

Nanny Cay, Tortola British Virgin Islands

A TERRESTRIAL RESOURCE CHARACTERIZATION



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*Cover Photo: Nanny Cay's eastern shoreline,
looking towards Road Town*

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A TERRESTRIAL RESOURCE CHARACTERIZATION

SUMMARY

Island Resources Foundation (IRF) was retained by Econcerts Ltd., to undertake a terrestrial resource characterization of Nanny Cay for the Nanny Cay Development Project. This private cay, immediately south of Sea Cow Bay and about 5 km west of Road Town, is owned by Cameron McCall, Nanny Cay Marina, Tortola, BVI. This study forms part of requirements for submission of a Category “A” Environmental Impact Assessment (EIA) to the Town and Country Planning Department of the British Virgin Island Government.

In May 2010, IRF’s Kevel Lindsay and Jean-Pierre Bacle, as part of the EIA team headed by Clive Petrovic (Econcerts, Ltd.), undertook terrestrial field surveys throughout the 25 acre island. The effort included:

- Reviewing available project site documents
- Undertaking field observations
- Providing species lists (Flora and Fauna), and characterizing the site with respect to habitat, biodiversity interests and existing threats
- Predicting impacts likely to occur from the proposed development and provide recommendation measures to reduce these likely adverse impacts
- Report on the findings and main environmental issues.

LOCATION

Nanny Cay is located approximately a mile south of Sea Cow's Bay, Tortola (Figure 1). It lies immediately east of Hannah Bay and Locust Bay. The island coordinates are: 18° 23' 58''N and 64° 38' 04''W. Road Town is 5 km driving distance to the east.

Nanny Cay is approximately 25 acres in size and is linked to Tortola via a small bridge. The entire cay is flat and consists of landfill material originating from local coral rubble, rock rubble and landfill (building rubble) from other areas. The cay has no standing freshwater ponds.



Figure 1. Nanny Cay (source: Google 2009).

PROJECT DESCRIPTION

The Nanny Cay Development Project proposes significant upgrades to existing facilities with the addition of new residential units, a redesign of portions of the existing marina to accommodate mega-yachts, and the construction of a new marina along the east coastline. In addition the project proposes some coastal

reclamation along the northeast side of the Cay for luxury residential units. The reclaimed area is estimated at 120,000 ft².

The development will include the provision of necessary roads and foot access, utilities, support services and recreational amenities both for the use of island guests and residents and for the general public.

The proposed development will emphasize as much as possible on adopting “green and carbon neutral” design. Wastes will be recycled and reused wherever possible. Site drainage, wherever possible will be used for irrigation. Implementation of “green” technologies will be applied to mitigate previous damaged areas and to reduce the level of new impacts, and promote good environmental management at all levels.

EXISTING CONDITIONS

Today, most of Nanny Cay is characterized as an artificial landscaped island comprised of fill from locally dredged material and landfill material mainly of building debris from off cay. Recent sediments deposited by wave action and weathered rocks are found interspersed along the coast.

There are 5 main vegetation communities found at Nanny Cay which only cover minor parts of the island since most of the surface area is developed. Open areas and grasslands are the most common communities found.

A total of 131 species of plants in 53 families were recorded during the survey. Of these, 51 are herbaceous, 28 are shrubs, 36 tree species, and 16 are vines. About 59 of the species (45%) found are introduced exotics from around the world.

About 26 species of birds, representing 14 families were recorded during the survey, and from previous studies, observations, and reports. Although no mammals were directly observed, anecdotal information suggests that bats and rodents frequent the island.

Of the 25 species of reptiles and amphibians recorded elsewhere in the BVI, five species of reptiles were sighted. No amphibians were observed during the field surveys or have been recorded in the past.

CLIMATE AND WEATHER

As with most islands in the British Virgin Islands, Nanny Cay is strongly affected by the Northeast Trade winds, which means winds approach with great constancy from directions between east-northeast and southeast. The average wind direction varies throughout the year according to the following general patterns:

- December to February: winds blow from east-northeast (known locally as “Christmas Winds”).
- March to May: winds blow from easterly directions.
- June to August: winds blow from east to east-southeast directions.
- September to November: winds blow mainly from the east to southeast.

Squalls are fairly common at certain times of the year, and except for the occasional hurricane, highest wind speeds are experienced from December to February and again in June and July. Average wind speeds for the months of June and July are around 12-20 km per hour (7-12 miles per hour), while for October, average wind speeds drop to 7 km (4 miles) per hour.

The area also lies within the hurricane belt. These intense storms occur between June and November, with September being the most active month. Within recent years, several hurricanes passed sufficiently close to the BVI to cause significant damage (Table 1).

Hurricanes generate high winds and waves, storm surge and heavy rainfall and flooding. Hurricanes may approach from any direction, as was seen in November 1999 when Hurricane Lenny moved from west to east across the Caribbean Sea and more recently Omar (October 2008), which followed a similar pattern.

Temperatures vary little throughout the year, with daytime temperatures that fall within the range 25°-29° C (77° – 84° F) and usually drop by six degrees at night. Temperatures average an annual 27.2° C (81° F), with the winter lows averaging 24.4° C (76° F), and the summer high reaching the mid to upper 20 degrees C (low-to-mid 80s F). The temperature and climate are moderated by near constant on-shore breezes. Due to year-round high temperatures and nearly constant winds, the evapo-transpiration rate is generally high.

Heavy rainfall sometimes occurs during the passage of the easterly tropical waves, which are spurned off the West African coast from June to November of each year. Occasionally, these waves intensify into tropical depressions, tropical storms, or hurricanes.

Table 1. Recent Tropical Storms and Hurricanes
in the British Virgin Islands

Date	Storm
1955, August	Hurricane. Connie
1960, August	Hurricane. Donna
1979, 29 August	Hurricane. David
1979, 4 September	Hurricane. Frederic
1984 November	Tropical Storm Klaus
1988, 10 September	Tropical Storm Gilbert
1989, 17 September	Hurricane. Hugo
1995, 19 August	Hurricane. Iris
1995, 4 September	Hurricane. Louis
1995, 15 September	Hurricane. Marilyn
1996, 6 July	Hurricane. Bertha
1996, 9 September	Tropical Storm. Hortense
1998, 21 September	Hurricane. Georges
1999, 21 October	Hurricane. Jose
1999, 17 November	Hurricane. Lenny
2000, 22 August	Hurricane Debby
2008, 15 October	Hurricane Omar

GEOLOGY

Regionally the British Virgin Islands are exposed topographic high points of the Puerto Rican Bank (also referred to as the Puerto Rico-Virgin Islands Platform). The area is a submarine platform that extends from just west of Puerto Rico to east of Anegada and occupies the northeastern corner of the Caribbean plate. It is bounded by the Puerto Rico Trench to the north, by the los Muertos Trough to the south, and the Anegada Trough to the east and southeast. The Los Muertos and Anegada Troughs separate the Puerto Rican Bank from the Lesser Antilles (Earle, 2002).

The Puerto Rican Platform is generally defined by the 600-ft (200m) depth contour; during the Pleistocene low stand sea level, a continuous, subaerially exposed landmass extended eastward from Puerto Rico to the BVIs

Bedrock geology throughout these islands has been subject to several episodes of tectonic deformation. Extensive folding of rocks, primarily volcanoclastic units (volcanic sediments ejected into the air and that accumulated either subaerially or subaqueously), has resulted in steeply dipping rock units; the dips are primarily to the north and south. No major, active faults are present; however, small scale faulting within local rock units is common (Earle, 2002).

Geologically, Nanny Cay has taken present form as the result of the drastic changes in sea level associated with recent glaciations or ice ages. Starting about 100,000 years ago the Wisconsin glaciations began lowering sea levels, exposing the coral reef and surrounding marine sediments and eventually the Puerto Rican platform. As the last ice age ended, the ice cap began to melt and return their water to the oceans and sea level rose. As this area was flooded by rising sea, coral communities formed on the shelves, and as sea levels continued to rise, new reef system began to form over the older Pleistocene reef. As the modern reef continued to expand horizontally and vertically, mangroves were able to root and grow in the shallow water around the reef and coralline outcrops, thereby trapping more carbonate sand and mud so the cay began to form and grow, a process that continued to the pre development phase.

Based on historical maps and photos, it is estimated that Nanny Cay was approximately 5 acres in size by the early 1970's before major dredging began (see Kent, 2010).

DRAINAGE and SOILS

Because of its size, flat topography, and low elevation there are no freshwater ponds and no natural streams. Because the Cay is mostly porous fill material comprised of coarse sand, coral rubble and building rubble, precipitation rapidly infiltrates the ground. Surface ponding is however common when the ground quickly becomes saturated during heavy rain events. There are no visible surface storm water drainage systems on the Cay. The extent of seawater intrusion all along the perimeter is unknown and usually depends on sea conditions and the Cay's subsurface hydrological condition.

Although, no natural drainage exists on the island, a man made channel was constructed in the early phases of the cay's expansion. This channel, crossing the south portion of the Cay, is approximately 450 meters long and has an average width of 10 meters. The depth also varies throughout this channel. Except for the west section where residential development is currently taking place, most of the channel is lined with red mangroves.

Soil formations of organic nature are limited to landscaped areas such as within the Hotel property and in more heavily vegetated areas. Elsewhere, surface soil material is mostly of mineral content derived from calcium carbonate sands.

COASTAL CHARACTERISTICS

The entire coastline of Nanny Cay has been extensively modified during several decades of construction and fill activities. The original shorelines as inferred through historical photographs and old nautical charts likely consisted of a low coral ledge platform with pockets of coralline sand (Figure 2). Red mangroves formed the core vegetation cover. The Cay was surrounded by a shallow-water lagoon, and a well developed reef system further offshore.

Today, most of the shoreline is characterized as antropogenic (of human origin) as depicted by features such as; the existing marina marking the entire western coastline; a series of groins and narrow pocket beach system along the south and east side of the cay; and a narrow beach along the northeast sector of the cay adjacent to the lagoon (proposed land reclamation area). This coastal section shows severe erosion (Figure 3). Many palm trees show exposed root systems and most tiki huts are undermined by wave activity.



Figure 2. Nautical chart showing Sea Cow's Bay and Nanny Cay
(Source: BVI Admiralty Chart #2019, 1930)



Figure 3. Northeast shoreline showing severe erosion.

METHODOLOGY

The time spent on Nanny Cay conducting the terrestrial survey for this characterization offers only a fleeting glimpse of and into the ecological character of the island. To truly understand the nature of animals, plants and ecological processes, including the interaction between and the nexus of the human-nature interface, more time must be spent learning the intimate and intricate details of complex events and activities that take place. Nevertheless, this momentary window allows us to learn a great deal about the nature of the island.

Much, if not most of the flora and fauna on Nanny Cay are transient and/or widely distributed throughout the Virgin Island and Puerto Rico. Some species, such as birds, would regularly move in and out of the confines of its shores, some staying as long as food, shelter and stable conditions are available; some may only pass through or fly by on their way to more productive grounds.

To provide the most representative and comprehensive picture of life at Nanny Cay, surveys required going beyond the boundaries of the proposed development area. The challenge was to assess the communities of plants and animals and not exclude or miss those features and assets that may lie just beyond the immediate boundaries of the island, remain hidden and obscure, beyond the reach of our senses, or those that may only occupy the property during periods convenient to them, but not during our presence there.

Prior to and during the period of survey, extensive reviews of existing literature, aerial imagery and baseline information relevant to the island and surrounding area were conducted. The specific methods used to survey and assess flora, fauna, and landscape of Nanny Cay are discussed below:

Survey of the Vegetation and Plants

Nanny Cay's 25 acres is small enough to allow for targeted surveys of specific areas of the island's landscapes, species and features. The flora was assessed by traversing the island's roads, gardens, paths and open spaces: investigating

drains and channels, and by, targeting outstanding areas and features such as grasslands and waste areas, the grounds of residences, the beaches and coastal areas. The survey team also targeted specific plant communities and focused on the unique features and characteristics and species makeup. Specimens were identified on site and where and when necessary, photos and specimens were taken for further study and identification. The team also used aerial photos to determine past and current land-use, vegetation types and distribution, and outstanding and special features.

Survey of Terrestrial Vertebrates

The terrestrial vertebrate fauna of Nanny Cay is limited to native bats, the introduced Black Rat (*Rattus rattus*), possibly the House Mouse (*Mus musculus*), also an introduced species, birds and reptiles.

Reptiles were surveyed and assessed using a combination of incidental observations and encounters, targeted searches of habitats and specific sites/features and from previous reports and records.

Amphibians were similarly assessed, but no amphibians were observed or were previously reported on Nanny Cay.

Bats were surveyed by making nightly observations of activities, by roost searches, for incidental signs of bat activities, and from previous reports and anecdotal information.

For birds, the survey team undertook roost surveys, the targeting of specific sites such as feeding areas and nest roosts, by incidental observations and from previous reports and records.

Survey of Terrestrial Invertebrates

Terrestrial invertebrate surveys were carried out by using incidental observations, by searching dead/decaying plant materials, by direct capture of specimens, from incidental captures and observations, and from previous records.

Survey of Threatened, Rare and Endangered Species and Habitats

Particular attention was taken to locate and identify any critical species of plants, animals and habitats and determine the threats and issues relating to their conservation status. No species of plants and/or animals of critical concerns were observed on Nanny Cay.

Landscape Survey

The landscape of Nanny Cay was observed at every opportunity to ascertain the island's geologic evolution, history, and its past development cycles, and to determine the possible implications for how the physical characteristics and features will impact the proposed development, and the island's ecology. The team made its way along much of this coastline to investigate the island's geology, past land-use, the ecology and the flora and fauna. The team also employed the use of aerial photos, previous reports, historical accounts, and anecdotal information.

THE FLORA OF NANNY CAY

The Flora

The plants of Nanny Cay are largely a mix of introduced ornamentals, exotics and few relict native species in highly modified natural areas and in heavily managed and manicured gardens. Most of the native plants can be found in the narrow coastal vegetation communities in the coastal hedge, herbaceous beach vegetation, along the narrow mangrove channel, and in open grassy areas. The gardens consist mainly of shrubs, individual trees and lawns. Many of the species are introduced exotics, but a few such as *Tabebuia heterophylla*, are native.

Appendix A provides a list of the plants observed on Nanny Cay, and includes many of the exotic introductions found in the gardens and on the lawns. A total of 131 species of plants in 53 families have been recorded for the Cay. Of these, 51 are herbaceous, 28 are shrubs, 36 tree species, and 16 are vines (Appendix A).

About 59 of the species, or about 45% found on the island are introduced exotics from around the world. The fact that nearly half of the plant species on the island are introduced is not surprising given the highly developed and managed nature of the island. However, the environments created by non-native plants may not provide suitable habitats for many native Virgin Island species, including amphibians, some reptiles and birds.

Table 2. Physionomic Plant Categories.

Category	Numbers	Percentage
Herbs	51	39%
Shrubs	28	21%
Vines	16	12%
Trees	36	28%
Total	131	100%

Vegetation Community Types

There are five vegetation community types found on Nanny Cay. In addition, one category, commercial, is primarily a non-vegetated community, except for small patches of artificial plantings and grassy fields used to dry dock yachts and other boats. The vegetation community types of Nanny Cay include:

Beach Vegetation

This community type occurs along the shoreline beach of sand, gravel, cobbles, and coral rubble. It is primarily found along the south and southeast coast of the cay. The vegetation consists of a low growth of grasses, vines and herbaceous plants (Figure 4). Constant changing beach and shoreline provide unstable growing condition, although some plant species are well adapted like the Bay Bean (*Canavalia rosea*), Morning Glory (*Ipomoea pescaprae*) and Sea Purslane (*Sesuvium portulacastrum*).



Figure 4. Beach vegetation type along southern shoreline.

Ornamental Gardens

Gardens are artificially created and managed plant communities created for their aesthetic and other values. Many of the plants of the gardens are exotic imports, and are therefore not native to the Cay or the Caribbean. The Nanny Cay plant list in Appendix 1 provides a list of the non-native plants cultivated on the island, and Figure 5 shows an area of the gardens.



Figure 5. Ornamental gardens and landscape.

Coastal Hedge

This community is influenced by wind, sun exposure and salt-spray. It is found in small narrow patches on the southern and northeastern coastline of the cay (Figure 6). The vegetation consists of low trees and shrubs, dominated mainly by Seagrape (*Coccoloba uvifera*), and Seaside Mahoe (*Thespesia populnea*).



Figure 6. Coastal hedge.

Open Areas and Grasslands

This plant community is scattered throughout Nanny Cay, and includes lawns and low herbaceous patches (Figure 7).

The vegetation is dominated by grasses and herbaceous species such as: *Trianthema portulacastrum*, *Bidens alba*, *Cyanthillium cinereum*, *Tridax procumbens*, and *Sphagneticola trilobata*. Grasses include: *Axonopus compressus*, *Bothriochloa* cf. *pertusa*, *Cenchrus* sp., and *Chloris barbata*



Figure 7. Grassland and open area community type.

Fringing Mangroves

The primary mangrove habitat on Nanny Cay is fringing. This occurs in two types:

The first is fringing Red Mangrove (*R. mangle*) occurs along the northeastern coastline forming small patchy stands between the coastline and the sea (Figure 8). More extensive stands are found on the southwestern shoreline of the nearby mainland of Tortola at Hannah Bay, and along the northeastern shoreline of Seacow's Bay. The fringe is dominated primarily by Red Mangrove, but scattered here and there are Black Mangrove (*Avicennia germinans*), White Mangrove (*Laguncularia racemosa*), Buttonwood (*Conocarpus erectus*), and Seaside Mahoe or Haiti-haiti (*Thespesia populnea*).

The second type occurs along artificial channels located on the northern and eastern areas of the Cay. These channels are lined with mangroves, including all four species and Seaside Mahoe (Figure 9).



Figure 8. Fringing Red Mangroves along the northeast coastline.



Figure 9. Red mangroves lining the channel.

THE FAUNA OF NANNY CAY

Birds

About 26 species of birds, representing 14 families, were observed over the period of the survey, and from previous reports, studies and observations. However, this number reflects a short and limited period of field observations, and offers only a very tiny glimpse of the numbers of species that may occur there throughout the year and over the years. The list will undoubtedly expand considerably if further surveys were done over the years with more frequent observations covering all seasons.

Of notable absence were the North American migrants. This survey was conducted well after the northward spring migration of birds, and most, if not all of the species have long departed these shores for their American nesting habitats.

Given the close proximity of Nanny Cay to the mainly of Tortola, most of the bird species may occur within the area at one time or the other. Birds are the most mobile of all animals and no doubt move easily from site to site depending on their needs. Many of the species, especially seabirds, wetland and shorebirds, are transients, and are often seen in low numbers or stop by the Cay on their way elsewhere. Most other species of seabirds are transient in surrounding waters, and are present only during the spring and summer months. These species nest on islands and cays through the Virgin Islands and Puerto Rico, and feeds in the extensive marine waters, including the areas around Nanny Cay.

Landbird numbers and species fluctuate greatly, depending on the season, the amount of rains, the availability of food, and on nesting habitat. Birds such as pigeons and doves may reside there most of the year, and in fact may nest there. At least eight of the species recorded are believed to be nesting, including a pair of Killdeer (*Charadrius vociferus*). A list of the species of birds of Nanny Cay is provided in Appendix B.

Mammals

Bats are the only native mammals extant on the BVI today. There are at least five species of bats recorded for the BVI territory (Kwiecinski et al. 2009). Of these species, only the Velvety Free-tailed Bat (*Molossus molossus*), the Jamaican Fruit Bat (*Artibeus jamaicensis*), and the Fishing Bat (*Noctilio leporinus*) are suspected to visit Nanny Cay. No direct observations of bats were made on Nanny Cay, but based on anecdotal reports and habitat availability on the island, the survey team concluded that these three species are likely present during part of the year when circumstances may prove beneficial, such as when food become available. Both the Free-tailed and the Jamaican bats are the most common species of bats in all of the Virgin Islands. The Fishing Bat is relatively uncommon to rare and localized in distribution. It has been observed fishing in the calm waters of Hannah Bay.

The only other mammal known from Nanny Cay is the Black Rat (*R. rattus*), though the introduced House Mouse (*M. musculus*) is also suspected, though not observed. The rat, a non-native species, is a very common pest, and in most places throughout the Virgin Islands, it can be frequently seen climbing trees or scurrying about at nights, and sometimes even during the day. It sometimes invades homes and causes considerable damage to vegetation and property. The Mouse, also introduced from Europe, prefers to live primarily around human habitation, and rarely climbs.

Reptiles and Amphibians

At least seven species terrestrial reptiles have been recorded or are believed to inhabit Nanny Cay. These include:

Ameiva exsul exsul – Virgin Islands Ground Lizard

Anolis cristatellus wileyae – Virgin Island Crested Anole

A. stratulus – Spotted Anole

Sphaerodactylus macrolepsis macrolepsis – Cotton Ginner/Dwarf Gecko

Hemidactylus mabouia – House Gecko/Woodslave

Alsophis portoricensis – Puerto Rican Racer

Typhlops rijersmi – Virgin Islands Blindsnake

No direct observations of the House Gecko and the Puerto Rican Racer were made by the IRF survey team. However, the Gecko is a common inhabitant of homes, buildings and man-made structures and is undoubtedly present there. The House Gecko or Woodslave, believed to be a West African immigrant, arriving in the West Indies via slave ships from Africa within the last 400 years, can often be seen at night near lights where it preys on invertebrates.

The only snake observed during the survey was the Virgin Islands Blindsnake (Figure 10). This small snake was found near the Hotel under rocks and leaf litter. There are also reports of a medium-sized snake on Nanny most likely pertain to the Puerto Rican Racer, a species that is considered vulnerable in all of the Virgin Islands.

The two species of Anoles or tree lizards are relatively common on Nanny Cay. Both anoles are commonly observed on structures and vegetation on the island. The Crested Anole is often observed on tree trunks and rocks, and along trails and paths, and occupies niches higher off the ground than its smaller cousin. The Spotted Anole is the smaller of the two species can be seen throughout the island, including around the buildings and in woodlands, gardens and close to the ground on rocks and structures.

The Virgin Island Ground Lizard is relatively common throughout Nanny Cay, and is seen at all hours of the day, but more so at around mid-mornings and mid-afternoons. Males can grow quite large, and are very distinct with their bright blue and white spots and blotches on the sides and flanks (Figure 11).



Figure 10. Virgin Islands Blindsnake about 18 cm long.



Figure 11. Virgin Island Ground Lizard (male specimen).

Amphibians

There is no evidence that amphibians are currently present on Nanny Cay. However, further surveys over different seasons would need to be done to confirm these findings.

Terrestrial Invertebrates: A Brief Overview

The invertebrates of Nanny Cay are the most diverse and abundant group of animals on the island, even outnumbering plants in their diversity and population numbers.

Terrestrial invertebrates were collected along the trails, from under and within logs and other dead and decaying plant materials, under bark, from the foliage and inflorescence of plants, from old trash and waste piles, under rocks and stones, and from around and in the abandoned structures and facilities.

Appendix C provides a list of the taxon observed during the brief field surveys on Nanny Cay. A total of 23 species were noted, but this does not in any way suggest a complete list for the island. In fact, this list should be treated as preliminary and provide only a limited glimpse of what may be far greater number of species.

ENVIRONMENTAL ISSUES

The proposed development raises several issues regarding flora, fauna and habitats in which the main ones are described below:

Potential loss of mangroves

Mangrove habitats on Nanny Cay are relatively small and its distribution limited primarily along the channel, adjacent to the bridge, and to a smaller extent as small patches fringing along the coastline, especially on the northeastern side of the island. Recent residential development along the southwest bank of the channel has already reduced the mangrove coverage (Figure 12). Ground clearing activities to create more storage areas, and construction activities and the movement of heavy machinery have already caused some encroachment along the edges of the mangroves lining the channel.

The future proposed development will dramatically alter the existing coastline and will contribute to loss of the stabilizing shoreline vegetation including fringing mangroves along the northeast coast, and mangrove seedlings that are currently colonizing the shallow waters between existing groins,. At one of these sites, the team counted at least 80 red mangrove seedlings growing in shallow waters between two groins. In all likelihood, these will be lost (Figure 13).

It is critical that a vegetation buffer be maintained or widened along the channel as this not only helps to preserve mangrove species but provide a continuous protective habitat and support for wildlife, as well as provide aesthetic value to the area. The creation of more green space is easier to maintain than artificial gardens. It helps stabilize and consolidate the banks of the channel, providing additional support and protection during storm surges.

Potential loss of shallow-water tidal flats

As stated above, the loss of mangrove habitats is of major concern. Equally important is shallow water habitats that now exists between the groin systems and on the northeast coast that will be destructed if without some form of mitigation to maintain and/or enhance the habitats. These shallow-water coastal

habitats not only provide good condition for the growth of mangrove seedlings, and benthic species, but also provide great foraging opportunity for shore birds and wading birds.

Preserving some of these sites or alternatively, creating similar conditions elsewhere along the Cay's shallow-water coastline should be considered as a mitigation option.



Figure 12. Near the southwest channel entrance where channel has been widened to allow for new residential construction. Most mangroves were destroyed during this process. However, new red mangrove seedlings are sprouting along the edge.



Figure13. Red Mangrove seedlings along the shallows.

Potential loss of vegetation and wildlife habitat

Most of the existing vegetation cover (ranging from grasses to shrubs and trees) will be removed to create space for new structures and facilities. The loss will directly impact wildlife species that use these habitats for nesting or foraging such as the Killdeer which was observed during the survey and exhibited nesting behaviors, believed to be somewhere along the beach zone area (Figure 14).

Remedial measure should be considered to offset the loss of these habitats. These could include the relocation of existing trees, and seeding and the inclusion of native plant species in the proposed green landscape scheme or plan. The following partial list of native species should be considered for possible use based on location and microclimate requirements:

Native grasses

Seashore paspalum (Paspalum cf virgatum)

French weed (Commelia erecta)

Sea purslane (Sesuvium portulacastrum)

Seaside heliotrope (Heliotropium curassavicum)

Native shrubs

Maiden berry (Crossopetalum rhacoma)

Coco plum (Chrysobalanus icaco)

Bay lavender (Argusia gnaphalodes)

Bay cedar (Suriana maritima)

Native trees:

Buttonwood (Conocarpus erectus)

White mangrove (Laguncularia racemosa)

Black mangrove (Avicennia germinans)

Red mangrove (Rhizophora mangle)

Seagrape (Coccoloba uvifera)

Seaside mahoe (Thespesia populnea)

White cedar (Tabebuia heterophylla)

Turpentine tree (Bursera simaruba)

Marble tree (Cassine xylocarpa)



Figure 14. Killdeer foraging in shore zone area.

Potential erosion and sedimentation during construction

After heavy rains, we observe many instances of sediment runoff due to poor control and mitigation practices, including along the channel corridor where land was recently cleared and silt fences were not properly maintained thereby allowing fine sediments to enter into the channel (Figure 15). Many other areas of uncovered soil showed signs of erosion and sediment runoff.



Figure 15. Clearing activity along mangrove edge.

The implementation and monitoring of proper erosion control measure will be critical in the construction phase. We strongly recommend the adoption of guidelines and best management practices (BMP's) for erosion and sediment control for all of Nanny Cay during the construction phase, and also include some measures following the construction phases that would involve the homeowners. There should be some independent monitoring of these measures to ensure compliance and increase the level of transparency and confidence in the development process. A number of reference documents specific and

applicable to the Virgin Islands are readily available from the USVI and the wider Caribbean:

- *Guidelines for Sediment Control Practices in the Insular Caribbean* (Anderson, 1994).
- *Virgin Islands Environmental Protection Handbook* (Wright, 2002).
- *Sediment and Erosion control on Construction Sites: Field Guide* (University of the Virgin Islands, 2002).

Rodent control

Although rodents such as rats and mice were not observed during our short survey period, there is ample evidence that they inhabit the area. Besides being a pest to homeowners, rats in particular pose a substantial threat to the fauna and flora. They are agile tree climbers and can prey on young birds and eggs. They also prey on tree lizards, young ground lizards, snakes, and insects. Their foraging activity also includes a variety of fruiting trees and the garbage disposal areas, posing a risk to health and safety..

An eradication and monitoring program is recommended and would be certainly successful mainly because of Nanny Cay's size. In 2002, The Island Resources undertook a prototype rat eradication program for Sandy Cay (14 acres), and post eradication monitoring activities since still confirm no presence of rats (Bacle and Towle, 2008).

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Appendix A: Nanny Cay — PLANT LIST

Family	Subfamily	No.	Scientific name	Common name	Growth form	Origin	Habitat
DICOTS							
ACANTHACEAE			<i>Asystasia gangetica</i>		H	I	Oa/We/C/Ga
			<i>Ruellia tuberosa</i>	Mini-root	H	N	Oa/We
AIZOACEAE			<i>Sesuvium portulacastrum</i>	Sea purslane	H	N	Be
			<i>Trianthema portulacastrum</i>		H	N	Be
AMARANTHACEAE			<i>Amaranthus</i> cf. <i>viridis</i>	Whitey Mary	H	N	We/Oa/Wp/Gl
ANACARDIACEAE			<i>Comocladia dodonaea</i>	Pick Evil, Hog Bush, Christmas Bush	S	N	Wo
			<i>Mangifera indica</i>	Mango	T	I	C/Ga
APOCYNACEAE			<i>Allamanda cathartica</i>	Yellow Allamanda, Yellow Bell	V	I	Ga
			<i>Nerium oleander</i>	Oleander	S	I	C/Ga
			<i>Plumeria rosea</i>	Frangipani	T	I	C/Ga
ASCLEPIADACEAE			<i>Cryptostegia grandiflora</i>	Purple Allamanda	V	I	C/Ga/Wp

Family	Subfamily	No.	Scientific name	Common name	Growth form	Origin	Habitat
ASTERACEAE			<i>Bidens alba</i>	Spanish Needle	H	N	Oa/Wp/Gl
			<i>Cyanthillium cinereum</i>		H	N?	Oa/Wp/Gl
			<i>Launaea intybacea</i>	Wild lettuce	H	N	Oa/Wp/Gl
			<i>Pluchea odorata</i>	Cattle Tongue	S	N	Oa/Wp
			<i>Sphagneticola trilobata</i>	Creeping Ox Eye	H	N	Oa/Wp/Gl/C/Ga
			<i>Tridax procumbens</i>		H	N	Oa/Wp/Gl
BIGNONIACEAE			<i>Tabebuia heterophylla</i>	White cedar	T	N	Oa/Ga
BORAGINACEAE			<i>Argusia gnaphalodes</i>	Bay lavender, crab bush	S	N	Be
			<i>Cordia sebestena</i>	Scarlet Cordia	T	N	C/Ga
			<i>C. rickseckeri</i>	Dog almond	T	N	C/Ga
			<i>Heliotropium curassavicum</i>	Seaside heliotrope	H	N	Be
BURSERACEAE			<i>Bursera simaruba</i>	Turpentine	T	N	Wo
CAPPARACEAE			<i>Capparis flexuosa</i>	Limber caper	V	N	Wo
CARICACEAE			<i>Carica papaya</i>	Papaya	T	N	C/Ga/Wp
CELASTRACEAE			<i>Cassine xylocarpa</i>	Marble Tree	T	N	Wo/C/Ga
			<i>Crossopetalum rhacoma</i>	Maidenberry	S	N	Wo

Family	Subfamily	No.	Scientific name	Common name	Growth form	Origin	Habitat
CHRYSOBALANACEAE			<i>Chrysobalanus icaco</i>	Coco plum	S	N	C/Ga
COMBRETACEAE			<i>Bucida buceras</i> var.		T	I	C/Ga
			<i>Conocarpus erectus</i>	Buttonwood	T	N	Wet/Be
			<i>Laguncularia racemosa</i>	White Mangrove	T	N	Wet/Be
			<i>Terminalia catappa</i>	Tropical almond	T	I	C/Be/Ga/Wp/Wo
CONVOLVULACEAE			<i>Ipomoea pes-caprae</i>	Beach morning glory, bay vine	V	N	Wo/Be
			<i>I. cf. tricolor</i>		V	N	Wo/Be
			<i>I. violacea</i>		V	N	Wo/Be
EUPHORBIACEAE			<i>Astraea lobata</i>	Croton	H	N?	We/Oa/Wp/Gl
			<i>Codiaeum variegatum</i>	Variegated laurel, garden croton	S	I	C/Ga
			<i>Euphorbia hirta</i>	Milk weed	H	N	We/Oa/Wp/Gl
			<i>E. hyssopifolia</i>		H	N	We/Oa/Wp/Gl
			<i>E. mesembrianthemifolia</i>	Beach euphorbe/beach spurge	H	N	Be
			<i>E. prostrata</i>		H	N	We/Oa/Wp/Gl
			<i>Euphorbia heterophylla</i>	Red milkweed	H	N	We/Oa/Wp/Gl
			<i>Ricinus communis</i>	Castorbean	S	I	Oa/We
			<i>Phyllanthus niruri</i>		H	I?	Oa/Be/Wp/Gl
FABACEAE							
	Caesalpinoideae		<i>Caesalpinia bonduc</i>	Gray nicker	S	N	Wo/Oa/Be

Family	Subfamily	No.	Scientific name	Common name	Growth form	Origin	Habitat
			<i>C. pulcherrima</i>	Barbados Pride	S	I	Ga
	Faboideae		<i>Brya ebenus</i>	Jamaican Rain Tree, Jamaican Ebony	T	I	Ga
			<i>Canavalia rosea</i>	Bay bean	V	N	Be
			<i>Centrosema virginianum</i>	Butterfly pea, wist vine	V	N	Oa/We/Wp/Gl
			<i>Canavalia rosea</i>	Bay bean	V	N	Be
			<i>Crotalaria incana</i>	Shak-shak	H	N	Wo
			<i>C. retusa</i>	Shak-shak	H	N	Oa/Be/Wp/Gl
			<i>C. verrucosa</i>	Rattle box	H	N	Oa/Be/Wp/Gl
			<i>Desmodium cf. incanum</i>	Begger's ticks	H	N	Oa/Be/Wp/Gl
			<i>Rhynchosia minima</i>		V	N	We/Oa/Wp/Gl
			<i>Sesbania sericea</i>	Sesbania	S	I?	Oa/Be
			<i>Stylosanthes hamata</i>	Donkey weed	H	I	We/Oa/Wp/Gl
			<i>Tephrosia cinerea</i>		V	N	We/Oa/Wp/Gl
			<i>Teramnus labialis</i>		V	N	We/Oa/Wp/Gl
			<i>Vigna luteola</i>	Goat wiss, wild pea	V	N	We/Be/Oa/Wp
	Mimosoideae		<i>Acacia</i> sp.	Casha, stink casha	T	I	Wo
			<i>Leucaena leucocephala</i>	Tan-tan	T	I	Wo
			<i>Samanea saman</i>	Rain Tree	T	I	C/Ga
GOODENIACEAE			<i>Scaevola plumieri</i>	Inkberry	S	N	Be

Family	Subfamily	No.	Scientific name	Common name	Growth form	Origin	Habitat
			<i>Scaevola sericea</i>	Sea Lettuce	S	I	Be
LARACEAE			<i>Cassytha filiformis</i>		V	N	Wo
MALVACEAE			<i>Gossypium barbadense</i>	Cotton	S	I	Wo/C/Ga
			<i>Hibiscus rosa-sinensis</i>	Hibiscus	S	I	C/Ga
			<i>Sida acuta</i>	Wire weed	H	N	Oa/We/Wp/Gl
			<i>Thespesia populnea</i>	Haiti-haiti, Seaside Mahoe	T	N	Be/Wo/Wet/C/Ga
MELIACEAE			<i>Swietenia mahagoni</i>	Westindian mahogany	T	I	C/Ga
			<i>Azadirachta indica</i>	Neem	T	I	C/Ca
MORACEAE			<i>Ficus benjamina</i>	Weeping Fig	T	I	C/Ga
NYCTAGINACEAE			<i>Bougainvillea spectabilis</i>	Bougainvillea	S	I	C/Ga
PASSIFLORACEAE			<i>Passiflora foetida</i>	Pap bush	V	N	Wo/Oa/Wp
			<i>P. suberosa</i>	Indigo berry	V	N	Wo/Oa/Wp
POLYGONACEAE			<i>Coccoloba uvifera</i>	Seagrape	T	N	Oa/Be/C/Ga
PORTULACACEAE			<i>Portulaca oleracea</i>	Purslane, jump up an' kiss me	H	N	We

Family	Subfamily	No.	Scientific name	Common name	Growth form	Origin	Habitat
RHAMNACEAE			<i>Colubrina arborescens</i>		T	N	Wo
RHIZOPHORACEAE			<i>Rhizophora mangle</i>	Red mangrove	T	N	Wet
RUBIACEAE			<i>Ixora coccinea</i>	Ixora	S	I	C/Ga
			<i>Ixora sp.</i>	Ixora	S	I	Ga
			<i>Spermacoce sp.</i>		S	N	We/Wp/Gl
RUTACEAE			<i>Citrus aurantifolia</i>	West Indian Lime, Lime	T	I	C/Ga
SAPINDACEAE			<i>Blighia sapida</i>	Ackee	T	I	C/Ga
			<i>Melicoccus bijugatus</i>	Genip	T	I	We/Ga
SAPOTACEAE			<i>Sideroxylon obovatum</i>	West Indian box, boxwood	T	N	Wo/Oa/Ga
SCROPHULARIACEAE			<i>Capraria biflora</i>	Goatweed	S	N	Oa/Wp/Be
SOLANACEAE			<i>Melochia pyramidata</i>		H	N	Oa/Be/Wp/Gl
SURIANACEAE			<i>Suriana maritima</i>	Bay cedar	S	N	Be
THEOPHRASTACEAE			<i>Jacquinea arborea</i>		S	N	Wo/Be/Oa

Family	Subfamily	No.	Scientific name	Common name	Growth form	Origin	Habitat
VERBENACEAE			<i>Avicennia germinans</i>	Black Mangrove	T	N	Wet/Be
			<i>Lantana. involucrata</i>	Sage	S	N	Wo/Oa
			<i>Stachytarpetha jamaicensis</i>	Worry-wine	H	N	Oa/We/Wp/Gl
MONOCOTS							
POLYPODIACEAE			<i>Nephrolepis</i> sp.	Sword Fern	H	I?	C/Ga
CYCADACEAE			<i>Cycas</i> sp.	Sago, Cycad	T	I	C/Ga
ZYGOPHYLLACEAE			<i>Kallstroemia pubescens</i>	Police macca	H	I	We
AGAVACEAE			<i>Agave</i> sp.	Century Plant, Agave	S	I	C/Ga
			<i>Yucca aloifolia</i>	Yucca, Bayonet	S	I	C/Ga
MUSACEAE			<i>Musa</i> sp.	Banana	S	I	C/Ga
HELICONIACEAE			<i>Heliconia</i> sp.	Wild Plantain	S	I	C/Ga
STRELITZIACEAE			<i>Ravenala madagascariensis</i>	Traveler Palm	T	I	C/Ga
ZINGIBERACEAE			<i>Alpina purpurata</i>	Ginger Lily	H	I	C/Ga
			<i>A. zerumbet</i>	Shell Ginger Lily	H	I	C/Ga

Family	Subfamily	No.	Scientific name	Common name	Growth form	Origin	Habitat
AMARYLLIDACEAE			<i>Hymenocallis caribaea</i>	Spider lily	H	I?	C/Ga
ARECACEAE			<i>Cayota cf. mitis</i>	Fishtail Palm	T	I	C/Ga
			<i>Chamaerops humilis</i>	Mediterranean (European) Palm	T	I	C/Ga
			<i>Cocos nucifera</i>	Coconut palm	T	I	Be/Oa/Ga
			<i>Cyotis cf. mitis</i>				
			<i>Dysis lutescens</i>	Areca Palm, Butterfly Palm	T	I	C/Ga
			<i>Pitcardia pacifica</i>	Fiji Fan Palm	T	I	C/Ga
			<i>Veitchia merrellii</i>	Manila Palm	T	I	C/Ga
ASPHODELACEAE			<i>Aloe vera</i>	Medicine aloe, aloe	H	I	C/Ga
COMMELINACEAE			<i>Commelina erecta</i>	French weed	H	N	Oa/We/Wp/Gl
CYPERACEAE			<i>Fimbristylis cymosa</i>		H	N	Be/Oa
					H	N	Be/Oa/Wet
DRACAENACEAE			<i>Dracaena marginata</i>	Dragon Tree	S	I	C/Ga
			<i>Sansevieria trifasciata</i>	Snake plant	H	I	C/Ga
POACEAE			<i>Axonopus compressus</i>	Blanket grass, Louisiana grass	H	I	Ga/Oa/Gl/Wp
			<i>Bothriochloa cf. pertusa</i>	Hurricane grass	H	N?	Wo/Oa/We
			<i>Buteloua americana</i>		H	N?	Wo/Oa/We

Family	Subfamily	No.	Scientific name	Common name	Growth form	Origin	Habitat
			<i>Cenchrus sp.</i>	Sandbur, Sand-spurs, Bur-grass	H	N	Be
			<i>Chloris barbata</i>	Purple top	H	I	Oa/We
			<i>Cynodon dactylon</i>	Bermuda grass	H	I	Oa/We/Wp/Gl
			<i>Digitaria sp.</i>		H	I?	Oa/We/Wp/Gl
			<i>Eleusine indica</i>	Dutch Grass, Wire Grass	H	I	Oa/We/Wp/Gl
			<i>Heteropogon contortus</i>		H	I?	Wp/Be
			<i>Paspalum cf. virgatum</i>	Seashore Paspalum	H	N	Be
			<i>Paspalum sp.</i>		H	I?	Oa/We
			<i>Sporobolus virginicus</i>	Salt grass	H	N	Oa/Be
			<i>S. indicus</i>		H	I?	Wp/Gl/Oa
			<i>Zoysia tenuifolia</i>	Korean Velvet Grass	H	I	Ga/Gl

Table Key: *Habitat*: Be – beach; Fo – forests; Ga – gardens; Gl – grasslands/lawns; Oa – open areas; Ro – rocks; We – weed; Wet – wetlands; Wo – woodlands; Wp – waste places.

Growth Form: Aq – aquatic; H – herb; S – shrub; T – tree; V – vine. *Origin*: C – Cultivated; I – introduced; ? – origins questionable.

Appendix B: Nanny Cay — Bird List

Species	Common Name	This Survey	Previous Reports/Observations	Habitat	Conservation Status
SULIDAE					
Boobies					
<i>Sula sula</i>	Brown Booby	✓		P/M	Transient
PELECANIDAE					
Pelicans					
<i>Pelicanus occidentalis</i>	Brown Pelican	✓	✓	M	Locally Common/Transient
FREGATIDAE					
Frigatebirds					
<i>Fregata magnificens</i>	Magnificent Frigate Bird	✓	✓	M	Transient
LARIDAE					
Terns & their Allies					
<i>Larus atricilla</i>	Laughing Gull	✓	✓	P/M/Oa	Locally common/Transient
<i>Sterna antillarum</i>	Least Tern	✓	✓	P/M	Transient
<i>Sterna sandvicensis</i>	Sandwich Tern	✓	✓	P/M	Transient
<i>Sterna dougallii</i>	Roseate Tern	✓	✓	P/M	Transient
ARDEIDAE					
Egrets & Bitterns					
<i>Ardea alba</i>	Great Egret	✓		Co/Oa	Uncommon to Rare
<i>Egretta caerulea</i>	Little Blue Heron	✓	✓	Co	Uncommon to Rare

Species	Common Name	This Survey	Previous Reports/Observations	Habitat	Conservation Status
<i>Bubulcus ibis</i>	Cattle Egret	✓		Co	Locally Common
<i>Butorides virescens</i>	Green Heron	✓		Co	Uncommon
FALCONIDAE					
Falcons					
<i>Falco sparverius</i>	American Kestrel	✓	✓	Wo/Oa	Uncommon
CHARADRIIDAE					
Plovers					
<i>Charadrius vociferus</i>	Killdeer	✓		Co	Uncommon to Rare/Nesting(?)
HAEMATOPODIDAE					
Oystercatchers					
<i>Haemantopus palliatus</i>	American Oystercatcher		✓	M	Rare/Transient
COLUMBIDAE					
Pigeons & Doves					
<i>Patagioenas squamosa</i>	Scaly-Naped Pigeon	✓	✓	Wo/Ga/Oa	Locally Common/Nesting
<i>Zenaida asiatica</i>	White-Winged Dove	✓		Wo/Ga/Oa	Locally Common
<i>Zenaida aurita</i>	Zenaida Dove	✓	✓	Wo/Ga/Oa	Very Common/Nesting
<i>Columbina passerina</i>	Common Ground Dove	✓		Wo/Ga/Oa	Relatively Common
TROCHILIDAE					
Hummingbirds					
<i>Eulampis holossericeus</i>	Green-Throated Carib	✓		Ga/Oa	Locally Common/Nesting
ALCEDINIDAE					
Kingfishers					

Species	Common Name	This Survey	Previous Reports/Observations	Habitat	Conservation Status
<i>Ceryle alcyon</i>	Belted Kingfisher		✓	Co	Uncommon to rare
TYRANNIDAE					
Tyrant Flycatchers					
<i>Tyrannus dominicensis</i>	Gray Kingbird	✓		Wo/Ga/Oa/Co	Locally Uncommon/Nesting
MIMIDAE					
Mockingbirds & Thrashers					
<i>Mimus polyglottos</i>	Northern Mockingbird	✓		Oa/Co	Rare/Transient
<i>Margarops fuscus</i>	Pearly-Eyed Thrasher	✓	✓	Wo/Ga/Oa	Abundant/Nesting
EMBERIZIDAE					
Wood Warblers, Blackbirds & their Allies					
<i>Dendroica petechia</i>	Yellow Warbler	✓	✓	Wo/Oa/Wet	Locally Common/Nesting
<i>Coereba flaveola</i>	Bananaquit	✓	✓	Wo/Ga/Oa/Co	Common/Nesting

Observers: Kevel Lindsay and Jean-Pierre Bacle

Acronyms: Cl = Cliffs; Co = Coastal; Ga = Gardens; M = Marine; O = Open Areas; P = Pelagic; Wo = Woodlands

Appendix C: Nanny Cay — List of Invertebrates

CLASS	ORDER	SUB-ORDER	FAMILY	SPECIES	COMMON NAME	Conservation Status
GASTROPODA - MOLLUSKS	PULMONATA	EUPULMONATA – PULMONATED SNAILS	SUBULINIDAE	<i>Obeliscus</i> sp.		Data deficient, though the species is reported to be widely distributed throughout the Virgin Islands and the Caribbean.
	STYLOMMATOPHORA	SIGMURETHRA – TREE SNAILS	BULIMULIDAE	<i>Bulimulus</i> cf. <i>guadelupensis</i>		Rare on Nanny Cay, but widely distributed throughout the Virgin Islands and Lesser Antilles with many sub-populations found, some new to science.
CHELICERATA	ARANEAE	ARANEOMORPHEA –	THERIDIIDAE – Comb-	Species		Data deficient

CLASS	ORDER	SUB-ORDER	FAMILY	SPECIES	COMMON NAME	Conservation Status
		TYPICAL SPIDERS	clawed Spiders	undetermined		
		LYCOSIDEA – WOLF SPIDERS	ARANEIDAE – Orbweavers	<i>Argiope</i> sp.		Data deficient
			LYCOSIDAE – Wolf Spiders	Species undetermined		Data deficient. Found under rocks and amongst organic debris.
CHILOPODA - CENTIPEDES	SCOLOPENDIOMORPHA	SCOLOPENDDIOMORPHAE – GIANT CENTIPEDES & THEIR KIN	SCOLOPENDROMORPHAE – Scolopendrid Centipedes	<i>Scolopocryptops</i> sp.		Data deficient
DIPLOPODA - MILLIPEDES	POLYDESMIDA	POLYDESMIDEA – FLAT-BACK MILLIPEDES	POLYDESMIDAE	<i>Polydesmus</i> sp.	Millipede	Data deficient, though fairly common in leaf litter and under rocks.
	SPIROBOLIDA	SPIROBOLIDEA - ???	RHINOCRICIDAE	<i>Anadenobolus arboreus</i>		A common and rather variable species found throughout the Virgin Islands in woodlands and gardens.

CLASS	ORDER	SUB-ORDER	FAMILY	SPECIES	COMMON NAME	Conservation Status
MALACOSTRACA - WOODLICE		ONISCIDEA – SOW BUGS		<i>Porcellio</i> sp. (?)		A very arboreal species.
	ISOPODA - PILLBUGS		PORCELLIONIDAE – Sow Bugs		Wood Lice	Seemingly common under rocks and organic matter.
	DECAPODA – LOSTERS, SHRIMP, CRABS & THEIR KIN	PLEOCYEMATA – LAND CRAB, GHOST CRABS AND FIDDLER CRABS	GECARCINIDAE – Land Crabs	<i>Cardiosoma guanhumi</i>	Giant Land Crab	Uncommon to rare. Limited to the two saltponds on island.
			OCYPODIDAE – Fiddler Crabs	<i>Uca</i> sp	Fiddler Crab	Uncommon. Limited in distribution to mangrove areas along mud banks.
			COENOBITIDAE – Land Hermit Crabs	<i>Coenobita clypeata</i>	Hermit Crab	Common, though specimens tend to be on the small size, perhaps limited by the availability of large

CLASS	ORDER	SUB-ORDER	FAMILY	SPECIES	COMMON NAME	Conservation Status
						appropriate shells.
INSECTA	BLATTODEA – ROACHES	APOCRITA	BLATTELLIDAE – Wood Roaches	<i>Blattella</i> sp.		Data deficient
	ISOPTERA - TERMITES		TERMITIDAE – Nasutiform Termites	<i>Nasutitermes costalis</i>	Termite/Wood Louse	Data deficient
	COLEOPTERA - BEETLES	ADEPHEGA	TENEBRIONIDAE – Darkling Beetles	Species undetermined		Data deficient
		POLYPHAGA	CURCULIONIDAE – Weevils/Snout Beetles	<i>cf. Diaprepes abbreviatus</i>	Citrus Root Weevil/Sugarcane Rootstock Borer Weevil	Data deficient
HEMIPTERA	HOMOPTERA – CICADAS, LEAFHOPPERS & THEIR KIN	AUCHENORRHYNCHA	CICADIDAE – Cicadas	<i>Tibicen</i> sp.	Cicada	Rare, likely a result of the limited tree cover on the island.
	HYMENOPTERA – WASPS, ANTS & BEES	APOCRITA	VESPIDAE – Vespidae Wasps	<i>Polistes</i> sp.	Paper Wasp/Jack Spaniard	Data deficient. A few small nests were seen scattered

CLASS	ORDER	SUB-ORDER	FAMILY	SPECIES	COMMON NAME	Conservation Status
						throughout the property.
		GLOSSATA	FORMICIDAE – Ants	Several species undetermined		Data deficient. Several species seem to be present. Further study is required to determine the number and conservation status.
	LEPIDOPTERA – BUTTERFLIES & MOTHS		HESPERIIDAE – Skippers	Species undetermined		Uncommon to rare along the coast among native plants.
			LYCAENIDAE – Gossamer-Wing Butterflies	Species undetermined	Hairstreak butterfly	Localized among patches of Tephrosia plants on coast.
	ORTHOPTERA – GRASSHOPPERS. KATYDIDS, CRICKETS & THEIR KIN	ORTHOPTERA	ACRIDIDAE – Grasshoppers	<i>Schistocerca</i> cf. <i>americana</i>		Common throughout the Virgin Islands in

CLASS	ORDER	SUB-ORDER	FAMILY	SPECIES	COMMON NAME	Conservation Status
						coastal habitats.
		ENSIFERA	GRYLLIDAE – Crickets	Species undetermined		Data deficient. Common under rocks and under organic debris.

Observer: Kevel Lindsay

