issuance of the Permit is **AFFIRMED**.

II. FINDINGS OF FACT

A. Overview

Sea Island is a barrier island along the Georgia coast, with a coastline that stretches approximately 4.5 miles long. (Written Direct Testimony of Bret Webb ["Webb WD"] ¶ 19.) While much of the island has been developed with residences, private clubs, and recreational amenities, the southern portion of the island consists of a narrow, one-mile strip of undeveloped land known as the Spit. (Webb WD ¶ 19; T. 781-83.) The Spit is bounded on the east by the Atlantic Ocean and on the west by the Black Banks River. (Webb WD ¶ 20.) The Black Banks River flows to the south end of the Spit, where Gould's Inlet separates the Spit from neighboring St. Simons Island. (Webb WD ¶ 20.) The Spit is largely protected by a conservation easement, and its beach offers valuable habitat for seabirds, shorebirds, and nesting sea turtles. (Ex. SI-1.)

[2] The record closed on July 26, 2016, when the transcript of the closing arguments was received. The parties also filed additional post-closing argument pleadings, which were not authorized and have not been considered.

1. Proposed Project

The project area lies immediately north of the conservation easement boundary, along a 1,200-foot stretch of beach that is bounded on its north end by an existing groin[3] installed in 1991. (Ex. J-1.) The shoreline in this area, along with the remainder of the Spit, has retreated significantly since the installation of the existing groin. (Webb WD ¶ 67; Exs. P-9, P-10, SI-20A, SI-20B.) By restoring the beach in the project area, Sea Island seeks to provide storm protection for the adjacent upland, which is home to a future residential development called the Reserve at Sea Island ("Reserve"). (T. 786; Ex. J-1 at 1, 18-19.) The Reserve property has been subdivided into eight lots, which are currently for sale and bear asking prices of $3.9 million to $5.6 million. (T. 811.) No homes have yet been built, but the infrastructure for the Reserve properties, including roads, bridges, utilities, and other improvements, has been completed. (T. 792; Exs. SI-24B, SI-24D.)

Sea Island submitted its permit application to the Committee on October 9, 2015. (Ex. J-1.) The application sought authorization for Sea Island to construct, at its own expense, a new T-head rock groin 1,200 feet south of the existing groin, together with beach nourishment and dune construction in the area between the two groins. (T. 809-10 [Steilen]; Ex. J-1.) The application was reviewed by Department of Natural Resources ("DNR") personnel, and notice was provided to adjacent property owners and the public. (Burgess WD ¶ 17; Ex. R-4.) During the public comment period, 102 written comments were received. (Burgess WD ¶ 18.) Ninety-nine of these comments opposed the issuance of the Permit, while three were in favor of the project. (Burgess WD ¶ 18.) In addition to the comments submitted by individuals, the Committee also

[3] A groin is a structure built perpendicular to the beach. (Young WD ¶ 16.) Its primary purpose is to trap sand, which controls erosion and stabilizes the updrift shoreline by preventing sand from flowing naturally with the current to the downdrift side of the groin. (Young WD ¶¶ 16, 31.)

received written comments from both the Nongame Conservation Section of DNR's Wildlife Resources Division ("WRD") and the United States Fish and Wildlife Service ("USFWS"). (Exs. P-6, P-7.) WRD's comments included a statement that "the construction of the T-head groin will result in the loss of sea turtle nesting habitat and will interfere with the conservation of sea turtle populations in Georgia."[4] (Ex. P-6 at 1.) USFWS's comments explicitly recommended denial of the Permit and further stated, "Construction of another groin will have negative impacts to sea turtles and have possible adverse impacts to the Sea Island spit which is utilized habitat for federally listed shorebirds and sea turtles." (Ex. P-7 at 2.) Despite this opposition, the Committee voted 2-1 to issue the Permit following a public hearing on December 11, 2015.[5] (Exs. J-3, R-29.) The Permit as issued includes eleven standard permit conditions and seventeen special conditions. (Burgess WD ¶ 19; Ex. J-2.)

The Petitioners in this matter are organizations with individual members who use the beaches on Sea Island, including the project area and the Spit, for such recreational activities as swimming, kayaking, windsurfing, stand-up paddleboarding, birdwatching, fishing, observing wildlife, and walking on the beach. (T. 362-65 [Hardin], 368-69 [Post], 385 [Patton], 387-88

[4] The original draft of WRD's comments, which was prepared by Mark Dodd, the Coordinator of Georgia's Sea Turtle Program, recommended against issuing the Permit and included Mr. Dodd's opinion that the proposed T-head groin "will unreasonably interfere with the conservation of sea turtle populations in Georgia." (T. 254, 256-57 [Dodd]; Ex. P-5 at unnumbered pp. 1, 6.) Mr. Dodd's draft was approved by his program manager, Jason Lee, and the Chief of the Nongame Conservation Section, John Ambrose, before the comments were submitted to DNR's Coastal Resources Division for use by the Committee. (T. 256 [Dodd].) However, the comments were withdrawn days later, after being reviewed by Dan Forster, the Director of WRD, and a revised comment letter was submitted. (T. 260-61, 263, 289 [Dodd].) The revised comment letter removed the recommendation against issuing the Permit and deleted the word "unreasonably" from the sentence quoted above. (T. 257-59, 263-65 [Dodd]; Exs. P-5, P-6.) Sea Island submitted a written response to the public comments, which included WRD's final comment letter. (Burgess WD ¶ 19; T. 268; Ex. R-8.) Mr. Dodd and other WRD staff prepared a written response to Sea Island's submission, but it appears that this document was not provided to the Coastal Resources Division or the Committee. (T. 268-70, 292-93 [Dodd]; Ex. P-104.)

[5] The Committee has five members, four of whom attended the public meeting. (Exs. J-2, R-29.) The Commissioner of the Department of Natural Resources attended but did not vote. The remaining three attending members approved the Permit issuance by a vote of 2-1. (Ex. R-29.)

[Sattelmeyer].) They are concerned that they will suffer injury to their recreational, aesthetic, or other interests if the project is completed. (T. 365-66 [Hardin], 370 [Post], 388 [Sattelmeyer].)

2. History of Shoreline Protection Projects on Sea Island

Sea Island, like other barrier islands, is characterized by a dynamic coastline that migrates over time and is shaped by gradual processes, such as changing sea levels and ocean currents, as well as faster-acting processes, such as storm events. (Written Direct Testimony of George Oertel (Corrected) ["Oertel WD"] ¶ 4; Webb WD ¶¶ 29-31.) Although the island has historically experienced periods of erosion and accretion, a significant erosional phase began in the 1970s. (Oertel WD ¶ 22; T. 920-21; Exs. J-4 at Recommendation, p. 5, SI-32.) The erosion began at the north end of the island, where it seemed to be most severe, and progressed southward. (Oertel WD ¶ 22.) From the late 1970s through the mid-1980s, Sea Island property owners attempted to protect their homes and land by installing sloped concrete and rock revetments along the shoreline. (Oertel WD ¶¶ 41-42; Written Direct Testimony of David R. Basco ["Basco WD"] ¶ 85; T. 463, 650-51; Exs. SI-8, SI-9, SI-16.) These armoring structures halted the landward shift of the shoreline along approximately 3.6 miles of the Sea Island coast. (Oertel WD ¶ 42; Basco WD ¶ 85; T. 554.) However, the beach surface continued to erode in these areas until little or no dry sand beach remained. (Basco WD ¶ 86.)

In an effort to replenish the sand that had been washed away from the island's beaches and prevent further erosion, Sea Island undertook a beach nourishment and groin project[6] during the early 1990s. (Basco WD ¶¶ 86-87.) In 1990, approximately 1.8 million cubic yards ("cy") of sand were placed on the beach at the center of the island, with the expectation that the sand would spread naturally to the north and south over time. (Basco WD ¶ 87.) Later, in 1991 and

[6] The project was authorized by Shore Protection Committee Permit No. 149, which was issued in 1989. (Ex. J-4.)

1992, groins were installed on the north and south ends of the island ("north groin" and "south groin") to retain the sand that had been placed during the nourishment project. (Basco WD ¶ 87.) The groins have been used to create catchment basins, meaning that sand is not encouraged or allowed to bypass the groins.[7] (Written Direct Testimony of Robert S. Young ["Young WD"] ¶ 43.) Rather, as sand collects in the fillet areas, Sea Island periodically transports it mechanically back to the center beaches as part of what it calls a sand recycling program. (Basco WD ¶ 87; Ex. SI-51.) In 1996, a 400-foot-long breakwater[8] was installed seaward of the south groin to further ensure that sand bypassing did not take place. (Young WD ¶ 43; Webb WD ¶ 36; Ex. J-1, Attach. D, at 15.)

B. The Sand-Sharing System

The sand-sharing system is an interconnected coastal network of dunes, beaches, and offshore sandbars and shoals that marks the transition between land and sea. Within the sand-sharing system, sand is continually picked up by wind or waves and transported to, or shared with, another location. (Webb WD ¶ 15.) On Sea Island, as on the rest of the Atlantic coastline, sand generally moves from north to south, consistent with the dominant wave direction, in a shore-parallel current known as the longshore current. (Webb WD ¶¶ 14, 21.) This movement of sand is called littoral drift. (Webb WD ¶ 14.)

The mechanisms that govern the movement of sand through the sand-sharing system are complex and, in certain aspects, poorly understood. (Webb WD ¶¶ 21-28; Oertel WD ¶ 13.) On Sea Island, the dominant direction of the longshore current is to the south. (Webb WD ¶ 24.)

[7] Prior to 2014, it was not apparent that any sand was allowed to bypass the south groin. (T. 146-47 [Webb].) In 2016, when aerial photography showed sand seaward of the south groin, Sea Island began excavating the sand for recycling. (T. 147 [Webb]; Ex. SI-51.)

[8] A breakwater is a shore-parallel structure, similar in appearance to a groin, which reduces erosion by dissipating wave action. (Young WD ¶ 43; Webb WD ¶ 36; Ex. SI-51.)

However, reversals are common at certain times throughout the year, as waves approach from the southeast. (Webb WD ¶ 24.) In addition, the island's shallow continental shelf and its large inlet shoal systems[9] have a tendency to refract waves as they approach the shore. (Oertel WD ¶ 20.) As a result, wave-driven currents may flow from a nodal point near the center of the island toward the inlets on the north and south sides. (Oertel WD ¶¶ 19-21.) Depending on the configuration of the sand bars, shoals, and channels of the tidal delta, wave and tidal currents may either push sand from the offshore bars and shoals onto the beaches of nearby islands, including Sea Island, or erode sand away from those beaches. (Webb WD ¶ 28; Oertel WD ¶ 13.) This process, although naturally occurring, happens with unpredictable frequency and timing. (Webb WD ¶ 28; Oertel WD ¶ 13.)

Groins are widely known to cause disruption of the sand-sharing system. (Young WD ¶¶ 30, 33.) For instance, the Coastal Engineering Manual published by the United States Army Corps of Engineers ("USACE Manual") states, in part:

> [Groins] are probably the most misused and improperly designed of all coastal structures. . . . Over the course of some time interval, accretion causes a positive increase in beach width updrift of the groin. Conservation of sand mass therefore produces erosion and a decrease in beach width on the downdrift side of the groin.

(Ex. P-33 at V-3-59.) For this reason, groins have become disfavored tools of shoreline protection, in the United States and elsewhere. (Ex. P-33 at V-3-61.) Of the 139 beach nourishment projects completed in the southeastern United States during the past ten years, only

[9] Sea Island is situated between two tidal inlets: the Hampton River Inlet, to the north, and Gould's Inlet, to the south. (Oertel WD ¶ 10.) The Hampton River's main axial channel is deep and ebb-dominated, with strong ebb currents that reach far into the ocean during maximum ebb. (Oertel WD ¶ 11.) The outer reaches of its ebb delta, where millions of cubic yards of sand are stored, extend 2.5 to three miles offshore. (Oertel WD ¶ 11.) South of this ebb-dominated channel are a marginal shoal and a funnel-shaped, flood-dominated channel that draws currents from the south. (Oertel WD ¶ 12.) Northward flowing currents have been observed up to 1.25 miles south of the Hampton River Inlet. (Oertel WD ¶ 12.)

five have involved a groin.[10] (Young WD ¶ 27; Ex. P-63.) For projects that include a groin, modern standards of coastal engineering practice combine groin construction with a beach nourishment project that allows sand to begin bypassing the groin immediately. (Ex. P-33 at V-3-61.) However, the preferred alternative remains beach nourishment without a groin, with periodic renourishment at scheduled maintenance intervals. (Young WD ¶ 29; Basco WD ¶ 46.)

1. Shoreline Retreat South of the South Groin

Over the past twenty-five years, since the north and south groins were constructed, shoreline retreat on the Sea Island coastline between the south groin and Gould's Inlet has increased. (Webb WD ¶ 54; T. 871-894 [Jackson].) More likely than not, this accelerated rate of shoreline retreat is attributable the sand-trapping function of the south groin, as explained below.

The parties presented expert testimony regarding various methods of measuring shoreline change using either a numerical proxy or a feature-based proxy. A methodology that relies on a numerical proxy analyzes shoreline change based on a vertical measurement that is tied to a geodetic (land-based) datum as a base reference and then converted to a tidal datum. (T. 575 [Oertel], 845 [Jackson]; Ex. P-32 at 3.) Sea Island's expert, George Oertel, used a methodology that incorporated a numerical proxy. (Oertel WD ¶¶ 24-36; Ex. SI-4.) A methodology that relies on a feature-based proxy, in contrast, analyzes shoreline change based on a horizontal measurement that is tied to an observable physical feature, such as a stable vegetation line, high water line, or wrack line, within the shoreline system. (T. 842-44 [Jackson]; Ex. P-32 at 3.) Both of the Petitioners' experts, Chester Jackson and Bret Webb, used methodologies that incorporated a feature-based proxy. (Webb WD ¶¶ 54-65; T. 859-97 [Jackson].) Each methodology is explained in more detail below.

[10] Of those five groins, three were built at the southern point of an island where the potential for downdrift harm to neighboring shorelines was minimized. (Young WD ¶ 27.)

a. Numerical Proxy

A shoreline change analysis using a numerical proxy begins with a survey of the beach profile. (Oertel WD ¶ 24; T. 657 [Oertel].) This work is performed by a registered surveyor, and the survey data is collected with reference to a geodetic datum. (T. 672-75 [Shupe].) Use of the geodetic datum allows the survey data taken in the field to be measured relative to a fixed elevation. (T. 674-75 [Shupe].) Measurements tied to the geodetic datum are then converted to a tidal datum, and beach profile data are incorporated to provide a picture of the shoreline change over time. (T. 656-57 [Oertel], 674 [Shupe].)

Dr. Oertel used the numerical proxy of Mean High Water ("MHW")[11] to analyze shoreline position over time on Sea Island. (Oertel WD ¶ 33.) To do this, he took data from annual surveys of fixed transects at twenty-eight locations on Sea Island's beaches between 1979 and 2015, with a geodetic datum as a baseline reference. (Oertel WD ¶¶ 24-36, 77; T. 602-03; Ex. SI-4.) These measurements were converted to a tidal datum for MHW based on correlations with measurements from the tidal gauge on St. Simons Island. (Oertel WD ¶ 36; T. 574-76 [Oertel]); T. 845, 848, 913 [Jackson].) A computer program then calculated the shifts in the MHW shoreline based on the beach profile data. (Oertel WD ¶ 35.) Using this process, Dr. Oertel determined that between 1979 and 1988, prior to the installation of the south groin, shoreline retreat along the 1,864 meters of coastline that he called "Shore Reach 5"[12] averaged -7.3 feet per year, and that the rate of shoreline retreat in the project area specifically was between five and ten feet per year during this time frame. (Oertel WD ¶ 76; Exs. SI-34, SI-48.)

[11] MHW is the average high water elevation over a tidal epoch, which is a period of 18.6 years. (Oertel WD ¶ 24; T. 574-75 [Oertel].)

[12] The south groin was constructed at the approximate center line of Shore Reach 5. (Oertel WD ¶ 76.)

Dr. Oertel's testimony was undermined by a number of weaknesses in his analysis. First, he did not account for potential errors in the collection of survey data,[13] in the conversion from one geodetic datum to another,[14] in the conversion from a geodetic datum to a tidal datum,[15] or in the interpolation of tide gauges necessary for accurate calculation of MHW.[16] (T. 593 [Oertel]; T. 846-52 [Jackson].) Second, Dr. Oertel's calculations of shoreline change encompassed the entire area arbitrarily defined as Shore Reach 5, even though only half of Shore Reach 5 is downdrift of the south groin.[17] (Oertel WD ¶ 76; T. 603-04 [Oertel].) Third, in drawing his conclusions, Dr. Oertel testified that his own findings compared favorably with those of other scientists. (Oertel WD ¶ 76.) However, his representation of their findings, found in a chart titled "Summary of shoreline shift rates at the groin location prior to groin construction," is misleading. (Ex. SI-48.) The chart appears to equate measurements taken from different areas[18]

[13] It is impossible to test the reliability of the survey data, as only one surveyor testified at the hearing, and he did not begin surveying for Sea Island until 2003. (T. 681 [Shupe].) He did not review the earlier survey data. (T. 685 [Shupe].)

[14] Two geodetic data were in use during this time. The first, NGVD 29 (National Geodetic Vertical Datum of 1929), was adopted in 1929 and replaced in 1988 by NAVD 88 (North American Vertical Datum of 1988). Although NAVD 88 is more accurate, Dr. Oertel did not use it as his baseline reference until 2008. (T. 658 [Oertel]; T. 675-76 [Shupe], 853-55 [Jackson].) However, the adjustment would have been minimal. (T. 659-60 [Oertel].)

[15] Dr. Oertel used the St. Simons Island tide gauge to convert from the geodetic datum to the tidal datum. (Oertel ¶ 24.) However, because the St. Simons Island gauge has logged measurements for only nine years, rather than an entire tidal epoch, its data is interpolated using a model based on the tide gauge at Fort Pulaski. (T. 850-52 [Jackson].)

[16] Interpolation employs a complex formula with inputs that must be updated regularly to compensate for the curvature of the earth and different tidal ranges between two gauges. (T. 845-48 [Jackson].)

[17] The other half of Shore Reach 5 is north of the south groin. (Oertel WD ¶ 76; T. 603-04 [Oertel].) Because Dr. Oertel's data did not distinguish between the northern and southern halves of Shore Reach 5, it is impossible to assess the rate of erosion or accretion in the area directly south of the south groin before the groin was installed. (Oertel WD ¶ 48; T. 605-06, 609-11 [Oertel]; Ex. SI-34.)

[18] Some data, including Dr. Oertel's, were taken from an area that included areas both north and south of the south groin, while other data, notably Dr. Jackson's and Dr. Webb's, included measurements only from the relevant area south of the south groin. (Oertel WD ¶ 76; Exs. SI-34, SI-48.)

using different criteria[19] over different periods of time,[20] in a way that overstates erosion prior to the groin construction. (Oertel WD ¶ 76; Ex. SI-48.) Moreover, Dr. Oertel did not give appropriate weight to historical shoreline data, which would have factored out short-term fluctuations and provided a more accurate picture of shoreline shifts over the long term. (T. 572-73 [Oertel].) Because of this, the Court declines to rely on Dr. Oertel's conclusion that the pre-groin shoreline in the area south of the south groin was retreating at the rate of five to ten feet per year.

Dr. Oertel next analyzed survey data from 1990 to 2012, from which he concluded that the average post-groin rate of shoreline shift in the project area was -7.4 feet per year. (Oertel WD ¶ 77.) This conclusion is significantly more reliable, given that it was based on more precise survey data that isolated the area south of the south groin. (Oertel WD ¶ 77; Exs. SI-49, SI-50.)

b. Feature-Based Proxy

To measure shoreline change using a feature-based proxy, shoreline measurements are referenced to a fixed point and compared over time. (T. 842-44 [Jackson].) Here, both Dr. Jackson and Dr. Webb relied on aerial photography to establish the high water line,[21] which they used as a proxy for measuring shifts in the shoreline south of the south groin. (Webb WD ¶ 55; T. 858-59 [Jackson]; Ex. P-32 at 1, 4.) The high water line is the visible line of demarcation between wet and dry beach on a given day. (T. 65-67 [Webb].)

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[19] For example, the chart cites Olsen Associates' mean low water shoreline change data from 1979 to 1988, which is an invalid comparison to mean high water data. (T. 613 [Oertel]; Ex. SI-34.)

[20] The chart compares data from the following time periods: 1983-84; 1979-88; 1924-55; 1955-74; 1974-80; 1933; and 1951. (Ex. SI-34.)

[21] Dr. Jackson referred to this line as a high water line, while Dr. Webb called it a mean high tide line. The meaning is the same. (T. 65 [Webb], 842-43, 858 [Jackson].)

Dr. Jackson's methodology applied a software program called AMBUR (Analyzing Moving Boundaries Using R), which was developed by Dr. Jackson and is widely accepted in the coastal scientific community.[22] (T. 839-40, 868-69 [Jackson].) Dr. Jackson began his analysis by obtaining geo-referenced aerial photographs[23] from a number of federal agencies. (T. 859 [Jackson].) He also obtained other aerial photographs and geo-referenced them himself using established protocols. (T. 859-60 [Jackson].) To determine shoreline position for periods prior to the advent of aerial photography, Dr. Jackson obtained topographic survey maps, or "T-sheets," and geo-referenced them using benchmarks to ensure accuracy. (T. 862-64 [Jackson].) After scanning the photographic and topographic data into his computer, Dr. Jackson created transects across the beach and shoreline and used AMBUR to measure the distances and rates of change across the transects over time. (T. 861-62 [Jackson].) Consistent with recognized scientific standards, he included conservative margins of error in all of his calculations. (Ex. P-32 at 8.)

Dr. Jackson's analysis showed that the Sea Island shoreline south of the south groin has eroded approximately 100 meters, or over 300 feet,[24] since the groin's installation. (T. 894 [Jackson]; Ex. P-90.) Analyzing long-term trends, Dr. Jackson determined that during the pre-groin period from 1869 to 1988, the mean rate of shoreline change in the area south of the south groin was -0.08 meters per year, with an error margin of plus or minus 0.07 meters per year. (T.

[22] AMBUR uses geographic information system data and a suite of algorithms to calculate change in the position of a boundary over time. (T. 839-40, 869 [Jackson]; Ex. P-32 at 2.) It was a scientific breakthrough when it was introduced because it was the first program capable of mapping and analyzing a curved shoreline. (T. 839 [Jackson].) It has since gained broad acceptance and is now used to map shorelines worldwide. (T. 839 [Jackson].)

[23] Geo-referenced photographs are in a digital format that has been referenced to a coordinate system. (T. 859 [Jackson].)

[24] Dr. Jackson's margin of error equates to 0.31 meters (approximately one foot) per year, or plus or minus twenty-five feet during the post-groin time period. (T. 894 [Jackson]; Exs. P-32 at 8, P-90.)

874 [Jackson]; Ex. P-32 at 8.) Moreover, the shoreline north and south of the south groin was relatively uniform prior to the groin installation, with the 1988 shoreline position roughly comparable to that of 1869. (T. 884-85, 929-30 [Jackson]; Ex. P-90.) In stark contrast, the mean rate of shoreline change south of the south groin accelerated to -3.02 meters per year from 1988[25] to 2013, with an error margin of plus or minus 0.31, and -2.87 meters per year from 2003 to 2013, with an error margin of plus or minus 0.86. (T. 876-78 [Jackson]; Ex. P-32 at 8.)

Dr. Jackson's methodology was more reliable than the methodology used by Dr. Webb, which used his visual estimation of the high tide line based on a series of aerial photographs that had not been geo-referenced. (Webb WD ¶ 55; Ex. P-46.) Notwithstanding Dr. Webb's use of a less-refined methodology,[26] however, his findings were remarkably similar to those of Dr. Jackson. Dr. Webb determined that the shoreline south of the south groin had retreated approximately 270 feet from its 1988 position. (Webb WD ¶ 56.)

It must be noted that since a methodology that employs a feature-based proxy relies on aerial photographs, it can be limited by the quality of the data that accompanies the photographs. For instance, the high water line fluctuates with the tides, which are governed by the lunar cycle, and the slope of the beach may vary at different locations. (Oertel WD ¶ 65; T. 65-75 [Webb], 911-12 [Jackson].) These factors influence the position of the high water line and insert potential error into the determination of shoreline position. (Oertel WD ¶ 65; T. 65-75 [Webb], 911-12 [Jackson].) However, Dr. Jackson was able to eliminate much of this potential error rate by

[25] Dr. Jackson used 1988 as a starting point for his post-groin analysis because Sea Island used a 1988 aerial photograph to represent the shoreline prior to the groin installation. (T. 877.) Sea Island completed a small beach nourishment project in 1987, during which 125,000 cy of sand was placed at the northern segment of Shore Reach 5. (Oertel WD ¶ 51-52.) The sand was quickly washed away by storms. (Oertel WD ¶ 52.) Although some of the nourishment sand may have remained in the area and influenced shoreline position to some degree, Dr. Jackson still considers his calculations "fairly reliable" and has assumed a worst-case error rate. (T. 877-78 [Jackson].)

[26] Dr. Webb estimated the potential error rate at 80 to 100 feet in either direction. (T. 61, 133-34.)

obtaining the dates and times that photographs were taken and accounting for tidal influence. (T. 912 [Jackson].) Moreover, because the photographs that Dr. Jackson used in his analysis were not taken at his direction, they were equivalent to random samples. (T. 885 [Jackson].) Further adding to the reliability of Dr. Jackson's methodology is the fact that his findings are both repeatable and verifiable – crucial qualities that Dr. Oertel's methodology does not share. (T. 887-88, 900, 927 [Jackson].) Therefore, Dr. Jackson's methodology and findings, while still imperfect, were the most reliable of the three experts.

Based on the evidence presented, the Court finds that the pre-installation rate of shoreline retreat in the area south of the south groin was substantially less than the post-installation rate of shoreline retreat in the same area, and that the existing groins have caused this accelerated rate of retreat by trapping sand and reducing historical longshore transport rates in the area.[27]

2. The Existing Groins' Sand-Trapping Function

The precise amount of sand trapped by the groins, however, cannot be determined based on the evidence presented at the hearing. For instance, Dr. Webb opined that the existing north and south groins could have trapped 12.1 million cy of sand between them during the past twenty-four years. (Webb WD ¶ 43.) Yet because his estimate includes an error factor of plus or minus 50%, due to "the difficulty inherent in making such a calculation," the actual number could be anywhere between approximately 6 million cy and 18 million cy. (Webb WD ¶ 43.) At the hearing, Dr. Webb also acknowledged that his data did not allow him to determine whether the revetments lining the Sea Island shoreline had an impact on the amount of littoral drift, and that his base number of 400,000 cy per year was only a potential rate of longshore sand transport.

[27] The rate of shoreline shift on Sea Island is also influenced by sea level rise, tidal currents, and wave energy distribution. (Oertel WD ¶ 4.) However, because these factors existed both before and after the south groin was constructed, they cannot explain the sudden, post-installation acceleration of the retreat rate in the area south of the south groin.

(T. 90-93 [Webb].) Therefore, the Court declines to rely on Dr. Webb's opinion as to the amount of sand trapped by the groins, which is too speculative to be reliable in this instance.

On the other hand, Dr. Oertel's opinion that the groins have trapped no additional sediment at all, which is based on the faulty premise that there is no littoral drift to be trapped,[28] is belied by the accelerated rate of shoreline retreat south of the south groin. (Oertel WD ¶¶ 83, 137.) Sea Island's 2015 survey, which found only 1.6 million cy of sand between the groins and attributed this amount to the sand remaining from the 1990 nourishment project, did not measure the volume of sand in the entire active beach profile. (Oertel WD ¶ 143; Webb WD ¶ 44-45; T. 97, 142-43 [Webb].) Thus Dr. Oertel's opinion regarding the amount of sand between the groins is similarly unreliable, leaving the Court unable to make a finding on this issue.

3. Deflation of the South End of the Spit

Dr. Webb analyzed the shoreline position at the south end of the Spit, where it reaches Gould's Inlet, to determine whether the Spit has experienced a post-groin reduction in its length. (Webb WD ¶ 38.) Using aerial photographs for the time period from 1988 to 2014, he identified the high water line in a series of photographs and traced the resulting lines onto a baseline photograph from 2014. (Webb WD ¶¶ 38-39, 54.) His analysis revealed that after the groins were installed, the south end of the Spit continued to grow until approximately 1999. (Webb WD ¶ 41, 52; Ex. P-45.) This period of accretion most likely resulted from an accumulation of sand that was already in the sand-sharing system, including sand from the short-lived 1987 beach nourishment project. (Webb WD ¶ 41.) After 1999, a substantial retreat began, causing the Spit to lose nearly 3,000 feet in length and decrease its width from 788 to 436 feet by 2014. (Webb

[28] Even if no dry beach remained prior to the construction of the north and south groins, sand would have continued to move through the active portions of the submerged beach profile. (Webb WD ¶ 44.) The Court therefore concludes that the annual volume of littoral drift along the Sea Island coastline likely falls somewhere between Dr. Webb's estimate of 400,000 cy per year and Dr. Oertel's estimate of zero cy per year.

WD ¶ 53; Ex. P-45.) Dr. Webb also noted that a significant majority of other Georgia barrier islands have either grown or remained stable during the time period of retreat on the south end of the Spit. (Webb WD ¶ 68-73; Exs. P-84A-J.) However, this evidence does not establish that the deflation of the Spit has been caused by the groins, as it appears that other factors are also involved.

The south end of the Spit is a particularly dynamic and variable component of the sand-sharing system. It is influenced not only by the longshore transport of sediment, but by the inflation, movement, and collapse of ebb shoals and the southward movement of Gould's Inlet. (Webb WD ¶ 28; Oertel WD ¶¶ 16, 80.) In the 1860s, for example, the mouth of Gould's Inlet was approximately one mile wide, with spits entering from both the north and south. (Oertel WD ¶ 15; Ex. SI-28.) Over the past 150 years, the inlet has moved gradually southward several thousand feet. (Oertel WD ¶ 16.) From the 1950s through the 1970s, as Gould's Inlet migrated to the south, the Spit was accreting, while the northern shore of East Beach, on St. Simons Island, was eroding. (Oertel WD ¶ 78.) During the 1960s, revetments were installed at East Beach, which prevented the inlet throat from migrating any further southward. (Oertel WD ¶ 78.) For years, the ebb-dominated channel of Gould's Inlet pressed up against East Beach's northern shore. (Oertel WD ¶ 78.)

In the 1990s, the main ebb channel was almost perpendicular to the coastline, and the Spit continued to accrete to the south even as East Beach gained enough sand to bury the revetments from the inlet south to the King and Prince Hotel. (Oertel WD ¶¶ 79-80.) Then, between 2003 and 2008, a flood delta formed on the landward side of the inlet in the Black Banks channel, which changed the sediment exchange dynamics between the Spit and the ebb delta. (Oertel WD ¶ 80.) This coincided with a widening of the inlet throat and a northward

migration of the Spit. (Oertel WD ¶ 80.) By 2014, sand was migrating toward East Beach from a marginal shoal on the south side of Gould's Inlet. (Oertel WD ¶ 80.) It appears that accretion on East Beach is in the neighborhood of 1 million cy of sand, as some parts of the shoreline have advanced seaward five to ten feet per year. (Oertel WD ¶ 81.) Thus, the shorelines at both East Beach and the south end of the Spit have shifted at much higher rates than shorelines that are not influenced by ebb deltas. (Oertel WD ¶ 81.)

Dr. Webb's testimony suggested that the retreat of the south end of the Spit was caused by the impact of the groins, as littoral drift down the east side of the Spit would otherwise counteract the erosional effects of the inlet currents to the south. (Webb WD ¶ 68.) However, he was unable to quantify this effect or to distinguish the impact of the groins from that of the sediment exchange dynamics across Gould's Inlet between East Beach and the Spit. (Webb WD ¶ 68.) Consequently, given the somewhat speculative nature of this testimony, the Court is unable to determine to what extent, if any, the groins have influenced the deflation at the south end of the Spit.

C. The Proposed Project's Impact on the Sea Island Shoreline

Although the Court is persuaded, as explained above, that the existing groins have caused erosion along the shoreline south of the south groin, this does not dictate a conclusion that the permitted project will exacerbate the erosional process. Rather, the evidence showed that the new project is unlikely to increase downdrift erosion and may even mitigate some of the impacts of the existing groins.

1. Project Design

The project area runs 1,200 linear feet between the existing south groin and the conservation easement boundary. The new groin, as permitted, would begin at the south end of

the project area and extend 350 feet seaward from the beach, with a 120-foot-long T-head section that runs parallel to the shore. (Basco WD ¶ 12; Ex. J-1 at 2-3.) The groin has been designed to use geotextile materials and layers of rocks of different sizes[29] to ensure stability under storm conditions. (T. 705.) If necessary, the rocks could be adjusted or removed using heavy equipment. (T. 705-06.) The crest elevation of the groin would begin at six feet and slope down to three feet at the seaward end. (Basco WD ¶¶ 12, 69; Ex. J-1 at 2.) The length of the new groin would be approximately 75% of the length of the existing south groin, which would allow for a tapering effect to aid in the transition back to the natural beach. (Basco WD ¶¶ 68, 93.) Crucially, however, tapering the length of the groin will only work if sand bypass is allowed in volumes equivalent to the historic transport rates along the shoreline. (T. 145 [Webb].)

Unlike the existing north and south groins, the new groin is designed to allow sand bypassing, beginning during construction and continuing over the life of the project. (Basco WD ¶¶ 13, 57, 100, 113-14.) Consistent with modern coastal engineering practices, the project includes a plan to nourish and overfill the beach in the project area using 85,000 cy of beach quality sand that is currently held on the north side of the south groin.[30] (Basco WD ¶¶ 12; T. 149 [Webb]; Ex. J-1 at 2-3.) The beach profile would be 150 feet wide, tapering from an elevation of six feet above mean sea level to six feet below mean sea level. (Ex. J-3 at 1.) Thus the berm elevation of the beach nourishment would be brought to the same height as the crest elevation of the groin. (Basco WD ¶ 70.) The newly constructed beach profile would end

[29] The existing groins were constructed of large, unsightly concrete blocks known as Campbell units. (T. 705-06; Ex. J-1 at 2-3; Site Visit [May 11, 2016].)

[30] The Permit requires Sea Island to submit sediment samples from the borrow area to DNR for approval and establishes criteria for the composition, grain size and color. (Ex. J-3 at Special Condition 1.) Based on Sea Island's initial testing, it appears that the sand from this area will meet the applicable beach quality criteria. (Written Direct Testimony of Daniel H. Bucey ["Bucey WD"] ¶ 21; Ex. SI-11.) The volume and design calculations specifying the amount of nourishment necessary to fill the groin field were not disputed. (Basco WD ¶¶ 62-66.)

beyond the tip of the new groin, allowing sand bypassing to begin immediately. (Basco WD ¶ 66; T. 748.) This design, combined with "leaky" elements of the groin, would allow some sand to pass over, around, and through the groin structure to the downdrift beach on the Spit. (Basco WD ¶ 70.)

In addition to the groin and beach nourishment components of the project, Sea Island plans to use an additional 35,000 cy of sand to construct a dune with a crest elevation of twenty feet and a crest width of twenty feet, consistent with FEMA guildelines. (Basco WD ¶ 12, 78; Ex. J-1 at 2-3.) The constructed dune would strengthen the existing frontal dune, protect the Reserve, and serve as an additional source of sand for the downdrift beach during storm events. (Basco WD ¶ 13.) The dune would be planted with native dune vegetation, with sand fencing used as necessary for stabilization. (Ex. J-3 at 1.)

2. Permit Conditions

In evaluating the Permit application, CRD staff informed the Committee that "[u]pon reviewing the information provided by Dr. Jackson, Dr. Young, Dr. Oertel, and Dr. Basco, Department staff finds there may be continued erosion along shorelines immediately south of the proposed project site." (Burgess WD ¶ 21; Ex. J-2 at 8.) The Permit therefore imposes special conditions intended to ensure that the groin does not cause adverse impacts to the sand-sharing system. Specifically, the Permit provides, at Special Condition No. 2:

> The groin shall be constructed of such material and in such a manner as to be adjustable and removable. A detailed plan must be provided to the Department for approval prior to construction. Should the Department determine the groin to have negative impacts to the sand-sharing system, the applicant shall submit an adjustment or removal plan for the groin to the Department for approval within 60 days following Department notice to remove. Adjustment or removal must be completed within a timeframe approved by the Department. A decision to adjust or remove will be based on the following criteria:

a. Quantifiable adverse effects upon other shoreline locations[;] or[]

b. If groins are no longer merely holding sand that was added to the system through the beach nourishment but also trapping sand from the longshore sediment transport.

(Ex. J-3 at Spec. Cond. 2.) Special Condition No. 5 would help monitor erosion by requiring Sea Island to conduct beach profile surveys both within the project area and in the area immediately south of the project area. (Ex. J-3 at Spec. Cond. 5.) In addition to required pre- and post-construction surveys, the Permit requires surveys at six months, one year, two years, three years, four years, and five years after the post-construction survey, with additional surveys if warranted after storm events. (Ex. J-3 at Spec. Cond. 5.) Similarly, Special Condition No. 8 requires that "an engineering report shall be prepared that presents, summarizes and interprets the survey data and assesses the project performance" within ninety days after the completion of each post-construction survey. (Ex. J-3 at Spec. Cond. 8.) Such reports must include "a quantification of shoreline and volumetric changes within and adjacent to the beach fill area along the monitoring area." (Ex. J-3 at Spec. Cond. 8.)

D. The Proposed Project's Impact on the Conservation of Sea Turtles

All species of sea turtles are protected under the Endangered Species Act, as well as by Georgia law, and several of these species nest along the Georgia coast. (Written Direct Testimony of Kirt William Rusenko ["Rusenko WD"] ¶¶ 18-19; T. 231-32 [Dodd].) On Sea Island, the most common species is the loggerhead sea turtle (*Caretta caretta*), which is listed as a threatened species. (Rusenko WD ¶ 19; T. 231 [Dodd].) Two other species, the green sea turtle (*Chelonian mydas*) and the leatherback sea turtle (*Demochelys coriacea*), are found occasionally. (Rusenko WD ¶ 19.)

When a species is listed as endangered or threatened, the Endangered Species Act requires the creation and implementation of a recovery plan. (T. 232 [Dodd].) The recovery plan lists the actions (classified as Priority 1, 2, or 3) that are considered necessary for the recovery of the species. (T. 232-33 [Dodd]; Ex. P-28.) The Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle ("Recovery Plan"), which was developed by the National Marine Fisheries Service and USFWS, lists 208 recovery actions. (T. 306 [Dodd]; Ex. P-28 at xii.) Of these, thirty-four are classified as Priority 1 (the highest priority), which is reserved for "actions that must be taken to prevent extinction or to prevent the species from declining irreversibly in the near future." (T. 233 [Dodd]; Ex. P-28 at xii.) Among other Priority 1 actions, the Recovery Plan contains a Priority 1 mandate to "[m]aintain at least the current length and quality of protected nesting beach." (Rusenko WD ¶ 20; T. 233; Ex. P-28 at II-25, III-13.)

Sea turtles nest on dry sand beaches along the Atlantic coast, including the beaches on Sea Island. (T. 234-36 [Dodd].) A female sea turtle nests five to seven times during each summer's nesting season, emerging from the sea at night to dig a nest, lay her eggs, and cover them with sand before returning to the ocean. (T. 308-09 [Dodd].) Each nest contains 100 to 126 eggs, which incubate for approximately sixty days. (T. 234 [Dodd]; Ex. P-28 at I-18.) Sea turtle hatchlings emerge at night and enter the water. (T. 246 [Dodd].)

A dry sand beach is critical for embryo development and egg hatching; a nest that is repeatedly inundated with waves will likely be lost. (T. 234, 328 [Dodd].) To find dry sand, a nesting sea turtle may climb over small obstacles (for example, a scarped dune lower than knee-high), but larger impediments may leave her unable to locate a suitable nesting location. (T. 299-300 [Dodd].) In that event, she returns to the ocean without releasing her clutch of eggs, in

what is known as a "false crawl." (Rusenko WD ¶ 64.) Available data suggest that a sea turtle will continue to attempt nesting after a false crawl, but if she remains unsuccessful after roughly three days,[31] she will drop her clutch in the water and ovulate again. (T. 308-09 [Dodd].)

Although Sea Island has argued that its project will create high-quality sea turtle nesting habitat where none presently exists, its evidence on this point was decidedly lacking. At the hearing, Sea Island called no sea turtle experts to testify.[32] The Petitioners, in contrast, called two such experts, Kirt Rusenko[33] and Mark Dodd,[34] both of whom testified that the project would not create additional nesting habitat because the project area is already functioning as nesting habitat. (Rusenko WD ¶ 50; T. 344 [Dodd].) This testimony was credible and reliable. A generally accepted maxim within the community of sea turtle experts holds that sea turtles are better than humans at identifying suitable nesting habitat; thus, suitable nesting habitat is any location where sea turtles nest. (Rusenko WD ¶ 58; T. 271, 273 [Dodd].) Indeed, sea turtles have few, if any, nesting requirements beyond the presence of a functioning sand-sharing system

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[31] In a study in which sea turtles were kept in tanks to prevent them from nesting, they dropped their clutches after three days. (T. 309 [Dodd].)

[32] To the extent Sea Island proffered the testimony of Daniel Bucey in an effort to establish that the permitted project would create additional sea turtle nesting habitat in the project area, such testimony is rejected in its entirety, as Mr. Bucey is not a sea turtle expert and has had only minimal education and training in this area. (Bucey WD ¶¶ 1-5, 14-28; T. 521-22 [Bucey].)

[33] Dr. Rusenko has worked more than for twenty years as the Marine Conservationist for the City of Boca Raton, Florida's Gumbo Limbo Nature Center. (Rusenko WD ¶¶ 1, 5.) In that capacity, he manages the sea turtle conservation and research program and trains and supervises nine sea turtle specialists. (Rusenko WD ¶ 6.) Dr. Rusenko monitors beach renourishment projects for the city and reports on all beachfront construction permits along Boca Raton's five miles of Atlantic barrier island shoreline. (Rusenko WD ¶¶ 5, 7.) He holds a Ph.D. in marine zoology, and he also works as an adjunct professor in the Department of Biological Sciences at Florida Atlantic University. (Rusenko WD ¶¶ 3, 11.)

[34] Mark Dodd has worked for DNR for over seventeen years as a Senior Wildlife Biologist and the coordinator of Georgia's sea turtle program. (T. 224-25 [Dodd].) His job responsibilities include conducting sea turtle research, establishing protocols for sea turtle conservation in Georgia, and reviewing and commenting on projects with potential impacts to sea turtles. (T. 226-28 [Dodd].) Mr. Dodd holds a master's degree in aquaculture, fisheries, and wildlife, and he is one of the authors of the Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle, which was mandated by the Endangered Species Act. (T. 225, 232 [Dodd]; Ex. P-28 at v.)

that contains dry sand beach. (T. 273 [Dodd].) The 1,200-foot project area currently functions as suitable sea turtle nesting habitat, as it has done historically.[35] (Rusenko WD ¶ 37; T. 244, 250-51, 285, 299-301 [Dodd].)

In fact, nesting density in the project area is comparable to nesting density on the rest of the island.[36] (Rusenko WD ¶¶ 41-50; Exs. P-48, P-51, P-81.) Even in segments of the project area where scarped dunes are present, suitable nesting habitat will return as scarped areas collapse and create ramps into the dry sand. (T. 299-300 [Dodd].) Barrier island beaches are variable and constantly in motion, and the beach in the project area will continue to provide sea turtle nesting habitat so long as the sand-sharing system functions properly. (T. 301-02.)

Similarly, the degree of nesting success in the project area is similar to that of Sea Island overall. The nesting success rate is determined by dividing the total number of nests by the combined total of nests and false crawls. (Rusenko WD ¶ 64.) A nesting success rate of at least 50% is generally considered satisfactory. (Rusenko WD ¶ 64.) During the seventeen years from 1999 to 2015, the nesting success rate in the area north of the south groin was 54.5%; for the area south of the south groin, it was 54.1%. (Rusenko WD ¶ 65; Exs. P-49, P-50, P-51, P-53, P-54,

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[35] To the extent Sea Island attempted to show that the existing groins have created additional sea turtle nesting habitat on the island (and that the new groin can therefore be expected to do the same), the evidence presented was not persuasive. First, looking at the island as a whole, Sea Island had 4.56 kilometers of suitable nesting habitat before the groins were installed, and 4.58 kilometers afterwards. (T. 280-82 [Dodd].) Thus, the existing groins have not created additional nesting habitat; they have simply moved the nesting habitat from the north and south ends of the island to the more-developed, less-desirable (from a sea turtle perspective) center of the island. (T. 280-82 [Dodd].) Second, Sea Island proffered sea turtle nesting data from 1989, the year before the 1990 nourishment project got underway, and a year in which only nineteen nests were documented, as a baseline. (Bucey WD ¶ 24; Ex. SI-62.) However, this number was wholly unreliable, given that the data were collected by a volunteer who surveyed the beaches only infrequently – twice a week, rather than every day. (T. 337-38 [Dodd].) Furthermore, nesting numbers can vary widely from year to year, and these fluctuations cannot be accounted for in just one year's worth of data. (Rusenko WD ¶ 59; T. 337-38, 350 [Dodd]; Exs. P-56, P-57, P-58.) Even during the post-project years when daily surveys were performed, very low nest numbers were occasionally documented on Sea Island's beaches: twenty-three nests in 2004; thirty-eight in 1993; and forty-one in 2014. (Ex. P-56.)

[36] From 1999 to 2015, there were a total of 287 sea turtle nests per mile north of the south groin and 275 nests per mile south of the south groin. (Rusenko WD ¶¶ 41-42; Exs. P-48, P-51.) On an annual basis, nesting density averages 13.6 nests per mile for the project area and 16.9 nests per mile for the remainder of the Spit. (Rusenko WD ¶¶ 43-49; Ex. P-81.)

P-55, P-60, P-65.) The nesting success rate in the project area was somewhat less, at 44%. (Rusenko WD ¶ 66; Ex. P-79A.) However, this result is skewed by two outlier years, 2000 and 2012, when eighteen false crawls were documented but only two nests were found. (Rusenko WD ¶ 66; Ex. P-79A.)

The construction of a new groin in the project area, particularly one with a T-head, will impede sea turtle nesting in several ways. First, a T-head is a physical obstacle that interferes with females attempting to reach the shore and may prevent them from reaching their nesting habitat. (Rusenko WD ¶ 36; T. 244-45 [Dodd]; Ex. P-6 at 3.) Second, it functions as a barrier to hatchling migration to the ocean, potentially trapping them within the groin structure. (Rusenko WD ¶ 36; T. 246 [Dodd]; Ex. P-6 at 3.) Third, hatchling mortality increases due to the tendency of predators to cluster in the vicinity of a groin. (Rusenko WD ¶ 36; T. 246 [Dodd]; Ex. P-6 at 3.) Moreover, because hatchlings may wander up to forty-five degrees off-course from a straight line from nest to water, the "danger zone" extends approximately 100 meters (328 feet) on either side of a groin. (T. 247 [Dodd]; Ex. P-6 at 4.) In this case, with the addition of the T-head, another forty meters (131 feet) of viable nesting habitat will be lost. (Ex. P-6 at 4.) Thus, the proposed project will render 240 meters (787 feet) of sea turtle nesting habitat on Sea Island functionally unusable. (Ex. P-6 at 4.)

Even so, these effects of the proposed groin can be mitigated by relocating nests found in the danger zone to safer locations. Current DNR guidelines call for a nest to be relocated if it is expected that the nest will be lost or overwashed with waves more than three times. (Written Direct Testimony of Raleigh Nyenhuis ["Nyenhuis WD"] ¶¶ 14-15; T. 328 [Dodd].) Although DNR attempts to keep relocations to a minimum, Mr. Dodd's research has shown no difference in the emergence success rate of relocated vs. *in situ* sea turtle nests. (T. 284, 328-29 [Dodd].)

In fact, sea turtle nests are frequently relocated from the project area under current conditions. (T. 284, 332 [Dodd]; Ex. SI-70.) From 2012 through 2015, ten of the eleven nests in the project area were relocated,[37] with six of these being placed outside the project area. (T. 332-33 [Dodd]; Ex. SI-70.) Two nests were moved to the project area from other locations. (T. 333 [Dodd].) While the high percentage of relocations does not indicate that the project area lacks suitable nesting habitat,[38] it does suggest that the addition of a new groin is unlikely to increase nest relocations significantly. (Rusenko WD ¶ 58; T. 271-73 [Dodd].) Moreover, it must be noted that the total number of nests found in the project area is small. Nesting density in the project area is approximately seven nests per kilometer, which equates to two nests per year.[39] (T. 242, 322 [Dodd].)

CRD staff recognized that the permitted project would interfere with the conservation of sea turtles, even if the effects of the groin were mitigated. (Burgess WD ¶ 22; Ex. J-2 at 10.) The Permit therefore incorporates special conditions designed to minimize the negative impacts on sea turtles. (Burgess WD ¶ 22; Ex. J-3 at Spec. Cond. 1, 7, 9-12, 16-17.) Special Condition No. 1 imposes standards for the quality of sand that would be used in the project area to create the dune and surcharge the groin compartment. (Ex. J-3 at Spec. Cond. 1.) Special Condition No. 7 prohibits any construction activities during sea turtle nesting and hatching season. (Ex. J-3 at Spec. Cond. 7.) Under Special Conditions Nos. 9 and 10, tilling of the project area would be

[37] In prior years, the relocation rate was much lower: from 1999 to 2008, only 35% of nests in the project area were moved. (T. 284 [Dodd].)

[38] As Mr. Dodd put it, the number of nest relocations "is a very poor standard" that "has more to do with the philosophy of the people who are on the beach" than with the quality of the habitat. (T. 348 [Dodd].) Moreover, some relocations are dictated by the nests' proximity to the south groin, which is a problem of Sea Island's own making. (Rusenko WD ¶ 58.)

[39] Although this number is similar to the nesting density on Sea Island as a whole, it is quite low compared to certain areas in Florida, for example, where loggerhead nesting density is 500 nests per kilometer. (Rusenko WD ¶¶ 43-49; T. 242 [Dodd]; Ex. P-51.) Additionally, Sea Island has not been designated a "critical habitat" for sea turtles, although other Georgia barrier islands have been so designated. (T. 305-06 [Dodd].)

required immediately after construction and annually, as needed, for five years post-construction, to ensure that the surcharged area is not overly compacted. (Burgess WD ¶ 22; Ex. J-3 at Spec. Cond. 9-10.) In a related vein, Special Condition No. 11 requires Sea Island to report the results of annual compaction surveys to DNR. (Ex. J-3 at Spec. Cond. 11.) Special Conditions Nos. 12 and 13 would minimize impediments to nesting by requiring Sea Island to conduct surveys and undertake corrective actions to address any escarpments in the project area that may exceed eighteen inches in height for a distance of 100 feet or more. (Burgess WD ¶ 22; Ex. J-3 at Spec. Cond. 12-13.) Special Condition No. 16 establishes requirements for sand fencing, for the purpose of ensuring that sand fencing would not interfere with ingress and egress of nesting sea turtles. (Burgess WD ¶ 22; Ex. J-3 at Spec. Cond. 16.) Finally, Special Condition No. 17 would limit vehicle access to the project area so as to minimize the effects on the sand-sharing system and sea turtle habitat. (Burgess WD ¶ 22; Ex. J-3 at Spec. Cond. 17.)

E. The Proposed Project's Impact on the Conservation of Shorebirds

Gould's Inlet and the Spit are used by large numbers of federally listed shorebirds, including the piping plover (*Charadrius melodus*) and the red knot (*Calidris canutus*). (Written Direct Testimony of Adam Kent ["Kent WD"] ¶¶ 31-35; Exs. P-6 at 8, P-7 at 1-2.) These shorebirds rely on the low tide beach, sand flats, shoals, and sand bars in and around Gould's Inlet for foraging and nesting. (Kent WD ¶¶ 39-40, 43.) The project area, however, does not attract significant numbers of piping plover and red knot due to human activity and the absence of dry beach above high tide. (Kent WD ¶ 9.) Increased erosion south of the project area would not have a negative impact on shorebirds unless it reduced the amount of foraging area available to them. (Kent WD ¶ 19.) In this case, as explained above, the proposed project is not expected to increase the downdrift erosion that has been caused by the existing groins. Consequently, it is

unlikely that the permitted project will impact the conservation of threatened or endangered shorebirds. To the extent negative impacts to shorebirds are possible, the Permit incorporates Special Conditions Nos. 2, 5, and 8, discussed above, which are intended to reduce the potential for erosion downdrift of the new groin. (Burgess WD ¶ 23; Ex. J-3 at Spec. Cond. 2, 5, 8.)

F. The Proposed Project's Impact on Recreational Use and Enjoyment of Public Properties

It is undisputed that many people, both residents and non-residents of Sea Island, enjoy the waters of Gould's Inlet and the beaches of Sea Island, including the Spit. (T. 364 [Hardin], 369 [Post], 385 [Patton], 387-88 [Sattelmeyer], 794 [Steilen].) The permitted project will not restrict the public's access to these areas. (Ex. J-3 at 2.) In fact, Special Condition No. 9 of the Permit specifically provides that "[t]he public shall maintain right of ingress and egress on the foreshore beach seaward of the ordinary high water mark." (Ex. J-3 at Spec. Cond. 9.) Moreover, Sea Island has already placed the remainder of the Spit, south of the Reserve property, in a conservation easement which prohibits future development of the area. (Ex. SI-1.) In addition, as explained above, the permitted project is not expected to increase the downdrift erosion caused by the existing groins. To the extent future erosion may reduce the acreage of land available for use and enjoyment by the public, it is the existing groins, rather than the permitted project, that would likely be responsible for such erosion. Therefore, the evidence does not support a finding that the permitted project itself will interfere with the public's use and enjoyment of public properties.

G. Alternatives to the Permitted Project

At the hearing, the Petitioners attempted to identify a reasonable or viable alternative to the permitted project. To that end, both Dr. Webb and Dr. Young testified that Sea Island could achieve the objectives of its project by conducting a beach nourishment project that does not

include a groin. (Webb WD ¶ 95; Young WD ¶ 20; T. 47 [Young], 114-15 [Webb].) However, there was consensus among the experts that a beach nourishment project confined to the project area would have limited effect, and its maintenance costs would be prohibitive due to its short half-life.[40] (Basco WD ¶ 49; T. 45 [Young], 117 [Webb].) Consequently, the Petitioners have proposed a beach nourishment project that extends from the existing south groin all the way to the end of the Spit. (Webb WD ¶ 95; T. 114.)

The Petitioners' experts offered few details regarding such a project, choosing instead to emphasize the number of beach nourishment projects without groins that have been completed along the Atlantic coastline in recent years. (Young WD ¶¶ 23-36; Webb WD ¶ 95; T. 41-42 [Young].) For example, in his written direct testimony, Dr. Webb stated that the project would require approximately 500,000 cy of sand and could remain stable "[i]f combined with a beach management plan, having specific renourishment intervals and volumes." (Webb WD ¶ 95.) No further details were provided. At the hearing, he elaborated somewhat, explaining his calculations of the necessary sand volume and suggesting that suitable sand could be removed from Gould's Inlet, the ebb shoals of the Hampton River, or another offshore area. (T. 115-16.) He did not estimate the project's cost or offer more precise specifications for the project design.

In addition to the lack of detail regarding a project involving extended beach nourishment without a groin, the evidence showed that the Petitioner's proposal overlooks a number of shortcomings. First, the conservation easement contains activity and use restrictions that could be interpreted as prohibiting a beach nourishment project along the Spit south of the project

[40] The half-life of a nourishment project is the point at which only 50% of the sand volume remains on the beach. (Basco WD ¶ 47.) The half-life of a 1,200-foot nourishment project would be approximately one month. (Basco WD ¶ 49.) The half-life increases exponentially in relation to the length of beach involved. (Basco WD ¶¶ 47-50.)

area.[41] (Ex. SI-1 at § 8, § 11.) Second, the primary goal of the permitted project is to protect the Reserve property. (T. 734 [Basco]; Ex. J-1.) A project that extended the length of the Spit would require Sea Island to expend significant funds to protect property that is beyond the scope of its defined project area and does not benefit its bottom line. (Ex. SI-1.) Third, a typical beach nourishment project is several miles in length, with an expected duration measured in years; the half-life of a one-mile project in this location could be as short as eighteen months. (Basco WD ¶¶ 47-51, 108.) Fourth, the source of a majority of the sand needed for a mile-long nourishment project has not been identified. Although 120,000 cy of sand would presumably come from the catchment area on the updrift side of the south groin, consistent with the permitted project design, it would be necessary to identify a source of 380,000 cy of additional sand. This sand would be required to meet the applicable standards for grain size, composition, and color, and any dredging project would need to avoid adverse impacts to threatened or endangered species. (T. 320 [Dodd], 485-86 [Bucey]; Exs. J-3 at Spec. Cond. 1, P-6 at 8.) Finally, there is no evidence that the construction and maintenance costs of a beach nourishment project the length of the Spit will be reasonable. (T. 117-18 [Webb], 701-03, 741-42 [Basco].) For these reasons, the evidence presented at the hearing was insufficient to support a finding that a beach nourishment project without a groin is a reasonable or viable alternative to the permitted project.

[41] The Petitioners interpret the conservation easement to allow a nourishment project involving the use of mechanized equipment so long as it did not cross the high water line. (Petitioners' Proposed Findings of Fact and Conclusions of Law, filed June 30, 2016, at 66-71.) Sea Island, not surprisingly, has a contrary interpretation, arguing that the conservation easement extends to the low water line. (Sea Island's Proposed Findings of Fact and Conclusions of Law, filed June 30, 2016, at 35-41.) The limited evidence presented regarding possible alternatives to the use of mechanized equipment on the beach was not persuasive. (T. 699-702, 741-42 [Basco].)

III. ANALYSIS

A. Statutory Framework

The Shore Protection Act, O.C.G.A. § 12-5-230 to -248 ("Act"), was enacted for the purpose of protecting the sand-sharing system in Georgia. O.C.G.A. § 12-5-231. In doing so, the General Assembly recognized that "coastal sand dunes, beaches, sandbars, and shoals comprise a vital natural resource system, known as the sand-sharing system, which acts as a buffer to protect real and personal property and natural resources from the damaging effects of floods, winds, tides, and erosion." Id. The General Assembly further declared that the sand-sharing system "is costly, if not impossible, to reconstruct or rehabilitate once adversely affected by man related activities and is important to conserve for the present and future use and enjoyment of all citizens and visitors to this state and that the sand-sharing system is an integral part of Georgia's barrier islands, providing great protection to the state's marshlands and estuaries." Id. In addition, the "sand-sharing system is a vital area of the state and is essential to maintain the health, safety, and welfare of all the citizens of the state." Id. Therefore, the Act "allow[s] only activities and alterations of the sand dunes and beaches which are considered to be in the best interest of the state and which do not substantially impair the values and functions of the sand-sharing system . . . ." Id. Under the Act, the Committee is vested with the authority to issue permits to "construct or erect any structure or construct, erect, conduct, or engage in any shoreline engineering activity or engage in any land alteration which alters the natural topography or vegetation of any area within the jurisdiction of this part." O.C.G.A. § 12-5-237(a). A permit applicant must meet all applicable requirements of the Act before a permit may be issued. O.C.G.A. § 12-5-239.

Under O.C.G.A. § 12-5-244(a), "[a]ny person who is aggrieved or adversely affected[42] by any order or action of the [C]ommittee shall . . . have a right to a hearing before an administrative law judge appointed by the [B]oard [of Natural Resources]." O.C.G.A. § 12-5-244(a); see O.C.G.A. § 12-5-232(5), (7). The evidentiary hearing is *de novo*,[43] and the administrative law judge "shall make an independent determination on the basis of the competent evidence presented at the hearing." Ga. Comp. R. & Regs. 616-1-2-.21(1). As third parties challenging the issuance of a permit, the Petitioners bear the burden to prove, by a preponderance of the competent evidence presented at the hearing, that the Permit was "wrongfully issued." Hughey v. Gwinnett County, 278 Ga. 740, 741 (2004); see Ga. Comp. R. & Regs. 616-1-2-.07(1), .21(4); Longleaf Energy Assoc., LLC v. Friends of the Chattahoochee, 298 Ga. App. 753, 768 (2009) (the administrative law judge is required "to consider the applicable facts and law anew, without according deference or presumption of correctness to the EPD's decision, and to render an independent decision on whether the Challengers carried their burden to prove by the preponderance of the evidence that the permit should not have been issued.").

The Petitioners seek the reversal of the Committee's decision to issue the Permit to Sea Island on several grounds. First, the Petitioners argue that issuance of the Permit violates O.C.G.A. § 12-5-239(c)(3)(B) because the permitted project does not minimize the effects to

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[42] "Persons are 'aggrieved or adversely affected' where the challenged action has caused or will cause them injury in fact and where the injury is to an interest within the zone of interests to be protected or regulated by this part." O.C.G.A. § 12-5-244(c). The Petitioners in this case have established, by affidavits submitted in conjunction with their Petitions for Hearing and by the testimony of members of their organizations, that they are aggrieved or adversely affected by the Committee's action, and that the injury is within the zone of interests to be protected or regulated under the Act. See OHM Am. Pet. Exs. B-E; ARK/Surfrider Pet. Exs. 2-7; T. 364-66 [Hardin], 369-70 [Post], 385 [Patton], 387-88 [Sattelmeyer]; see also Ga. River Network v. Turner, 328 Ga. App. 381, 386-89 (2014), rev'd on other grounds, Turner v. Ga. River Network, 297 Ga. 306 (2015); Aldridge v. Ga. Hospitality & Travel Ass'n, 251 Ga. 234, 235-36 (1983). In any event, the Petitioners' standing was not challenged.

[43] When a contested case is referred to the Office of State Administrative Hearings, the administrative law judge assigned to the case has "all the powers of the referring agency . . . ." O.C.G.A. § 50-13-41(b).

sand-sharing mechanisms. Second, the Petitioners assert that issuance of the Permit violates O.C.G.A. § 12-5-239(c)(3)(C) because a reasonable or viable alternative to the groin exists. Finally, the Petitioners contend that issuance of the Permit is prohibited by O.C.G.A. § 12-5-239(i) because the permitted project is not in the public interest. More specifically, the Petitioners argue that the project will create "unreasonably harmful, increased alteration of the dynamic dune field or submerged lands, or function of the sand-sharing system," in violation of O.C.G.A. § 12-5-239(i)(1); that the project "will unreasonably interfere with the conservation of marine life, wildlife, or other resources," in violation of O.C.G.A. § 12-5-239(i)(2); and that the project will "unreasonably interfere with reasonable access by and recreational use and enjoyment of public properties impacted by the project," in violation of O.C.G.A. § 12-5-239(i)(3). However, after hearing and evaluating the evidence and the parties' arguments, the Court finds that the Committee's issuance of the Permit was lawful.

B. To the Extent Possible, the Proposed Project Minimizes the Effects to Sand-Sharing Mechanisms.

It is undisputed that Sea Island's permitted project involves "shoreline engineering activity," which is defined by statute to include beach nourishment, artificial dunes, and groin construction and maintenance. O.C.G.A. § 12-5-232(17). A permit for shoreline engineering activity may be issued "only when . . . [t]he proposed project will insofar as possible minimize effects to the sand-sharing mechanisms from storm-wave damage and erosion both to the subject parcel and at other shoreline locations . . . ." O.C.G.A § 12-5-239(c)(3)(b). Implicit in this provision is the recognition that any shoreline engineering activity can be expected to cause certain unavoidable impacts to the sand-sharing system. Thus the Act directs the Committee to ensure that such impacts are minimized. Id.

Notably, the only issue presented for determination by this Court is whether the newly-permitted project complies with the Act. The inquiry is not whether the adverse downdrift impacts of the *existing* groins have been minimized,[44] but rather whether the adverse downdrift impacts of the *proposed* groin have been minimized. The answer to this question is yes.

Sea Island has designed its new project to include three complementary design elements—a T-head groin, beach nourishment, and a rebuilt dune—that work together to minimize the adverse effects to sand-sharing mechanisms.[45] As explained in the Findings of Fact, the groin itself slopes down three feet as it extends seaward and tapers the transition from the existing south groin, which allows more sand bypassing as compared with the existing groins. The groin is also engineered and constructed in a way that allows some volume of sand to move over and through it. Second, the beach nourishment component adds 120,000 cy of sand to the project area and ensures that sediment is allowed to bypass the end of the groin immediately. This design is consistent with modern coastal engineering practice and minimizes the impact to the downdrift beach. The third element, the constructed dune, holds sand on the beach and contributes sand to the downdrift area during storm events. Additionally, the Permit includes specific provisions that require Sea Island to adjust or remove the groin if it traps sand in longshore transport or causes adverse impacts on the downdrift shoreline.[46] These design elements and permit conditions serve to mitigate, to the extent possible, effects to the sand-

[44] The evidence showed that it is more likely than not that the area south of the south groin will continue to erode at an accelerated rate, whether or not the permitted project is completed, due to the sand-trapping function of the existing groins. However, whether or not the existing groins are functioning in compliance with the Shore Protection Act is simply beyond the scope of this proceeding.

[45] The Petitioners did not challenge any of the design specifications for the project beyond their general opposition to the use of a groin.

[46] There is no basis for a determination that the permit conditions would not be enforced. "The law presumes [a] public officer[] will follow the law in the exercise of [his or her] statutory duties and authority." McDowell v. Judges ex Officio, 235 Ga. 364, 365 (1975).

sharing system caused by storms and erosion, both in the project area and in the adjacent shoreline area, as required by O.C.G.A § 12-5-239(c)(3)(b).

C. The "Reasonable or Viable Alternative" Requirement Does Not Apply.

The Petitioners contend that the Committee's issuance of the Permit violated O.C.G.A. § 12-5-239(c)(3)(C) because beach nourishment without a groin is a reasonable or viable alternative to the permitted project. The Act provides, regarding the alternatives analysis:

> A permit for shoreline engineering activity or for a land alteration on beaches, sand dunes, and submerged lands may be issued only when:
>
> . . .
>
> (C) In the event that shoreline stabilization is necessary, either low-sloping porous rock structures or other techniques which maximize the dissipation of wave energy and minimize shoreline erosion shall be used. **Permits may be granted for shoreline stabilization activities when the applicant has demonstrated that no reasonable or viable alternative exists**; provided, however, that beach restoration and renourishment techniques are preferable to the construction of shoreline stabilization activities[.]

O.C.G.A. § 12-5-239(c)(3) (emphasis added). The Petitioners' claim, however, fails as a matter of law, because the permitted project—for groin construction and maintenance, beach nourishment, and dune rebuilding—does not involve "shoreline stabilization activities" as that term is used in the Act. Thus, to obtain a permit for its proposed project, Sea Island did not have to demonstrate a lack of reasonable or viable alternatives in accordance with O.C.G.A. § 12-5-239(c)(3)(C).

The Generally Assembly did not separately define "shoreline stabilization activities" within the Act, choosing instead to reference the term within the context of the statutory definition of "shoreline engineering activity." See O.C.G.A. § 12-5-230 *et seq*. The question thus becomes one of statutory construction—in short, whether the term "shoreline stabilization

activities," as used in O.C.G.A. § 12-5-239(c)(3)(C), encompasses groin construction, beach nourishment, and/or dune creation. This is a question of law to be reviewed *de novo*. See Upper Chattahoochee Riverkeeper, Inc. v. Forsyth County, 318 Ga. App. 499, 502 (2012) (holding that the interpretation of a statute is a question of law and therefore reviewed de novo on appeal); see also Ga. Comp. R. & Regs. 616-1-2-.21(3) (stating that this Court's hearings "shall be de novo in nature").[47]

This Court applies the "fundamental rule" of statutory construction, which is to "give words their plain and ordinary meaning, and to avoid a construction that makes some language mere surplusage." Ga. Dep't of Nat. Res. v. Ctr. for a Sustainable Coast, Inc., 294 Ga. 593, 603 (2014) (citation and quotation omitted). "Absent clear evidence that a contrary meaning was intended by the legislature, [this Court] assign[s] words in a statute their ordinary, logical, and common meanings." Turner v. Ga. River Network, 297 Ga. 306, 308 (2015) (citation and quotations omitted); see also O.C.G.A. § 1-3-1(b). In the case of "words of art or words connected with a particular trade or subject matter," the words "shall have the signification attached to them by experts in such trade or with reference to such subject matter." O.C.G.A. § 1-3-1(b).

"At the same time" that this Court looks to the ordinary meaning of a statute's words, it also "must seek to effectuate the intent of the legislature." Ctr. for a Sustainable Coast, 294 Ga.

[47] This Court's *de novo* review renders null the Petitioners' arguments that both the Committee and Sea Island have previously taken the position that the "reasonable or viable alternatives" analysis applied to the Permit. Namely, the Petitioners assert that (a) the CRD, in its recommendations regarding the Permit, stated that groins served as shoreline stabilization devices; and (b) the Committee and Sea Island, in their prior pleadings in this action, claimed that O.C.G.A. § 12-5-239(c)(3)(C) would require the Petitioners to demonstrate the existence of a reasonable or viable alternative. (See Ex. J-2 at p. 5; Sea Island's Reply on its Motion to Dismiss, filed Mar. 14, 2016, at 4; Committee's Reply in Support of Motion to Dismiss, filed Mar. 14, 2016, at 6.) These prior positions do not negate this Court's duty to conduct a *de novo* review of the statute's interpretation, nor have the Committee and Sea Island waived their right to raise the argument that the claim fails as a matter of law. See Gould v. Gould, 240 Ga. App. 481, 483 (1999) (stating that a defense of failure to state a claim under the Civil Practice Act "is a fundamental defense preserved from waiver through trial"); Ga. Comp. R. & Regs. 616-1-2-.02(3).

at 603 (citation and quotation omitted). See also Turner, 297 Ga. at 308 (stating that a court must apply the "cardinal rule of statutory construction" and "look diligently for the intention of the General Assembly") (citation and quotations omitted); O.C.G.A. § 1-3-1(a) ("In all interpretations of statutes, the courts shall look diligently for the intention of the General Assembly . . . ."). One way to deduce legislative intent is to construe a statute's language "in pari materia with other relevant statutes; and language in one part of a statute must be construed in the light of the legislative intent as found in the statute as a whole." Ga. PSC v. Alltel Ga. Communs. Corp., 227 Ga. App. 382, 385 (1997) (citations omitted).

Here, because the terminology in question is used in connection with shoreline geology and coastal engineering, this Court may look to the meanings provided by experts in these particular subject matters. See O.C.G.A. § 1-3-1(b). Going by this standard, groin construction appears to be widely considered a type of "shoreline stabilization" activity.[48] In particular, Dr. Young, a geologist who testified for the Petitioners, stated that "[g]roins are clearly a shoreline stabilization activity," and he further stated that such a characterization is "not my opinion, it's everybody's opinion." (See T. 44.)[49] Dr. Webb, a coastal engineer who also testified for the Petitioners, testified that groins are "associated very, very frequently" with shoreline stabilization activities. (See T. 46.) Testifying for Sea Island, Dr. Basco and Dr. Oertel characterized groins

[48] In contrast, nothing in the record indicates that experts in coastal engineering uniformly consider beach renourishment and dune creation to be "shoreline stabilization" actions. For example, Chapter 3 of Part V of the U.S. Army Corps of Engineers Coastal Engineering Manual treats "beach nourishment" as an alternative to "shoreline stabilization" techniques. (See Ex. P-33 at V-3-3 to V-3-7.) Dr. Basco, an expert witness for Sea Island who also authored Chapter 3, provided written testimony in which he categorized beach nourishment as "Beach Restoration," as opposed to "Beach Stabilization Structures." (See Basco, WD ¶¶ 42, 114.) However, Dr. Young, who testified for the Petitioners, described renourishment as a type of "soft stabilization" technique. (See Young WD ¶ 45.)

[49] In his written direct testimony, Dr. Young also repeatedly grouped groins into the category of shoreline stabilization projects. (See Young WD ¶ 6 (stating that he was "very familiar with a wide variety of shoreline stabilization devices, including groins, jetties, seawalls, and revetments"); id. ¶ 29 (referring to "shoreline stabilization structures, including groins . . .").)

as "beach stabilization structures" and "stabilization devices," respectively. (See Basco WD ¶ 42; Oertel WD ¶ 121.) Chapter 3 of Part V of the USACE Manual, authored by Dr. Basco, also repeatedly characterizes groins as "shoreline stabilization" structures. (See Ex. P-33; see also Basco WD ¶ 7.)[50]

Despite this apparent consensus within the coastal engineering field, however, a review of the Act as a whole strongly indicates that the General Assembly did not intend for groin construction to be considered one of the "shoreline stabilization activities" referenced in O.C.G.A. § 12-5-239(c)(3)(C). See Alltel, 227 Ga. App. at 385. Primarily, the Act lists groin construction, beach renourishment, dune creation, and shoreline stabilization activities within four distinct categories of "shoreline engineering activities." See O.C.G.A. § 12-5-232(17).

As defined in the Act:

> "Shoreline engineering activity" means an activity which encompasses any artificial method of altering the natural topography or vegetation of the sand dunes, beaches, bars, submerged shoreline lands, and other components of the sand-sharing system. This includes, but is not limited to, such activities as:
>
> (A) Grading, clearing vegetation, excavating earth, or landscaping, where such activities are for purposes other than erection of a structure;
>
> (B) **Artificial dune construction**;
>
> (C) **Beach restoration or renourishment**;
>
> (D) **Erosion control activities, including, but not limited to, the construction and maintenance of groins and jetties**;
>
> (E) **Shoreline stabilization activities, including, but not limited to, the construction and maintenance of seawalls and riprap protection**; and

[50] The manual, for example, notes that groins are used for "erosion mitigation and shoreline stabilization"; includes groins under the "Shoreline Stabilization Structures and Facilities" category in a table; discusses groins under subtitles such as "Shoreline Stabilization," "Beach Stabilization Structures," and "Beach Stabilization Structures and Beach Nourishment"; and states that groins are the "most common shore-connected beach stabilization structure." (Ex. P-33 at V-3-3, V-3-4, V-3-7, V-3-35, V-3-59, V-3-87.)

(F) The construction and maintenance of pipelines and piers.

O.C.G.A. § 12-5-232(17) (emphasis added). The fact that the General Assembly listed "artificial dune construction" and "beach restoration or renourishment" as separate categories of shoreline engineering activities—as opposed to examples within the category of "shoreline stabilization activities"—indicates that the General Assembly intended for dunes and beach renourishment to be treated as distinct from shoreline stabilization activities. Section 12-5-239(c)(3)(C) further highlights this distinction, as it states that "beach restoration and renourishment techniques" remain preferable to the construction of "shoreline stabilization activities." O.C.G.A. § 12-5-239(c)(3)(C). By indicating a preference for one specific category of shoreline engineering activities over another, the General Assembly signifies that these categories do not overlap.

Similarly, the fact that groins are mentioned in the category for "erosion control activities," but are omitted from the "shoreline stabilization activities" category, suggests that the legislature did not consider groins to be the latter type of shoreline engineering activity. See O.C.G.A. § 12-5-232(17)(D)-(E). Arguably, the phrase "including, but not limited to" in the category description for "shoreline stabilization activities" denotes that such activities may encompass other structures beyond the listed examples of "seawalls and riprap protection." Given this term of expansion, groins, beach nourishment, and dunes are not necessarily excluded from the category of "shoreline stabilization activities." See Berryhill v. Ga. Cmty. Support & Solutions, Inc., 281 Ga. 439, 440-42 (2006) (holding that "including," by itself, may be a term of enlargement, depending on the context of the statute).[51]

[51] Given this potential term of expansion, the Committee's reliance on two other canons of construction fails on the merits. Namely, the Committee argues that the express reference to seawalls and riprap as examples of "shoreline stabilization activities" implies that groins were deliberately excluded from this category. The Committee refers to *expressio unius est exclusio alterius* (the expression of one thing implying the exclusion of the other) and *expressum facit cessare tacitum* (when some things are expressly mentioned, the inference is stronger that those omitted are intended to be excluded). See Hinton v. State, 224 Ga. App. 49, 50-51 (1996). Neither canon applies here,

However, the phrase "including, but not limited to" is subject to the restrictive canon of construction known as *ejusdem generis*. Record Town, Inc. v. Sugarloaf Mills L.P., 301 Ga. App. 367, 371 (2009) (interpreting a contract provision). In this case, the phrase "including, but not limited to" limits the category of "shoreline stabilization activities" to activities "of the same kind or class" as those specifically named, i.e. seawalls and riprap. See O.C.G.A. § 12-5-232(17)(E); Record Town, 301 Ga. App. at 371.

The question then turns to whether groins, beach renourishment, and dunes are "of the same kind or class" as seawalls and riprap. The USACE Manual describes a seawall as a "coastal armoring structure" that is "typically a massive, concrete structure with its weight providing stability against sliding forces and overturning moments." (Ex. P-33 at V-3-19; see also Basco, SI-WD-5 at p. 23, ¶ 42 (categorizing seawalls as "Armoring Structures").) A seawall also "hardens the shoreline to a fixed position." (Ex. P-33 at V-3-28.) The manual provides several diagrams of seawalls, all of which depict structures running parallel to the coastline. (Ex. P-33 at V-3-20.) Additionally, the online Merriam-Webster Dictionary defines "seawall" as "a wall built to keep sea waves from coming up onto land." See *http://www.merriam-webster.com/dictionary/seawall.* "Riprap," moreover, is defined by the dictionary as "a foundation or sustaining wall of stones or chunks of concrete thrown together without order (as in deep water); also: a layer of this or similar material on an embankment slope to prevent erosion." See *http://www.merriam-webster.com/dictionary/riprap.* The USACE Manual, although not providing a definition, refers to riprap as a type of design for a revetment, which is

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however, because the phrase "including, ***but not limited to***" allows for additional, unlisted examples of "shoreline stabilization activities." See Montgomery County v. Hamilton, 337 Ga. App. 500, 509 (2016) (stating that *expressio unius* "must be applied with great caution, since its application depends so much on context") (citation and quotation omitted).

"a cover or facing of erosion resistant material placed directly on an existing slope, embankment or dike to protect the area from waves and strong currents." (Ex. P-33 at V-3-24.)

Based on the above descriptions, the "shoreline stabilization activities" mentioned in O.C.G.A. § 12-5-232(17)(E) consist of wall-like structures that run along a shoreline or embankment. In contrast, groins are described in the USACE Manual as being built "usually perpendicular or nearly at right angles to the shoreline." (Ex. P-33 at V-3-59, V-3-74; see also Webb, P-WD at p. 4, ¶ 16 ("A groin is a structure that is built perpendicular to a beach . . . . ").) This difference is further underscored by the fact that groins are listed in the separate category for "erosion control devices" alongside jetties, which also are constructed perpendicular to the coastline. (See T. 617); see also *http://www.merriam-webster.com/dictionary/jetty* (defining "jetty" as "a long structure that is built out into water and used as a place to get on, get off, or tie up a boat" as well as "a structure extended into a sea, lake, or river to influence the current or tide or to protect a harbor"; O.C.G.A. § 12-5-232(17)(D).

By applying *ejusdem generis*, it appears that the General Assembly intended for "shoreline stabilization activities" to be limited to armored structures that run parallel to a coastline. See Record Town, 301 Ga. App. at 371. Such a class of structures would not include groins, which instead are grouped, under "erosion control devices," with another structure that similarly runs perpendicular to the shore. "Shoreline stabilization activities" also would not encompass beach renourishment and dune creation, which involve the movement of volumes of sand to the shoreline from another location. (See Ex. P-33 at V-3-5, V-3-7; T. 114-15, 156, 703-04, 719.)

Therefore, regardless of any apparent consensus among coastal-engineering experts that groins serve a role in stabilizing shorelines, the definitional provisions in the Shore Protection

Act clearly indicate that the General Assembly intended for groins—as well as beach restoration and dune creation—to be separate and distinct from "shoreline stabilization activities." See O.C.G.A. § 12-5-232(17); Turner, 297 Ga. at 308. Cf. Glanton v. State, 283 Ga. App. 232, 233-34 (2007) (in interpreting statute criminalizing "riots in penal institutions," court rejected common understanding that "riot" involves two or more people acting in concert, because General Assembly did not include element of concerted action in statute). Accordingly, as the Permit does not encompass any project components that qualify as "shoreline stabilization activities," the alternatives analysis set forth in O.C.G.A. § 12-5-239(c)(3)(C) does not apply,[52] and this claim by the Petitioners fails as a matter of law.

D. Public Interest Considerations

When the Committee makes a decision regarding whether or not to grant a permit application, it "shall consider the public interest," which is defined in the statute to include the following:

> (1) Whether or not unreasonably harmful, increased alteration of the dynamic dune field or submerged lands, or function of the sand-sharing system will be created;
>
> (2) Whether or not the granting of a permit and the completion of the applicant's proposal will unreasonably interfere with the conservation of marine life, wildlife, or other resources; and
>
> (3) Whether or not the granting of a permit and the completion of the applicant's proposal will unreasonably interfere with reasonable access by and recreational use and enjoyment of public properties impacted by the project."

[52] Further, as explained in the Findings of Fact, even if the alternatives analysis of O.C.G.A. § 12-5-239(c)(3)(C) were to apply, the Petitioners did not meet their burden of proof. Although the Petitioners offered a general proposal for a beach nourishment project extending from the existing south groin to Gould's Inlet, their proposal lacked specificity regarding its legal, technical, and economic feasibility. This evidence was insufficient to establish the existence of a reasonable or viable alternative to the permitted project.

O.C.G.A. § 12-5-239(i). At the hearing, the Petitioners were unable to prove that the issuance of the Permit violated any of the three public interest considerations.

1. The Permitted Project Will Not Cause Unreasonable Harm.

The first public interest component requires the Committee to consider whether issuance of a permit will cause "unreasonably harmful, increased alteration of the dynamic dune field or submerged lands, or function of the sand-sharing system." O.C.G.A. § 12-5-239(i)(1). By the express terms of the statute, all harmful effects are not prohibited; the critical inquiry is whether such effects are *unreasonably* harmful. This reasonableness standard contemplates a balancing of the relevant interests to determine whether or not a particular permit application should be granted.

It is undisputed that the permitted project will alter the dynamic dune field[53] and submerged lands[54] and that it will impact the function of the sand-sharing system. However, as previously noted, the project has been designed to minimize adverse effects to the sand-sharing system to the extent possible, and the permit conditions provide an additional failsafe. Weighed against Sea Island's interest in protecting its valuable upland property, the modest adverse impacts of the permitted project are not unreasonable. The Petitioners therefore did not meet their burden to prove that the project will cause "unreasonably harmful, increased alteration of the dynamic dune field or submerged lands, or function of the sand-sharing system." O.C.G.A. § 12-5-239(i)(1).

[53] The dynamic dune field is "the dynamic area of beach and sand dunes, varying in height and width, the ocean boundary of which extends to the ordinary high-water mark and the landward boundary of which is the first occurrence either of live native trees 20 feet in height or greater or of a structure existing on July 1, 1979. . . ." O.C.G.A. § 12-5-232(8).

[54] The term "submerged shoreline lands" (which presumably carries the same meaning as "shoreline lands") is defined as "the intertidal and submerged lands from the ordinary high-water mark seaward to the limit of the state's jurisdiction in the Atlantic Ocean." O.C.G.A. § 12-5-232(20).

2. The Permitted Project Will Not Unreasonably Interfere with the Conservation of Sea Turtles or Shorebirds.

The second public interest provision requires the Committee to consider whether the permitted project "will unreasonably interfere with the conservation of marine life, wildlife, or other resources." O.C.G.A. § 12-5-239(i)(2). Like the first public interest consideration, this provision does not proscribe all interference with conservation; rather, only unreasonable interference can be a reason to deny a permit application. In this case, although the Petitioners established that the project would impact sea turtles listed as threatened or endangered under the Endangered Species Act, they were unable to prove that such interference would be unreasonable.

The Petitioners proved that the permitted project will interfere with their conservation in several ways, as explained more fully in the Findings of Fact. First, the T-head segment of the groin will create a physical obstacle for nesting females attempting to reach the beach. Second, even when females are able to nest in the area, the T-head will impede hatchlings attempting to reach the deeper ocean and increase hatchling mortality by concentrating predators in the area of the groin. To reduce these risks to hatchlings, any nest within 100 meters of the groin, including its T-head segment, must be moved to another location. This renders 787 feet of existing sea turtle nesting habitat functionally unusable. However, the evidence also showed that sea turtles will make multiple attempts to find a suitable nesting location, thereby increasing the likelihood that a nesting female will find her way past the T-head to shore. In addition, the average total of nests in the project area is just two per year. Many of these are moved to another location, for various reasons, and the eggs in a relocated nest are no less likely to hatch. Therefore, because the adverse impact of the groin can be largely mitigated by relocating any nests found within 100 meters on either side, the quantifiable impact to sea turtles is not substantial. The Permit also

contains a number of provisions that are specifically aimed at minimizing impacts to sea turtles within the 1,200-foot project area. While the Act does not explain precisely what it means to "unreasonably interfere" with wildlife conservation,[55] the Court finds that the level of interference that was proven in this case, while not inconsequential, does not rise to the level of unreasonable interference required by the statute.

As to federally protected shorebirds, the Petitioners' evidence was less robust and did not carry their burden to show that the permitted project would interfere with conservation. Although USFWS recommended denial of the Permit, this recommendation was based on concerns that the new groin would eliminate critical habitat on the Spit by exacerbating the erosion caused by the existing south groin. Given that the permitted project has been designed to minimize any adverse downdrift impacts, however, this concern is too speculative to support a conclusion that the permitted project would unreasonably interfere with shorebird conservation.

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[55] In contrast to the Shore Protection Act, the federal Endangered Species Act ("ESA"), 16 U.S.C. § 1531 *et seq.*, forgoes a "reasonableness" analysis and instead focuses on the degree of actual harm inflicted upon a protected species. For example, the ESA makes it a violation for any person to "take" any endangered species, which may involve "significant habitat modification or degradation where it actually kills or injures wildlife by *significantly impairing* essential behavioral patterns, including breeding, feeding or sheltering." 16 U.S.C.S. §§ 1532(19), 1538(a); 50 C.F.R. § 17.3 (emphasis added). Furthermore, in considering the entry of an injunction under the ESA, "(1) the Court does not have the 'traditional equitable discretion' to balance the parties' interests, (2) any threatened harm is per se irreparable harm, and (3) the public interest always favors the imposition of an injunction under the Act." Loggerhead Turtle v. Cnty. Council, 92 F. Supp. 2d 1296, 1301-02 (M.D. Fla. 2000). Yet even with a specific focus on the extent of the anticipated interference with sea turtles, the Permit's proposed actions may not rise to a violation of the ESA. Although loggerhead, green, and leatherback sea turtles are designated as either endangered or threatened under the ESA, 50 C.F.R. § 17.11(h), the evidence shows that the permitted project may not "significantly impair" these turtles' behavior, given the low number of nests found in a relatively small area of their overall habitat. See Hawksbill Sea Turtle v. Fed. Emergency Mgmt. Agency, 11 F. Supp. 2d 529, 554 (D.V.I. 1998) (concluding that no injunctive relief under ESA was warranted based on loss of food and shelter for sea turtles in one particular area, because "Sea Turtles might be able to seek food somewhere else"), rev'd on other grounds, 126 F.3d 461 (3d Cir. 1997); see also Leatherback Sea Turtle v. Flagler Cnty. Bd. of Cnty. Comm'rs, 359 F. Supp. 2d 1209, 1213-14 (M.D. Fla. 2004) (concluding that claimants failed to meet burden for injunction under ESA because, *inter alia*, there was no evidence that hatchlings perished after being stuck in tire ruts from daytime vehicle traffic on beach, or that false crawls occurred because of tire ruts).

3. The Permitted Project Will Not Unreasonably Interfere with the Recreational Use and Enjoyment of Public Properties.

Despite the evidence that the Petitioners' members are concerned about the project's potential impacts, the Petitioner did not prove that granting of a permit and the completion of Sea Island's proposal will unreasonably interfere with their access to and recreational use and enjoyment of any public properties. See O.C.G.A. § 12-5-239(i)(3).

IV. ORDER

In accordance with the foregoing Findings of Fact and Conclusions of Law, the Committee's issuance of Shore Protection Act Permit No. 438 to Sea Island Acquisition, LLC, is hereby **AFFIRMED**.

SO ORDERED, this 26th day of August, 2016.

KRISTIN L. MILLER
Administrative Law Judge