



FINLEY CAY



Re:
Environmental Impact Assessment
FINAL

Prepared for:
Justin Etzin

Date:
17 August 2020

FINLEY CAY
ENVIRONMENTAL IMPACT ASSESSMENT
FINAL

Prepared by:



#4 Saint Street
P.O. Box N-10377
Nassau, The Bahamas
Ph: (242)601-0251

Prepared for:

The BEST Commission
Ministry of the Environment and Housing
Ground Floor, Charlotte House
P.O. Box N-7132
Nassau, The Bahamas

On behalf of:

Justin Etzin
c/o Hubert Ingraham Chambers
Caves Village,
West Bay Street,
Nassau, The Bahamas

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1.0 SCOPE AND PURPOSE

The following document was prepared at the request of Mr. Justin Etzin, hereafter referred to as The Owner, for assistance in fulfilling the requirements of an application for approval to the Bahamas Investment Authority (BIA). The purpose of this report is to assess and document the existing conditions on Finley Cay and potential impacts associated with the proposed project. It provides recommendations to avoid, negate, minimize or mitigate potential impacts.

2.0 EXECUTIVE SUMMARY

2.1 Project Location, Description and Alternatives

Finley Cay is a seventeen (17) acres, undeveloped, small island located approximately twenty-eight (28) Nautical miles Southeast of New Providence and approximately thirteen (13) Nautical miles South of the southern tip of Current Island, Eleuthera.

The Owner proposes to undertake installation of five (5), low impact structures with an overall building footprint of less than three thousand (3,000) square feet. Structures include an owner's residence, conservation centre, two (2) researchers' housing unit and a caretaker's housing.

Alternatives to the project included the "*no action alternative*" which would allow the island to remain in its current state; however, the conservation and educational aspects of the project would not be realized. A reduction in the size of the development is not presented as an alternative given the already low impact that is proposed.

2.2 Agency Consultation

The Bahamas Environment Science and Technology (BEST) Commission and the Bahamas National Trust (BNT) were consulted in the preparation of this report. Site visits were conducted by both agencies.

2.3 Baseline Data

Physical Environment

There are no known existing wells or trenches for fresh water extraction on the island. The main source of potable water for the project will be from reverse osmosis which will be augmented with rain water collection.

Natural Environment

The vegetation and avian populations of the site were investigated to record the existing conditions of the terrestrial environment on the island and a benthic assessment was conducted in the area proposed for the dock infrastructure.

Botanical Assessment

Five (5) vegetation type classes were encountered on the island - Black Mangrove (*Avicennia germinans*) Forest, Rocky shore, Beach strand, Dry broadleaf evergreen formation (DBEF) and Human Altered. A total of fifty-two (52) vascular plant species were observed during the investigation including: two (2) species listed on the Conservation and Protection of the Physical Landscape Act, Protected Trees Order (1997) - Lignum Vitae (*Guaiacum sanctum*) and Narrow leaf Blolly (*Guapira discolor*); and three (3) species listed on National Invasive Species Strategy (2013) - Australian Pine (*Casuarina equisetifolia*), White Inkberry (*Scaevola taccada*) and Jumbay (*Leucaena leucocephala*).

Avian Assessment

A total of seven (7) avian species were recorded during the investigation including six (6) permanent residents and one (1) fall/winter non-breeding migrant species. All species observed

are protected under the Wild Birds Protection Act of The Commonwealth of The Bahamas, 1952. All species observed are considered of Least Concern by International Union for Conservation of Nature (IUCN) with the exception of the White crown pigeon (*Patagioenas leucocephala*) that is listed as near threatened. No endangered or endemic species were recorded.

Benthic Survey

A benthic survey was conducted in the area of the proposed dock infrastructure. The substrate was sandy bottom dominated by Manatee Grass (*Syringodium filiforme*) and Turtle Grass (*Thalassia testudinum*) with various alga types. A total of nine (9) flora species were recorded and seven (7) fauna which included two (2) sponges, two (2) coral species and two (2) fish species. There were no commercially important or protected species observed.

Socioeconomic Aspects

Finley Cay is uninhabited. The closest islands are New Providence and Eleuthera. It is not designated as a National Park. There are four (4) National Parks on New Providence and one (1) on Eleuthera. The Parks will not be physically impacted by the development. Zoning for Finley Cay is outlined in the Town Planning (Finley Cay) Zoning Order, 2001 which has restrictions indicated that construction on Finley Cay should be restricted to buildings related to the enhancement and preservation of the Cay in its natural state. No land acquisition is necessary for the project as the Owner is in legal possession of the land. Due to the relatively small scale of the project it is not anticipated to impact the economy significantly during the construction or operational phases.

2.4 Anticipated Impacts and Mitigation Measures

Physical Environment Impacts

As there will be no sourcing of ground water there are no impacts associated with ground water supply. There is however, a concern related to ground water contamination due to the storage and use of fuels on the island. Best management practices as per the Environmental Management Plan will be implemented during construction. No fuel will be stored on site during construction and operations.

Natural Environment Impacts

Ecosystem Impacts

Activities that have the potential to impact the ecosystem include habitat loss with land clearing; introduction of invasive species through the importation of plants; use of pesticides and herbicides that directly and indirectly impact avian species and their food source; hunting; human induced fires and rodents.

To mitigate for the loss of ecosystem and protected species, the Owner proposes to undertake habitat restoration of human altered areas on the site resulting in a net positive impact. In addition, selective plants will be harvested from areas to be cleared for building foot prints, and replanted in the restoration areas thus further decreasing the impact on habitat loss. Plants selected for habitat restoration would include native and protected species found on the site and of the same types found in the vegetation type to be replanted. Local procurement of plants will be a first option. If importation of plants is required; no banned species will be permitted on the landscape palette and all plant shipments will be accompanied by the necessary plant permits which includes inspections and a phytosanitary certificate from the point of origin and plant import permits from The Bahamas Department of Agriculture.

There will be absolutely **NO** hunting allowed on Finley Cay and the constant presence on the island will discourage others from using it as a hunting ground.

A Pest Control Plan will be developed to identify control measures for mosquitos, rodent and plant pest & disease that does not adversely impact the natural environment and wildlife. To address the present use of the island by others and detail steps to prevent, contain and control fires as a part of the project; a Fire Control and Prevention Plan will be developed that includes no fuel stored on site, implementation of firebreaks and enforcement of a No Smoking band for the island. A rodent control plan will be implemented to addresses eradication of individuals presently on the island and outline control measure to prevent introduction of new species.

Protection of water bodies

If Reverse Osmosis (RO) effluence is release back into the sea, the salinity levels at the outflow area increases which can impact marine life. Thus, the RO effluence will be disposed of by deep well injection.

Protection of natural resources

Quarrying and mining operations are regulated under the Conservation and Protection of the Physical Landscape Act of The Bahamas. Resources including sand, rock and fill should not be harvested from on or around the island. Materials used for the construction will be procured from an approved facility and verification provided for the same.

Solid Waste Impacts

Solid waste impacts will include land clearing debris, construction waste, domestic waste and human waste. Solid waste generated by land clearing will be minimal as this activity will be limited to the building footprints and some plants within the footprint will be harvested and

reused in the habitat restoration component of the project. The remaining debris will be cut up and placed among the retained vegetation to naturally degrade and add to the forest ecosystem.

Construction waste will be stored in a litter bin and removed by a licensed contractor that will provide a chain of custody receipt indicating tonnage at the site and receiving location.

During construction, domestic garbage will be disposed of in a lidded litter bin which will be removed from the site on a daily basis and stored on board the liveaboard for disposal at the end of the week. During operations waste will be sorted, with biodegradables disposed of by composting and the remainder of the municipal waste will be compacted and removed from the island for disposal in the New Providence Ecology Park. Portable potties will be provided for workers on site during the construction phase to handle human waste. The units will be serviced weekly and emptied in the live aboard vessel tank for collection and storage of human waste. The live aboard vessel will be serviced on monthly trips to New Providence. During the operation a combination of septic and a FAST unit will be used.

Socioeconomic Impacts

Land use Impacts

The development will require limited land use and minimal removal of natural vegetation. The visual and aesthetic impacts will be limited considering the unique design of the building.

Impacts on Communities

The greatest direct impacts to communities would be a restriction on indiscriminate use of the Cay for camping and hunting purposes.

Economic Impact

The development is not estimated to have a significant positive impact on the Bahamian economy during the construction or operational phases. The cost for development is estimated at five million dollars (\$5,000,000.00). Approximately fifty percent (50%) of this will go directly

into the Bahamian economy in the form of purchasing of goods, services and labour. The development is projected to employ approximately thirty (30) persons during the construction phase and two (2) persons during operations.

3.0 PROJECT DESCRIPTION AND ALTERNATIVES

3.1 Project Location

Finley Cay is a seventeen (17) acres, undeveloped, small island in The Bahamas. It is located approximately twenty-eight (28) Nautical miles Northeast of New Providence and approximately thirteen (13) Nautical miles South of the southern tip of Current Island Eleuthera (See Figure 1: Project Location).



Figure 1: Project Location

3.2 Projection Description

The Owner proposes to undertake installation of five (5) buildings, improvements to five (5) existing trails and installation of one (1) dock (See Figure 2: Project Conceptual Layout).



Figure 2: Conceptual Layout

3.2.1 Housing

3.2.1.1 Buildings

Buildings include five (5) low impact housing structures. Housing structures will include an owner's residence, a conservation centre, researchers housing and a caretaker's housing. The overall building footprint for all structures will be less than three thousand (3,000) square feet (See Table 1: Building square footage allotment, Finley Cay).

Table 1: Building square footage allotment, Finley Cay

Building	Support Footing (Sq. ft.)	Base Structure (Sq. ft.)
Owner's Residence	270	1,200
Conservation Centre	270	828
Researchers Housing	90	300
Researchers Housing	90	300
Caretaker's Housing	90	300
Overall square footage	810	2,928

Owner's Residence:

The owner's residence is designed to house six (6) persons but the occupancy will typically be two (2) persons. The unit will be occupied for two (2) weeks at a time every three (3) months.

Conservation Centre:

The Conservation Centre will house a small library of books and media records from the wildlife cameras throughout the island as well as banding supplies. The unit will be outfitted with a work space for up to four (4) persons and can accommodate one to two (1-2) researchers. This unit will be occupied by the Conservation Manager that will visit the island four (4) times per year.

Researchers' Housing:

Two (2) housing units will be used for researchers visiting the island to conduct banding exercises and research studies. The units will be occupied for one to two (1-2) weeks at a time and it is anticipated that there will be at least four (4) trips per year by researchers.

Caretaker's Housing:

The island will be managed by a full-time caretaker that will be replaced with a substitute during times of absence to ensure full time presence on the island. The caretaker's housing will be of the exact same size and make as the research's units.

All housing structures are to be Solaleya dome homes. These ecologically sound structures that utilizes the latest innovation in modern architecture and are sustainably constructed, energy efficient and resistant to earthquakes and hurricanes.



Figure 3: Proposed design for Owner's Residence and Conservation Centre



Figure 4: Proposed design for Researchers and Caretaker Housing

Sustainable Construction Features include:

1. The units are prebuilt and will be assembled on the island, which can be achieved in a few months, limiting the construction time and activity on site.
2. The units will be constructed using natural and renewable materials including:
 - **FSC certified wood**, that meets the requirements of the Forest Stewardship Council that sets standards to ensure that forestry is practiced in an environmentally responsible and socially beneficial manner.
 - **Recycled Steel**
 - **Engineered Compressed Saw** that recycles used wood chip and saw dust to make new building material.

- **Cork bead** which is considered sustainable because the production of cork does not involve the killing of the tree and cork products and by products are easily recycled.
 - Products with no harmful chemicals
3. The units can be disassembled with minimal impact to the substrate of the building envelope which makes restoration of the area with native vegetation a possible option.

Energy Efficient Features:

Solaleya dome home are more energy efficient when compared to traditional building styles.

Energy efficient features of the units include:

1. The units are fitted with panels for solar power generation (specifics outlined in section 3.1.2.1).
2. The unique shape is adapted to the sun's daily and year-round course with inclinable solar panel providing maximized solar energy gains and additional shade when necessary.
3. The structure's tightness created by the dome shape conserves energy, making them easier to heat and cool.
4. Durable & ecological white sun reflecting roof finish for controlled heat gains.
5. Roofing shell insulated with a 1" layer of air and a 12" layer filled with cork beads for >R28 insulating value. R values relates the thermal resistance in buildings. The more a material is intrinsically able to conduct heat, the lower its R value. Typical R values for ceilings and attics is >R49.
6. Side external walls made of 12" thick engineered resin with built-in straw insulation.
7. Geothermal and wood pellet fed heating systems diffusing floor radiant heat to both levels.
8. Computerized venting system at the top of its large bay windows to automatically evacuate or circulate accumulated hot air.

The structures aerodynamic dome shape enables it to be anti-cyclonic, proven to withstand winds up to 115mph with minimal damages, specifically:

- The shell's interior has no weight bearing walls supporting roof structures overhead.
- The use of pressure formed wooden arches as the main structural support is earthquake resistance due to the lack of perpendicularity to seismic rays.

The housing structure type proposed was used in Taiwan and survived Typhoon Tim in 1994 without deterioration. All window treatments used are compliant with the Miami Dade building codes. All solar breakers and shading options are adapted into a vertical configuration to protect windows and offer the possibility to close the buildings in a shutter-like manner as protection in case of natural disasters. See Appendix 1: Manufacturer's specifications for proposed structures. These documents will be submitted to Ministry of Works, Building Control Unit for approval prior to the start of construction.

All units are located near the shoreline to avoid areas of greatest concentration of nesting activity but set back of a minimum of fifty (50) feet from the line of mean high water in consideration of erosion and climate change impacts on coastlines which includes rising sea levels.

3.2.1.2 Construction Accommodations

Approximately thirty (30) workers will be housed on a self-contained liveaboard vessel during construction. The seventy-four (74) foot vessel is of a flat bottom design with a two and a half (2½) foot draft. It is fully equipped with cooking, sleeping and sanitary facilities. The live aboard is powered by solar which will be augmented with a back-up generator. The vessel will be docked at the proposed operational docking facility for thirty (30) days at a time and return to New Providence for seven (7) days to allows workers respite, restock supplies, service of sanitary facility and vessel maintenance.



Figure 5: Style of liveaboard vessel proposed for use during construction

3.2.2 Utilities and Infrastructure

Provisions will have to be made for utilities as the site is undeveloped with no electrical, water or telecommunication infrastructure.

3.2.2.1 Electricity

Electricity will be achieved by solar photovoltaic power generation. The housing structure are outfitted with solar panels and the solar energy harnessed will be used to power the units and heat water. Solar panels on each housing structure will be connected to an individual Tesla Powerwall. Tesla Powerwall is a fully-integrated AC battery system for residential or light commercial use. Its rechargeable lithium-ion battery pack provides energy storage for solar self-consumption, time-based control, and backup. One (1) power wall can store 13.5 kWh, which can power essential appliances for 24 hours.

3.2.2.2 Potable Water

The main source of potable water will be from Reverse Osmosis (RO). The water supply system will consist of a one thousand (1,000) US gallon per day containerized reverse osmosis desalination system, a five thousand (5,000) US gallon storage tank and a constant pressure pumping system. The desalination system will be designed to obtain saltwater from a single supply well and produce a finished water meeting World Health Organization (WHO) drinking water standard.

The overall treatment process will consist of cartridge filtration, the ability to add a trace quantity of a sulfuric acid to the feedwater for alkalinity recovery, membrane separation, and post treatment consisting of calcium carbonate contactor, pH adjustment, ozonation and activated carbon. A separate chemical addition system will be provided for the addition of sodium hypochlorite should the owner desire to maintain a residual disinfectant in the finished water. Membrane concentrate will be disposed via a disposal well.

The treatment unit will consist of a single treatment unit or “train”, with two pressure vessels. All pressure vessels are designed in accordance with ASME standards for Boiler and Pressure Vessel Code. The unit will incorporate an automatic flushing feature that reduces the chance of scale formation or equipment corrosion during periods of shutdown. The system is supplied with a membrane cleaning system for periodic cleaning for the membrane array.

The proposed high-pressure pump is an axial piston, positive displacement pump constructed from 2507 super duplex stainless. The system will be furnished with an energy recovery unit to reduce overall treatment power consumption, provide greater flexibility in terms of system operating recovery, and to reduce the size of the membrane feed pumping system. This design reduces the high-pressure pump and motor size by reducing the pumping rate to approximate the permeate flow rate. It also provides the lowest possible energy usage and the greatest degree of flexibility, while maintaining a residual pressure on the membrane concentrate to eliminate the need for re-pumping for disposal.

The unit has been designed to allow monitoring and control of each individual unit process from a main control panel or remotely via a broadband internet connection. The control system will be Partial Least-Squares (PLS) based with a touch screen interface.

The RO system will be installed along the southern trail (Trail A – See Figure 6). Vegetation to be removed for accessing plant site, well locations and installation of the unit is human altered and will be restored with native vegetation as a part of the habitat restoration exercise. The intake well will be strategically placed closer to the Southeastern side of the trail, more than two hundred (200) feet from any septic system and one hundred (100) feet from the deep injection well. Both wells will be drilled at one hundred and fifty (150) feet.

3.2.2.3 Septic Treatment

The housing units will be fitted with a dual wastewater management system that will include a septic tank and a FAST unit. FAST wastewater system uses a Fixed Activated Sludge Treatment (FAST) process to treat wastewater. The unit is inserted into the conventional septic system and activates the waste to encourage aerobic conditions to denitrify the effluent.

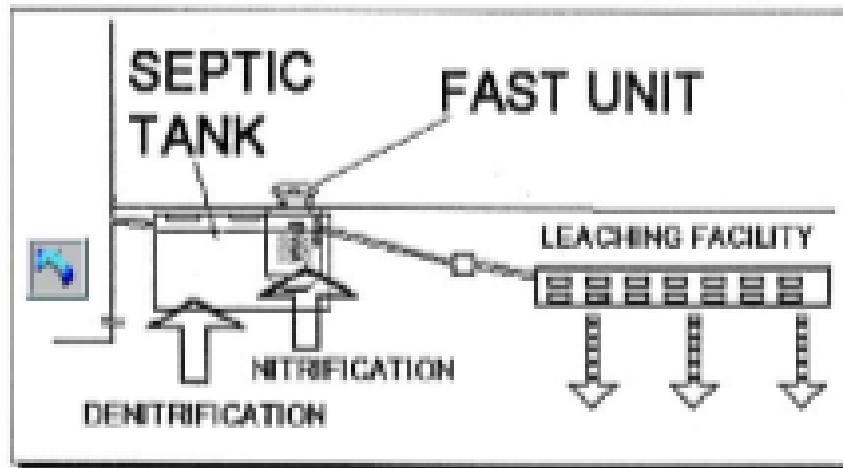


Exhibit 2: Illustration of FAST unit with septic tank

3.2.2.4 Telecommunications

While there is no telecommunications infrastructure on the island, there is a low cell phone reception signal that is likely originating from towers on the island of Eleuthera which is approximately thirteen (13) miles to the North. Reliable telecommunication is essential during the operations as the site is an isolate Cay. The Owner intends to install a range extender with the permission of or through Bahamas Telecommunications Company. The unit will be affixed to one of buildings and will not require any towers or extended antennas. A Satellite phone will also be available on site.

3.2.3 Trails

There is an existing trail system on the island that consist of five (5) trails approximately fifteen (15) feet in width (See Figure 6). These trails have been mechanically cleared of native vegetation and are presently overgrown with weeds and non-native plant species. To minimize the project's impact by habitat loss to a net positive impact, the Owner proposes to improve these trails by decreasing their size to six (6) feet in width and undertaking habitat restoration of the remaining nine (9) feet along the trails. Areas for habitat restoration were previously dry broadleaf evergreen formations which is the same vegetation type as areas of land clearing impacts. Plants for the habitat restoration will be native species of the same kind removed during land clearing.

The new trails will be constructed with a sand base and will be utilized as Golf cart/pedestrian pathways. The sand base trails will also function as fire breaks. Firebreaks are strips of cleared vegetation, free of combustible material, that help to control and contain fires by creating a barrier between sections of vegetation. With restoration, the existing trail system can divide the island into six (6) sections separated by fire breaks. To achieve this, Trail E will need to be extended to the northern shoreline as outlined in Figure 6 which, would require removal of approximately two hundred (200) feet by six (6) feet or twelve hundred square feet (1,200 sq. ft.) or 0.027 acres of dry broadleaf evergreen formation vegetation. While Trail D does not extend to the coastline it stops at wetland vegetation which is a natural fire break.

Division of the island into sections can also be helpful in data collection and analysis with the implementation of the conservation management plan outlined in section 8.1.



Figure 6: Existing Trail System on the island

3.2.4 Dock

To safely access the island by boat, a forty (40) foot dock will be installed on the Southwestern point. The structure will incorporate adaptive and resilient features to address hurricanes and climate change. A floating dock design will be used that allow for adjustment to varying water levels and general movement. It will be constructed as several modules instead of one continuous piece. This will allow the dock to be removed from the water in preparation for hurricanes or other adverse weather conditions. The relatively short length makes removal from water an easier task. Use of the module system also allows for easier repairs as damaged modules can be removed or replaced.

Two (2) types of boats will use the dock. A seventy-four (74) foot, steel hull supply boat will service the island every three (3) months. And passenger boats, forty (40) foot or less speed boat, will visit the island monthly or as needed.

3.3 Project Alternatives

3.3.1 The “No Action” Alternative

The “No Action” alternative would be to let the island remain in its present condition. This would serve to preserve the island in its natural state. However, the conservation benefits of the project, discussed in more detail in section 5.3 would not be realized.

3.3.2 Alternative Size

The project aims for a net positive impact on habitat by restoring human altered areas and a correspondingly lower building footprint. A reduction in the size of the development is not presented as an alternative given the already low impact that is proposed.

4.0 AGENCY CONSULTATION

4.1 Bahamas Environment Science & Technology (BEST) Commission

The Bahamas Environment Science Technology (BEST) Commission was notified of the project by the Owner’s legal representatives, Ingraham Law. On 5 September 2018, Design Elements submitted a request to BEST for a scoping meeting prior to the commencement of field studies for baseline data collection, to ensure that issues of environmental concern were assessed during the survey. The Finley Cay EIA R0 dated 9 November 2018 was submitted by Design Elements to BEST on 10 November 2018. A joint site visit with personnel from BEST and Design Elements was conducted 20 February 2019. The BEST Commission provided formal feedback on the EIA R0 and the site visit in a communication dated 13 March 2019. Finley Cay EIA R1 dated 17 June 2019 was submitted by Design Elements to BEST and a response received in a communication from BEST dated 21 July 2019.

4.2 Bahamas National Trust

The Owner and its legal representatives have consulted with the Bahamas National Trust (BNT) on details of the project and proposed conservations efforts. The project plan outlined in Appendix 2 was presented to BNT representatives in February 2018. The BNT was present during a site visit with Design Elements on 14 September 2018 and conducted a rapid assessment.

5.0 BASELINE DATA

5.1 Physical Environment

Hydrogeology:

There are no known existing wells or trenches for fresh water extraction on the island. The main source of potable water for the project will be from reverse osmosis which will be augmented with rain water collection.

5.2 Natural Environment:

The vegetation and avian populations of the site was investigated to record existing conditions of the natural environment. Terrestrial biological field studies for botanical and avian surveys, were conducted on 14 September 2018 and a benthic assessment was conducted on 20 February 2019 in the area proposed for the dock infrastructure.

5.2.1 Botanical Survey

The purpose of the botanical study was to map vegetation types, determine floristic diversity, record protected species abundance and identify the presence of invasive species.

5.2.1.1 Methodology

Vegetation types were mapped by examining aerial photography and verified by walking within the interior of the vegetation and targeting specific locations. Vegetation type taxonomy is based on Areces et al. (1999). Vascular plant species occurring in each vegetation type were recorded and used to compile an overall floral list. Plant taxonomy is based on Corell & Corell (1982). The presence, location and abundance of vascular species listed under the Conservation and Protection of the Physical Landscape Act, Protected Trees Order (1997) and the National Invasive Species Strategy for The Bahamas, 2013 were noted when encountered. Percentage cover were recorded in the abundance categories Occasional (less than 20%), Moderate abundance (20-50%), Abundant (50-80%) and Dominant (80-100%).

5.2.1.2 Results

5.2.1.2.1 Vegetation types

Five (5) vegetation type classes were encountered on the island - Black Mangrove (*Avicennia germinans*) Forest, Rocky shore, Beach strand, Dry broadleaf evergreen formation and Human Altered. These vegetation types are described in the sections below.

5.2.1.2.1.1 Coastal

5.2.1.2.1.1.1 Beach Strand

Beach Strand is present at two (2) locations along the coastline: at the North eastern point and along the western shoreline. Vegetation along the north-eastern beach strand occurred within a small band less than two (2) meters in width between the high-water mark and the upland vegetation. The vegetation was primarily ground covers which was almost exclusively Seashore salt grass (*Distichlis spicata*) and Sea purslane (*Sesuvium portulacastrum*).



Photo 1: Beach Strand profile along north-eastern shoreline



Photo 2: Beach Strand vegetation along north-eastern shoreline

The beach strand vegetation strip along the western shoreline was four (4) to five (5) meters wide between the high-water mark and the upland vegetation. In some areas there was a band of consolidated limestone between the sandy shoreline and the beach strand vegetation. In these areas, vegetation height was less than two (2) meters and consisted of shrubs such as Bay cedar (*Suriana maritima*) and Bay lavender (*Argusia gnaphalodes*); and ground covers such as Golden creeper (*Ernodea littoralis*) and Bay Geranium (*Ambrosia hispida*).



Photo 3: Beach Strand profile along western shoreline



Photo 4: Beach Strand vegetation along western shoreline beyond consolidated limestone

Vegetation in other sections along the western shoreline beach strand included areas dominated by Sea oats (*Uniola paniculata*) with occasional shrubs such as Bay cedar (*Suriana maritima*) and Bay lavender (*Argusia gnaphalodes*).



Photo 5: Beach Strand vegetation along western shoreline beyond consolidated limestone strip

5.2.1.2.1.1.2 Rocky Shore

Approximately 50% of the shoreline is Rocky shore. It is present along the North western tip of the island and along the South eastern and South western shoreline. The North western rocky shore has large areas of exposed rock with little to no vegetation. When present vegetation included Sea purslane (*Sesuvium portulacastrum*) within rock crevices and shrubs such as Bay cedar (*Suriana maritima*) and Silver Buttonwood (*Conocarpus erectus sericeus*) on the inland periphery.



Photo 6: Rocky shore profile along North western coastline

Vegetation along the South eastern rocky shore is subject to frequent salt spray and occasional inundation in some areas. The species present here have high salt tolerance and include Silver Buttonwood (*Conocarpus erectus sericeus*) trees, Salt marsh cordgrass (*Spartina patens*) and sea purslane (*Sesuvium portulacastrum*).



Photo 7: Rocky shore profile along South eastern coastline



Photo 8: Rocky shore vegetation along South eastern coastline

The south western rocky shoreline has an abundance of weathered out holes and crevices ranging from inches to more than a meter in size. Vegetation is similar to the south eastern rocky shoreline however the unconsolidated material in the crevices allows for vegetation growth in areas where there is no vegetation on the eastern side.

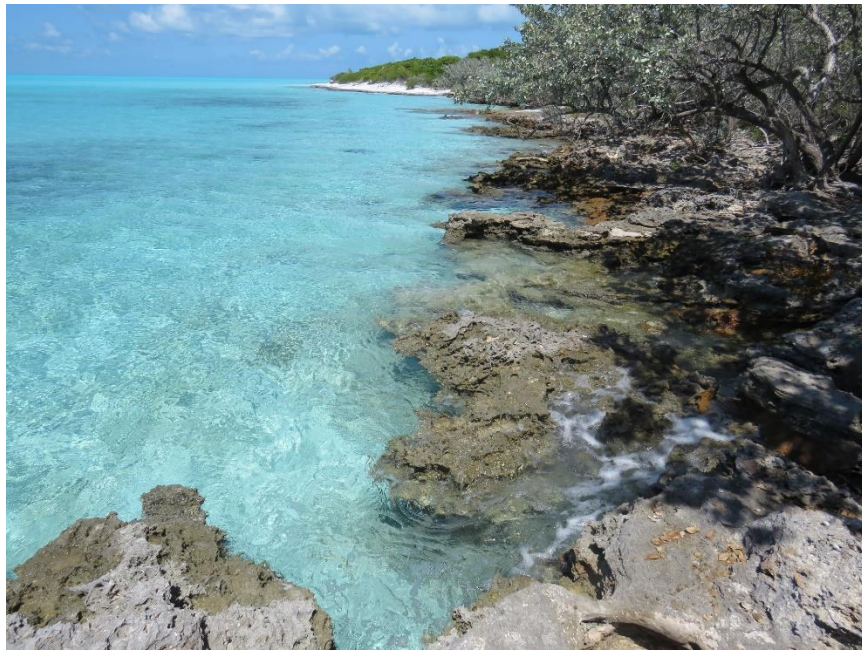


Photo 9: Rocky shore profile along section of South western coastline



Photo 10: Rocky shore vegetation along section of South western coastline

5.2.1.2.1.1.3 Black Mangrove (*Avicennia germinans*) Formation

Black Mangrove (*Avicennia germinans*) is present along the eastern shoreline. The vegetation is exclusively Black Mangrove and extends seaward of the high-water mark and continues into the interior of the island.



Photo 11: Black Mangrove (*Avicennia germinans*) along eastern shoreline

5.2.1.2.1.2 Wetlands

5.2.1.2.1.2.1 Black Mangrove (*Avicennia germinans*) Formation

The Black Mangrove (*Avicennia germinans*) Formation along the eastern shoreline extend into the interior of the island and encompasses approximately thirty percent (30%) of the vegetation cover of the island. This area is almost exclusively Black mangrove with a few associated species such as Sea purslane (*Sesuvium portulacastrum*) along the interior periphery. At the time of the investigation, the interior of the formation had sections with standing water less than one (1) foot in depth and areas of saturated soil with no standing water.



Photo 12: Interior periphery of Black Mangrove Formation

5.2.1.2.1.3 Interior Upland

5.2.1.2.1.3.1 Dry Broadleaf Evergreen Formation

The majority of the island is covered with dry broadleaf evergreen formation (DBEF) which is fairly homogenous from one location to the next. Common species include Gum Elemi (*Bursera simarouba*), Silver top Palm (*Coccothrinax argentata*), and Lignum vitae (*Guaiacum sanctum*). There were slight variations in species composition in the southern section where Silver top palm

(*Coccothrinax argentata*) was more abundant. Other variations occurred in the north western section closer to the shoreline where the canopy cover is tight due to wind pruning.



Photo 13: DBEF in the northern section of the site



Photo 14: Wind pruned DBEF along North western shoreline

5.2.1.2.1.4 Other Mappable areas

5.2.1.2.1.4.1 Human Altered

Human Altered areas on the island are present along the existing trails. These areas were mechanically cleared and revegetated with weed species such as Canker berry (*Solanum bahamensis*); Invasive species such as Jumbay (*Leucaena leucocephala*) and planted crops such as Banana (*Musa sp.*).



Photo 15: Human Altered Area

5.2.1.2.2 Invasive Species

Three (3) species listed on National Invasive Species Strategy (2013) were recorded during the investigation (See Table 2).

Table 2: Invasive plant species recorded on Finley Cay

Botanical Name	Common Name	Presence on site	Recommendations for control*
<i>Casuarina equisetifolia</i>	Australian Pine	A few individuals along the NW coast.	Control
<i>Scaevola taccada</i>	White Inkberry	A few individuals along the Beach strand and Human Altered areas.	Eradication
<i>Leucaena leucocephala</i>	Jumbay	Common species in human altered areas.	Control

*Based on National Invasive Species Strategy (2013)

5.2.1.2.3 Protected Species

Lignum Vitae (*Guaiacum sanctum*) and Narrow leaf Blolly (*Guapira discolor*) were the only two (2) species listed on the Conservation and Protection of the Physical Landscape Act, Protected Trees Order (1997) that were observed on the site.

Both species were present in the dry broadleaf evergreen formation areas of the site, where Lignum Vitae was present as a common species and Narrow leaf Blolly was an occasional species.

5.2.1.2.4 Vascular Plant Diversity

A total of fifty-six (56) vascular plant species were observed during the investigation (See Table 3). It is highly unlikely that this number represents all of the plant species present within the vegetative communities on the island as data collection was limited to a single field visit for a rapid assessment.

Table 3: List of vascular plant species observed at Finley Cay, The Bahamas

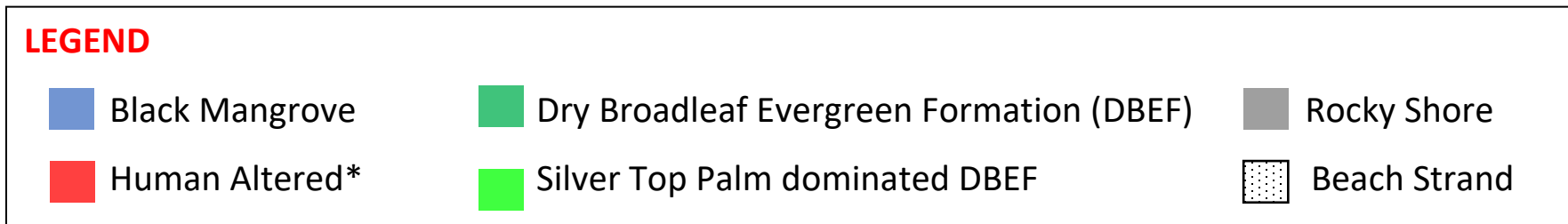
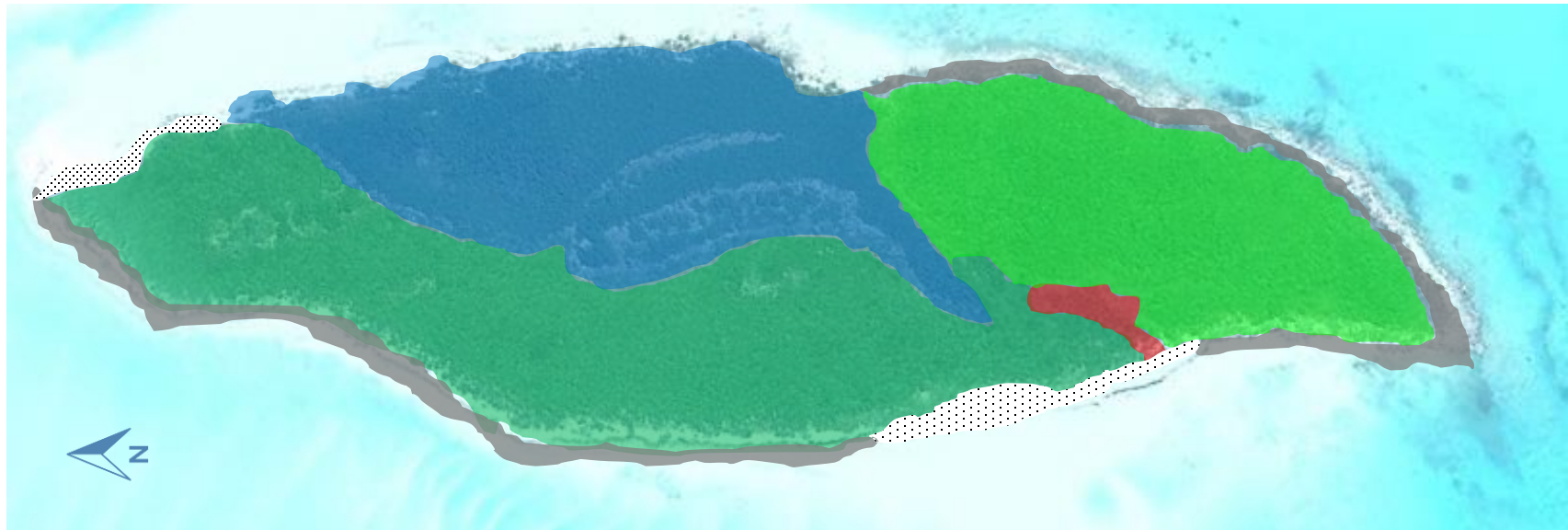
Table Key: **BS** = Beach Strand, **RS** = Rocky Shoreline, **BMF** = Black Mangrove Formation, **DBEF**= Dry Broadleaf Evergreen Formation, **HA** = Human Altered.

Botanical Name	Common Name	Location				
		BS	RS	BMF	DBEF	HA
<i>Acacia choriophylla</i>	Cinnecord				√	
<i>Alvaradoa amorphoides</i>	Alvadora				√	
<i>Ambrosia hispida</i>	Bay Geranium	√				
<i>Argusia gnaphalodes</i>	Bay Lavender	√				
<i>Avicennia germinans</i>	Black Mangrove			√		
<i>Borrchia arborescens</i>	Bay Marigold	√		√		
<i>Bougainvillea glabra</i>	Bougainvillea					√
<i>Bouyeria ovata</i>	Strongback				√	
<i>Bumelia americana</i>	Milk berry				√	
<i>Bursera simarouba</i>	Gum Elemi				√	
<i>Casasia clusiifolia</i>	Seven year Apple	√	√		√	
<i>Cassytha filiformis</i>	Love vine				√	√
<i>Casuarina equisetifolia</i>	Australian Pine		√			
<i>Cenchrus incertus</i>	Coast sandbur	√				√
<i>Centrosema angustifolium</i>	Butterfly Pea				√	
<i>Chiococca alba</i>	Snowberry				√	
<i>Citrus sp.</i>	Lime					√
<i>Coccoloba diversifolia</i>	Pigeon Plum				√	
<i>Coccoloba uvifera</i>	Seagrape		√			
<i>Cocos nucifera</i>	Coconut	√				√

Botanical Name	Common Name	Location				
		BS	RS	BMF	DBEF	HA
<i>Coccothrinax argentata</i>	Silver Top Palm				√	
<i>Conocarpus erectus</i>	Buttonwood	√	√			
<i>Conocarpus erectus var sericeus</i>	Silver Buttonwood	√	√	√		
<i>Distichlis spicata</i>	Seashore Saltgrass	√	√			
<i>Echites umbellata</i>	Devil's potato		√		√	
<i>Ernodea littoralis</i>	Common Ernodea	√	√			
<i>Eugenia axillaris</i>	White Stopper				√	
<i>Eugenia foetida</i>	Spanish Stopper				√	
<i>Euphorbia mesembrianthemifolia</i>	Coast Spurge	√				√
<i>Exothea paniculata</i>	Inkwood				√	
<i>Fimbristylis cymosa</i>	Spike rush		√			
<i>Guaiacum sanctum</i>	Lignum Vitae				√	
<i>Guapira discolor</i>	Narrow-leaved Blolly				√	
<i>Hymenocallis arenicola</i>	Spiderlilly				√	
<i>Jacquinia keyensis</i>	Joewood	√				
<i>Lasiacis divaricata</i>	Wild Bamboo				√	
<i>Mastichodendron foetidissium</i>	Mastic				√	
<i>Metopium toxiferum</i>	Poisonwood				√	
<i>Musa sp.</i>	Banana					√
<i>Opuntia cochenillifera</i>	Scurgeon Needle		√		√	
<i>Passiflora sp</i>	Passion fruit				√	
<i>Picramnia pentandra</i>	Snake root				√	
<i>Pithecellobium keyense</i>	Ram's Horn				√	

Botanical Name	Common Name	Location				
		BS	RS	BMF	DBEF	HA
<i>Pseudophoenix sargentii</i>	Buccaneer Palm				√	
<i>Reynosia septentrionalis</i>	Darling Plum				√	
<i>Scaevola plumieri</i>	Black Inkberry	√				
<i>Scaevola taccada</i>	White Inkberry	√				√
<i>Sesuvium portulacastrum</i>	Sea Purslane	√	√	√		
<i>Solanum bahamensis</i>	Canker Berry					√
<i>Sophora tomentosa</i>	Pearl Necklace		√			
<i>Spartina patens</i>	Salt marsh cordgrass	√	√			
<i>Sporobolus virginicus</i>	Seashore rush grass	√	√			
<i>Suriana maritima</i>	Bay Cedar	√	√			
<i>Thespesia populnea</i>	Seaside Mahoe			√		
<i>Urechites lutea</i>	Wild Allamanda				√	
<i>Zanthoxylum fagara</i>	Wild Lime					√

5.2.1.2.5 Vegetation Map



*Only includes human altered areas that were visible from aerial image (does not include trails which are illustrated on Figure 6)

Figure 7: Vegetation Cover Map

5.2.2 Avian Assessment

The avian survey was conducted to identify the presence, abundance and habitat utilization of avian species on the island.

5.2.2.1 Methodology

The assessment comprised of three and one half (3.5) hours of active avian and ecological observation. The avifauna of the area was assessed and recorded by walking through the vegetation, along existing trails and around the perimeter of the cay and checking cleared areas of the vegetation at various locations. Species numbers were recorded in the abundance categories, Single, Few (2-10) and Many (11-100). Species recorded were compiled for final abundance estimates.

5.2.2.2 Results

5.2.2.2.1 Species Observations

5.2.2.2.1.1 Species Abundance

A total of seven (7) species were recorded during the investigation (See Table 4).

Table 4: Avifauna Observed on Finley Cay, Bahamas.

(Taxonomic list below based on The Clements Checklist of Birds of the World, sixth edition published (2007). Status is based on International Union for Conservation of Nature (IUCN).

TABLE KEY:	
RANGE	STATUS
PR = Permanent Resident	LC = Least Concern (Conservation - IUCN)
WRN = Winter Resident Non-breeding	NT = Near Threatened (Conservation- IUCN)

COMMON NAME	SCIENTIFIC NAME	MASTER OBSERVATION	STATUS/RANGE/ CONSERVATION
White-crowned pigeon	<i>Patagioenas leucocephala</i>	Many	NT/PR
Common ground dove	<i>Columbina passerina</i>	Few	LC/PR
Cuban pewee	<i>Contopus caribaeus</i>	Single	LC/PR
Thick-billed vireo	<i>Vireo crassirostris</i>	Few	LC/PR
Prairie warbler	<i>Setophaga discolor</i>	Few	LC/WNR
Bananaquit	<i>Coereba flaveola</i>	Many	LC/PR
Black-faced grassquit	<i>Tiaris bicolor</i>	Few	LC/PR

5.2.2.2.1.2 Species Range

The range of a species is the geographic areas where the birds can be consistently found e.g. migrant birds have seasonal ranges while restricted range species remain on same island or in same region year-round.

5.2.2.2.1.2.1 Permanent Resident

The predominant avian species at the site was the White-crowned pigeon (*Patagioenas leucocephala*). All of the species recorded live and breed throughout the islands of The Bahamas, except the Prairie warbler *Setophaga discolor*, which is a regular fall/winter non-breeding migrant species from North America.



Photo 16: White-crowned pigeon, *Patagioenas leucocephala* (immature)

5.2.2.2.1.2.2 Endemic Species

No endemic species were recorded.

5.2.2.2.1.3 Conservation Status

5.2.2.2.1.3.1 Protected Species

All of the species observed are protected under the Wild Birds Protection Act Chapter 249, Statute Law of The Bahamas (1952).

5.2.2.2.1.3.2 Endangered Species

There were no endangered species recorded.

5.2.2.2.1.3.3 Species of Concern

White-crowned pigeon - *Patagioenas leucocephala* (global conservation status as near-threatened) is the most abundant species on the island.

5.2.2.2.1.4 Habitat Utilization

The majority of the birds recorded were observed in the dry broadleaf vegetation. Finley Cay has been historically documented as an important breeding site and remains so to the present for the White-crowned pigeon. Scores of White-crowned pigeon were observed to be actively nesting.



Photo 17: Nest in branches of Gum Elemi tree



Photo 18: White-crowned pigeon, *Patagioenas leucocephala* (chicks)

White-crowned pigeon nesting was concentrated in the southern section of the island. Palm dominated areas had the greatest density, with a slightly less concentration in the adjacent broadleaf areas. The wind pruned broadleaf vegetation in the north eastern section of the island were less conducive to nesting due to the tight-knit canopy and a lower concentration was observed in this area. The interior of the Black Mangrove wetland was inaccessible and while it is likely that some nesting might take place it is highly unlikely that these areas would have a significant concentration, as the growth habit of this species is not ideal for nest building. Nesting concentration was significantly low along the existing trails.



Figure 8: White Crown Pigeon Habitat Utilization (nesting) Map

The numbers of the common bird species (Bananaquit, Black-faced grassquit, Common ground dove and Thick-billed vireo) on the site confirmed they have adapted to the habitat and utilize all of the resources.

Bananaquit is a very active and social species, groups of two and three were often seen chasing through the coppice and feeding on palm berries. Black-faced grassquits were observed foraging for seeds in the open areas and trails.

Vireos and warblers search for small insects in the dry broadleaf vegetation and flycatchers use the bare branches as perches from which to dart and capture flying insects.



Photo 19: Bananaquit, *Coereba flaveola* (Adult)



Photo 20: Black-faced grassquit, *Tiaris bicolor* (left-female/right-male)

5.2.2.3 Discussion

5.2.2.3.1 Species Abundance

There was only seven (7) species of birds recorded during the survey. However, there was significant bird activity and the numbers of White-crowned pigeon was abundant. A Bahamas National Trust Officer was present during the survey and conducted a separate avian study that recorded twelve (12) species (See Appendix 3). The combined total number of species observed is thirteen (13).

There were a number of factors contributing to the low number of species recorded including the time of day that the data was collected. Field studies were conducted between the hours of 11am and 3 pm which is the least productive time for bird activity. Design Elements conducted a rapid ecological assessment that was focused on investigating habitat and habitat use for the entire island while the BNT study was focused on the White crowned Pigeon nesting and more time was spent in one location and was supplemented with video recordings.

The time of year also played a role in the amount of birds observed. Migrant species account for a significant number of bird species recorded for The Bahamas. The survey was conducted leading into the Fall migration period that peaks in mid - October and only the exceptionally early migrants would be expected on the site.

To get a fair representation of the avian population on the site, data should be collected over a full year at key times in each season. Studies conducted over multiple seasons will yield additional information.

It should be noted that there may be a number of factors involved in the designation of Wild Bird Reserve including the abundance of species utilizing the site, or habitat utilization by a specific species of concern. In the case of Finley Cay literature review suggest that the significant White Crown Pigeon population was a determining factor in the designation.

5.2.2.3.2 Habitat Conservation

Finley Cay is listed as a 'Wild Bird Reserve' in the Wild Birds Protection Act Chapter 249 (Statute Law of The Bahamas) Reserves (Section Four).

The White-crowned pigeon uses the cay as a breeding site due to its isolation. The dense vegetation provided the ideal cover for this wary species. There were numerous active nests with chicks recorded and many immature birds were visible.

Formerly abundant throughout its range, this species has declined dramatically and is now threatened due to impacts of habitat loss, severe over-hunting and introduced predators.

Finley Cay is an especially important White-crowned pigeon breeding site. This species is known to travel long distances from their roost to their feeding areas, so the food supply onsite is not a problem for such a large population. Historically, White-crowned pigeon have been recorded flying from the Finley Cay to feeding grounds in Central and North Eleuthera.

5.2.3 General Terrestrial Wildlife Observations

With the exception of the avian assessment, no other specific terrestrial wildlife studies were conducted by Design Elements. Herpetological observations made by the BNT during a site visit indicate that four (4) species of reptiles were observed (see Appendix 3).

Additional fauna research and educational programs will be conducted on a continuous basis during the operations to better understand the biological components of the island in order to effectively manage and maintain existing populations. Considerations to avoid, minimize or mitigate the impact to avifauna during construction will extend for all fauna.

5.2.4 Benthic Assessment

A benthic survey was conducted at the southwestern section of Finley Cay to identifying and describing benthic habitats and the presence and abundance of marine flora and fauna.

5.2.4.1 Methodology

The benthic ecosystem of the proposed area for the dock infrastructure was assessed using transects perpendicular to the shore. A record was taken of all flora, fauna and substrate type encountered during the survey. Species abundance was recorded as Single, Few (2-10) and Many (10+).

5.2.4.2 Findings

5.2.4.2.1 General Observations

The habitat type of the shoreline is a rocky shore. The weather conditions were clear, with winds at eleven (11) knots. Visibility was five (5) based on a range of one to ten (1-10) with one (1) being zero visibility and ten (10) being transparent. Depth ranged between approximately zero and fifteen feet (0-15 ft). Wave energy was high at the time of the investigation.

5.2.4.2.2 Benthic Description

The majority of the substrate in survey area was sandy bottom dominated by Manatee Grass (*Syringodium filiforme*) and Turtle Grass (*Thalassia testudinum*) with various alga types. The

Manatee Grass density increased as the dominant species from nearshore to offshore. The seagrass beds were relatively sparse without many dense areas. There were no epifauna observed during the assessment.

5.2.4.2.3 Species Diversification

5.2.4.2.3.1 Flora observed

Table 5: Algae and seagrasses (species no. 9) observed during assessment.

Scientific Name	Common Name
<i>Acetabularia crenulate</i>	Mermaid’s Wine Glass
<i>Caulerpa cupressoides</i>	Cactus Tree Algae
<i>Dictyota spp.</i>	Dictyota
<i>Halimeda spp.</i>	Green Algae
<i>Penicillus sp.</i>	Mermaid’s Shaving Brushes
<i>Rhizocephalus phoenix</i>	Pinecone Algae
<i>Sargassum natans</i>	Sargassum Seaweed
<i>Thalassia testudinum</i>	Turtle Grass
<i>Syringodium filiforme</i>	Manatee Grass

5.2.4.2.3.2 Fauna observed

Table 6: Fauna (species no. 7) observed during assessment.

Scientific Name	Common Name	Abundances
Sponges (species no. 2)		
<i>Ircinia felix</i>	Stinker Sponge	Few
<i>Ircinia strobilina</i>	Black Ball Sponge	Few

Scientific Name	Common Name	Abundances
Coral (species no. 2)		
<i>Plexaurella sp.</i>	Sea Rod	Many
<i>Porites porites</i>	Finger Coral	Few
Fish (species no. 2)		
Atherinidae, Clupeidae, Engraulididae Family*	Silver sides	Many
<i>Sparisoma radians</i>	Bucktooth Parrotfish	Few
Other (species no. 1)		
<i>Hypanus americanus</i>	Southern Stingray	Single

*The common name Silver side refers to a group of fish from several different families that are usually found together. It is difficult to distinguish any one particular species when in a large group.

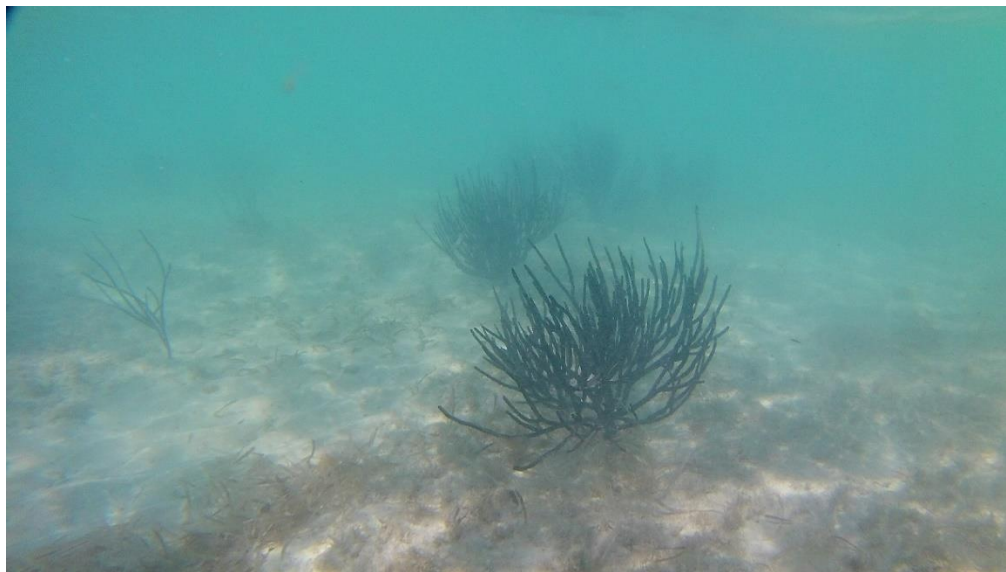


Photo 21: Showing Sea Whip (*Plexaurella sp.*)
with Turtle Grass (*Thalassia testudinum*) and Manatee Grass (*Syringodium filiforme*)



Photo 22: Showing Finger Coral (*Porites porites*) Colony

5.2.4.2.4 Commercial, Endangered and Protected Species

There were no commercially important or protected species observed.

5.2.4.3 Discussion

There was little to no activity throughout the assessment site. The distribution of sand and low species abundance suggests that the wave energy in the area is extremely high on a consistent basis and this may be a challenge for coral recruitment. There was also very low fish diversity and population which may be due to the lack of available feeding opportunity. Coral diversity and abundance are extremely low. Only two colonies observed.

5.3 Socioeconomic Aspects

5.3.1 Land Use

5.3.1.1 Surrounding Areas

The closest islands to Finley Cay are Eleuthera which is thirteen (13) miles to the North and New Providence which is twenty-eight (28) miles to the Southwest.

5.3.1.1.1 National Parks

Finley Cay is not designated as a National Park. New Providence has four (4) National Parks: The Retreat, Harold & Wilson Ponds, Primeval Forest and Bone Fish Pond. There is one (1) National Park located on the island of Eleuthera – Leon Levy Native Plant Preserve. The Parks listed will not be physically impacted by the development.

5.3.2 Zoning

The Town Planning (Finley Cay) Zoning Order, 2001 outlines restrictions related to building on the island. In accordance with this legislation, construction on Finley Cay is restricted to buildings related to the enhancement and preservation of the Cay in its natural state (See Exhibit 1 below for excerpt from this document).

S.I. 5/2001

**TOWN PLANNING (FINLEY CAY) ZONING
ORDER, 2001**

(SECTION 5)

[Commencement 24th January, 2001]

Citation.

1. This Order may be cited as the Town Planning (Finley Cay) Zoning Order, 2001.

Interpretation.

2. In this Order —

“building” includes —

- (a) any part of a building and any addition to any building of whatsoever material and in whatsoever manner constructed, any installation, machinery and plant fixed or attached to any building or property;
- (b) any wall, fence or similar structure bounded by or fronting on a public highway;
- (c) any other boundary wall, fence or similar structure.

Buildings prohibited. Schedule.

3. No person shall build any buildings upon the area of land described in the Schedule hereto, except buildings relating to the enhancement and the preservation of the Cay in its natural state.

Exhibit 1: Extract from Town Planning (Finley Cay) Zoning Order, 2001

The Owner has consulting with the BNT on conservation management strategies which include an arrangement for BNT to conduct research and educational programs that would contribute to the enhancement and preservation of the cay in its natural state. The buildings erected will serve as facilities for this purpose in accordance with the legislation. A Conservation Management Plan has been developed outlining the Owner’s statement of intent with regard to conservation, management and enhancement of Finley Cay in accordance with the Town Planning (Finley Cay) Zoning Order, 2001. (See Section 8.1: Conservation Management Plan).

5.3.3 Land Acquisition

No land acquisition is necessary for the project as the Owner has legal possession of the property.

5.3.4 Population

The 2010 National Census indicates the population of The Bahamas as three hundred and fifty-three thousand six hundred and fifty-eight (353,658) people. New Providence contains two hundred and forty-eight thousand nine hundred and forty-eight (248,948) people or seventy percent (70%) of the country's population. Finley Cay is uninhabited.

5.3.5 Economy

The Bahamas' economy is heavily dependent on Tourism which account for sixty (60%) of the Gross Domestic Product. It is the second largest employer after the government. The project is not anticipated to impact the Bahamian economy significantly during the construction or operational phases. There would be an increase in the number of persons visiting the island that would include international scientist and advisors which would result in a negligible increase in the overall tourist numbers for the country. As the visitors will be staying on the island, for the most part, there will be little direct economic impact on the overall economy.

5.4 Legal Aspects

There are ten (10) Legislations that are relevant to the physical and natural environment which may apply to the project as outlined in Table 7 below:

Table 7: Summary of Applicable Legislation

Act Title	Year Enacted	Comments
Water & Sewerage Corporation Act (Amended 2015)	1976	Provides regulatory framework for the management of water resources in The Bahamas.
Environmental Health Services Act (Amended 2004)	1987	Provides the framework for environmental regulations that will ensure compliance for the Project. The Act authorized the DEHS to develop regulations that prevent and control air pollution, soil contamination and preserve water quality.
Wild Animals (Protection) Act (Amended 1974)	1968	Prohibits the taking, capturing or hunting of any animal without a permit.
Wild Birds Protection Act (Amended 1994)	1952	Prohibits the taking, capturing or hunting of any wild birds without a permit. Protects birds and eggs during closed season.
Plants Protection Act (Amended 1987)	1916	Relates to plant disease and controls importation of plants to prevent outbreaks of exotic disease and establishment of unwanted species.

Act Title	Year Enacted	Comments
<p>Conservation and Protection of the Physical Landscape of The Bahamas Act (Amended 2000)</p>	<p>1997</p>	<p>Protects physical landscape from environmental degradation, flooding and removal of hills; regulates filling of wetlands, drainage basins or ponds; prohibits digging or removing sand from beaches and sand dunes; prevents harvesting or removing protected trees. In order to perform activities that may affect the physical landscape of The Bahamas, permits must be obtained for these activities based on methodology and purpose. The Department of Physical Planning issues the permits and enforces the regulations.</p>
<p>The Bahamas National Trust Act (Amended 2010)</p>	<p>1959</p>	<p>Directs the Bahamas National Trust to promote permanent preservation of lands, buildings, underwater areas of beauty, and areas of natural interest. The Act also allows the Trust to identify sites for protection, and to manage areas declared protected.</p> <p>It was empowered to prohibit or regulate activities on land or on the seabed within national parks or protected areas. The Act formalizes the organization’s role as an advisor to the government and the private sector on development, biodiversity and heritage issue policies.</p>

Act Title	Year Enacted	Comments
<p>Planning and Subdivision Act</p>	<p>2010</p>	<p>This Act provides for: A land use planning based development control system led by policy, land use designations and zoning;</p> <p>Prevention of indiscriminate division and development of land; Promotion of sustainable development in a healthy natural environment; Maintenance and improvement of the quality of the physical and natural environment; Protection and conservation of the natural and cultural heritage of The Bahamas; and Planning for the development and maintenance of safe and viable communities.</p> <p>The Act repeals the Town Planning Act, the Private Roads and Sub-divisions Act, the Private Roads and Subdivisions (Out Islands) Act and the Conservation and Protection of Physical Landscape of The Bahamas (Quarrying and Mining Zones) Order, 1997.</p>
<p>Town Planning (Finley Cay) Zoning Order</p>	<p>2001</p>	<p>The Town Planning (Finley Cay) Zoning Order, 2001 outlines restrictions to building on the island limiting to structures related to the enhancement and preservation of the Cay in its natural state.</p>

Act Title	Year Enacted	Comments
The Forestry Act	2010	Protects wetlands, water reserves, endemic flora and fauna and protected trees. It establishes a legal framework for the long-term sustainable management of forests, a governmental forestry agency and a permanent forest estate. It requires a license for timber cutting and other activities in the Forest Reserves. The Act mandates that a National Forest Plan be developed every five years to govern management activities, such as harvesting and reforestation measures, prescriptions for fire prevention, wildfire suppression and prescribed burning and soil and water conservation.
Department of Environment Planning Act	2019	This bill establishes an integrated environmental management system and provides a legal framework for the protection and conservation of the environment. It establishes the Department of Environmental Planning and Protection, to provide for the prevention or control of pollution, the regulation of activities, and the administration, conservation and sustainable use of the environment and for connected purpose.

6.0 ANTICIPATED IMPACTS

6.1 Physical Environment Impacts

6.1.1 Ground Water Supply

Potential Impact

Rainwater is the only source of freshwater in The Bahamas. The filtered rainwater travels through the underground drainage system and collects in aquifers where it settles on top of the denser seawater creating a freshwater lens. Freshwater resources in The Bahamas are finite and vulnerable and are considered scarce according to the United Nations criteria.

Mitigation

There are no known wells or sources of ground water currently existing on the island and the Owner does not intend to source ground water for the construction or during operation. The main source of water will be from reverse osmosis. Additionally, the housing units will be fitted with rainwater catchment features which will augment water supplied by the reverse osmosis system.

6.1.2 Ground Water Quality

Potential Impact

Storage and use of fuels on the island present the concern for contamination of soil and ground water from hydrocarbon spills.

Mitigation

There will be no storage and use of fuels on the island as the housing units will operate completely from solar with battery backup. There will be no use of generators on the island and golf carts will be battery operated. Best management practices for storage and handling of fuels during construction will be identified in the Environmental Management Plan.

6.2 Natural Environment Impacts

6.2.1 Terrestrial Ecosystem

6.2.1.1 Land Clearing

Potential Impact

Land clearing for the construction will result in direct and complete loss of four thousand one hundred and twenty-eight (4,128) square feet or 0.095 acres of natural vegetation which includes protected species. All native vegetation to be impacted by construction is dry broadleaf evergreen formation as illustrated in Table 8.

Table 8: Native vegetation to be impacted by construction*

<i>Structure</i>	<i>Acreage</i>	<i>Vegetation Type</i>
<i>Owner's Residence</i>	<i>0.028</i>	<i>Dry broadleaf evergreen formation</i>
<i>Conservation Centre</i>	<i>0.019</i>	<i>Dry broadleaf evergreen formation</i>
<i>2 Researchers Housing and 1 Caretaker's Housing</i>	<i>0.021</i>	<i>Dry broadleaf evergreen formation</i>
<i>Subtotal</i>	<i>0.068</i>	
<i>Fire Break Clearance</i>	<i>0.027</i>	<i>Dry broadleaf evergreen formation</i>
<i>Total</i>	<i>0.095</i>	<i>Dry broadleaf evergreen formation</i>

* This does not include human altered areas that will be enhanced with habitat restoration

Mitigation

To mitigate for the loss of ecosystem and protected species, the Owner proposes to undertake habitat restoration of dry broadleaf evergreen formation vegetation that were previously human altered for construction of existing trails on the site. There is conservatively at least two thousand (2,000) feet of trails throughout the island that average fifteen (15) feet in width for a total of thirty thousand (30,000) square feet or 0.68 acres. These trails have been mechanically cleared and have revegetated with weeds and invasive species. The habitat restoration exercise intends to decrease the size of the trails to six (6) feet by removing weeds and invasive species and planting native species within the remaining nine (9) feet width along the trails. Approximately

eighteen thousand (18,000) square feet or 0.413 acres will be restored resulting in a net positive impact of 0.318 acres or thirteen thousand eight hundred and fifty-two (13,852) square feet of added native flora which is four (4) times the amount in native vegetation restored over vegetation removed for construction. Plants selected would be from native and protected species found on the site (See table 9 below). In addition, selective plants will be harvested from areas to be cleared for building foot prints and firebreak installation, and replanting in the restoration areas thus further decreasing the habitat loss impact.

Invasive species removal will also be conducted during the land clearing process. Removal and replacement of these species with native plants will further increase the positive impact to the native vegetation and habitat for the avian population.

6.2.1.2 Landscaping and Habitat Restoration

Potential Impact

The importation of plants to the island can have negative impacts on the ecosystem and biodiversity through the introduction of invasive species that can compete with and displace native vegetation. The landscape palette will require vetting to ensure that no invasive species are included. In addition, plant importation can result in the introduction of pest and plant disease that can prey on native plants, threatening floral diversity and the wild life that they support.

Mitigation

To ensure against the impacts of plant importation, local procurement of plants will be a first option. If importation of plants is required, no banned species will be permitted on the landscape palette and all plant shipments will be accompanied by the necessary plant permits which includes inspections and a phytosanitary certificate from the point of origin and plant import permits from The Bahamas Department of Agriculture in accordance with the Plant Protection Act.

The follow plants outlined in Table 9 below are proposed for habitat restoration and passive landscaping. Passive landscaping will include planting of selected fruit trees near the structures. Plant selection criteria is based on the following: native plants, natives present on the island currently and native plants that can be a food source for the White Crown Pigeon. Approximately eleven (11) of the twenty-nine (29) species proposed for habitat restoration (38%) provide food for the White crown pigeon and other birds.

Table 9: Landscape Palette, Finley Cay

Table Key:

N=Native, **NN-NI**=Non-Native Non-Invasive, **HR**=Habitat Restoration, **PL**= Passive Landscaping, **E**=Existing on island, **I**=Introduction to island, **WPC**=White Crown Pigeon Food Source

Botanical Name	Common Name	N	NN -NI	HR	PL	E	I	WCP
<i>Acacia choriophylla</i>	Cinnecord	√		√		√		
<i>Bourreria ovata</i>	Strongback	√		√		√		
<i>Bumelia americana</i>	Milk berry	√		√		√		
<i>Bursera simarouba</i>	Gum Elemi	√		√		√		√
<i>Casasia clusiifolia</i>	Seven-year Apple	√		√		√		
<i>Chiococca alba</i>	Snowberry	√		√		√		
<i>Chrysobalanus icaco</i>	Cocoplum	√		√				√
<i>Citrus sp.</i>	Lime				√	√	√	
<i>Coccoloba diversifolia</i>	Pigeon Plum	√		√				√
<i>Coccoloba uvifera</i>	Sea grape	√		√				√
<i>Cocothrinax argentata</i>	Silver Top Palm	√		√				
<i>Conocarpus erectus</i>	Buttonwood	√		√	√	√		
<i>Conocarpus erectus var sericeus</i>	Silver Buttonwood	√		√	√	√		

Botanical Name	Common Name	N	NN -NI	HR	PL	E	I	WCP
<i>Eugenia axillaris</i>	White Stopper	√		√		√		√
<i>Eugenia foetida</i>	Spanish Stopper	√		√		√		√
<i>Exothea paniculata</i>	Inkwood	√		√		√		
<i>Ficus aurea</i>	Golden wild fig	√		√				√
<i>Guaiacum sanctum</i>	Lignum Vitae	√		√		√		
<i>Guapira discolor</i>	Narrow-leaved Blolly	√		√		√		√
<i>Guapira obtusa</i>	Broad leaved Blolly	√		√				√
<i>Jacquinia keyensis</i>	Joewood	√		√		√		
<i>Mastichodendron foetidissium</i>	Mastic	√		√		√		
<i>Metopium toxiferum</i>	Poisonwood	√		√		√		√
<i>Picramnia pentandra</i>	Snake root	√		√		√		
<i>Pithecellobium keyense</i>	Ram's Horn	√		√		√		
<i>Pseudophoenix sargentii</i>	Buccaneer Palm	√		√		√		
<i>Reynosia septentrionalis</i>	Darling Plum	√		√		√		√
<i>Sophora tomentosa</i>	Pearl Necklace	√			√	√		
<i>Suriana maritima</i>	Bay Cedar	√			√	√		

6.2.1.3 Pesticide and Herbicide Application

Potential Impact

The use of pesticide and herbicides on plants can have direct and indirect impact on bird populations on the island. Chemical application use in plant maintenance is known to cause direct death to birds from contact with the substance. As pesticides target insect pest, the decrease in the number of insects indirectly affects birds as a result of the corresponding decrease in the amount of food source for insectivores.

Mitigation

The landscape palette is primarily native plants which are more resilient to pest and disease. A Pest Control Plan will be developed to identify control measures for mosquitos and plant pest & disease that does not adversely impact the natural environment and wildlife.

6.2.1.4 Fires

Potential Impact

Fires are a major threat to ecosystems. They can spread rapidly, destroying acres of vegetation and the wildlife it supports. A significant portion of Finley Cay is dry broadleaf evergreen formation with Silver top palms which naturally shed its leaves as a part of the growing process. Hence, in a natural environment like Finley Cay where the Forest floor is covered with dry palm fronds they can act as an accelerant in the case of a fire. The threat of fire is particularly a concern with the introduction of humans to uninhabited areas and intentional fires that are not controlled or managed. There is evidence of camp fires along the shore and anecdotal accounts of the island being used for picnic and camping. The storage and use of fuel are also a concern as fire contact with these accelerant agents can cause a widespread damage on an island the size of Finley Cay.



Photo 23: Remains of camp fire along shoreline

Mitigation

A Fire Control and Prevention Plan is needed to address the present use of the island by others and detail steps to prevent, contain and control fires during operation. Fire control measures will include firebreaks, no smoking designation and no use or storage of fuel.

6.2.1.5 Hunting

Potential Impact

Anecdotal accounts of hunting on Finley Cay are of particular concern especially given that during the baseline data collection, which took place on 14 September 2018, there were a significant number of nests with white-crown pigeon chicks and the hunting season for this species open annually on 29 September. White-crown pigeon is one of The Bahamas' most popular game birds. Its global conservation status is near-threatened and over-hunting is cited as one of the causes.

Mitigation

There will be absolutely **NO** hunting allowed on Finley Cay and the consistent presence on the island will discourage others from using it as a hunting ground.

6.2.1.6 Rats

Potential Impact

One (1) single Rat (*Rattus sp.*) was observed during the site survey. Rats serve as vectors for transmittance of disease. An uncontrolled rat population poses a threat to human health and wildlife. Rats are very good climbers and prey on birds and eggs which can have devastating effects on an island like Finley Cay which is a significant breeding site for White Crown Pigeon (*Patagioenas leucocephala*).

Mitigation

A rodent control plan is needed which addresses eradication of individuals presently on the island and outlines control measure to prevent introduction of new species.

6.2.2 Protection of waterbodies

6.2.2.1 Reverse Osmosis (RO) Effluence

Potential Impact

The waste product of RO water treatment plants is typically 1.5 to 2 times more concentrated than the source sea water. Marine organisms have a salinity tolerance range in which it can survive, which is close to or slightly higher than sea water. If RO effluence is release back into the sea, the salinity levels at the outflow area increases, which can impact marine life.

Mitigation

RO effluence will be disposed of by deep well injection.

6.2.2.2 Sediment Control

Potential Impact

Drilling for dock pilings will result in suspension of sediment. Sediment laden water could potentially affect water quality and marine organism health.

Mitigation

Turbidity barriers will be installed in the area of works to contain sediment plumes.

6.2.3 Protection of natural resources

Potential Impact

Quarrying and mining operations are regulated under the Conservation and Protection of the Physical Landscape Act of The Bahamas. Resources including sand, rock and fill should not be harvested from on or around the island.

Mitigation

Materials used for the construction will be procured from an approved facility and verification provided for the same.

6.3 Solid Waste Impacts

6.3.1 Land Clearing Debris

Potential Impact

Land clearing will result in solid waste that will need to be disposed of in a proper manner.

Mitigation

Land clearing will be done by manually removal. Solid waste generated by land clearing will be minimal as this activity will be limited to the building footprints. Additionally, some plants within the footprint will be harvested and reused in the habitat restoration component of the project. The remaining land clearing debris will be cut up and placed among the retained vegetation to naturally degrade and add to the forest ecosystem. Invasive species debris will be disposed of with construction waste to avoid inadvertent spread to other parts of the island.

6.3.2 Construction Waste

Potential Impact

Inappropriate disposal of construction waste can be an eyesore and in the case of hazardous waste such as cement and paints it can pose a threat to wildlife.

Mitigation

Construction waste will be stored in a covered litter bin and removed by a licensed contractor that will provide a chain of custody receipt indicating tonnage at the site and receiving location.

6.3.3 Domestic Waste

Potential Impact

Waste food is of particular concern during the construction and operation as improper disposal and or storage can encourage rats which pose a threat to human health and the wildlife population on the island.

Mitigation

During construction, domestic garbage will be disposed of in a lid trash bin which will be removed from the site on a daily basis. The Owner will implement waste reduction and sorting practices during the operation to reduce the amount of waste generated and facilitate ease of disposal of garbage. Food items will be disposed of at a composting site on the island that will be fitted with rodent control measures to prevent rodent accumulation. Cans will be sorted and bagged for recycling and general waste will be compacted. Waste will be removed from the island on a constant basis with the delivery of supplies and movement of visitors on and off island. Waste removed from the island will be disposed of in the New Providence Ecology Park.

6.3.4 Human Waste

Potential Impact

Improper treatment of human waste is a health concern as it is a pathway for diseases.

Mitigation

Portable potties will be provided for workers during the construction phase. The units will be serviced weekly and emptied in the live aboard vessel tank for collection and storage of human waste. The live aboard vessel will be serviced on monthly trips to New Providence. Human waste during the operation will be managed using a combination of septic and a Fixed Activated Sludge Treatment (FAST) unit. FAST wastewater system allows for improved performance over traditional leach field and septic tank systems and requires a smaller footprint.

6.4 Socioeconomic Impacts

6.4.1 Land Use Impacts

The development will require limited land use and minimal removal of natural vegetation. The visual and aesthetic impacts will be limited considering the unique design of the building.

6.4.2 Impact on Communities

The greatest direct impacts to communities would be a restriction on indiscriminate use of the Cay for camping and hunting purposes. While this may be perceived as a negative impact on an individual level in the broader scheme it is a significant positive impact on the conservation and preservation of the island and protection of avian wildlife that utilize the Cay as a breeding ground.

6.4.3 Economic Impact

The project is not estimated to have a significant positive impact on the Bahamian economy during the construction or operational phases.

The project cost is estimated at five million dollars (\$5,000,000.00). Approximately fifty percent (50%) of this will go directly into the Bahamian economy in the form of purchasing of goods, services and labour.

The project is projected to employ approximately thirty (30) persons during the construction phase and two (2) persons during operations. An eighty percent (80%) Bahamian work force is anticipated.

7.0 MITIGATION MEASURES

Mitigation Measures have been addressed following the description of the impacts in Section 6: Anticipated Impacts.

8.0 MANAGEMENT PLANS

8.1 Conservation Management Strategy

8.1.1 Overview

This Conservation Management Plan (CMP) was developed as a guidance to outline the key components proposed for the conservation, management and enhancement of Finley Cay. It is the Owner's statement of intent with regard to managing the island in accordance with the Town Planning (Finley Cay) Zoning Order, 2001. The objectives are as follows:

- Detail management strategy
- Outline conservation policies
- Provide goals and objectives to achieve policies
- Present an overview of programs to be implemented

This plan will be updated as more information becomes available through additional avian studies.

8.1.2 Management Strategy

The Owner intends to establish an international non-profit organization (NPO) for the management of the island. The NPO will be established as an arm of One Ocean, One Sea which is an existing organization by the Owner. The NPO will engage a scientist that will be responsible for implementing programs and liaising with government officials and non-government organizations (NGO) on the same. The BNT has expressed interest in conducting studies on the island and was consulted in the preparation of this plan. It is the intent to establish a Memorandum of Cooperation with the BNT that will allow the organization access to the island and accommodations to assist in a research program.

8.1.3 Policy Statements

The following statements defines the immediate objectives of the management plan in the mission statement and states the future or long-term goals in the vision statement.

8.1.3.1 Mission Statement

To facilitate research and programs for the enhancement and preservation of Finley Cay in its natural state.

8.1.3.2 Vision Statement

Working together with scientist and non-government organizations (NGO) to provide data that can be used to make informed, evidenced-based decisions about the management of the *Patagioenas leucocephala* - White Crown Pigeon (WCP) and its habitat.

8.1.4 Goals and Objectives

Broad goals and specific objectives identified to achieved the defined mission statement are outlined in the section that follow.

8.1.4.1 Research

Goal:

To strengthen local knowledge of the White Crown Pigeon and its habitat by conducting and facilitating research activities.

Objectives:

1. To establish a banding program to monitor the range of the WCP.

2. To gather data on the WCP breeding season that can be useful in providing scientific data that can be in the decision-making process.
3. To conduct vegetation surveys to determine the effect on WCP due to variations in food sources.

8.1.4.2 Education

Goal:

To provide opportunities for education through research and stakeholder engagement programs.

Objectives:

1. To implement a training component into the banding program that will promote capacity building and support the longevity of the program.
2. To engage the hunting community through a hunter education program

8.1.4.3 Outreach

Goal:

To involve stakeholders through a collaborative and participatory process.

Objectives:

1. To engage in a two-way exchange of information with the hunting community to gain useful information and disseminate information that can affect hunting practices.
2. To make the results of research accessible to a wide audience including government agencies, NGOs and the scientific community to provide data that can be used for decision making and other research efforts.
3. To gain support of stakeholders in the conservation effort.

8.2 Environmental Management Plan

An Environmental Management Plan (EMP) will be developed that includes but is not limited to addressing the following concerns during the construction and operation:

- a. Noise, Dust and Light Control Plan
- b. Fire Control Plan
- c. Invasive Species Control Plan
- d. Pest Control Plan
- e. Emergency Response Plan
- f. Hurricane Preparedness Plan

The Operational Management Plan should be updated as more information becomes available through additional avian studies.

9.0 CONCLUSION

Finley Cay has been identified as an important bird area and has thrived for decades. It will likely continue to do so if allowed to remain in its current state with no action. However, it would also remain susceptible to threats such as fires, littering and hunting by unauthorized visitors to the island. Unauthorized visitors can also inadvertently introduce rats from boats. All of these threats can have a severe detrimental effect to the White Crown Pigeon population on Finley Cay which is significant.

The option to proceeding with the proposed project would result in an enhancement to the island's vegetation through the habitat restoration exercise and installation of facilities that would provide a mechanism for the Bahamas National Trust and other agencies and scientist to collect valuable data on the White Crown Pigeon, that is currently lacking. The constant presence on the island will also serve as a deterrence to unauthorized visitors, thereby reducing the associated risks outlined.

If the project were to proceed as planned and all recommendations and measures outlined are adhered to the project can have a significant positive impact on the environment and set a new standard for public-private partnership in conservation management in The Bahamas.

10.0 REFERENCES

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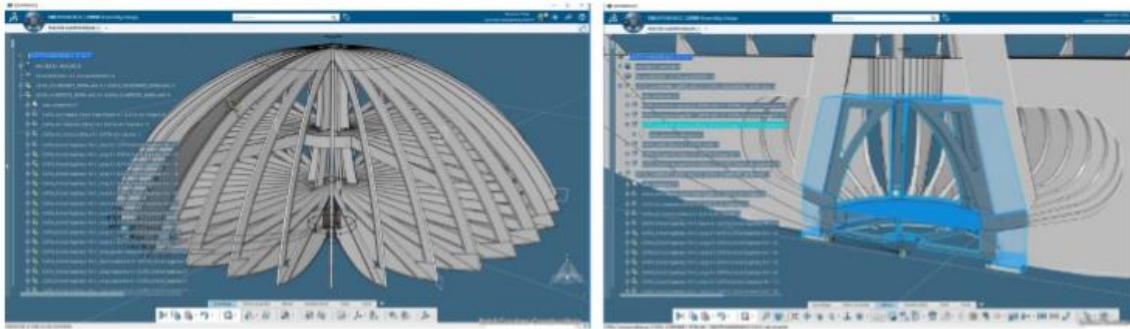
SCHEDULE (Sections 2, 4, 6, 8 and 11).

Appendix1: Manufacturer's specification for proposed structures

SOLALEYA DOMESPACE
DESIGNS - CONSTRUCTION - TECHNOLOGY

Software base:

For ease of engineering adjustments and regulatory compliance, our buildings entire technology is based on Catia software from Dassault Systems, which has, among other things, enabled the Airbus 380 to be built.



The experience acquired since 1988, building our designs in various latitudes and climates found on our planet allowed us to develop our technology to the highest stands in the construction industry.

All our designs are based on the archetypal form inspired by nature's golden proportions,

There are several sizes and designs to choose from all benefitting from our expertise and technology.

Fabrication:

Our buildings have always been prefabricated in the workshop, and are now made with roof /wall caissons. These prefabricated elements considerably reduce installation time. They include inner skin, the insulation, the undercover support ready to be installed to the structure within a few days.

Hereinafter: demonstrative box/caisson on a support.



Our company benefits from the prolonged trust of MMA worldwide insurance coverage.

It is no longer necessary to look for local skills that must succeed in building these particular architectures in given times.

Our buildings are PASSIV HAUS equivalent using validated ecological materials such as German GUTEX or PROCLIMA for sealing techniques that avoid uncontrolled heat exchange.

Intrinsic structural attributes:

HIGH ALTITUDE

This unit was built on a full concrete slab for commercial purposes (restaurant) at an altitude of 3000 m = 10,000 ft in Verbier Switzerland.



HURRICANES

These units were built in Taiwan and survived Typhoon TIM in 1994 without any deterioration.

**For hurricane prone areas our windows treatment are all « Miami Dade » compliant.
All solar breakers and shading options are adapted into a vertical configuration to protect windows and offer the possibility to close the buildings in a shutter-like manner.**



EARTHQUAKES

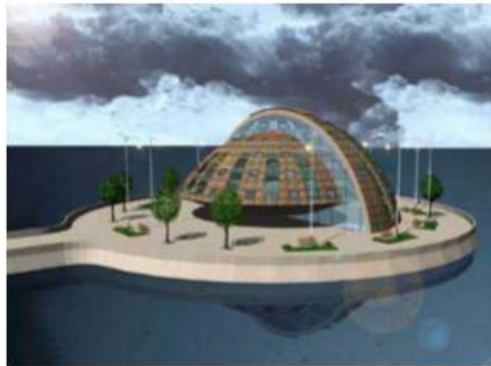
This unit was built on a concrete central pedestal (10x10 ft base) on a slopped terrain in New Zealand. It survived Christchurches' violent earthquake (7,8 Richter scale) in 2016 without any damage.



For coastal areas very exposed to ocean spray, all elements go through C5m treatment which is a real guarantee for durability.

In addition to these structural advantages, our design all benefit from exceptional thermal performance.

Foundations:



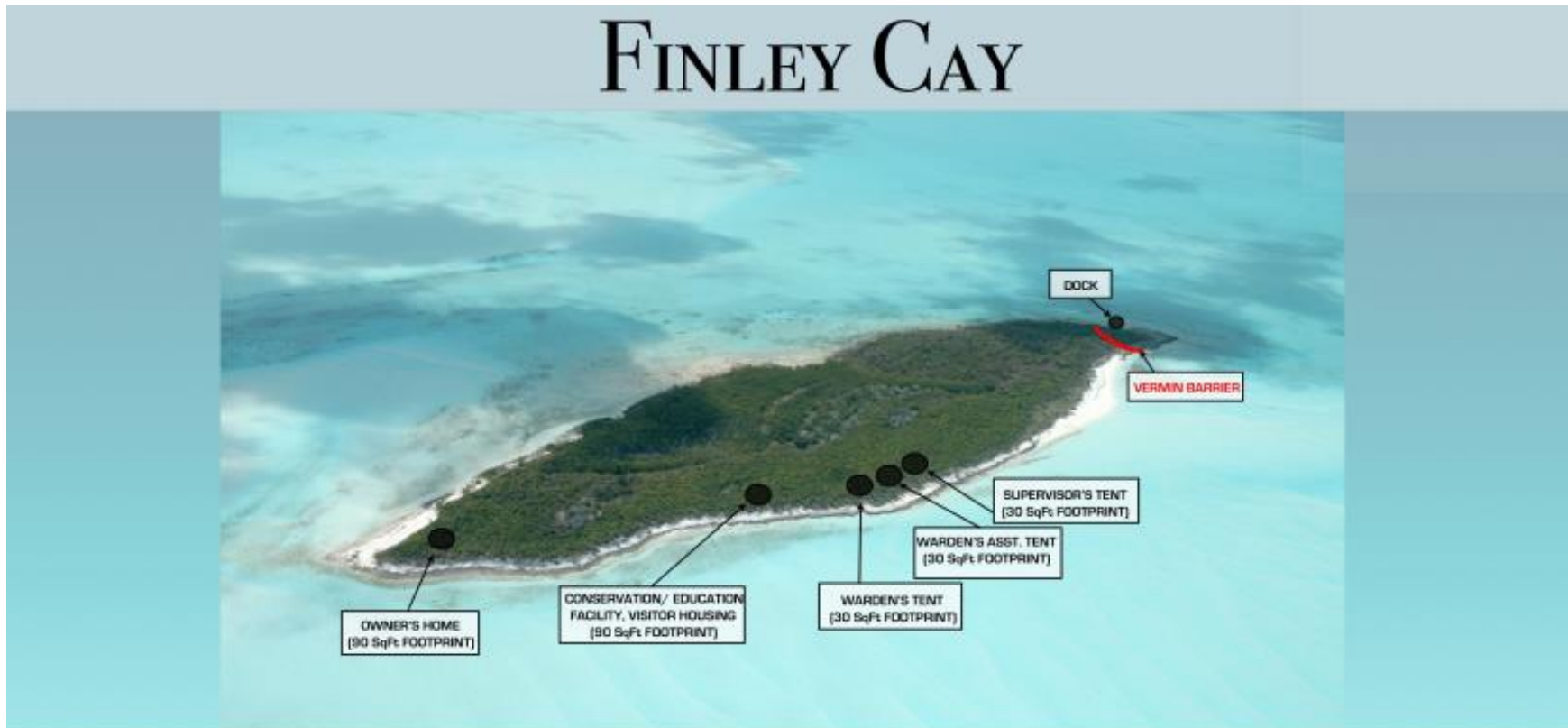
Our design can be built on:

- Pilings (techno pieux)
- Full or partial concrete slabs
- Concrete pedestals according to local needs and requirements.



Appendix 2: Project Plan

FINLEY CAY



Finley Cay will be using a new form of architecture specifically designed for delicate ecosystems. Built on stilts offering minimal soil disruption, the unique shape provides great resistance to hurricanes. Completely powered by the sun and wind, utilizing the most advanced eco-friendly technologies available. Built completely off site, the structures can be laid down quickly with no disturbance to the surrounding area.

WARDEN & SUPERVISOR TENT HOUSING



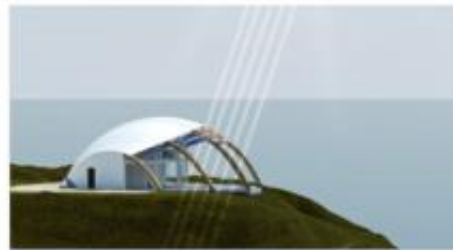
- Ecologically sound tent, engineered as a permanent structure, yet can be raised in just a few weeks and disassembled without a trace
- The shell's interior has no weight bearing walls and is equipped with solar panels paired with adequate rainwater storage, serving as an impeccable eco-friendly structure
- Engineered to withstand hurricane winds of 115mph
- Pre-built and then assembled on the island
- Built on stilts (using 30SqFt of footprint) offering minimal soil disruption

OWNER'S HOME & ECOLOGICAL CENTER

- An ecologically sound habitat engineered as a permanent structure, pre-built and assembled on the island in just a few months
- Equipped with solar panels paired with adequate rainwater storage, serving as an impeccable eco-friendly structure
- Optimized passive solar design offering unparalleled self-generating energy
- Engineered to withstand hurricane winds of 115mph
- Built on stilts (using 90SqFt of footprint) offering minimal soil disruption



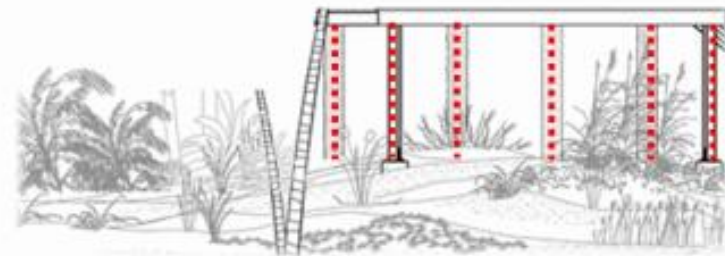
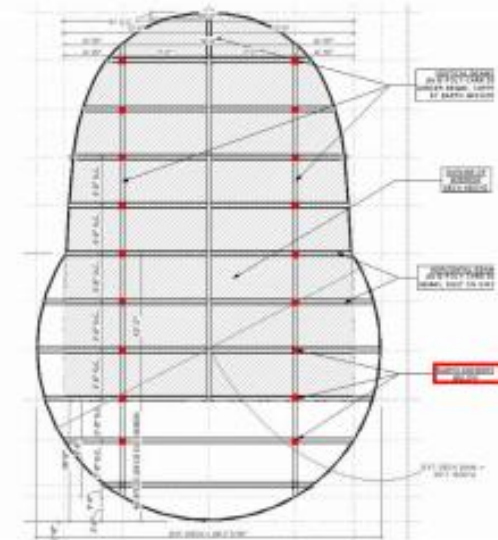
ECOLOGICAL CENTER & GUEST HOUSING



OWNER'S HOME

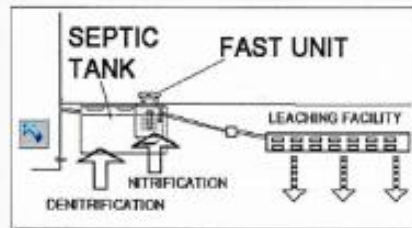
FOOTINGS – MINIMAL DISTURBANCE

- Structures will be elevated off the ground on stilts to allow for a minimal footprint onto the island and allow the vegetation to be minimally disturbed
- Supervisor's Tent - 30 SqFt Footing's Footprint
- Warden's Tent - 30 SqFt Footing's Footprint
- Warden Assistant's Tent - 30 SqFt Footing's Footprint
- Conservation/Education Facility, Housing for Visitors and/or Scientists (from reputable environmental organizations and agencies involved with conservation and birdlife) - 90 SqFt Footing's Footprint
- Owner's Home - 90 SqFt Footing's Footprint
- **Total Footing Footprint on the island for all structures is only 270 SqFt**



ADVANCED ECO-MECHANICS

- Mechanics on the island are the most powerful, latest and environmentally friendly available
- An array of solar panels and TESLA powerwall will provide energy for the whole island including:
 - Powerwall integrates with solar to store excess energy, eliminating the need for a generator
 - Solar-water-heater-panels for hot water
 - Solar-powered lighting and cooling



- Combination of septic and FAST unit for disposal of waste
 - FAST wastewater system uses a Fixed Activated Sludge Treatment process to treat and denitrify wastewater

100%
Self-powered

0%
Grid-powered

On a typical day, Powerwall and solar will meet all of your home's energy needs.



LEED CONSTRUCTION/ASSEMBLING PROCESS

- Construction workers will be housed on a self-contained boat during the construction/assembling phase, containing toilets, kitchens, etc. providing protection to the island.
- All structures will be pre-built; our landing craft will be used to transport the structures to the island and used as the assembly area to eliminate the lay down area on the island
- The structures use a rigorous selection of eco-logical sound building materials bringing it to exceed LEED Platinum certification requirements
 - LEED, or Leadership in Energy and Environmental Design, is the most widely used green building rating system in the world. LEED provides a framework to create healthy, highly efficient and cost-saving green builds. LEED certification is a globally recognized symbol of sustainability achievement
- We wish to show a commitment to use environmental best practice standards and will be adopting and using all the latest available eco-friendly technologies



CAMOUFLAGED BIRD WATCHING POINT



Working with leading ornithologists, we will create a bird watching point where environmental staff and members of the scientific community observe, study, tag the birdlife on the cay.

PROTECTING THE CAY



The new owner of Finley Cay, Justin Etzin, has entrusted the One World One Ocean Foundation to take responsibility in ensuring Finley Cay remains fully protected.



OOOF collaborates with Influencers from the World of Film, Music, Art & Fashion to raise global awareness to prevent the destruction of our fragile Oceans.



Leading ornithologists will advise on all conservation for the Cay whilst raising environmental awareness among staff, invasive species prevention and control and environmental sustainability improvement.

FINLEY CAY'S ECO-PRACTICE

RODENTS



A quarantine area will be set up similarly to that which exists on Fregate Island to keep rodents out and prevent further infestation.

HUNTING vs. NESTING



We will address the overlap with nesting season starting in May and hunting continuing in Eleuthera until November.

WHITE CROWNED PIGEONS



Our team will be consulted by renowned species experts on how to ensure these birds, native to the Caribbean remain protected and immune from poaching.

REMOVE OLD STRUCTURES



STOP THE LITTERING



**STOP LEAVING BEHIND
HARMFUL CAMPFIRE RESIDUE**



WE KNOW WE CAN'T DO IT ALONE...

With the extensive knowledge from active conservationists from Bird Island, Fregate Island and Cousin island alike, the support of The Bahamian Prime Minister's Office and its council, and advice from experts like Matthew Jeffrey of the Audubon Society we know that we can provide the enhancement and preservation of Finley Cay in its natural state.

Our ecologically sound habitats will allow us to preserve Finley Cay for centuries to come.





Finley Cay

Site Visit – 14 September 2018

By Scott Johnson

Background (prepared by Lynn Gape):

Finley Cay is a well-documented nesting cay for the White Crowned Pigeon. Finley Cay is a 13 acre island located one hour from Nassau just East of North Eleuthera. A “no build” order was placed on the island in 2001 stating that no buildings shall be built on the island except buildings relating to the enhancement and preservation of the cay in its natural state. The island was privately owned and was listed for sale by HG Christie and was recently purchased by Mr. Justin Etzin. Mr. Etzin is the Seychelles Consul General and Ambassador of Travel & Tourism – based in NYC.

The BNT attended a meeting with the Bahamas Investment Authority and Mr. Etzin on February 28th. Mr. Etzin had submitted a proposal to build an “Eco Tourism Resort” on the island. In the meeting which was attended by L. Gape, BNT Deputy Executive Director and Past President P. Maillis, the BNT indicated that they were concerned that the proposal was not in keeping with the “No Build Order” and would not be in support of any development for Finley Cay on the scale that has been presented.

Mr. Etzin responded that he is interested in protecting the cay and the resident birds and would want to support a warden for the island and promote conservation.

Introduction:

The White-crowned Pigeon (*Patagioenas leucocephala*), hereafter WCPI, is a large species of bird in the family Columbidae. It is a popular game bird, sought after and highly prized by hunters. Hunting pressures and habitat loss are the two biggest threats to this species and it is currently listed as Near Threatened by the IUCN. During the Breeding season (May-October) the WCPI nests on small cays throughout The Bahama Archipelago. Unfortunately, these cays are threatened by development and by hunters who sometimes hunt the birds during the nesting season.

The purpose of the site visit was to survey Finley Cay, a small cay just west of Eleuthera known for having a significant WCPI breeding population and to determine if the birds are still actively nesting late in the breeding season. The site visit included Justin Etzin (Owner) and Sophie Longford (Owner’s guest), Scott Johnson, Terrestrial Science Officer for BNT, along with Tanya Ferguson and Predensa Moore,

representatives from Design Elements, conducting botanical and avian baseline data for the Environmental Impact Assessment for the propose project.

Methods:

The island was surveyed by walking along over grown trails throughout the island, walking along the perimeter of the island and through the coppice forests. All species of birds and other noticeable terrestrial fauna was recorded. Plant diversity was also recorded as well as number of WCPI nests both active and not active.

Results:

A total of 74 nests were found throughout the island of which 38 nests were still active. Nests were observed primarily in the coppice with a lot of “flushing” activity observed in the black mangrove forest, indicating more birds with nests still present and possibly active. Most active nests had chicks that were almost ready to fledge. Only one nest was observed with eggs. Some young birds jumped out of their nest and “flopped” on the ground. With the activity seen in the Mangroves, it is highly likely that there were more nesting birds but the muddy terrain made it difficult to survey.

Wildlife

Avian species:

A total of 12 species of birds were observed on Finley Cay.

1. Northern Parula
2. Bananaquit
3. Common ground Dove
4. American Redstart
5. Northern Waterthrush
6. Prairie Warbler
7. Black-faced Grassquit
8. Thick-billed Vireo
9. White-crowned Pigeon
10. Baltimore Oriole
11. Laughing Gull
12. Royal Tern

Reptiles

Four species of reptiles were observed

1. Cuban Whiptail

2. Green Anole (Endemic)
3. Brown Anole
4. Bark Anole

Other:

Snails

1. Cerion
2. Nerites

Plants

The island had surprisingly rich native plant diversity. The coppice and the mangrove forest were both between 3-4 m tall.

Native:

1. Black Mangrove
2. Silver Buttonwood
3. Gumelemi
4. Long-leafed Blolly
5. Frangiapani
6. Wild Bamboo
7. Ram's horn
8. Prickley pear Cactus
9. Lignum Vitae
10. Bay Cedar
11. Bay Lavender
12. Inkwood
13. Snowberry
14. Calliandra
15. Pigeon Plum
16. Joe wood
17. False Mastic
18. Buccaneer Palm
19. Silver Thatch
20. Anaconda Tree
21. Eupetorium odoramnis
22. Black Torch
23. Sea Oats

24. Canker berry
25. Scaveola
26. Brier
27. Darling plum

Non-native

1. Scaveola
2. Casaurina
3. Coconut palm (Planted)
4. Frangipani- (Planted)
5. Bouganvilla- (Planted)

Conclusions:

Finley Cay is a beautiful island that supports a reasonably rich biodiversity. The coppice forest and the mangroves are impressively tall and support a wide range of plant and animal species. It also has a surprisingly high population of Cuban whiptails, the most I have ever seen with dozens observed in all life stages. The diversity of this cay can most likely be attributed to the WCPI which most likely aided in seed dispersal.

Mr. Etzin inquired about the breeding season of the birds and expressed that if any works were permitted on the cay it would be done after the breeding season. He also advised that he would have someone on the island to watch over it once his proposed development is completed but doesn't want the presence of someone on the island to agitate the birds. As this cay is a very important nesting and roosting site for WCPI, I strongly suggest that no development or very limited development be done on the Cay.

Photos:



Photo 1: Approach to island



Photo 2: Young White crowned Pigeon



Photo 3: White crowned Pigeon eggs in nest



Photo 4: Vegetation