

SUBJECT
Task 3: Public-Private Implementation Analysis

FROM
APTIM

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TO
Captiva Erosion Prevention District

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Executive Summary

The Captiva Bayside Adaptation Plan is designed to address the increasing flood risks on Captiva Island, with a particular focus on how bayside private properties can adapt to protect shared infrastructure inland. This project aims to develop and implement effective adaptation strategies to safeguard the island's residents, critical infrastructure, and natural resources from the impacts of current and future flooding conditions. This technical memo outlines the methodology and findings of Task 3 - Public-Private Implementation Analysis. This analysis seeks to understand the challenges and opportunities involved in implementing adaptation projects on privately-owned lands, identify strategic options for effective implementations, and provide recommendations for fostering public-private collaboration.

Key Findings:

- **Legal and Regulatory Considerations:** The Captiva Erosion Prevention District (CEPD) requires property owner consent, easements, and may use eminent domain for project implementation. Legal frameworks and regulatory approvals are critical for project success.
- **Adaptation Strategies:** Short-term strategies include drainage improvements, berm reinforcement, seawall enhancements, and nearshore breakwaters. Long-term strategies involve raising the island, constructing tidal gates, and large-scale infrastructure projects.
- **Funding and Permitting:** Various funding options and permitting processes are explored, emphasizing the importance of stakeholder engagement and collaboration.
- **Recommendations:** The memo suggests standards for evaluating erosion control projects and provides strategies for fostering public-private partnerships to enhance Captiva Island's resilience.

This analysis has been used to inform engagement with the public and steering committee during workshops, inform the selection of strategies included in the adaptation plan and define design criteria for the design concepts to be delivered as part of this project.

1. Introduction

1.1 Project Overview

The Captiva Bayside Adaptation Plan will provide the Captiva Erosion Prevention District (CEPD) with actionable information to address erosion and flood risks along the bayside shorelines of Captiva. The plan will include strategies to identify and implement nature-based solutions, infrastructure projects and policy measures to adapt to and mitigate the impacts of erosion caused by recurrent flooding. The plan intends to protect homes, natural habitats and community assets while promoting long term resilience and sustainability. The input and consensus of Captiva residents is essential to developing a feasible plan and implementing it effectively. The Captiva Bayside Adaptation Plan Project tasks include engaging with the public and the project steering committee, acquiring necessary data, developing the adaptation plan and an engineering report with conceptual adaptation drawings, and completing a public-private implementation analysis. This technical memo summarizes the findings of the public-private implementation analysis.

TAKEAWAYS

- *The Captiva Bayside Adaptation Plan is designed to protect Captiva Island’s bayside shorelines from erosion and recurrent flooding through a mix of nature-based solutions, infrastructure projects, and policy measures.*
- *The public-private implementation analysis, summarized in this memo, evaluates the feasibility of adaptation strategies on privately-owned lands and explores opportunities for collaboration between the Captiva Erosion Prevention District (CEPD) and private property owners.*

1.2 Purpose of Public and Private Implementation Analysis

This technical memo outlines the methodology and findings of the analysis undertaken to evaluate public versus private options for flood adaptation along the bayside with consideration of the locations of the state aquatic preserve and Buck Key. This analysis seeks to understand the challenges and opportunities involved in implementing adaptation projects on privately-owned lands, identify strategic options for effective implementation by CEPD, and provide recommendations for fostering public-private collaboration.

This memo includes the information as requested by the scope of work and supportive questions to inform the analysis. For readability, the document was structured as listed in the table of contents to flow logically in the order the analysis was completed to derive the recommendations.

- Section 2: Review of private land ownership information
- Section 3: Characterization of structural and non-structural adaptation approaches on public nearshore and sovereign submerged lands versus private onshore lands
- Section 4: Review the authority of the Captiva Erosion Prevention District to implement a bayside erosion and flood control protection project on private lands
- Section 5: Adaptation project feasibility including permissibility, fundability, and local, state and federal stakeholder interests
- Section 6: Suggested standards and criteria for the evaluation and approval of erosion control projects on public and private lands
- Section 7: Incentives to implement public and private adaptation strategies on private lands
- Section 8: Summary of public-private implementation analysis
- Section 9: Recommended strategies for inclusion in the Bayside Adaptation Plan
- Section 10: Appendices

2. Review of Land Ownership Information

Captiva Island's bayside is primarily composed of private properties, with public roadways and critical infrastructure located further inland. This intricate ownership pattern shapes the coordination and implementation of adaptation efforts across different authorities. Effective collaboration between private landowners, public stakeholders, and regulatory agencies is essential to address the varied interests and concerns, streamline permitting processes, and ensure the successful deployment of resilience measures that protect both private properties and public assets.

2.1 Characteristics of Private Lands and Shorelines on Captiva

To further investigate the existing conditions on the bayside, APTIM's data collection process involved identifying the characteristics of private lands and shorelines on Captiva. Key data sources included Lee County property appraiser parcel level data, critical infrastructure and asset inventories, LiDAR and flood elevation data, and a comprehensive list of both privately and publicly owned seawalls and roadways. The data collection efforts focused on several critical parameters, including parcel ownership, parcel and building value, building ground elevations, base flood elevations as determined by FEMA, shoreline type, shoreline width and elevation, and the presence of seawalls and docks within each parcel. In addition, an aerial imagery assessment was conducted to document specific shoreline types and identify the presence of docks and seawalls. Collected data is also verified via a site visit by the APTIM staff on April 26, 2024. This assessment revealed that the bayside is characterized by a diverse array of shoreline types, including mangroves, seawalls, ripraps, and beaches (Figure 1). Each type plays a unique role in the island's coastal dynamics.

Geospatial analysis was another tool used for data extraction, allowing for accurate determination of ground elevations and base flood elevations for each parcel using raster data. Twelve **(12) buildings were identified as being on relatively low ground (2-3 ft NAVD) based on the LiDAR data.** This spatial analysis created a detailed elevation profile for the bayside of Captiva Island, fundamental in assessing flood risk and planning mitigation measures. Additionally, **elevation certificates were obtained for the 39 bayfront parcels where exists** (Figure 2), providing verified elevation data that further refined the analysis. Among the island's critical infrastructures, only one building at the

TAKEAWAYS

- *Captiva Island's bayside is mostly privately owned, requiring collaboration between landowners, public stakeholders, and regulatory agencies for effective adaptation.*
- *A diverse array of shoreline types (mangroves, seawalls, beaches) exists, each playing a unique role in coastal dynamics.*
- *Data collection and GIS analysis identified 12 buildings on low ground, and almost all shorelines are lower than 3.5 ft NAVD, necessitating protection against high tide events and rising sea levels.*
- *61 bayfront buildings are below the recommended 3.5 ft NAVD elevation, indicating a need for targeted adaptation strategies.*
- *Securing easements is crucial for shoreline projects on private lands to ensure legal access for construction and maintenance.*
- *Private riparian rights include access, use, and unobstructed views of the water, which are essential for the enjoyment and value of waterfront properties.*
- *As sea levels rise, private lands may become submerged and transition to state-owned lands, necessitating new easements or leases from the state.*

wastewater treatment plant has an elevation certificate. In contrast, the fire station and the library lack such recorded certification.



Figure 1. Shoreline types of bayside parcels



Figure 2. Bayside parcels with (green polygons) and without (pink polygons) Elevation Certificates

Once data collection was complete, statistical calculations were performed to derive key metrics for the bayside of Captiva Island. These metrics included the percentage of different shoreline types (Figure 3), as well as the minimum, maximum, and average shoreline widths and building footprint elevations (Table 1). These statistics provided a clear picture of the variability and characteristics of the shoreline, essential for tailoring adaptation strategies to specific conditions. Below Table 2 summarizes the parcel metrics compiled as a result of the parcel level data analysis:

	Shoreline Width (ft)	Shoreline Elevations (ft NAVD)	Seawall Elevations (ft NAVD)	Building Footprint Elevations (ft NAVD)	Distance of Buildings to MHW (ft)
Min	7	0	0.8	1.92	0
Average	147	1.8	2.1	4.45	85
Max	7300	5.55	4.0	9.91	265

Table 1. Bayside Shoreline Statistics

Number of parcels:	
with seawall	69
without seawall	84
with boat docks	131
without boat docks	22
with submerged (partially or fully) boat docks	11
extending into the bay per property appraiser GIS data	46
Total number of bayfront parcels:	153

Table 2. Bayside Parcel Metrics

It is noted that:

- Most parcels **do not** have seawalls (84 out of 153), and most parcels have a dock (131 out of 153).
- Average shoreline is less than 2 feet NAVD, where flooding is observed during extreme tides today.
- Less than 6 road segments are flooding today.
- Less than 30 parcels flooding their neighbors (see Figure 12 for flood trespassing examples).
- Most parcels will be mostly flooded by 2070 or small storm in 2040.

This effort helps distinguish between publicly owned lands, privately owned properties, and identifying the sovereign submerged areas, and provides a clear understanding of the existing landscape and informed subsequent analysis stages.

Existing Shoreline Type Distribution

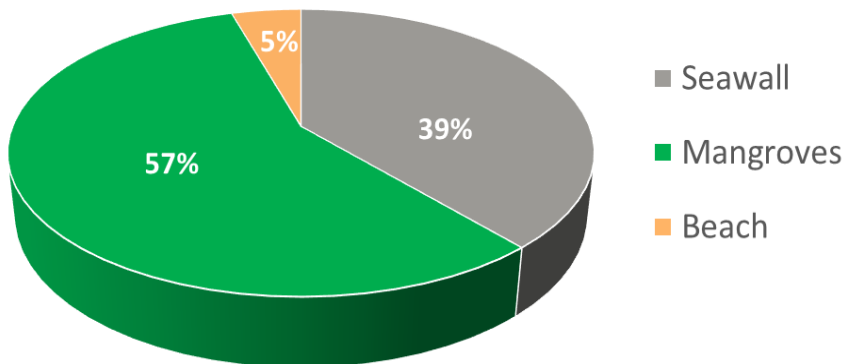


Figure 3. Shoreline Type Distribution along Captiva's Bayside

Topographic elevations were also plotted to identify areas on Captiva Island that are either above or below the 3.5 ft NAVD threshold, which is the recommended minimum elevation for future development and adaptation to sea level rise (Figure 4). **Sixty-One (61) bayfront buildings fall into areas that are below 3.5 ft NAVD, and 75 bayfront buildings are located in areas that are above 3.5 ft NAVD.**

Topographic and bathymetric elevations were extracted along six (6) transects shown in Figure 5 to assess the accuracy of the raster datasets. Transects shown in Figure 6 are determined to be in good alignment with the aerial imagery and are within reasonable range. While the **highest elevation observed along the transects is 10.6 ft NAVD, the lowest elevation recorded is -8.0 ft NAVD** in Roosevelt Channel. Nearshore bathymetry data shows seafloor elevations up to 2.59 ft below mean sea level (-3 ft NAVD). **Mean High Water (MHW)** is at 0.06 ft NAVD per the Fort Myers tide gage. Typical distance from buildings to MHW along the island is 85 feet, potentially allowing sufficient space for upland implementation projects for most parcels. Transects 3-6 show similar characteristics where a Gulf-beach-roadway-building-shoreline-bay elevations are represented in this order from west to east along the transects. Transects 1 and 2 are also similar where they also capture elevations in mangrove islands and wetlands.

Transect	Shoreline Slope at MHW (~ 0 ft NAVD)
1	50% - 1:2
2	49% - 1:2
3	82% - 1:1.2
4	3% - 1:33
5	29% - 1:3.5
6	20% - 1:5

Table 3. Nearshore Slopes at the Bayside Shorelines at Transect Locations

2.2 Requirement of Property Owner’s Consent to Build Shoreline Projects

When planning and executing shoreline protection projects on private lands, obtaining the property owner's consent is a fundamental requirement. This necessity stems from the legal principle that private property rights are protected and that any alteration or construction on private land must be authorized by the landowner. For shoreline projects, this typically involves securing easements or legal agreements that grant permission for the project to proceed. These easements are critical for ensuring that projects can be legally and effectively implemented, providing access for construction and long-term maintenance.

Easements not only facilitate the physical construction and maintenance of structures like seawalls, berms, and living shorelines but also ensure that these projects are designed and executed in a manner that respects the property rights of landowners. Additionally, public interest plays a significant role in the provision of easements. By obtaining easements, the CEPD can implement projects that provide widespread benefits, such as enhanced flood protection, improved coastal resilience, and the preservation of natural habitats.

2.3 Private Riparian Rights Include Access, Use and Unobstructed View of Water

Private riparian rights are the entitlements of landowners whose property abuts a body of water. These rights are integral to the use and enjoyment of waterfront properties and encompass several key privileges. Riparian rights include the right of access to the water, allowing property owners to reasonably reach the water directly from their land, which is crucial for various activities such as boating, fishing, and recreational use. In addition to access, riparian rights cover the use of water. Property owners are entitled to make reasonable use of the water adjacent to their property, including activities such as swimming, irrigation, and drawing water for domestic purposes. This use must not interfere with the rights of other riparian landowners and must comply with applicable regulations and environmental protections.

Furthermore, the right to an unobstructed view of the water is a significant aspect of riparian rights. This right ensures that property owners can enjoy the scenic and aesthetic benefits of their waterfront location without undue obstructions, which is particularly important in maintaining the value and enjoyment of waterfront properties.

2.4 Property Limits Along Water and Lack of Privately Owned Submerged Lands

The property boundaries for parcels along the waterfront in Captiva Island generally extend to the mean high-water line (MHWL), beyond which the submerged lands are typically state-owned. This determination has been confirmed by the Florida Department of Environmental Protection (FDEP) Bureau of Survey and Mapping Division of State Lands, Lee County Property Appraiser, and APTIM surveyors. According to Florida Statutes Section 253.12, the state, through the Board of Trustees, holds title to all sovereignty tidal and submerged bottom lands, which includes all islands, sandbars, shallow banks, and any other lands made by the process of dredging

in navigable waters, unless explicitly conveyed otherwise in historical deeds or statutory provisions. This principle ensures that lands below the MHWL are considered public trust lands, managed by the state through the Florida Department of Environmental Protection (FDEP). This management is crucial for protecting public interests, environmental resources, and navigational rights. Property owners along Captiva's bayside, therefore, do not possess exclusive rights to these submerged lands and must obtain the necessary easements or leases from the FDEP to conduct any activities on these submerged lands. This policy ensures that the state retains control over submerged lands to manage and protect public interests, environmental resources, and navigational rights.

2.5 Private Lands Change to State Lands as Sea Level Rises

As sea levels rise, private lands adjacent to the coast may gradually become submerged, transitioning into state-owned lands. This occurs because the MHWL, which delineates the boundary between private property and state-owned submerged lands, shifts inland with rising sea levels. Consequently, areas that were once above water and privately owned become part of the state's public trust lands. This transition has significant implications for property owners, as their rights to use and develop these lands become limited. They must secure new easements or leases from the FDEP to undertake any adaptation projects or other activities on these now-submerged lands. The legal transition of private lands to state ownership as sea levels rise underscores the need for careful planning and coordination with state authorities to ensure compliance with environmental regulations and the effective implementation of coastal adaptation strategies.

Blue: Below 3.5 ft NAVD: 61 bayfront buildings
 Orange: Above 3.5 ft NAVD: 75 bayfront buildings



Figure 4. Island-wide ground elevation map. Orange colored areas are above 3.5 ft NAVD, and blue colored areas are below 3.5 ft NAVD



Figure 5. Locations of the transects (yellow lines) along Captiva Island where elevations were extracted for detailed analysis. (Illustrated lengths of the transects represent the actual transect length plotted on the charts below)

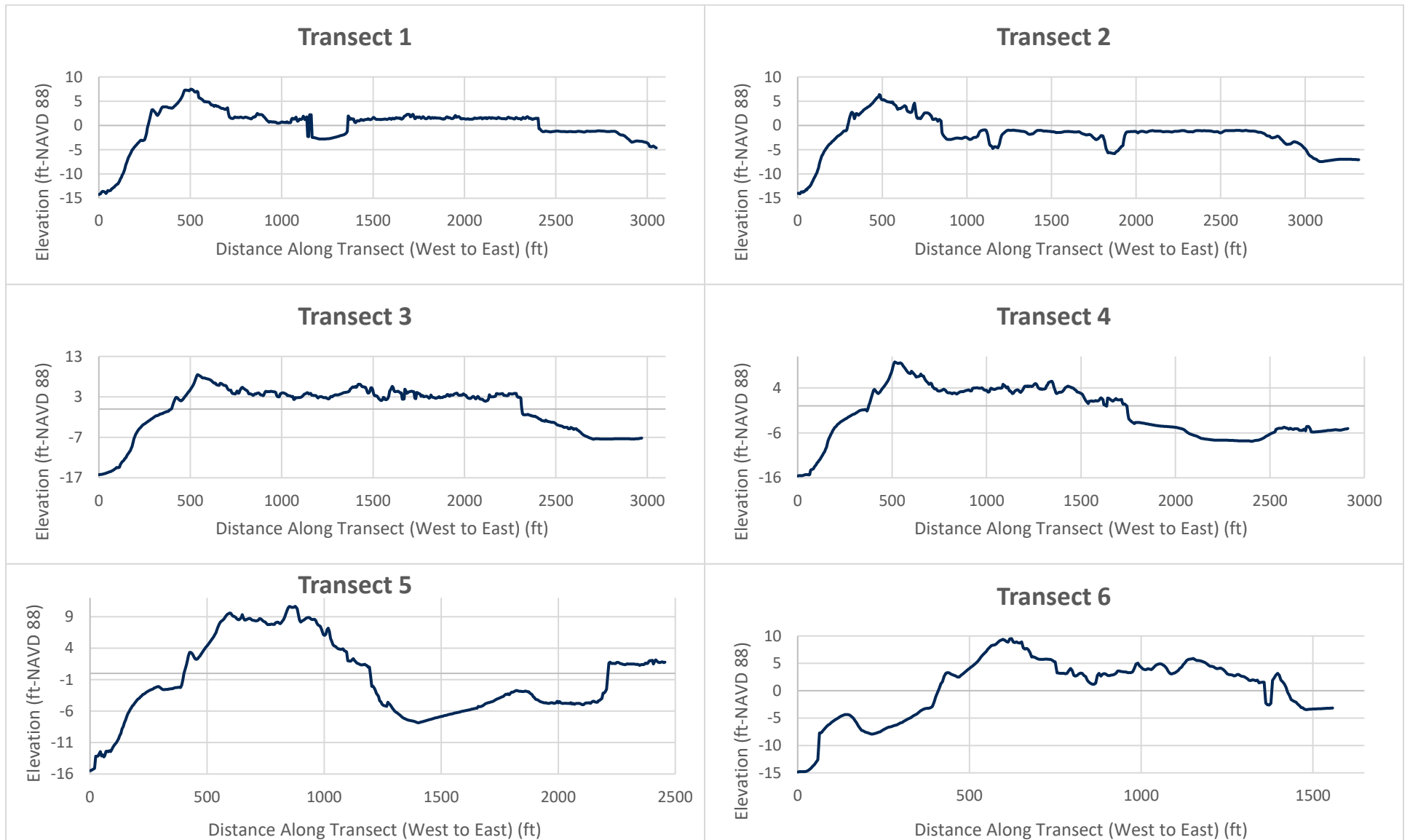


Figure 6. Transects Along Captiva Island Showing the Elevations from the Gulf of Mexico to the Bayside

3. Characterization of Structural and Non-Structural Adaptation Approaches

The analysis framework was structured to address multiple facets of public-private implementation. Initially, APTIM identified the ownership and jurisdiction of lands to clarify the boundaries of public versus private responsibilities. A detailed assessment of bayside parcels was conducted where the parcel metrics such as shoreline types and elevations, flood zones, base flood elevations, building footprint elevations were compiled for each bayside parcel as described above. Additionally, Captiva Erosion Prevention District’s (CEPD) authority to implement adaptation projects on public and private lands was assessed (See Section 4. Review of CEPD Authority to Implement Projects on Private Lands: Legal & Regulatory Considerations). Considering this information, potential **structural** and **non-structural** adaptation approaches suitable for various land types were characterized. Adaptation strategies were categorized based on their suitable implementation locations as “**on public nearshore and sovereign submerged lands,**” versus “**private onshore lands**” (Table 4). To do so, it was essential to understand the current erosion and wave action the bayside is exposed to.

3.1 Current Erosion and Wave Action Status

Over the past decade, Captiva Island's bayside shorelines have experienced minor changes. Comparing the current Mean Higher High Water (MHHW) line to the 1939 shorelines reveals areas of both erosion and accretion (Figure 7). This is partly due to more than half of the bayside being situated within the FEMA VE Zone, exposing it to minor to moderate wave action (Figure 8). Additionally, strong currents in deep channels such as Redfish Pass and Roosevelt Channel (Figure 9) can exacerbate shoreline erosion, necessitating robust adaptation measures to mitigate wave impacts and prevent further shoreline degradation due to strong currents.

TAKEAWAYS

- **Structural and non-structural adaptation:** *Potential structural and non-structural adaptation approaches suitable for various land types were characterized based on locations as “on public nearshore and sovereign submerged lands”, versus “private onshore lands”.*
- **Erosion and Wave Action:** *Captiva's bayside has seen minor changes over the past decade due to wave action, with some areas experiencing erosion, particularly near strong currents in deep channels. Mangroves and seagrass beds offer natural protection but have experienced some degradation.*
- **Flood trespassing:** *27 parcels are identified to be flood trespassing. This highlights the need for coordinated adaptation efforts to protect both private properties and critical public infrastructure.*
- **Structural Adaptation Strategies:** *Strategies include flood-proof glass walls, living shorelines, and retaining walls. These are classified as gray (hard structures), green (nature-based), or hybrid approaches, with specific strategies suited for either public or private lands.*
 - *Only ~ 0.1 acres of seagrass lie within 30 feet of the shoreline that might be impacted by adaptation projects.*
- **Non-Structural Adaptation Strategies:** *Focuses on:*
 - *Shoreline protection policies: such as “minimum bayside shoreline elevation”*
 - *Planning initiatives: such as Developing a Post-Disaster Plan.*
 - *Coordination with surrounding entities.*
- **Public Input:** *Community feedback influenced the refinement of adaptation strategies, identified additional needs like zoning impacts, and highlighted concerns about viewshed, riparian rights, and maintenance responsibilities.*

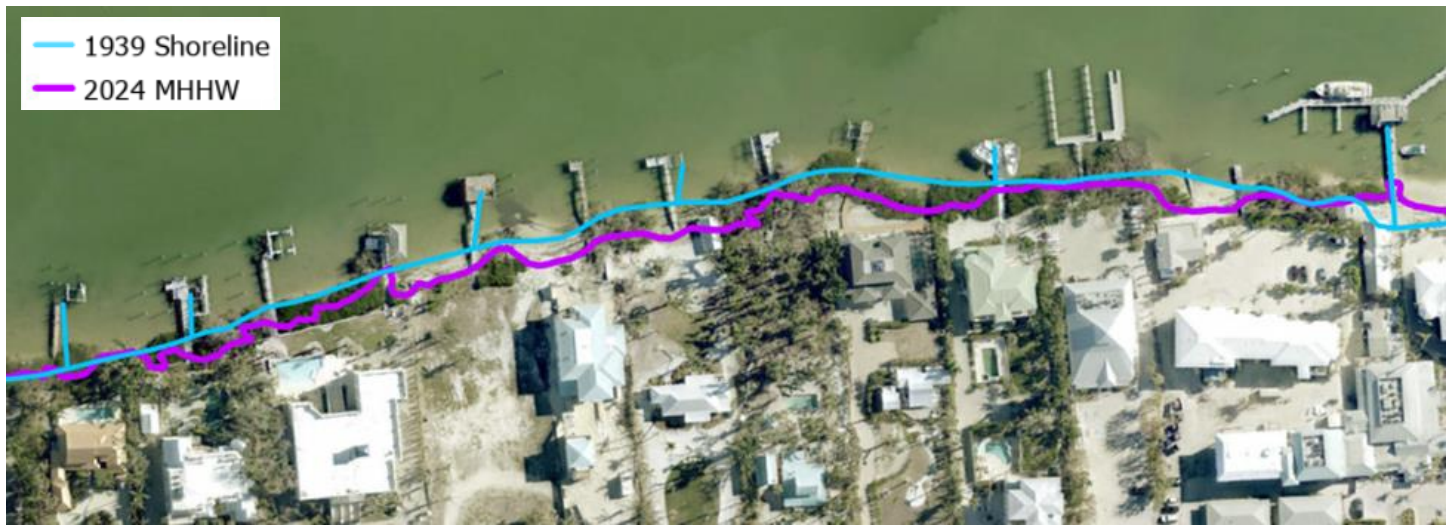


Figure 7. 1939 shoreline compared to 2024 shoreline (represented by the Mean High Water (MHHW)) line illustrates the shoreline erosion on the bayside.



Figure 8. Areas subject to wave action are marked in yellow rectangles.

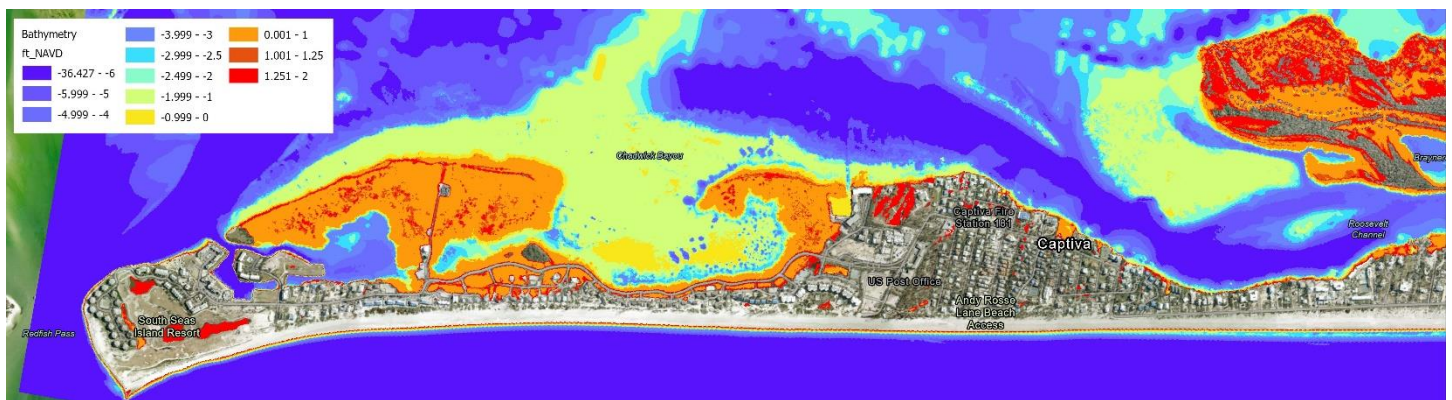


Figure 9. Strong currents are observed in deep channels such as the Redfish Pass and Roosevelt Channel (dark blue color indicates the highest water depths)

Half of Captiva’s bayside has mangrove coverage, providing protection against shoreline erosion. Mangroves in Captiva exhibit high survivability, with the ability to regrow after being damaged by storms. Despite their resilience, small areas of mangrove loss have occurred due to construction activities (Figure 10).



Figure 10. An example of mangrove loss. Image on the left is from 2021 and image on the right is from 2024

Seagrass beds are prominent from Central Captiva to the north end of the island, offering essential protection against erosion by stabilizing the seafloor. On the bayside of Captiva Island, only about **0.1 acres** of seagrass lie within 30 feet of the shoreline that might be impacted by adaptation projects. While mitigation of any impact on seagrass can be costly, it can be avoided with careful planning around these areas that are smaller than 0.1 acres. Pockets of seagrass degradation is also observed on the bayside (Figure 11). This may require restoration to enhance the protective benefits of seagrass. Effective seagrass restoration can significantly contribute to shoreline stabilization and flood mitigation.

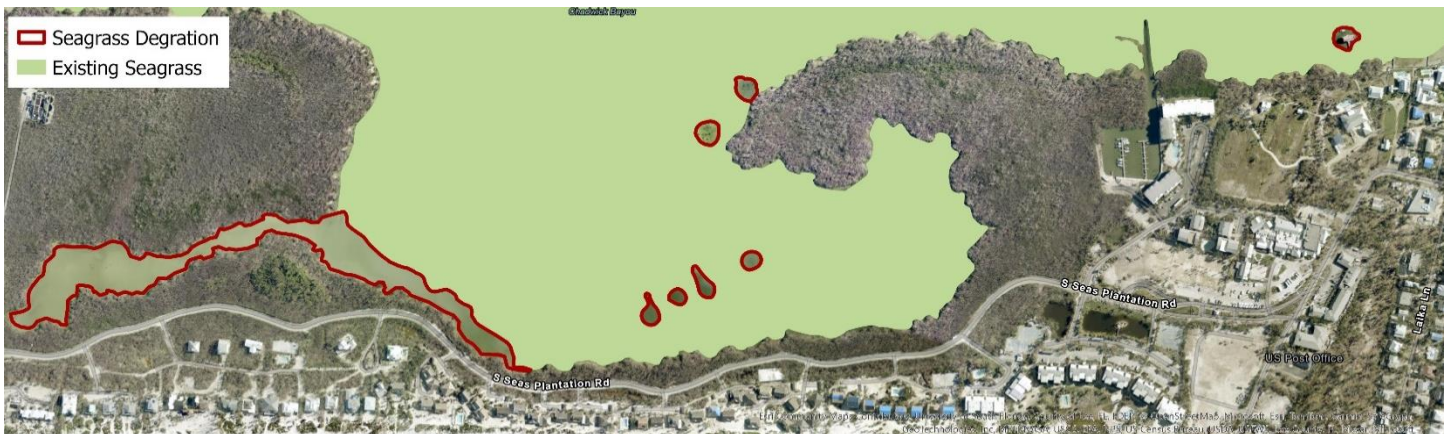


Figure 11. Areas where the seagrass has degraded

3.2 Potential Impacts of Flood Trespassing to Neighboring Properties and Critical Infrastructure

Due to low lying elevations on the bayside, most parcels are vulnerable to current and/or future flood conditions that may require adaptation actions. Flood trespassing between bayside parcels as shown in Figure 12 highlights the interconnected nature of flood risk management. Adaptation measures taken at one parcel can extend protective benefits to surrounding areas, public roads, and critical infrastructure such as Captiva Memorial Library, Fire Station, and Disaster Recovery Center further inland, emphasizing the need for coordinated efforts among property owners and stakeholders.

Results from the Captiva Vulnerability Assessment indicate that current tidal flooding temporarily inundates low-lying areas, impacting transportation, utilities, and private properties. Approximately 97% of bayfront seawalls, the South Seas Plantation Road Wastewater Treatment Plant, and the lift station south of the Fire Station are

vulnerable to extreme high tides, which are projected to increase significantly by 2040. Projected tidal flooding in 2040 will likely cause extensive flooding along bayfront parcels, mangrove areas, and roads, especially in the northern parts of the island. Chadwick's at South Seas Plantation, the on-island disaster recovery center (DRC) is likely to experience impactful inundation by 2040, which has the potential to make the DRC inoperable and prohibit residents from receiving the aid and assistance needed. Additional critical needs were highlighted by public suggestions and include enhancing mangrove buffers and native vegetation, implementing drainage improvement strategies, and constructing wetlands near outfalls.

On the other hand, private property owners can be liable if affirmative action on their property increased the neighbor's flooding or erosion, therefore careful planning and implementation are imperative.

3.3 Structural Adaptation Strategies

For public and private lands, structural adaptation strategies may include seawalls, breakwaters, berms, fills (above mean high water), shoreline renourishment, injection wells behind seawalls, channel dredging, flood barriers, tidal gates, and living shorelines. Living shorelines utilize natural vegetation and materials to stabilize and protect shorelines from erosion and flooding. This approach not only provides physical protection but also enhances the ecological health of coastal areas. Breakwaters, constructed offshore, function as barriers that reduce wave energy before it reaches the shore, thereby minimizing erosion and protecting infrastructure. Seawalls, which involve reinforcing existing walls or constructing new ones, provide a robust barrier against wave action and storm surge, although they may have more significant environmental and visual impacts compared to natural solutions. Vegetation is crucial for erosion prevention and visual appeal. These upland features can also contribute to stormwater retention, improving water quality. Ultimately, the feasibility of these options depends on the available space and project goals.

Structural adaptation strategies can be categorized as gray (engineered hard structures), green (nature-based low impact applications), and hybrid (combination of both). **Table 4** lists potential adaptation strategies that can be applied on the bayside, as well as their classifications and implementation locations. See Section 0 and the attached spreadsheet for a list of adaptation strategies with detailed descriptions and applicability considerations.

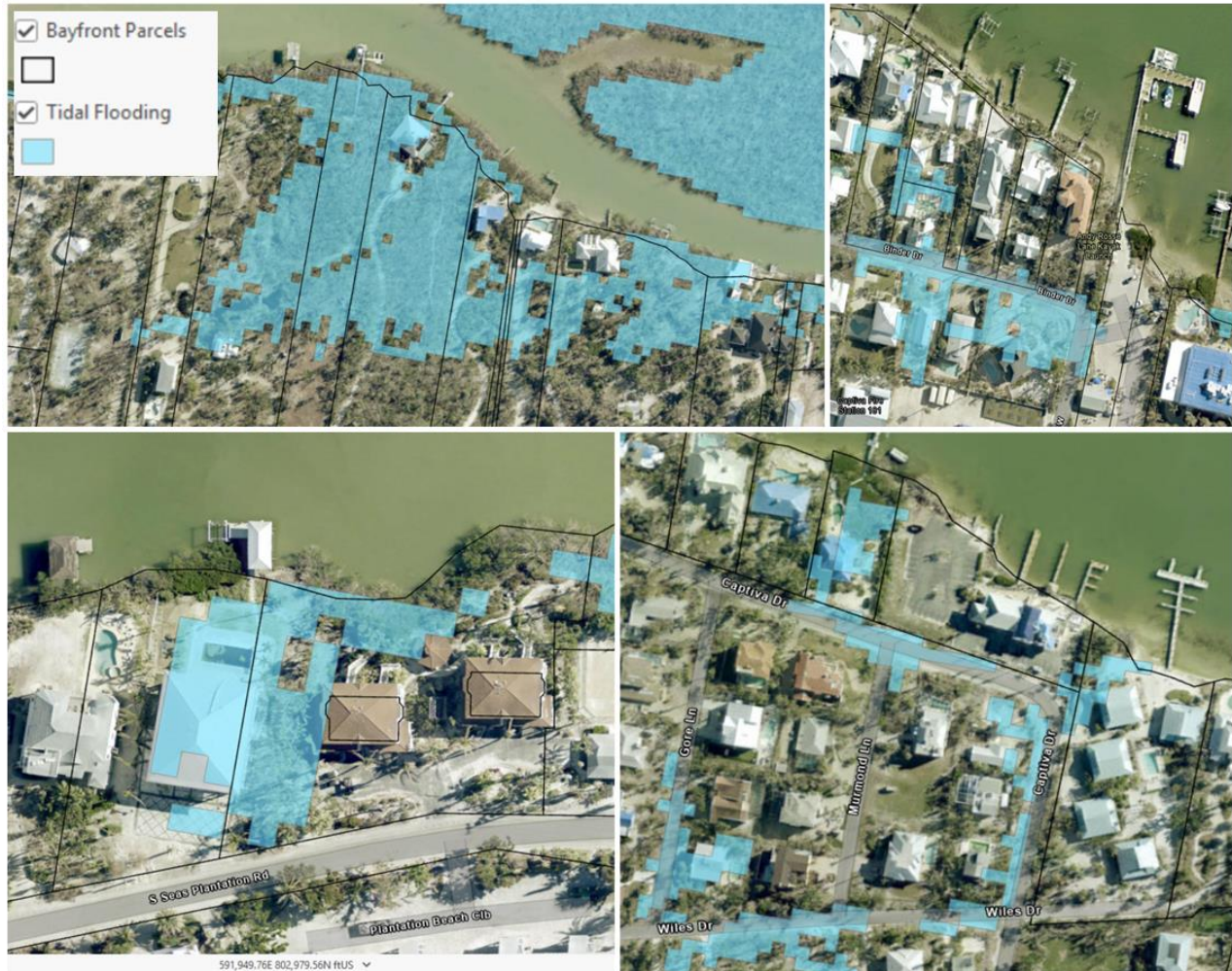


Figure 12. Flood trespassing examples between bayside parcels

Table 4. Structural Adaptation Strategies

Approach/Project Type	Adaptation Infrastructure	Suitable Location (Private /Public/Both)
Oyster reef balls	Green	Sovereign submerged lands
Seagrass restoration	Green	Sovereign submerged lands
Shoreline renourishment	Green	Sovereign submerged lands
3D printed concrete blocks	Hybrid	Sovereign submerged lands
Fill submerged lands (below mean high water) to change habitat	Hybrid	Sovereign submerged lands
Moving locations of existing docks or replacing them with floating docks	Gray	Sovereign submerged lands
Nearshore emergent breakwaters	Gray	Sovereign submerged lands
Tidal gates in Roosevelt Channel	Gray	Sovereign submerged lands

Approach/Project Type	Adaptation Infrastructure	Suitable Location (Private /Public/Both)
Channel dredging or relocation	Gray	Sovereign submerged lands
Adaptive landscape planting	Green	Private onshore land
Salt marsh restoration	Green	Private onshore land
Seawall removal	Green	Private onshore land
Flood-proof glass walls along the shorelines where the unobstructed view is desired	Hybrid	Private onshore land
Seawalls with attached or floating planters or habitat panels	Hybrid	Private onshore land
Buried seawalls	Gray	Private onshore land
Increase seawall height	Gray	Private onshore land
Injection wells behind seawalls	Gray	Private onshore land
Retaining Walls	Gray	Private onshore land
Mangrove planting and management	Green	Both
Filling above mean high water	Hybrid	Both
Living Shorelines	Hybrid	Both
Low-carbon concrete	Hybrid	Both
Raising Roadways	Hybrid	Both
Replace Seawalls	Hybrid	Both
Automated flood barriers along shoreline	Gray	Both
Berm reinforced with geotextile mats	Gray	Both

3.4 Non-Structural Adaptation Strategies

Non-structural adaptation strategies focused on policy changes, community engagement, and public outreach. Shoreline protection policies, planning initiatives and integration, coordination with surrounding entities, and property owner incentives can play critical roles as part of the non-structural adaptation to current and future flooding conditions. Policy changes involve implementing best management practices and amending local ordinances to support adaptation measures such as adopting a minimum bayside shoreline elevation policy, setting minimum standards and design criteria for shoreline protection elements within the land development code. Engaging the community and encouraging private landowner participation through incentives is also important for the success of adaptation projects. Financial incentives, regulatory relief, and technical support can motivate landowners to adopt and implement recommended adaptation measures. Public outreach and education campaigns aim to raise awareness about the benefits of adaptation strategies, fostering a collaborative environment for tackling climate risks.

3.4.1 Shoreline Protection Policies

Shoreline protection policies are a crucial component of non-structural strategies within the Captiva Bayside Adaptation Plan. These policies aim to establish a comprehensive framework for managing and protecting the shoreline against erosion, flooding, and the impacts of sea level rise. By implementing consistent regulations and standards, these policies help ensure that all shoreline protection measures are effective, sustainable, and

harmonized across different sectors. The goal is to create a unified defense system that not only addresses immediate threats but also promotes long-term resilience and environmental stewardship. These policies provide the necessary guidelines for design, construction, and maintenance of shoreline protection elements, facilitating a coordinated and adaptive approach to coastal management. Potential shoreline protection policies include:

1. Minimum Bayside Shoreline Elevation Policy

2. Design Criteria for Shoreline Protection Elements within the Land Development Code

3. Minimum Standards for Living Shorelines and Toe Protection

4. CEPD Easement for Submerged Lands

3.4.2 Planning Initiatives and Integration

Planning initiatives and integration efforts focus on aligning adaptation strategies with existing planning frameworks and developing new initiatives to support comprehensive and effective bayside adaptation management. By integrating the adaptation plan into current programs and regulatory structures, these initiatives ensure cohesive and synergistic efforts across various levels of governance. The aim is to leverage resources, enhance local coordination, and foster collaborative planning to address the multifaceted challenges posed by climate change and sea level rise. This approach not only maximizes the efficiency and impact of adaptation measures but also supports the sustainable development and resilience of Captiva's bayside community. Potential planning initiatives include:

1. Funding Strategy for Bayside Shoreline Restoration and Maintenance

2. Adding Adaptation Plan to Shore and Beach Preservation Program

3. Integrating the Adaptation Plan into the County Local Mitigation Strategy

4. Developing a Post-Disaster Plan

5. Sediment Management Plan for Bayside

3.4.3 Coordination with Surrounding Entities

Coordination with surrounding entities is a vital strategy within the Captiva Bayside Adaptation Plan. This approach focuses on fostering collaboration and partnerships with neighboring jurisdictions, governmental agencies, and other stakeholders to address regional climate adaptation challenges effectively. By working together, these entities can share resources, expertise, and data, ensuring a comprehensive and unified response to sea level rise and coastal erosion. Such coordination helps align policies and strategies, promoting consistency and efficiency in adaptation efforts. This collaborative framework enhances the resilience of the entire region, ensuring that both public and private interests are safeguarded against the impacts of climate change. Potential coordination efforts can include:

1. Advocating for the Inclusion of Raised Shorelines in the Lee County Vulnerability Assessment

2. Engaging in Discussions on the Adaptation of the No New Seawall Policy

3. Coordinating Adaptation Strategies for Buck Key

4. Discussing Regulatory Changes to Increase Water Storage Capacity

5. Recommending the Reinforcement of the Sanibel Causeway

6. DOT Evacuation Resiliency Study (10-Year Horizon)

7. Request Lee County Funding for Phase 2 of the Drainage Study

3.5 Public Input on Adaptation Strategies

The final phases of this project will include analyzing implementation options and developing evaluation standards and criteria to guide future projects, as well as permit plans in Task 6. Public outreach meetings held by APTIM throughout the process were essential to getting input from the private property owners. The following input from the workshops informed this analysis.

1. Refinement of Adaptation Strategies:

- Feedback from the public workshops helped refine the proposed adaptation measures to ensure they align with community goals and address the most pressing vulnerabilities. Concerns and adaptation needs listed by the residents were:
 - Internal drainage capacity improvement needs,
 - Frequently flooded roads or impassable driveways during high tide events and 3 inches or more rainfall,
 - Expectation of a comprehensive approach to address adaptation needs.
- Specific strategies discussed included installing nearshore breakwaters or artificial reefs, enhancing mangrove buffers and native vegetation, implementing drainage improvement strategies, and constructing wetlands near outfalls.

2. Identification of Additional Needs:

- Participants identified additional needs and concerns, such as the impacts of zoning restrictions on flood mitigation efforts, the need for consistent shoreline protection measures across properties, and addressing the health risks associated with septic system failures during flooding. Concerns were also raised about the effectiveness of storm sewers during heavy rains and the need for policies that protect individual property rights while considering collective adaptation strategies.
- Residents stated the importance of maintaining resident scenic views while implementing flood protection measures. Residents were concerned that certain adaptation strategies, such as elevated seawalls and dense vegetation buffers, might obstruct their views of the water and natural surroundings.
- The impact on riparian rights was also highlighted as a significant concern, and the following will be addressed when framing strategies for the Adaptation Plan:

- How the proposed adaptation strategies might impact the riparian rights of residents, particularly regarding access to and use of waterfront property.
- Clear guidelines on how adaptation measures like seawalls, breakwaters, and mangrove enhancements might affect property boundaries and water access.
- Emphasis on balancing collective adaptation strategies with the protection of individual property rights.

3. Consideration of Maintenance and Costs:

- Emphasis was placed on the need to consider the maintenance costs of the proposed adaptation measures and the impact of implementation timeframes on costs and planning horizons. The Adaptation Plan will account for responsible parties for maintaining and enforcing the new adaptation measures and will provide clear and realistic budgeting for both initial costs and long-term maintenance of the adaptation strategies.

4. Review of CEPD Authority to Implement Projects on Private Lands: Legal & Regulatory Considerations

A comprehensive analysis was conducted by the Environmental Lawyer Richard Grosso, to determine the extent of CEPD's authority to implement projects on private lands. Key questions addressed included whether property owners have rights to submerged lands within parcel boundaries and the need for easements for work in these areas. The analysis also explored the implications of property ownership changes due to sea level rise, determining whether such lands transition to state ownership and if property owners retain any rights. Additionally, Grosso examined the requirements for public projects on private lands, including permit requirements, legal documentation, and the need for property owner approval. This thorough review helped delineate the legal landscape and the necessary steps for project implementation. Sections below is a summary of a detailed legal and regulatory analysis conducted by Richard Grosso.

4.1 CEPD Authority to Implement Projects with Consent and Regulatory Approvals

The District has very broad authority to plan, raise and expend funds, and implement erosion and flood control projects (which are defined broadly) on the bayside of Captiva, with its jurisdiction extending out to 300' below the mean high water line surrounding Captiva, including Roosevelt Channel and Pine Island Sound.

The District cannot however implement plans on private land unless it acquires that land or the requisite interest in that land such as a license or easement. Actual placement / construction of erosion or flood control projects would require the requisite approval of the owner of the land or water into which the project would be physically located which, in the case of lands below the mean high water line, includes the state of Florida.

TAKEAWAYS

CEPD Authority:

- *CEPD has broad authority under Special Act 2000-399 to implement erosion and flood control projects within its jurisdiction, **which extends 300 feet below the mean high water line** around Captiva, including Roosevelt Channel and Pine Island Sound.*
- ***CEPD does not have authority** to build shoreline projects **without** a property owner's **consent**.*

Submerged Land Rights:

- *Private property owners generally do not own submerged lands in Roosevelt Channel, meaning CEPD does not need easements from them for work in these areas. However, permits from FDEP and other agencies are required.*

Easement and Permitting Requirements:

- *If property owners possess submerged land rights within parcel boundaries (not common), an easement is required for construction and maintenance activities, such as living shorelines.*
- *CEPD must secure property owner approval to conduct activities on private land or submerged areas owned by the state.*

CEPD Regulatory Authority:

- *CEPD can regulate and enforce standards for erosion control projects. This includes potentially enacting regulations to mandate shoreline compliance with engineering standards or recommending Lee County to supplement its coastal regulations with CEPD standards.*

Eminent Domain and Private Owner Consent:

- *CEPD can exercise eminent domain to acquire property interests for public-purpose projects. However, securing consent from private owners through negotiation (easements or licenses) is preferred.*
- *Property owners' perception of the project's benefit to their property may influence their willingness to grant consent.*

Private property owners do not own submerged lands in the Roosevelt Channel, therefore any work to be done by CEPD in these areas do not require private property easements. Florida Department of Environmental Protection’s Division of State Lands stated that “Based on the records within the Title and Land Records Section, the Board of Trustees holds title to the submerged lands below the mean high water line of the Roosevelt Channel and Pine Island Sound at the subject parcels and said lands are within the boundaries of the Pine Island Sound aquatic preserve. Any work conducted landward of the mean high water line, would not affect Board of Trustees owned lands.

The conclusions stated herein are based on a review of records currently available within the FDEP as supplemented, in some cases, by information furnished by the requesting party and do not constitute a legal opinion of title. A permit from the FDEP and federal, state and local agencies “may be required prior to conducting activities.”

If a property owner possesses title to submerged lands within parcel boundary, an easement is required that grants the right to conduct a specific activity – such as construction and maintenance of a living shoreline.

Absent such approval, the District’s implementation of such a project[s] would consist of encouraging and supporting such projects through a variety of mechanisms, including, but not limited to, education, funding and permitting support.

The District also has regulatory authority, should it choose to exercise it, to regulate erosion control projects by any person and/or prohibit activities adverse to the District’s purposes. It could enact regulations mandating and enforcing shoreline compliance with specific engineering standards. Alternatively, the District could propose to Lee County that the County supplement its existing coastal development regulations with specific standards recommended by the District. No formal process is necessary to pursue that option, which would most likely be initiated via direct communications with the proper officials with the Lee County Community Development Department and Office of the County Manager. County staff would determine the substantive details of such standards. This memorandum identifies provisions of the County’s Comprehensive Plan and Land Development Code that could be the focus of CEPD recommendations in their request to the County.

Brief Analysis of Range of Authority

Through the combined authority of Special Act 2000-399 and general law in Chapter 161, Fla. Stat., the key features of the CEPD’s authority to implement a beach or shore preservation program are:

TAKEAWAYS - Continued

Financial Authority and Funding Options:

- *CEPD can receive grants and levy taxes or special assessments to fund projects. Grants for projects on private lands or submerged lands require a clear public benefit, often necessitating public access easements and compliance with environmental regulations.*

Maintenance Responsibilities:

- *Property owners are responsible for maintaining projects they initiate on their property. For projects implemented by CEPD on private property via an easement, CEPD is responsible for maintenance unless otherwise agreed.*

Public Interest and Submerged Lands:

- *A state submerged lands easement is required for construction projects extending more than 10 feet beyond the mean high water line, ensuring adherence to state and federal regulations and demonstrating public benefit.*

- Develop and execute a logical and suitable program for comprehensive beach and shore preservation, relating to the use and maintenance of the beaches and sand dunes which may be important to their preservation and enjoyment.
- The program must concern beach and shore restoration and erosion control and may provide to an appropriate extent for other aspects of beach and shore preservation. It may incorporate recommendations of the US Army Corps of Engineers and the state Department of Environmental Protection.
- Construct, reconstruct, or improve Erosion Prevention Projects.
- Receive grants and contributions for the construction, maintenance, or operation of Erosion Prevention Project.
- Exercise authority, control, and supervision over the construction of any Erosion Prevention Project by any person.
- Levy special assessments and issue bonds to fund erosion prevention projects (with voter referendum approval) after an economic analysis determining the nature and extent of benefits expected to accrue from the program and allocating those benefits to their proper recipients by categories or zones of comparable benefits.
- Acquire land or interests in land, including by eminent domain.

In summary, the combination of the statutory authority and relevant definitions grants to the CEPD a very broad array of activities and physical structures to employ to “affect the physical condition of the beach or shore” and otherwise prevent or reduce erosion. That would be true on both the Gulf side and Bay side, regardless of the cause or contributing or exacerbating factors, including rising sea levels or otherwise. Erosion prevention and mitigation features, sea level rise infrastructure and resilience projects and the like can be implemented on beaches and shores. While there is no definition for shore or shoreline in Ch. 161, Fla. Stat., the definition of “apparent shoreline” in Chapter 177, related to Land Boundaries for Coastal Mapping¹, indicates a shoreline is viewed broadly as the intersection of the mean high-water datum with the outer limits of vegetation. Although a beach and a shore are distinct geographic features, in some locations they are interchangeable.

The extent to which the CEPD has the authority to implement a bayside erosion and flood control protection project on private lands, and on sovereign lands

The District will need the consent of private property owners to construct an erosion control project on their property or access their property for the purposes of constructing or maintaining such a project. As has been the case in the past with beach renourishment projects, this consent is typically secured through a negotiated easement or license granted by the owner. One key variable is whether owners perceive a benefit to their property or property value to accrue from having the District construct an erosion or flood protection project benefitting their land, or whether they would consent to such a project on their property only if provided financial compensation.

The Extent of CEPD’s Regulatory Authority

¹ “Apparent shoreline” means “the line drawn on a map or chart in lieu of the mean high-water line or mean low-water line in areas where either or both may be obscured by marsh or mangrove, cypress, or other types of marine vegetation. This line represents the intersection of the mean high-water datum with the outer limits of vegetation and appears to the navigator as the shoreline.” §177.27(1), Fla. Stat.

The CEPD can adopt and enforce such and regulations as it deems necessary or desirable to effectuate its purposes. As a result of Sp. Act 2000-399, LOF, the CEPD is authorized to:

1. Exercise authority, control, and supervision over the construction of any Erosion Prevention Project, constructed or to be constructed by any person, firm, or corporation, public or private.
2. **Adopt and enforce regulations for any such Projects.**
3. Restrain, enjoin, or otherwise prevent the establishment or construction of any Erosion Prevention Project without prior written approval.
4. Restrain, enjoin, or otherwise prevent the violation of any provision of the statute or of any CEPD resolution, rule, or regulation.

If the District has adopted a resolution pursuant to s. 161.32, Fla. Stat., adopting the provisions of Ch. 161 related and established under the provisions of this part, under the general statutory authority in Ch. 161, Fla. Stat., the CEPD is authorized to:

1. **Regulate and supervise all physical work or activity along the county shoreline which is likely to have a material physical effect on existing coastal conditions or natural shore processes – “with the consent of the department and of any municipality or other political authority involved.”**
2. This regulatory and supervisory authority **shall specifically include, but not be limited to, installation of groins, jetties, moles, breakwaters, seawalls, revetments, and other coastal construction as defined herein.**

This grant of authority is caveated by the requirement to first receive consent from the Department of Environmental Protection. However, the Special Act grants a broader regulatory authority that does not require the consent of the Department of Environmental Protection. Under Florida constitutional law, where a conflict exists between a special and a general law, the special act prevails unless the general law evidences a clear intent to supersede the special act. *Town of Palm Bch v. Palm Beach Local, 1866, I.A.F.F., 275 So.2d 247 (Fla. 1973)*. The question that arises is whether this law truly conflict (i.e., one cannot be complied with without violating the other) or whether they can both be met. On its face, the latter situation would seem to exist here. So it may be that the CEPD’s authority to regulate the construction of such projects requires approval by FDEP. **A definitive determination will need to be made if the District chooses to exercise any regulatory authority.**

With the combined authority of the Special Act and the general law, the CEPD has the authority to prevent the construction and maintenance and require a permit for any structure, work or activity that is “used for beach renourishment or erosion control” and any “physical work or activity along the county shoreline which is likely to have a material physical effect on existing coastal conditions or natural shore processes.” These are broad words and phrases that include a wide variety of structure and activities.

To the extent that the District would choose not to enact regulations to prevent what it deems as damaging individual parcel owner erosion or flood control projects, it may choose to offer incentives to private owners to conduct individual activities consistent with the District’s goals and responsibilities. Potential options for encouraging and supporting such projects might include:

- **Education:** The District could distribute to bayside landowners’ information on the benefits of recommended projects, basic guidance on the relevant processes and substantive standards and information on how to find qualified contractors.
- **Funding:** The District could offer a cost – share with landowners to assist in covering the costs of recommended projects, relative to permitting, construction and maintenance.
- **Permitting Support:** The District could provide technical assistance to riparian owners in the process of securing regulatory approvals for recommended projects.

4.2 CEPD Liabilities for Construction Damages or Negligence

CEPD may be liable for causing erosion or flooding on private land as a result of its construction or operation of structural measures². Fla. law is unsettled. Factors include the extent and impact of resulting flooding or erosion and the degree of reasonable care taken. CEPD is most likely not liable for damages that may have been prevented.

4.3 Easement Requirements from Private Property Owners for Access or Construction

Model easements and legal documentations were developed for this assessment (see Appendix A: Model Easement). These documents needed to include specific terms for access, construction, and maintenance on upland or submerged lands, provisions for environmental protection, and clauses addressing changes in land ownership and usage due to sea level rise (see Section 2.5 Private Lands Change to State Lands as Sea Level Rises). The goal was to create a legal framework that facilitates the implementation of adaptation projects while protecting the rights and interests of private property owners and ensuring compliance with regulatory requirements. Important considerations regarding potential submerged land ownership language in private property deeds are:

Property Line Extension:

- The phrase “extends to waters of Roosevelt Channel” typically implies that the property boundary extends to the **mean high water line**, which is the average high tide line. This is a common interpretation for properties adjoining navigable waters.

Mean High Water vs. Low Tide:

- If the property description explicitly states it extends to the waters without specifying high or low water marks, the default legal interpretation often applies to the **mean high water line**. This means the property owner would have rights up to the high tide line, not including submerged lands.

Submerged Lands:

- The submerged lands (below the mean high water line) are generally considered public trust lands managed by the State. Property owners typically do not have exclusive rights to these areas unless specifically granted through a lease or other agreement.
- Florida’s Department of Environmental Protection (FDEP) manages submerged lands. If the submerged lands are public trust lands, an easement or lease should be obtained from the FDEP for any activities.

² Fish and Wildlife Conservation v. Daws, 256 So.3d 907, 924-925 (Fla. 1st DCA 2018).

Unless private property deeds specifically state submerged land ownership (not common), CEPD does not need easements from property owners to conduct activities in the submerged lands.

4.4 Options for Addressing Private Owner Objections: No Action or Eminent Domain

If a property owner objects to a project, CEPD's options are:

- Take no action; advise the landowner of the projected erosion or flooding for their property and of options available for self – help.
- Exercise eminent domain to acquire the property interest necessary to construct a project deemed to serve a public purpose in the protection of other lands.

The Exercise of Eminent Domain Authority

The taking of private property through eminent domain, otherwise known as “condemnation,” is constitutional if it is for a valid public purpose and just compensation is paid to the landowner. Condemning land to protect a community from the physical, safety, social, ecological and other hazards associated with increased flooding, sea level rise, and storm impacts would easily qualify as a valid public purpose.

The District is authorized to secure the requisite interest in private land using eminent domain, should it make the policy choice to do so.

To the extent the District chooses not to, or is unable, to acquire interests in land from private property owners, its actions to implement recommended measures would focus on encouraging, educating, and potentially supporting (for example with permitting assistance, funding or both) private implementation of recommended projects.

Due to the property rights of private landowners, as part of the analysis of the most appropriate erosion and flood control projects to pursue, the District would consider:

1. What locations that require specific types of erosion control structures or features are at least partially privately owned?
2. What erosion control structures or features could feasibly be placed and maintained by the CEPD solely on publicly – owned land or submerged land while still providing cost – effective protection. This analysis would consider the potential for these new structures or features to work in concert with existing privately – owned structures or features.
3. To the extent that a cost - effective erosion control project requires a “whole bayside” approach that demands the placement of structures or features on privately – owned land, what is the extent and likely cost of acquiring the requisite interest in private lands through licenses or easements?
4. How might District – implemented projects potentially impact adjacent and nearby private lands – both positively and negatively.

4.5 State Submerged Lands Easement for Projects Beyond 10 Feet from Mean High Water

A state submerged lands easement is required for any construction project extending more than 10 feet beyond the mean high water line (MHWL). Obtaining such an easement involves demonstrating that the project will provide a public benefit and that it adheres to state and federal regulations designed to protect the marine

environment. This process aims to ensure that construction activities do not adversely impact the ecological balance and that they contribute positively to the community and environment.

4.6 Public Interest in Maintenance Requirements

During public workshops, the Captiva residents raised questions regarding the maintenance responsibilities of the projects that may be implemented by CEPD on the easements they provide. The residents voiced their desire for CEPD to take ownership of maintenance duties for any project CEPD may implement on their property. They also emphasized desire to retain their riparian rights that provides them with a viewshed to the bay. On this extent, property owners are responsible for maintaining projects that are built on their initiative within their property limits. For the projects implemented by CEPD on private property pursuant to an easement acquired from the property owner, CEPD is responsible for the maintenance unless agreed otherwise by the terms of the easement.

4.7 CEPD's Financial Authority and Options

Under Ch. 2000-399 LOF, the CEPD may:

- Receive and accept from any source grants for or in aid of the construction, maintenance, or operation of any Erosion Prevention Project and receive and accept aid or contributions from any source of either money, property, labor, or other things of value to conduct its purposes.
- Levy and assess an ad valorem tax not exceeding 10 mills.
- Upon referendum approval, issue bonds to fund capital projects required by the beach and shore preservation program.
- Levy special assessments upon benefitted property for erosion prevention projects.

Grants ranging from \$10,000 to \$1 million can be utilized for projects on private lands or submerged lands protecting private properties. For projects on private lands, it is imperative that they provide a clear public benefit, typically necessitating public access easements. Compliance with relevant environmental laws, zoning requirements, and other regulations is also required. When using funds for projects on submerged lands, similar criteria apply: the project must offer a clear public benefit and comply with state and federal regulations. Additionally, it must be demonstrated that the project will not harm the marine environment, and it will require permits and approvals from various state and federal agencies, including the US Army Corps of Engineers (USACE). Easements from the state may also be necessary.

5. Adaptation Project Feasibility Analysis: Funding and Permitting Options & Stakeholder Interest

5.1 Stakeholder Roles, Responsibilities and Jurisdiction Limits

Stakeholders for Captiva’s bayside adaptation projects are private property owners, CEPD, Lee County, and the State of Florida. The CEPD is identified as the lead entity responsible for coordinating and overseeing the implementation of adaptation projects. For the CEPD implemented projects on public land, private landowners are also anticipated to participate actively in the process and comply with legal and regulatory requirements, as well as provide easements for CEPD to implement island-wide projects. State and federal agencies can provide funding, regulatory oversight, and technical support. Clear delineation of roles and responsibilities helps streamline the implementation process and fostered collaborative efforts among all stakeholders.

TAKEAWAYS

- *Most strategies in menu can be implemented by individual property owners.*
- *Larger projects within water components may be easier for CEPD to implement than for the individual.*
- *A few strategies may be more feasible in the future as regulation changes with rising sea levels.*
- *Central Captiva appears to have the greatest number of parcels that scored highest in vulnerability.*

Figure 13 illustrates private, state, and CEPD authority zones, and example permitting and easement requirements within upland and submerged lands. Property owners are responsible for maintaining projects that are built within their property limits. For the projects implemented by CEPD on private property pursuant to an easement acquired from the property owner, CEPD is responsible for the maintenance unless agreed otherwise by the terms of the easement.

For public lands, the permitting process is generally more straightforward, with fewer restrictions compared to private lands. However, projects on private lands require careful navigation of legal requirements, including securing easements and obtaining necessary permits from various regulatory agencies. The analysis conducted by ESA highlighted the need for clear guidelines and streamlined processes to facilitate permitting and reduce delays in project implementation. Sections 5.2.1- 5.2.5 are outlined by ESA to go over the permitting considerations in detail. Please see **Appendix B** for a full legal assessment completed by Environmental Lawyer Richard Grosso.

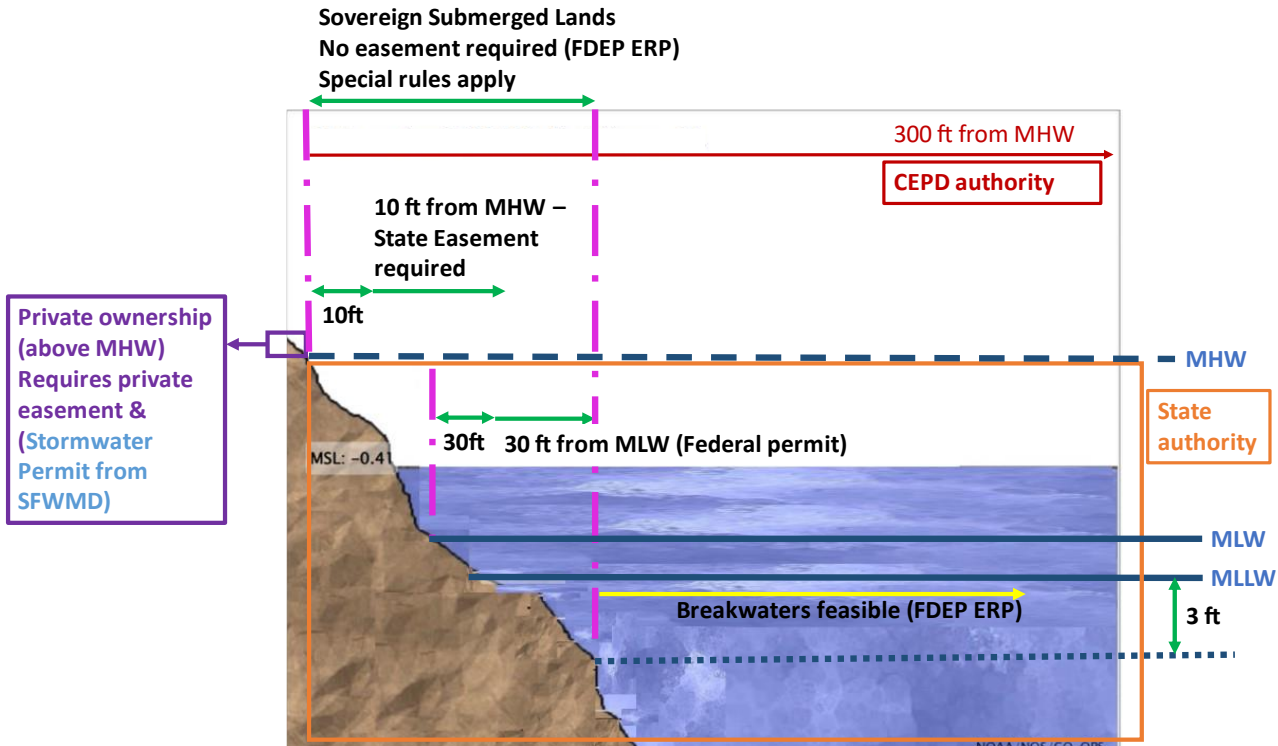


Figure 13. Sample Permitting Requirements and Zones of Authority

5.2 Permitting Considerations

5.2.1 Permit Applications and the Pre-Application Meeting

As a first step to navigating the regulatory process, a preliminary project plan will be needed. This plan can be professionally produced or by the property owner; however, the more thorough the site and construction detail, the more quickly regulatory review staff can determine the required level of permitting. This is important, because the detail needed to determine project impacts and feasibility can be substantially different between levels of application. For example, plans and cross-sectional drawings are required for works in surface waters or wetlands which would be needed for most green infrastructure designs. However, if in-water work is avoided (e.g., adding a landward-offset retaining/stem wall, in adaptation to sea level rise) then this may qualify under the County’s Building Permit which may not require engineering plans. With preliminary plans in hand, agency staff will be able to direct clients toward the appropriate level of licensing or permitting.

Licensing and permitting agencies want to ensure project safety, environmental compliance and make sure no unintended consequences affect the neighboring properties or environment. In advance of a formal permit application, agency staff are often available to answer questions and provide suggestions if there is any uncertainty regarding the application process. It is recommended that a “pre-application meeting” be formally requested via phone call or email. Pre-application meetings are formal in-person gatherings of clients, or design professionals, and agency staff to review project plans for permitting completeness, fee schedules, and filing requirements. Pre-application meetings are often held when proposing large-scale projects, and often present opportunities to modify plans to improve outcomes and/or expedite the permitting process.

Care should be exercised when formally submitting a permit application because processing time can be significantly delayed if agency staff determine that plans are insufficient for formal review, or incomplete. Agency staff typically review project plans and specifications for “completeness,” and incomplete applications or project plans will prolong the review process. Incomplete applications, or poorly specified documentation, can necessitate request(s) for additional information (sometimes abbreviated RAI) and again this can delay processing times. Therefore, it may be beneficial to develop projects under consultation with environmental and coastal engineering professionals that are familiar with application process and applicable planning detail requirements.

5.2.2 Local Permitting

Florida cities and counties often have the capacity to act independent of state review when enacting ordinances, codes, plans, and resolutions that do not conflict with state or federal law. Local government ordinances regulating seawall height standards or construction materials may therefore differ from state or federal recommendations and should be consulted early in the project design and planning process.

State and Federal permits must be submitted to the County to be included in Lee County development orders and permits. Lee County Environmental Sciences staff will participate in the compliance and enforcement of permit conditions. Lee County does not regulate mangrove trimming, it is regulated by the Florida Department of Environmental Protection through the Mangrove Trimming and Preservation Act (Florida Statutes Sections 403.9321-403.9333).

5.2.3 State of Florida Permitting

Unless transferred through deed, the State of Florida owns tidally submerged lands up to the mean high-water line (MHW), therefore authorization is required to construct seawalls, riprap, and shoreline stabilization structures that impact state-owned submerged lands is through the Department of Environmental Protection (FDEP). One of the first things to consider before planning a green infrastructure project is whether it will occur on sovereign submerged lands. Although there are over 40 instances where submerged lands appear to be privately owned on the Property Appraiser’s website, most submerged lands adjacent to the shoreline are held by the state (Fla. Stat. § 253.12(1) 2017). In these cases, the property owner must first obtain sovereign submerged lands authorization from the FDEP before proceeding with a permit application. This authorization can come in the form of an exception, a lease, a letter of consent, or consent by rule (Fla. Admin. Code Ann. r. 18-21.005 2009). The South Florida Water Management District has been delegated State permitting authority, so that they may be able to issue on the State’s behalf, especially if there are impacts to State Lands, then an authorization or easement from State Lands will also be required.

The State permit options vary in costs and complexity based on the layout and the site conditions, and regional FDEP staff can help identify which permits will be required based on your needs. Most living shoreline projects on private properties are small and can be considered “exempt” from some of the regulatory requirements that are involved with larger projects, if they meet certain conditions [Ch. 62-330.051(12)(e)]. All property owners are encouraged to meet with the FDEP representative prior to submitting an application to FDEP for verification that the proposed project is exempt.

Permit Exemptions

Many individually owned shorelines on public and private property are small enough to fall within the exemption of Ch. 62-330.051(12)(e) of the Florida Administrative Code.

To qualify for an exemption, the living shoreline project must meet the criteria below:

- The project must be 500 linear feet or less.
- The project must be located no farther than 10 feet waterward of the mean high-water line.
- Plantings must be native wetland plants appropriate for the site and must be obtained from local commercially grown stock.
- The living shoreline project must also include plans to remove invasive plants and deploy a turbidity curtain during construction to control silt and sediment.
- Qualifying projects may not involve depositing fill materials in surface waters or wetlands (Fla. Stat. § 373.403(14) 2017) unless necessary for a **breakwater** (Fla. Admin. Code Ann. r. 62-330.051(12)(e) 2013).
- A **breakwater** may be used if permanent wave **attenuation** is necessary to maintain the shoreline vegetation (Fla. Admin. Code Ann. r. 62-330.051(12)(e) 2013). If the project requires a **breakwater**, the inner toe of the breakwater must extend no more than 10 feet waterward of the mean high water line, and it must not be taller than the mean high tideline. Any such **breakwater** must be composed predominantly of natural oyster shell (in mesh bags having openings of no more than 3 inches) or other stable, non-degradable material. **Breakwaters** must not be placed within three feet of any submerged grass or emergent marsh vegetation and must have gaps at least 5 feet wide located at least every 75 feet along the **breakwater** to not substantially impede the flow of water or movement of fish, manatees, sea turtles or small tooth sawfish. (Fla. Admin. Code Ann. r. 62-330.051(12) (e) 2013).

Projects that qualify for exemptions often lead to the shortest review timeframes (30-day initial review) and lower permitting fees. If the project qualifies for the exemption, the shoreline owner should pursue the verification of exemption through FDEP website³.

5.2.4 State Lands Permitting

If the proposed project extends seaward of the mean high water line (MHWL) then Division of State Lands may need to provide review of the permit application. There is an exemption if the project uses natural materials (rip rap, oyster bags or precast concrete modules within 10 feet of the (MHWL). Sandy fill will not be allowed to be placed seaward of the MHWL and if sandy fill has the possibility of accreting in the project area from the placement of the living shoreline or seawall enhancement project, then a Boundary Line Agreement (BLA) would need to be executed between the property owner and the State. If the property owner is a private homeowner, business, or utility the applicant will apply for a private easement and may be subject to an appraisal of the property and the easement will be valid for 10 to 15 years. If the applicant is a municipality or county, then they would apply for a public easement. Whether public or private, a MHWL survey completed in the last year and a sketch and legal description of the proposed improvements must be submitted to State Lands and requires that the documents be signed and sealed by a surveyor licensed and registered in the State of Florida.

If the project borders a Florida Department of Transportation (FDOT) roadway or bridge then additional applications for permits will be required. The FDOT permits can be applied for through their One Stop Permitting website: <https://osp.fdot.gov/#/ContentPage/18ccf98b-9dba-48a8-b5ea-a78e01198699>

5.2.5 Federal Permitting

Federal review of shoreline construction projects is typically conducted under authority granted by the National Environmental Policy Act (NEPA), assuring that all branches of government consider the environment prior to

³<https://floridadep.gov/water/submerged-lands-environmental-resources-coordination/forms/request-verification-exemption>

undertaking any federal action that significantly affects the environment. The Clean Water Act (CWA) regulates pollution discharges into waters of the United States and the Endangered Species Act (ESA) providing oversight for the conservation of threatened and endangered plants and animals. Most likely, a NEPA review will not be required for smaller projects, but CWA and ESA determinations will still need to be verified.

For green infrastructure projects, the US Army Corps of Engineers (USACE) will head federal regulatory review. If applicable, the USACE will review project plans and will initiate consultation with associated environmental resource agencies, for example, EPA, US Fish and Wildlife Service, and National Marine Fisheries Service, for determinations of potential impacts.

The USACE currently has two primary regulatory mechanisms to streamline permitting for habitat restoration or living shoreline projects: Nationwide Permits 13, 27 and 54. The Nationwide 13 is typically used for maintenance of existing living shoreline, seawall enhancement or shoreline stabilization projects. The Nationwide 27 has traditionally been utilized for authorizing a variety of bank stabilization and habitat restoration projects. However, the recently authorized (March 2017) Nationwide 54 Permit was developed specifically for living shorelines.

Another improvement to the permitting timeline is the Jacksonville Biological Opinion or “Jax BO”, if a project is able to meet the criteria for the Jax BO (no impacts to natural resources) then the USACE does not have to hold a separate consultation with National Marine Fisheries Service (NMFS) and/or the US Fish and Wildlife Service (USFWS).

This saves substantial time in the review process. Below is a description of federal permitting options starting from the least cumbersome to the more intricate permitting for larger shoreline stabilization and living shoreline designs. Additional Federal permitting information can be found here: <http://w3.saj.usace.army.mil/permits/trainingmodule/index.html>

Nationwide Permit 54

The recently adopted Nationwide Permit 54 may be a fairly easy way to permit a living shoreline. For a project to qualify for the NWP 54, the following conditions must be adhered to qualify for authorization. The living shoreline should have a substantial biological component that maintains the natural continuity of the land-water interface and retain or enhance shoreline ecological processes. In addition, the following design conditions must be met:

- The structure and/or fill area cannot extend more than 30 feet from mean low water in tidal waters.
- The activity is no more than 500 feet in length along the bank.
- Variances to the 500- and 30-foot limitations may be requested but are not guaranteed to be authorized and may delay permitting.
- Structural materials (e.g., *coir logs*, *oyster shell*) must be anchored or be sufficiently weighted to prevent relocation due to wave action or flows.
- Native vegetation should be utilized.
- The discharges of dredged or fill material must be the minimum necessary for establishment of the living shoreline.

- The activity must be designed, constructed, and maintained so that it has no more than minimal adverse effects on water movement between the waterbody and the shore.
- The living shoreline must be properly maintained (exotic vegetation must be removed in perpetuity).
- If the project is along the Intracoastal Waterway (ICWW) the project plans must show the limits of the project referenced to the Federal Channel rig or involve impacts to navigation right-of-way and must be greater than 62.5 feet from the centerline of the ICWW.

Letter of Permission (LOP)

For living shoreline projects that do not qualify for a Nationwide Permit, the LOP is an option. A LOP is a type of individual permit issued through an abbreviated processing process which includes coordination with federal and state fish and wildlife agencies and public interest evaluation, but without the publishing of an individual public notice. The process is less cumbersome than the Individual Permit, which is for projects that have a more significant likelihood of environmental impacts or involve impacts to navigation or federal real estate.

5.3 State Environmental Resource Permits and De Minimis Exemption for Minor Projects

Projects located above the mean high water line in Florida are subject to state environmental resource permit (ERP) regulations. A streamlined programmatic permit process exists for expedited permitting, primarily for restoration and shoreline projects. For projects impacting habitats or listed species, an individual permit process is required, involving a ranking system to assess impacts and community quality.

Florida Fish and Wildlife Conservation Commission is a key commenting agency with a focus on manatees, smalltooth sawfish, and sea turtles. While some exemptions exist, such as riprap placement within 10 feet of a seawall for toe scour protection, these can conflict with federal regulations protecting smalltooth sawfish. **The state encourages more natural shoreline stabilization methods like mangrove plantings over riprap.** Local regulations also influence riprap and seawall placement. Existing seawalls can often be replaced or enhanced within certain limitations. For projects extending beyond these limits or requiring expansion of existing footprint, easements from the state's Division of State Lands may be necessary. These easements can be private or public, with varying fees and terms depending on the property's use and ownership.

Certain activities can fall under the De Minimis exemption if they do not add more than a de minimis amount of impervious surface. The De Minimis exemption allows for minor activities that pose minimal environmental risk. These activities may qualify for an exemption under specific rules (Rule 62-330.051, F.A.C.)⁴. A De Minimis exemption may be granted for shoreline stabilization projects if they **remain within 10 feet of the mean high water line**. For seawalls, this measurement is calculated from the front face of the structure. For unarmored or natural shorelines, a survey is necessary to determine the exact location of the mean high water line before initiating any work.

5.4 State Lands Restriction on Placing Sand and Riprap

State Lands do not allow sandy fill seaward of the mean high water line due to unintended consequences such as the possibility of sand shifting towards neighboring properties and blocking access to their docks and boats. Instead, State Lands is in favor of riprap like material that can contain sand, which is incongruous with what the federal government's restrictions on riprap due to the potential impacts on small tooth sawfish habitat.

⁴ https://www.swfwmd.state.fl.us/sites/default/files/medias/documents/Applicant_Hanbook_I_-_Combined.pdf

5.5 Potential Special Conditions and Survey Requirements in Permits

In 2017, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA NMFS) provided guidance regarding the Regional General Permit (RGP) SAJ-46 for Shoreline Stabilization Activities in Florida as it relates to Smalltooth Sawfish. Such guidance indicates that the installation of new shoreline stabilization materials in Smalltooth Sawfish critical habitat is limited to:

- Placement of new shoreline stabilization materials (i.e., riprap, articulated concrete mats) in water depths deeper than -3 feet Mean Lower Low Water (MLLW). No stabilization materials can be placed in waters between the MHWL and -3 feet MLLW.
- Installation of new or repair/replacement seawalls within 1.5 feet waterward of the existing seawall or MHW.
- Repair and replacement of shoreline stabilization materials (i.e., riprap, articulated concrete mats) within the same footprint of existing materials in depths between the MHWL and -3 feet MLLW. This means that these materials cannot result in the waterward extension or lateral expansion of materials beyond the previous footprint. Shoreline stabilization materials can be expanded in water depths deeper than -3 feet MLLW.

Sea Turtle and Smalltooth Sawfish Construction Conditions are required by the United States Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service. These conditions are specified in the context of the Regional General Permit SAJ-20, issued by the U.S. Army Corps of Engineers (see Appendix F), which regulates construction activities in coastal and marine environments to ensure that protected species, such as sea turtles and smalltooth sawfish, are not harmed during such operations. The conditions mandate specific measures to avoid collisions and entanglements, and to report any incidents involving these species immediately, ensuring compliance with the Endangered Species Act of 1973 and other relevant environmental regulations. Protected species construction conditions for permits mandate that all construction activities must include observation for these species, and there are civil and criminal penalties for harming, harassing, or killing them. Siltation barriers must be made of non-entangling material, properly secured, and regularly monitored. Vessels must operate at no-wake speeds in shallow areas, and if a sea turtle or smalltooth sawfish is seen within 100 yards, construction activities must cease until the animal has left the area. Any collisions or injuries must be reported immediately to the National Marine Fisheries Service and local sea turtle rescue organizations. These conditions ensure protection and compliance with environmental regulations during construction projects.

5.6 Stormwater Permits from South Florida Water Management District

Permitting for upland projects primarily involves obtaining stormwater permits from the South Florida Water Management District or the Florida Department of Environmental Protection. Federal permits are typically not required unless listed species, such as the bald eagle, are present.

5.7 Public Interest in Viewshed

Private riparian rights allow landowners adjacent to bodies of water to access and use the water for activities like boating, fishing, and irrigation, if they do not infringe on others' rights or violate regulations. These rights also ensure unobstructed views of the water, enhancing the value and enjoyment of waterfront properties.

Captiva residents voiced their desire to preserve their viewshed during public outreach meetings. Given the community’s strong emphasis on maintaining visual appeal, any erosion prevention project undertaken by CEPD needs to carefully consider its impact on the scenic character of the area. When private property owners prefer to maintain their water views at a location suitable for mangrove planting, solutions like mangrove trimming can be utilized. Installation of flood-proof glass walls to balance ecological benefits with aesthetic preferences also remains as an alternative where feasible. It should also be noted that CEPD is authorized to implement projects that provide erosion control benefits to the public. If such a project substantially and materially obstructs a private, riparian landowner's view of the water, the District will either be required to secure an easement from the landowner allowing such obstruction or compensate the owner for the reduced fair market value of the property resulting from the obstruction.

The APTIM team will conduct a viewshed analysis as part of Task 6 - Engineering Concepts to help inform the public and CEPD of potential impacts of the projects on the viewshed.

5.8 Public or Private Project Options

Implementing adaptation strategies on Captiva Island can vary significantly in complexity depending on the strategy and whether it is undertaken by private property owners or by a larger entity like CEPD. Some strategies present more challenges due to factors such as permitting and easement requirements, the need for detailed surveying or modeling, and the level of maintenance involved. For instance, private property owners may find it particularly difficult to implement projects on submerged lands, such as channel dredging or nearshore emergent breakwaters, due to the complex process of obtaining necessary easements from State Lands and navigating regulatory approvals. In contrast, CEPD may have an easier time securing these easements due to their established relationships and broader jurisdictional authority.

Building upon the permitting considerations and legal authority analysis detailed in previous sections, the APTIM team compiled and scored public and private implementation project options. Scoring was based on the relevant permitting and easement requirements, whether the strategy meets an urgent need and requires surveying or modeling, level of maintenance required, and view obstruction it may cause. Then, the strategies were grouped based on the suitable shoreline type that they can be implemented. In other words, **Table 7** lists the adaptation strategies from the least to most challenging for private property owners to implement for their specific shoreline type. **Last six rows highlighted in yellow are intended for CEPD to implement as part of a grand vision to protect the island long-term.** These six strategies may not be necessary or feasible to implement in the short term, however they will be essential components of the island’s protection when the water levels are above 3.5 ft NAVD by 2100.

Strategies implemented by CEPD can offer distinct advantages, such as cost-sharing opportunities that are less feasible for individual property owners. For example, a CEPD-led project could spread costs across multiple stakeholders, making large-scale interventions like breakwater construction or channel dredging more financially viable and easier to execute. Conversely, strategies like flood-proof glass walls or mangrove planting might be more manageable for private owners but still necessitate careful planning and sustained effort to ensure long-term effectiveness. This disparity highlights the importance of considering who is best positioned to implement certain strategies, balancing feasibility, and the potential for collective benefit. Please see the attached spreadsheet for the full Adaptation Strategy Matrix, i.e., “the menu of options” that evaluates each adaptation strategy in detail for feasibility and policy considerations, as well as how they were scored for prioritization and ease of implementation.

The APTIM team has also evaluated parcel level risks to inform CEPD and private property owners on prioritization of adaptation needs. Parcels were scored based on building and shoreline elevation, proximity to mean high water line, flood trespassing risk, proximity to roads expected to flood by 2040, and absence of mangroves. Figure 14 shows vulnerability score distribution along the bayside. **Central Captiva appears to have the greatest number of parcels that scored highest in vulnerability.**

Number of parcels	
Flood trespassing	27
Adjacent to 2040 roadway flooding	6
Without mangroves	64
With buildings below 3.5 ft NAVD	62
With buildings near MHW	54
With shorelines below 3.5 ft NAVD	150

Table 5. Number of Bayside Parcels Under Listed Risks

Vulnerability Score	Number of Parcels
5	2
4	5
3	23
2	31
1	52
0	40

Table 6. Number of Bayside Parcels and Their Vulnerability Scores

This analysis informed potential focus areas for prioritized adaptation action and conceptual designs that will be developed as part of Task 6 - Engineering Report with Conceptual Adaptation Drawings. It also beneficial on informing private property owners on their vulnerabilities so they can make informed decisions for implementation.



Figure 14. Vulnerability Score Distribution Along the Bayside

Table 7. Menu of Adaptation Strategies and Relevant Considerations

Approach/project type	Benefits	Upland or Submerged	Suitable shoreline types	Maintenance requirement	View obstruction	On public or private land?	Meets an urgent need?	Longest permitting duration (state or federal)	Surveying or Modeling Requirement
Filling above mean high water	Increase in crest height	Submerged	All	Minimal grading	Partial	Private	Yes	3-6 months	Yes
Mangrove planting	Mangrove solution	Both	All	Annual trimming if required	Partial to full	Both	No	None	No
Adaptive landscape planting	Reduction of maintenance for future sea level rise	Upland	All	25 years or after storm	Partial to full	Both	No	None	Yes
Retaining walls	Sediment retention	Upland	All	Cracking and spalling increase with age	None to partial	Both	Yes	Up to 12 months	Yes
Shoreline renourishment	Mangrove solution, soft shoreline	Both	All	Every 5-10 years, or after storm	None	Both	Yes	3-6 months	Yes
3D printed concrete blocks	Shoreline and reef stabilization	Submerged	All	25 years or after storm	Partial to full	Both	No	6-12 months	Yes
Living shorelines	Adapts with sea level rise, increases habitat	Both	All	Very little, plant maintenance, some repair after large storm event	Partial	Both	No	Up to 12 months	Yes
Oyster reef balls	Wave dissipation, essential fish habitat	Submerged	All	25 years or after storm	None to partial	Both	No	6-12 months	Yes
Moving existing docks or replacing them with floating docks	Adjustment for sea level rise	Both	All	Inspect every 2 years	None to partial	Private	No	6-12 months	Yes
Salt marsh restoration	Flood absorption, habitat, wave dissipation	Upland	Beach	Every 5-10 years, or after storm	Partial	Both	No	6-12 months	Yes
Berm reinforced with geotextile mats	Soil retention, increased crest height and width	Upland	Beach, mangrove	Stormwater conveyance	Partial	Both	Yes	3-6 months	Yes

Approach/project type	Benefits	Upland or Submerged	Suitable shoreline types	Maintenance requirement	View obstruction	On public or private land?	Meets an urgent need?	Longest permitting duration (state or federal)	Surveying or Modeling Requirement
Automated flood barriers along shoreline	Sealed/automated flood protection	Upland	Beach, seawall	Cleaning, regular maintenance, corrosion	Visible, partial to full	Both	Yes	6-9 months	No
Flood-proof glass walls along the shorelines	Sealed wall without affecting view	Upland	Seawall	Minimal care for cleaning and corrosion	None	Both	Yes	None	No
Increase seawall height	Increased crest height, new tie backs	Upland	Seawall	Minor cracks and spalling	Partial	Both	Yes	Up to 12 months	No
Buried seawalls	Soil retention, increased crest height, amenity	Upland	Seawall	Minor cracks and spalling	Minimal	Both	Yes	3-6 months	Yes
Replace seawalls	Soil retention, increased crest height, amenity	Upland	Seawall	Minor cracks and spalling	Minimal	Both	Yes	3-6 months	Yes
Injection wells behind seawalls	Seals existing seawalls extending usable life	Upland	Seawall	Inspect every 2 years	None	Private	No	None	No
Low-carbon concrete	Reduced emissions	Upland	Seawall	Inspect every 2 years	Partial	Both	No	3-6 months	No
Seawalls with attached or floating planters or habitat panels	Soil retention, increased crest height, improved habitat creation and minimize wave reflection	Upland	Seawall	Fill and vegetation replacement after storm	Visible, partial to full	Both	No	3-6 months	Yes
Seawall removal to create mangrove shorelines/beaches	Reduction of wave reflection and end effect erosion, habitat enhancement	Upland	Seawall	Annual inspection for vegetation	None to partial depends on planting	Private	No	6-12 months	No
Tidal gates in Roosevelt Channel	Tidal surge protection	Submerged	All	Cleaning, regular maintenance	Visible, partial to full	Public	Yes	6-12 months	Yes
Fill submerged lands (below mean	Can be soft or hard solution, habitat diversity	Submerged	All	Every 5-10 years, or after storm	None	Public	No	6-12 months	Yes

Approach/project type	Benefits	Upland or Submerged	Suitable shoreline types	Maintenance requirement	View obstruction	On public or private land?	Meets an urgent need?	Longest permitting duration (state or federal)	Surveying or Modeling Requirement
high water) to change habitat									
Channel dredging or relocation	Reduction of boat wake and surge effects	Submerged	All	Every 5-10 years, or after storm	None	Public	Yes	6-12 months	Yes
Seagrass restoration	Sub-bottom retention of substrate, wave dissipation, essential fish habitat	Submerged	All	Every 5-10 years, or after storm	None	Both	No	6-12 months	Yes
Raising a roadway	Resiliency to flood/storm surge, protects evacuation routes	Upland	All	Regular roadway maintenance and erosion control	Minimal	Public	Yes	12-18 months	Yes
Nearshore emergent breakwaters	Wave dissipation, essential fish habitat	Submerged	All	25 years or after storm	Partial	Public	Yes	6-12 months	Yes

5.9 Project Grant Funding Eligibility, Availability and Requirements

Identification of potential funding sources is an important consideration for the feasibility of adaptation projects. Possible funding strategies include securing federal and state grants, forming public-private partnerships, and leveraging local government funding and incentives. Federal and state grants can provide significant financial support, particularly for large-scale projects. Public-private partnerships can bring additional resources and expertise, fostering collaborative efforts to address climate risks. Local government funding and incentives can encourage community involvement and support for adaptation measures, ensuring sustainable and long-term project implementation.

To further assess the fundability of adaptation strategies, the APTIM team has conducted a preliminary Benefit-Cost Analyses (BCA) for four (4) different implementation scenarios. Methodology and Results of this analysis can be found in Appendix E: Implementation Scenarios and Benefit-Cost Analysis.

6. Suggested Standards and Criteria for Erosion Control Project Evaluation & Approval

Standards and criteria for evaluating adaptation projects were established, focusing on compliance with local, state, and federal regulations. Environmental impact assessments were integral to this process, ensuring that proposed projects do not adversely affect natural habitats and ecosystems. Additionally, engineering and construction standards were developed to ensure the structural integrity and effectiveness of adaptation measures, balancing safety, functionality, and environmental considerations.

TAKEAWAYS

- *CEPD has the authority to regulate shoreline protection projects.*
- *CEPD must first update program documents, request policy amendment from County and plan for enforcement.*

6.1 CEPD's Authority to Implement & Enforce Regulations for Erosion Prevention Projects

CEPD holds the authority to implement and enforce regulations for Erosion Prevention Projects (EPP) that are necessary or useful in protecting lands within the district from tidal action and other causes of beach and coastal erosion. CEPD is responsible for controlling and supervising the construction of any EPP undertaken by individuals or entities. To ensure effective coastal protection, CEPD can enforce regulations that include prohibiting new seawalls, requiring existing seawalls to meet specific standards and maintenance requirements, and allowing only living shorelines. Additionally, CEPD can establish regulatory standards for coastal development, prevent unauthorized construction, and enforce compliance with its resolutions, rules, and regulations.

6.2 Lee County Coordination for Policy Advancement

Policy recommendations to Lee County include amendments to the county's coastal construction standards to implement specific recommended practices. Additionally, CEPD could propose new or revised policies for Captiva shorelines, which could either be enacted directly by CEPD or integrated into the Lee County Comprehensive Plan and Land Development Code.

The APTIM team met with Lee County virtually to ensure alignment with their policy, plans, and codes and clarify their seawall, dock, and riprap permitting processes. Below is a summary of questions asked and responses received from Lee County representatives:

Seawall Permitting

Under what conditions are seawalls permitted? (e.g., risk of building failure or replacement of old wall if there is no seagrass)?

Lee County (LC) strictly adheres to the Land Development Code (LDC) regarding seawall construction. The LDC permits rip-rap placement and the replacement of pre-1984 seawalls. However, the construction of new seawalls along natural shorelines has been prohibited since 1984, and this policy remains unchanged. The Captiva Plan within the LDC further emphasizes the preservation of natural shorelines.

While variances for seawalls based on extreme hardship exist, LC has not granted any permits to date. Instead, property owners have opted to relocate structures to avoid such hardships.

How many seawall permits were denied in the past year and why?

While variances for seawalls can be granted under extreme hardship conditions, Lee County has not approved any seawall permits in the past year. Instead of granting permits, the county has encouraged property owners to relocate structures to mitigate hardships rather than constructing seawalls, as exemplified by the case of Upper Captiva.

It was noted that while seawall permits are generally not granted, the construction of retaining walls and the placement of riprap is permitted under specific conditions. Retaining walls must adhere to the setback requirements outlined in Section 26-75(c) of the Land Development Code, maintaining a minimum distance of five feet from the mean high-water line or landward of wetland vegetation.

Riprap Permitting

How far from the shoreline can riprap be placed?

LC policy aligns with the Coastal Construction Control Lines for riprap placement. Beyond these lines, there are no specific restrictions on riprap placement adjacent to retaining walls.

What are the policies and permitting requirements for riprap?

Riprap revetments are subject to specific regulations outlined in Section 26-75(d) of the LDC. Key requirements include:

- Riprap must be located and placed so as not to damage or interfere with the growth of wetland vegetation.
- Material used for riprap should be sized properly for intended use, be an average of 12 inches in diameter, and installed on top of filter fabric or equivalent material to prevent erosion of subgrade. Riprap must be clean and free of debris deemed harmful to the environment and public safety.
- Mangroves or other approved wetland vegetation must be planted three feet on center in compliance with Section 26-77(b)(2) for added shoreline stabilization and ecological benefit within the riprap. Other wetland mitigation techniques may be considered in lieu of vegetation planting. No vegetation planting is required for riprap revetments constructed in artificial upland canals with a minimum of 50 percent of the bank having seawalls, or for a linear distance less than 300 feet where both adjoining properties have seawalls.

What are the limitations of riprap placement in smalltooth sawfish harvesting areas?

Riprap limitations related to smalltooth sawfish habitat are primarily regulated by the National Wildlife & Fishery (NWF) under the US Army Corps of Engineers (USACE). LC is unaware of any riprap installations in designated sawfish nursery areas and has not received challenges to this status. While LC will inform developers about NWF regulations, it has no direct enforcement or policies regarding sawfish habitat and riprap. Marine contractors or sub-consultants may provide more detailed information on NWF-enforced limitations.

Dock Permits and Potential Policy Changes

If environmental mitigation is planned, can docks be extended or enlarged?

LC requires a benthic survey for any dock extension. Most dock permits issued by LC have been for maintaining existing configurations.

What would County staff consider if CEPD proposed a minimum elevation for seawalls and berms to avoid tidal flooding?

LC has expressed concerns about the potential negative impacts of a mandatory minimum elevation for seawalls and berms. These include:

- Unequal enforcement leading to issues for compliant property owners.
- Potential drainage problems for neighboring properties.
- Difficulties in enforcement and negative public perception.
- Creation of a “bowl-like” effect leading to internal drainage issues.

6.3 Prevent Overtopping and Flood Trespassing with Infrastructure

Overtopping and flood trespassing between bayside parcels highlight the interconnected nature of flood risk management. Adaptation measures taken at one parcel can extend protective benefits to surrounding areas, public roads, and critical infrastructure further inland, emphasizing the need for coordinated efforts among property owners and stakeholders. Overtopping and flood trespassing can be prevented by creating a uniform shoreline and implementing suitable shoreline protection elements.

6.4 Existing Seawall and Retaining Wall Minimum and Maximum Elevations

Examples of existing seawall and retaining wall minimum and maximum elevation standards from various Florida municipalities provide valuable insights into how coastal communities are addressing the challenges of sea level rise and tidal flooding. Specifically, (the City of Miami Beach, the City of Hollywood), and Broward County (Appendix C: Example Policy Language From Other Municipalities on Tidal Flood Barrier Ordinance and New Seawalls), have set robust elevation standards for seawalls and retaining walls, often requiring elevations between 4 to 8.5 feet NAVD88. Some municipalities, including the Town of Longboat Key, also set maximum seawall elevations. These policies are designed to mitigate flooding impacts, adapt to future sea level rise, and ensure the longevity of coastal infrastructure. The Captiva Erosion Prevention District (CEPD) can utilize these examples to develop their own standards tailored to their specific needs and geographical conditions. Establishing clear minimum and maximum elevation requirements is crucial for enhancing coastal resilience, protecting property, and ensuring the safety and well-being of the community.

A new model ordinance template, developed by the Tampa Bay Regional Planning Council (TBRPC) with funding from the Florida Department of Environmental Protection, identifies shoreline protection strategies to support community flood protection and habitat preservation and restoration. The template is designed to assist local governments in adopting a regionally consistent set of policies to ensure that local shorelines are resilient through the next 50 years. The ordinance template establishes a 5-foot above mean sea level (North American Vertical Datum 88) minimum height for tidal flood barriers based on projections of sea level rise conditions in combination with high tides through the year 2070.

After setting minimum and maximum elevations, it is essential for municipalities to take swift action to avoid constructing tidal flood barriers and seawalls under water and be ahead of the potential sea level rise impact. The relevant policy should iteratively be updated to ensure the policy captures the latest climate data and provides the maximum benefit to the community.

6.5 Minimum Standards For Living Shorelines and Toe Protection

Establishing minimum standards for living shorelines and toe protection involves defining the essential criteria for these natural defense mechanisms. This policy specifies the types and arrangements of vegetation, as well as the necessary structural supports, to ensure effective erosion control and habitat enhancement. Implementing these standards promotes the use of sustainable and resilient shoreline protection methods. Setting standards will require identifying suitable plant species, ensuring compatibility with local ecosystems, and addressing potential maintenance requirements.

7. Incentives to Implement Public and Private Adaptation Strategies on Private Lands

To encourage private landowner participation in adaptation efforts, several potential incentives were proposed. Financial assistance programs were recommended to help landowners cover the costs of implementing adaptation measures. Regulatory relief, such as streamlined permitting processes and reduced regulatory burdens, was suggested to facilitate project implementation. Technical support and guidance from CEPD and other agencies were also identified as critical incentives to assist landowners in adopting and implementing effective adaptation strategies. These incentives aimed to create a supportive environment for private landowners, fostering collaboration and active participation in adaptation efforts. Below are the potential implementation pathways:

TAKEAWAYS

CEPD may offer incentives to encourage owners to adapt shorelines by offering use of easement for state submerged lands (if obtained), providing technical standards, and sharing costs.

- 1. CEPD obtains and shares state submerged lands easement to expedite and encourage larger projects.**
To facilitate and encourage comprehensive shoreline protection projects, CEPD can acquire and share state submerged lands easements. This approach would expedite the permitting process and enable larger-scale initiatives that address erosion and tidal flooding concerns more effectively.
- 2. CEPD implements projects to share costs and provide uniform protection with a single project.**
CEPD can undertake large-scale shoreline protection projects, particularly in areas of Captiva with significant infrastructure vulnerability such as Central Captiva. By consolidating efforts, CEPD can share project costs, ensure consistent protection standards, and potentially achieve long-term benefits for the entire island.
- 3. CEPD offers technical standards for living shoreline, adaptive riprap and seawalls to minimize impacts.**
To empower property owners in shoreline management, CEPD can develop technical standards for living shorelines, adaptive riprap, and seawall elevation. These guidelines can provide clear recommendations for environmentally friendly and effective shoreline protection options, minimizing negative impacts while maximizing benefits, while also removing confusion and inconsistencies between different marine contractor applications.

8. Summary of Public-Private Implementation Analysis

The Public-Private Implementation Analysis highlighted the importance of collaborative efforts between public entities and private landowners in addressing flooding risks and enhancing the resilience of Captiva Island. By addressing legal, regulatory, and financial challenges, and providing clear pathways for implementation, the adaptation plan can effectively mitigate flooding risks and protect the island's infrastructure and natural resources. The recommendations and strategies outlined in this memo provide a comprehensive framework for public-private collaboration, ensuring the successful implementation of adaptation projects and the long-term resilience of Captiva Island.

8.1 Key Takeaways of the Public-Private Implementation Analysis

A compilation of takeaways from the tech memo is presented below as a summary of the Private-Public Implementation Analysis:

Section 1: Introduction

- The Captiva Bayside Adaptation Plan is designed to protect Captiva Island's bayside shorelines from erosion and recurrent flooding through a mix of nature-based solutions, infrastructure projects, and policy measures.
- The public-private implementation analysis, summarized in this memo, evaluates the feasibility of adaptation strategies on privately-owned lands and explores opportunities for collaboration between the Captiva Erosion Prevention District (CEPD) and private property owners.

Section 2: Review of Land Ownership Information

- Captiva Island's bayside is mostly privately owned, requiring collaboration between landowners, public stakeholders, and regulatory agencies for effective adaptation.
- A diverse array of shoreline types (mangroves, seawalls, beaches) exists, each playing a unique role in coastal dynamics.
- Data collection and GIS analysis identified 12 buildings on low ground, and almost all shorelines are lower than 3.5 ft NAVD, necessitating protection against high tide events and rising sea levels.
- Sixty-one (61) bayfront buildings are below the recommended 3.5 ft NAVD elevation, indicating a need for targeted adaptation strategies.
- Securing easements is crucial for shoreline projects on private lands to ensure legal access for construction and maintenance.
- Private riparian rights include access, use, and unobstructed views of the water, which are essential for the enjoyment and value of waterfront properties.
- As sea levels rise, private lands may become submerged and transition to state-owned lands, necessitating new easements or leases from the state.

Section 3: Characterization of Structural and Non-Structural Adaptation Approaches

- **Structural and non-structural adaptation:** Potential structural and non-structural adaptation approaches suitable for various land types were characterized based on locations as “on public nearshore and sovereign submerged lands”, versus “private onshore lands”
- **Erosion and Wave Action:** Captiva's bayside has seen minor changes over the past decade due to wave action, with some areas experiencing erosion, particularly near strong currents in deep channels. Mangroves and seagrass beds offer natural protection but have experienced some degradation.
- **Flood trespassing:** 27 parcels are identified to be flood trespassing. This highlights the need for coordinated adaptation efforts to protect both private properties and critical public infrastructure.
- **Structural Adaptation Strategies:** Strategies include flood-proof glass walls, living shorelines, and retaining walls. These are classified as gray (hard structures), green (nature-based), or hybrid approaches, with specific strategies suited for either public or private lands.
 - only ~ 0.1 acres of seagrass lie within 30 feet of the shoreline that might be impacted by adaptation projects.
- **Non-Structural Adaptation Strategies:** Focuses on:
 - *Shoreline protection policies:* such as “minimum bayside shoreline elevation”
 - *Planning initiatives:* such as Developing a Post-Disaster Plan.
 - *Coordination with surrounding entities.*
- **Public Input:** Community feedback influenced the refinement of adaptation strategies, identified additional needs like zoning impacts, and highlighted concerns about viewshed, riparian rights, and maintenance responsibilities.

Section 4: Review of CEPD Authority to Implement Projects on Private Lands: Legal & Regulatory Considerations

CEPD Authority:

- CEPD has broad authority under Special Act 2000-399 to implement erosion and flood control projects within its jurisdiction, **which extends 300 feet below the mean high water line** around Captiva, including Roosevelt Channel and Pine Island Sound.
- CEPD **does not have authority** to build shoreline projects **without** a property owner's **consent**

Submerged Land Rights:

- Private property owners generally do not own submerged lands in Roosevelt Channel, meaning CEPD does not need easements from them for work in these areas. However, permits from FDEP and other agencies are required.

Easement and Permitting Requirements:

- If property owners possess submerged land rights within parcel boundaries (not common), an easement is required for construction and maintenance activities, such as living shorelines.

- CEPD must secure property owner approval to conduct activities on private land or submerged areas owned by the state.

CEPD Regulatory Authority:

- CEPD can regulate and enforce standards for erosion control projects. This includes potentially enacting regulations to mandate shoreline compliance with engineering standards or recommending Lee County to supplement its coastal regulations with CEPD standards.

Eminent Domain and Private Owner Consent:

- CEPD can exercise eminent domain to acquire property interests for public-purpose projects. However, securing consent from private owners through negotiation (easements or licenses) is preferred.
- Property owners' perception of the project's benefit to their property may influence their willingness to grant consent.

Financial Authority and Funding Options:

- CEPD can receive grants and levy taxes or special assessments to fund projects. Grants for projects on private lands or submerged lands require a clear public benefit, often necessitating public access easements and compliance with environmental regulations.

Maintenance Responsibilities:

- Property owners are responsible for maintaining projects they initiate on their property. For projects implemented by CEPD on private property via an easement, CEPD is responsible for maintenance unless otherwise agreed.

Public Interest and Submerged Lands:

- A state submerged lands easement is required for construction projects extending more than 10 feet beyond the mean high water line, ensuring adherence to state and federal regulations and demonstrating public benefit.

Section 5: Adaptation Project Feasibility Analysis: Funding and Permitting Options & Stakeholder Interest

- Most strategies in menu can be implemented by individual property owners.
- Larger projects within water components may be easier for CEPD to implement than for the individual.
- A few strategies may be more feasible in future as regulation changes with rising sea levels.

Section 6: Suggested Standards and Criteria for Erosion Control Project Evaluation & Approval

- CEPD has the authority to regulate shoreline protection projects.
- CEPD must first update program documents, request policy amendment from County and plan for enforcement.

Section 7: Incentives to Implement Public and Private Adaptation Strategies on Private Lands

- CEPD may offer incentives to encourage owners to adapt shorelines by offering use of easement for state submerged lands (if obtained), providing technical standards, and sharing costs.

9. Recommended Strategies for Inclusion in Bayside Adaptation Plan

TAKEAWAYS

- *CEPD should prioritize implementing a shoreline protection policy.*
- *Individual owners should prioritize adaptation over next 10 years.*
- *CEPD should assist in preventing tidal flooding where necessary.*
- *The community should begin major adaptation by 2060 to sustain itself through 2100.*

The Bayside Adaptation Plan for Captiva Island must balance immediate needs with long-term resilience to address the varying degrees of vulnerability across the island. To achieve this, a phased approach with clear adaptation pathways is recommended:

1. County Coordination to Regulate Seawall Replacement and Living Shoreline Projects in Upland Areas

This pathway is the most straightforward for both CEPD and private property owners. By aligning local adaptation strategies and policies with existing county regulations, the

process of implementing seawall replacements and living shoreline projects becomes more streamlined and efficient. Objections or issues that may arise can be resolved more easily, as CEPD will have clear authority and established protocols to follow. Example ordinances are included in the appendices to assist CEPD to develop theirs. This coordination ensures that the adaptation efforts are consistent across the island, providing a cohesive and effective approach to shoreline protection.

2. Prioritize Vulnerable Parcels: Parcel-Level Adaptation until 2070

For properties identified as highly vulnerable in Section 0, parcel-level adaptation is recommended, especially for those that could potentially exacerbate flooding on neighboring lands. The parcel vulnerability analysis, which considered factors such as building and shoreline elevation, proximity to the mean high water line, flood trespassing risk, and the absence of mangroves, identified **Central Captiva** as a critical area of concern. This region not only contains the most vulnerable properties but also houses critical infrastructure that could be jeopardized by rising flood risks. If individual property owners do not collaborate to address these risks, there will be a need for CEPD intervention. However, this is a complex undertaking; design, modeling, and permitting could take up to 12 months once easements are secured. By focusing on these parcels, risks can be mitigated in the most flood-prone areas and prevent further damage to both private and public assets.

3. CEPD-Led Large-Scale Projects: The Grand Vision

For adaptation strategies that are more challenging for individual property owners to implement, such as large-scale interventions on submerged lands or comprehensive projects like tidal gates, CEPD's leadership and coordination will be crucial. These projects can be phased in over time, with the current regulatory environment guiding the approach. While large-scale "grand vision" projects, such as filling the island or constructing tidal gates, may not be immediately feasible, they will become more critical after 2070 as sea levels continue to rise. Specifically, when sea levels rise above 3.5 feet NAVD, more drastic measures will be necessary to protect the island's integrity. Until then, a mix of individual and collective adaptation efforts, led by CEPD where appropriate, will help prepare Captiva for the challenges ahead.

9.1 The Grand Vision

The APTIM team envisions a comprehensive adaptation strategy for Captiva Island to address flooding and sea level rise, protecting the community and its unique coastal environment long term. A large-scale, cohesive vision is essential to ensure Captiva remains dry and habitable, as NOAA's Sea Level Rise Viewer projects a 3.67 ft rise in sea level by 2100 under the Intermediate scenario. Figure 15 shows the inundation extents of 3 and 4 feet of sea level rise in the region. This level of sea level rise could inundate more than half of the island if no action is taken, highlighting the need for a forward-looking, multifaceted approach.

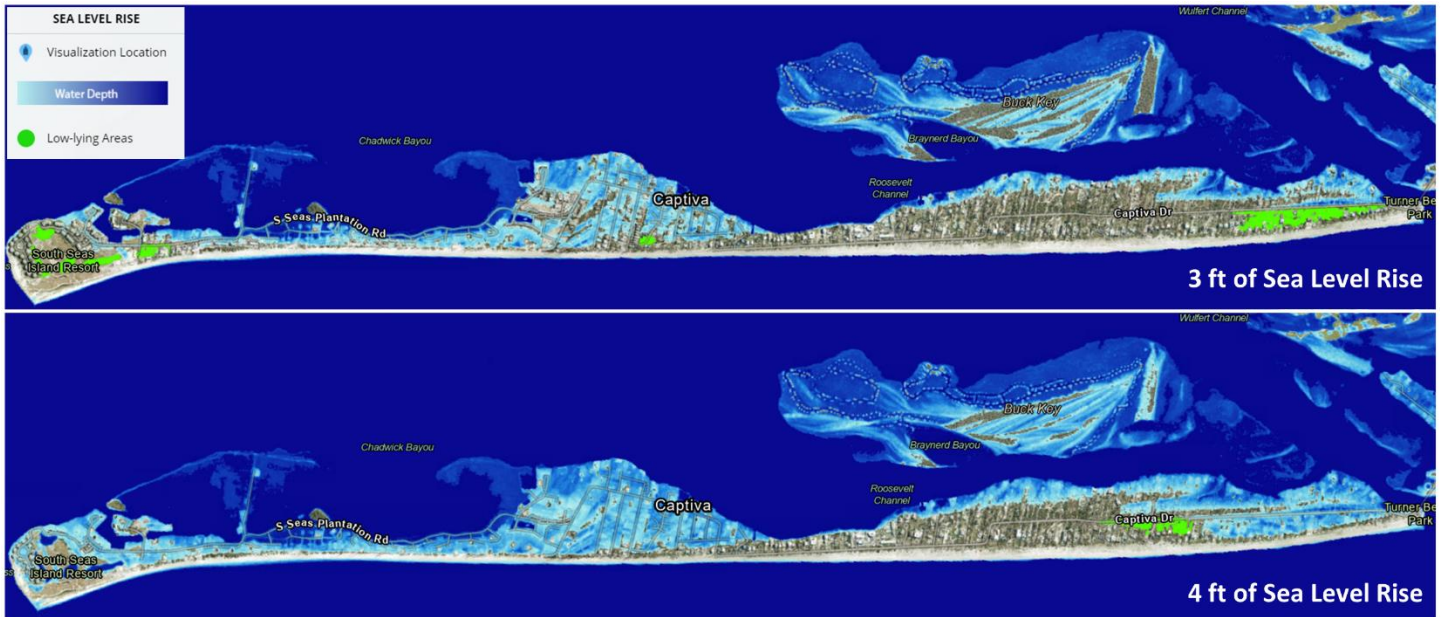


Figure 15. 3 ft and 4 ft of Sea Level Rise in Captiva Island (Source: NOAA Sea Level Rise Viewer)

Figure 16 illustrates future island-wide vision adaptation elements. This vision includes filling submerged lands below the mean high water mark to create additional barriers against rising waters. Complementing this, seagrass restoration efforts can help stabilize the sub-bottom, promoting biodiversity, and enhancing natural coastal defenses. A tidal gate in Roosevelt Channel can be installed to manage tidal events and prevent storm surge from inundating the island's interior, while channel dredging or relocation can ensure navigability and mitigate the impacts of sea level rise.

Additionally, the implementation of nearshore emergent breakwaters and mangrove enhancement in wave action zones can buffer the island against wave energy, reducing erosion and protecting shorelines. Infrastructure adaptation can include elevating homes and critical facilities to safeguard against higher flood levels. Raising key roadways can provide continued access and connectivity during extreme weather events and future sea level rise scenarios. Further, upland drainage projects and constructed wetlands near outfalls can improve stormwater management and enhance the island's resilience to heavy rainfall events. This multi-faceted approach aims to create a resilient Captiva Island that not only withstands the challenges of climate change but thrives through innovative and sustainable adaptation measures, preserving its natural beauty and community for generations to come. Implementing this vision will require collaboration between the Captiva Erosion Prevention District (CEPD) and private property owners, ensuring that future generations can enjoy and protect this treasured coastal region.

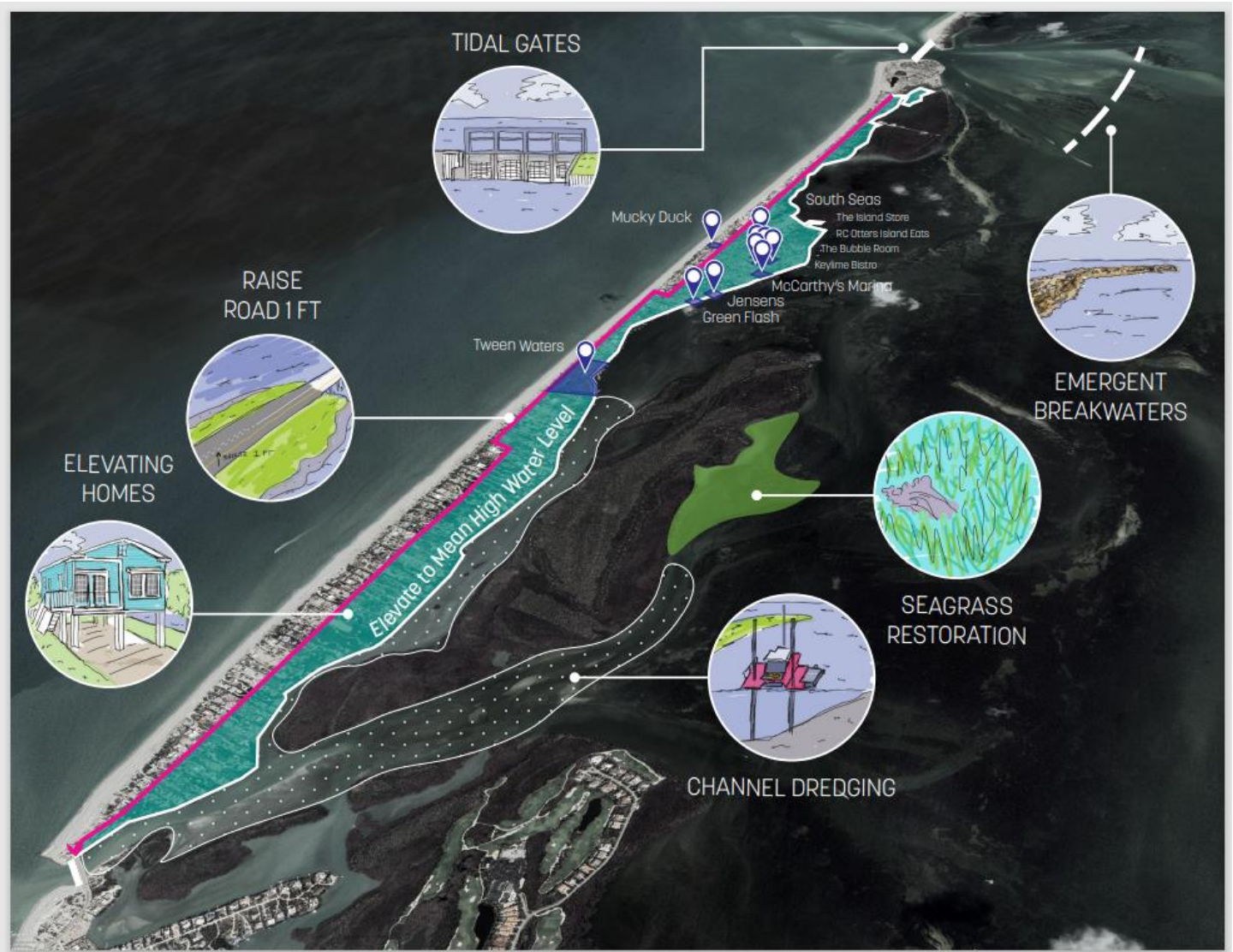


Figure 16. Future Island-wide Vision Adaptation Elements

9.2 Implementation Challenges and Solutions

Several challenges were identified in the implementation of adaptation projects on private lands. Legal complexities, such as securing easements and navigating property rights, can pose significant hurdles. Ensuring landowner participation and cooperation is another challenge, as private property owners might have concerns about the impact of adaptation measures on their properties and viewshed. Navigating regulatory requirements and securing necessary permits also add to the complexity of the implementation process. Proposed solutions include clear communication and education campaigns to inform property owners about the benefits and necessity of adaptation projects. One of the key solutions is to encourage property owner buy-in involves offering a range of incentives. Expanding the easement area for more robust shoreline projects can be a strong incentive. The current state restriction limits work to within 10 feet of the existing shoreline, which can be quite restrictive. If CEPD collaborates with residents and provides justification for regionalizing projects across the island, it might be possible to secure larger easements, ranging from 30 feet for uniform living shorelines to up to 100 feet as

achieved by others. This increased flexibility could incentivize residents to participate, knowing they have more space to implement effective shoreline solutions.

Another incentive is cost-sharing for collective projects. By working together, residents can ensure uniform protection and potentially reduce individual costs. Setting a policy that requires specific measures to be in place by certain deadlines can help achieve comprehensive protection in a timely manner. Providing technical standards for adaptation measures, such as living shorelines or riprap enhancements, can also serve as an incentive. These standards would offer clear guidance, reducing the burden on property owners to research and design their own solutions. Additionally, addressing challenges related to docks by collectively negotiating with the state for more flexible regulations could encourage participation. These incentives are designed to make adaptation efforts more appealing and feasible for property owners, thereby enhancing the overall resilience of the community.

9.3 Constraints and Limitations in Implementation

The APTIM team identified a few constraints and limitations that may impact the feasibility of certain adaptation measures for the Captiva Bayside Adaptation Plan. One restriction is the legal and regulatory framework by the National Marine Fisheries Service and potentially by Lee County regulations, which limits the height of seawalls and prohibits the construction of new seawalls or riprap structures. These restrictions necessitate the exploration of alternative shoreline protection strategies that comply with regulatory standards while still providing adequate defense against erosion and flooding.

Additionally, CEPD cannot build on private property without the explicit consent of the landowners. For any application within private property limits, CEPD needs to obtain an easement. The financial aspect may also present a barrier, as several adaptation strategies are cost-prohibitive in the near future, limiting the scope of immediate actions that can be taken. Furthermore, while certain strategies might offer effective solutions now, their adaptability over time remains a concern. These strategies must be revisited and adjusted as conditions change, ensuring they continue to provide the necessary protection against evolving environmental threats via a phased approach.

10. Appendices

10.1 Appendix A: Model Easement

DRAFT Erosion and Flood Control Easement

Prepared by:

Captiva Erosion Prevention District

Grantor: [name of property owner]

Grantee: Captiva Erosion Prevention District, an Independent Beach and Shore Preservation Special District of the State of Florida, 11513 Andy Rosse Lane, 3rd Floor, Unit 4, Captiva FL 33924.

GRANT OF EASEMENT

THIS EASEMENT this _____ day of 202_, by and between _____
[landowner], whose address is _____, grantor and the Captiva
Erosion Prevention District, an Independent Beach and Shore Preservation Special District of the
State of Florida, whose address is 11513 Andy Rosse Lane, 3rd Floor, Unit 4, Captiva FL 33924,
grantee.

WITNESSETH, that for and in consideration of the sum of One Dollar (\$1.00) and other valuable considerations, receipt and sufficiency of which is hereby acknowledged, the grantor hereby gives, grants, bargains, releases and conveys to the grantee, its representatives, agents, contractors, successors and assigns **the following rights** on, along, over, through, across or under the property situate in Lee County, Florida and described in Exhibit "A", incorporated by reference and made a part hereof.:

1. an unobstructed right-of-way and easement with the right, privilege and authority to said grantee, its successors and assigns, to: [**note:** one or more of these may apply]
 - a. access the property to construct the following **project**:
 - i. seawall
 - i. seawall and rock revetment
 - ii. rock revetment
 - ii. living shoreline berm
 - iii. habitat restoration project
 - iv. breakwater
 - v. other

The project is further described in attachment X [insert sketch of project]

- b. ingress and egress to and over the property to access the lands and waters below the mean high water line to construct the following project:
 - i. seawall
 - ii. seawall and rock revetment
 - ii. rock revetment
 - iii. living shoreline berm
 - iv. habitat restoration project
 - v. breakwater
 - vi. other

The project is further described in attachment B [insert sketch of project]

- c. use the area as a staging area for equipment and supplies and materials, and, during reasonable working hours, personnel necessary for the construction and maintenance of the project.
- d. perform any other work necessary and incidental to the successful implementation and maintenance of the project.
- e. To do anything necessary or useful or convenient, or removing at any time any and all of said improvements upon, over, under or in said lands, together also with the right and easement, privileges and appurtenances in and to said land which may be required for the enjoyment of rights herein granted.
- f. enter upon Grantor's property in areas outside of the easement described in Exhibit "A" only for and during emergency situations to protect either the property of Grantee or the property of Grantor.

The term of this easement is:

- (option 1) **25-years (or other term)**, beginning date and terminating date.
- (option 2) **perpetual**.
- (option 3) a **temporary right**, beginning date and terminating date, for the purposes of allowing Grantee to traverse the subject property to gain access to the water and land below the mean high water line and / or to place and maintain on the property equipment, supplies and materials and personnel (limited to reasonable work hours) as needed for the construction of the project.

This Easement is subject to the following terms and conditions:

(a) Grantee will be responsible to maintain and repair the _____ at Grantee's sole cost and expense at all times.

(b) All activity performed by the Grantee shall be done in a manner that does not cause subsidence or threaten the safety or structural stability of Grantor's residential or other structures in any way.

(c) Grantee will indemnify and hold harmless the Grantor from and against all claims of liability suffered by Grantee, Grantee's employees, Grantee's contractors, and Grantee's

agents entering upon and, or working within the easement area described in Exhibit "A" or anywhere else on Grantee's property outside of the easement area described in Exhibit "A" that arise out of the intentional acts or negligence of Grantee's own employees, contractors, or agents.

(d) Grantee will indemnify and hold harmless the Grantor from any actions, claims, or damages any third party may seek against Grantor as a direct result of the work performed under this easement.

(e) Grantee will install permanent "No Trespassing" signs at locations approved by Grantor and in areas most likely to be used by the general public for accessing the sovereign lands adjacent to the property. beach or ocean from public rights of way. Grantee agrees that it shall not unreasonably withhold approval of the location of "No Trespassing" signs.

(f) Grantee shall be responsible for the full cost of repair or reconstruction of damage to Grantor's property (including but not limited to Grantor's residential or other major structure) caused by the acts of Grantee, as well as the cost of restoration of landscaping damaged by Grantee when exercising any of the rights conveyed by this instrument.

(g) The prevailing party in any litigation, arbitration, or mediation relating to this instrument shall recover its reasonable attorney's fees from the other party for all matters, including, but not limited to, appeals. Proper venue for any litigation arising out of this instrument shall be Lee County, Florida. Grantor and Grantee hereby mutually waive any right to a jury trial regarding any dispute arising out of this instrument.

IN WITNESS WHEREOF, Grantor has herein set its hand and seal the day and year written above.

Signature: (Grantor)

Printed Name:

Witness Signature:

Printed Name:

Witness Signature:

Printed Name:

STATE OF
COUNTY OF LEE

The foregoing instrument was acknowledged before me by means of physical presence or online notarization, this ___ day of _____ 202__, by _____
for _____.

Personally Known or Produced Identification Type of Identification Produced

Notary Public Signature

Print Notary Name: _____

My commission expires _____

[AFFIX NOTARY SEAL]

DRAFT FOR DISCUSSION PURPOSES ONLY

10.2 Appendix B: Richard Grosso's June 7, 2024 Legal Analysis

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DRAFT

PRELIMINARY LEGAL ANALYSIS: CAPTIVA EROSION PREVENTION PROJECTS

(June 7, 2024)

I. Introduction

This memorandum:

- Identifies the scope of legislative authority granted the CEPD to implement a bayside erosion and flood control protection project, including the seaward and landward extent of the District's authority.
- Addresses the extent to which the District can implement a project on private lands.

II. The Captiva Erosion Prevention District's Legislative Authority

Summary

The District has very broad authority to plan, raise and expend funds, and implement erosion and flood control projects (which are defined broadly) on the bayside of Captiva, with its jurisdiction extending out to 300' below the mean high water line surrounding Captiva, including Roosevelt Channel and Pine Island Sound.

The District cannot however implement plans on private land unless it acquires that land or the requisite interest in that land such as a license or easement. Actual placement / construction of erosion or flood control projects would require the requisite approval of the owner of the land or water into which the project would be physically located which, in the case of lands below the mean high water line, includes the state of Florida.

A more detailed discussion and recommendations concerning the substance of private landowner easements will be forthcoming.

Absent such approval, the District's implementation of such a project[s] would consist of encouraging and supporting such projects through a variety of mechanisms, including, but not limited to, education, funding and permitting support.

The District also has regulatory authority, should it choose to exercise it, to regulate erosion control projects by any person and / or prohibit activities adverse to the District's purposes. It could

enact regulations mandating and enforcing shoreline compliance with specific engineering standards. Alternatively, the District could propose to Lee County that the County supplement its existing coastal development regulations with specific standards recommended by the District. No formal process is necessary to pursue that option, which would most likely be initiated via direct communications with the proper officials with the Lee County Community Development Department and Office of the County Manager. The substantive details of such standards would be determined by the technical team this memorandum identifies a number of provisions of the County's Comprehensive Plan and Land Development Code that could be the focus of CEPD recommendations.

Brief Analysis of Range of Authority

Through the combined authority of Special Act 2000-399 and general law in Chapter 161, Fla. Stat., the key features of the CEPD's authority to implement a beach or shore preservation program are:

- Develop and execute a logical and suitable **program for comprehensive beach and shore preservation**, relating to the use and maintenance of the beaches and sand dunes which may be important to their preservation and enjoyment.
- **The program must concern beach and shore restoration and erosion control and may provide to an appropriate extent for other aspects of beach and shore preservation.** It may incorporate recommendations of the US Army Corps of Engineers and the state Department of Environmental Protection.
- **Construct, reconstruct, or improve Erosion Prevention Projects.**
- **Receive grants and contributions for the construction, maintenance, or operation of Erosion Prevention Project.**
- Exercise **jurisdiction, control, and supervision over the construction of any Erosion Prevention Project by any person.**
- Levy **special assessments and issue bonds to fund erosion prevention projects (with voter referendum approval) after an economic analysis determining the nature and extent of benefits expected to accrue from the program and allocating those benefits to their proper recipients by categories or zones of comparable benefits.**
- **Acquire land or interests in land**, including by eminent domain.

The CEPD website reveals the existence of a document entitled *Captiva Island, Florida Beach Comprehensive Management and Emergency Response Plan, Revised April 2012*. It states:

- a. “[t]he Captiva Shore Protection Program includes an on-going beach nourishment program that mitigates erosion of the island by periodically placing sand dredged from offshore sources onto the beach. (p. 3).

- b. “CEPD adopted a Comprehensive Plan to maintain Captiva’s Beaches in July 1990, and it was amended in December 2000 and is updated in this document.” (p. 9)

This program likely qualifies as a component of a “program for comprehensive beach and shore preservation”. The current bayside analysis may supplement that program.

This statutory authority specifically mentions the ability to “enter upon private property to making surveys, soundings, drillings and examinations”. The authority “to construct, acquire, operate and maintain works and facilities” does not explicitly mention that the District may do so on private property. However, the totality of its authority to implement erosion control projects and acquire property or property interests to effectuate its purposes, appears to provide the requisite authority to construct, acquire, operate and maintain works and facilities on land which it has purchased or hold an easement for such purposes.

Relative to the use of special assessments and bonds to fund the District’s erosion control projects, the law recognizes the interconnectedness of the very narrow barrier island of Captiva Island, and authorizes the assessment of all landowners (as long as it is properly – apportioned relative to benefits) for projects intended to protect the island as a whole. A more detailed discussion and recommendations concerning the required public referenda.

The CEPD does not appear to have adopted regulations governing the maintenance and operation of Erosion Prevention Project by public or private persons. As to the geographic scope of any such regulations, given the statutory definition of “shore”, which is equated with the term “beach” the District may regulate private projects on the bayside, where there is no sand, but instead mangroves and seawalls. Also, to the extent that projections and analysis demonstrate that construction, such as armoring, that might be now be placed above the current mean high water line would cause or contribute to erosion or otherwise have detrimental impacts on the District’s mission as sea levels continue to rise, the District would appear to have the authority to regulate such practices.

In sum, the combination of the statutory authority and relevant definitions grants to the CEPD a very broad array of activities and physical structures to employ to “affect the physical condition of the beach or shore” and otherwise prevent or reduce erosion. That would be true on both the Gulf side and Bay side, regardless of the cause or contributing or exacerbating factors, including rising sea levels or otherwise. Erosion prevention and mitigation features, sea level rise infrastructure and resilience projects and the like can be implemented on beaches and shores. While there is no definition for shore or shoreline in Ch. 161, Fla. Stat., the definition of “apparent shoreline” in Chapter 177, related to Land Boundaries for Coastal Mapping¹, indicates a shoreline is viewed broadly as the intersection of the mean high-water datum

¹ “Apparent shoreline” means “the line drawn on a map or chart in lieu of the mean high-water line or mean low-water line in areas where either or both may be obscured by marsh or mangrove, cypress, or other types of marine vegetation. This line represents the intersection of the mean high-water datum with the outer limits of vegetation and appears to the navigator as the shoreline.” §177.27(1), Fla. Stat.

with the outer limits of vegetation. Although a beach and a shore are distinct geographic features, in some locations they are interchangeable.

III. The extent to which the CEPD has the authority to implement a bayside erosion and flood control protection project on private lands, and on sovereign lands.

Public versus private ownership

There are **two categories of property rights potentially impacted by regulation or physical activity along the shoreline – private and public.** *Broward v. Mabry*, 50 So. 826, 830 (1909).

The State of Florida owns the land and water below the mean high water line. Fla. Const. Art. X, Section 11. *Walton Cnty. v. Stop the Beach Renourishment, Inc.*, 998 So.2d 1102, 1111 (Fla.2008). Thus, the CEPD, or any private riparian landowner, must secure Sovereign Submerged Lands approval from the Trustees of the Internal Improvement Trust Fund (the Governor and Cabinet) to construct any erosion control projects on sovereign land.

But the lands above the MHWL are typically owned by private property owners, and their private property rights include the ability to prevent the District from conducting activities on their land without their consent. Riparian rights are “legal rights incident to lands bounded by navigable waters and are derived from the common law as modified by statute.” *Haynes v. Carbonell*, 532 So.2d 746, 748 (Fla. 3d DCA 1988).

The dividing line between public and private ownership is the mean high water line – unless the riparian private owner’s title includes title to the submerged lands as well. *Bd. of Tr. of the Internal Improvement Fund v. Medeira Beach Nominee*, 272 So.2d 209, 213 (Fla. 2d DCA 1973).

In *Walton Cnty. v. Stop the Beach Renourishment, Inc.*, 998 So.2d 1102, 1111 (Fla. 2008),² the Florida Supreme Court explained that:

“The boundary between public or sovereignty lands and private uplands is a dynamic boundary, which is located on a shoreline that, by its very nature, frequently changes. Florida's common law attempts to bring order and certainty to this dynamic boundary in a manner that reasonably balances the affected parties' interests.” *Id* at 1112.³

² *aff'd sub nom., Stop the Beach Renourishment, Inc. v. Fla. Dep't of Env'tl. Prot.*, 560 U.S. 702, 130 S.Ct. 2592, 177 L.Ed.2d 184 (2010)

³ The Florida Supreme Court has explained that the use of the mean high water line as the dividing line between private upland ownership and state sovereign land was necessary because “[a]ny other rule would leave riparian owners continually in danger of losing access to water which is often the most valuable feature of their property, and continually vulnerable to harassing litigation challenging the location of the original water lines.” *Bd. of Tr. of the Internal Improvement Fund v. Medeira Beach Nominee*, 272 So.2d 209, 213 (Fla. 2d DCA 1973).

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“The boundary between public or sovereignty lands and private uplands is a dynamic boundary, which is located on a shoreline that, by its very nature, frequently changes. Florida's common law attempts to bring order and certainty to this dynamic boundary in a manner that reasonably balances the affected parties' interests.” Id at 1112.⁵

Private Property Rights Preclude Government From Physically Occupying Private Land Without Consent

The Constitutions of the United States⁶ and the State of Florida both provide that no private property shall be taken except for a public purpose and with just⁷ compensation.⁸ These provision act as a “guarantee that private property shall not be taken for a public use without just compensation was designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole.”⁹ Florida’s *Harris Act* precludes government from requiring a property owner to “bear[] permanently a disproportionate share of a burden imposed for the good of the public, which in fairness should be borne by the public at large.”¹⁰

⁴ *aff'd sub nom., Stop the Beach Renourishment, Inc. v. Fla. Dep't of Env'tl. Prot.*, 560 U.S. 702, 130 S.Ct. 2592, 177 L.Ed.2d 184 (2010)

⁵ The Florida Supreme Court has explained that the use of the mean high water line as the dividing line between private upland ownership and state sovereign land was necessary because “[a]ny other rule would leave riparian owners continually in danger of losing access to water which is often the most valuable feature of their property, and continually vulnerable to harassing litigation challenging the location of the original water lines.” *Bd. of Tr. of the Internal Improvement Fund v. Medeira Beach Nominee*, 272 So.2d 209, 213 (Fla. 2d DCA 1973).

⁶ The “takings clause” of the Fifth Amendment applies to the states through the Fourteenth Amendment. *Webb’s Fabulous Pharmacies, Inc. v. Beckwith*, 449 U.S. 155, 160 (1980); *Chicago B. & Q. R.R. Co. v. Chicago*, 166 U.S. 226, 241 (1897).

⁷ The Florida Constitution requires “full” compensation, which has been interpreted to include attorney’s fees and interest on the amount by which a jury verdict in a condemnation case exceeds the state’s estimate. *Behmn v. Division of Administration Dept. of Transp.*, 383 So.2d 216, 218 (1980). In *Joseph B. Doerr Trust v. Central Florida Expressway Authority*, 177 So.3d 1209, 1215 (2015), the Florida Supreme Court explained that the term “full” compensation includes the right to a reasonable attorney’s fee for the property owner. See also, *JEA v. Williams*, 978 So.2d 842, 845 (Fla. 1st DCA 2008) which observed that “a landowner’s constitutional right to full compensation for property taken by the government includes the right to a reasonable fee for the landowner’s counsel.”

⁸ U.S. Const. amend. V; Art. X, § 6, Fla. Const.

⁹ *Armstrong et al. v. United States*, 364 U.S. 40, 49 (1960); See also, *First English Evangelical Lutheran Church of Glendale v. Los Angeles County, Cal.*, 482 U.S. 304 (1987).

¹⁰ § 70.001(3)(e)(1) (2024), Fla. Stat.

The doctrine of property rights law with the most direct impact on the District’s ability to implement erosion or flood control projects itself is that it constitutes a violation of property rights for government to physically intrude (even to a small extent) on private land without consent or compensation. Doing so constitutes an unconstitutional “permanent physical invasion” of private property”. *Lingle v. Chevron U.S.A. Inc.*, 544 U.S. 528, 538 (2005); *Loretto Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 102 S.Ct. 3164, 73 L.Ed.2d 868 (1982).

Thus, the District will need the consent of private property owners to construct an erosion control project on their property or access their property for the purposes of constructing or maintaining such a project. As has been the case in the past with beach renourishment projects, this consent is typically secured through a negotiated easement or license granted by the owner. One key variable is whether owners perceive a benefit to their property or property value to accrue from having the District construct an erosion or flood protection project benefitting their land, or whether they would consent to such a project on their property only if provided financial compensation.

The District is also authorized to secure the requisite interest in private land through the use of eminent domain, should it make the policy choice to do so.

To the extent the District chooses not to, or is unable, to acquire interests in land from private property owners, it’s actions to implement recommended measures would focus on encouraging, educating, and potentially supporting (for example with permitting assistance, funding or both) private implementation of recommended projects.

Due to the property rights of private landowners, as part of the analysis of the most appropriate erosion and flood control projects to pursue, the District would consider:

1. What locations that require specific types of erosion control structures or features are at least partially privately owned?
2. What erosion control structures or features could feasibly be placed and maintained by the CEPD solely on publicly – owned land or submerged land while still providing cost – effective protection. This analysis would take into account the potential for these new structures or features to work in concert with existing privately – owned structures or features.
3. To the extent that a cost - effective erosion control project requires a “whole bayside” approach that demands the placement of structures or features on privately – owned land, what is the extent and likely cost of acquiring the requisite interest in private lands through licenses or easements?
4. How might District – implemented projects potentially impact adjacent and nearby private lands – both positively and negatively.

IV. The Exercise of Eminent Domain Authority

The taking of private property through eminent domain, otherwise known as “condemnation” is constitutional as long as it is for a valid public purpose and just compensation

is paid to the landowner.¹¹ **Condemning land to protect a community from the physical, safety, social, ecological and other hazards associated with increased flooding, sea level rise, and storm impacts would easily qualify as a valid public purpose.** See, e.g. *Shoemaker v. United States*, 147 U.S. 282, 298 (1893). *Swan Lake Hunting Club v. United States*, 381 F.2d 238, 242 (5th Cir. 1967); *Rindge Co. v. Cnty. of L.A.*, 262 U.S. 700, 707 (1923).

The Florida Constitution specifically addresses eminent domain authority in Article X, § 6 (Eminent domain), stating:

- (a) *No private property shall be **except taken for a public purpose and with full¹² compensation** therefor paid to each owner or secured by deposit in the registry of the court and available to the owner.*
- (b) [...]
- (c) ***Private property taken by eminent domain** pursuant to a petition to initiate condemnation proceedings filed on or after January 2, 2007, **may not be conveyed to a natural person or private entity except as provided by general law passed by a three-fifths vote of the membership of each house of the Legislature.***
History.—Am. H.J.R. 1569, 2006; adopted 2006.

The appellate decision in the case of *Altman v. Brevard Cnty.*, 300 So. 3d 347 (Fla. 5th DCA 2020) is the most comprehensive and authoritative judicial decision on the relationship of public projects (in that case beach renourishment), the use of eminent domain authority, and private property rights. The key principles from that case are:

- In order to conduct a beach renourishment project on private property, the relevant government agency must hold or acquire “[a] perpetual and assignable easement and right-of-way in, on, over and across the land.
- This right must specifically identify the physical activities and long -term or perpetual maintenance to take place on the private land, including the end project, storing and operating equipment and supplies and all other work necessary and incident to the project.
- If it has such statutory authority, the agency may seek to acquire the interest in land via eminent domain by complying with all attendant procedural requirements for the exercise of that power.
- Beach renourishment projects (and presumably other projects intended to prevent or reduce erosion) are deemed to serve a public purpose – a prerequisite to the exercise of eminent

¹¹ *Kelo v. City of New London*, 545 U.S. 469, 481 (2005).

¹² The Florida Constitution requires “full” compensation, which has been interpreted to include attorney’s fees and interest on the amount by which a jury verdict in a condemnation case exceeds the state’s estimate. *Behmn v. Division of Administration Dept. of Transp.*, 383 So.2d 216, 218 (1980). In *Joseph B. Doerr Trust v. Central Florida Expressway Authority*, 177 So.3d 1209, 1215 (2015), the Florida Supreme Court explained that the term “full” compensation includes the right to a reasonable attorney’s fee for the property owner. See also, *JEA v. Williams*, 978 So.2d 842, 845 (Fla. 1st DCA 2008) which observed that “a landowner’s constitutional right to full compensation for property taken by the government includes the right to a reasonable fee for the landowner’s counsel.”

domain, and the acquisition of easements from private landowners is necessary to effectuate that purpose.

Altman v. Brevard Cnty., 300 So. 3d at 350-351.

As explained in *Altman*, **the key requirements for the exercise of eminent domain authority** are that:

- The agency must file a petition to condemn easements with the local circuit court pursuant to the eminent domain provisions in Chapters 73, 74, and 127 of the Florida Statutes. *Altman v. Brevard Cnty.*, 300 So. 3d 347, 351 (Fla. 5d DCA 2020)
- "The condemning authority initially must come forward with proof that there is a public purpose for the taking and a reasonable necessity that the land in question is being taken for the contemplated public use." *Altman v. Brevard Cnty.*, 300 So. 3d 347, 357 (Fla. 5d DCA 2020) (citing *City of Lakeland v. Bunch*, 293 So. 2d 66, 69 (Fla. 1974))
- To establish a "reasonable necessity"; while there is no "bright line" for meeting this test, the agency should be prepared to show the unavailability of an alternative to serve the public purpose, but it is adequate for the agency to show that it is engaged in future planning for the project. It need not have the funds on hand or plans and specifications completely prepared, or have completed all preparations for immediate construction.
- The agency has wide discretion to select the amount, location and interest of the property to be condemned as long as this determination is based upon any sound engineering, environmental or other valid analysis. *Altman v. Brevard Cnty.*, 300 So. 3d at 357 – 358 (Fla. Fla. 5d DCA 2020) (citing *City of Lakeland v. Bunch*, 293 So. 2d 66, 69 (Fla. 1974))
- The agency Resolution of condemnation must specific exactly the nature and spatial extent of the land interest it is seeking to condemn, and an overbroad Resolution will be invalidated – not judicially amended to allow condemnation only of the extent of the interest for which a reasonable necessity exists. *Altman v. Brevard Cnty.*, 300 So. 3d at 359-360.

V. The Extent of CEPD's Regulatory Authority

The CEPD can adopt and enforce such and regulations as it deems necessary or desirable to effectuate its purposes. As a result of Sp. Act 2000-399, LOF, the CEPD is authorized to:

1. **Exercise jurisdiction, control, and supervision over the construction of any Erosion Prevention Project**,¹³ constructed or to be constructed by any person, firm, or corporation, public or private.

¹³ "Erosion Prevention Projects" or "Project" is defined to "mean and shall include any seawalls, groins, breakwaters, bulkheads, fills, and other works, structures, equipment or other facilities used for beach renourishment or erosion control as defined by s. 161.021(3), [F.S.], and in each case

2. **Adopt and enforce regulations for any such Projects.**
3. Restrain, enjoin, or otherwise prevent the establishment or construction of any Erosion Prevention Project without prior written approval
4. Restrain, enjoin, or otherwise prevent the violation of any provision of the statute or of any CEPD resolution, rule, or regulation.

If the District has adopted a resolution pursuant to s. 161.32, Fla. Stat., adopting the provisions of Ch. 161 related and established under the provisions of this part, under the general statutory authority in Ch. 161, Fla. Stat., the CEPD is authorized to:

1. **Regulate and supervise all physical work or activity along the county shoreline which is likely to have a material physical effect on existing coastal conditions or natural shore processes** – “with the consent of the department and of any municipality or other political authority involved”.
2. This regulatory and supervisory authority **shall specifically include, but not be limited to, installation of groins, jetties, moles, breakwaters, seawalls, revetments, and other coastal construction as defined herein.**

This grant of authority is caveated by the requirement to first receive consent from the Department of Environmental Protection. However, the Special Act grants a broader regulatory authority that does not require the consent of the Dept. of Environmental Protection. Under Florida constitutional law, where a conflict exists between a special and a general law, the special act prevails unless the general law evidences a clear intent to supersede the special act. *Town of Palm Bch v. Palm Beach Local, 1866, I.A.F.F., 275 So.2d 247* (Fla. 1973). The question that arises is whether these law truly conflict (i.e., one cannot be complied with without violating the other) or whether they can both be met. On its face, the latter situation would seem to exist here. So it may be that the CEPD’s authority to regulate the construction of such projects requires approval by FDEP. **A definitive determination would need to be made if the District chooses to exercise any regulatory authority.**

With the combined authority of the Special Act and the general law, the CEPD has the authority to prevent the construction and maintenance and require a permit for any structure, work or activity that is “used for beach renourishment or erosion control” and any “physical work or activity along the county shoreline which is likely to have a material physical effect on existing coastal conditions or natural shore processes.” These are broad words and phrases that include a wide variety of structure and activities.

To the extent that the District would choose not to enact regulations to prevent what it deems as damaging individual parcel owner erosion or flood control projects, it may choose to offer incentives to private owners to conduct individual activities consistent with the District’s goals and responsibilities. Potential options for encouraging and supporting such projects might include:

necessary or useful in the protection of the lands, including beaches, within the District from tidal action and other causes of beach and coastal erosion.

- **Education:** The District could distribute to bayside landowners information on the benefits of recommended projects, basic guidance on the relevant processes and substantive standards and information on how to find qualified contractors.
- **Funding:** The District could offer a cost – share with landowners to assist in covering the costs of recommended projects, relative to permitting, construction and maintenance.
- **Permitting support:** The District could provide technical assistance to riparian owners in the process of securing regulatory approvals for recommended projects.

VI. Relevant Lee County Comprehensive Plan and Code Provisions

Lee County has both a partnership and a regulatory role regarding erosion control projects that any person may seek to construct and maintain within its borders. The substance and application of its coastal construction regulations can prevent or minimize new activities and construction that increase flooding and erosion and, on the other hand, can either facilitate or limit erosion control options.

What follows is a detailed description of the most relevant provisions of the County Comprehensive Plan and Land Development Code that could apply to recommended erosion control projects and also includes potential areas where Plan or Code language could be modified to further the County’s partnership with the District.

The current Lee County Comprehensive Plan provisions potentially applicable to erosion prevention projects include the following list. Where the potential exists for an amendment that could supplement the erosion prevention efforts of the CEPD, a note is included. It is important to note that Plan provisions governing “development” likely apply to erosion control projects the District might implement or encourage, given that the definition of that term includes “coastal construction.”¹⁴

POLICY 23.1.1: Mangrove Fringe. Consider development regulations that will provide additional protection to the shoreline, including mangrove fringe, to the greatest extent possible. (Ord. 18-04, 18-18)

POLICY 23.1.4: Beach and Shore Preservation. **Continue to support the effort of the Captiva Erosion Prevention District**, a beach and shore preservation authority under provisions of Chapter 161, Florida Statutes, to preserve, protect and maintain Captiva's beaches using environmentally responsible methods. (Ord. No. 03-01, 18-04, 18-18)

POLICY 61.3.12: The design of shorelines of retention and detention areas and other excavations must be sinuous rather than straight. (Ord. No. 00-22)

¹⁴ The Lee Plan defines “development” to have “the meaning given in Chapter 380, Fla. Stat.” Lee Plan. P. XIV-4 (Jan. 2023). The statutory definition of “development” in section 380.04 (2) (c), Fla. Stat. includes “[a]lteration of a shore or bank of a seacoast, river, stream, lake, pond, or canal, including any “coastal construction” as defined in s. 161.121.” Section 161.021 (6), Fla. Stat. defines “coastal construction” to “include[] any work or activity which is likely to have a material physical effect on existing coastal conditions or natural shore and inlet processes.”

Note: This policy could apply to erosion control projects the District may seek to implement.

POLICY 72.2.1: Maintain land development regulations that *provide for additional setbacks in critical erosion areas, conservation and enhancement of dunes and vegetation*, flood proofing of utilities, structural wind resistance and floodplain management. (Ord. No. 18-28)

Note: To the extent the CEPD would choose to make recommendations to Lee County concerning this policy, options to strengthen or clarify this policy would include:

- recommend specific additional setback distances.

POLICY 82.2.2: Encourage the use of vegetated buffers which provide protection against the erosion of natural shorelines, opportunity for the creation of additional wetlands habitats, and enhancement of the natural scenery along Lee County waterways. Clearing of vegetation will be subject to local regulations and permit requirements. (Ord. No. 00-22, 18-28).

Notes:

- a. This policy would apply to erosion control projects the District may seek to implement.
- b. To the extent the CEPD would choose to make recommendations to Lee County concerning this policy, options to strengthen or clarify this policy would include:
 - Require the use of vegetated buffers unless certain conditions are met.

POLICY 101.1.1: Require that development within the Coastal High Hazard Area be compatible with natural systems, such as, water retention and purification, wildlife habitat, primary productivity, and defense against coastal flooding.

Notes:

- a. This policy may apply to erosion control projects the District may seek to implement.
- b. To the extent the CEPD would choose to make recommendations to Lee County concerning this policy, options to strengthen or clarify this policy would include:
 - The Plan could further define what specific features are required to make development *compatible with natural systems and defend against coastal flooding*.
 - The District could publish and share with the County and developers its recommendations as to what specific features are required to make development *compatible with natural systems and defend against coastal flooding*.

POLICY 101.1.2: Protect and conserve the following environmentally sensitive coastal areas: wetlands, estuaries, mangrove stands, undeveloped barrier islands, beach and dune systems,

aquatic preserves, wildlife refuges, undeveloped tidal creeks and inlets, critical wildlife habitats, benthic communities, and marine grass beds.

Notes:

- a. This policy may apply to erosion control projects the District may seek to implement.
- b. To the extent the CEPD would choose to make recommendations to Lee County concerning this policy, options to strengthen or clarify this policy would include:
 - The Plan could further define what development standards are needed to protect and conserve the listed environmentally sensitive coastal areas.
 - The District could publish and share with the County and developers its recommendations as to what specific development standards are needed to protect and conserve the listed environmentally sensitive coastal areas.

POLICY 101.3.1: Protect shoreline development in V zones from coastal erosion, wave action, and storms with natural systems, setbacks, and/or beach re-nourishment, rather than by seawalls or other hardened structures which tend to hasten beach erosion. Repairs of lawfully constructed, functional, hardened structures as defined in Chapter 161, F.S. may be allowed subject to applicable state and local review and approval.

Notes:

- a. This policy would apply to erosion control projects the District may seek to implement.
- b. To the extent the CEPD would choose to make recommendations to Lee County concerning this policy, options to strengthen or clarify this policy would include:
 - Clarify the “rather than seawalls” to specific that seawalls are allowed only when an applicant demonstrates that, due to site conditions, only a seawall or other hardened structure can provide adequate protection from erosion, and will not increase erosion on adjoining properties.

POLICY 101.3.2: Restrict development in the Coastal High Hazard Area to uplands except as needed for the provision of public facilities.

Note: This policy *may* apply to erosion control projects the District may seek to implement. The Plan does not define “public facilities”. It defines “public services” as the “requisite services, facilities, capital improvements, and infrastructure necessary to support growth and development” and identifies a list of non – exclusive examples that include “surface water management”. Lee Plan, p. XIV-9 (Jan. 2023). The Plan includes a “Community Facilities and Services Element”, which does not address erosion control.

POLICY 101.3.9: Prohibit new development that requires seawalls for protection from coastal erosion. (Ord. No. 18-28)

Note: This policy would apply to erosion control projects the District may seek to implement.

OBJECTIVE 101.4: SHORELINE STABILIZING SYSTEMS. Encourage the construction of environmentally compatible shoreline stabilizing systems where stabilizing systems are needed. (Ord. No. 00-22, 18-28)

Notes:

- a. This policy would apply to erosion control projects the District may seek to implement.
- b. To the extent the CEPD would choose to make recommendations to Lee County concerning this policy, options to strengthen or clarify this policy would include:
 - **Require** the construction of environmentally compatible shoreline stabilizing systems where stabilizing systems are needed

POLICY 101.4.1: Construction of environmentally compatible shoreline stabilizing systems will be allowed along the active gulf beach where necessary for the protection of shorelines from erosion. (Ord. No. 00-22, 18-28)

Note: To the extent the CEPD would choose to make recommendations to Lee County concerning this policy, options to strengthen or clarify this policy would include:

- Adding a clause at the end: “as the exclusive method of erosion protection.”

POLICY 101.4.2: Vertical seawalls must not be constructed along natural waterways except where such a wall is the most reasonable alternative (using criteria established by ordinance) and vertical seawalls along artificial canals will not be permitted unless an adequate littoral zone consistent with the surrounding environment is provided. Seawalls in artificial canals where 50% of the canal or greater is seawalled or for seawalls of less than 300 feet where both adjoining properties are seawalled, will be exempt from this requirement. (Ord. No. 00-22, 18-28)

Note: This policy would apply to erosion control projects the District may seek to implement.

POLICY 101.4.3: Encourage the planting of mangroves or placement of rip-rap in artificial and natural canal systems to replace existing seawalls in need of repair. (Ord. No. 00-22, 18-28)

Note: This policy would apply to erosion control projects the District may seek to implement.

POLICY 101.4.4: Build-back of vertical seawalls will not be permitted along natural waterbodies if one or more of the following conditions exist:

- Build-back would cause excessive shoreline erosion or endanger shorelines of surrounding properties.

- Build-back would threaten wetland resources.
- Build-back would be a threat to public safety or block access to state-owned submerged lands.
- Build-back would be waterward of the existing seawall alignment on adjacent shorelines. (Ord. No. 00-22, 18-28)

Note: This policy would apply to erosion control projects the District may seek to implement.

OBJECTIVE 101.5: BEACH AND DUNE SYSTEMS. Maintain a beach preservation and management plan through the Lee County Coastal Advisory Council or successor agency. (Ord. No. 98-09, 18-28)

POLICY 101.5.1: Maintain a beach and dune management program which includes:

1. Preparing beach and dune management plans, with priority to areas designated by the Florida DEP as critically eroded in the report entitled Critically Eroded Beaches in Florida.
2. Coordinating with local municipalities and the Captiva Erosion Prevention District in preparing beach and dune management plans.
3. Coordinating with governments and private entities to identify sources of beach-quality sand for renourishment projects, concentrating on areas that will have minimal impacts on the County's aquatic resources.
4. Utilizing all possible means to protect beach-quality sand resources from use by public and private out of County users. Lee County will provide comments to USACE and DEP regarding impacts to off-shore beach-quality sand resources.
5. Preparing renourishment plans for eroding areas where public facilities and access exist, including areas designated by DEP as critically eroded in the report entitled Critically Eroded Beaches in Florida.
6. Recommending regulations and policies to restrict hardened coastal engineering structures such as groin fields and seawalls, protect eroding coastal areas and sand dunes, and discourage development of undeveloped coastal barriers.
7. Protecting sand resources from the placement of infrastructure that may impede access to the resource such as, but not limited to, pipelines and transmission cables.
8. Educating citizens and developers about the costs and benefits of beach and dune conservation approaches.
9. Preparing a sand conservation plan that emphasizes the importance of maintaining beach quality sand within the littoral system.
10. Continuing to participate in the Federal Shore Protection Project as the local sponsor and coordinate with the Town of Fort Myers Beach for implementation of the Estero Island segment.
11. Pursuing all available sources of funding, specifically state and federal funding, for implementation of beach and dune projects.
12. Requiring the installation of dune vegetation as a component of all County funded renourishment projects. (Ord. No. 94-30, 98-09, 00-22, 07-09, 11-23, 18-28)

POLICY 123.2.10: Require that development adjacent to aquatic and other nature preserves, wildlife refuges, and recreation areas be designed to protect the natural character and public investment in these areas.

Note: To the extent the CEPD would choose to make recommendations to Lee County concerning this policy, options to strengthen or clarify this policy would include:

- Specify the design features that “protect the natural character and public investment in these areas.”

POLICY 128.4.5: New boat access facilities must be designed to avoid erosion on adjacent shorelines. (Ord. No. 00-22, 07-09)

POLICY 128.5.8: Marina design must incorporate natural wetland vegetative buffers near the docking area and in ingress/egress areas for erosion and sediment control, runoff purification, and habitat purposes. (Ord. No. 00-22)

Lee County Code

The following County Code provisions would likely impact the ability to construction erosion control structures.

- **Sec. 6-362. - Structural requirements for major structures.**¹⁵

(a)*Design and construction generally.* Major structures must conform to the minimum building code standards adopted by the County in Section 6-111. [...]

(c)*Elevation, floodproofing and siting.* Major structures must be designed, constructed and located in compliance with the National Flood Insurance Regulations as found in 44 CFR 59 and 60, or Article IV of this chapter, whichever is more restrictive.

(d)*Velocity pressure.* Major structures ... must, at a minimum be designated and constructed in accordance with the Florida Building Code using a fastest-mile wind velocity of 110 miles per hour.

(e)*Foundation design.* Foundation design and construction of a major structure must consider all anticipated loads resulting from a 100-year storm event, including wave, hydrostatic, and hydrodynamic loads acting simultaneously with live and dead loads. Erosion computations for foundation design must account for all vertical and lateral erosion and scour-producing forces, including localized scour due to the presence of structural components. Foundation design and construction must provide for adequate bearing capacity taking into consideration the anticipated loss of soil above the design grade as a result of localized scour. The erosion computations required by this section do not apply landward of coastal construction control lines which have been established since June 30, 1980. (LDC 1994, § 6-362; Ord. No. 91-21, § 5, 7-31-1991; Ord. No. 94-22, § 1, 8-17-1994; Ord. No. 94-22, § 1, 8-17-1994; Ord. No. 98-06, § 1, 3-24-1998)

¹⁵ Section 6-333 of the County Code defines “Major structure” to include, but not be limited to ...construction having the potential for substantial impact on the coastal building zone.”

- **Sec. 6-467. - Considerations for issuance of variances.**

In reviewing requests for variances, the Board of Adjustment and Appeals will consider all technical evaluations, all relevant factors, all other applicable provisions of the Florida Building Code, this article, and the following: [...]

(2) The danger to life and property due to flooding or erosion damage;

(3) The susceptibility of the proposed development, including contents, to flood damage and the effect of such damage on current and future owners; [...]

(5) The availability of alternate locations for the proposed development that are subject to lower risk of flooding or erosion; [...]

(7) The relationship of the proposed development to the Comprehensive Plan and floodplain management program for the area; [...]

(9) The expected heights, velocity, duration, rate of rise and debris and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site; and

(10) The costs of providing governmental services during and after flood conditions including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems, streets and bridges. (LDC 1994, § 6-467; [Ord. No. 15-09](#), § 1, 5-19-2015)

- **Sec. 6-488. - Limitations on placement of fill.**

Subject to the limitations of this article, fill must be designed to be stable under conditions of flooding including rapid rise and rapid drawdown of floodwaters, prolonged inundation, and protection against flood-related erosion and scour. In addition to these requirements, if intended to support buildings and structures (Zone A only), fill must comply with the requirements of the Florida Building Code. (LDC 1994, § 6-488; Ord. No. 15-09, § 1, 5-19-2015)

- **Sec. 6-511. - Other development in coastal high hazard areas (Zone V).**

In coastal high hazard areas, development activities other than buildings and structures may be permitted only if also authorized by the appropriate federal, State or local authority; if located outside the footprint of, and not structurally attached to, buildings and structures; and if analyses prepared by qualified registered design professionals demonstrate no harmful diversion of floodwaters or wave runup and wave reflection that would increase damage to adjacent buildings and structures. Such other development activities include, but are not limited to:

Bulkheads, seawalls, retaining walls, revetments, and similar erosion control structures

- **Sec. 6-512.** - Nonstructural fill in coastal high hazard areas (Zone V).

In coastal high hazard areas:

(1) Minor grading and the placement of minor quantities of nonstructural fill may be permitted for landscaping and for drainage purposes under and around buildings.

(2) Nonstructural fill with finished slopes that are steeper than one unit vertical to five units horizontal may be permitted only if an analysis prepared by a qualified registered design professional demonstrates no harmful diversion of floodwaters or wave runoff and wave reflection that would increase damage to adjacent buildings and structures.

(3) Where authorized by the State Department of Environmental Protection or applicable local approval, sand dune construction and restoration of sand dunes under or around elevated buildings are permitted without additional engineering analysis or certification of the diversion of floodwater or wave runoff and wave reflection if the scale and location of the dune work is consistent with local beach-dune morphology and the vertical clearance is maintained between the top of the sand dune and the lowest horizontal structural member of the building. (LDC 1994, § 6-512; Ord. No. 15-09, § 1, 5-19-2015)

(2) Solid fences and privacy walls, and fences prone to trapping debris, unless designed and constructed to fail under flood conditions less than the design flood or otherwise function to avoid obstruction of floodwaters; and

(3) On-site sewage treatment and disposal systems defined in F.A.C. 64E-6.002 as filled systems or mound systems. (LDC 1994, § 6-511; Ord. No. 15-09, § 1, 5-19-2015)

- **Sec. 34-411.** - **General standards.**

(a) All planned developments must be consistent with the provisions of the Lee Plan.

(b) All planned developments must be designed and constructed in accordance with the provisions of all applicable County development regulations in force at that time. Deviations from the general provisions of this chapter may be permitted if requested as part of the application for a planned development in accordance with Section 34-373(a)(9) and approved by the Board of County Commissioners based on the findings established in Section 34-377(a)(4). Pursuant to Section 34-373(a)(10) the establishment of property development regulations for planned developments does not require deviations from Articles VI and VII of this chapter. Amendments to approved Master Concept Plans may be reviewed pursuant to Section 34-380. [...]

(f) Development and subsequent use of the planned development shall not create or increase hazards to persons or property, whether on or off the site, by increasing

the probability or degree of flood, erosion or other danger, nor shall it impose a nuisance on surrounding land uses or the public's interest generally through emissions of noise, glare, dust, odor, air or water pollutants.

(g) Every effort shall be made in the planning, design and execution of a planned development to protect, preserve or to not unnecessarily destroy or alter natural, historic or archaeological features of the site, particularly mature native trees and other threatened or endangered native vegetation. **Alteration of the vegetation or topography that unnecessarily disrupts the surface water or groundwater hydrology, increases erosion of the land**, or destroys significant wildlife habitat is prohibited. That habitat is significant that is critical for the survival of rare, threatened or endangered species of flora or fauna. (LDC 1994, § 34-411; Zoning Ord. 1993, § 804.02(A); Ord. No. 95-12, § 8, 7-12-1995; Ord. No. 12-20, § 4, 9-11-2012; Ord. No. 13-10, § 10, 5-28-2013; Ord. No. 17-11, § 1, 9-5-2017; Ord. No. 19-03, § 7, 4-2-2019)

- **Sec. 26-75. - Seawalls, retaining walls and riprap revetment.**

- (a) ***Seawalls on artificial waterbodies and retaining walls.***

- (1) Seawalls may be permitted in an artificial canal with a minimum of 50 percent of the bank having seawalls, or for a linear distance less than 300 feet where both adjoining properties have seawalls. A new or replacement seawall must be installed in line with the existing seawall alignment or adjoining seawalls and placed no greater than one foot waterward of an existing seawall. Until the backfill area is stabilized, a silt fence or sod must be placed immediately landward of the seawall cap to minimize erosion into the water.

- (2) **Except where it conflicts with State or federal regulations, riprap rock or other similar approved material must be placed waterward along no less than 50 percent of the linear length of a new or replacement seawall. This riprap is not required where it would interfere with designated watercraft tie-up areas.** The rock must be placed a minimum of three feet in height above the bottom, waterward of the seawall, or up to the mean high water line. The rock must be an average size of 12 inches in diameter.

- (b) ***Seawalls on natural waterbodies.***

- (1) The Lee Plan through Objective 101.4 and Policy 101.4.2 regulates hardened structures along the natural shoreline.

- (2) New or expanded seawalls are not allowed along natural waterbodies, including the Gulf of Mexico.

- (3) Other hardened structures, including, but not limited to, geotextile tubes, groin, fencing and other similar structures, may be permitted along natural waterbodies, except along the Gulf of Mexico.

(4) Lawfully existing seawalls along natural waterbodies may be maintained or repaired and may be replaced with the same type structure, built to the same dimensions and in the same location as the previously existing structure.

(c)Retaining walls. Retaining walls must be setback a minimum of five feet from the mean high water line or landward of any wetland vegetation.

(d)Riprap revetment.

(1)Riprap must be located and placed so as not to damage or interfere with the growth of wetland vegetation.

(2) Material used for riprap should be sized properly for intended use, be an average of 12 inches in diameter, and installed on top of filter fabric or equivalent material to prevent erosion of subgrade. Riprap must be clean and free of debris deemed harmful to the environment and public safety.

(3) Mangroves or other approved wetland vegetation must be planted three feet on center in compliance with Section 26-77(b)(2) for added shoreline stabilization and ecological benefit within the riprap. Other wetland mitigation techniques may be considered in lieu of vegetation planting. No vegetation planting is required for riprap revetments constructed in artificial upland canals with a minimum of 50 percent of the bank having seawalls, or for a linear distance less than 300 feet where both adjoining properties have seawalls. (LDC 1994, § 26-75; Ord. No. 96-17, § 4, 9-18-1996; Ord. No. 09-23 , § 7, 6-23-2009; Ord. No. 22-24 , § 1(26-75), 9-6-2022)

- **Sec. 26-77.** - Turbidity; protection of vegetation.

(a) *Turbidity.* All structures must be placed so as to provide the least possible impact to seagrass, aquatic or wetland vegetation. During work that will generate turbidity, turbidity screens must be installed and properly maintained until turbidity levels are reduced to normal (ambient) levels.

(b)*Protection of vegetation.*

(1)*Permit conditions.* Conditions for the protection of shoreline vegetation can be placed on permits issued in accordance with this article. The conditions can include: the method of designating and protecting vegetation to remain after construction; and replacement planting for vegetation removed due to construction.

(2)*Mangrove replacement and plantings.*

a. For each mangrove removed due to construction, three mangroves must be replanted at an alternate location on the subject property. If planting on the subject property is not appropriate, alternative forms of mitigation, such as payment into a mitigation bank, may be allowed.

b. Mangrove plantings must be container grown, no less than one year old, eight inches in height and have a guaranteed 80 percent survivability rate for at least a five-year period. Mangrove plantings must be planted three feet on center. Mangrove replanting is required if the 80 percent survivability rate is not attained.

(3) *Mangrove removal.*

a. **Mangrove removal in conjunction with construction of riprap revetments, seawalls, or retaining walls along natural waterbodies is prohibited.**

b. Mangrove removal necessary for access walkway construction is limited to the minimum extent necessary to gain access to the dock facility. To the greatest extent possible, the access must be located to:

1. Use existing natural openings;

2. Use areas infested with invasive exotic vegetation;

3. Avoid larger mangroves; and

4. Provide a maximum width of four feet and a maximum height of eight feet above the level of the walkway base. (LDC 1994, § 26-77; Ord. No. 96-17, § 4, 9-18-1996; Ord. No. 09-23, § 7, 6-23-2009; Ord. No. 22-24, § 1(26-77), 9-6-2022)

Sec. 10-8. - Specific requirements.

A development order will be issued when the development is designed so as to reasonably achieve the following: [...]

(8) *Drainage and stormwater management.* The development must be designed in accordance with applicable County and water management districts' runoff, retention and attenuation requirements and any other State and local drainage laws. The development must also be designed to avoid flooding or erosion damage to adjacent property and the County drainage system and to avoid the creation of stagnant pools that would encourage mosquito breeding. The development must provide a method of continual maintenance and operation through legal documentation and must ensure proper stormwater management so as to reduce the potential impacts of flooding.

ARTICLE II. - DOCK AND SHORELINE STRUCTURES

DIVISION 1. - GENERALLY

Sec. 26-41. - Definitions.

Retaining wall means a vertical bulkhead constructed landward of the mean high water line and wetland vegetation.

Linear shoreline means the **mean high water line in tidally influenced areas** and the ordinary high water line along waterbodies that are not tidally influenced. The term "linear shoreline" does not apply to shorelines artificially created after October 24, 1989, through dredge and fill activities (such as boat basins or canals). Shorelines artificially created before October 24, 1989, must have been permitted in accordance with the regulations in effect at that time. Shoreline along manmade ditches (such as mosquito control, flood control ditches, etc.) will not qualify as linear shoreline, regardless of the date of construction unless verifiable documentation of regular navigational use prior to July 1, 2004, exists. For the purposes of the Manatee Protection Plan, linear shoreline will be calculated using survey quality aerial photographs or by accurate field survey. The calculation of linear shoreline for the purposes of this chapter is based upon shoreline owned or legally controlled by the property owner.

ARTICLE I. - IN GENERAL

Sec. 34-2. - Definitions.

Shoreline means a straight or smoothly curved line which, on tidal waters, follows the general configuration of the mean high-water line, and which on nontidal waters is determined by the annual average waterline. Boat slips and other manmade or minor indentations will be construed as lying landward of the shoreline and are considered upland when computing the lot area of waterfront property.

Vertical Sewall means a vertical bulkhead located at or below mean high water, built to withstand wave force and erosion. See Retaining wall.

ARTICLE III. - COASTAL CONSTRUCTION CODE

- **Sec. 6-332. - Intent; applicability.**

The purpose of this article is to provide minimum standards for the design and construction of buildings and structures to reduce the harmful effects of hurricanes and other natural disasters occurring along the coastal areas of the County which front on the Gulf of Mexico and San Carlos Bay. These standards are intended to specifically address design features which affect the structural stability of the beach, dunes and topography of adjacent properties. This article is site-specific to the coastal building zone, as defined in this article, and is not applicable to other locations. In the event of a conflict between this section and other sections of this article, the requirements resulting in the more restrictive design will apply. No provisions in this article will be construed to permit any construction in any area where such is prohibited by State or federal regulation.

(1) *Applicability generally.* The requirements of this article will apply to the following types of construction in the County coastal building zone:

a. The new construction of, improvement to or repair of structures when involving greater than 50 percent of the market value of the major structure, nonhabitable major structure and minor structure either:

1. Before the improvement or repair was initiated; or
2. If the structure is damaged and is being restored before the damage occurred.

b. Construction which would change or alter the character of the shoreline, e.g., excavation, grading or paving. This article does not apply to minor work in the nature of normal beach cleaning or debris removal.

(2) *Structures under construction*. The requirements of this article will not apply to structures under construction for which a valid and unexpired County building permit was issued prior to March 19, 1986.

(3) *Multizone structures*. For structures located partially in the coastal building zone, the requirements of this article will apply to the entire structure.

(4) *Construction seaward of mean high water*. **Structures or construction** extending seaward of the mean high water line which are **regulated by F.S. § 161.041**, e.g., groins, jetties, moles, breakwaters, seawalls, revetments, beach nourishment, inlet dredging, etc., **are specifically exempt from the provisions of this article**. In addition, this article does not apply to piers, pipelines or outfalls which are regulated pursuant to the provisions of F.S. § 161.053.

(5) *Certification of compliance*. Plans for buildings in the coastal building zone must be signed and sealed by an architect or engineer registered in the State. Upon completion of the building and prior to the issuance of a Certificate of Occupancy, a statement must be filed with the Building Official, signed and sealed by an architect or engineer registered in the State and in substantially the following form: "To the best of my knowledge and belief the above-described construction of all structural loadbearing components complies with the permitted documents and plans submitted to the Building Department."

(LDC 1994, § 6-332; Ord. No. 91-21, § 3, 7-31-1991; Ord. No. 94-22, § 1, 8-17-1994; Ord. No. 06-17, § 1, 9-26-2006)

Sec. 6-333. - Definitions.

Major structure includes, but is not limited to, residential, commercial, institutional, industrial or other public buildings and other construction having the potential for substantial impact on the coastal building zone.

Mean high water line means the intersection of the tidal plane of mean high water with the shore. Mean high water is the average height of high waters over a 19-year period. (See F.S. § 177.27(15).)

Minor structure includes, but is not limited to, pile-supported elevated dune and beach walkover structures; beach access ramps and walkways; stairways; pile-supported viewing platforms, gazebos and boardwalks; lifeguard support stands; public and private bathhouses, sidewalks, driveways, parking areas, shuffleboard courts, tennis courts, handball courts, racquetball courts

and other uncovered paved areas; earth retaining walls; and ornamental garden structures, aviaries and other ornamental construction. Minor structures are those structures considered expendable under design wind, wave and storm forces.

Sec. 34-2194. - Setbacks from bodies of water.

(a) *Gulf of Mexico.* Except as provided in this section or elsewhere in this chapter, buildings and structures may not be placed closer to the Gulf of Mexico than set forth in Chapter 6, Article III, pertaining to coastal zone protection, or 50 feet from mean high water, whichever is the most restrictive.

(b) *Other bodies of water.* Except as provided in this section or elsewhere in this chapter, buildings and structures may not be placed closer than 25 feet to a canal or to a bay or other water body or the distance required by the provisions of Chapter 6, Article IV, pertaining to flood hazard reduction, whichever is greater.

For the purposes of measuring setbacks from a canal, bay, or other body of water, the following will be used:

(1) If the body of water is subject to tidal changes, the mean high water line (MHWL) will be used.

(2) If the body of water is seawalled, setback will be measured from the seaward side of the seawall, not including the seawall cap.

(3) If the body of water is rip-rapped or has a natural or unimproved shoreline, the setback will be measured from the control elevation of the body of water. If the control elevation is unknown or not available, then the setback will be measured from the ordinary high water line (OHWL).

(c) *Exceptions.*

(1) *Planned developments.* In a Planned Development Zoning District, the Board of County Commissioners shall have the authority to grant less stringent setbacks than required in this section for the following situations:

a. Artificial bodies of water such as retention ponds or reflection ponds, when development surrounding the entire body of water is under unified control.

b. Natural bodies of water which are totally contained on a parcel of land proposed for development under unified control, provided all applicable State or local permits are obtained.

c. Those portions of natural or artificial bodies of water which may be defined as navigable and accessible to the public, but which do not provide for through navigation, including, but not limited to, lakes, ponds or pockets which have only one means of navigable ingress and egress, provided that:

1.All necessary State and local permits are obtained; and

2.The entire circumference of the body of water, except the navigable point of ingress and egress, is under unified control.

(2)*Docks, seawalls and other watercraft landing facilities.* See Section 34-1863.

(LDC 1994, § 34-2194; Zoning Ord. 1993, § 202.18(B)4; Ord. No. 97-10, § 6, 6-10-1997; Ord. No. 01-18, § 5, 11-13-2001)

PRELIMINARY DRAFT

10.3 Appendix C: Example Policy Language From Other Municipalities on Tidal Flood Barrier Ordinance and New Seawalls

TIDAL FLOOD PROTECTION

§ 150.30 RESILIENCY STANDARDS FOR TIDAL FLOOD BARRIERS.

(A) *Purpose and intent.* The purpose of this section is to establish a consistent minimum elevation for tidal flood barriers that will:

(1) Provide a standard for tidal flood mitigation infrastructure that serves as a barrier to tidal flooding, not groundwater seepage, by accounting for water levels predicted under combined conditions of sea level rise, high tides, and high frequency (25-year return interval) storm surge through year 2070;

(2) Ensure new shoreline structures and major shoreline improvements are designed for use as tidal flood barriers through application of consistent standards that account for future predicted tidal flood conditions and coastal water levels associated with sea level rise in accordance with current sea level rise projections, as updated and adopted by the Broward County Board of Commissioners; and

(3) Re-evaluate the five feet NAVD elevation requirement in 2034 or before with consideration of updated sea level rise projections and models developed since adoption of this section to assess whether the minimum elevations set forth herein remain adequate to provide tidal flood mitigation.

(B) *Applicability.* This subchapter applies to all new tidal flood barriers, substantial repair or substantial rehabilitation to shorelines and shoreline structures, and the installation of any fixed infrastructure attached to tidal flood barriers (such as mooring structures). This subchapter is not applicable to oceanfront beaches or shorelines seaward of the Coastal Construction Control Line.

(C) *Definitions.* For the purposes of this subchapter, the following terms, phrases, words, and their derivation shall have the meanings given below, except when the context clearly indicates a different meaning. In the interpretation and application of this subchapter, the definitions provided herein shall control over the definitions that may be included in other documents, manuals, and regulations, including but not limited to, the Florida Building Code. The word “shall” is mandatory and the word “may” is permissive.

BANK. The level space separating a waterway from an inland area, often elevated and constructed of compacted soil.

BERM. An earthen mound designed with impermeability to resist the flow of tidal waters through it to an adjacent property or public right-of-way.

COASTAL CONSTRUCTION CONTROL LINE (CCCL) or CONTROL LINE. The line established pursuant to F.S. § 163.053 and recorded in the official records of the county, which defines that portion of the beach-dune system subject to severe fluctuations based on a 100-year storm surge, storm waves, or other predictable weather conditions.

GREEN-GREY INFRASTRUCTURE or GREEN-GREY MATERIALS. A combination of engineered and natural features that provide environmental qualities and ecosystem value.

LIVING SHORELINE. A green infrastructure technique using native vegetation alone or in combination with low elevation sills to stabilize the shoreline as a natural enhancement to "hard" shoreline stabilization methods like seawalls. **LIVING SHORELINES** add resiliency to shorelines by attenuating waves and diminishing the effects of hurricanes. A **LIVING SHORELINE** may have its waterside face consist of plants and other natural elements that improve water quality, provide essential fish habitat, and foster increased biodiversity, provided the landside interface of a **LIVING SHORELINE** be substantially impermeable and constructed to a finished elevation that meets the minimum elevation for tidal flood barriers set forth in this Code. The landside interface may be located anywhere on an existing property fronting the **LIVING SHORELINE**, as long as it is constructed in a

manner and location that ensures any habitable structures on that property are protected from flooding from tidal waters and it prevents tidal flooding of adjacent properties and the public right-of-way.

MOORING STRUCTURE. A boat dock, slip, davit, hoist, lift, floating vessel platform, mooring pile, or similar structure attached to land or to a seawall, to which a vessel can be moored, lifted, or stored upon.

NORTH AMERICAN VERTICAL DATUM (NAVD88). The vertical control for datum of orthometric height established for vertical control surveying in the United States of America based upon the General Adjustment of the North American Datum of 1988.

PUBLIC NUISANCE. A condition injurious to the public health or safety of the community or neighborhood, or injurious to any considerable number of persons, or a condition that obstructs the free passage or use, in the customary manner, of any public right-of-way.

RIP-RAP. A foundation of unconsolidated boulders, stone, rubble, concrete without protruding rebar, or similar materials placed on or near a shoreline to mitigate wave impacts and prevent erosion.

SEAWALL (aka BULKHEAD). A vertical or near vertical (often interlocking) structure placed between an upland area and a waterway or waterbody for erosion and/or tidal flood control.

SEAWALL CAP. A concrete box structure (usually reinforced) that connects seawall panels, piles, and anchoring system (if present) together at the top.

SHORELINE. A tidally influenced area where land meets water.

SUBSTANTIAL REPAIR or SUBSTANTIAL REHABILITATION. A single and complete project which is the total project proposed or accomplished by one owner/developer, partnership, or other association of owners/developers, and where major shoreline improvement triggers either of the following:

(a) Any modification to the shoreline or a shoreline structure along more than 50% of the length of the property's shoreline; or

(b) Any modification, alteration, or installation of an appurtenant structure (such as a mooring structure) that exceeds 50% of the cost of a new tidal flood barrier along the property's shoreline as determined by the City Engineer.

TIDAL FLOOD BARRIER. Any structure or shoreline feature including, but not limited to, banks, berms, green-grey infrastructure, seawalls, seawall caps, upland stem walls, or other infrastructure that impedes tidal surface waters from flowing onto adjacent property or public right-of-way, and located within or along a tidally influenced area. This definition is not meant to include rip-rap, derelict erosion control structures, or permeable earthen mounds that do not provide an impermeable water barrier to surface tidal flooding.

TIDALLY INFLUENCED AREA. The real property adjacent to, or affected by, a waterway with water level changes in response to the daily tides.

(D) *Minimum elevations for tidal flood barriers.*

(1) All new or substantially repaired or substantially rehabilitated banks, berms, green-grey infrastructure, seawalls, seawall caps, upland stem walls, or other similar infrastructure shall be designed and constructed to perform as tidal flood barriers. Tidal flood barriers shall have a minimum elevation of five feet NAVD88. Applications for new or substantially repaired or substantially rehabilitated tidal flood barriers submitted prior to January 1, 2035, may be permitted at a minimum elevation of four feet NAVD88, if designed and constructed to accommodate a minimum elevation of five feet NAVD88 by January 1, 2050.

(2) All property owners must maintain a tidal flood barrier in good repair. A tidal flood barrier is presumed to be in disrepair if it allows tidal surface waters to flow unimpeded through or over the barrier and onto adjacent property or public right-of-way. Failure to maintain a tidal flood barrier in good repair shall be a citable offense. The owner of the tidal flood barrier shall demonstrate progress towards repairing the cited defect within 60 days after receiving a citation and shall complete repairs within 365 days after receipt of the citation. If the required repair or rehabilitation meets the substantial repair or substantial rehabilitation threshold, no later than 365 days after receipt of the citation, the property owner shall design, obtain permits, cause to be constructed, and obtain final inspection approval of seawall improvements that meet the minimum elevation and design requirements.

(3) Tidal flood barriers below a minimum of five feet NAVD88 elevation shall be improved, designed, and constructed so as to prevent tidal surface waters from impacting adjacent property or public right-of-way. Causing, suffering, or allowing the trespass of tidal surface waters onto adjacent property or public right-of-way is hereby declared a public nuisance and a citable offense requiring abatement. The owner shall demonstrate progress toward addressing the cited concern within 60 days after receipt of the citation and complete the construction of an approved remedy no later than 365 days after receipt of the citation.

(4) Tidal flood barriers shall be designed and constructed to prevent tidal waters from flowing through the barrier, while still allowing for the release of upland hydrostatic pressure, to the extent practicable.

(5) To the extent practicable, tidal flood barriers shall be designed and constructed to adjoin immediately proximate tidal flood barriers to close gaps and prevent trespass of tidal water.

(6) All tidal flood barriers undergoing substantial repair or substantial rehabilitation shall be constructed along the property's entire tidally influenced shoreline. If it is not practicable to adjoin immediately proximate tidal flood barriers, return structures shall be constructed sufficient to prevent flanking under design storm conditions and prevent tidal waters from otherwise entering the property.

(7) All tidal flood barriers shall be faced with a minimum of one cubic yard per linear foot of natural limerock rip-rap, or other approved habitat enhancement, at the waterward face of the structure.

(8) Property owners are encouraged to consider approaches and materials that enhance the biological value of traditional (flat surface) seawalls and flood barriers with the incorporation of living shoreline features, use of hybrid green-grey materials, and the use of biological forms, where practicable. A living shoreline may have its waterside face consisting of plants and other natural elements to improve water quality, provide essential fish habitat, and foster increased biodiversity, provided the landside interface of a living shoreline is substantially impermeable and constructed to a finished elevation that meets the minimum elevation for tidal flood barriers set forth in this section. The landside interface may be located anywhere on an existing property fronting the living shoreline, as long as it is constructed in a manner and location that ensures any habitable structures on that property are protected from flooding from tidal waters and it prevents tidal flooding of adjacent properties and the public rights-of-way.

(9) This section shall not be construed to require the installation of a seawall where other surface flood protection measures serve as an equally effective tidal flood barrier.

(10) Tidal flood barriers capable of automatically being elevated in advance of high tides to prevent tidal flooding are permissible, provided that automation does not require daily human intervention.

(E) *Required disclosure in contracts for sale of real estate.* In any contract for the sale of real estate located in tidally influenced areas within the City of Hollywood, executed after the effective date of this subchapter, the seller shall include in the contract or a rider to the contract the following disclosure in not less than fourteen point, capitalized, bold-face type:

THIS REAL ESTATE IS LOCATED IN A TIDALLY INFLUENCED AREA. THE OWNER MAY BE REQUIRED BY BROWARD COUNTY OR HOLLYWOOD CODE OF ORDINANCES TO MEET MINIMUM TIDAL FLOOD BARRIER ELEVATION STANDARDS DURING CONSTRUCTION OR SUBSTANTIAL REPAIR OR SUBSTANTIAL REHABILITATION OF SEAWALLS, BANKS, BERMS, AND SIMILAR INFRASTRUCTURE OR WHEN REQUIRED TO ABATE NUISANCE FLOODING.

(Ord. O-2022-01, passed 2-2-22)

Broward County, FL Code of Ordinances

ARTICLE XXV. - RESILIENCY STANDARDS FOR TIDAL FLOOD PROTECTION

Sec. 39-404. - Purpose and intent.

The purpose of this article is to establish a consistent minimum elevation for tidal flood barriers that will:

- (a) Provide a standard for flood mitigation infrastructure that serves as a barrier to tidal flooding, not seepage, by accounting for water levels predicted under combined conditions of sea level rise, high tides, and high frequency storm surge through the year 2070; and
- (b) Ensure new shoreline structures and major shoreline improvements are designed for use as tidal flood barriers through application of consistent standards that account for future predicted tidal flood conditions and coastal water levels associated with sea level rise in accordance with current regional sea level rise projections, as updated and adopted by the Broward County Board of County Commissioners.

(Ord. No. 2020-11, § 1, 3-31-20)

Sec. 39-405. - Applicability.

This article applies to all new tidal flood barriers, substantial repair or substantial rehabilitation to shorelines and shoreline structures, and the installation of any fixed infrastructure attached to tidal flood barriers (such as mooring structures). This article is not applicable to oceanfront beaches or shorelines seaward of the Coastal Construction Control Line.

(Ord. No. 2020-11, § 1, 3-31-20)

Sec. 39-406. - Definitions.

For the purposes of this article, the following terms, phrases, words, and their derivation shall have the meanings given herein, except when the context clearly indicates a different meaning. In the interpretation and application of this article, the definitions provided for herein shall control over definitions that may be included in other documents or manuals, including, but not limited to, the Florida Building Code. Words used in the present tense include the future tense, words in the plural number include the singular number, and words in the singular number include the plural number. The word "shall" is mandatory and the word "may" is permissive.

Bank means the level space separating a waterway from an inland area, often elevated and constructed of compacted soil.

Berm means an earthen mound designed with impermeability to resist the flow of tidal waters through it to an adjacent property or public right-of-way.

Green-grey infrastructure or green-grey materials means a combination of engineered and natural features that provide environmental qualities and ecosystem value.

Mooring structure means a boat dock, slip, davit, hoist, lift, floating vessel platform, mooring pile, or similar structure attached to land or to a seawall, to which a vessel can be moored.

North American Vertical Datum (NAVD88) means the vertical control for datum of orthometric height established for vertical control surveying in the United States of America based upon the General Adjustment of the North American Datum of 1988.

Public nuisance means a condition injurious to the public health or safety of the community or neighborhood, or injurious to any considerable number of persons, or a condition that obstructs the free passage or use, in the customary manner, of any public right-of-way.

Rip-rap means a foundation of unconsolidated boulders, stone, rubble, concrete without protruding rebar, or similar materials placed on or near a shoreline to mitigate wave impacts and prevent erosion.

Seawall means a vertical or near vertical (often interlocking) structure placed between an upland area and a waterway or waterbody for erosion control.

Seawall cap means a concrete box structure (usually reinforced) that connects seawall panels, piles, and anchoring system (if present) together at the top.

Shoreline means a tidally influenced area where land meets water.

Substantial repair or substantial rehabilitation means:

- (a) Any modification to the shoreline or a shoreline structure along more than fifty percent (50%) of the length of the property's shoreline; or
- (b) Any modification, alteration, or installation of an appurtenant structure (such as a mooring structure) that exceeds fifty percent (50%) of the cost of a tidal flood barrier along the property's shoreline.

Tidal flood barrier means any structure or shoreline feature including, but not limited to, banks, berms, green-grey infrastructure, seawalls, seawall caps, upland stem walls, or other infrastructure that impedes tidal waters from flowing onto adjacent property or public right-of-way, and located within or along a tidally influenced area. This definition is not meant to include rip-rap, derelict erosion control structures, or permeable earthen mounds that do not provide an impermeable water barrier to tidal flooding.

Tidally influenced area means the real property adjacent to, or affected by, a waterway with water level changes in response to the daily tide.

(Ord. No. 2020-11, § 1, 3-31-20)

Sec. 39-407. - Minimum elevations for coastal infrastructure within tidally influenced areas.

- (a) All new or substantially repaired or substantially rehabilitated banks, berms, green-grey infrastructure, seawalls, seawall caps, upland stem walls, or other similar infrastructure shall be designed and constructed to perform as tidal flood barriers. Tidal flood barriers shall have a minimum elevation of five (5) feet NAVD88. Applications for new or substantially repaired or substantially rehabilitated tidal flood barriers submitted prior to January 1, 2035, may be permitted a minimum elevation of four (4) feet NAVD88, if designed and constructed to accommodate a minimum elevation of five (5) feet NAVD88 by January 1, 2050.
- (b) All property owners must maintain a tidal flood barrier in good repair. A tidal flood barrier is presumed to be in disrepair if it allows tidal waters to flow unimpeded through or over the barrier and onto adjacent property or public right-of-way. Failure to maintain a tidal flood barrier in good repair shall be a citable offense. The owner of the tidal flood barrier shall demonstrate progress towards repairing the cited defect within sixty (60) days after receiving a citation and shall complete repairs within three hundred sixty-five (365) days after receipt of the citation. If the required repair or rehabilitation meets the substantial repair or substantial rehabilitation threshold, no later than three hundred sixty-five (365) days after receipt of the citation, the property owner shall design, obtain permits, cause to be constructed, and obtain final inspection approval of seawall improvements that meet the minimum elevation and design requirements.
- (c) Tidal flood barriers below a minimum five (5) feet NAVD88 elevation shall be improved, designed, and constructed so as to prevent tidal waters from impacting adjacent property or public right-of-way. Causing, suffering, or allowing the trespass of tidal waters onto adjacent property or public right-of-way is hereby declared a public nuisance and a citable offense requiring abatement. The owner shall demonstrate progress toward addressing the cited concern within sixty (60) days after receipt of the citation and complete the construction of an approved remedy no later than three hundred sixty-five (365) days after receipt of the citation.
- (d) Tidal flood barriers shall be designed and constructed to prevent tidal waters from flowing through the barrier, while still allowing for the release of upland hydrostatic pressure.
- (e) To the extent practicable, tidal flood barriers shall be designed and constructed to adjoin immediately proximate tidal flood barriers to close gaps and prevent trespass of tidal water.
- (f) All tidal flood barriers undergoing substantial repair or substantial rehabilitation shall be constructed along the property's entire shoreline.
- (g) All tidal flood barriers shall be constructed with natural limerock rip-rap, or other approved habitat enhancement, at the waterward face of the structure.
- (h) Property owners are encouraged to consider approaches and materials that enhance the biological value of traditional (flat surface) seawalls and flood barriers with the incorporation of living shoreline features, use of hybrid green-grey materials, and the use of biological forms, where practicable.

- (i) This section shall not be construed to require the installation of a seawall where other flood protection measures serve as an equally effective tidal flood barrier.
- (j) Tidal flood barriers capable of automatically being elevated in advance of high tides to prevent tidal flooding are permissible, provided that automation cannot require daily human intervention.

(Ord. No. 2020-11, § 1, 3-31-20)

Sec. 39-408. - Required disclosure in contracts for sale of real estate.

In any contract for the sale of real estate located in tidally influenced areas of Broward County executed after December 31, 2020, the seller shall include in the contract or a rider to the contract the following disclosure in not less than fourteen-point, capitalized, bold-faced type:

THIS REAL ESTATE IS LOCATED IN A TIDALLY INFLUENCED AREA. THE OWNER MAY BE REQUIRED BY COUNTY OR MUNICIPAL ORDINANCE TO MEET MINIMUM TIDAL FLOOD BARRIER ELEVATION STANDARDS DURING CONSTRUCTION OR SUBSTANTIAL REPAIR OR SUBSTANTIAL REHABILITATION OF SEAWALLS, BANKS, BERMS, AND SIMILAR INFRASTRUCTURE OR WHEN REQUIRED TO ABATE NUISANCE FLOODING.

(Ord. No. 2020-11, § 1, 3-31-20)

Secs. 39-409, 39-410. - Reserved.

ORDINANCE NO. 2021-4393

AN ORDINANCE OF THE MAYOR AND CITY COMMISSION OF THE CITY OF MIAMI BEACH, FLORIDA, AMENDING CHAPTER 54 OF THE CODE OF THE CITY OF MIAMI BEACH, ENTITLED "FLOODS," BY CREATING ARTICLE III, TO BE ENTITLED "RESILIENCY STANDARDS FOR TIDAL FLOOD PROTECTION," TO STATE THE PURPOSE AND INTENT OF THE ARTICLE; ESTABLISH DEFINITIONS; AND ESTABLISH CONSTRUCTION STANDARDS THAT ENSURE THAT SEAWALLS AND OTHER TIDAL FLOOD BARRIERS STRENGTHEN COASTAL RESILIENCE AND MITIGATE THE EFFECTS OF TIDAL FLOODING AND SEA LEVEL RISE; AND PROVIDING FOR REPEALER, SEVERABILITY, CODIFICATION, AND AN EFFECTIVE DATE.

WHEREAS, sea level rise is one of the effects of climate change and is a result of different factors, including – an increase in water volume that is added by melting land ice and the thermal expansion of sea water as it warms up; and

WHEREAS, sea level rise experts project an estimated increase in sea level of approximately 10 to 17 inches by 2040; 21 to 40 inches by 2070; and 40 to 92 by 2120; and

WHEREAS; seawalls and similar tidal flood barriers strengthen coastal resilience when constructed in a manner that is substantially impermeable, and meet a minimum height standard that effectively addresses existing tidal flooding and future sea level rise for the expected lifetime of the seawall or structure; and

WHEREAS; In 2016, the Mayor and City Commission passed Resolution No. 2016-29454, which required that all new seawalls on private property, and for public projects, have a minimum elevation of 5.7 feet NAVD; however, applications for new or substantially rehabilitated seawalls not associated with new or substantial building construction would be permitted a minimum elevation of 4.0 feet NAVD88 if designed and constructed to accommodate a minimum elevation of 5.7 feet NAVD88 (and not lower than the adjacent yard); and

WHEREAS, seawall elevation requirements need to be set and the structures designed and constructed in a manner that does not create erosion and/or drainage issues on the adjacent properties; and

WHEREAS, a minimum and maximum elevation standard for seawall construction should be set to reduce the potential for a substantial visual discontinuity with their neighbors; and

WHEREAS, properties with low-lying seawalls can be the source of tidal waters flooding adjacent properties or public rights-of-way; and

WHEREAS, seawalls, bulkheads, living shorelines, or other shoreline protection structures need to be raised in a timely manner to reduce tidal flooding impacts on adjacent private properties and public rights-of-way; and

WHEREAS, the City promotes and encourages the use of living shorelines to provide a natural alternative to “hard” shoreline stabilization methods and provide numerous benefits including nutrient pollution remediation, essential fish habitat structure, and buffering of shorelines from waves and storms; and

WHEREAS, the proposed changes in this Ordinance will result in a more resilient waterfront.

NOW, THEREFORE, BE IT ORDAINED BY THE MAYOR AND CITY COMMISSION OF THE CITY OF MIAMI BEACH, FLORIDA, AS FOLLOWS:

SECTION 1. That Article III of Chapter 54 of the Code of the City Miami Beach is hereby created as follows:

CHAPTER 54

FLOODS

* * *

ARTICLE III. Resilience Standards for Tidal Flood Protection.

Sec. 54-59. Purpose and intent.

The purpose of this article is to protect the public's health, welfare and safety by setting minimum standards to be used in the design, construction and maintenance of waterfront structures. This article establishes a minimum elevation for new seawalls and requires failing and low seawalls, bulkheads, living shorelines, or other shoreline protection structures that cause tidal surface water flooding to adjacent properties to be maintained. The physical seawall improvements ensure new seawalls, bulkheads, living shorelines, or other shoreline protection structures are designed with application of consistent standards that account for future tidal flood conditions and coastal water levels predicted with sea level rise, in accordance with current regional sea level rise projections, as updated and adopted by the City Commission.

Sec. 54-60. Applicability.

Mandatory compliance with the requirements of this Article shall be required for all applicants with building permit applications that meet the following criteria:

- (1) All new waterfront construction and substantial improvements; or
- (2) All new seawalls; or

(3) Substantial improvements to shorelines and shoreline structures.

Mandatory compliance with the requirements of this Article shall be required for all low seawalls, bulkheads, living shorelines, or other shorelines protection structures that cause tidal surface water flooding to adjacent properties and/or public right of way.

This article is not applicable to oceanfront beaches or shorelines seaward of the Coastal Construction Control Line.

Sec. 54-61. Definitions.

The following words, terms, and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Bulkhead: A vertical or near-vertical, substantially impermeable structure erected along water or a waterway, designed and constructed in such manner as to be substantially impermeable and safely sustain any loads, both vertical and lateral, that may come upon it, such as earth fill, water, moving traffic, storage of materials alongside, and the like. coastal bulkheads are most often referred to as Seawalls; however, by definition, they are intended to act as a shoreline stabilization structure that primarily retains soil and provides minimal protection from waves.

Green-grey infrastructure or materials is a combination of engineered and natural features that provide environmental qualities and ecosystem value.

Living Shoreline: A green infrastructure technique using native vegetation alone or in combination with low sills (such as low elevation Seawalls or Bulkheads) to stabilize the shoreline as a natural alternative to “hard” shoreline stabilization methods like Riprap or Bulkheads. Living Shorelines may be more resilient than Bulkheads in protecting against the effects of hurricanes. A Living Shoreline may have its waterside face consist of plants and other natural elements that improve water quality, provide additional fish habitat, and fosters increased biodiversity. The landside interface may be located anywhere on an existing property fronting the Living Shoreline, as long as it is constructed in a manner and location that ensures any habitable structures on that property are protected from flooding from tidal waters and it prevents flooding of adjacent properties and the public right-of-way.

NAVD88 or the North American Vertical Datum (“NAVD 88”) means the vertical control datum of orthometric height established for vertical control surveying in the United States of America based upon the General Adjustment of the North American Datum of 1988.

Public nuisance means injurious to the safety or health of the entire community or neighborhood, or any considerable number of persons, or unlawfully obstructs the free passage or use, in the customary manner, of any public right-of-way.

Rip-rap means a foundation of unconsolidated boulders, stone, rubble, concrete without protruding rebar or similar materials placed on or near a shoreline to mitigate wave impacts and prevent erosion.

Seawall means the vertical or near vertical (often interlocking) structures placed between an upland area and a waterway or waterbody for erosion control.

Seawall cap means the concrete beam (usually cast-in-place and reinforced) which connects seawall panels, piles and anchoring system (if present) together at the top of the seawall structure.

Shoreline means the tidally influenced area where land meets water.

Substantial repair or rehabilitation means:

- a) Any improvement and/or repairs to the existing seawall with a cost of \$300 or more per linear foot.

Tidally-influenced areas means a waterway with water level changes in response to the daily tide.

Sec. 54-62. Minimum Elevations and Materials for New or Substantially Rehabilitated Coastal Infrastructure within Tidally-Influence Areas.

- a) All new seawalls or existing seawalls that require substantial repairs; shall have a minimum elevation of 5.7 feet NAVD88. All existing seawalls that require repairs but the repairs are considered less than substantial and existing seawalls that fall below an elevation that incurs flooding to adjacent property and/or public right of way shall have a minimum elevation of 4.0 feet NAVD88 if designed and constructed to accommodate a minimum elevation of 5.7 feet NAVD88.
- b) To the extent practicable, seawalls shall be designed and constructed to adjoin immediately proximate seawalls to close gaps and prevent trespass of tidal surface water.
- c) Property owners are encouraged to consider approaches and materials that enhance the biological value of traditional (flat surface) seawalls with the incorporation of living shoreline features, the use of materials that encourage biodiversity, and the use of biological forms, where practicable.
- d) This section shall not be construed to require the installation of a seawall where other flood protection measures and living shorelines serve as an equally effective tidal flood barrier.

Sec. 54-63. Coastal Infrastructure Maintenance Requirements within Tidally-Influence Areas.

- a) All property owners must maintain their seawalls, bulkheads, living shorelines, or other shoreline protection structures or elements in good repair. A shoreline protection structure is presumed to be in disrepair if it allows for upland erosion, transfer of material through the barrier/wall or allows tidal waters to flow unimpeded through and/or over the top of the barrier/wall to adjacent properties or public right-of-way. Property owners with seawalls, bulkheads, living shorelines, or other shoreline protection structures or elements below the minimum required finished elevation, with permeable erosion barriers such as riprap, or land/water interface of another nature are prohibited from allowing tidal waters entering their property to flow to adjacent properties or public rights-of-way. Failure to maintain flood mitigation infrastructure shall be a citable offense. The owner of the seawall shall demonstrate progress towards repairing the cited defect within sixty (60) days of receiving a citation. If the required repair meets the substantial repair threshold, the property owner must design, obtain permits, and cause to be constructed seawall improvements that meet the minimum elevation and design requirements within seven hundred and thirty days (730) days of receipt of the citation.

- b) Property owners with seawalls below the minimum elevation set forth in section 54-62(a), or permeable erosion barriers such as rip-rap, living shorelines, or a land/water interface of another nature, shall not allow tidal waters entering their property to impact adjacent properties or public rights-of-way. Property owners failing to prevent tidal waters from flowing overland and leaving their property may be cited. The owner of the property is required to initiate a process including, but not limited to, hiring a contractor or submitting a building permit, and be able to demonstrate progress toward addressing the cited concern within sixty (60) days of receiving a citation from the city and must complete the proposed remedy within seven hundred and thirty days (730) days of citation.

Sec. 54-64. As-built Requirements and Resilience Standard Certification.

- a) Property owners are required to submit to the Building Department and Public Works Department an as-built survey that is prepared by a professional surveyor to show elevation of seawall (NAVD88) at the commencement of construction.

- b) Property owners are required to submit to the Building Department and Public Works Department certification by a professional engineer stating that shoreline protection structures have been designed and constructed in accordance with this Article and Miami Beach's Resilience Standards for Tidal Flood Protection ordinance.

Sec. 54-65. Enforcement; Warnings; Civil Penalties.

- (a) Failure to maintain flood mitigation infrastructure as set forth in Section 54-63(a)

or to prevent tidal waters from flowing overland and leaving their property as set forth in Section 54-63(b) shall be enforced by a floodplain administrator or designee, a code compliance officer, or a police officer ("enforcement officer") in accordance with the procedures and penalties set forth in Section 54-65(b) through (i).

- (b) Warning. An enforcement officer shall first issue a written warning to remedy the violation prior to issuing a notice of violation unless one written warning has been issued in the 12 months preceding the date of violation. The written warning shall require the property owner to initiate seawall repair or improvement, and be able to demonstrate progress toward addressing the cited concern within sixty (60) days of receiving notice from the city and complete the proposed remedy within seven hundred and thirty days (730) days of citation. The written warning shall be substantially in the same form as a notice of violation as identified in section 54-65(c). Failure to either demonstrate progress towards addressing the cited concern within (60) days of receiving notice from the City or upon failing to complete the proposed remedy within seven hundred and thirty days (730) days of citation shall result in subsequent violations set forth in this subsection. Each day such violation continues shall be considered a separate offense.
- (c) Penalties. If an enforcement officer finds a violation, the officer shall issue a notice of violation to the violator as provided in chapter 30. The notice shall inform the violator of the nature of the violation, amount of fine for which the violator may be liable, instructions and due date for paying the fine, notice that the violation may be appealed by requesting an administrative hearing within ten days after service of the notice of violation, and that failure to do so shall constitute an admission of the violation and waiver of the right to a hearing.
- (d) A violator who has been served with a notice of violation shall elect either to:
- (1) Pay the civil-fine as follows for violations of sections 54-63(a) and/or (b):
 - i. First offense\$250.00;
 - ii. Second and subsequent offenses\$500.00.
- or
- (2) Request an administrative hearing within ten days before a special master appointed as provided in article II of chapter 30 to appeal the decision of the enforcement officer which resulted in the issuance of the notice of violation.
- (e) If the named violator, after notice of violation, fails to pay the civil fine or fails to timely request an administrative hearing before a special master, the special master shall be informed of such failure by report from the enforcement officer. Failure of the named violator to appeal the decisions of the enforcement officer within the prescribed time period shall constitute a waiver of the violator's right to administrative hearing before the special master. A waiver of the right or an administrative hearing shall be treated as an admission of the violation and penalties may be assessed accordingly. The special master shall be prohibited

from hearing the merits of the notice of violation or consideration of the timeliness of the request for an administrative hearing if the violator has failed to request an administrative hearing within ten days of the issuance of the notice of violation.

- (f) A certified copy of an order imposing a fine may be recorded in the public records, and thereafter shall constitute a lien upon any real or personal property owned by the violator, which may be enforced in the same manner as a court judgment by the sheriffs of this state, including levy against the violator's real or personal property, but shall not be deemed to be a court judgment except for enforcement purposes.
- (g) Any party aggrieved by the decision of the special master may appeal the decision in accordance with law.
- (h) The city may institute proceedings in a court of competent jurisdiction to compel payment of civil fines.
- (i) A certified copy of an order imposing a civil fine may be recorded in the public records and thereafter shall constitute a lien upon any other real or personal property owned by the violator and it may be enforced in the same manner as a court judgment by the sheriffs of this state, including levy against the personal property, but shall not be deemed to be a court judgment except for enforcement purposes. After two months from the filing of any such lien which remains unpaid, the city may foreclose or otherwise execute upon the lien.
- (j) The procedures for appeal of the notice of violation by administrative hearing shall be as set forth in sections 30-72 and 30-73.

SECTION 2. REPEALER.

All ordinances or parts of ordinances in conflict herewith are hereby repealed.

SECTION 3. SEVERABILITY.

If any section, subsection, clause or provision of this Ordinance is held invalid, the remainder shall not be affected by such invalidity.

SECTION 4. CODIFICATION.

It is the intention of the Mayor and City Commission of the City of Miami Beach, and it is hereby ordained that the provisions of this Ordinance shall become and be made part of the Code of the City of Miami Beach, Florida. The sections of this Ordinance may be renumbered or relettered to accomplish such intention, and the word "ordinance" may be changed to "section," "article," or other appropriate word.

SECTION 5. EFFECTIVE DATE.

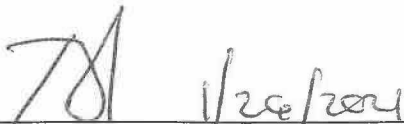
This Ordinance shall take effect on the 23 day of January, 2021.

PASSED AND ADOPTED this 13 day of January, 2021.

ATTEST:



Dan Gelber, Mayor



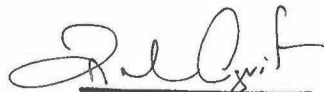
Rafael E. Granado, City Clerk

(Sponsored by Commissioner Samuelian)

Underline denotes additions



**APPROVED AS TO
FORM & LANGUAGE
& FOR EXECUTION**


City Attorney 12/2/20
Date
FA

MIAMI BEACH

COMMISSION MEMORANDUM

TO: Honorable Mayor and Members of the City Commission
FROM: Raul J. Aguila, Interim City Manager
DATE: January 13, 2021

2:25 p.m. Second Reading Public Hearing

SUBJECT: AN ORDINANCE OF THE MAYOR AND CITY COMMISSION OF THE CITY OF MIAMI BEACH, FLORIDA, AMENDING CHAPTER 54 OF THE CODE OF THE CITY OF MIAMI BEACH, ENTITLED "FLOODS," BY CREATING ARTICLE III, TO BE ENTITLED "RESILIENCY STANDARDS FOR TIDAL FLOOD PROTECTION," TO STATE THE PURPOSE AND INTENT OF THE ARTICLE; ESTABLISH DEFINITIONS; AND ESTABLISH CONSTRUCTION STANDARDS THAT ENSURE THAT SEAWALLS AND OTHER TIDAL FLOOD BARRIERS STRENGTHEN COASTAL RESILIENCE AND MITIGATE THE EFFECTS OF TIDAL FLOODING AND SEA LEVEL RISE; AND PROVIDING FOR REPEALER, SEVERABILITY, CODIFICATION, AND AN EFFECTIVE DATE.

RECOMMENDATION

The Administration recommends that the City adopt the Ordinance.

BACKGROUND/HISTORY

The 2019 Community Satisfaction Survey shows that 39.7% of residents have observed increased flooding in their neighborhood, down from 73.7% in 2016. The City of Miami Beach is investing in aging infrastructure to reduce food risk, adapt to climate change, and is committed to building resilience on several fronts. Over the last few years, the City has updated its land use development regulations for new construction to address water retention, setbacks and increase in base flood and freeboard elevation. These measures also contemplate sea level rise scenarios to reduce the risk to the new inventory of buildings.

Miami Beach has approximately 53 miles of seawalls, of which 92% are owned by private property. Existing City legislation does not address tidal waters overtopping seawalls and impacting adjacent property and public right-of-way.

The proposed Ordinance was modeled from seawall ordinances recently adopted by Broward County and the City of Fort Lauderdale. The City of Miami has also drafted an ordinance that is going through the review and approval process. The proposed Ordinance looks at best management practices from these other municipalities but is specific to Miami Beach, and accounts for the feedback from the community. The main purpose of the Ordinance is to provide the City the enforcement ability to address overtopping and to integrate the city's

seawall elevation requirements adopted in 2016 into Chapter 54 Floods.

The Ordinance was developed after discussions and direction at the Land Use and Sustainability Committee. On July 24, 2020, the Committee forwarded the ordinance, by acclamation, to the City Commission for first reading. On December 9, 2020, the Mayor and City Commission unanimously adopted the Ordinance on first reading.

Stakeholder Engagement

Staff has engaged the following entities that provided feedback on the draft ordinance:

- Marine and Waterfront Protection Committee
- National Flood Insurance Program Community Rating System Program for Public Information
- Sustainability Committee
- Marine Industry Focus Group
- General Public Engagement Meeting

On August 17, 2020, staff held a focus group discussion with marine contractors to gain insight on the industry's perspective on the proposed ordinance and discuss potential of setting special rates for Miami Beach property owners. Each seawall is unique and is designed to accommodate existing conditions and specific design elements required by the property. In addition, contractors pricing includes many factors such as variable material costs the amount of work in relationship to their equipment and staff.

On October 6, 2020, staff held a public meeting and provided a seven-day public comment period to obtain feedback of the proposed ordinance from residents. The meeting had 62 participants the questions and comments can be broken down into the following three areas:

1. Affordability and financing of private property upgrade costs
2. Complexity and time needed for permitting and construction of new seawalls
3. Necessity to protect private properties adjacent to low and failing seawalls

The public has expressed concerns related to affordability of seawall upgrade and the process to replace seawalls. The city examined a special assessment district (discussed at June 2019 Sustainability and Resilience Committee) and convened banks and funders to develop a special program for Miami Beach property owners (discussed at September 2019 and January 2020) to identify means to facilitate funding of private property adaptation. After thorough research and discussions with the financial industry, it has been determined that these are not feasible alternatives at this time.

Seawall replacement requires permitting approvals from the Army Corps of Engineers, the State of Florida, Miami-Dade County Resources and Regulatory Department, and the City of Miami Beach. The ordinance presented to the Land Use and Sustainability Committee in July 2020 proposed that 550 days be provided to a property owner to have enough time to complete the permitting, design, and construction. Based on discussions with the marine industry and feedback from residents regarding design and permitting challenges the Ordinance has been updated to allow for 730 days for reconstruction of failing seawalls. The City has also initiated discussions with Miami-Dade County to understand if the local regulatory permitting process can be streamlined.

To understand how neighboring municipalities are addressing overtopping and enforcement, staff also convened meetings with City of Miami, Broward County, and the City of Fort Lauderdale. Broward County and the City of Fort Lauderdale have passed ordinances addressing overtopping and the City of Miami is in the process of developing an ordinance.

Proposed Seawall Ordinance Overview

The proposed Seawall Ordinance codifies minimum elevations for new seawalls and requires seawalls that are in disrepair and are causing flooding on adjacent properties be maintained.

The Ordinance establishes that all new seawalls must be constructed to an elevation of 5.7 ft NAVD, or 4 ft NAVD if designed to support a future elevation of 5.7 NAVD. The elevation requirements are already in effect. On May 11, 2016, the City passed a resolution to require that new seawalls, and those meeting the substantial reconstruction requirements, have higher elevation standards (R2016-4009). The Ordinance further codifies this requirement and includes that seawalls must be upgraded if the property has new construction or substantial improvements. It should be noted that property owners are encouraged to consider designs using materials to further biodiversity of the City's coastal marine habitat.

The Ordinance also establishes overtopping as a trigger for seawall elevation and seawall maintenance requirements. Seawalls must be maintained in good repair as to not allow soil to eroded into the bay or waterway or to allow tidal waters to flow through the seawall and impact adjacent private property(s). The Ordinance also requires that seawalls must be maintained to prevent tidal waters from flowing overland and leaving their property.

Enforcement of the maintenance requirements set forth in the Ordinance will be enforced by either the floodplain administrator, a Code Compliance officer, or a police officer. The Ordinance includes a \$250 fine for the first offence (day) and \$500 per day fine for subsequent infractions and requires that following a citation, the property owner has 730 days to complete repairs. A violator that has been served a notice can request an administrative hearing within ten days to appeal the decision of the enforcement officer.

Information about the new Ordinance and how to report potential violations will be included on the City's website at www.mbrisingabove.com/seawalls.

CONCLUSION

The Administration recommends the Mayor and City Commission to approve the Ordinance on Second Reading.

Applicable Area

Citywide

Is this a "Residents Right to Know" item, pursuant to City Code Section 2-14?

Yes

Does this item utilize G.O. Bond Funds?

No

Strategic Connection

Environment & Infrastructure - Reduce risk from storms, high tides, groundwater, and sea level rise.

Legislative Tracking

Environment and Sustainability

Sponsor

Commissioner Mark Samuelian

RESILIENT SHORELINES MODEL ORDINANCE TEMPLATE

A vetted, model ordinance resource to advance consistent, resilient tidal flood barriers across the region.



WHAT'S INCLUDED:



THREE CLASSIFICATIONS

Three standardized tidal flood barrier classifications: natural shorelines, hybrid shorelines, and armored shorelines.



MINIMUM ELEVATION

Sets a minimum finished elevation of five feet NAVD 88 to account for projected sea level rise & high tides by 2070.



OVERLAY DISTRICT

Establishes a Shoreline Protection Overlay District to identify the types and hierarchy of permitted tidal flood barriers.



INTEGRATED POLICIES

Recommendations for coordinated installation, maintenance, oversight, enforcement and permitting, avoiding adverse impacts, and liability.

WHY ADOPT?

- Peer-reviewed resource to help local governments update policies, codes, and plans.
- Promotes resiliency of shorelines to rising sea levels and tidally influenced flooding through 2070.
- Offers more shoreline adaptation techniques for property owners to protect and adapt their shorelines.
- Supports policy consistency across the region.
- Facilitates the construction of living shorelines and nature-based features where appropriate, supporting the ecological integrity of coastal habitats.
- Provides clarity on responsibilities and future risks for property owners.

LOCAL GOVERNMENTS ARE ENCOURAGED TO CUSTOMIZE THE MODEL ORDINANCE TO THEIR OWN NEEDS AND ADOPT IT BY 2025!

DOWNLOAD THE MODEL ORDINANCE AT:

tbrpc.org/model-shoreline-ordinance



TO GET STARTED,

10.4 Appendix D: Strategy Matrix Spreadsheet

Please see attached spreadsheet.

10.5 Appendix E: Implementation Scenarios and Benefit-Cost Analysis

The APTIM team has analyzed four (4) different implementation pathways based on the location, size, and implementation timeline of the adaptation strategies as listed in Table 8. To better understand the costs and benefits of each implementation pathways, Benefit-Cost Analyses (BCA) were conducted for all scenarios. The following sections explain these scenarios and the results of BCAs in detail.

Table 8. Implementation Scenarios

Scenario		Adaptation Strategies and Corresponding Length/Area
1	No Action	This scenario evaluates the cost of taking no adaptation measures, focusing solely on the risks without any investment in adaptation strategies. Cost of taking no action can include disaster recovery and rebuilding, re-vegetation, and debris cleanup.
2	Individual Projects (IP)	This scenario involves targeted adaptation projects on specific parcels, addressing erosion and flood risks through a variety of strategies.
3	Central Captiva and Individual Projects (CCIP)	This scenario combines a nearshore emergent breakwater in Central Captiva (1550 ft long) with the individual projects outlined in Scenario #2. Measures CEPD may take include: <ul style="list-style-type: none"> • Raising Binder Drive (~400 ft long). • Raising South Seas Plantation Road (1 mile long). • Floodproofing critical infrastructure: Captiva Memorial Library, Fire Station, Disaster Recovery Center, and Wastewater Treatment Plant (WWTP).
4	Uniform Bayside Shoreline (UBS)	This scenario proposes a comprehensive approach to managing the entire 39,000 ft of developed shorelines on the bayside, incorporating all relevant adaptation strategies and calculating the costs individually.

1. No Action

The No Action or “business-as-usual” scenario evaluates the cost of taking no adaptation measures, focusing solely on the risks without any investment in adaptation strategies. Cost of taking no action can include disaster recovery and rebuilding, re-vegetation, and debris cleanup. This scenario does not include any physical adaptation measures, so there are no direct footprints on public or private lands, submerged lands, or uplands. This scenario represents the natural progression of coastal processes without intervention.

2. Individual Projects (IP)

In the Individual Projects scenario, the footprint of adaptation measures varies. Berms reinforced with geotextile mats, riprap, and mangrove planting would primarily affect private property above the mean high-water level, requiring property owner consent. Mangrove breakwaters and shoreline renourishment might extend below the mean high-water level into submerged lands, necessitating coordination with regulatory bodies. Seawall replacements, flood-proof glass installments, and filling above mean high water would primarily impact private uplands, while oyster reef balls and seagrass restoration would be implemented in submerged areas.

3. Central Captiva and Individual Projects (CCIP)

This scenario combines individual projects with broader measures in Central Captiva. Nearshore emergent breakwaters, seagrass restoration, and oyster reef balls would extend into submerged lands, potentially impacting aquatic preserves. Raising Binder Drive and South Seas Plantation Road would involve significant work on uplands, affecting public infrastructure and potentially some private properties. Floodproofing critical

infrastructure, including the Captiva Memorial Library, Fire Station, Disaster Recovery Center, and Wastewater Treatment Plant, would occur on uplands, primarily on public property. Shoreline renourishment, mangrove planting, and adaptive landscape planting design would span both private lands and submerged lands.

4. Uniform Bayside Shoreline (UBS)

The Uniform Bayside Shoreline scenario proposes comprehensive adaptation measures across the entire 39,000 ft of developed shorelines. Adaptation strategies like berms, buried seawalls, mangrove planting, and adaptive landscape planting design would primarily affect private properties above the mean high-water level. Seagrass restoration, oyster reef balls, channel dredging, and channel relocation would be implemented in submerged lands, requiring coordination with environmental regulatory bodies. This scenario also considers measures like moving existing docks or replacing them with floating docks. The extensive scope of this scenario involves a combination of public, private, and submerged lands to ensure comprehensive shoreline resilience.

For each of the four implementation scenarios, it is important to consider limits of authorities and ownership. Please refer to Figure 13, which illustrates private, state, and CEPD authority zones, and example permitting and easement requirements within upland and submerged lands.

10.5.1 Economic Assessment: Benefit-Cost Analysis

Ensuring a thorough assessment of adaptation alternatives and obtaining property owners' buy-in can be achieved through a comprehensive Benefit-Cost Analysis (BCA). A BCA quantifies the economic efficiency of different strategies by comparing the benefits of avoided costs (e.g., flood damage) with the expenses of implementing these measures. Informed decision-making, investment prioritization, and funding request justification can be made easier by this procedure, which promotes the adoption of the most practical and long-lasting adaptation strategies.

Introduction to FEMA BCA Tool

The FEMA BCA tool is a standardized software application used to evaluate the cost-effectiveness of hazard mitigation projects. It compares the project's projected benefits—mostly in the form of avoided losses and damages through mitigation projects—against its expenditures in order to determine the Benefit-Cost Ratio (BCR). An economically viable project is one where the benefits exceed the expenses, as indicated by a BCR greater than 1.0. Following items are the key components of a BCA analysis:

- **BCR Calculation:** $BCR = \text{Total Benefits} / \text{Total Costs}$
- **Key Factors:** Recurrence Intervals (RI) of hazard events, Project Useful Life (PUL), project effectiveness influence BCR, etc.
- **Scenario Analysis:** Each scenario's BCR is calculated based on estimated benefits (avoided damages, service/function losses, fatalities/injuries avoided) and costs (construction, maintenance).
- **Total Cost:** A key component of the cost-benefit analysis for the UBS projects in Captiva, Florida, involves understanding the principles of cost calculation. The implementation of floodproofing measures in this project will come with a substantial upfront cost, and it will also require regular maintenance to guarantee the measures' long-term effectiveness.
- **Total Benefits:** The benefits of the floodproofing measures at Captiva, Florida, are calculated using a number of important factors that estimate the possible decrease in flood-related damages as a result of the mitigation steps being implemented. When assessing the project's financial benefits over its usable life, these parameters are crucial. The overall benefit of the project is quantified by the reduction in expected annual losses due to flood damage. This is achieved by elevating buildings, implementing

flood barriers, and other floodproofing measures, thereby decreasing the vulnerability of properties to flooding. The benefits are realized in terms of reduced repair costs, avoided property damage, and improved safety for residents. The calculation uses a standardized approach to ensure accuracy and comparability across different projects and scenarios. By implementing these flood mitigation measures, Captiva Island can significantly reduce the economic impact of future flood events, providing long-term financial and social benefits to the community.

A detailed cost-benefit analysis of four adaptation scenarios is shown in Table 9 to assess their feasibility from an economic standpoint. Each scenario is evaluated by weighing the anticipated costs and benefits of hazards and hazard mitigation actions. Some costs and benefits calculations such as mangrove planting, seagrass restoration, and road elevation were deferred to the next tasks due to site-specific project implementation data (such as the percentage of land use in the projects area for categories, historical damages before mitigation, and professional estimated damages after mitigation) that will be obtained after conceptual engineering plans were created. We will be able to complete the investigation and run a precise evaluation of the ecosystem benefits when we get this information.

Scenario 1: No Action

Strategy: There are no direct expenses in this case because there is no physical adaptation action taken. However, estimated annual damage to residential buildings (i.e., “the cost of doing nothing”) in all the project-covered area amounts to an estimated \$1,646,234. Because it allows for the continuation of natural coastal processes, this scenario may eventually lead to increased vulnerability to threats as a result of rising sea levels and changing climate.

- **Total Cost:** \$0
- **Total Benefits:** \$0
- **BCR:** N/A

Scenario 2: Individual Projects (IP)

Strategy: The costs associated with individual projects are justified by the targeted nature of interventions aimed at protecting specific properties. On private property, mangrove planting and reinforced berms can reduce potential damages now, which lowers repair and recovery expenses in the future. The costs are a reflection of the need to obtain permission from landowners and follow regulations for operations that involve submerged areas in order to guarantee efficacy and compliance. The prevention of physical harm and the improvement of coastal resilience are the main benefits here. Together, the riprap and reinforced berms shield properties from flooding and erosion, lowering the need for future replacement and repair expenses. By stabilizing the shoreline and supplying habitat, the planting of mangroves also helps to further reduce the risk of flooding. The estimated \$5,688,389 total benefit highlights the large decrease in possible future damage costs that would have been incurred had these safeguards not been put in place.

- **Total Cost:** \$1,775,772
- **Total Benefits:** \$5,688,389
- **BCR:** 3.20

Scenario 3: Central Captiva and Individual Projects (CCIP)

Strategy: The plan of action in this scenario is to improve resilience throughout Central Captiva by combining small-scale and large-scale measures. The comprehensive strategy for safeguarding vital infrastructure and

boosting community resilience justifies the greater expenses. By minimizing risks on both public and private properties, investments in floodproofing public buildings and significant shoreline renourishment lessen vulnerability to coastal hazards. The costs include large-scale environmental management initiatives and infrastructure investments necessary to maintain long-term resilience. The floodproofing measures yield significant advantages, such as reduced repair expenses and preserved service performance. These benefits are particularly important for maintaining community operations both during and after hazardous events.

- **Total Cost:** \$3,162,772
- **Total Benefits:** \$12,522,124
- **BCR:** 3.96

Scenario 4: Uniform Bayside Shoreline (UBS)

Strategy: The UBS scenario justifies its costs through its comprehensive scope covering 39,000 feet of developed shorelines. Various adaptation options, such as underground seawalls, berms, and biological restoration in inundated lands, are assigned costs. A comprehensive strategy to coastal protection is ensured by the investment in adaptive landscape design and infrastructure enhancements, which meet both present risks and future resilience needs. The extent of intervention in submerged, public, and private areas illustrates the proactive steps required to successfully reduce coastal threats. Large-scale environmental and infrastructure upgrades result in large long-term avoided costs and increased community resilience, even when the BCR is smaller. The substantial overall benefit emphasizes how important it is to fund extensive adaptation plans to safeguard and maintain coastal regions against potential threats.

- **Total Cost:** \$52,650,000
- **Total Benefits:** \$68,051,520
- **BCR:** 1.29

Table 9. Cost and Benefit Analysis Results by Scenario

#	Mitigation Scenario	Mitigation Actions	Project Useful Life (years)	Initial Cost	Maintenance Cost	Total Cost	Can be funded by a single grant?	# of grants this project can be eligible for	Total Benefit	CBR
1	No Action	None	25	\$0	\$0	\$0			\$0	N/A
	Total			\$0	\$0	\$0			\$0	
2	Individual Projects (IP)	Berm Reinforced with Geotextile Mats: 36 parcels with seawalls without pools	18	\$864,862	\$5/LF	\$757,764		6	\$5,252,364	3.20
		Riprap and Mangrove Planting	25	\$235,200	\$7/LF	\$944,004	Y	8	\$429,113	
		Mangrove Planting for Uniformity	25	\$74,002	\$7/LF	\$74,004	Y	8	\$6,912	
	Total			\$1,174,064	\$0	\$1,775,772			\$5,688,389	
3	Central Captiva and Individual Projects (CCIP)	Nearshore Emergent Breakwater in Central Captiva	25	\$775,000	\$0	\$775,000			\$171,905	3.96
		All Actions in IP Scenario	25	\$1,174,064	\$0	\$1,775,772	N	2	\$5,688,389	
		Raise Binder Dr.	10 to 15	\$2,010,000 - \$ 3,310,000	\$0	TBD	Y	2	TBD	
		Raise South Seas Plantation Road	10 to 15	\$26,410,000 - \$41,862,000	\$0	TBD	Y	2	TBD	
		Floodproof Captiva Memorial Library	40 +	\$137,426	\$0	\$137,426	Y	4	\$1,826,919	
		Floodproof Fire Station	40 +	\$158,740	\$0	\$158,740	Y	4	\$2,819,488	
		Floodproof Disaster Recovery Center	40 +	\$254,182	\$0	\$254,182	Y	4	\$32,540	



		Floodproof Wastewater Treatment Plant	40 +	\$61,651	\$0	\$61,651	Y	4	\$1,982,883	
	Total			\$2,561,064	\$0	\$3,162,772			\$12,522,124	
4	Uniform Bayside Shoreline (UBS)	All Adaptation Strategies on Developed Shorelines	25	\$27,300,000 - \$78,000,000	\$0	\$52,650,000	N		\$68,051,520	1.29
		Seagrass Restoration	25 +	\$8,853,256	\$0	TBD		6	TBD	
	Total			\$61,503,256	\$0	\$52,650,000			\$68,051,520	

10.5.2 Summary of BCA Results

This section provides a comparison of the implementation scenarios and their Benefit-Cost Ratios.

Scenario 1: No Action

While the no action scenario avoids an upfront investment today, it does not reduce the potential damages caused by current flooding conditions. The island’s bayside is vulnerable to flooding occurrences and can sustain significant damage if mitigation measures are not taken. The estimated annual damage is \$1,646,234, for buildings and contents (\$1,189,821 + \$456,413). Using a discount rate of 3.1%, the estimated total damages for the next 25 years (average useful life of mitigation projects) will be \$28,349,305. (Table 10)

Table 10. Estimated Annual Damages by Flood Depth

Flood Depth (ft)	Recurrence Interval (yr)	Building (\$)	Contents (\$)
-6.98	1.11	\$0	\$0
-6.11	2	\$0	\$0
-4.99	5	\$0	\$0
-4.4	8	\$0	\$0
-4.15	9.82	\$0	\$0
-3.17	20	\$0	\$0
-2.59	30	\$0	\$0
-2.17	40	\$0	\$0
-2	44.82	\$1,362	\$0
-1.96	45.88	\$37,086	\$3,563
-1.54	60	\$46,301	\$7,328
-1.29	70	\$47,643	\$7,811
-1.06	80	\$47,262	\$9,649
-0.86	90	\$283,961	\$86,814
0.01	149.14	\$4,083	\$1,524
0	149.99	\$180,565	\$73,336
0.52	200	\$141,527	\$66,373
1.08	270.76	\$38,993	\$19,496
1.28	300	\$90,260	\$45,130
1.84	400	\$270,778	\$135,389
Total (\$)		\$1,189,821	\$456,413

Scenario 2: Central Captiva and Individual Projects (CCIP)

Individual projects, including berm reinforcement and mangrove planting, can reduce annual flood damage substantially. By raising the protective barriers, these actions lower the anticipated yearly losses. The \$1,174,064 initial investment plus maintenance expenditures result in \$5,688,389 in benefits. The projects' economic



feasibility is demonstrated by their 3.20 cost-benefit ratio (CBR), which offers a net benefit by mitigating the risk of flood damage.

Scenario 3: Individual Projects (IP)

This all-encompassing strategy incorporates a number of mitigation techniques, including building breakwaters, elevating roadways, and floodproofing critical infrastructures. These precautions provide robust defense and dramatically reduce the anticipated yearly losses due to flood damage. Although there is a much higher initial cost of \$2,561,064, the significant reduction in flood danger and damage, along with the yearly benefits of \$12,522,124 and a **CBR of 3.96**, show that the investment is justified, **making this the most cost-effective option.**

Scenario 4: Uniform Bayside Shoreline (UBS)

Restoring seagrass lowers the risk of flooding by strengthening the shoreline and reducing erosion. This is an expensive investment, but the advantages of \$68,051,520 in avoided damages outweigh the high initial and ongoing costs of \$52,650,000. Though advantageous, the CBR of 1.29 indicates that it is less economical when compared to alternative circumstances. Over time, the restoration offers major benefits for the environment and flood protection.

In conclusion, **Scenario 3** (Central Captiva and Individual Projects) is estimated to be the most economically sound alternative for adapting against flooding on Captiva Island due to its high cost-benefit ratio. This strategy offers complete protection against coastal flooding and storm damage while skillfully balancing initial and ongoing expenditures against significant long-term advantages.



10.6 Appendix F – Department of the Army Permit on Special Conditions



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE FLORIDA 32232-0019

March 22, 2013

REPLY TO
ATTENTION OF

Regulatory Division

DEPARTMENT OF THE ARMY PERMIT

GENERAL PERMIT SAJ-20
SAJ-2006-06017 (TSH)

PRIVATE RESIDENTIAL DOCKS/PIER FACILITIES IN FLORIDA

Upon recommendation of the Chief of Engineers, pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403), general authority is hereby given to construct private residential dock facilities in navigable waters of the United States within the State of Florida subject to the following conditions:

SPECIAL CONDITIONS:

1. Structures authorized under this general permit are private residential docks/pier facilities designed to accommodate not more than four vessels, including those that may be dry stored such as but not limited to personal watercraft, unless a Florida Fish and Wildlife Conservation Commission approved Manatee Protection Plan is more restrictive. This includes normal appurtenances such as boat hoists, boat shelters with open sides, stairways, walkways, mooring pilings, dolphins, and maintenance of same.
2. No work shall be performed until the applicant submits satisfactory plans for the proposed structure and receives written authorization from the District Engineer.
3. The following areas are specifically excluded from authorization under SAJ-20:
 - a. Motorboat prohibited zones, no entry zones, and Federal Manatee Sanctuaries.
 - b. All areas regulated under the Lake Okeechobee and Okeechobee Waterway Shoreline Management Plan, located between St. Lucie Lock in Martin County and W.P. Franklin Lock in Lee County.
 - c. Monroe County
 - d. American Crocodile designated critical habitat, Biscayne Bay National Park Protection Zone (Dade County), St. Lucie Impoundment (Martin County), and areas identified in the Wild and Scenic Rivers Act (16 U.S.C. 1317, et seq.): the St. Mary's River, from its headwaters to its confluence with the Bells River, the entire Wekiva

River, including Wekiwa Springs Run, Rock Springs Run, the entire Seminole Creek, and Black Water Creek from its outfall at Lake Norris to its confluence with the Wekiva River, the Loxahatchee River from Riverbend Park downstream to Jonathan Dickinson State Park.

e. The following state parks: John Pennekamp Coral Reef State Park, Lignum Vitae Key State Botanical Site and Aquatic Preserve, Long Key State Park, Curry Hammock State Park, and Bahia Honda State Park.

f. Kings Bay/Crystal River/Homosassa/Salt River system (Citrus County) and canals connected to these waterways.

g. Lake Miccosukee (located on the common boundary of Leon and Jefferson Counties).

h. Within the coastal lakes, their outfalls and/or the shore areas between the lakes and the Gulf of Mexico as depicted on the attached map (Figure 1).

i. Elkhorn coral (*Acropora palmata*) and Staghorn coral (*Acropora cervicornis*) designated critical habitat (Figure 2).

j. Areas on or contiguous to ocean beaches.

4. No structures shall be authorized by SAJ-20 within the boundaries of the Timucuan Ecological and Historical Preserve (Duval County) until the National Park Service has been contacted and offered the opportunity to submit comments to the Corps on the effects of the proposed project on the preserve.

5. Prior to verification of authorization, the dichotomous key titled, "*The Corps of Engineers, Jacksonville District, and the State of Florida Effect Determination Key for the Manatee in Florida, March 2011*," (see <http://www.saj.usace.army.mil/Missions/Regulatory/SourceBook.aspx>) will be used to determine potential manatee impacts. Those determined to be a "may affect" to the manatee will not be authorized unless consistent with the 2011 Manatee Programmatic Consultation or individual consultation on the project is required and has been reinitiated and concluded with the U.S. Fish and Wildlife Service in accordance with the Endangered Species Act. Additionally, depending on the location of the project, some projects determined to be "may affect, not likely to adversely affect" will not be authorized until consultation on the project has been concluded. *Note: The manatee key may be subject to revision at any time. It is our intention that the most recent version of this technical tool will be utilized during the evaluation of the permit application.*

6. For projects in waters accessible to manatees, the Permittee will utilize the "*Standard Manatee Conditions for In-Water Work, 2011*" (see <http://www.saj.usace.army.mil/Missions/Regulatory/SourceBook.aspx>) and/or requirements, as appropriate for the proposed activity. *Note: The manatee conditions may be subject to revision*

at any time. It is our intention that the most recent version of these conditions will be utilized during the evaluation of the permit application.

7. For projects in waters accessible to sea turtles, Smalltooth sawfish, Gulf sturgeon, Atlantic sturgeon, or Shortnose sturgeon, the Permittee will utilize the “*Sea Turtle and Smalltooth Sawfish Construction Conditions*” March 2006 (see <http://www.saj.usace.army.mil/Missions/Regulatory/SourceBook.aspx>) and/or requirements, as appropriate for the proposed activity. *Note: These conditions may be subject to revision at any time. It is our intention that the most recent version of these conditions will be utilized during the evaluation of the permit application.*

8. The Permittee shall adhere to the NOAA Fisheries Service *Vessel Strike Avoidance Measures and Reporting for Mariners* (see <http://www.saj.usace.army.mil/Missions/Regulatory/SourceBook.aspx>)

9. In accordance with Section 7 of the Endangered Species Act, projects proposed within habitat for federally listed freshwater mussels and freshwater mussels proposed for listing cannot be authorized until consultation on the project has been concluded with the U.S. Fish and Wildlife Service. Habitat is found in the following drainages: Escambia River, Yellow River, Choctawhatchee River, Chipola River, Apalachicola River, Ochlockonee River, Santa Fe and New Rivers, and Econfina Creek (Florida panhandle) and their creeks and tributaries (see <http://www.saj.usace.army.mil/Missions/Regulatory/SourceBook.aspx>).

10. Projects proposing installation of any type of piling greater than 24-inches in diameter, or installation of any size of metal piling or sheet piling by impact hammer cannot be authorized under SAJ-20 until project-specific consultation has been reinitiated and concluded with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service, as appropriate.

11. Projects proposing installation of any type or size of piling or sheet piling by impact hammer cannot be authorized under SAJ-20 during the period March 1 through June 30 in the noise restriction areas as contained within the polygons described by the latitudinal/longitudinal coordinates listed in Appendix 1 and shown in Appendices 2-5.

12. This permit has undergone consultation with U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) on the listed species and any designated critical habitat noted on Table 1 (attached). If the proposed activity requires additional Section 7 consultation under the Endangered Species Act with the FWS and/or NMFS on: 1) these or any other federally listed threatened or endangered species or species proposed for Federal listing; or 2) designated critical habitat or proposed designated critical habitat for these or any other federally listed threatened or endangered species, or proposed species, then, until consultation is reinitiated and concluded, the proposed activity cannot be authorized under SAJ-20.

13. No work shall be authorized by SAJ-20 which may have direct or indirect adverse impacts to essential fish habitat such as but not limited to hard or soft corals, including listed corals, mangroves, estuarine emergent vegetation, marine emergent vegetation, and/or the following species of submerged aquatic vegetation: shoal grass (*Halodule wrightii*), paddle grass (*Halophila decipiens*), star grass (*Halophila engelmanni*), Johnson's seagrass (*Halophila johnsonii*), sago pondweed (*Potamogeton pectinatus*), clasping-leaved pondweed (*Potamogeton perfoliatus*), widgeon grass (*Ruppia maritima*), manatee grass (*Syringodium filiforme*), turtle grass (*Thalassia testudinum*), tapegrass (*Vallisneria americana*), horned pondweed (*Zannichellia palustris*), and eel grass (*Zostera marina*). Indirect effects include secondary and cumulative effects. In addition, the project cannot have adverse effects on any other essential fish habitat.

14. Adverse impacts to aquatic vegetation from dock construction shall be avoided by adherence to the attached joint U.S. Army Corps of Engineers'/National Marine Fisheries Service's "*Construction Guidelines in Florida for Minor Piling-Supported Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat - U.S. Army Corps of Engineers/National Marine Fisheries Service - August 2001*" (See <http://www.saj.usace.army.mil/Missions/Regulatory/SourceBook.aspx>). Dock construction everywhere in the State of Florida must comply with the above, and additionally, because of concerns about adverse impacts to Johnson's seagrass (*Halophila johnsonii*), dock construction in the lagoon (as well as canal) systems on Florida's east coast from Sebastian Inlet (Brevard County) south to and including central Biscayne Bay (Miami-Dade County) must also comply with the construction guidelines titled "*Key for Construction Conditions for Docks or Other Minor Structures Constructed in or Over Johnson's seagrass (Halophila johnsonii) National Marine Fisheries Service/U.S. Army Corps of Engineers - October 2002.*" (See <http://www.saj.usace.army.mil/Missions/Regulatory/SourceBook.aspx>) *Note: Both of the Construction Guidelines may be subject to revision at any time. It is our intention that the most recent versions of these technical tools will be utilized during the evaluation of the permit application.*

15. This permit does not authorize dredging or the removal of red mangrove (*Rhizophora mangle* L.).

16. For projects proposed adjacent to Federally-maintained channels, no structure, including mooring piles, authorized under this regional general permit shall be within the established setback. The setback is normally 100 feet in the various Intracoastal Waterways but may vary in a few specific reaches as well as in other Federal channels. Exact locations of the proposed structures relative to the channel may need to be verified by use of the Florida State Plane (x, y) Coordinate System, calculated from the near-bottom edge of the Federal channel. Any activity within Federal rights-of-way will require the Permittee to enter into a consent-to-easement with the Real Estate Division, U.S. Army Corps of Engineers, Jacksonville or Mobile District, as appropriate, prior to the commencement of any construction activity.

17. For projects authorized under the SAJ-20 in navigable waters of the United States, the Permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structures or work herein authorized, or if, in the

opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration. A structure authorized under this regional general permit must not interfere with general navigation.

18. No activity may cause more than a minimal adverse effect on navigation. Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the Permittee's expense on authorized facilities in navigable waters of the United States.

19. To maintain no less than 50% of the open-water portion of the waterbody available for public use, structures constructed on canals or channels must not extend more than 25% of the canal/channel width, excluding dense areas of shoreline vegetation such as mangroves, as measured from the project location to the opposite shoreline.

20. Cultural Resources/Historic Properties:

a. No structure or work shall adversely affect, impact or disturb properties listed in the National Register of Historic Places (NRHP) or those eligible for inclusion in the NRHP.

b. If during the ground disturbing activities and construction work within the permit area, there are archaeological/cultural materials encountered which were not the subject of a previous cultural resources assessment survey (and which shall include, but not be limited to: pottery, modified shell, flora, fauna, human remains, ceramics, stone tools or metal implements, dugout canoes, evidence of structures or any other physical remains that could be associated with Native American cultures or early colonial or American settlement), the Permittee shall immediately stop all work in the vicinity and notify the Corps within two calendar days. The Corps shall then notify the Florida State Historic Preservation Officer (SHPO) and the appropriate Tribal Historic Preservation Officer(s) (THPO(s)) to assess the significance of the discovery and devise appropriate actions.

c. A cultural resources assessment may be required of the permit area, if deemed necessary by the SHPO, THPO(s), or Corps, in accordance with 36 CFR 800 or 33 CFR 325, Appendix C (5). Based on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume on non-federal lands without written authorization from the SHPO and the Corps.

d. In the unlikely event that unmarked human remains are identified on non-federal lands, they will be treated in accordance with Section 872.05 Florida Statutes. All work in the vicinity shall immediately cease and the Permittee shall immediately notify the medical examiner, Corps, and State Archeologist. The Corps shall then notify the appropriate SHPO and THPO(s). Based on the circumstances of the discovery, equity to all parties, and considerations of the public interest,

the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume without written authorization from the State Archeologist, SHPO and the Corps.

e. In the unlikely event that human remains are encountered on federal or tribal lands, or in situations where Archaeological Resources Protection Act of 1979, or Native American Graves Protection Repatriation Act of 1990 applies, all work in the vicinity shall immediately cease and the Permittee immediately notify the Corps. The Corps shall then notify the appropriate THPO(s) and SHPO. Based on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. After such notification, project activities on federal lands shall not resume without written authorization from the Corps, and/or appropriate THPO(s), SHPO, and federal manager. After such notification, project activities on tribal lands shall not resume without written authorization from the appropriate THPO(s) and the Corps.

21. Turbidity control measures may be required, and the work must be conducted so as to prevent violations of State Water Quality Standards as established in sections 62-4.242 and 62-4.244 of the Florida Administrative Code and Chapters 62-302, 62-520, 62-522, and 62-550 of the Florida Administrative Code.

22. Prior to the initiation of any construction, projects qualifying for this regional general permit must qualify for an exemption under section 403.813(1)(i) Florida Statutes (F.S.) or 373.406, F.S., or otherwise be authorized by the applicable permit required under Part IV of Chapter 373, F.S., by the Department of Environmental Protection, a water management district under section 373.069, F.S., or a local government with delegated authority under section 373.441, F.S., and receive Water Quality Certification (WQC) and applicable Coastal Zone Consistency Concurrence (CZCC) or waiver thereto, as well as any authorizations required for the use of state-owned submerged lands under Chapter 253, F.S., and, as applicable, Chapter 258, F.S.

23. No work shall be performed until after the Permittee provides notification to the owner(s) or operator(s) of any marked utilities in the area of the structure.

24. Conformance with the descriptions and criteria contained herein does not necessarily guarantee authorization under this regional general permit. The District Engineer reserves the right to require that any request for authorization under this regional general permit be processed as a standard permit.

25. This regional general permit will be valid for a period of five years from the date specified above unless suspended or revoked by the District Engineer prior to that date. If SAJ-20 expires or is revoked prior to completion of the authorized work, authorization of activities that have commenced or are under contract to commence in reliance on SAJ-20 will remain in effect provided the activity is completed within 12 months of the date SAJ-20 expired or was revoked.

26. This authorization does not include conditions that would prevent the 'take' of a state-listed fish or wildlife species. These species are protected under sec. 379.411, Florida Statutes, and listed under Rule 68A-27, Florida Administrative Code. With regard to fish and wildlife species designated as species of special concern or threatened by the State of Florida, you are responsible for coordinating directly with the Florida Fish and Wildlife Conservation Commission (FWC). You can visit the FWC license and permitting webpage (<http://www.myfwc.com/license/wildlife/>) for more information, including a list of those fish and wildlife species designated as species of special concern or threatened. The Florida Natural Areas Inventory (<http://www.fnai.org/>) also maintains updated lists, by county, of documented occurrences of those species.

27. The Permittee shall perform all work in accordance with the general conditions for permits. The general conditions attached hereto are made a part of this permit.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:



Alan M. Dodd
Colonel, U. S. Army
District Commander

Enclosures:

Table 1 – Effect determinations for Federally listed species in Florida

General Conditions

Figure 1 – Coastal Lakes

Figure 2 – Elkhorn and Staghorn coral critical habitat maps

Standard Manatee Conditions for In-Water Work, 2011

Sea Turtle and Smalltooth Sawfish Construction Conditions, 2006

Appendix 1 – Noise restriction zones in smalltooth sawfish critical habitat

Appendices 2 – 5: Juvenile smalltooth sawfish hot spots (see special condition 10)

Construction Guidelines in Florida for Minor Piling-Supported Structures Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat - U.S. Army Corps of Engineers/National Marine Fisheries Service - August 2001

Key for Construction Conditions for Docks or Other Minor Structures Constructed in or Over Johnson's seagrass (*Halophila johnsonii*) - National Marine Fisheries Service/U.S. Army Corps of Engineers - October 2002

NOAA Fisheries Service - Vessel Strike Avoidance Measures and Reporting for Mariners

Table 1			
Federally Listed Species in Florida			
Consultation for Regional General Permit SAJ-20 Private Single-family Docks/Piers in Florida			
<i>Finding</i>	<i>Agency</i>	<i>Status</i>	<i>Species Listing</i>
MAMMALS			
NE	FWS	E	Bat, Grey (<i>Myotis grisescens</i>)
NE	FWS	E	Deer, Key (<i>Odocoileus virginianus clavium</i>)
MANLAA	FWS*	E	Manatee, West Indian (<i>Trichechus manatus</i>)
NE	FWS	E	Mouse, Anastasia Island Beach (<i>Peromyscus polionotus phasma</i>)
NE	FWS*	E	Mouse, Choctawhatchee Beach (<i>Peromyscus polionotus allophrys</i>)
NE	FWS	E	Mouse, Key Largo Cotton (<i>Peromyscus gossypinus allapaticola</i>)
NE	FWS*	E	Mouse, Perdido Key Beach (<i>Peromyscus polionotus trissyllepsis</i>)
NE	FWS	T	Mouse, Southeastern Beach (<i>Peromyscus polionotus niveiventris</i>)
NE	FWS*	E	Mouse, St. Andrew Beach (<i>Peromyscus polionotus peninsularis</i>)
NE	FWS	E	Panther, Florida (<i>Puma concolor coryi</i>)
NE	FWS	E	Rabbit, Lower Keys Marsh (<i>Sylvilagus palustris hefneri</i>)
NE	FWS*	E	Rice Rat (Lower FL Keys) (<i>Oryzomys palustris natator</i>)
NE	FWS	E	Vole, Florida Salt Marsh (<i>Microtus pennsylvanicus dukecampbelli</i>)
NE	NMFS	E	Whale, Blue (<i>Balaenoptera musculus</i>)
NE	NMFS	E	Whale, Finback (<i>Balaenoptera physalus</i>)
NE	NMFS	E	Whale, Humpback (<i>Megaptera novaeangliae</i>)
NE	NMFS*	E	Whale, Right (<i>Eubalaena glacialis</i>)
NE	NMFS	E	Whale, Sei (<i>Balaenoptera borealis</i>)
NE	NMFS	E	Whale, Sperm (<i>Physeter macrocephalus</i>)
NE	FWS	E	Wolf, Red (<i>Canis rufus</i>)
NE	FWS	E	Woodrat, Key Largo (<i>Neotoma floridana smalli</i>)
BIRDS			
NE	FWS	T	Caracara, Audubon's Crested (<i>Polyborus plancus audubonii</i>)
NE	FWS	T	Jay, Florida Scrub (<i>Aphelocoma coerulescens</i>)
NE	FWS*	E	Kite, Everglade Snail (<i>Rostrhamus sociabilis plumbeus</i>)
NE	FWS*	T	Plover, Piping (<i>Charadrius melodus</i>)
NE	FWS	E	Sparrow, Cape Sable Seaside (<i>Ammodramus(=Ammospiza) maritimus mirabilis</i>)
NE	FWS	E	Sparrow, Florida Grasshopper (<i>Ammodramus savannarum floridanus</i>)
NE	FWS	E	Stork, Wood (<i>Mycteria americana</i>)
NE	FWS	T	Tern, Roseate (<i>Sterna dougallii dougallii</i>)
NE	FWS	E	Warbler, Bachman's (<i>Vermivora bachmanii</i>)
NE	FWS	E	Warbler, Kirtland's (<i>Dendroica kirtlandii</i>)
NE	FWS	E	Woodpecker, Red-cockaded (<i>Picoides borealis</i>)
REPTILES & AMPHIBIANS			
NE	FWS*	T	Crocodile, American (<i>Crocodylus acutus</i>)
NE	FWS*	T	Salamander, Frosted Flatwoods (<i>Ambystoma cingulatum</i>)
NE	FWS*	E	Salamander, Reticulated Flatwoods (<i>Ambystoma bishopi</i>)
MANLAA	NMFS/FWS	E	Sea Turtle, Green (<i>Chelonia mydas</i>)

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Table 1 Continued			
<i>Finding</i>	<i>Agency</i>	<i>Status</i>	<i>Species Listing</i>
			REPTILES & AMPHIBIANS continued
MANLAA	NMFS/FWS	E	Sea Turtle, Hawksbill (<i>Eretmochelys imbricata</i>)
MANLAA	NMFS/FWS	E	Sea Turtle, Kemp's ridley (<i>Lepidochelys kempii</i>)
MANLAA	NMFS/FWS	E	Sea turtle, Leatherback (<i>Dermochelys coriacea</i>)
MANLAA	NMFS/FWS	T	Sea Turtle, Loggerhead (<i>Caretta caretta</i>)
NE	FWS	T	Skink, Bluetail Mole (<i>Eumeces egregius lividus</i>)
NE	FWS	T	Skink, Sand (<i>Neoseps reynoldsi</i>)
NE	FWS	T	Snake, Atlantic Salt Marsh (<i>Nerodia clarkii taeniata</i>)
NE	FWS	T	Snake, Eastern Indigo (<i>Drymarchon corais couperi</i>)
<i>Finding</i>	<i>Agency</i>	<i>Status</i>	FISH
NE	FWS	T	Darter, Okaloosa (<i>Etheostoma okaloosae</i>)
MANLAA	NMFS ¹	E	Sawfish, Smalltooth (<i>Pristis pectinata</i>)
MANLAA	NMFS/FWS*	T	Sturgeon, Gulf (<i>Acipenser oxyrinchus desotoi</i>)
MANLAA	NMFS	E	Sturgeon, Shortnose (<i>Acipenser brevirostrum</i>)
MANLAA	NMFS	E	Sturgeon, Atlantic (<i>Acipenser oxyrinchus oxyrinchus</i>)
<i>Finding</i>	<i>Agency</i>	<i>Status</i>	INVERTEBRATES
MANLAA	FWS*	T	Bankclimber, Purple (<i>Elliptoideus sloatianus</i>)
MANLAA	FWS*	E	Bean, Choctaw (<i>Villosa choctawensis</i>)
NE	FWS	E	Butterfly, Schaus Swallowtail (<i>Heraclides aristodemus ponceanus</i>)
NE	NMFS*	T	Coral, Elkhorn (<i>Acropora palmata</i>)
NE	NMFS*	T	Coral, Staghorn (<i>Acropora cervicornis</i>)
MANLAA	FWS*	E	Ebonysshell, Round (<i>Fosconaia rotulata</i>)
MANLAA	FWS*	E	Kidneyshell, Southern (<i>Ptychobranhus jonesi</i>)
MANLAA	FWS*	E	Moccasinshell, Gulf (<i>Medionidus penicillatus</i>)
MANLAA	FWS*	E	Moccasinshell, Ochlockonee (<i>Medionidus simpsonianus</i>)
MANLAA	FWS*	T	Pigtoe, Fuzzy (<i>Pleurobema strodeanum</i>)
MANLAA	FWS*	T	Pigtoe, Narrow (<i>Fusconaia Escambia</i>)
MANLAA	FWS*	E	Pigtoe, Oval (<i>Pleurobema pyriforme</i>)
MANLAA	FWS*	T	Pigto, Tapered (<i>Fusconaia burkei</i>)
MANLAA	FWS*	E	Pocketbook, Shinyrayed (<i>Lampsilis subangulata</i>)
MANLAA	FWS*	T	Sandshell, Southern (<i>Hamiota australis</i>)
NE	FWS	T	Shrimp, Squirrel Chimney Cave (<i>Palaemonetes cummingi</i>)
MANLAA	FWS*	T	Slabshell, Chipola (<i>Elliptio chipolaensis</i>)
NE	FWS	T	Snail, Stock Island Tree (<i>Orthalicus reses</i>)
MANLAA	FWS*	E	Three-ridge, Fat (<i>Amblema neislerii</i>)
<i>Finding</i>	<i>Agency</i>	<i>Status</i>	PLANTS
NE	FWS	E	Aster, Florida Golden (<i>Chrysopsis floridana</i>)
NE	FWS	E	Beargrass, Britton's (<i>Nolina brittoniana</i>)
NE	FWS	E	Beauty, Harper's (<i>Harperocallis flava</i>)
NE	FWS	E	Bellflower, Brooksville (<i>Campanula robinsiae</i>)
NE	FWS	T	Birds-in-a-nest, White (<i>Macbridea alba</i>)
NE	FWS	E	Blazingstar, Scrub (<i>Liatrix ohlingerae</i>)

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Table 1 Continued			
<i>Finding</i>	<i>Agency</i>	<i>Status</i>	<i>Species Listing</i>
			PLANTS continued
NE	FWS	T	Bonamia, Florida (<i>Bonamia grandiflora</i>)
NE	FWS	T	Buckwheat, Scrub (<i>Eriogonum longifolium gnaphalifolium</i>)
NE	FWS	T	Butterwort, Godfrey's (<i>Pinguicula ionantha</i>)
NE	FWS	E	Cactus, Key tree (<i>Pilosocereus robinii</i>)
NE	FWS	E	Campion, Fringed (<i>Silene polypetala</i>)
NE	FWS	E	Chaffseed, American (<i>Schwalbea americana</i>)
NE	FWS	E	Cladonia, Florida Perforate (<i>Cladonia perforata</i>)
NE	FWS	E	Fringe-tree, Pygmy (<i>Chionanthus pygmaeus</i>)
NE	FWS	T	Gooseberry, Miccosukee (<i>Ribes echinellum</i>)
NE	FWS	E	Gourd, Okeechobee (<i>Cucurbita okeechobeensis okeechobeensis</i>)
NE	FWS	E	Harebells, Avon Park (<i>Crotalaria avonensis</i>)
NE	FWS	E	Hypericum, Highlands Scrub (<i>Hypericum cumulicola</i>)
NE	FWS	E	Jacquemontia, Beach (<i>Jacquemontia reclinata</i>)
NE	FWS	E	Lead-plant, Crenulate (<i>Amorpha crenulata</i>)
NE	FWS	E	Lupine, Scrub (<i>Lupinus aridorum</i>)
NE	FWS	E	Meadowrue, Cooley's (<i>Thalictrum cooleyi</i>)
NE	FWS	E	Milkpea, Small's (<i>Galactia smallii</i>)
NE	FWS	E	Mint, Garrett's (<i>Dicerandra christmanii</i>)
NE	FWS	E	Mint, Lakela's (<i>Dicerandra immaculata</i>)
NE	FWS	E	Mint, Longspurred (<i>Dicerandra comutissima</i>)
NE	FWS	E	Mint, Scrub (<i>Dicerandra frutescens</i>)
NE	FWS	E	Mustard, Carter's (<i>Warea carteri</i>)
NE	FWS	E	Pawpaw, Beautiful (<i>Deeringothamnus pulchellus</i>)
NE	FWS	E	Pawpaw, Four-petal (<i>Asimina tetramera</i>)
NE	FWS	E	Pawpaw, Rugel's (<i>Deeringothamnus rugelii</i>)
NE	FWS	T	Pigeon Wings (<i>Clitoria fragrans</i>)
NE	FWS	E	Pinkroot, Gentian (<i>Spigelia gentianoides</i>)
NE	FWS	E	Plum, Scrub (<i>Prunus geniculata</i>)
NE	FWS	E	Polygala, Lewton's (<i>Polygala lewtonii</i>)
NE	FWS	E	Polygala, Tiny (<i>Polygala smallii</i>)
NE	FWS	E	Prickly-apple, fragrant (<i>Cereus eriophorus fragrans</i>)
NE	FWS	E	Rhododendron, Chapman (<i>Rhododendron chapmanii</i>)
NE	FWS	E	Rosemary, Apalachicola (<i>Conradina glabra</i>)
NE	FWS	E	Rosemary, Etonia (<i>Conradina etonia</i>)
NE	FWS	E	Rosemary, Short-leaved (<i>Conradina brevifolia</i>)
NE	FWS	E	Sandlace (<i>Polygonella myriophylla</i>)
MANLAA	NMFS ²	T	Seagrass, Johnson's (<i>Halophila johnsonii</i>)
NE	FWS	T	Skullcap, Florida (<i>Scutellaria floridana</i>)
NE	FWS	E	Snakeroot (<i>Eryngium cuneifolium</i>)
NE	FWS	E	Spurge, Deltoid (<i>Chamaesyce deltoidea deltoidea</i>)
NE	FWS	T	Spurge, Garber's (<i>Chamaesyce garberi</i>)
NE	FWS	T	Spurge, Telephus (<i>Euphorbia telephioides</i>)
NE	FWS	E	Torreya, Florida (<i>Torreya taxifolia goveniana</i>)
NE	FWS	E	Warea, Wide-leaf (<i>Warea amplexifolia</i>)

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Table 1 Continued			
<i>Finding</i>	<i>Agency</i>	<i>Status</i>	<i>Species Listing</i>
			PLANTS continued
NE	FWS	E	Water-willow, Cooley's (<i>Justicia cooleyi</i>)
NE	FWS	T	Whitlow-wort, Papery (<i>Paronychia chartacea</i>)
NE	FWS	E	Wireweed (<i>Polygonella basiramia</i>)
NE	FWS	E	Ziziphus, Florida (<i>Ziziphus celata</i>)
Endangered (E), Threatened (T), Candidate Species (C), U.S. Fish & Wildlife Service (FWS), National Marine Fisheries Service (NMFS), No Effect (NE), May Affect Not Likely to Adversely Affect (MANLAA), Likely to Adversely Affect (LAA)			
*Finding also applies to Designated Critical Habitat			
1 – LAA for Smalltooth sawfish Designated Critical Habitat			
2 – LAA for Johnson's seagrass Designated Critical Habitat			

GENERAL CONDITIONS FOR DEPARTMENT OF THE ARMY GENERAL PERMITS

General Conditions

1. The time limit for completing the work authorized ends on **March 22, 2018**.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature and mailing address of the new owner in the space provided below and forward a copy of the permit to this office to validate the transfer of this authorization.
5. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Further Information:

1. Limits of this authorization.
 - a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.
 - b. This permit does not grant any property rights or exclusive privileges.
 - c. This permit does not authorize any injury to the property or rights of others.
 - d. This permit does not authorize interference with any existing or proposed Federal projects.
2. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:
 - a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
 - b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
 - c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
 - d. Design or construction deficiencies associated with the permitted work.
 - e. Damage claims associated with any future modification, suspension, or revocation of this permit.

3. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

4. Reevaluation of Permit Decision: This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 3 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

5. Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE-SIGNATURE)

(DATE)

(NAME-PRINTED)

(ADDRESS)

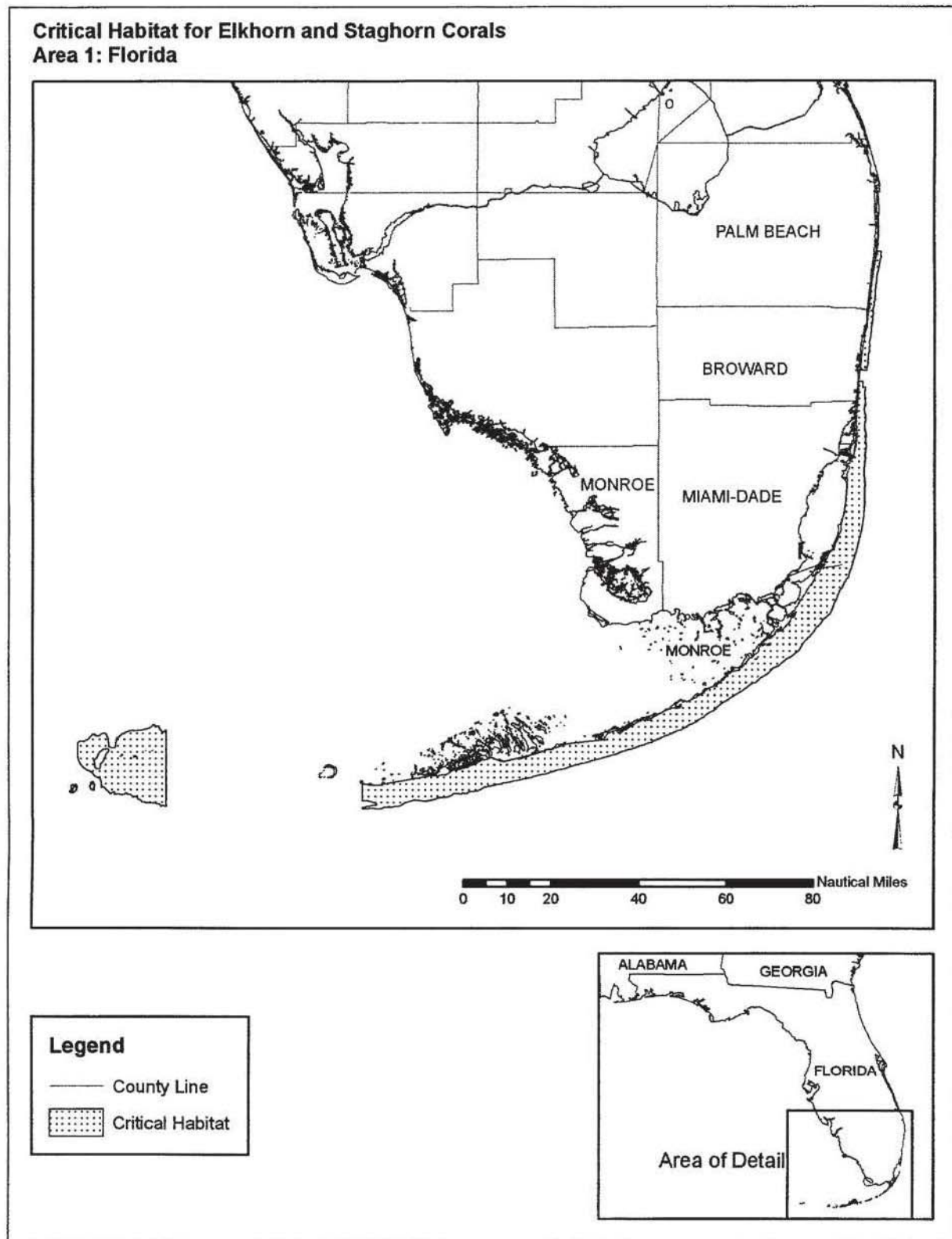
GENERAL PERMIT

Florida Panhandle Coastal Dune Lakes



Regional General Permit SAJ-20

Figure 2.





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

The permittee shall comply with the following protected species construction conditions:

- a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.
- b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.
- c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.
- d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.
- e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.
- f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.
- g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

Revised: March 23, 2006

O:\forms\Sea Turtle and Smalltooth Sawfish Construction Conditions.doc



STANDARD MANATEE CONDITIONS FOR IN-WATER WORK
2011

The Permittee shall comply with the following conditions intended to protect manatees from direct project effects:

- a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The Permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
- b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or in Vero Beach (1-772-562-3909) for south Florida, and emailed to FWC at ImperiledSpecies@myFWC.com.
- f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the Permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8½ " by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at http://www.myfwc.com/WILDLIFEHABITATS/manatee_sign_vendors.htm. Questions concerning these signs can be forwarded to the email address listed above.

CAUTION: MANATEE HABITAT

All project vessels

IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work
all in-water activities must

SHUT DOWN

Report any collision with or injury to a manatee:

Wildlife Alert:

1-888-404-FWCC(3922)

cell *FWC or #FWC



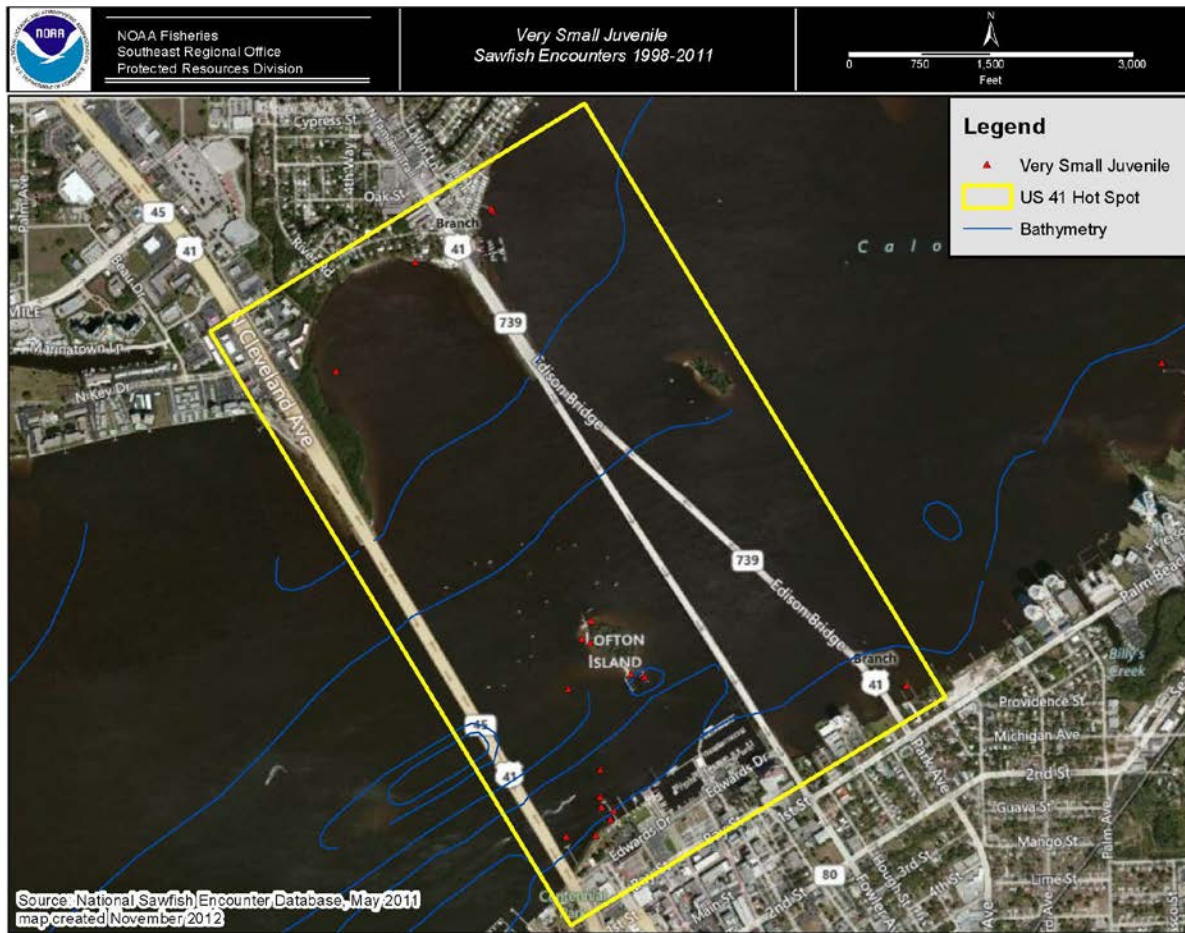
Regional General Permit SAJ-20

Appendix 1.

Appendix 1: Noise restriction zones in smalltooth sawfish critical habitat.

Name	Latitude	Longitude
U.S. 41 Bridges		
US 41 NW	26.660413°	-81.885243°
US 41 NE	26.666827°	-81.872966°
US 41 SW	26.642991°	-81.873880°
US 41 SE	26.649405°	-81.861605°
Iona Cove		
IC NW	26.521437°	-81.991586°
IC NE	26.521212°	-81.976191°
IC SW	26.511762°	-81.991762°
IC SE	26.511537°	-81.976368°
Glover Bight		
GB NW	26.542971°	-81.997791°
GB NE	26.542678°	-81.977745°
GB SW	26.529478°	-81.998035°
GB SE	26.529185°	-81.977992°
Cape Coral		
CC 1	26.551662°	-81.947412°
CC 2	26.551561°	-81.940683°
CC 3	26.539075°	-81.940916°
CC 4	26.539205°	-81.951049°
CC 5	26.542181°	-81.951047°
CC 6	26.542133°	-81.947776°

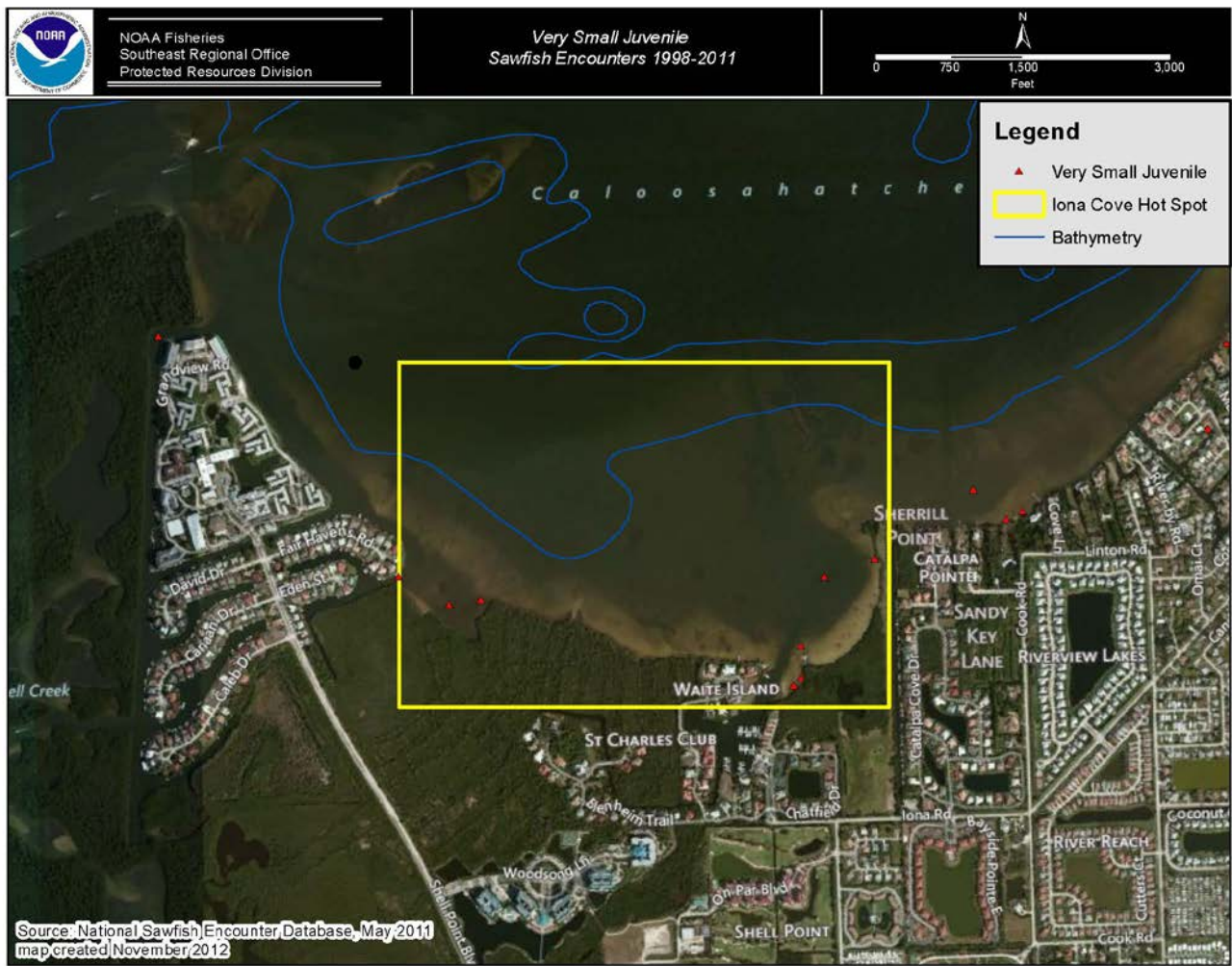
Regional General Permit SAJ-20 Appendix 2.



Appendix 2: U.S. 41 Bridges with very small juvenile sawfish encounters

Regional General Permit SAJ-20

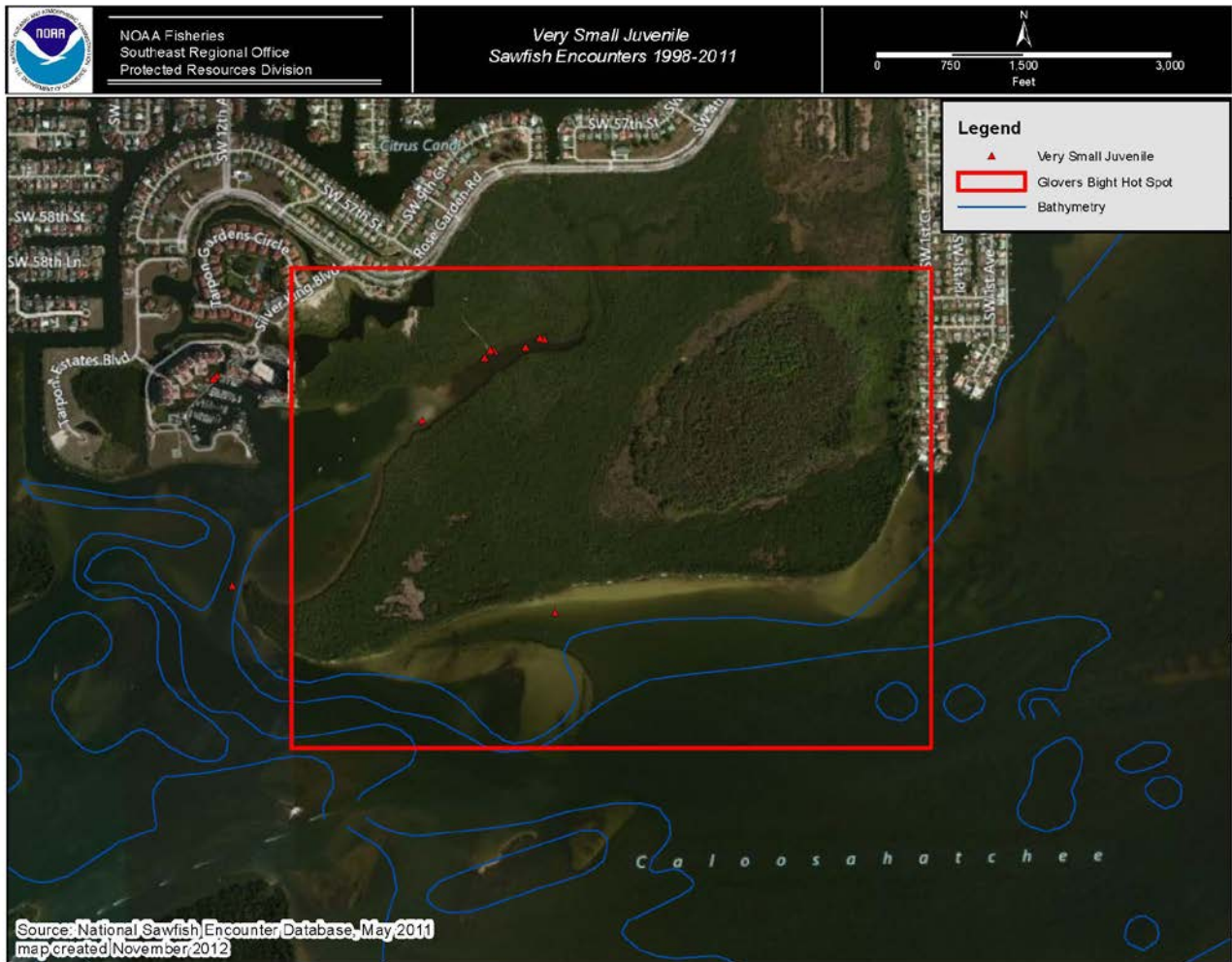
Appendix 3.



Appendix 3: Iona Cove with very small juvenile sawfish encounters

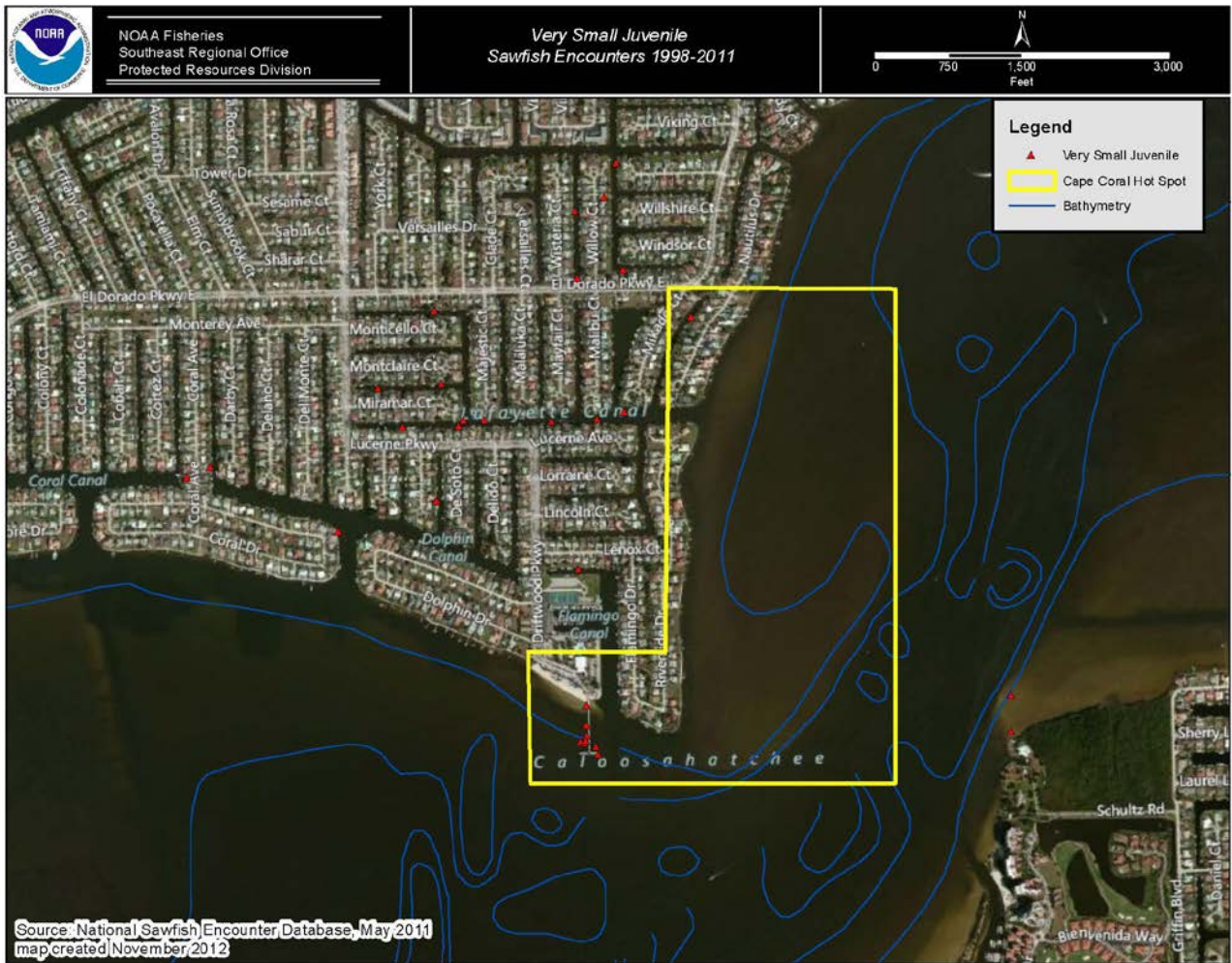
Regional General Permit SAJ-20

Appendix 4.



Appendix 4: Glove Bight with very small juvenile sawfish encounters

Regional General Permit SAJ-20 Appendix 5.



Appendix 5: Cape Coral Canals with very small juvenile sawfish encounters

**Dock Construction Guidelines in Florida for Docks or Other Minor Structures
Constructed in or over Submerged Aquatic Vegetation (SAV), Marsh or Mangrove Habitat
U.S. Army Corps of Engineers/National Marine Fisheries Service
August 2001**

Submerged Aquatic Vegetation:

1. Avoidance. The pier shall be aligned so as to minimize the size of the footprint over SAV beds.
2. The height of pier shall be a minimum of 5 feet above MHW/OHW as measured from the top surface of the decking.
3. The width of the pier is limited to a maximum of 4 feet. A turnaround area is allowed for piers greater than 200 feet in length. The turnaround is limited to a section of the pier no more than 10 feet in length and no more than 6 feet in width. The turnaround shall be located at the midpoint of the pier.
4. Over-SAV bed portions of the pier shall be oriented in a north-south orientation to the maximum extent that is practicable.
5. a. If possible, terminal platforms shall be placed in deep water, waterward of SAV beds or in an area devoid of SAV beds.

b. If a terminal platform is placed over SAV areas and constructed of grated decking, the total size of the platform shall be limited to 160 square feet. The grated deck material shall conform to the specifications stipulated below. The configuration of the platform shall be a maximum of 8 feet by 20 feet. A minimum of 5 feet by 20 feet shall conform to the 5-foot height requirement; a 3 feet by 20 feet section may be placed 3 feet above MHW to facilitate boat access. The long axis of the platform should be aligned in a north-south direction to the maximum extent that is practicable.

c. If the terminal platform is placed over SAV areas and constructed of planks, the total size of the platform shall be limited to 120 square feet. The configuration of the platform shall be a maximum of 6 feet by 20 feet of which a minimum 4-foot wide by 20-foot long section shall conform to the 5-foot height requirement. A section may be placed 3 feet above MHW to facilitate boat access. The 3 feet above MHW section shall be cantilevered. The long axis of the platform should be aligned in a north-south direction to the maximum extent that is practicable. If the 3 feet above MHW section is constructed with grating material, it may be 3 feet wide.
6. One uncovered boat lift area is allowed. A narrow catwalk (2 feet wide if planks are used, 3 feet wide if grating is used) may be added to facilitate boat maintenance along the outboard side of the boat lift and a 4-foot wide walkway may be added along the stern end of the boat lift, provided all such walkways are elevated 5 feet above MHW. The catwalk shall be cantilevered from the outboard mooring pilings (spaced no closer than 10 feet apart).
7. Pilings shall be installed in a manner which will not result in the formation of sedimentary deposits("donuts" or "halos") around the newly installed pilings. Pile driving is the preferred method of installation, but jetting with a low pressure pump may be used.
8. The spacing of pilings through SAV beds shall be a minimum of 10 feet on center.
9. The gaps between deckboards shall be a minimum of ½ inch.

Marsh:

1. The structure shall be aligned so as to have the smallest over-marsh footprint as practicable.
2. The over-marsh portion of the dock shall be elevated to at least 4 feet above the marsh floor.
3. The width of the dock is limited to a maximum of 4 feet. Any exceptions to the width must be accompanied by an equal increase in height requirement.

Mangroves.

1. The width of the dock is limited to a maximum of 4 feet.
2. Mangrove clearing is restricted to the width of the pier.
3. The location and alignment of the pier should be through the narrowest area of the mangrove fringe.

Grid Specifications and Suppliers

The following information does not constitute a U.S. Army Corps of Engineers endorsement or advertisement for any particular provider and is provided only as an example for those interested in obtaining these materials for dock construction. A type of fiberglass grate panel is manufactured by SeaSafe (Lafayette, LA; phone: 1-800-326-8842) and FiberGrate (1-800-527-4043). Plastic grate panels are also available from Southern Pine Lumber Company (Stuart, FL; phone: 772-692-2300). Panels are available in a variety of sizes and thicknesses. For safety, the grate should contain an anti-slip texture which is integrally molded into the top surface. The manufacturer or local distributor should be consulted to ensure that the load-bearing capacity of the selected product is sufficient to support the intended purpose. Contact the manufacturer(s) for product specifications and a list of regional distributors.

**Key¹ for Construction Conditions for Docks or Other Minor Structures Constructed
in or Over Johnson's Seagrass (*Halophila johnsonii*)
National Marine Fisheries Service/U.S. Army Corps of Engineers
October 2002**

- 1a. The construction site is within the known range of Johnson's seagrass occurrence (Sebastian Inlet to central Biscayne Bay in the lagoonal systems on the east coast of Florida). *Go to 2.*
- 1b. The construction site is not within the known range of Johnson's seagrass occurrence but submerged aquatic vegetation (SAV) is present at the site. Use "*Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation, Marsh or Mangrove Habitat*" - U.S. Army Corps of Engineers/National Marine Fisheries Service, August 2001.
- 1c. The construction site is not within the range of Johnson's seagrass and SAV is not present at the site: *No construction conditions for SAV are necessary.*
- 2a. Seagrass survey for Johnson's seagrass is performed at the proposed site during the April 1 – August 31 growing season. *Go to 3.*
- 2b. No survey for Johnson's seagrass is performed at the proposed site during the growing season, or a survey is performed at the proposed site but is outside of the growing season. *Go to 4.*
- 3a. Johnson's seagrass is present at the proposed construction site. *Go to 5.*
- 3b. Johnson's seagrass is not present at the proposed construction site. *Go to 6.*
- 4a. The construction is in an area designated by the National Marine Fisheries Service - Protected Resources Division (NMFS-PRD) as **critical habitat²** for Johnson's seagrass. Use "*Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation, Marsh or Mangrove Habitat*" - U.S. Army Corps of Engineers/National Marine Fisheries Service, August 2001, **except that light-transmitting materials² (LTMs) shall comprise 100% of all pedestrian surfaces waterward of the mean low water (MLW) line.**
- 4b. The construction is not in an area designated by NMFS-PRD as critical habitat for Johnson's seagrass. Use "*Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation, Marsh or Mangrove Habitat*" - U.S. Army Corps of Engineers/National Marine Fisheries Service, August 2001, **except that LTMs shall comprise at least 75% of all pedestrian surfaces waterward of the MLW line and a minimum 1-inch spacing shall be maintained between all wooden deckboards used waterward of the MLW line.**
- 5a. The construction is in an area designated by NMFS-PRD as critical habitat for Johnson's seagrass. Use "*Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation, Marsh or Mangrove Habitat*" - U.S. Army Corps of Engineers/National Marine Fisheries Service, August 2001, **except that LTMs shall comprise at least 75% of all pedestrian surfaces waterward of the MLW line and a minimum 1-inch spacing shall be maintained between all wooden deckboards used waterward of the MLW line.**
- 5b. The construction is not in an area designated by NMFS-PRD as critical habitat for Johnson's seagrass. Use "*Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation, Marsh or Mangrove Habitat*" - U.S. Army Corps of Engineers/National Marine Fisheries Service, August 2001, **except that all pedestrian surfaces directly over Johnson's seagrass areas shall be constructed of LTMs and a minimum**

This key was modified in October 2002 to change the percent light transmittance requirement of the grids from 46 to 43 as stipulated in Note #3 .

1-inch spacing shall be maintained between all wooden deckboards used waterward of the MLW line.

- 6a.** The construction is in an area designated by NMFS-PRD as critical habitat for Johnson's seagrass. *Use "Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation, Marsh or Mangrove Habitat" - U.S. Army Corps of Engineers/National Marine Fisheries Service, August 2001, except that a minimum 1-inch spacing shall be maintained between all wooden deckboards used waterward of the MLW line.*
- 6b.** The construction is not in an area designated by NMFS as critical habitat for Johnson's seagrass. *Go to 7*
- 7a.** SAV other than Johnson's seagrass is present at the site. *Use "Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation, Marsh or Mangrove Habitat" - U.S. Army Corps of Engineers/National Marine Fisheries Service, August 2001.*
- 7b.** No SAV present. *No construction conditions for SAV are necessary.*

Notes:

- ¹ This key is meant to complement but not supersede the "*Dock Construction Guidelines in Florida for Docks or Other Minor Structures Constructed in or over Submerged Aquatic Vegetation, Marsh or Mangrove Habitat - U.S. Army Corps of Engineers/National Marine Fisheries Service, August 2001.* **Docks incorporating light-transmitting materials shall not exceed the dimensions recommended in the Guidelines.**
- ² Federal Register 65 FR 17786, April 5, 2000, Designation of critical habitat for Johnson's seagrass.
- ³ Light-transmitting materials are made of various materials shaped in the form of grids, grates, lattices, etc., to allow the passage of light through the open spaces. **All light-transmitting materials used for dock construction in the known range of Johnson's seagrass shall have a minimum of forty-three (43) percent open space.**



Vessel Strike Avoidance Measures and Reporting for Mariners NOAA Fisheries Service, Southeast Region

Background

The National Marine Fisheries Service (NMFS) has determined that collisions with vessels can injure or kill protected species (e.g., endangered and threatened species, and marine mammals). The following standard measures should be implemented to reduce the risk associated with vessel strikes or disturbance of these protected species to discountable levels. NMFS should be contacted to identify any additional conservation and recovery issues of concern, and to assist in the development of measures that may be necessary.

Protected Species Identification Training

Vessel crews should use an Atlantic and Gulf of Mexico reference guide that helps identify protected species that might be encountered in U.S. waters of the Atlantic Ocean, including the Caribbean Sea, and Gulf of Mexico. Additional training should be provided regarding information and resources available regarding federal laws and regulations for protected species, ship strike information, critical habitat, migratory routes and seasonal abundance, and recent sightings of protected species.

Vessel Strike Avoidance

In order to avoid causing injury or death to marine mammals and sea turtles the following measures should be taken when consistent with safe navigation:

1. Vessel operators and crews should maintain a vigilant watch for marine mammals and sea turtles to avoid striking sighted protected species.
2. When whales are sighted, maintain a distance of 100 yards or greater between the whale and the vessel.
3. When sea turtles or small cetaceans are sighted, attempt to maintain a distance of 50 yards or greater between the animal and the vessel whenever possible.
4. When small cetaceans are sighted while a vessel is underway (e.g., bow-riding), attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area.
5. Reduce vessel speed to 10 knots or less when mother/calf pairs, groups, or large assemblages of cetaceans are observed near an underway vessel, when safety permits. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary measures should always be exercised. The vessel should attempt to route around the animals, maintaining a minimum distance of 100 yards whenever possible.

6. Whales may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, reduce speed and shift the engine to neutral. Do not engage the engines until the animals are clear of the area.

Additional Requirements for the North Atlantic Right Whale

1. If a sighted whale is believed to be a North Atlantic right whale, federal regulation requires a minimum distance of 500 yards be maintained from the animal (50 CFR 224.103 (c)).
2. Vessels entering North Atlantic right whale critical habitat are required to report into the Mandatory Ship Reporting System.
3. Mariners should check with various communication media for general information regarding avoiding ship strikes and specific information regarding North Atlantic right whale sighting locations. These include NOAA weather radio, U.S. Coast Guard NAVTEX broadcasts, and Notices to Mariners. Commercial mariners calling on United States ports should view the most recent version of the NOAA/USCG produced training CD entitled "A Prudent Mariner's Guide to Right Whale Protection" (contact the NMFS Southeast Region, Protected Resources Division for more information regarding the CD).
4. Injured, dead, or entangled right whales should be immediately reported to the U.S. Coast Guard via VHF Channel 16.

Injured or Dead Protected Species Reporting

Vessel crews should report sightings of any injured or dead protected species immediately, regardless of whether the injury or death is caused by your vessel.

Report marine mammals to the Southeast U.S. Stranding Hotline: 877-433-8299

Report sea turtles to the NMFS Southeast Regional Office: 727-824-5312

If the injury or death of a marine mammal was caused by a collision with your vessel, responsible parties should remain available to assist the respective salvage and stranding network as needed. NMFS' Southeast Regional Office should be immediately notified of the strike by email (takereport.nmfsser@noaa.gov) using the attached vessel strike reporting form.

For additional information, please contact the Protected Resources Division at:

NOAA Fisheries Service
Southeast Regional Office

263 13th Avenue South
St. Petersburg, FL 33701

Tel: (727) 824-5312

Visit us on the web at <http://sero.nmfs.noaa.gov>