



**THE PELICAN COVE CLIMATE CHANGE  
ADAPTATION PLAN  
MAY 11, 2017**

## **The Pelican Cove Community Climate Change Adaptation Plan Includes Five Major Areas:**

Shoreline adaptations for potential sea level rise and other coastal storm risks

Adaptations to protect and improve the water quality in Clower Creek and Little Sarasota Bay.

Adaptations to address flooding and runoff caused by potential sea level rise and increased rain fall and storm activities

Adaptations to address vulnerabilities to the structures, grounds, and infrastructure from trees that are most susceptible to wet soils and high winds

Identify plant and tree species that can reduce negative impacts on the water quality in Clower Creek and Little Sarasota Bay based on their need for fertilizer, pesticide and irrigation

# Recommended Adaptation Options Under Consideration

1. Options for sea level rise
  1. Living shorelines of different design
  2. Sediment supplementation
  3. Dune/Berm Construction
  4. Within the Marina Harbor
    1. Redesign (Elevating Docks, Walkways, and Decks)
    2. Floating Docks
  5. Increased Ground Floor Elevations When Rebuilding
2. Options for water quality improvement
  1. Sediment dredging
    1. Spot dredging
    2. Removal of all anoxic silt
  2. Floating Islands
  3. Filter feeders
    1. Reef Balls or similar structures
    2. Oyster Strings
    3. Clam Bags
  4. Pretreatment for drains and improved run-off capture
3. Options Examined for Flooding, Runoff and Erosion From Climate Change
  1. Improved swales and additional drainage swales with coastal dunes
  2. Removal of exotics and replacement with GeoWeb and natives
  3. Removal of silt from Clower Creek
  4. Remove vegetation blocks from Clower Creek
  5. Improved Evacuation Coordination
4. Options Examined for Vulnerabilities to the Structures, Grounds, and Infrastructure from trees and identified plant and tree species that can reduce negative impacts on the water quality in Clower Creek and Little Sarasota Bay based on their need for fertilizer, pesticide, and irrigation
  1. Removal of trees with low wind resistance
  2. Utilize native trees with high wind resistance in future tree replacements
  3. Favor native vegetation species over exotics.
  4. Select plants of the original coastal oak hammock uplands and flanking estuarine and creek transition zones by a mangrove shoreline and a riparian creek.
  5. Introduce some tropical hardwood hammock species
  6. Stabilize exposed and eroding shore and backshore areas with marsh grasses and herbaceous marsh species in Zonal Shoreline Plantings
  7. Changes in mangrove trimming
  8. Continual improvement in fertilizer management

# Options Examined for Infrastructure Protection From Sea Level Rise Coastal Flooding

- Living shorelines of different design
- Sediment supplementation
- Dune/Berm Construction
- Within the Marina Harbor
  - Redesign (Elevating Docks, Walkways, and Decks)
  - Floating Docks
- Increased Ground Floor Elevations When Rebuilding

# Coastal Shoreline Continuum Ideal & "Living Shorelines" Treatments



Graphic courtesy Burke Environmental Associates

- Riparian Vegetation Management
- Bank Grading
- Fiber Logs

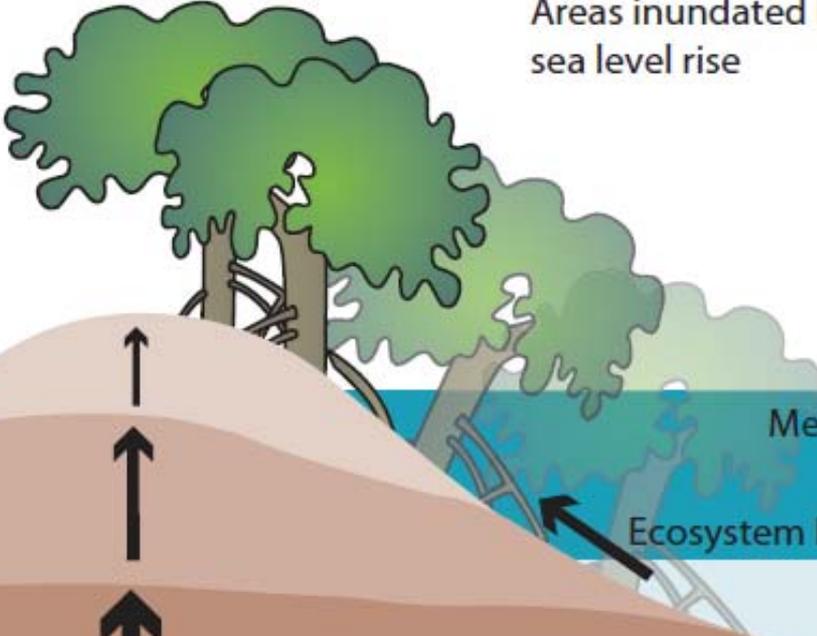
- Tidal Marsh Enhancement**
- Tidal Marsh Creation
  - Beach Nourishment & Dune Restoration
  - Marsh Toe Revetment
  - Marsh Sill
  - Marsh with Groins

- Living Breakwater**
- Offshore Breakwater System
  - Oyster Reefs

# Sediment supplementation

←  
Development to be protected

→  
Areas inundated by sea level rise



Location of Existing Seawall - Recommend Longterm Removal

Mean High Tide @ 44 inches sea level rise (2200 Moderate Case)

Ecosystem Retreat

2000 Mean High Tide

Deposit sediment at rate of sea level rise



By: Lisa B. Beever, PhD, AICP  
Date: 5/15/09  
Source: Micheal Volk, 2008  
[www.chnep.org/projects/CRE/CRE.asp](http://www.chnep.org/projects/CRE/CRE.asp)

## Filling (Protection)

Symbols courtesy of the Integration and Application Network ([ian.umces.edu/symbols/](http://ian.umces.edu/symbols/)), University of Maryland Center for Environmental Science

# Dune/Berm Construction

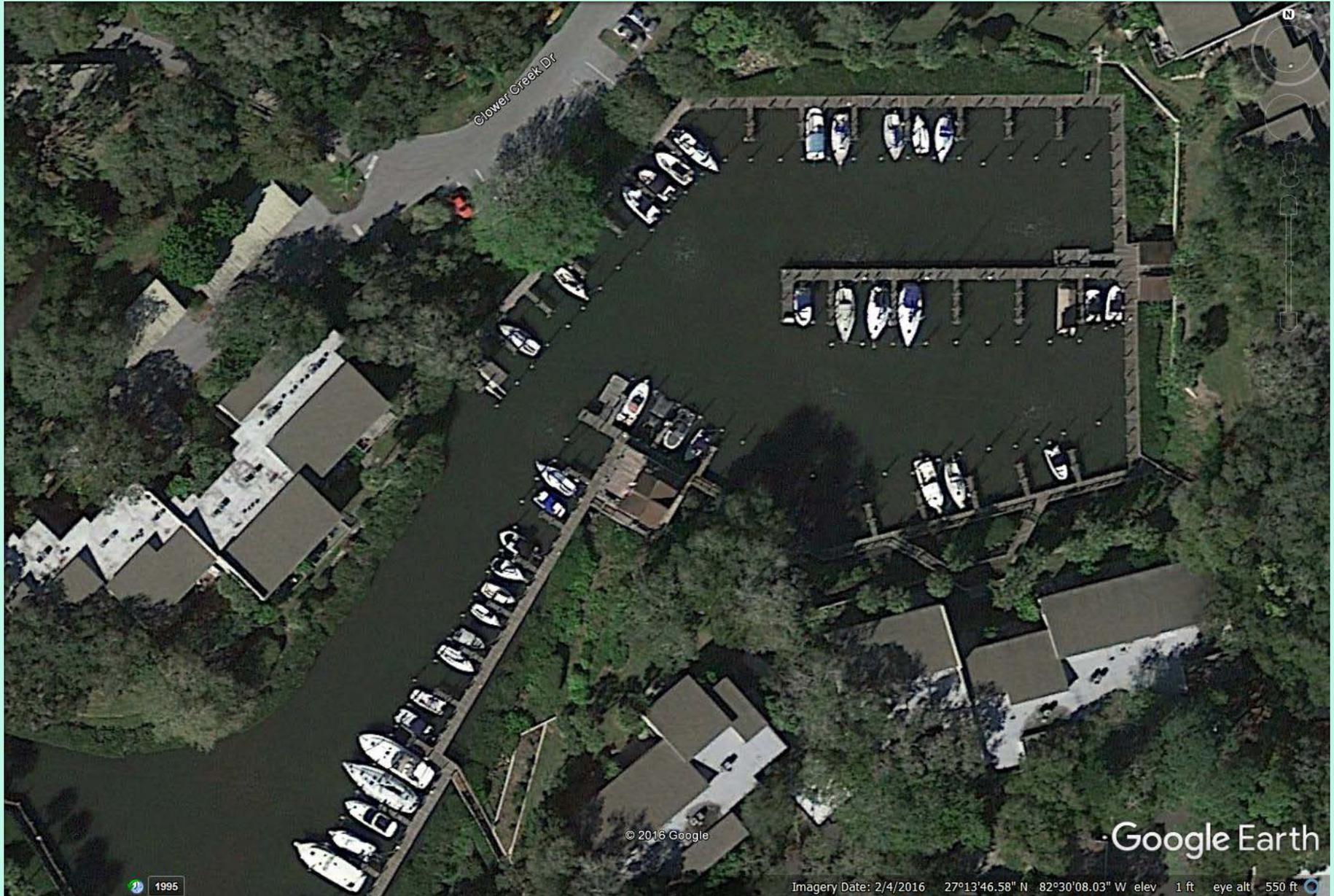


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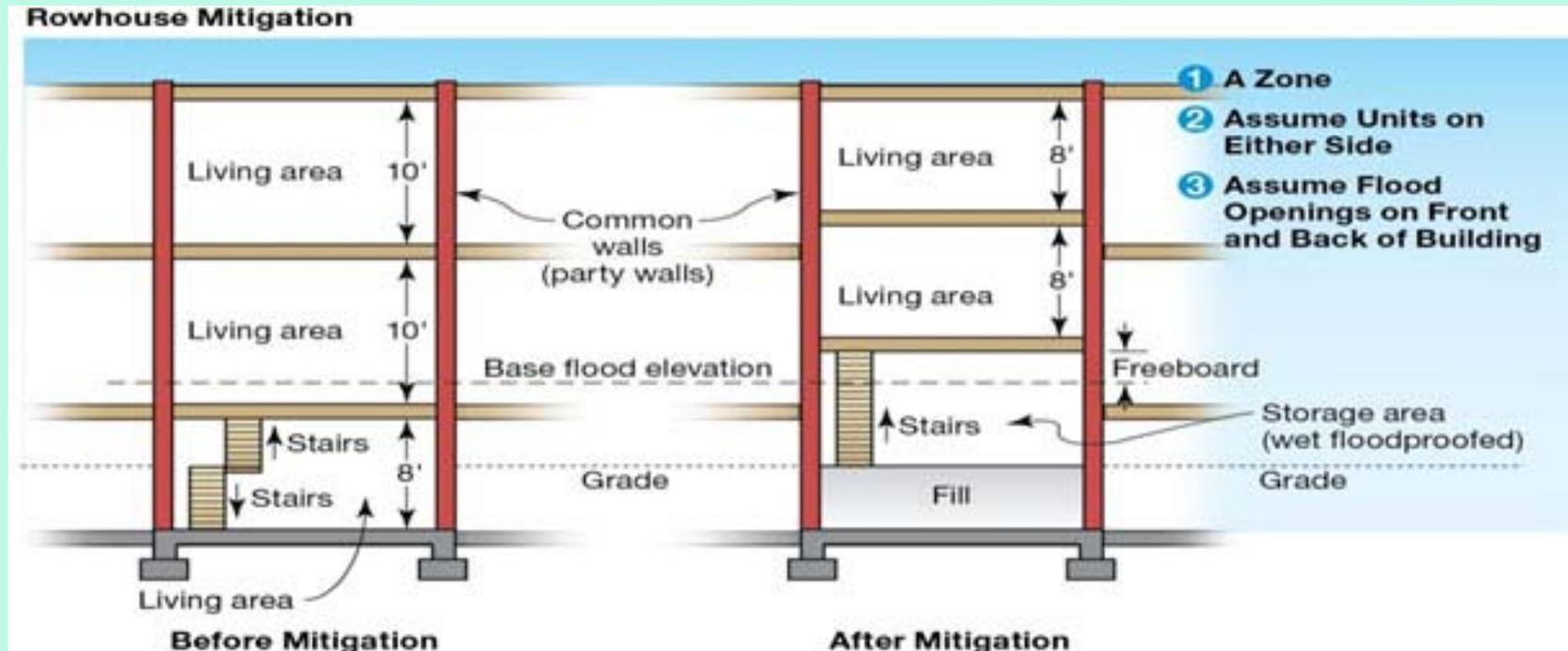
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# Elevating Docks on Rebuild and/or Floating Docks



# Increased Ground Floor Elevation



# Options Examined for Water Quality Improvement

- Sediment dredging
  - Spot dredging
  - Removal of all anoxic silt
- Floating Islands
- Filter feeders
  - Reef Balls or similar structures
  - Oyster Strings
  - Clam Bags
- Pretreatment for drains and improved run-off capture



## Before Floating Island



## After Floating Island



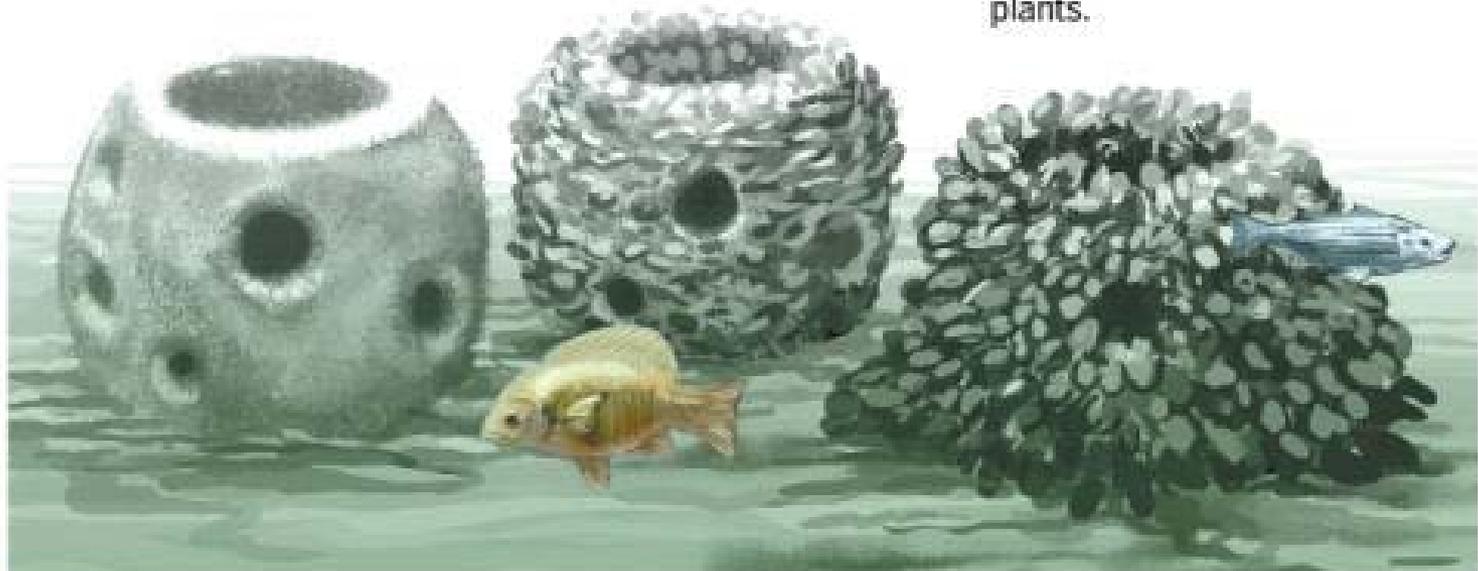
Floating Islands

Filter Feeders: Reef Balls and other under-dock and seawall base encrusting surfaces.

## Creating a new home for the Olympia oyster

100 reef balls were lowered into the shallow waters off Point Pinole Regional Park, creating a man-made oyster reef. Here's how it will work.

- 1 **Reef balls** are created with a mix of concrete, silt and shells.
- 2 **The hard textured surfaces** are ideal for Olympia oyster larvae to latch onto.
- 3 **The artificial reef** also creates an environment attractive to other marine animals and plants.



Source: Reef Ball Foundation, Inc.

BAY AREA NEWS GROUP

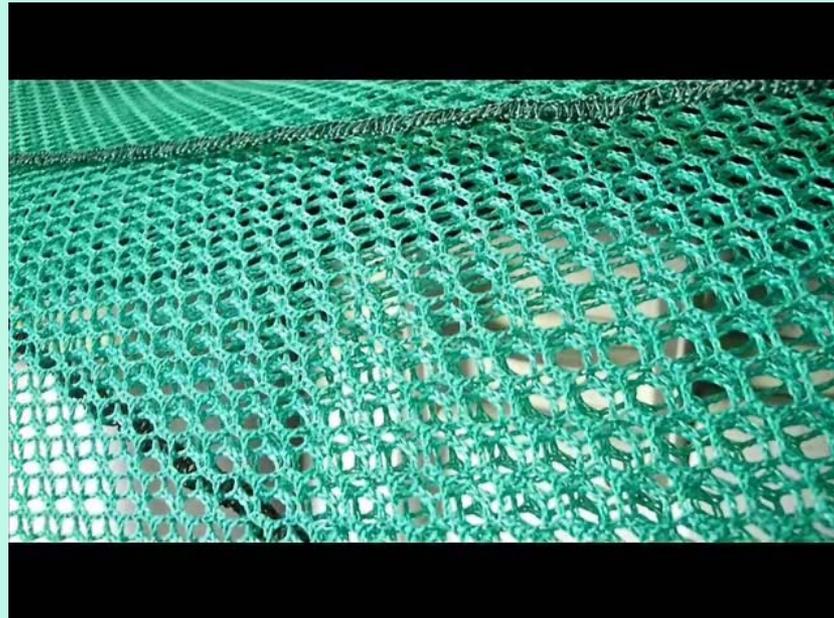
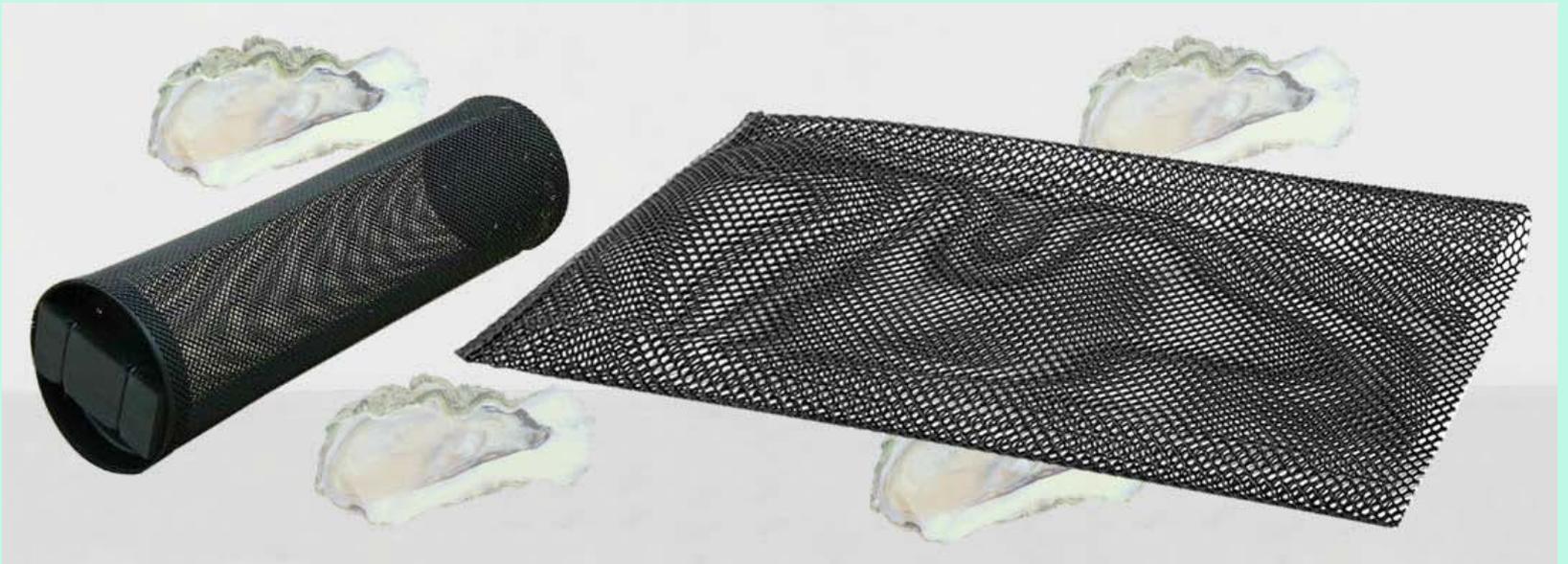


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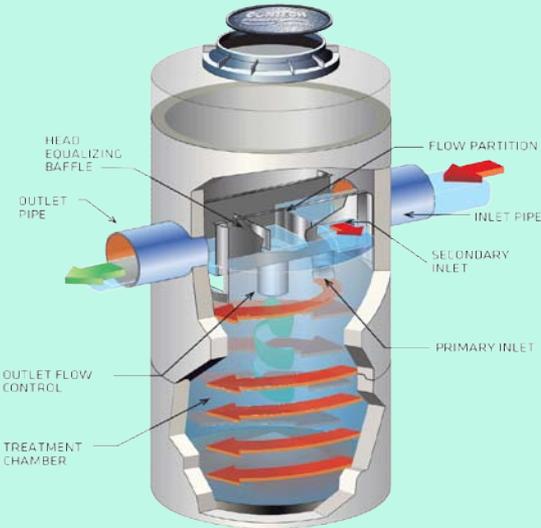
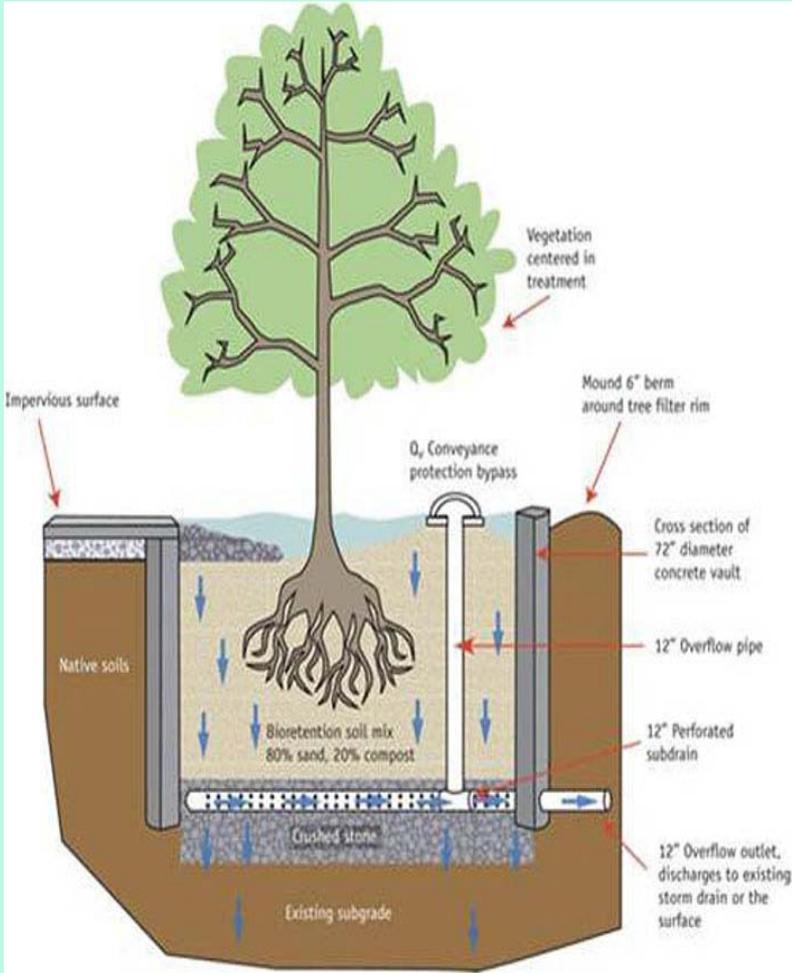
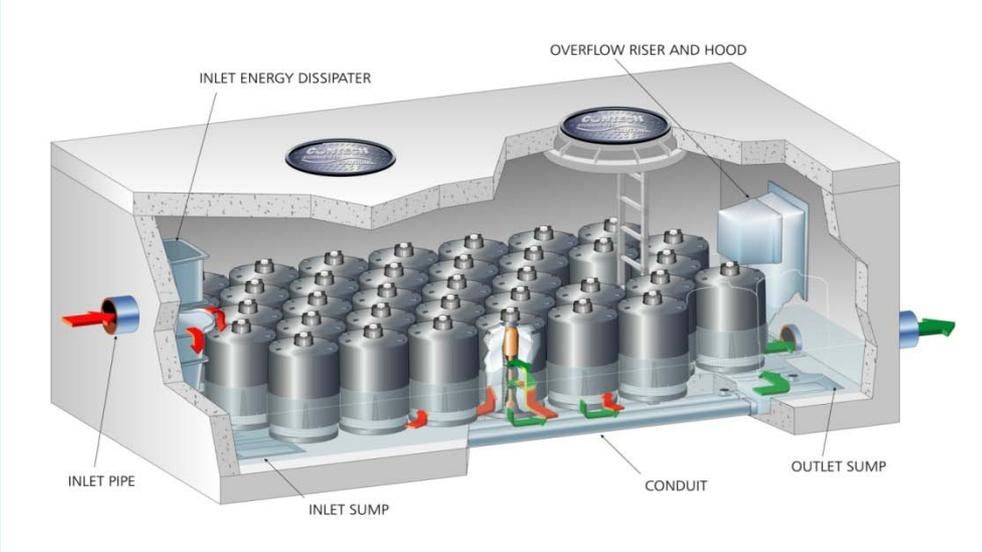


Filter Feeders: Oyster Strings



Filter feeders: Clam Bag Systems

# Pretreatment for drains and improved run-off capture



# Options Examined for Flooding, Runoff, and Erosion From Climate Change

- Improved swales and additional drainage swales with coastal dunes
- Removal of exotics and replacement with GeoWeb and natives
- Removal of silt from Clower Creek
- Remove vegetation blocks from Clower Creek
- Improved Evacuation Coordination

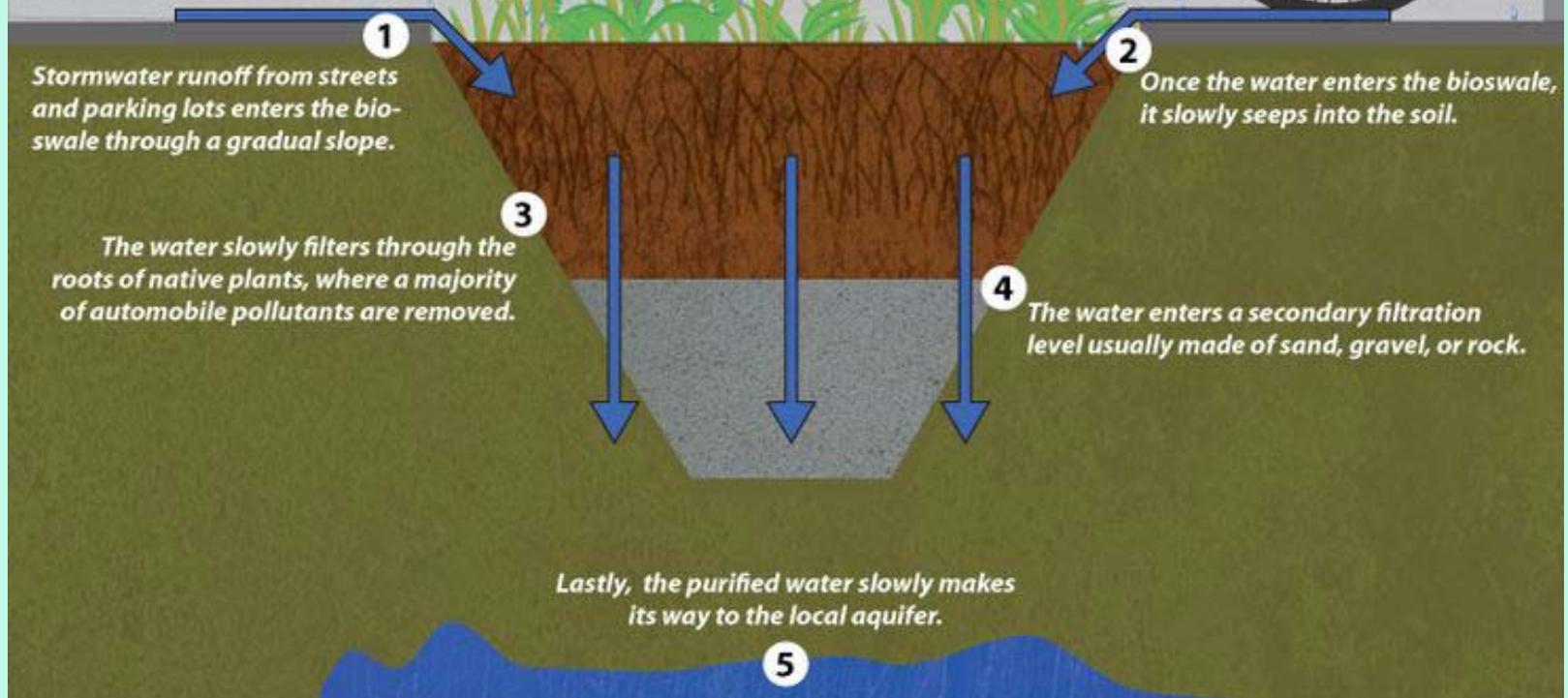


Improved swales and additional drainage swales with coastal dunes

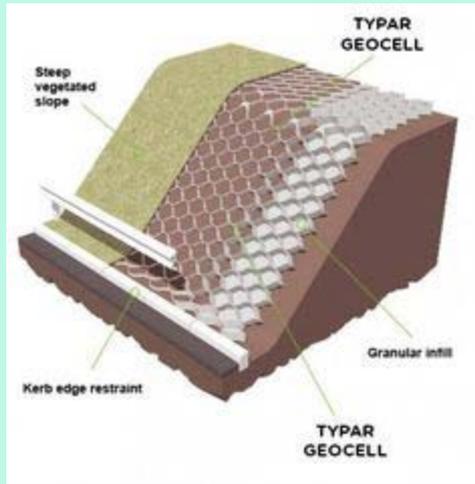
# What is a Bioswale?

A bioswale is a ditch that allows for rainwater to soak into the earth slowly, rather than flooding streets or going into the ocean.

Here's how it works:

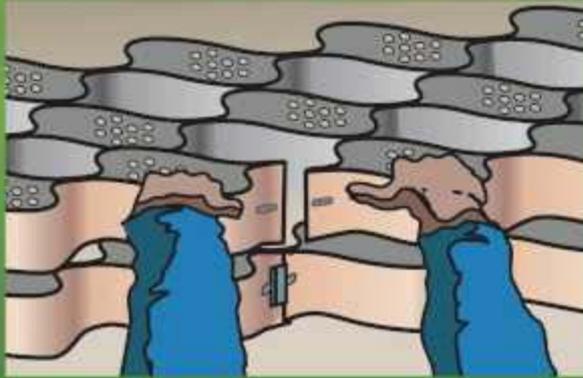


# Removal of exotics and replacement with GeoWeb and natives



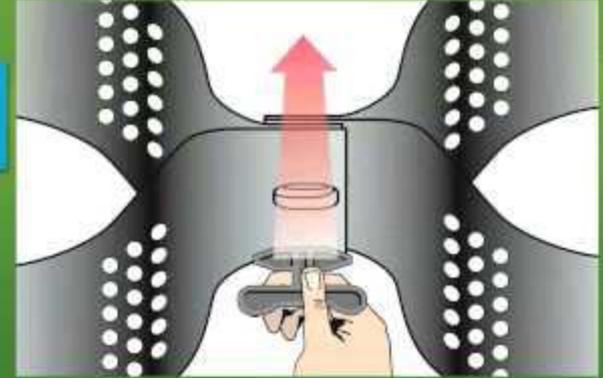
5

Cut GEOWEB® front fascia panels with utility knife to insert ATRA® keys.



6

Connect GEOWEB® sections with ATRA® Keys.



**GEOWEB®**  
Retaining Wall System – Geosynthetic Reinforced



**GEOWEB®**  
Channel Protection System with ATRA® Anchor Connection



7

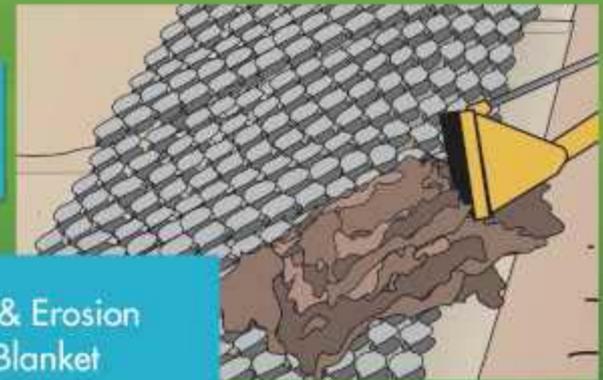
Hold sections open  
(use options A, B, C, or D).



D. Infill select outer cells

8

Place infill from the top of the slope. Use equipment suitable for infill placement.



A. Top soil & Erosion Control Blanket

**GEOWEB®**  
Load Support System



**GEOWEB®**  
Slope Protection System with ATRA® Anchor Connection



- 1) Removal of silt from Clower Creek
- 2) Remove vegetation blocks from Clower Creek



Removal of silt and  
vegetation blocks from  
Clower Creek



# Improved Evacuation Coordination Plan

## APPENDIX N

### HURRICANE PREPAREDNESS

Pelican Cove units and common buildings are not built to current hurricane standards and should not be used as shelters by residents in a hurricane. Although our 71 residential buildings are located in three different hurricane evacuation zones, PC Management will most likely extend evacuation orders to all residents. This will be disseminated via Pelican Cove's email blasts, bulletin boards, website ([http://www.pelicancovecondo.com/outside\\_home.asp](http://www.pelicancovecondo.com/outside_home.asp)) and Comcast in-house closed circuit channel 195. Information on evacuation zones is available in the PC Office and on the Sarasota County website (<http://www.scgov.net/EmergencyServices/allhazards.asp>). The hurricane season begins June 1st and ends November 30th. Residents living here during hurricane season should develop a hurricane preparedness plan prior to June 1st that includes evacuation.

- The Sarasota County Hurricane Guide, available in the PC Office, includes information about hurricane preparedness plans, an evacuation map, hurricane shelters (including ones that take pets), persons with special needs, hurricane supply kits, emergency contacts, insurance information and re-entry procedures after a hurricane.
- The Pelican Cove Disaster Preparedness and Response Committee and a team of volunteers provide information and advice to residents about hurricane preparedness, to include conducting a hurricane information meeting each year.
- If you will need assistance during an evacuation, it is important that you call Special Needs Registration at 861-5000. You must pre-register for this service - do not wait until the storm is here.
- If you have home health care service, plan ahead with your agency for emergency procedures. During an emergency, the Pelican Cove Staff will not be able to assist every individual.
- Second floor units should evacuate at the same time as the first floor units. A severe storm may damage the structural integrity of a building.
- Once a Hurricane Watch is announced, the Association will implement its Hurricane Plan. The Pelican Cove Office will be secured for the storm and staffed as long as it is deemed safe.
- All recreational buildings and pools will be prepared for the storm and deck furniture will be secured.
- As soon as Sarasota County issues a tropical storm or hurricane warning, residents must remove all outdoor objects: patio furniture, hanging pots, potted plants, grills, propane tanks, hoses, decorative items and other unsecured items. These must be moved inside to limit the amount of flying debris during hurricane season. If it is necessary for the Pelican Cove staff to remove such items, the owners will be fined \$100, per storm, plus the costs of the removal of items as determined by Management.
- Boat and canoe/kayak owners are solely and completely responsible for the safety and security of their own vessels and must abide by the Hurricane Regulations in The Rules We Boat By.
- Residents should stay updated by watching the National Weather Channel (cable channel 31) or local television channels.

- After a hurricane, there will be building damage information on the PC website. Unit owners not in residence may be instructed to call a special telephone number to find out specific information about their condo unit.
- Residents who have evacuated must be aware of Sarasota County re-entry procedures in effect, especially the need for valid credentials with a Pelican Cove address such as a drivers' license, utility bill, property tax bill or condo lease agreement.
- After a hurricane, Pelican Cove Board Emergency Powers may be implemented which includes the right to close the property for occupancy and contract for items or services as outlined in the Pelican Cove Disaster Preparedness and Response Plan.
- Should the Association need to contact individual owners directly and their whereabouts are unknown, the Association will contact the person(s) designated as their Emergency Contact.
- The Association will make an effort to keep roads clear from debris.
- The Association will direct traffic and will open the South Gate if necessary.
- Upon re-entry, watch Pelican Cove's in-house closed circuit channel 195 or call one of the numbers listed in the hurricane guide. Use Sarasota County website for updates on the local conditions.

## Options Examined for Vulnerabilities to the Structures, Grounds, and Infrastructure from trees and identified plant and tree species that can reduce negative impacts on the water quality in Clower Creek and Little Sarasota Bay based on their need for fertilizer, pesticide, and irrigation

- Removal of trees with low wind resistance
- Utilize native trees with high wind resistance in future tree replacements
- Favor native vegetation species over exotics.
- Select plants of the original coastal oak hammock uplands and flanking estuarine and creek transition zones by a mangrove shoreline and a riparian creek.
- Introduce some tropical hardwood hammock species
- Stabilize exposed and eroding shore and backshore areas with marsh grasses and herbaceous marsh species in Zonal Shoreline Plantings
- Changes in mangrove trimming
- Continual improvement in fertilizer management

# Removal of trees with low wind resistance

The problem tree species with the lowest wind resistance and the greatest danger to buildings, infrastructure, and access		
<i>Araucaria excelsa</i>	Norfolk Pine	Planned Removal and replace with alternate native
<i>Brassia actinophylla</i>	Schemera	Reduce or Remove only if threatening Structures and access
<i>Cassia fistula</i>	Golden Shower Tree	Reduce or Remove only if threatening Structures and access
<i>Casuarina equisetifolia</i>	Australian Pine	Planned Removal and replace with alternate native
<i>Chorisia speciosa</i>	Floss-Silk Tree	Reduce or Remove only if threatening Structures and access
<i>Cupamopsis anacardioides</i>	Carrotwood Tree	Planned Removal and replace with alternate native
<i>Ficus benamina</i>	Weeping Fig	Reduce or Remove only if threatening Structures and access
<i>Grevillea robusta</i>	Silk Oak	Reduce or Remove only if threatening Structures and access
<i>Jacaranda acutifolia</i>	Jacaranda	Reduce or Remove only if threatening Structures and access
<i>Juniperus sillicicola</i>	Red Cedar	Reduce or Remove only if threatening Structures and access
<i>Melaleuca leucadendron</i>	Punk Tree	Planned Removal and replace with alternate native
<i>Peltaphorum</i>	Yellow Poinciana	Reduce or Remove only if threatening Structures and access
<i>Quercus laurifolia</i>	Laurel Oak	Reduce or Remove only if threatening Structures and access
<i>Spathodea companulata</i>	African Tulip Tree	Reduce or Remove only if threatening Structures and access
<i>Syagrus romanzoffianna</i>	Queen Palm-Cocos Plumossa	Planned Removal and replace with alternate native
<i>Tabebuia argentea</i>	Tree of Gold	Reduce or Remove only if threatening Structures and access
<i>Washington robusta</i>	Washington Palm	Planned Removal and replace with alternate native

# Utilize native trees with high wind resistance in future tree replacements

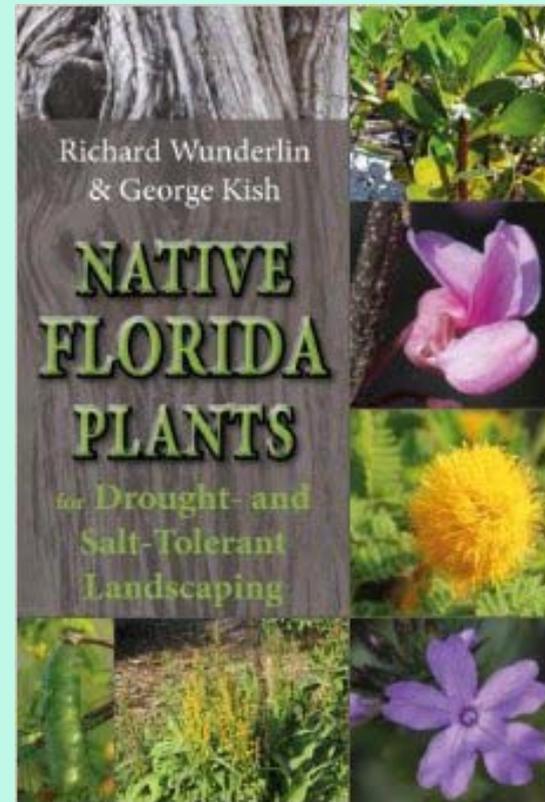
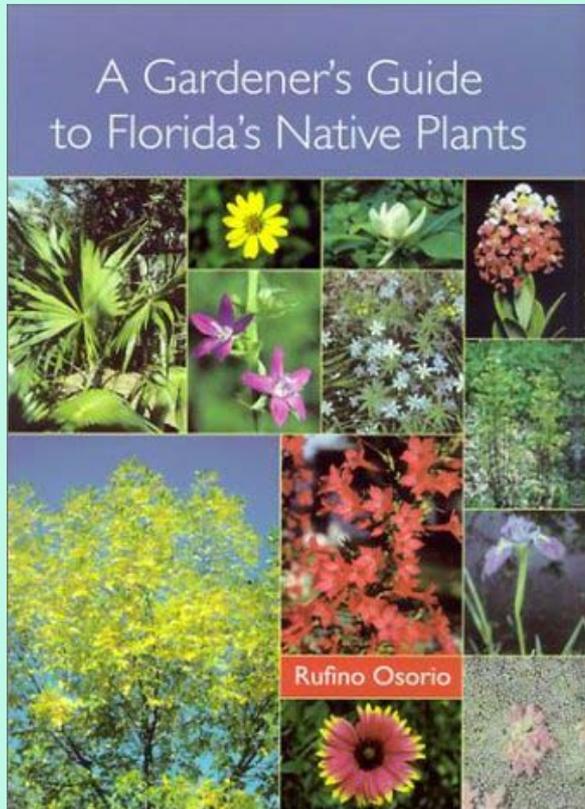
**Queen Palm subject to easy wind-throw**



**Cabbage Palm the most resistant palm to strong winds**



Favor native vegetation species over exotics.





## ***Florida Friendly Native Landscaping***

Three related topics had the greatest support:

Require Municipal Use of Xeriscaping

Build Xeriscaping into Codes and Educate Homeowners

Use Native Plants in Landscaping.

All three adaptations are geared to reducing the need for irrigation while increasing the drought hardiness of the planted landscape.

Florida-friendly landscaping can be considered an expansion of xeriscaping. A Florida-friendly yard goes beyond xeriscaping to better fit our unique landscape and climate. It includes best management practices concerning stormwater runoff and living on a waterfront.

A properly maintained Florida-friendly yard can help homeowners conserve water and reduce pollution of water resources. .

Both FYN and Florida Friendly programs approach to landscaping emphasizes nine interrelated principles including:

Right plant, right place

Water efficiently

Fertilize appropriately

Mulch

Attract Wildlife

Manage yard pests responsibly

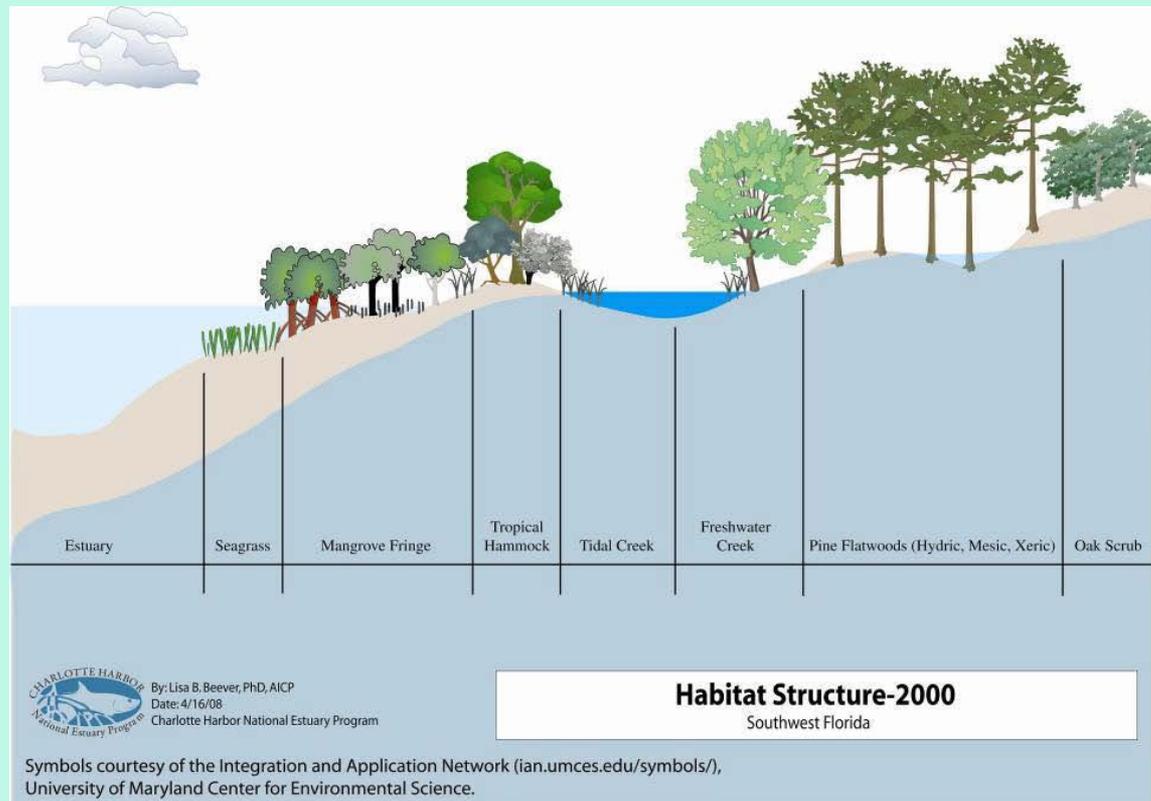
Recycle

Reduce stormwater runoff

Protect the waterfront



Select plants of the original coastal oak hammock uplands and flanking estuarine and creek transition zones by a mangrove shoreline and a riparian creek.



Introduce some tropical hardwood hammock species



Stabilize exposed and eroding shore and backshore areas with marsh grasses and herbaceous marsh species in Zonal Shoreline Plantings





Changes in mangrove trimming

# Continual improvement in fertilizer management

## SWFRPC Resolution #07-01

### Southwest Florida Regional Planning Council Fertilizer Resolution

A RESOLUTION SUPPORTING THE REGULATED USE OF FERTILIZERS CONTAINING NITROGEN AND/OR PHOSPHORUS WITHIN SOUTHWEST FLORIDA; PROVIDING SPECIFIC RECOMMENDATIONS AND GUIDELINES TO BE CONSIDERED BY LOCAL GOVERNMENT JURISDICTIONS FOR THE REGULATION AND CONTROL OF FERTILIZER APPLICATION; PROVIDING RECOMMENDED DEFINITIONS; PROVIDING RECOMMENDATIONS RELATING TO TIMING OF FERTILIZER APPLICATION, CONTENT AND APPLICATION RATE, IMPERVIOUS SURFACES, BUFFER ZONES AND MECHANICAL APPLICATION; PROVIDING RECOMMENDED EXEMPTIONS; PROVIDING RECOMMENDATIONS FOR LICENSING OF COMMERCIAL AND INSTITUTIONAL APPLICATORS; PROVIDING RECOMMENDATIONS FOR PUBLIC EDUCATION PROGRAMS; PROVIDING RECOMMENDATIONS RELATING TO THE RETAIL SALE OF FERTILIZER; PROVIDING RECOMMENDATIONS FOR APPEALS, ADMINISTRATIVE RELIEF AND PENALTIES; PROVIDING FOR AN EFFECTIVE DATE.

**WHEREAS**, Southwest Florida is a region where the water quality of the bays, estuaries, rivers, lakes, wetlands, bayous and the Gulf of Mexico is critical to the region's environmental, economic, and recreational prosperity and to the health, safety and welfare of the citizens of this region;

**WHEREAS**, recent increased frequency and duration of red tide blooms and increased accumulation of red drift algae on local beaches and other algae and water related problems have heightened community concerns about water quality and cultural eutrophication of surrounding waters;

**WHEREAS**, there is a need to develop a stronger knowledge of the connection between activities in yards, streets, and stormwater systems and natural water bodies among all those who live, work and recreate in the Southwest Florida Region;

**WHEREAS**, this resolution is part of a multi-pronged effort by the Southwest Florida Regional Planning Council to reduce nutrient leaching and runoff problems by actions including, but not limited to, stormwater management, water conservation, septic systems, central sewage treatment, public education, restoration of surface and groundwater levels; and regional drainage of native habitats;

**WHEREAS**, nutrients are essential elements for plant growth and are commonly used in various forms as a Fertilizer for lawns (Turf), specialized Turf and landscape application;

**WHEREAS**, leaching and runoff of nutrients from improper or excess fertilization practices can contribute to nitrogen and phosphorus pollution of the Southwest Florida's water resources;

A Copy of The Pelican Cove Community Climate Change Vulnerability Assessment are available on-line at the Pelican Cove Project Portal at

<http://www.swflregionalvision.com/pelicancove.html>

in the resources tab

or directly at

<http://swflregionalvision.com/content/pelicancove/The%20Pelican%20Cove%20Community%20Climate%20Change%20Vulnerability%20Assessment%20Final%2020170130.pdf>

Other climate change reports for southwest Florida are at

[http://www.swfrpc.org/climate\\_change.html](http://www.swfrpc.org/climate_change.html)



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