

**Rapid Tropical Forest Assessment & Forest Conservation Plan for “The Palms”, St. Croix U. S. Virgin Islands**

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## **Rapid Tropical Forest Assessment & Forest Conservation Plan for "The Palms", St. Croix**

### **Overview of Work Performed:**

Geographic Consulting conducted a rapid forest assessment in mid-February to identify current threatened, endangered or significant trees as identified by the DPNR-CZM Tier I permitting process. No threatened or endangered woody or herbaceous species were found. Further work was conducted to identify relevant planting zones for native trees and shrubs to address turtle habitat as well as providing native vegetation for ecological compatibility and human enjoyment.

### **Findings : Rapid Forest Assessment**

The rapid forest assessment was conducted by field survey focusing on tree species greater than six-inch's (15.2 cm) diameter at breast height (DBH) (**Table 1**). The trees were located using a Trimble GPS unit and mapped over a 2007 aerial photo for locations and canopy (**Appendix A**).

**Table 1 : Trees found greater than 6" in diameter**

<b>Common Name</b>	<b>Genus</b>	<b>Species</b>	<b># Found</b>
Christmas Palm	<i>Adonidia</i>	<i>merrillii</i>	1
Tibit	<i>Albizia</i>	<i>lebbeck</i>	2
Silver palm	<i>Bismarckia</i>	<i>nobilis</i>	1
White Caper	<i>Capparis</i>	<i>indica</i>	1
Sea Grape	<i>Coccoloba</i>	<i>uvifera</i>	13
Coconut	<i>Cocos</i>	<i>nuciferous</i>	187
Buttonwood	<i>Conocarpus</i>	<i>erectus</i>	2
Flamboyant	<i>Delonix</i>	<i>regia</i>	1
Strangler Fig	<i>Ficus</i>	<i>spp.</i>	28
Wild Hibiscus	<i>Hibiscus</i>	<i>tiliaceus</i>	2
Date Palm	<i>Phoenix</i>	<i>spp.</i>	8
Pigmy date palm	<i>Phoenix</i>	<i>roebelenii</i>	3
Frangipani	<i>Plumeria</i>	<i>alba</i>	2
Royal Palm	<i>Roystonea</i>	<i>borinquena</i>	12
Cabbage Palm	<i>Sabal</i>	<i>palmetto</i>	1
Beach Almond	<i>Terminalia</i>	<i>catappa</i>	3
Seaside Mahoe	<i>Thespesia</i>	<i>populnea</i>	1

There were no threatened or endangered trees or herbaceous species found on the property during the survey. The Palms property is a well landscaped area comprised of native and non-native ornamental plants. The vegetation in the coastal area, generally following the CZM line, is comprised of coconuts (*Cocos*



*nuciferous*) sea grape (*Coccoloba uvifera*). and the potentially problematic, non-native inkberry (*Scaevola scarea*),

The interior landscape is planted with primarily palm trees and some other ornamental plants. Strangler Figs (*Ficus spp.*) and Wild Hibiscus (*Hibiscus tiliacea*) line the current parking areas.

### **Native Vegetation Planting Zones**

Geographic Consulting identified six separate zones on The Palms property each with unique conditions requiring appropriate plants. These zones are identified in **(Table 2)**. Geographic consulting generally recommends native plants for environmentally sensitive areas because they help create landscapes that are ecologically functional and add to the health of surrounding forest. The plants are adapted to thrive under specific conditions. By choosing the appropriate species, one can greatly reduce the water, fertilizer and pesticide requirements of the landscape planting. These zones were discussed and further refined through meetings with the turtle working group and the property owners, Joyce and Chuck Fischer

**Table 2 : Planting Zones**

<b>Zones</b>
<i>Zone 1 – Coastal Area (Special Emphasis on Human and Turtle Interaction)</i>
<i>Zone 2 – Interior Landscape area around buildings</i>
<i>Zone 3 – Water drainage areas</i>
<i>Zone 4 – Areas abutting trails</i>
<i>Zone 5 – Area around pool (wind and viewing blockage)</i>
<i>Zone 6 – Fence line along east end of property</i>

Six planting zones were identified **(Appendix B)**. The coastal zone addresses that area where people and sea turtles are most likely to interact and lies with the CZM Tier 1 line. The interior landscape is the area where there is no footprint from buildings, parking lots or trails. The water drainage areas were identified from the master plan of utilizing permeable concrete for parking and require landscape plants that will not be harmed by fluctuating water levels and not interfere with parking lot function or infrastructure. A five foot buffer was created around the proposed trails to identify an area with high pedestrian traffic and requiring low-growing attractive plants without thorns that can withstand human impacts. . The area around the pool was identified as a zone to provide wind protection for the residents and guests of the property. The eastern edge was identified as a possible area for a vegetative fence line with the ability to restrict pedestrian traffic.



There are hundreds of plants native to the Virgin Islands. This list highlights just a few of these and should not be considered comprehensive. These plants are all adapted to coastal conditions and will generally need less water, fertilizer and pesticide than imported ornamental plants. Each has additional characteristics that make them appropriate for the suggested zone. The agave, for example, can form an impenetrable barrier for border planting while the sea lavender will not impede pedestrians or sea turtles. As ornamentals, we chose these plants because their colors and textures will provide pleasant contrast with the existing landscape plants. As natives, they fit into the unique character of St. Croix's plant communities. This list (**Table 3**) is to act as a guide to the landscape designer and as an example to future developers.

**Table 3 : Recommended Planting List for the Palms Landscaping and appropriate zones**

Recommended Species List	Best Planting	Maturation	Local Availability	Zone
Sea Lavender	September-December	1 year	no	1,4
Coco Plum	September-December	5 years	rarely	1,2,4
Pitch Apple	any time	5 years	occasional	1,2,4,5
Eggers agave, Century plant	any time	5 years	occasional	1,2,5,6
Silver Buttonwood, Mangrove Tree	September-December	5 years	common	1,2,5,6
Inkberry (native)	September-December	1 year	rarely	1,4
Sea Grape	September-December	10 years	common	1,2,5,6
Pipe Organ Cactus, Dildo Cactus	any time	5 years	rarely	2,6
Silver Palm, Thatch Palm	September-December	10 years	rarely	2,4
White Frangipani	any time	5 years	sometimes	2,5
Jamaican Caper	September-December	5 years	rarely	2,4,5
Royal Palm	September-December	10 years	occasional	2,3

Full descriptions of each species as well as pictures are provided in **Appendix (C)**.

### ***Turtle Zone Recommendations***

Geographic Consulting held a meeting with the Turtle Advisory Group to identify areas of turtle occurrence and possible management strategies for these areas. From this meeting and current information Geographic Consulting created a planting list for these specific turtle zones (**Appendix D**).





*Turtle Zone 1* - The first zone was identified as having mainly leatherback nesting activities and some green turtle activity (**Fig. 1**). It is recommended this area be cleared of the non-native inkberry. This will make the strategy consistent with leatherback nesting needs for open sand.



**Figure 1 : Turtle Zone 1**



*Turtle Zone 2* - The zone was identified as more likely to have hawksbill nesting activities. Current vegetation is coconuts and sparse sea grape and patches of the non-native inkberry. We recommend a strategy of utilizing existing vegetation while planting the native inkberry and removing the non-native inkberry with possible plantings of sea grape to fill in areas. These plants and trees provide ground cover which is consistent with the hawksbill nesting within a ground cover.



**Figure 2 : Turtle Zone 2**



**Turtle Zone 3** - The zone was identified as more likely to have hawksbill and green nesting activities. Current vegetation is coconuts and sparse sea grape and patches of the non-native inkberry. We recommend a strategy of utilizing existing vegetation to create a strategy of planting the native inkberry and removing the non-native with possible plantings of sea grape to fill in areas. These plants and trees provide ground cover which is consistent with the hawksbill nesting within a ground cover. Part of the area could be removed of vegetation for the green turtle nesting.



Figure 3 : Turtle Zone 3

## Other Recommendations

The interior landscape consists of a collection of ornamental trees, primarily palm trees. These trees can be removed without significant environmental impacts as they are a planted landscape. The row of date palms are mature and valuable trees and some consideration should be given to protecting or removing those





trees during construction (**Figure 4**). An arborist is recommended for this job. The strangler figs located on the southwestern portion of the property lining the parking lot represent a significant management problem. These are highly aggressive trees and are ensnaring 120V electric lines and light fixtures. Some of the trees have grown around the WAPA power lines and need to be removed. Again, a professional arborist should be employed due to the very dangerous possibility of electrocution.



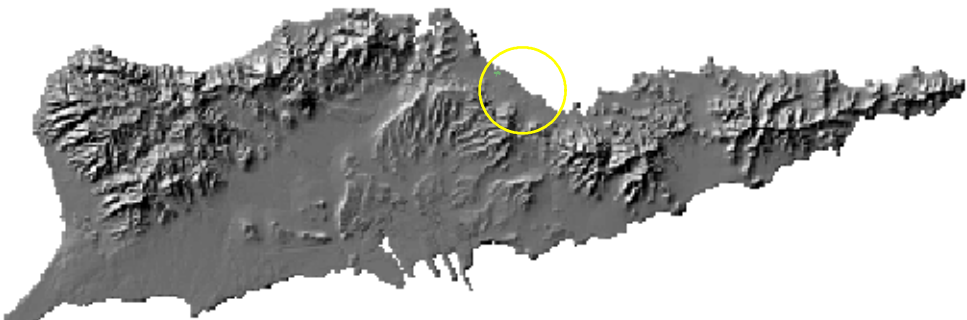
**Figure 4 : Strangler Fig in Power Line**

### **Conclusion**

This report identified the current vegetation and identified zones for native tree and shrub planting. These recommendations were compiled by Geographic Consulting with input from the Turtle Working Group and the Fischers. The planting list and zoning is meant to be used as a guide to the landscape designer with regard to turtle habitat and human habitation.



# Appendix A : Existing Vegetation Survey



Inset : St. Croix, U.S. Virgin Islands

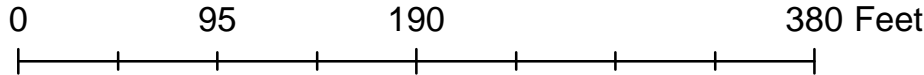
## Legend

- Contours (1')
- Beach Survey Areas
- Palms Outline

## Tree Points Collected species

- albleb
- capind
- cocnuc
- cocoloba uvifera
- concarp

- delreg
- ficus spp.
- hibtil
- palm spp.
- pheonix date
- plumeria alba
- roybor
- sabcas
- sabel spp.
- silver palm
- tercat
- thespop
- bisnob



## Trees found greater than 6" in diameter

Common Name	Genus	Species	# Found	Native
Christmas Palm	<i>Adonidia</i>	<i>merrillii</i>	1	
Tibit	<i>Albizia</i>	<i>lebbeck</i>	2	
silver palm	<i>Bismarckia</i>	<i>nobilis</i>	1	
White Caper	<i>Caparas</i>	<i>indicus</i>	1	*
Sea Grape	<i>Coccoloba</i>	<i>uvifera</i>	13	*
Coconut	<i>Cocos</i>	<i>nuciferous</i>	187	
Buttonwood	<i>Conocarpus</i>	<i>erectus</i>	2	*
Flamboyant	<i>Delonix</i>	<i>regia</i>	1	
Strangler Fig	<i>Ficus</i>	<i>spp.</i>	28	
Wild Hibiscus	<i>Hibiscus</i>	<i>tiliaceus</i>	2	*
Date Palm	<i>Phoenix</i>	<i>spp.</i>	8	
Pigmy date palm	<i>Phoenix</i>	<i>roebelenii</i>	3	
Frangiapani	<i>Plumeri</i>	<i>alba</i>	2	*
Royal Palm	<i>Roystonea</i>	<i>borinquena</i>	12	*
Cabbage Palm	<i>Sabal</i>	<i>palmetto</i>	1	
Beach Almond	<i>Terminalia</i>	<i>catappa</i>	3	*
Seaside Mahoe	<i>Thespesia</i>	<i>populnea</i>	1	*

Beach Survey Areas	# Coconuts	# Sea Grape
1	13	0
2	51	8
3	55	3
4	35	1

Map made for Sustainable Systems and Design International.

Data includes 2007 Aerial Photos, Puerto Rico DRNA 2008 2006 VI Cadastral Data and Master Plan from Jaradian Design Group

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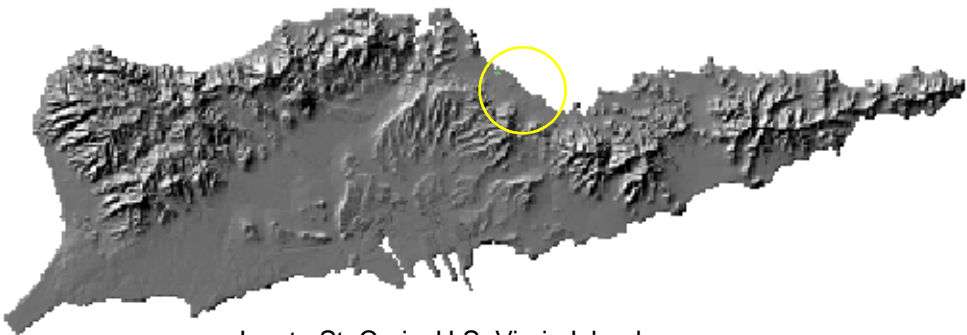
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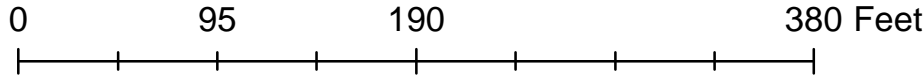
# Appendix B : Identified Planting Zones



Inset : St. Croix, U.S. Virgin Islands

## Legend

- Contours (1') Zone 1- Coastal  
Zone 2 - Interior  
Zone 3 - Drainage  
Zone 4 - 5' Area Trails  
Zone 5 - Pool Area  
Zone 6 - Fence East
- Type  
Trails  
Bldgs  
Rds



Recommened Species List	Best Planting	Maturation	Local Availability	Zone
Sea Lavander	September- December	1 year	no	1,4
Coco Plum	September- December	5 years	rarely	1,2,4
Pitch Apple	any time	5 years	occasional	1,2,4,5
Eggers agave, Century plant	any time	5 years	occasional	1,2,5,6
Silver Buttonwood, Mangrove Tree	September- December	5 years	common	1,2,5,6
Inkberry	September- December	1 year	rarely	1,4
Sea Grape	September- December	10 years	common	1,2,5,6
Pipe Organ Cactus, Dildo Cactus	any time	5 years	rarely	2,6
Silver Palm, Thatch Palm	September- December	10 years	rarely	2,4
White Frangipani	any time	5 years	sometimes	2,5
Jamaican Caper	September- December	5 years	rarely	2,4,5
Royal Palm	September- December	10 years		2,3

See Appendix C for Pictures and Descriptions

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## Appendix C: Recommended Plants for the Palms Beach Resort

This list is intended to serve as a guide for selecting plant material for the landscape at the Palm Beach Resort. All of these plants are native to the Virgin Islands and also adapted to the coastal environment found along St. Croix sandy north shore. There are many more plants species that are suitable for the area, but this list was developed based on the plants' ecological suitability, availability and utility in the landscape.

### Sea Lavender (*Argusia gnaphalodes*)



Native to the coast of south Florida, Puerto Rico and the Virgin Islands. This is a partially succulent, evergreen plant reaching up to 3 m in height and having a spreading growth habit and usually found in clumps on coastal dunes. In landscapes it is usually grown for its attractive blue-silver foliage. The plants are highly tolerant of drought and salt spray.

### Jamaican Caper (*Caparis cynophallaphora*)

Found from south Florida to Central America and throughout the Caribbean islands. Plants are usually concentrated to coastal scrub and beaches. They reach 4-7 m tall, have dark olive-green, compact foliage and flower throughout the year. Flowers open white and turn purple over several days and the blooming period can last several weeks and bloom multiple times per year. [Please see the attached fact sheet for more detailed information.]



### Coco Plum (*Chrysobalanus icaco*)



Native to both rocky and sandy coasts from south Florida, Central America and the Caribbean Islands. This medium sized shrub usually grows to less than 3 m tall. The waxy foliage makes it attractive in landscapes planted either singly or sculpted as a hedge. The slightly sweet fruit is edible and relished by shore birds and humans alike. The pinkish-white fruit is found on plants native to the Virgin Islands while those from Florida have a much smaller, dark purple fruit.

### Pitch Apple (*Clusia rosea*)

Native to humid forests and coastal areas throughout Central America and the Caribbean Islands. The medium sized tree can grow to 20 m over time, but tends to be smaller near the coast and can be shaped and pruned. Thick leathery leaves and attractive year-round flowers make this an attractive ornamental tree as well as a draw for wildlife, particularly native bats.



### **Eggers agave, Century plant (*Agave eggersiana*).**



This plant's natural world distribution is on St. Croix, U.S Virgin Islands only. It is one of the territory's most unique and endangered organisms. Healthy agaves are found in diverse areas including salty sand, steep rocky slopes and in manicured gardens. Its tolerance to bright sun, wind and drought are unsurpassed. It is locally known as a century plant for the stunning 5 m tall flower spike the plant produce, supposedly, every 100 years. In fact, plants live for 7-10 years, flower once and then die. Nectar from these immense flowers is critical food for wildlife during the dry season. Planted alone, the rosette shaped foliage adds texture and variety to a landscape. Planted together, the triangle shaped thorns along its succulent leaves can be used to create a formidable barrier. This plant is a close relative to the blue Mexican agave from which tequila is derived.

### **White Frangipani (*Plumeria alba*)**

Native to the dry forests and coastal areas throughout Central America and the Caribbean Islands. The small, attractive tree grows to 8 m tall. Branches are succulent, producing copious amounts of caustic white latex when cut. The leaves are very linear and concentrated to the end of curled branches, giving some trees a Dr. Seuss-like appearance. The large, somewhat fragrant flowers are white with yellow centers and are produced in bursts throughout the year. Giant, colorful caterpillars from the pseudosphinx moths consume the leaves in such quantities that they sometimes defoliate the tree and become inedible in the process. However, no harm is done to the tree.



### **Silver Buttonwood, Mangrove Tree (*Conocarpus erectus*)**

Probably native to most tropical, coastal areas in the western hemisphere, but now much more widely planted. The tree can reach over 10 m in height and can be either a tree or manicured into an attractive hedge. This is a very tough tree that can handle almost any seaside or urban conditions and still require little care. It is one of the most widely available native trees in the territory and both green and silver varieties are often available in nurseries. It is ideal for parking lot plantings, as a tall screen or a low hedge.



### **Inkberry (*Scaevola plumieri*)**

Native range is from south Florida throughout the Caribbean Islands. Inkberry is a shrub found along sandy beaches and dunes and often occurs in large, dense hedges. It is a beach stabilizing plant that traps sand and sometimes buries itself. The flower is white with all the petals positioned on one side, giving it the appearance of a sunrise. There are several species in the genus, but the Virgin Islands native produces a black, olive sized fruit with a single seed in the center. It has not been reported that this plant could interfere with turtle nesting.





### **Sea Grape (*Coccoloba uvifera*)**



Sea grape is a versatile tree well-suited to coastal landscapes. The tree can reach over 10 m in height but; like the buttonwood, can be pruned smaller and even into a hedge. The large, leathery leaves provide a smooth texture and outline in the landscape. The young leaves emerge reddish, providing extra color. Another desirable feature of the tree is the hanging bunches of berry sized fruits which are both edible and attractive. Its tolerance to salt and drought make it a relatively low-maintenance plant that does equally well in sandy beaches and parking lot plantings

### **Silver Palm, Thatch Palm (*Coccothrinax argentea*)**

This palm is one of three species native to the U.S. Virgin Islands and occurs naturally in grasslands and coastal areas throughout the Caribbean region. The plants can reach 7 m in height with a relatively slender 15 cm diameter trunk. However, silver palms are very slow growing and take many years to achieve such size. The broad, palm-shaped leaves are widely spaced and droop slightly on their long stems giving them a delicate appearance. The leaves are deep green on top with silvery undersides that earn the plant its local name.

This plant is growing increasingly rare and few remain in the wild. In landscapes it has been ignored in favor of similar looking imported palms that now threaten the genetic integrity of our natives via hybridization. They can be planted in sandy, rocky or even calcareous soil, but not directly in beach sand. Young plants seem to prefer a small amount of shade. They are most attractive when two or three individuals are planted closely together in a cluster, especially if they are different sizes.



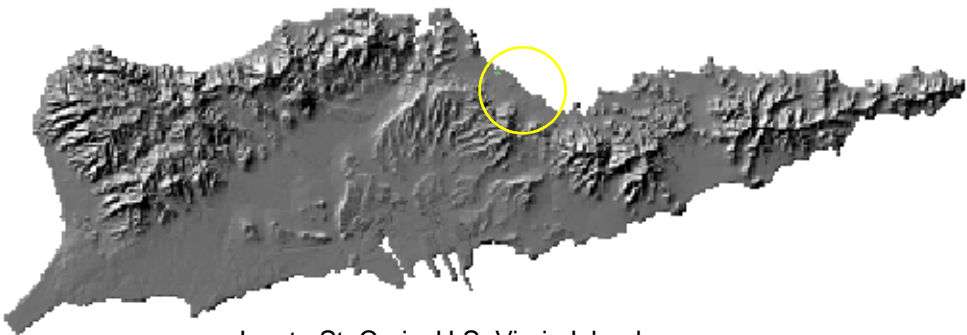
### **Pipe Organ Cactus, Dildo Cactus (*Pilocereus royerii*)**



This is the most conspicuous cactus of the Virgin Islands and is found in dry areas and along the coast throughout all the eastern Caribbean islands. The succulent pipe-organ stems grow mostly upright in a multi-branched clump reaching 3 or 4 m high over time and can eventually produce a woody, spineless trunk. The stems are blue green in color with vertical ridges lined with sharp spines. Flowers are very large, mostly white, opening at night only and lasting a matter of days. In the landscape the color and texture of the plant provides a striking contrast and requires almost no maintenance. This cactus is a slow grower, but should be given ample space and never placed near pedestrian ways. Cuttings are easily rooted in pots and if they are planted in a row they will grow to form an effectively impenetrable barrier. These cactus demand well-drained soil and do not grow well in the shade.



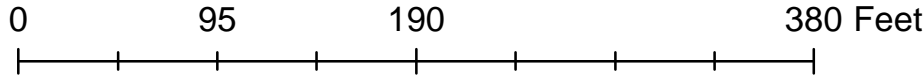
# Appendix D : Turtle Zones & Identified Planting Zones



Inset : St. Croix, U.S. Virgin Islands

## Legend

- Planting Zones**
- Type**
- Contours (1')
  - Bldgs
  - Rds
  - Zone 1- Coastal
  - Zone 2 - Interior
  - Trails
  - Zone 3 - Drainage
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  - Zone 5 - Pool Area
  - Zone 6 - Fence East
  - Turtle Zones



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