

## CYCLURA FOREST HABITAT

*The dry forests of the West Indian Islands that evolved in association with rock iguanas*

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**X**erophytic forests inhabited by large herbivorous lizards have existed in the West Indies for millions of years. They have survived drastic climatic variation, geological activity, and rising and falling sea level throughout their existence. With the arrival of man, this habitat has been changed forever.

The dry forests of the West Indian islands are some of the most endangered habitats of the region. They evolved under harsh conditions and are often less tolerant of disturbance than other vegetation communities. They occur on limestone substrate in areas with highly seasonal rainfall patterns. They are short in stature as a result of their exposure to salt laden winds. Dry forests grow slowly in sand or in sparse rocky soils. They thrive in areas of erratic rainfall and frequent drought conditions. They not only survive hurricanes and tropical storms but quickly recover if they are in good condition. The dry forests of the West Indian islands are tremendously efficient systems, capable of capturing nutrients from infrequent cycles of abundance and able to survive long periods of few resources. These xerophytic plant communities contain some of the world's hardest woods, they harbor many spectacular bird species, and the earth's largest saurian herbivores.

Xerophytic vegetation communities contain plants that are structurally adapted to growing under very dry conditions. Xerophytes often have greatly reduced leaf surfaces to avoid water loss. They are thick and fleshy to facilitate water storage. Many species of plants have hairs, spines, or thorns to provide shade on their surfaces. They are perfectly adapted for the areas where they occur.

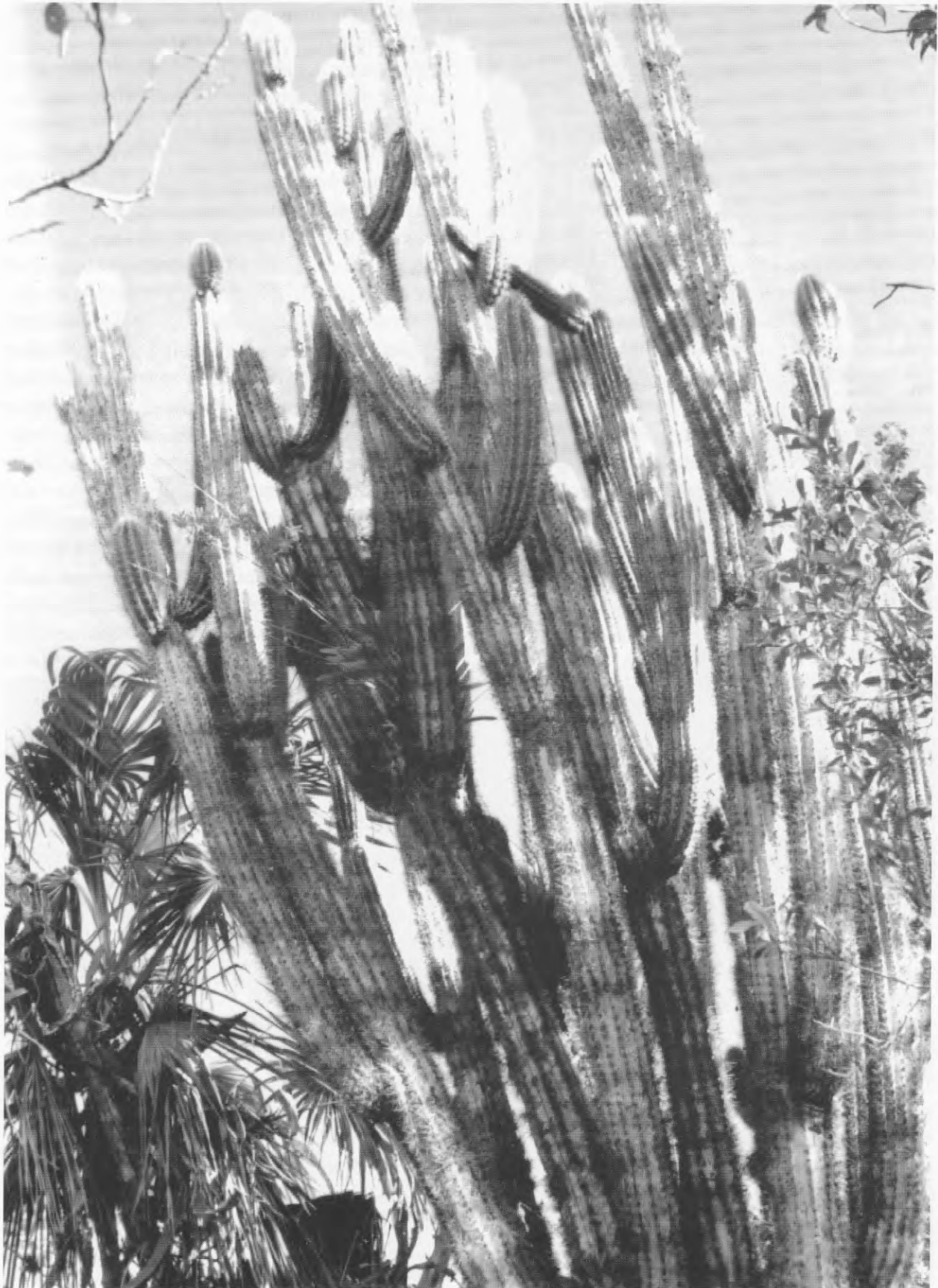
The rock iguanas of the genus *Cyclura* are the ideal vertebrate inhabitants of the West Indian dry forest. They are strongly heliothermic and survive long periods of time without fresh water. Rock iguanas thrive on a diet of rough fibrous leaves but

are well suited to take advantage of abundant but short-lived crops of flowers and fruits that most of the plants produce. *Cyclura* inhabit the many holes in the limestone substrate and create their own burrows in areas of sand.

In modern times, the West Indian dry forests have suffered a steady decline. On the larger islands and in populated areas these forests are mostly gone. Some excellent examples do survive in remote or sparsely populated areas, primarily in Cuba and the Bahamas. Excellent fragments remain in a number of other areas but most are under intense pressure and are in danger of being lost in the near future.

This type of habitat has been historically referred to as "Thorn Forest." This is due to the presence of cactus, agave, airplants, thorny or spiny trees and shrubs and the low canopy typical of this forest. Stem densities are extremely high, which helps reduce water loss. This makes moving through this habitat difficult for humans but not iguanas. The surface may be sandy, but more often is sharp pitted limestone full of holes and crevices. Solution holes and sinkholes are common, caused by rain dissolving softer areas in the rock over thousands of years. Sand and organic soils accumulate in these pockets providing places for trees and shrubs to grow. Larger holes may be kept open by the nesting activities of iguanas. Some sinkholes may contain pockets of a lateritic soil, especially on older and larger islands (Dominican Republic, Hellshire in Jamaica). Many of these soils were deposited by winds blowing dust off of Africa over the eons.

The rough nature and appearance of West Indian dry forest along with the heat and rocky terrain have made few people lament its destruction. The absence of permanent fresh water has been the main factor that has prevented destruction. On large islands the availability of water for irrigation has enabled agricultural development.



Giant Columnar Cacti, *Cephalocereus swartzii*, in the Hellshire Hills, August 1990. Photograph: R.W. Ehrig



Jamaican Silver Palms, *Coccothrinax jamaicanensis*, in the Hellshire Hills. Palm fruit provides desirable iguana food. August 1990. Photograph: R.W. Ehrig

Limestone mining has destroyed large areas in Cuba, Puerto Rico, and Jamaica. Woodcutting for the production of charcoal has destroyed vast areas in many countries. Few realize that Haiti was covered with rich dry forests containing massive quantities of mahogany and oak since these forests are 99% destroyed. Most of the soil has washed into the sea, thus depriving the island of its cover. The Hellshire Hills in southern Jamaica (the largest and most biologically diverse dry forest currently in existence in the region) is being consumed at present and will cease to exist in approximately 15 years at the present rate of deforestation.

Goats, burros, sheep, cattle, and other free ranging and feral mammalian browsers have caused untold damage. They have prevented natural regeneration of vegetation in many cases. In many degraded xeric forests non-native trees

such as Australian pine, (*Casuarina equisetifolia*) and jumbie bean, (*Leucaena leucocephala*) will become the dominant species. These trees have very low value for wildlife. Early successional native species such as *Acacia macracantha* will become major components of the forest at the expense of species diversity. Lower diversity of plants translates to reduced food resource for wildlife, which in turn leads to loss of more specialized organisms. The northern border of the Hellshire Hills, Jamaica was a tall dry forest with a 12-15 meter canopy until 1965, (E. Duffus, pers. com.). In 1990 this vegetation was composed of *Acacia macracantha* and *Haematoxylum campechianum* 2-3 meters in height. Although most large tracts of West Indian dry forest have already been destroyed, there are notable exceptions.

The Bahamas, Cuba, Dominican Republic, Virgin Islands, Florida Keys, and the Cayman Islands all have protected areas. In most cases these areas protect only parts of these habitats. Larger areas must be protected and reserves must be established in countries that do not yet have them if viable populations of *Cyclura* and other species are to survive.

Conservation of rock iguanas will be difficult in the face of growing poor human populations. The continued survival of these vegetation communities is the primary factor that will be responsible for the future survival of the West Indian rock iguanas. No other organism is more representative of West Indian dry forest and the continuing survival of both will be dependent on the same factors.

### Coexistence of Forest and Iguanas

*Cyclura* presently survive in scattered locations in the Bahamas, Cuba, the Cayman Islands, Haiti and some offshore islands, Dominican Republic and some offshore islands, Jamaica, Mona Island, Magueyes Island, Anegada, and Guana Island. It is believed that they had a much larger natural range than at present. Lucayan, Caloosa, Taino, and Arawak Indians probably all utilized *Cyclura* as food and had a negative impact on populations. The arrival of Europeans precip-



itated drastic declines in iguana populations and the destruction of the habitats. The arrival of exotic predators and competitors caused drastic declines and extinctions even where habitats were left intact.

Rock iguanas may survive in habitat that is degraded. Mona Island has suffered from grazing by goats for hundreds of years. Iguana densities only appear to be extremely high in areas that are still pristine or very close to pristine. Areas where *Cyclura* naturally occur all have common characteristics. They have limestone as a substrate and a distinct seasonal rainfall pattern. They occur at latitudes between 25° and 16° north. The vegetation is dry West Indian forest with many of the same species and is influenced by the sea.

The vegetation contains cactus, *Opuntia*, *Cereus*, and *Cephalocereus* and *Agave*. It contains xeriphytic palms, *Coccothrinax*, *Thrinax*, and *Pseudophoenix*. Most of the trees and shrubs produce seasonal crops of flowers and fruits which are extremely desirable to iguanas. Some produce flushes of growth of leaves after rains which are

also utilized as food. The reason iguanas have been so successful in this habitat is that they are able to use the resources without damaging the plants. They easily survive the periods of drought. Introduced mammals may survive but with disastrous impacts on the habitat.

There is compelling evidence that herbivorous land iguanas have a positive effect on the dispersal of the seed of many of the plants. The distribution and frequency of many of the iguanas favorite food plants are enhanced by the iguanas foraging. Iguanas and the White Crowned Pigeon are the main seed dispersers in this habitat. Large fruited trees such as 7 year apple, *Casasia clusifolia* and wild dilly, *Manilkara bahamensis* are found growing on the tops of hills where iguanas occur. Without transport by iguana these species would have a very difficult time reaching such sites. When the droppings of iguanas are examined they commonly contain seed of these plants. The scats resemble cigars, sometimes containing whole leaves, making identification of plant species possible.



San Salvador iguana, *Cyclura rileyi*, on Green Cay among the Sea Ox-Eye Daisy. Photograph: Rena Burch

### Conservation and Restoration of *Cyclura* Habitat

The first priority of any conservation project on behalf of West Indian iguanas should be protection of habitat. Without sufficient habitat to sustain a viable population, a surviving member of a species is nothing more than a living museum specimen. Preservation of habitat requires both legal protection and the physical ability to enforce that protection. Most existing populations of *Cyclura* occur in remote areas, increasing the difficulty of providing protection. Public support for conservation must be strong among the local population if the project is expected to succeed. In order for local people to be expected to support the project, respect and sensitivity of the local community is vital. The project should be designed to provide economic benefits for the local population. Headstart programs for iguanas should be in or near the habitat for both ecological and social reasons. To stop destruction of habitat and to prevent future habitat loss, employment in protection and restoration is a very strong incentive. People will develop pride in their unique natural heritage only when they are able to feed their own family.

Free ranging livestock and woodcutting for charcoal production are probably the most common negative impacts on habitat in rural areas. Goats must be removed if vegetation is going to recover. Xerophytic forests are slow growing and grazing by goats will prevent regeneration from occurring. Goats removed from protected areas provide fresh meat for local residents and reduce demand for smaller game such as iguanas. Owners will undoubtedly come forward and must be fairly compensated for their property. A warden from the local community will make transition periods more equitable for everyone. Goats kept for dairy use will have to be excluded from reserves. Conservationists may have to provide fencing materials to local residents or provide other assistance to realistically accomplish these goals.

Elimination of woodcutting will require a longer transition period. Several wardens will be needed to enforce new restrictions in a large area. Employment opportunities will be realized by



Male San Salvador iguana on Green Cay in the *Rachicallis americana*. Photograph: Rena Burch

establishing plant nurseries for native species near the settlement and a source of water. Seasonal employment in seed gathering and restoration planting will discourage violations of restrictions on woodcutting. Plantings of native hardwoods such as mahogany, *Swietenia mahagoni* and black ironwood, *Krugiodendron ferreum* in clearly defined buffer zones or close to settlements would be feasible to finance. Plantings of a variety of indigenous plants could provide firewood, medicinal plants, and wildlife habitat. Strong incentives for conservation and wise management of forest resources could result. Degraded habitats would recover and opportunities for starting ecotourist enterprises would result.

Iguanas themselves could be utilized as agents of restoration. Fruits collected from a variety of native plants could be presented to iguanas in discrete feeding stations. The iguanas again become the dispersal agents for the seed encased in fertilizer pellets. The plants of the West Indian dry forest have fruiting cycles synchronized to take advantage of seasonal rainfall. Headstart programs run in conjunction with restoration have the advantage of being able to provide hatchlings with their native foodstuffs.



# I.I.S. CYCLURA ISLAND HABITAT CLASSIFICATION SYSTEM

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## Small Island/Low Diversity

Reference islands: Green Cay and Low Cay (both in San Salvador complex)

32 species of plants or less present. Island is less than thirty acres, windblown with few sheltered areas. Sand or rock ridges or both.

● = Very abundant    ■ = Moderate    ▲ = Uncommon  
 ? = uncertain identification    x = non-native

### LOW CAY

- |                                   |                          |
|-----------------------------------|--------------------------|
| ■ Agave sp.                       | Agave                    |
| ● Ambrosia hispida                | Coastal Ragweed          |
| ▲ Argusia gnaphalodes             | Sea Lavender             |
| ▲ Avicennia germinans             | Black Mangrove           |
| ■ Borrichia arborescens           | Sea Ox-eye Daisy         |
| ▲ Bumelia americana               | Wild Saffron, Milk-berry |
| ■ Cenchrus incertus               | Sandspur                 |
| ▲ Chamaesyce mesembryanthemifolia | Spurge                   |
| ▲ Chamaesyce sp. 1                | —                        |

- |                                |                          |
|--------------------------------|--------------------------|
| ▲ Chamaesyce sp. 2             | —                        |
| ■ Cocoloba uvifera             | Seagrape                 |
| ▲ Conocarpus erectus           | Green buttonwood         |
| ▲ Cynanchum bahamense          | —                        |
| ▲ Cyperus sp.                  | Sedge                    |
| ▲ Distichlis spicata           | Salt-grass               |
| ▲ Eleusine indica?             | Goosegrass               |
| ▲ Guapira discolor             | Blolly                   |
| ▲ Ipomoea imperati             | Fiddleleaf Morning Glory |
| ● Ipomoea violacea             | Coastal Moon-vine        |
| ▲ Manilkara bahamensis         | Wild Dilly               |
| ▲ Opuntia nashii               | Nash's Prickly-pear      |
| ● Opuntia stricta var. dilleni | Common Prickly-pear      |
| ▲ Pithecellobium guadalupense  | Black Bead               |
| ▲ Scaevola plumieri            | Inkberry                 |
| ● Sesuvium portulacastrum      | Seaside Purslane         |
| ■ Spartina patens              | Saltmeadow Cordgrass     |
| ■ Sporobolus virginicus        | Seashore Dropseed        |
| ▲ Suriana maritima             | Bay Cedar                |
| ● Uniola paniculata            | Sea Oats                 |
| ■ Ximenia americana            | Hog Plum                 |



San Salvador iguana, *Cyclura rileyi*, on Green Cay among the Sea Ox-Eye Daisy, *Borrichia arborescens*.  
 Photograph: Rena Burch



## Small Island/Medium Diversity

Reference islands: Leaf Cay (part of Allans Cays), Guana Cay (San Salvador complex), and X Cay in the Northern Exumas

More than 32 plant species present. Island is more than 10 acres, and has sheltered areas and may be in the lee of larger landmass. Several habitats present.

● = Very abundant   ■ = Moderate   ▲ = Uncommon  
? = uncertain identification   x = non-native

### LEAF CAY

▲ Acacia choriophylla	Cinnecord
▲ Amyris elemifera	Torchwood
■ Antirhea myrtifolia	Antirhea
▲ Argythamnia lucayana	Argythamnia
■ Bumelia americana	Wild Saffron, Milk-berry
▲ Calliandra formosa (?)	White calliandra
● Casasia clusiifolia	7-year apple
■ Coccothrinax diversifolia	Pigeon plum
● Coccothrinax argentata	Silver palm
▲ Cocos nucifera	Coconut
■ Conocarpus erectus	Green buttonwood
● Conocarpus erectus var. sericeus	Silver buttonwood
▲ Crossopetalum rhacoma (?)	Poison cherry
▲ Cyperus sp.	Sedge
▲ Distichlis spicata	Salt-grass
■ Erithalis fruticosa	Black torch
■ Ernodea littoralis	Golden creeper
▲ Eugenia axillaris	White stopper
▲ Eugenia foetida	Spanish stopper
■ Guaiacum sanctum	Lignum vitae
● Guapira discolor	Blolly
▲ Hymenocallis sp.	Spider lily
▲ Iresine flavescens	Coastal iresine
▲ Iva sp. (?)	—
● Jacquinia keyensis	Joewood
● Manilkara bahamensis	Wild dilly
▲ Mastichodendron foetidissimum	Mastic
▲ Opuntia nashii	Nash's prickly-pear
▲ Opuntia stricta var. dillenii	Common prickly-pear
▲ Paspalum distichum	Knot grass
■ Pithecellobium bahamensis	Bahama Cat's-claw
■ Pithecellobium guadalupense	Black bead
■ PseudophAoenix sargentii	Cherry palm
▲ Psidium sp.	Stopper
● Reynosia septentrionalis	Darling plum
● Rhachicallis americana	Hog-bush
▲ Savia bahamensis	Maidenbush
▲ Sesuvium portulacastrum	Seaside purslane
▲ Solanum bahamense	Bahama nightshade
■ Sophora tomentosa	Necklace pod
▲ Spartina patens	Saltmeadow cordgrass
▲ Sporobolus virginicus	Seashore dropseed
▲ Strumpfia maritima	Strumpfia
● Suriana maritima	Bay cedar

- Thrinax morrisii
- ▲ Uniola paniculata
- ▲ Uniola virgata (?)

Thatch palm  
Sea oats  
Spike-grass

### X CAY

▲ Agave millspaughii	Agave
▲ Antirhea myrtifolia	Antirhea
■ Ateramnus lucidus	Crabwood
■ Borrchia arborescens	Sea oxeye daisy
■ Bourreria ovata	Strongbark, Strongback
■ Bumelia americana	Wild Saffron, Milk Berry
▲ Calliandra formosa	White calliandra
■ Capparis flexuosa	Limber Caper
■ Casasia clusiifolia	7-year apple
▲ Cassia caribaea	—
▲ Cenchrus incertus	Sandspur
■ Chiococca alba	Snowberry
■ Coccothrinax diversifolia	Pigeon plum
● Coccothrinax argentata	Silver palm
▲ Conocarpus erectus	Green buttonwood
● Conocarpus erectus var. sericeus	Silver buttonwood
▲ Cynanchum bahamense	—
▲ Cyperus sp.	Sedge
▲ Distichlis spicata	Salt-grass
● Erithalis fruticosa	Black torch
▲ Ernodea littoralis	Golden creeper
■ Eugenia axillaris	White stopper
■ Eugenia foetida	Spanish stopper
■ Guaiacum sanctum	Lignum vitae
● Guapira discolor	Blolly
■ Iresine flavescens	Coastal iresine
● Jacquinia keyensis	Joewood
▲ Lasiacis divaricata	Wild Bamboo
■ Malpighia polytricha ssp. confusa	Touch-me-not
● Manilkara bahamensis	Wild dilly
▲ Metopium toxiferum	Poisonwood
▲ Oplonia spinosa	Prickly-bush
▲ Paspalum distichum	Knot grass
▲ Phyllanthus epiphyllanthus	Sword-bush
■ Pithecellobium bahamense	Bahamas cat's claw
■ Pithecellobium guadalupense	Black bead
■ Randia aculeata	White indigo-berry
● Reynosia septentrionalis	Darling plum
● Rhachicallis americana	Hog-bush
▲ Sesuvium portulacastrum	Seaside purslane
▲ Setaria sp. (?)	Foxtail grass
■ Smilax havanensis	Prickly Green-brier
■ Sophora tomentosa	Necklace pod
▲ Suriana maritima	Bay cedar
▲ Thrinax morrisii	Thatch palm
■ Zanthoxylum coriaceum	Doctor's club
■ Zanthoxylum flavum	Yellow-wood



Gumbo Limbo, *Bursera simaruba*, emerge from the Hellshire Hills forest, 1990. Photograph: R.W. Ehrig



## Medium to Large Island/ High Diversity

Reference island: *Barn Cay*  
(*San Salvador complex*)

70 species of plants or more present. Island or region of island is more than thirty acres in area, has sheltered areas and valleys. Several habitats are present.

● = Very abundant   ■ = Moderate   ▲ = Uncommon  
? = uncertain identification   x = non-native

### BARN CAY

■ <i>Acacia choriophylla</i>	Cinnecord
■ <i>Amyris elemifera</i>	Torchwood
▲ <i>Antirhea myrtifolia</i>	Antirhea
▲ <i>Argythamnia lucayana</i>	—
■ <i>Ateramnus lucidus</i>	Crabwood
▲ <i>Avicennia germinans</i>	Black Mangrove
■ <i>Borrchia arborescens</i>	Sea Ox-eye Daisy
▲ <i>Bourreria ovata</i>	Strongbark
■ <i>Bumelia americana</i>	Wild Saffron
▲ <i>Bursera simaruba</i>	Gum Elemi, Gumbo-limbo
▲ <i>Caesalpinia</i> sp. ?	—
▲ <i>Calyptanthus pallens</i>	Spicewood
▲ <i>Capparis cynophallophora</i>	Black Willow, Jamaica Caper
■ <i>Casasia clusiifolia</i>	Seven-year Apple
▲ <i>Cassia lucayana</i>	—
▲ <i>Cephalocereus bahamensis</i>	Torch Cactus
■ <i>Chiococca alba</i>	Snow Berry
▲ <i>Citharexylum fruticosum</i>	Fiddlewood
■ <i>Coccoloba diversifolia</i>	Pigeon-plum
▲ <i>Coccoloba swartzii</i>	Tie-tongue
■ <i>Coccoloba tenuifolia</i>	Bahama Pigeon-plum
■ <i>Conocarpus erectus</i>	Green Buttonwood
■ <i>Conocarpus erectus</i> var. <i>sericeus</i>	Silver Buttonwood
▲ <i>Cordia bahamensis</i>	Cocobey
▲ <i>Cordia</i> sp.	—
■ <i>Crossopetalum rhacoma</i>	Poison Cherry
▲ <i>Croton</i> sp.	—
■ <i>Diospyros crassinervis</i>	Boa-wood
■ <i>Drypetes diversifolia</i>	Milk Bark
▲ <i>Echites umbellata</i>	Devil's Potato
▲ <i>Encyclia</i> sp.	Epiphytic Orchid
■ <i>Erithalis fruticosa</i>	Black Torch
■ <i>Erythroxylon rotundifolium</i>	Rat Wood
■ <i>Eugenia axillaris</i>	White Stopper
▲ <i>Eugenia confusa</i>	Ironwood, Redberry Stopper
■ <i>Eugenia foetida</i>	Spanish Stopper
▲ <i>Exothea paniculata</i>	Butter Bough, Inkwood
■ <i>Galactia bahamensis</i>	Bahama Milk-pea
■ <i>Galactia rudolphoides</i>	Red Milk-pea
■ <i>Grimmeodendron eglandulosum</i>	Young Manchioneel, Poison Bush

▲ <i>Guaiacum sanctum</i>	Lignum Vitae
■ <i>Guapira discolor</i>	Bolly
▲ <i>Guettarda krugii</i>	Frogwood
▲ <i>Guettarda scabra</i> (?)	Velvet Berry
▲ <i>Gymina latifolia</i>	False Boxwood, Walla-berry
■ <i>Hippomane mancinella</i>	Manchineel
■ <i>Hypelate trifoliata</i>	White Ironwood
■ <i>Jacquemontia havanensis</i>	—
■ <i>Jacquinia keyensis</i>	Joewood
■ <i>Krugiodendron ferreum</i>	Black Ironwood
▲ <i>Lantana involucrata</i>	Wild Sage
▲ <i>Leiphaimos parasitica</i>	Ghost Plant
▲ <i>Lysiloma bahamensis</i>	Wild Tamarind
■ <i>Manilkara bahamensis</i>	Wild Dilly
▲ <i>Maytenus buxifolia</i> (?)	Box-leaved Maytenus
■ <i>Metopium toxiferum</i>	Poisonwood
■ <i>Mimosa bahamensis</i>	Haulback
▲ <i>Nectandra coriacea</i>	Sweet Torchwood, Lancewood
■ <i>Oplonia spinosa</i>	Prickly Bush
▲ <i>Paspalum</i> sp.	Grass
▲ <i>Passiflora cupraea</i> (?)	Wild Watermelon
● <i>Phyllanthus epiphyllanthus</i>	Hardhead
▲ <i>Picramnia pentandra</i>	Bitterbush
▲ <i>Piscidia piscipula</i>	Fish Poison, Jamaica Dogwood
■ <i>Pithecellobium bahamense</i>	Bahama Cat's-Claw
▲ <i>Plumeria obtusa</i>	Frangipani
■ <i>Polygala oblongata</i> (?)	Oblong-leaved Polygala
▲ <i>Polypodium polypodioides</i>	Resurrection Fern
▲ <i>Pseudophoenix sargentii</i>	Cherry Palm
■ <i>Psychotria ligustrifolia</i>	Bahama Coffee
■ <i>Randia aculeata</i>	White Indigo-berry
■ <i>Reynosa septentrionalis</i>	Darling Plum
■ <i>Rhachicallis americana</i>	Hog-bush
▲ <i>Rhizophora mangle</i>	Red Mangrove
▲ <i>Savia bahamensis</i>	Maiden Bush
▲ <i>Smilax havanensis</i>	Green-brier
▲ <i>Solanum bahamense</i>	Bahama Nightshade
▲ <i>Sporobolus virginicus</i>	Seashore Dropseed
▲ <i>Tabebuia bahamensis</i>	Five-finger
■ <i>Thrinax morrisii</i>	Thatch Palm, Buffalo-top
■ <i>Thouinia discolor</i>	Quicksilver-bush
■ <i>Tillandsia circinnata</i>	Silvery Wild Pine
■ <i>Tillandsia utriculata</i>	Giant Wild Pine
■ <i>Tournefortia volubilis</i>	Soldier-bush
■ <i>Urechites lutea</i>	Wild Allamanda
▲ <i>Vallesia antillana</i>	Pearl-berry
■ <i>Vanilla barbellata</i>	Worm Vine
▲ <i>Zanthoxylum coriaceum</i>	Hercules' Club
▲ <i>Zizyphus taylori</i>	—

Plus six undetermined plants.



Semaphore Cactus,  
*Opuntia spinosissima*,  
center, Hellshire Hills,  
1990. Photograph:  
R.W. Ehrig

Wild Pine Airplant,  
*Tillandsia utriculata*,  
grows on the trunks  
of other trees.

Photograph:  
Deborah Neufeld



San Salvador iguana among  
Prickly Pear Cactus, *Opuntia stricta*.  
Photograph: John Bendon

