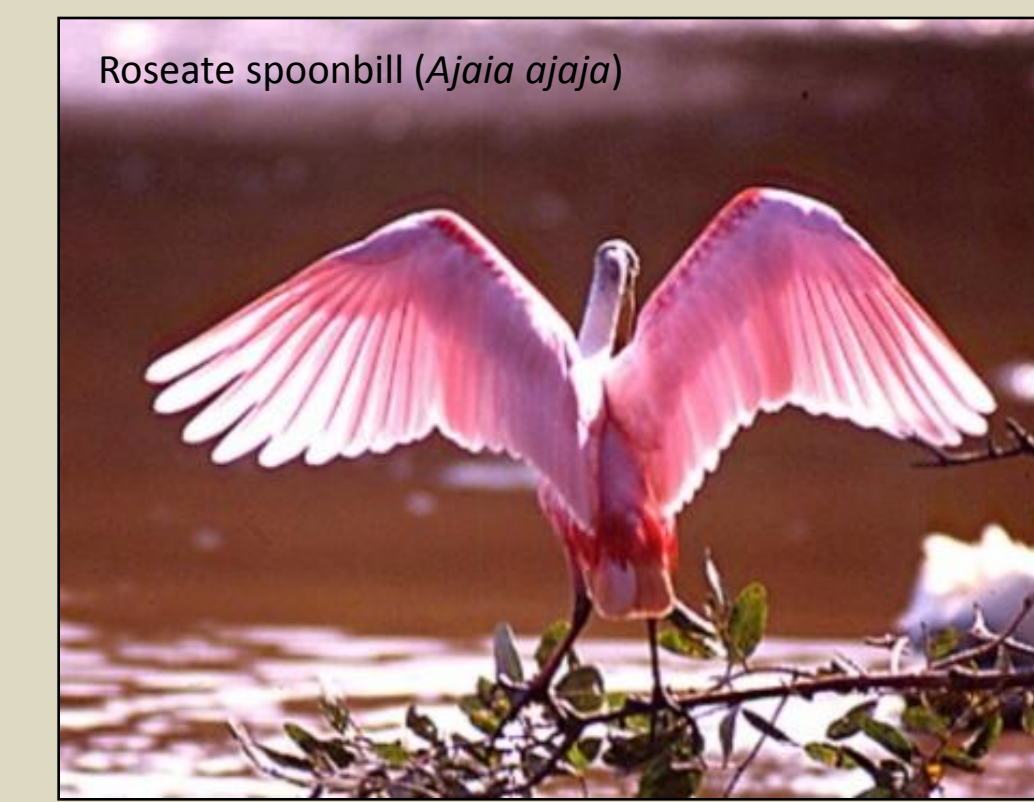


# Twenty Years of Restoration by a Barrier Island Partnership in Southwest Florida

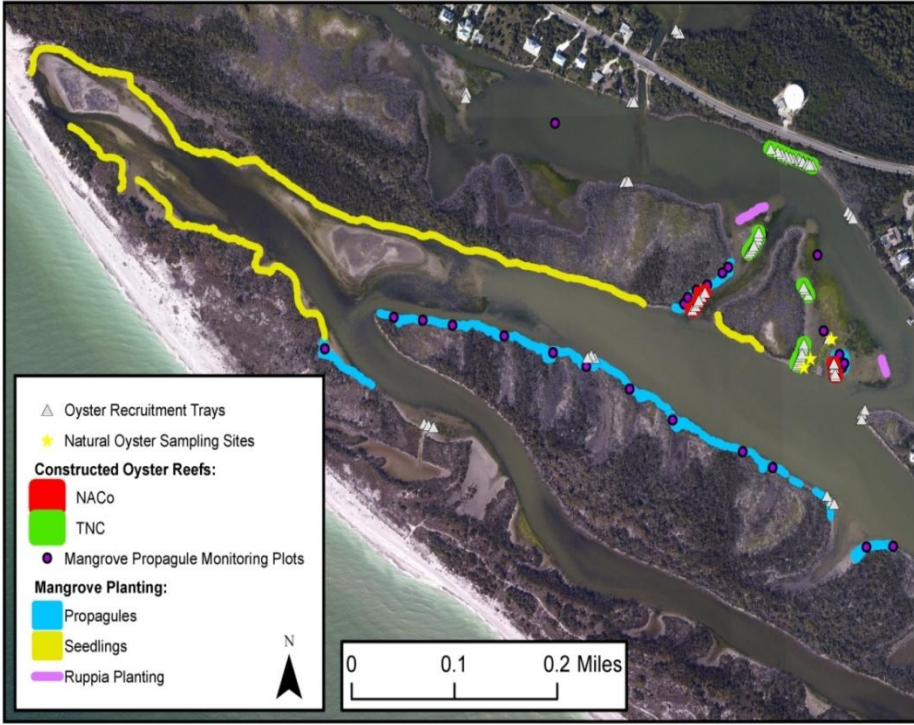
## Successes, lessons learned, and future directions



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### Mangrove and Shellfish Restoration in Clam Bayou

Success: Increase habitat values and capacity



The isolation of Clam Bayou from tidal flow caused a cascade of die-offs, oysters, mangroves, submerged aquatic vegetation). Hydrologic restoration did not bring about habitat recovery. The partnership effort to plant mangrove propagules and construct fringing tidal reefs enabled the natural recovery to flourish.

#### Oyster Reef Development

Metric	Goal	Actual (2012)
Reef Area (m <sup>2</sup> )	400	637
Recruitment (oysters m <sup>2</sup> yr <sup>-1</sup> )	50	137
Growth Rate (mm day <sup>-1</sup> )	Positive	0.1
Resident Species	>10	14
Water Quality Improvement	percent reduction in chl a	18%
Reef Relief	m above sediment	0.100
Community Involvement	volunteers	518
Community Involvement	hours	971



Volunteers collected and planted 60,000 mangrove propagules.

#### Lessons Learned:

- Multiple strategies are key in habitat recovery.
- Hydrological restoration is a critical first step, but additional efforts may be needed for vegetation and species recovery.



Sanibel is and shall remain a barrier island sanctuary, one in which a diverse population lives in harmony with the island's natural habitats. The Sanibel Community must be vigilant in the protection and enhancement of its sanctuary characteristics. (Sanibel Comprehensive Land Use Plan 2007)



### Restoring Natural Fire Regimes through Prescribed Burning (maintenance)

Freshwater marshland is dependent on fire to keep shrub encroachment in check. Prescribed fires reduce fuel loads along the wildland/urban interface and protect against catastrophic wildfires. Through shared resources and expertise, strong partnerships between federal, state and local organizations work seamlessly to achieve effective and proactive burns across the island.

Land Manager	Burnable Acres	Acres Burned	Acres to Burn
Refuge	718	718	0
SCCF	463	323	140
City of Sanibel	260	130	130

### Sanibel Gardens Wetland Restoration

Success: Increase wetland acreage and protection

The 107 ha Sanibel Gardens Preserve linked >2,630 ha of contiguous upland and wetland habitat on Sanibel. Restoration entailed acquiring >1,000 residential units (platted in the 1920's) in the heart of the island's interior freshwater wetlands. Invasive exotic vegetation (Brazilian pepper (*Schinus terebinthifolius*) and Australian pines (*Casuarina equisetifolia*) were removed. Over 29 km of fill roads were pushed into adjacent mosquito ditches. The historic, meandering flow of the Sanibel River was reestablished to complete the project.



#### Lessons Learned:

- Water quality improved as a result of wetland restoration.
- Overwhelming community support emphasized the need for increased freshwater wetland protection.

### Alligator Curve Mangrove Restoration

Future Goal: Naturally functioning mangrove habitat

In 1963 the construction of a dike (now a paved, public access road) through the estuary cut off >40 ha of tidal mangrove wetlands in the Alligator Curve area. This old growth mangrove, with already limited regeneration, was severely impacted by the devastation of Hurricane Charley in 2004. Plans for 2013 include restoring tidal flow to 25 ha with a box culvert through the dike. Also, 4 steel culverts placed under a powerline access road will restore an additional 17 ha of tidal mangrove wetlands. This will allow mangrove propagules to root and grow providing critical habitat for juvenile and neonatal smalltooth sawfish (*Pristis pectinata*).



Project area to be reconnected to estuary



Decadent mangrove stand in need of restoration



Smalltooth sawfish (*Pristis pectinata*)



Eastern Oyster (*Crassostrea virginica*)

A new oyster recruit ("spot") attached to other oysters.

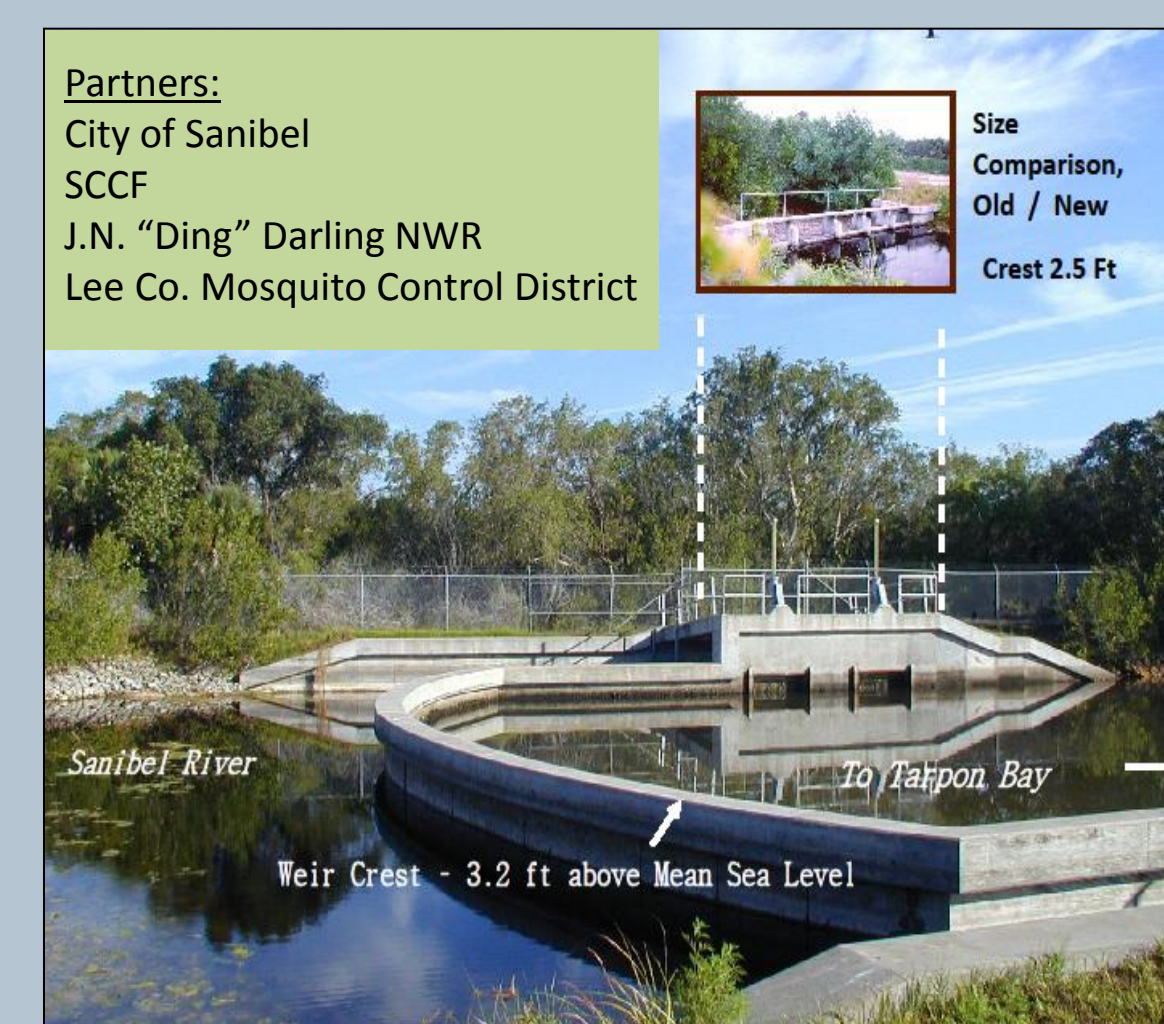


West Indian manatee (*Trichechus manatus*)

### Rehydrating Sanibel Slough and Interior Freshwater Wetlands

Success: Increase wetland acreage and function

In 1990 we began a pilot study to simulate higher water levels throughout historical freshwater marshes on Sanibel. Results indicated a higher weir crest was needed. An area of interior wetlands was bermed, and a pump raised water levels. A water control structure was built to decrease flashy, storm related changes in water levels island-wide. Eventually, historic *Spartina* marshes and seasonally flooded wetlands returned.



Partners: City of Sanibel, SCCF, J.N. "Ding" Darling NWR, Lee Co. Mosquito Control District

Size Comparison, Old / New Weir Crest 2.5 Ft

Weir Crest - 3.2 ft above Mean Sea Level



1996 dry season

1996 wet season



#### Lessons Learned:

- Restore hydrology early to effect change on the landscape.
- With little relief on the island, small changes in water depth make a significant difference in wetland restoration efforts.
- Prescribed fire was necessary to establish productive *Spartina* marsh and suppress woody shrub encroachment
- Consistent high water levels controlled non-native, invasive species in the area.

### Invasive Exotics Management (maintenance)

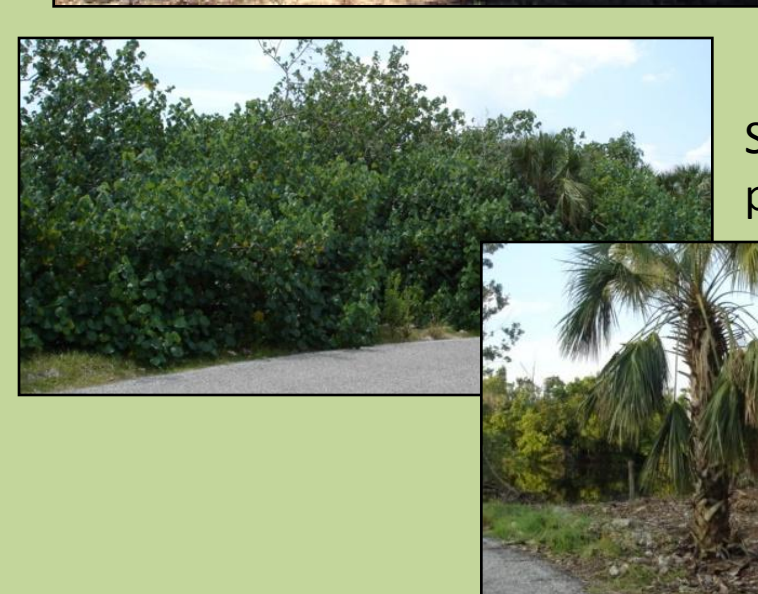
Sanibel has its share of challenges when controlling exotic species, particularly Brazilian pepper (*Schinus terebinthifolius*) and melaleuca (*Melaleuca quinquenervia*). Melaleuca is eradicated and 88% of Brazilian pepper has been removed from Sanibel. Joint funding efforts were successful in treating and controlling >4,050 ha. Ongoing efforts continually monitor areas for new infestations.

#### Lessons Learned:

- Community support was key for effective control and eradication.
- Sharing resources and funding allowed treatment of entire landscape.



Australian pine (*Casuarina equisetifolia*) removal following Hurricane Charley in 2004. Residents supported removal and native planting efforts.



Seaside mahoe (*Thespesia populnea*) removal 2005