Beach Management Feasibility Study
Walton County and Destin, Florida

for

Walton County and Destin, Florida

by

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11.0 SUMMARY AND RECOMMENDATIONS

Walton County and Destin have demonstrated a regional approach to beach management and a unique partnership between adjoining communities in this beach management feasibility study. This partnership, by allowing the analysis of coastal processes on a regional basis, afforded the opportunity to economically assess beach behavior, causative mechanisms, and management opportunities on both a large and a small-scale.

An evaluation of coastal processes throughout the two communities helped develop an understanding of long-term and short-term beach behavior and the causes of beach behavior. A risk assessment on shorefront structures incorporated storm erosion modeling results, current beach conditions, and structure locations to predict the extent of storm impact. A scoring system — incorporating the findings of the coastal processes analysis and risk assessment on shorefront structures — indicated the need for beach management actions for all state-designated critical erosion areas and non-critical erosion areas along the 32 miles of coastline. A two-phased regional sand source investigation explored offshore sand deposits and defined potential borrow sites required for the recommended beach management actions. The results of each of these analyses helped define a list of feasible beach management projects for Walton County and Destin.

The results of the coastal processes analysis indicate that the beaches of Walton County and Destin have the natural ability to recover from storm events given sufficient time. However, successive storms from 1995 to 1998 — most notably Hurricanes Opal, Georges, and Earl — severely eroded the beach and hindered the natural recovery process by transporting a large volume of sediment out of the littoral system both onshore and offshore. The shorefront development risk analysis — which combined beach erosion simulations, historic shoreline variability, and the variability of shorefront structure locations — indicated that many of the shorefront structures in Walton County and Destin will be impacted by a 20-year return period storm and nearly all will be impacted during 50-year and 100-year return period storms.

A beach management scoring system — which first targeted the need for general action and then examined, more specifically, the need for beach nourishment and dune restoration — helped prioritize the reaches according to the need for these beach management actions. In Walton County, the order of priority for beach nourishment and dune restoration is Reach 1 (western 4.2 miles), Reach 10 (eastern 3.5 miles), and Reach 4 (1.5 mile segment east of Stallworth Lake in central Walton County). In Destin, the

order of priority is Reach 4 (eastern 2 miles), Reach 1 (western 2 miles), and Reach 2 (1-mile segment west of Henderson State Park). Note that Reaches 1, 4, and 10 in Walton County and Reaches 1, 2, and 4 in Destin lie in state designated "critical erosion areas." Interestingly, the recent (October 2002) impact of Tropical Storm Isidore, which caused significant erosion in Reach 1 of Walton County and Reach 4 in Destin, confirms the beach management priority reaches established in this study.

Extensive sand source investigations (comprising bathymetric survey and analysis, vibracore collection, sediment sampling and analysis, and subbottom acoustic survey and analysis) revealed two potential sources of sand appropriate in size and composition with the native beach. However, the first potential source, an offshore sand ridge, did not have sand of beach-compatible color. The second potential source, located offshore East Pass, has sand of color, size, and composition generally similar to that of the native beach.

The construction feasibility analysis, which based its findings on the priority order defined by the scoring system, proximity of the potential borrow site to each reach (economic constraints), and the availability of suitable borrow material, developed a list of potential beach management actions. These management actions, which include dune management (dune vegetation and/or sand fences) region-wide and beach nourishment in Reach 1 in Walton County and Reach 4 in Destin, were, in turn evaluated based on the degree of protection offered, probability of success, project life, maintenance requirements, environmental impacts, and project costs. To summarize, the available volume of beach–compatible borrow material allows construction of a beach fill that offers 28- to 35-year storm protection. A simplified analytical model commonly used to predict beach fill evolution during beach nourishment design for engineering and economic purposes predicts that more than 80% of this beach fill should remain in the placement area 10 years after placement. By not considering the effects of storms in causing rapid, significant, short-term erosion, this simple model probably overpredicts the life of the project. Nevertheless, the beach nourishment project considered here should perform very well and compare favorably with other nourishment projects in Florida. The potential environmental impacts of the proposed beach management activities are typical for beach nourishment projects in Florida. Implementing standard protective measures would help minimize potential negative effects. The beach and dune nourishment project should have low maintenance requirements; monitoring efforts should examine post-construction scarp formation, sand compaction, and physical and biological impacts.

Based on these results, the recommended beach management actions are

- dune management (dune vegetation and/or sand fences) region-wide
- beach nourishment in Reach 1 in Walton County and Reach 4 in Destin

with sand obtained from the offshore vicinity of East Pass. Ascertaining potential impacts of borrow area excavation requires numerical modeling of waves, sediment transport, and inlet hydrodynamics. A concurrent study by Taylor Engineering (2002) evaluates these impacts for borrow area designs similar to Layouts 1–5.