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RECOMMENDATIONS TO THE 03/2018 CAYO COSTA STATE PARK DRAFT UNIT MANAGEMENT PLAN

Prepared for: Daniel Alsentzer, Park Planner

Office of Park Planning _ Division of Recreation & Parks; FL DEP

INTRODUCTION: As a twenty year resident of Matlacha, on scores of occasions I have taken advantage of my home's close proximity and ease of boat access to take family and friends to Cayo Costa State Park. I have explored the tropical hardwoods, fished around the bayside mangrove swamps and have played on the beaches with my children and grandchildren. The island and state park is a true gem, unique not only to Florida but to America as a whole! As a land use planner with over 33 years of professional consulting experience (see www.StuartUrbanDesign.com), I have a unique perspective on Cayo Costa Island, both as a planning professional and as an avid recreational user. Consequently I am taking this time to offer my comments and recommendations in response to the Cayo Costa Advisory Group's Draft Unit Management Plan. I look forward to participating in the public planning process and the 20 March workshop. My reports emphasis revolves around the Draft Unit Management Plan's Resource Management Component basis (page 11, para. 4):

"Because park units are often components of larger ecosystems, their proper management can be affected by conditions and events that occur beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program that assesses resource conditions, evaluates management activities and refines management actions, and reviews local comprehensive plans and development permit applications for park/ecosystem impacts."

The issue(s) that I am concerned about and am offering recommendations through the public participation process concern larger ecosystem/recreational use management issues and the rela-

tionship of these issues to outside commercial public access, public communications and economics. Specifically, the purpose of this brief is to introduce an appropriate Resiliency/Distance-decay Recreation Management Approach, more cost effective management through an enhanced interpretive signage program, and a new, much needed funding mechanism.

CAYO COSTA MANAGEMENT GOALS AND BEST PLANNING PRACTICES: In summary, the key Cayo Costa State Park management goals are: (a.) to restore and maintain the islands natural communities and habitat, (b.) to maintain, improve or restore imperiled species populations and habitat, (c.) to provide public access and recreational opportunities, and (d.) to develop and maintain capital facilities and infrastructure necessary to meet the goals and objective of the management plan.



Fig. 1 Cayo Costa Island's Murdock Point and The Lagoon Looking South

From a land use and park planning and management perspective, there are instances where the afore referenced goals are in conflict with each other. As will be discussed, for various island recreation management zones the objective of providing public access and recreational opportunities can be in direct conflict with the objective of maintaining and restoring habitat. Consequently, it is of vital importance that the 2018 Cayo Costa Unit Management Plan specifically identify the area(s) that recreational users and public access conflict with conservation values and objectives. From such explicit identification, better management planning will evolve.

There are a number of factors to be evaluated when assessing and planning for recreational visitor utilization of lands with high conservation values. They are: (i) the conservation value of the site, (ii) its resistance to use, (iii) its recovery from use, (iv) its susceptibility to erosion, (v) the severity of direct and indirect impacts associated with specific activities, (vi) the amount of use, and (vii)

the ecological dimensions to the timing and total area of use (*10 Factors That Affect The Severity of Environmental Impacts of Visitors In Protected Areas*, Catherine Pickering; *Ambio*, 02/2010, 39(1)). For the purpose of this brief, these seven evaluative factors form Best Planning and Recreational Management practices for the author's recommendations to the 2018 Cayo Costa Unit Management Plan.

ISLAND SYSTEMS AND COASTAL DYNAMICS: The new Unit Management Plan is based on clear environmental, habitat and systems documentation. In order to strengthen the proposed draft, it is important integrate upland systems and coastal processes into a unified recreation management framework. The SW Florida barrier island morphodynamics analysis by Richard Davis has led to a more sophisticated understanding of Cayo Costa coastal processes (*Morphodynamics of the West-Central Florida barrier System: The delicate balance between wave and tide domination*; Richard A Davis, Jr. Dept. of Geology Un. of South Florida, Tampa, FL 33620 20 Jan. 1988). This work needs to be better factored into State Park recreation management planning as it pertains to coastal erosion, and coastal user and activity locations.



Cayo Costa Island _ A Complex & Ecologically Diverse Barrier Island Featuring Marine Tidal Marsh, Beach Dune, Coastal Grasslands, Maritime Hammock & Mangrove Swamp Systems.

Fig. 2 The Cayo Costa Island Inlet Morphology

As the Davis study notes, the island narrows from a maximum north end width of 1.7 mi +/- to a minimum south end width of less than 500-ft.. In doing the island's ecological systems become more exposed to risk caused by greater exposure to severe tides, storms sand burial, and unconstrained user recreation activities. Generally speaking, for the southern end of the island (one mile north from Captiva Pass to past The Narrows) there is an absence of east to west upland systems depth which creates less resistance to use, longer recovery period from use and impacts, and susceptibility to coastal and upland erosion.

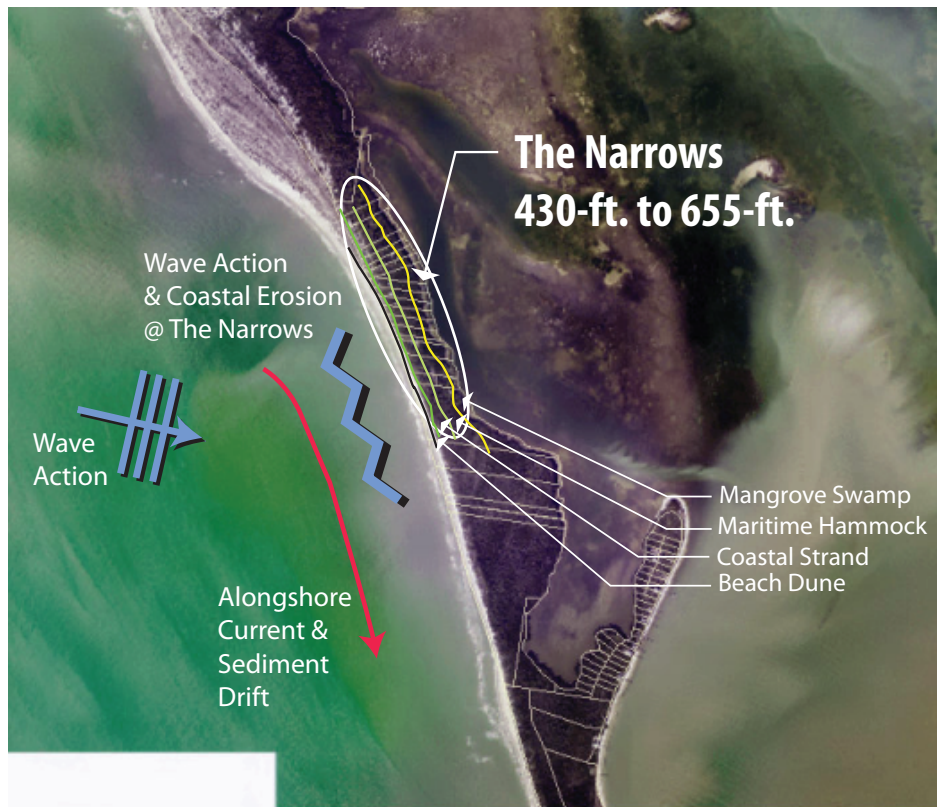
The south end of the island is bounded by Captiva Pass, a highly dynamic inlet system with associated beach erosion due to mixed conditions of natural evolution and anthropogenic change (*Evaluation of Beach Erosion Up-drift of Tidal Inlets In Southwest and Central FL*; Mohamed A Dabees and Brett Moore Humiston and Moore Engineers, 5679 Strand Ct Naples FL 34110 2017). Of particular note is the coastal cove area south of Murdock Bayou and within The Narrows geographic area. Due to wave action and north to southwest alongshore current, the curve of the coast is more susceptible to and has demonstrated a higher degree of coastal erosion. From the authors casual observations over time, it is clear that the lower and upper beach zones are regularly disturbed by high tides and storm waves. From an ecological perspective The Narrows upper beach zone recolonized by drift line annuals and trailing perennials. Above the reach of annual wave action is a very limited and thin fore dune area, consisting primarily of sea oats. From the authors observations, this zone exists under constant burial from sand blown off the beach and trampling from recreation users.



The Captiva Pass Inlet System _ A Complex Coastal Inlet System w./The 480-ft. +/- Wide Management Zones CC-10A & CC-10B Corresponding To The Narrows , An Area Noted For Dynamic Coastal Change Approx. 1 mi. North Of Captiva Pass

Fig. 3 Captiva Pass Inlet System Dynamics

The Narrows area is approximately 3,400-ft. in length, and 430-ft. to 700-ft. + in width. The Narrows consists of a Beach Zone, a Beach Dune Zone, a Coastal Strand Zone, a Maritime Hammock zone, and a Mangrove Swamp system. The Beach Dune zone is a predominantly herbaceous Sea Oats community occurring on the upper beach and fore dune. Due to the narrow geography and beach erosion, the Beach Dune community is limited in size and width. This area is not that stable, being disturbed by seasonal or storm high tides at least every few years. Behind the Beach Dune zone is the Coastal Strand shrubby community. It too is narrow and is occupied by grasses and trailing shrubs with a scattering of taller shrubs and cabbage palms. Located in front of the Mangrove Swamp system is the Narrow's Maritime Hammock. This includes the shell mound community identified in the Management Plan's Cultural Resources elements, along with FLUCCS 425 (tropical hardwoods), and 427 (live oak). Other than the dense Mangrove Swamp system, the Narrow's Maritime Hammock has an area and dimension that grants it a comparatively higher degree of resiliency when compared to the Coastal Strand and Beach Dune zones.



The Narrows Upland Systems _

- * Due To Narrow 430-ft. + Width Low Resistance To Recreational Use & User Impacts, Limited Recovery Potential & Susceptibility To Erosion
- * Management Zones CC-10A, CC-10B & CC-10C
- * FLUCCS 425 Tropical Hardwoods & Some 427 Live Oak, and Coastal Strand Behind The Dune Zone w./Scattered Grasses (grama grass and sea oats) & Shrubs (FL lantana); Beach Dune Zone Species of Concern Include Gopher Tortoise In CS and Roseate Tern, Piping & Snowy Plover, & Loggerhead, Green and Kemps Ridley Sea Turtle

Fig. 4 The Narrows Upland Systems

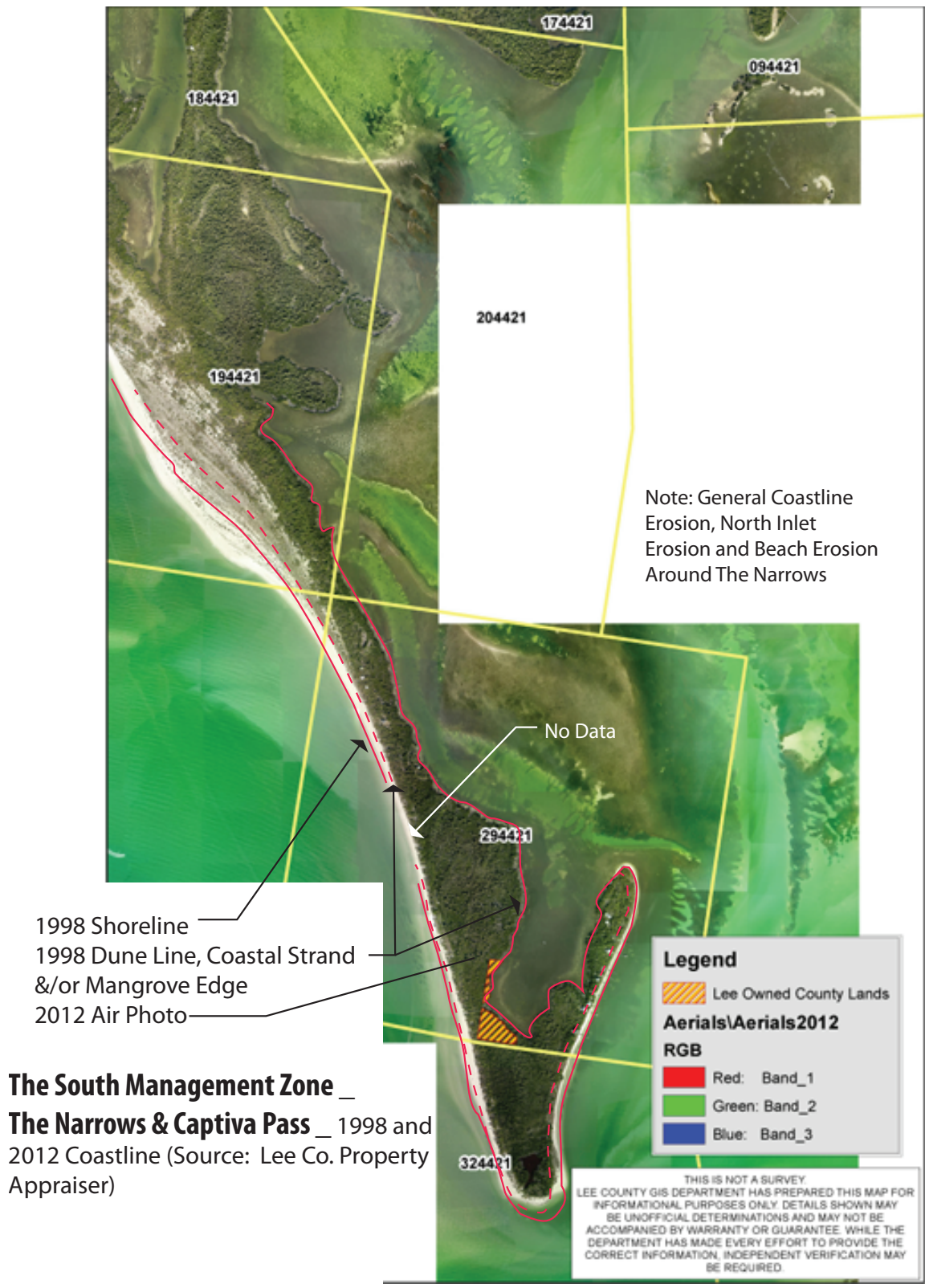


Fig. 5 The South Zone Coastal Erosion

THE RESILIENCY DISTANCE DECAY RECREATIONAL MANAGEMENT ASSESSMENT:

The utilized recreational management assessment is based on an integrated, systems analytical approach that factors in Cayo Costa Island geography, island morphology and coastal processes, ecology, habitat, and user activities. Referring to Figure Five, based on the island's "drumstick" form, Boca Grande Pass and Captiva Pass Inlet systems, the island's macro-geomorphic processes, and ecological systems, habitats and state park facilities and infrastructure, it is very clear that the north end of the island has the highest resilience to recreational uses and coastal processes.

The analysis divides the island into three "Resiliency Zones". The first zone is located in the island's north end. It is the widest part of the island, ranging from 0.7 mi. to 1.7 mi. in width. It contains approximately 1,500 acres, equal to 2.3 square miles. The North Zone is characterized as having high recreational user resiliency because of its width that grants superior habitat resiliency in area and depth. Due to its larger area and width, ecological zones and habitats have enhanced resistance to user activities, have better recovery from use and impacts, and have limited proportional impacted areas due to size. The North Resiliency Zone is noted for beach accretion due to south Boca Grande Pass coastal processes. The North Zone has a large variety of hardened trail systems, and good, back-bay boat docking and support facilities. These factors grant the north end superior user resiliency when compared to the middle and southern portions of Cayo Costa. Hence, it is logical to have the park's active and passive recreational facilities in this zone. The draft 2018 Unit Management Plan is correct in focusing park improvements within the north zone while building upon existing infrastructure. Furthermore, by clustering recreational facilities within the north, maintenance, monitoring and management objectives and tasks are more easily achievable. It is recommended that all group activities, commercial activities, including boat charters, should take place within the north zone area.

The Middle Zone has average user resiliency when compared to the north island. The area is generally comprised of Management Zones CC-07, CC-08 and CC-09 (a & b). It is on average 0.5 mi. to 0.8 mi. in width, has average sized upland mesic systems (Maritime hardwoods and Mesic flatwoods), some hardened trail systems and north to south/southwest longshore coastal sand drift. In the absence of back-bay dock facilities, boat access is restricted to shoreline anchoring. With an average distance of over 2 miles from the campsite area, the Middle Zone remains proximate to effective park management, maintenance and monitoring tasks.

The South Zone has poor user resiliency when compared to the two afore referenced zones. This is due to geography, coastal morphology and processes. The South Zone is very narrow, being less than 1/10th of a mile to 3/10th's of a mile wide. The curvature of the coast and proximity to Captiva Pass, causes greater sensitivity to wind, wave and tide coastal erosion. Historically it has little if any beach accretion. As the 2018 Draft Unit Management Plan points out, the south end of the island is starved of sediment (pg. 16 para. 4). The zone's narrow geography lends itself to poor resistance to user activities, has limited recovery potential from user activities and larger proportional impacted areas because of its small system size. The relative "thinness" of the Dune, Coastal Strand, and Maritime Hammock systems, and the relative absence of coastal grasslands, make the South Zone highly sensitive to negative long-term recreational user impacts. The fact that the South Zone is well over five miles from the campsite area makes the area more difficult for efficient management and monitoring. This fact is especially germane given the recent commercial boat charter use at the old Narrows back-bay dock. Since 2016 the dock has allowed multiple boats per day and with up to forty persons per boat, to have direct access to the least user resil-

ient part of the island. Clearly, the recreational management objective should be to reduce, and not to encourage, user impacts within the State Park's least resilient area.

THE CAYO COSTA ISLAND RESILIENCY DISTANCE-DECAY MANAGEMENT ASSESSMENT

An Integrated Systems Management Analysis Based On Island Geography, Island Morphology, Coastal Processes, Habitat and User/Activities

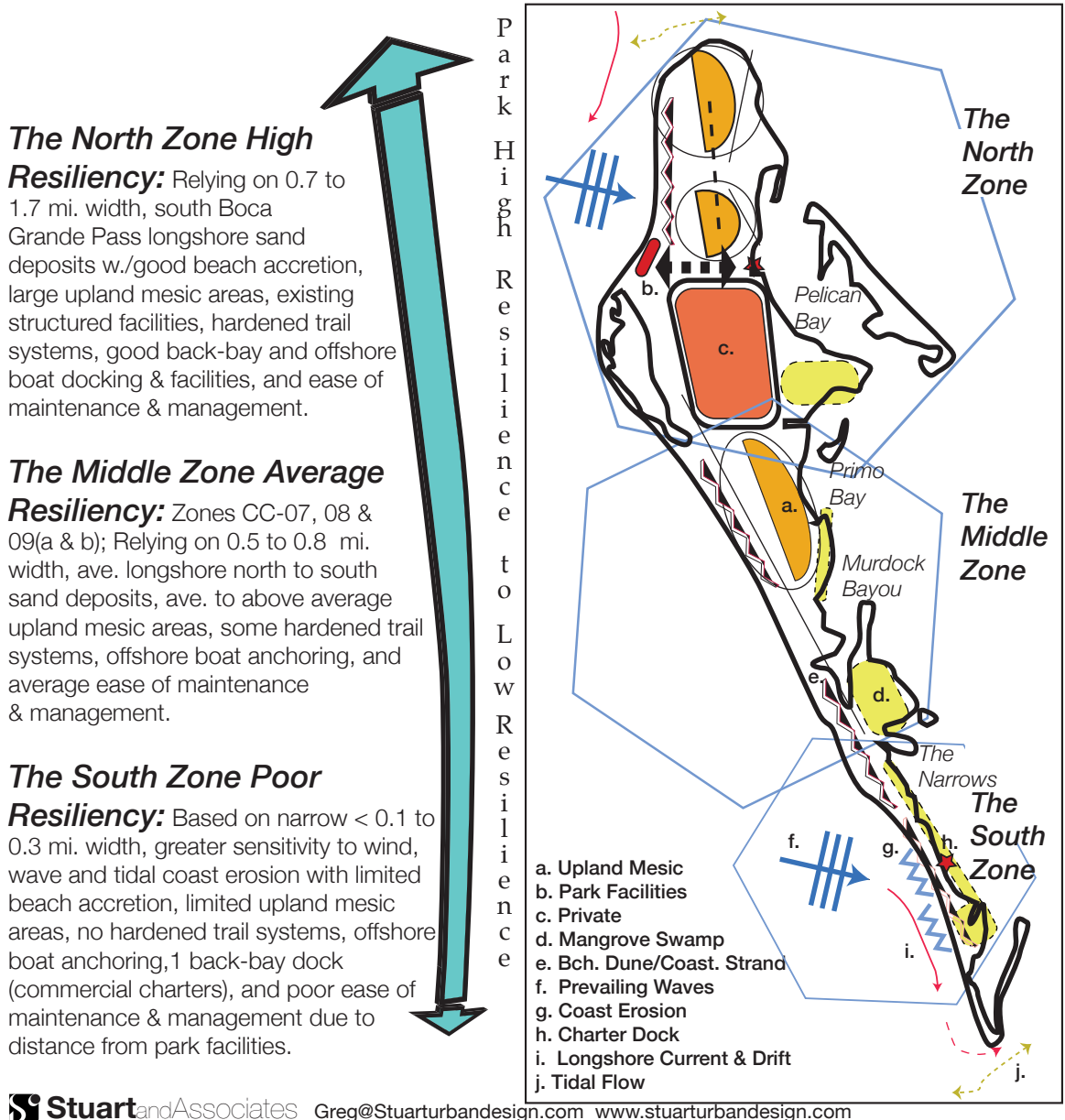


Fig. 6 The Resiliency Distance-decay Management Assessment

RECOMMENDATIONS - THE DISTANCE DECAY RECREATIONAL MANAGEMENT

PLAN: As a supplement to the 2018 Draft Unit Management Plan, (UMP) the author's proposed recreation management plan utilizes and builds upon the 2018 Draft UMP's objectives, policies and programs. The proposed recreation management plan uses a distance-decay resiliency approach; i.e., a geographically based, north to south recreation management plan. The plan is based on conservation values, existing facilities resistance to use, recovery from user impacts, potential severity of direct and indirect impacts, erosion resiliency, amount of use to proportionate area, and ease of management and monitoring.

Utilizing the three zonal approach (see Figure 6), the plan calls for the State to continue recreation management facility maintenance, improvement and expansion efforts directed toward the north end of the island. This is to include the State's proposed dock facility expansion, but with particular emphasis on ensuring suitable commercial charter boat docking and associated on-the-ground transportation facilities to assist commercial passengers in getting to the beach. Public access and recreational use is very important objective. Obviously, the best and most user resilient island area is the North Zone. For private boaters the North Zone's shoreline presents a highly resilient area for island recreation, so the area around Murdock Point and north, should be encouraged for anchoring. The Middle Zone is suitably resilient for medium active and passive recreation uses. Corresponding to CC-07, 08 and 09(a & b), the State should place much greater public communication, education and management emphasis via an enhanced interpretive signage program for the Middle Zone's Dune, Coastal Grass, Coastal Strand and Maritime Hammock habitat areas. The focus should be on systems education and responsible use, encouraging proper anchoring locations and the relationship of user to system impacts. If done properly management benefits will be significant. The plan calls for, from Murdock Bayou northward, commercial charter boats shoreline anchoring; South of Murdock Bayou commercial charter boats anchoring off the shoreline is to be prohibited due to the island's decreasing resiliency. The key new recreation management objective and policy for the South Zone is to limit The Narrow's boat dock to private recreation boater use. Commercial charter boats should be prohibited from using the dock based on acknowledging that two to four 40-person charter boat access ultimately is not sustainable for the South Management Zone. This is due to The Narrow's and South Zone's poor group user resiliency, the areas limited ability to recover from over-use, due to geography, proportional larger impacted areas because of limited habitat size, pronounced coastal erosion, large boat navigational sea grass impacts, and difficulties in effective management and monitoring. (see Figure 7). Succinctly, large group commercial charter boat access should logically be where the facilities and infrastructure are to support large groups; i.e., the North Zone and State Park dock. As with the Middle Zone, the State should place much greater public communication emphasis via interpretive signage. The focus should be on systems education and responsible use, encouraging proper anchoring locations and the relationship of user to system impacts.

Interpretive signs create great management value for the dollar. As such, a new funding mechanism is needed to implement an enhance public communications interpretive signage program and better management programs in general. In coordination with Lee County, the State should implement a Cayo Costa State Park Boat Access sticker program. When one is annually registering a boat, a \$20 optional surcharge for State Park use should be part of the program. Based on 2015 county boater registration data with 44,743 registered boats and assuming 15% of registered boaters go out to the barrier islands and Charlotte Harbour, \$134,229 dollars may be generated. Even

if one-half of the value is raised, the State Park can use \$67,000 + for it's various programs, including the new and enhanced interpretive sign program.

THE CAYO COSTA ISLAND RESILIENCY DISTANCE-DECAY RECREATION MANAGEMENT PLAN

A Management Model Based On Conservation Value, Existing Facilities Resistance To Use, Recovery From Use Impacts, Severity of Direct and Indirect Impacts, Erosion Resiliency, Amount of Use To Proportionate Area, & Management Ease

The North Zone _ High Passive & Active Recreational Users & Activities w./Shoreline & Back Bay Docking, Anchoring & Charter Boats; Maximum Recreation Focus On Existing Use, Improvement & Expansion of Existing North Island Park Facilities.

The Middle Zone _ Medium Passive & Select Active Recreational Users & Activities For Zones CC-07, 08 & 09(a & b) w./Shoreline Private & Commercial Anchoring; New Focus On Beach, Dune, Coastal Strand & Maritime Habitat Interpretative Signage For Education & Management.

The South Zone _ Medium To Low Passive & Active Recreational Users & Activities w./No Back Bay Commercial Charter Docking, Shoreline Commercial Charter Anchoring North of Murdock Bayou; Private Boat Shoreline & Back Bay Anchoring & Docking. New Focus On Trail Hardening, and Beach, Dune, Coastal Strand & Maritime Habitat Interpretative Signage For Education & Management.

All Zones _ New Management Funding Mechanism via Lee Co. Tax Collector Boat Sticker For Park Use

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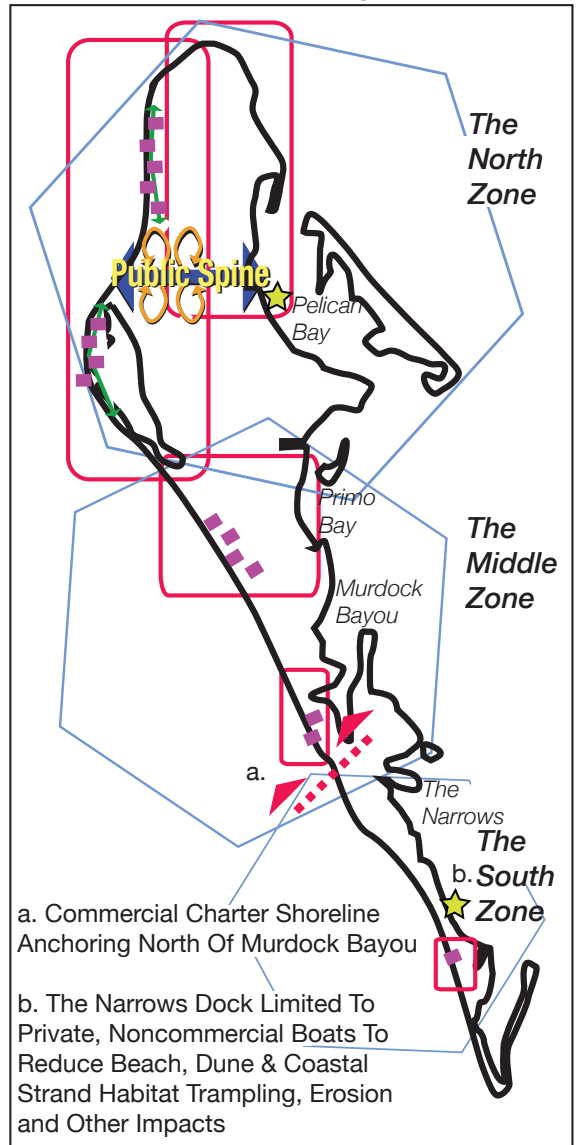
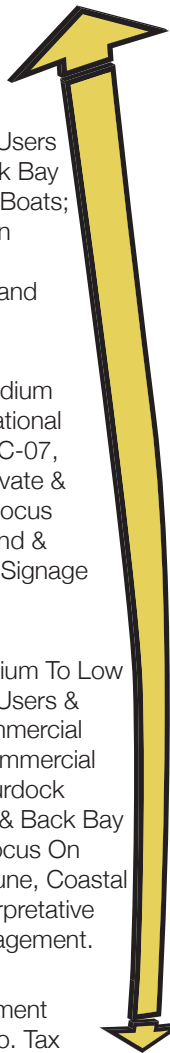


Fig. 7 The Cayo Costa Distance-decay Recreation Management Plan



Large Charter Boat Seagrass Impacts



Habitat Management & Monitoring Difficulties



40 Person Charter Boat v. 4 to 6 Person Private Boat



Large Scale Group Recreation @ The Narrows



Increase Trampling, Dune & Herbaceous Grass Impacts



Multiple Charter Boats w./Larger User Impacts At The Narrows

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Fig. 8 The Narrows/South Recreation Management Zone Pictures

RECOMMENDATIONS TO THE CAYO COSTA MANAGEMENT GOALS, OBJECTIVES AND POLICIES IMPLEMENTATION:

Goal One: Provide administrative support for all park functions.

- New Objective C _ In response to user coast impacts and limited south island system resiliency, expand administrative monitoring and management support for the South Zone and The Narrows/Capita Pass area.

Goal Two: Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored conditions.

- New Action Four _ Recognizing that viable seagrass beds are essential water quality components, coordinate with Lee County to implement new back-bay seagrass monitoring programs and programs aimed at reducing boater seagrass impacts.

Goal Three: Maintain, improve or restore imperiled species populations and habitats in the park.

- **Objective D _ Continue to improve protection and awareness of sensitive shorebird and sea turtle nesting areas.**
 - New Action One _ Implement enhanced interpretive signage program with particular emphasis on the South Zone/The Narrow/Capita Pass area's species and habitats.

Goal Six: Provide public access and recreational opportunities in the park.

- New Objective E _ Concentrate all group and commercial group charter boat access to the North Zone/State Park Dock and Facilities Area.
 - New Action One _ Off-shore Charter boat group access permitted from Murdock Bayou north; off-shore and back-bay charter boat group access prohibited south of Murdock Bayou.

Goal Seven: Develop and maintain the capital facilities and infrastructure necessary to meet the objectives of this management plan.

- New Objective E _ In coordination with Lee County implement a new Cayo Costa State Park Boat Access sticker program to generate revenues for an enhanced interpretive signage management program.