

RESILIENT CEDAR KEY

VULNERABILITY ASSESSMENT + ADAPTATION ACTIONS



Note on Tides.

Spot Key East

Resilient Cedar Key

Partnership between:

- City of Cedar Key
- UF Florida Institute for Built Environment Resilience (FIBER)
- UF Center for Landscape Conservation Planning (CLCP)
- UF Shimberg Center for Housing Studies
- UF/IFAS Nature Coast Biological Station
- UF/IFAS Food and Resource Economics Dept.
- UF Environmental and Community Development Clinic
- Florida Sea Grant



@jimcantore via X®



The Weather Channel



The Weather Channel

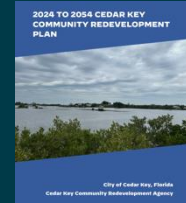
HIGH HAZARD EXPOSURE

Cedar Key, FL

BREAKING CAT 3 HURRICANE IDALIA LASHING FLORIDA

Hurricane Idalia
PRESSURE
057 mb

Previous and Ongoing Efforts to Enhance Flood Resilience in Cedar Key



2018

2019

2020

2021

2022

2023

Hurricane Idalia

2024

Studies

CK Shoreline Masterplan

Envision CK

CK Vulnerability Assessment

CK Adaptation Plan

CK CRA
2024-2054

Projects

Replacement Bridge Airport Road

CK Living Shorelines

Replacement Bridge C St.

CK ShORES Project- I

CK ShORES Project- II

Planning Process

Assess

Communicate process and get to know concerns and priorities to reduce flood vulnerability

Map

- Quantify effects of flooding
- Sea level rise
 - Storm surge
 - FEMA FIRM

React

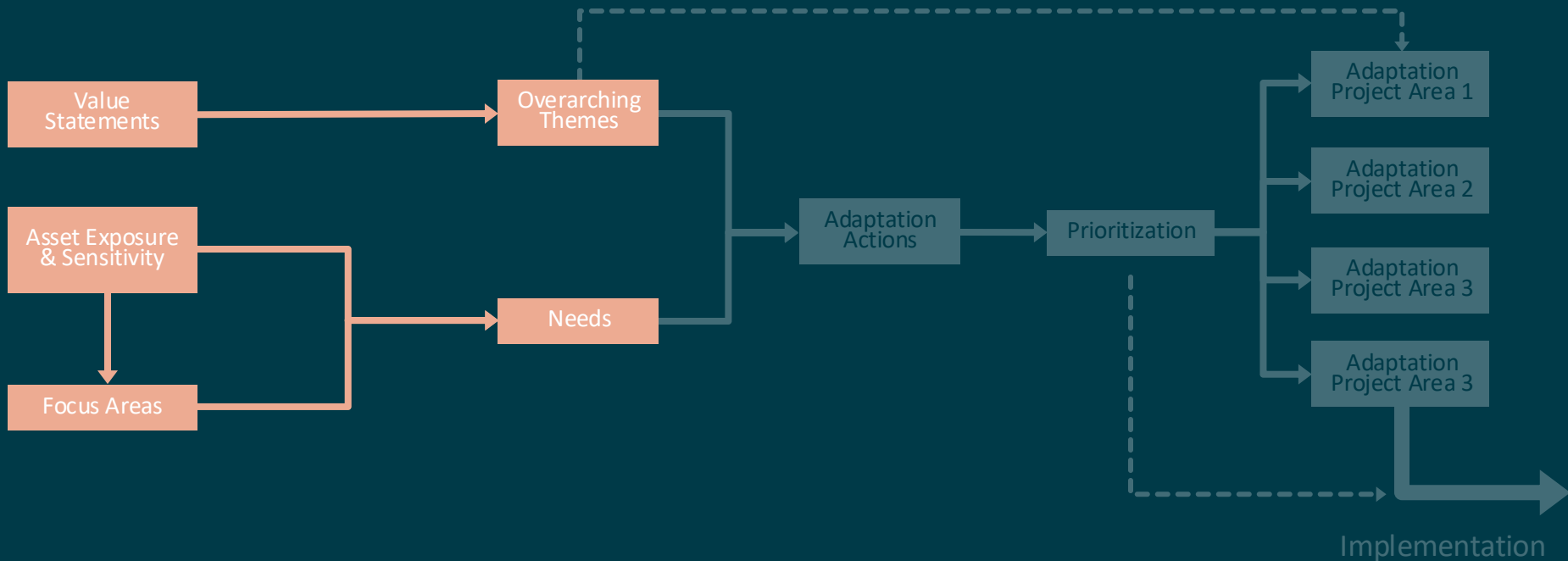
Discuss results, focus areas, possible actions, funding, policies

Take Action

- Resilience and Adaptation Plan
- Raise awareness about flood risk in community
 - Develop ideas for actions!
 - Basis to fund interventions

Planning Process

Vulnerability Assessment



Value Statements



Transportation

Enhancing connectivity across the city and ensuring reliable access to the mainland that can withstand tidal fluctuation is a top priority.



Community and Emergency Facilities

Strengthening the community and emergency network is key to long-term resilience as storm and flood risks increase.



Housing

Cedar Key's housing should be affordable, resilient, and varied to support diverse community members.



Natural & Cultural Resources

Enhance the ecosystems that support the clam economy, sport fishing, outdoor recreation, and coastal tourism is critical for the city's natural and cultural capital.



Critical Infrastructure

It is essential to ensure the continuous operation of critical utilities after extreme flood events.



Local Economy

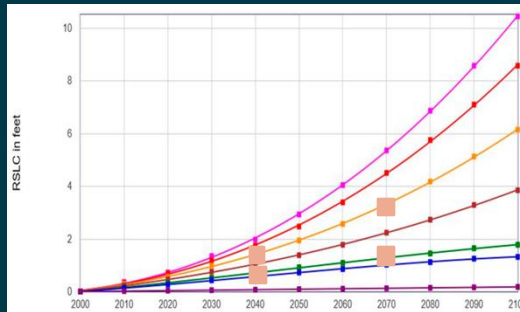
Maintain an economic and cultural identity tied to the working coast by pursuing diverse strategies to expand aquaculture, sport fishing, recreational boating, watersports, and coastal tourism.

Vulnerability Assessment

Included several flood hazards in response to FDEP requirements and community interests:

- High-tide flooding
- 1-year, 2-year, 10-year return events
- FEMA 100-year floodplain
- Category 1, 3, 5 hurricanes
- Sea level rise (NOAA Intermediate High, 2040/2070)

Planning Horizons (NOAA 2017)

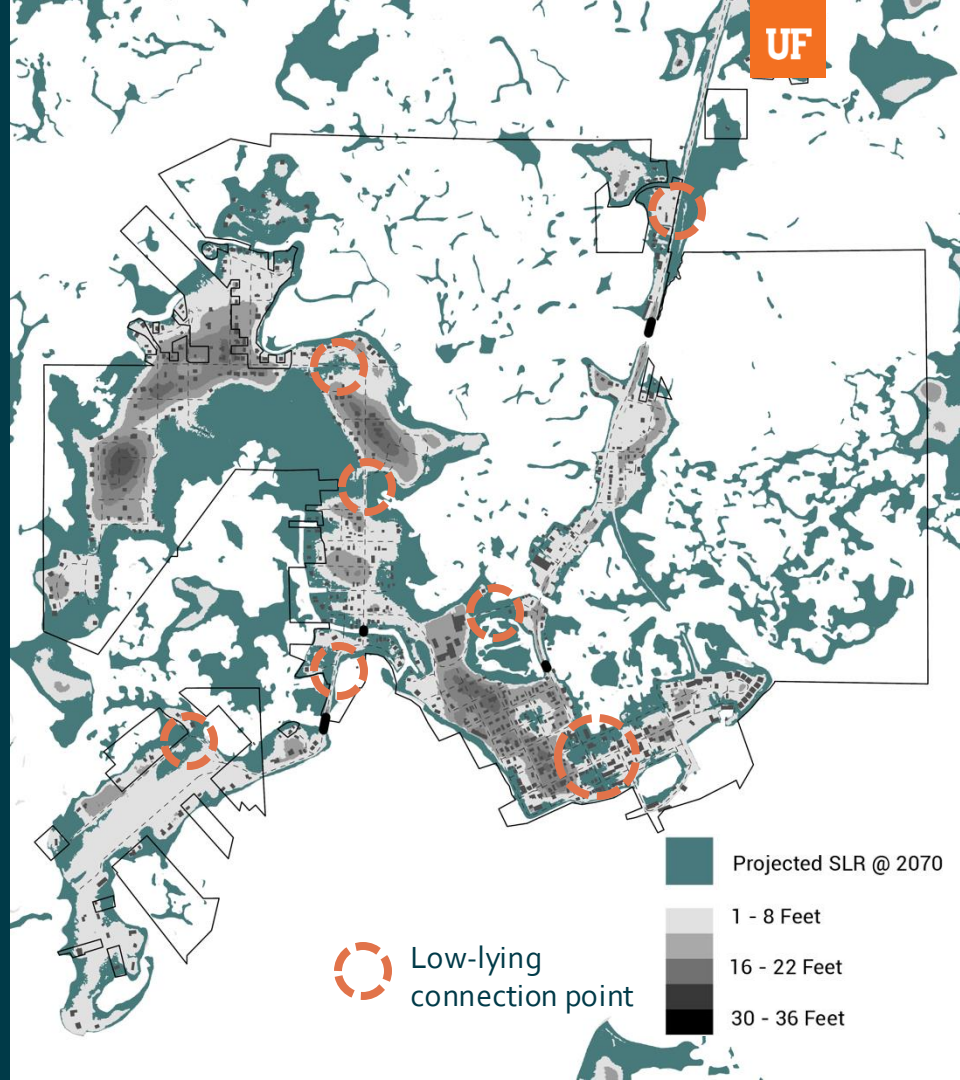


Intermediate - High

Intermediate - Low

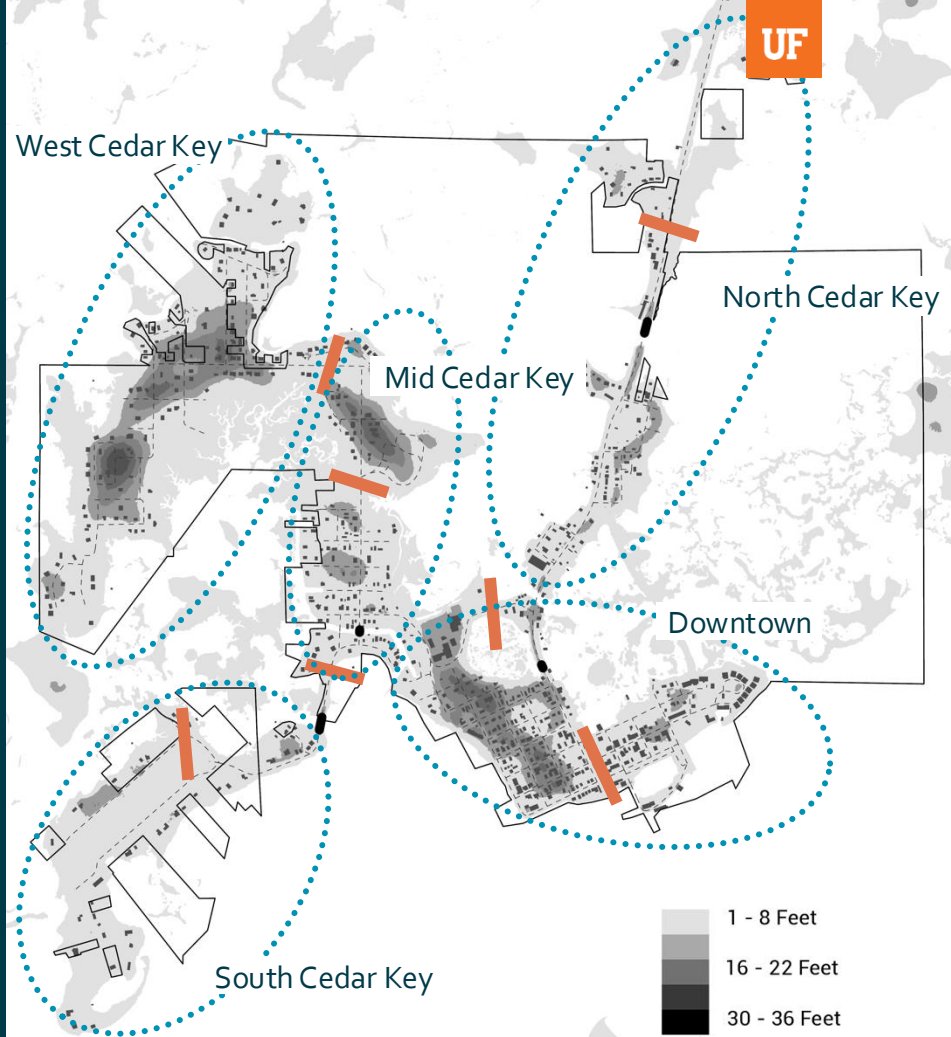
2040

2070



Study Areas

- Some areas will be subject to sea level rise and long-term inundation, which could cause disconnections that need to be addressed.
- Given these natural breaks across the island, the city can also be seen through a collection of interdependent sub-geographies.
- The Cedar “Keys” study areas shaped analysis and drove adaptation planning:
 - Downtown CK
 - Mid-CK
 - North CK
 - South CK
 - West CK
 - Also, inland areas (Levy county)



Resilient Cedar Key

A Dashboard to explore the impacts of compound flooding with different storm events under different sea-level rise scenarios.



GET STARTED

Disclaimer

The data and maps in this tool illustrate the scale of potential flooding, not the exact location, and do not account for erosion, subsidence, or future construction. Although every effort has been made to ensure that information is comprehensive and accurate, errors and omissions may exist. The data and the information included therein is provided on an "as is" basis. The Florida Institute for Built Environment Resilience (FIBER), Florida Sea Grant, the University of Florida, or any of their respective faculty, staff, or administration specifically disclaim any warranty, either expressed or implied, including but not limited to the implied warranties of merchantability and fitness for a particular use. The entire risk as to quality and performance is with the user. This tool should be used strictly as a planning reference tool and not for navigation, permitting, or other legal purposes.

<https://resilientcedarkey.web.app/>



Planning Process

Vulnerability Assessment

Value Statements

Asset Exposure & Sensitivity

Focus Areas

Overarching Themes

Needs

Adaptation Actions

Prioritization

Adaptation Project Area 1

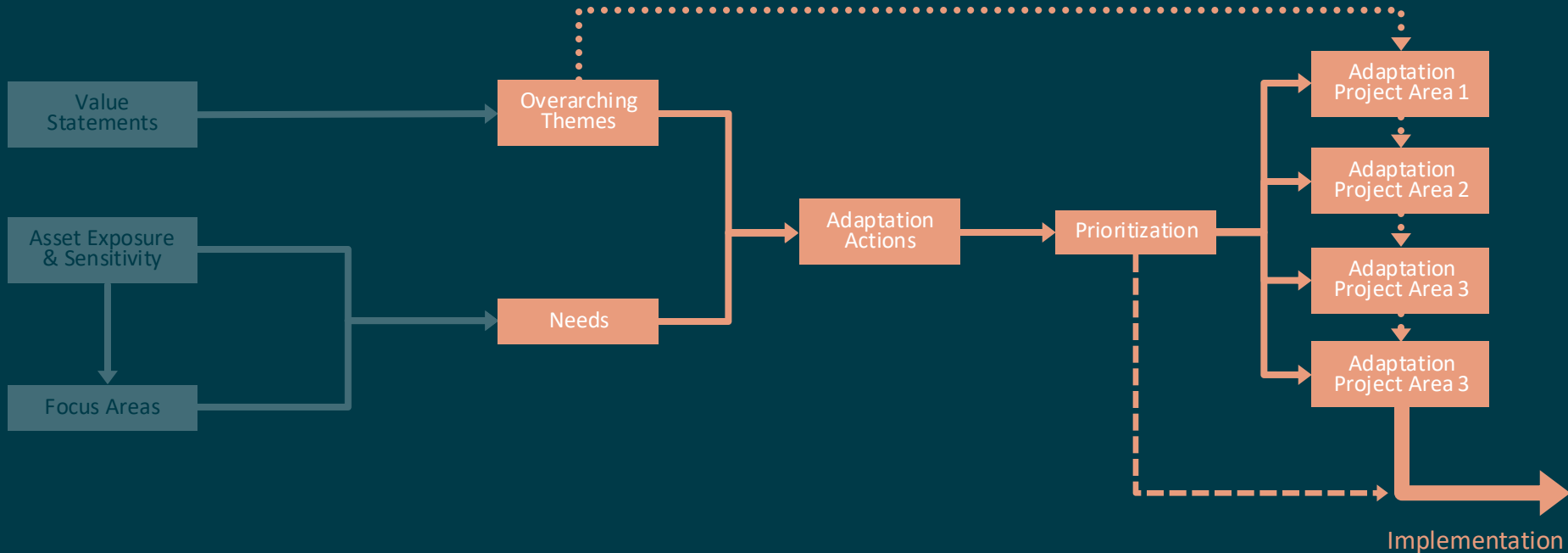
Adaptation Project Area 2

Adaptation Project Area 3

Adaptation Project Area 3

Implementation

Adaptation Plan



Overarching Themes

Theme:

Cedar Key is an archipelago.



Approach:

Restore Hydrologic Connectivity

Theme:

Cedar Key depends on its transportation network.



Approach:

Strengthen Transportation Network

Theme:

Cedar Key is a collection of diverse districts.



Approach:

Tailor Adaptation Actions for Diverse Districts

Theme:

Cedar Key's natural systems have defined its identity and will sustain its future.



Approach:

Preserve Natural Systems and Functions that Sustain the Local Economy

Project Prioritization

Based on the VA, we know that SLR and increased flood risks will affect different assets in different ways. Such damages will have an impact over different time horizons – from the next year to impacts over the decades to come. Effective actions will need to be prioritized.

We propose a priority scale based in the exposure level, asset influence, cost of risk reduction, and the time horizon in which the benefit will be seen.

1/ Exposure levels

Relevant level to asset type and flood depth

Low
Medium
High

2/ Risk reduction cost

FEMA STAPLEE (feasibility, social, technical, administrative, political, legal, economic, and environmental)

Low
Medium
High

3/ Asset influence

Extent serviced by asset type

Local, block
Neighborhood
City

4/ Timeframe

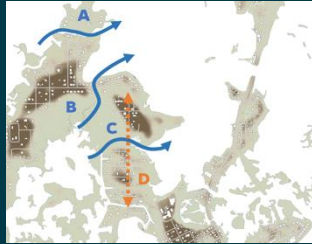
Adaptation benefit horizon

Short-term
Mid-term
Long-term

Adaptation Action Areas + Project Priorities



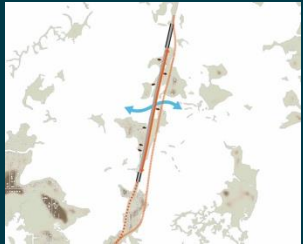
Downtown
"Reconnect and Redefine"



Mid CK
"Restore Keys Hydrology"



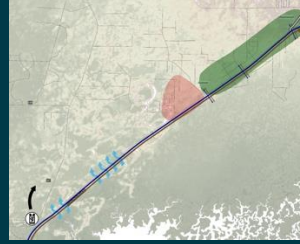
West CK
"Individual Action, Collective Impact"



North CK
Local + Regional Connections



South CK
Infrastructure & Shorelines



Inland/Adjacent Area
Protect and Plug-In



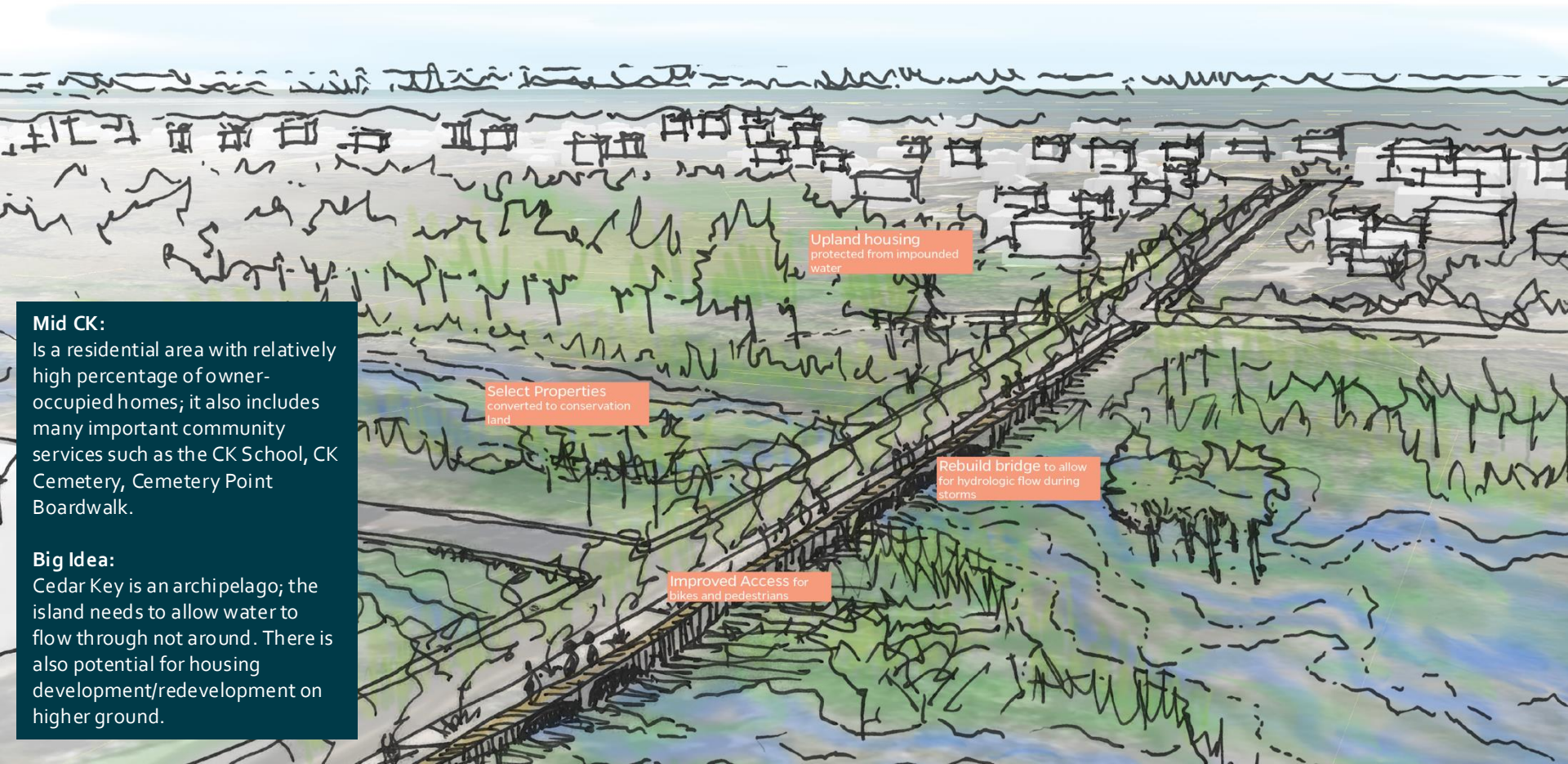
Restoring the Hydrology of the Cedar “Keys”

Mid CK:

Is a residential area with relatively high percentage of owner-occupied homes; it also includes many important community services such as the CK School, CK Cemetery, Cemetery Point Boardwalk.

Big Idea:

Cedar Key is an archipelago; the island needs to allow water to flow through not around. There is also potential for housing development/redevelopment on higher ground.



Upland housing protected from impounded water

Select Properties converted to conservation land

Rebuild bridge to allow for hydrologic flow during storms

Improved Access for bikes and pedestrians

Restoring the Hydrology of the Cedar “Keys”

PRIORITY PROJECTS:

- 1 Focus on let water to flow through the island at 3 vulnerable locations. Establish a replicable process for other emergent areas of the island.
- 2 New bridge from Indiana Ave. to Cemetery access will restore the hydro- and road connectivity at extreme high tide scenarios.
- 3 Elevate section Gulf Blvd. at Hodges Ave., restructure Andrews Circle section to allow through traffic in days of extreme high tides.







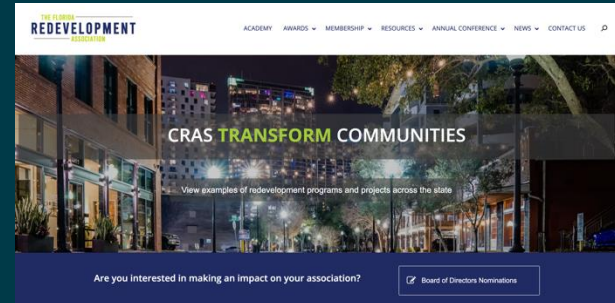
RESILIENT CEDAR KEY

INTEGRATION: COMMUNITY REDEVELOPMENT
AREA PLAN

CRA- WHAT IS IT?



- Under Florida law (Chapter 163, Part III), local governments can designate Community Redevelopment Areas (CRAs) when certain conditions exist
- All monies used in financing CRA activities are locally generated, and redevelopment plans must be consistent with local government comprehensive plans
- CRAs have statutory authority to utilize Tax Increment Financing (TIF) to revitalize blighted areas
- 220 CRAs in the State of Florida

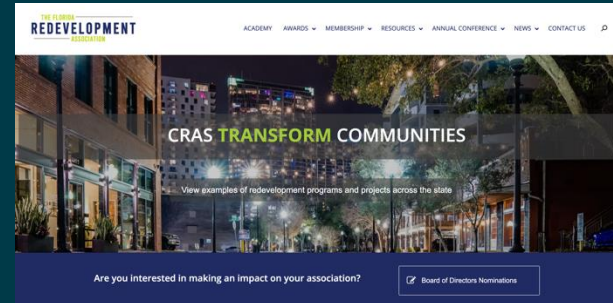


*Adapted from Florida Redevelopment Association (FRA)
<https://redevelopment.net/cra-resources/q-a-for-cras/>*

CRA- WHAT IS IT?



- Must address the unique needs of the targeted area
- CRA plans include the 1) **overall goals** for redevelopment in the area and 2) identify **specific types of projects** to be implemented
- Traditional examples include:
 - Streetscapes and roadway improvements
 - Building renovations
 - New building construction
 - Flood control initiatives
 - Water and sewer improvements
 - Parking lots and garages
 - Neighborhood parks
 - Sidewalks and street tree plantings....



Adapted from Florida Redevelopment Association (FRA)
<https://redevelopment.net/cra-resources/q-a-for-cras/>

CK CRA: A BRIEF CHRONOLOGY



- 1999** Cedar Key establishes CRA
- 2000** First redevelopment plan adopted & redevelopment trust fund created
- 2005** New redevelopment plan is created by outside firm (not adopted)
- 2007** CK amends the 2000 CRA Plan, incorporating the vision from the 2005 unadopted proposal, and establishes priorities and projects based on that vision
- 2007** CK bonds the future TIF in amount not to exceed \$9.2 million dollars
- 2007 - now** Variety of capital improvements and other projects called for by 2007 plan (parking, marina improvements, land acquisition, etc.) are completed by CK

CK CRA: A BRIEF CHRONOLOGY



2008 - 2009 Great recession depresses property values affecting CRAs and TIF across the State, including CK

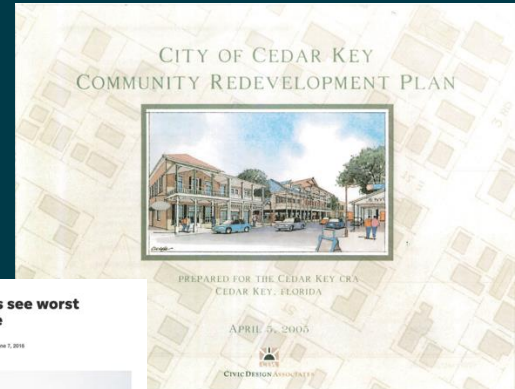
2023 CK pays off debt service on the 2007 bond issue

2024 CK CRA retains UF FIBER and UF Law Clinic to extend and amend 2007 CRA with resiliency focus

CK CRA: GOING FORWARD



- Retaining the original vision (2007)
 - Keeping the working waterfront working
 - Managing tourism & growth
 - Preserving history
 - Protecting natural resources
- Integrating a new vision element
 - Living with more water more of the time
- New priorities
 - Resiliency and adaptation
- Aligning with state priorities
 - FDEP Resilient Florida Program grants



CK CRA: DO'S AND DON'TS



CRA CANNOT:

- Can't fund projects outside the CRA (some very limited exceptions)
- Can't fund "general governmental operating expenses"
- Can't pay for capital improvement projects that are not in the plan
- Can't bank funds without allocating them to a specific project

CRA CAN:

- Fund CRA administration to work on CRA programs and projects
- Fund grant programs for not-for-profits, businesses, and homeowners
- Fund cost and engineering studies

USING CRA TO FUND CAPITAL IMPROVEMENTS



Definition of Capital Improvements:

(7) “Capital improvement” means physical assets constructed or purchased to provide, improve, or replace a public facility and which are typically large scale and high in cost. The cost of a capital improvement is generally nonrecurring and may require multiyear financing. For the purposes of this part, physical assets that have been identified as existing or projected needs in the individual comprehensive plan elements shall be considered capital improvements.

Ch. 163.3164(7) Florida Statutes

Typical Adaptation Actions / Funding opportunities

Category	Measure	Funding
Transportation	Road elevation	Rebuilding American Infrastructure with Sustainability Equity (RAISE) Discretionary Grants FHWA
	Elevate Bridges	Rebuilding American Infrastructure with Sustainability Equity (RAISE) Discretionary Grants FHWA
	Build Bridges	Rebuilding American Infrastructure with Sustainability FHWA
	Road improvement (widen section, improve sidewalks, create parking areas)	Rebuilding American Infrastructure with Sustainability Equity (RAISE) Discretionary Grants FHWA
	Retrofit boat ramps (reinforce boarding structures)	Rebuilding American Infrastructure with Sustainability Equity (RAISE) Discretionary Grants
Critical Infrastructure	Retrofit wastewater plant equipment	Interagency Nonstructural Flood Risk Management Projects Rural Development Water and Environmental Programs
	Relocate wastewater plant	Interagency Nonstructural Flood Risk Management Projects Rural Development Water and Environmental Programs
	Wastewater network improvements (retrofit lift stations, replace components to avoid salty water infiltration)	Rural Development Water and Environmental Programs
	Stormwater network improvements (implement check valves, build retention areas)	Clean Water State Revolving Fund; Water Infrastructure Finance and Innovation Act Program
	Waterplant retrofit (elevate control rooms, elevate equipment)	Interagency Nonstructural Flood Risk Management Projects Rural Development Water and Environmental Programs
	Relocation (City Hall, Police Department, Fire Department, Post Office, City Library)	Interagency Nonstructural Flood Risk Management Projects
Community Facilities	Wet floodproofing	Interagency Nonstructural Flood Risk Management Projects
	Dry floodproofing	Interagency Nonstructural Flood Risk Management Projects
	Elevate utilities	State Community Development Block Grant Program
	Marsh and mangrove restoration	Vegetation and Watershed Management Projects (Federal) Watershed and Flood Prevention Program
Natural Cultural Assets	Revetment	BRIC Resilient Florida
	Sea wall	BRIC Resilient Florida
	Detached breakwaters	U.S. Fish and Wildlife Service Coastal Program Watershed and Flood Prevention Program
	Hydroconnectivity restoration	U.S. Fish and Wildlife Service Coastal Program Watershed and Flood Prevention Program
	Beach nourishment + groin field	U.S. Fish and Wildlife Service Coastal Program Watershed and Flood Prevention Program
	Land Conservation buyouts	
	Building Elevation	Gulf County Local Housing Assistance Plan
	Wet floodproofing	Gulf County Local Housing Assistance Plan
Economy and Housing (building assets)	Dry floodproofing	
	Voluntary buyout	
	Building relocation	Interagency Nonstructural Flood Risk Management Projects
	Flood insurance	

CK ADAPTATION PLAN

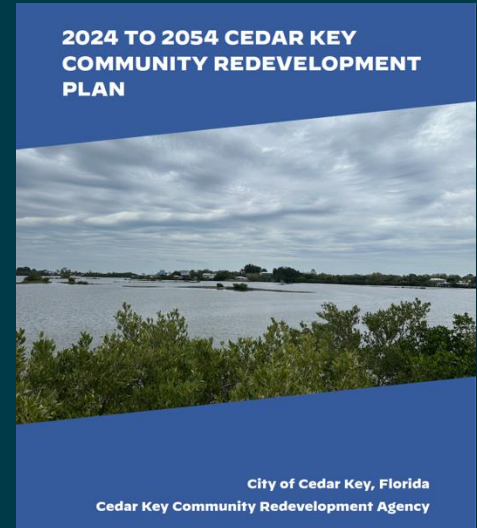


- Cedar Key is an archipelago (the *Cedar Keys*).
 - Approach: Restore hydrologic connectivity.
- Cedar Key depends on its transportation network.
 - Approach: Strength transportation network.
- Cedar Key is a collection of diverse districts.
 - Approach: Tailor adaptation actions for diverse districts.
- Cedar Key's natural systems have defined its identity and will sustain its future.
 - Approach: Preserve natural systems and their ecological functions that sustain the local economy.

CK CRA PROGRAM + RESILIENCE FOCUS



- CRA Administration
 - Hire a CRA administrator/grant writer, etc.
 - Cost out the selected capital improvement projects (consultant)
 - Join Florida Redevelopment Assoc. and attend annual meeting / board training
- Support Nature-Based Solutions
 - Living Shoreline Master Plan Implementation- 3 projects in CK Adaptation Plan
 - Support hydrologic restoration projects- 3 in CK Adaptation Plan
- Support resilience projects for non-profit, local business, and homeowners, such as aquaculture and historic preservation
 - Grant Program- 7 projects in CK Adaptation Plan



EXAMPLE OF CRA + RESILIENCE



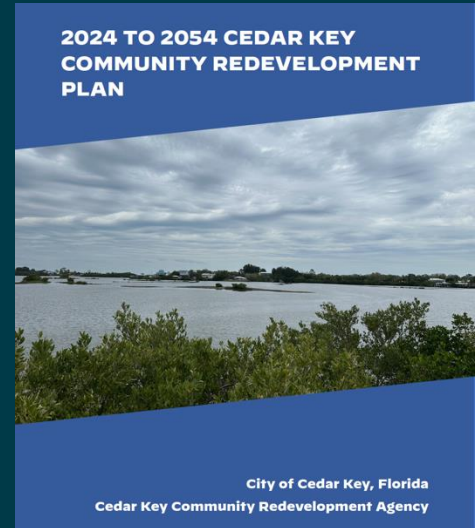
“The City of Pensacola Community Redevelopment Agency’s Residential Resiliency Program is designed to support blight removal and prevention by repairing storm-damaged structures or securing at-risk property against future damage caused by natural hazards such as hurricanes and flooding for residents within designated Community Redevelopment Areas.”

<https://www.cityofpensacola.com/531/DSD---Community-Redevelopment-Agency>

CK CRA PROGRAM + RESILIENCE FOCUS



- Support police, fire department & other administrative building resiliency project (provided all other taxing authorities agree)
 - 6 projects in CK Adaptation Plan
- Support transportation & stormwater resiliency
 - 16 projects in CK Adaptation Plan
- Support water, wastewater & electrical grid resiliency
 - 8 projects in CK Adaptation Plan
- Support cultural & recreational facility resiliency (including churches, cemeteries)
 - 10 projects in CK Adaptation Plan
- Support marine infrastructure resiliency
 - 2 projects in CK Adaptation Plan (boat ramps)



Restoring the Hydrology of the Cedar "Keys"

Land Conservation



New Bridge with Increased Clearance



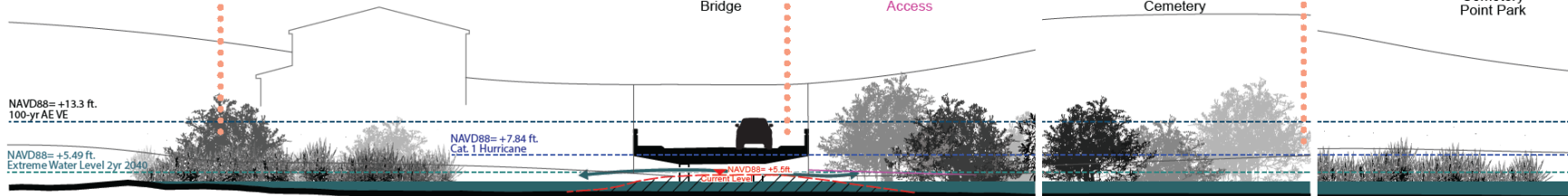
Gulf Blvd. Bridge

Cemetery Access



Cedar Key Cemetery

Cemetery Point Park



2024 TO 2054 CEDAR KEY COMMUNITY REDEVELOPMENT PLAN



**City of Cedar Key, Florida
Cedar Key Community Redevelopment Agency**