

## 11. ENVIRONMENTAL MANAGEMENT

The Environmental Management Plan (EMP) Addendum for the Project will detail the best environmental and safety practices for the construction and operation phases of the project. These guidelines explained in the EMP Addendum should reduce adverse environmental impacts.

### 11.1 Draft Environmental Management Plan Terms of Reference

- I. Executive Summary
- II. Introduction
  - a. Purpose
  - b. Scope and Content
- III. Project Description
  - a. Geographic Location
  - b. Master Plan
- IV. Relevant Environmental Regulatory Bodies and Laws/Standards
  - a. Regulatory Bodies
  - b. National Laws and Regulations
  - c. International Organizations for Standardizations (ISO)
- V. Environmental Management Organization Structure
  - a. Organization and Responsibilities Chart
  - b. Environmental, Health & Safety Training for Construction and Operational Staff
- VI. Environmental Impacts Summary
  - a. Construction
  - b. Operation
- VII. Management Plans and Mitigation Strategies

*Each subsection will include a description for processes during construction and operation.*

  - a. Terrestrial Resource Management
    - i. Geology
    - ii. Invasive Species Management
  - b. Air Quality Management
  - c. Water Quality Management
  - d. Energy Management
  - e. Spill Management
  - f. Wastewater Management
  - g. Solid Waste Management
  - h. Hazardous Waste Management
- VIII. Emergency, Health and Safety
  - a. Training
  - b. Storm Management
  - c. Fire / Explosion Risk

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- d. Accidents
- e. Malfunctions
- f. COVID-19 Awareness
- IX. Public Consultation and Grievance Response Mechanism
- X. Environmental Education and Outreach
- XI. Monitoring & Reporting
  - a. Planned Environmental Monitoring
  - b. Responsibilities and Accountability Reporting
- XII. Conclusion

## 12. PUBLIC CONSULTATION

An initial town hall meeting was held in regard to the original development. During this meeting the local community demonstrated overwhelming support for the project. A second town hall meeting was held in regard to the entire 27-acre development and plan. Prior to this town hall meeting, a petition of local voters was performed with over seven hundred (700) of the total nine hundred (900) voting residents signing in favor of the project. The result of the town hall meeting was for approval of the project which was provided.

Further public consultation will be guided by the Department of Environmental Planning and Protection and the Environmental Impact Assessment regulations.

## 13. RECOMMENDATIONS AND MITIGATION STRATEGIES

### 13.1 Methodology

Once the type and extent of the impact was determined for the various project activities, mitigation activities related to the specific impact were developed. While some recommendations and mitigation strategies are discussed below, more detailed mitigation and management will be described in the EMP Addendum. To oversee and coordinate the mitigation effort described in the EMP Addendum, there will be a resident environmental monitor on island trained by and working under the supervision of the established Environmental Manager.

### 13.2 Dune Stabilization Plan

Evidence of erosion of the dune on the Pink Sands Beach was observed during the site visit by CCS. To prevent further erosion, the invasive species will be removed and replaced with dune stabilizing plants native to the Bahamian environment. Plants will be sourced locally where possible. In the event that plants must be imported, relevant permitting will be secured and communicated to DEPP. Invasive species observed in this area include the Casuarina and the Hawaiian Inkberry. These will be replaced with species such as the Sea oats and Bay Lavender under the direction of the project Landscape Architect, Tyler Nielson. Sea Oats and Bay Lavender

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are growing naturally on the site, which indicates this species is suited to the site. The figures on the following page shows the invasive species in the East Lot area along the Pink Sands Beach.

Figure 40. Red arrow shows eroding dune along Pink Sands Beach

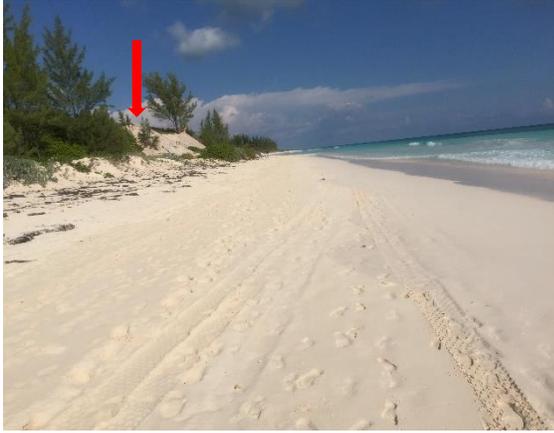
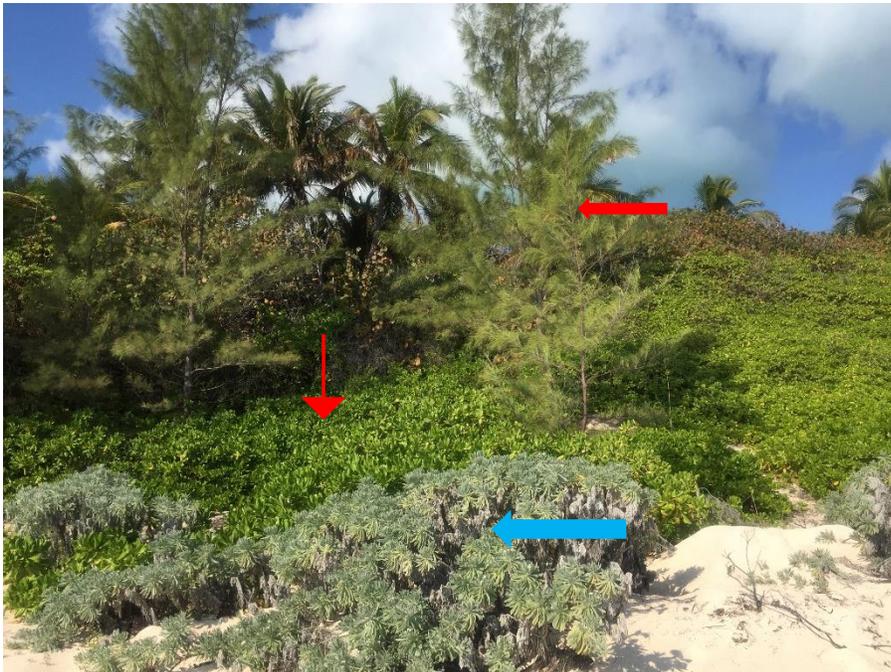


Figure 41. Casuarina within the dune leading to dune erosion



Figure 42. Invasive species leading to dune erosion on the Pink Sands Beach shown with red arrows. Native species is shown in blue arrow.



### 13.3 Coastal Water Quality Monitoring

Once site clearing begins along the former landing strip, sedimentation may increase in the southwestern harbor. Water quality will be measured in the area prior to the start of clearing and monitored regularly throughout the construction phase following industry standard for the

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prevention of soil erosion and stabilization will be practiced. Monitoring reports will be submitted to the Department of Environmental Planning and Protection.

#### 13.4 Spill Protection / Clean-up Plan

The “Petroleum Spill Recovery Plan” developed as a part of the 4M property will also apply to the 4M2 site. Mobile spill kits will be made available on site to help clean up any spill on site as soon as possible. This is described in section 1.3.3 in the *Petroleum Spill Recovery Plan* in the EMP approved for the 4M site. The title of the approved EMP is “Environmental Management Plan (Fifth Submittal) Briland Residences and Marina (formally known as Harbour Island Marina) Harbour island, The Bahamas”.

#### 13.5 Sewerage Pump-out Availability and Operations

Appendix D shows the sewer profiles for the property. In section 1.3.7 *Wastewater* of approved EMP of the 4M Property, the sewerage pump out described will also apply to the 4M2 site as required. The title of the approved EMP is “Environmental Management Plan (Fifth Submittal) Briland Residences and Marina (Formally Known as Harbour Island Marina) Harbour island, The Bahamas”.

#### 13.6 Trash Containment and Removal

In section 1.3.6 *Solid Waste* of the approved EMP for the 4M project site, solid waste disposal is discussed in detail. Trash on the 4M2 site will be disposed of using the same methodology described. Additionally, a clean-up plan was developed for the 4M site.

#### 13.7 Preservation and Education

Protected trees will be preserved and incorporated in the landscaping of the property or relocated once approvals are received from the Department of Forestry. The Landscape Architect developed a “Tree Disposition Schedule” for the site. The figures and tables on the following pages show the location of the trees slated for preservation and relocation.

The Green Space on the property will not only function as a biological corridor for avian species, but will also serve as a form of self-guided environmental education. Interpretive signs will be installed near species of interest along a nature trail that extends from the coconut grove to the western property. A total of 3.6 acres of reserved greenspace is included in the property, plus additional greenspace that will be required on each residential lot as a requirement of the purchase agreements in the total of 19.75 acres represented in this document. The greenspace is indicated in Appendix I. Plants included in the landscaping of the green space area will include native species known to provide a food source for the Avian community.

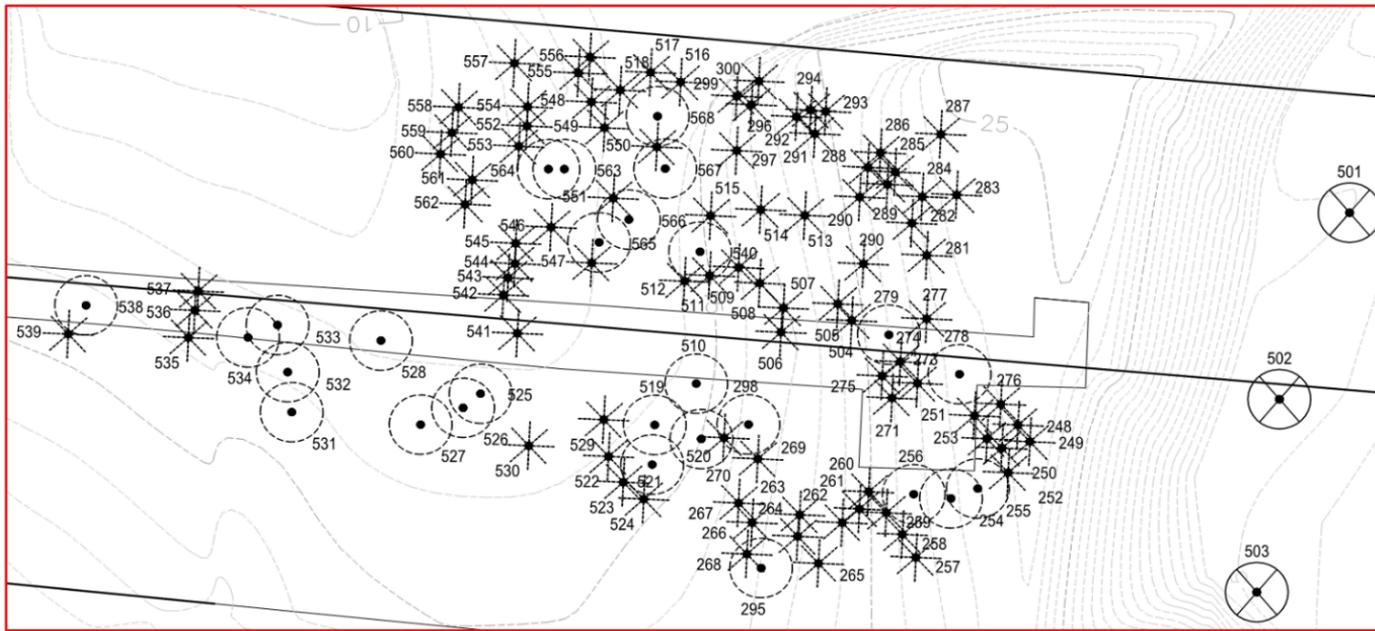
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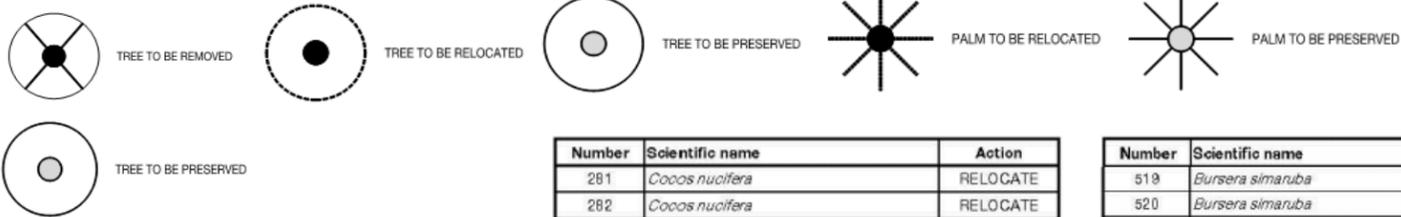
Figure 43. Site Plan shown in the upper left corner of the image. The magnified view of the area shown in red rectangle is shown on the bottom of the image. The tables show the list of species slated to be relocated and or preserved.



Number	Scientific name	Action
558	<i>Cocos nucifera</i>	RELOCATE
559	<i>Cocos nucifera</i>	RELOCATE
560	<i>Cocos nucifera</i>	RELOCATE
561	<i>Cocos nucifera</i>	RELOCATE
562	<i>Cocos nucifera</i>	RELOCATE
563	<i>Bursera simaruba</i>	RELOCATE
564	<i>Bursera simaruba</i>	RELOCATE
565	<i>Bursera simaruba</i>	RELOCATE
566	<i>Bursera simaruba</i>	RELOCATE
567	<i>Bursera simaruba</i>	RELOCATE
568	<i>Bursera simaruba</i>	RELOCATE



TREE DISPOSITION LEGEND

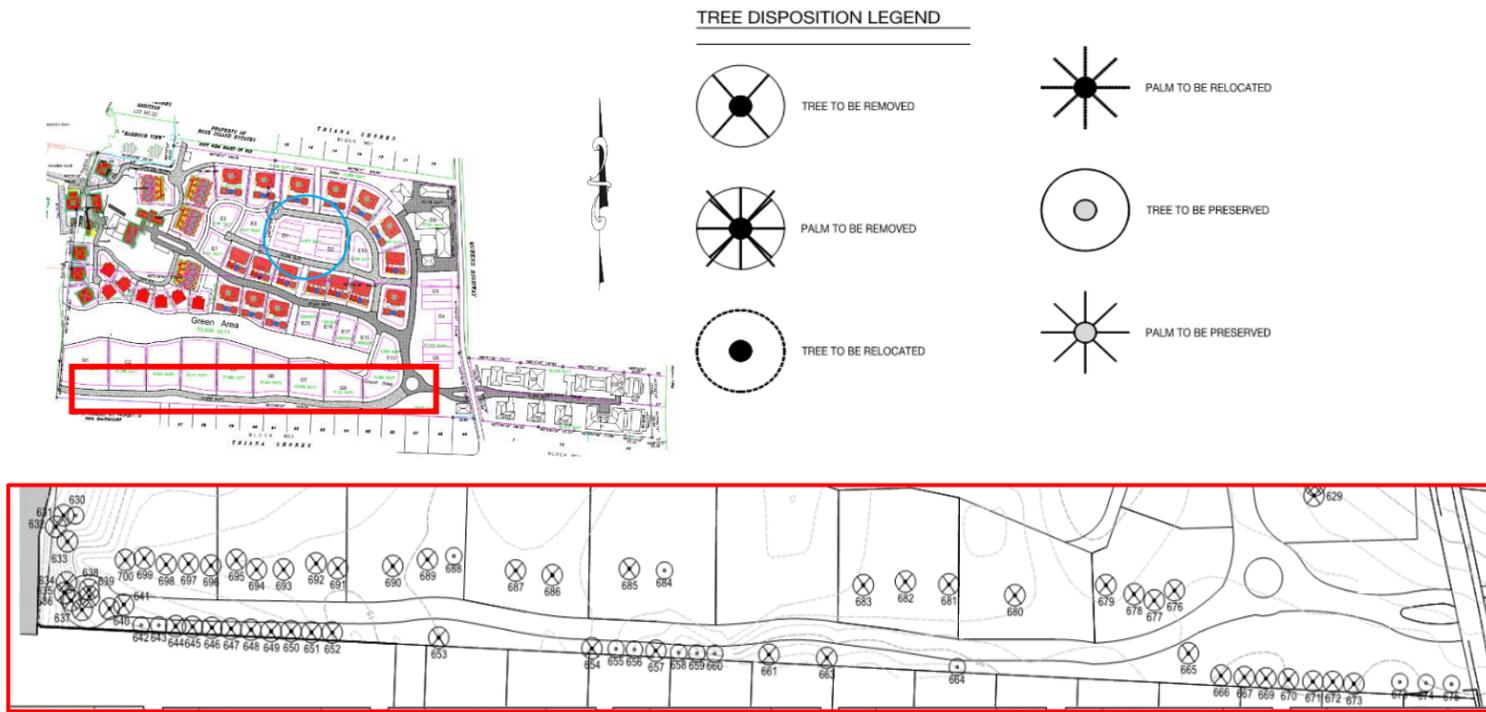


Number	Scientific name	Action
248	<i>Cocos nucifera</i>	RELOCATE
249	<i>Cocos nucifera</i>	RELOCATE
250	<i>Thrinax radiata</i>	RELOCATE
251	<i>Cocos nucifera</i>	RELOCATE
252	<i>Cocos nucifera</i>	RELOCATE
253	<i>Cocos nucifera</i>	RELOCATE
254	<i>Bursera simaruba</i>	RELOCATE
255	<i>Bursera simaruba</i>	RELOCATE
256	<i>Bursera simaruba</i>	RELOCATE
257	<i>Cocos nucifera</i>	RELOCATE
258	<i>Cocos nucifera</i>	RELOCATE
259	<i>Cocos nucifera</i>	RELOCATE
260	<i>Cocos nucifera</i>	RELOCATE
261	<i>Cocos nucifera</i>	RELOCATE
262	<i>Cocos nucifera</i>	RELOCATE
263	<i>Cocos nucifera</i>	RELOCATE
264	<i>Cocos nucifera</i>	RELOCATE
265	<i>Cocos nucifera</i>	RELOCATE
266	<i>Cocos nucifera</i>	RELOCATE
267	<i>Cocos nucifera</i>	RELOCATE
268	<i>Cocos nucifera</i>	RELOCATE
269	<i>Cocos nucifera</i>	RELOCATE
270	<i>Cocos nucifera</i>	RELOCATE
271	<i>Cocos nucifera</i>	RELOCATE
272	<i>Cocos nucifera</i>	RELOCATE
273	<i>Cocos nucifera</i>	RELOCATE
274	<i>Cocos nucifera</i>	RELOCATE
275	<i>Cocos nucifera</i>	RELOCATE
276	<i>Cocos nucifera</i>	RELOCATE
277	<i>Cocos nucifera</i>	RELOCATE
278	<i>Coccoloba uvifera</i>	RELOCATE
279	<i>Bursera simaruba</i>	RELOCATE
280	<i>Cocos nucifera</i>	RELOCATE

Number	Scientific name	Action
281	<i>Cocos nucifera</i>	RELOCATE
282	<i>Cocos nucifera</i>	RELOCATE
283	<i>Cocos nucifera</i>	RELOCATE
284	<i>Cocos nucifera</i>	RELOCATE
285	<i>Cocos nucifera</i>	RELOCATE
286	<i>Cocos nucifera</i>	RELOCATE
287	<i>Cocos nucifera</i>	RELOCATE
288	<i>Cocos nucifera</i>	RELOCATE
289	<i>Cocos nucifera</i>	RELOCATE
290	<i>Cocos nucifera</i>	RELOCATE
291	<i>Cocos nucifera</i>	RELOCATE
292	<i>Cocos nucifera</i>	RELOCATE
293	<i>Cocos nucifera</i>	RELOCATE
294	<i>Cocos nucifera</i>	RELOCATE
295	<i>Sideroxylon foetidissimum</i>	PRESERVE
296	<i>Cocos nucifera</i>	RELOCATE
297	<i>Cocos nucifera</i>	RELOCATE
298	<i>Sideroxylon foetidissimum</i>	PRESERVE
299	<i>Cocos nucifera</i>	RELOCATE
300	<i>Cocos nucifera</i>	RELOCATE
501	<i>Casuarina equisetifolia</i>	REMOVE
502	<i>Casuarina equisetifolia</i>	REMOVE
503	<i>Casuarina equisetifolia</i>	REMOVE
504	<i>Thrinax radiata</i>	RELOCATE
505	<i>Thrinax radiata</i>	RELOCATE
506	<i>Thrinax radiata</i>	RELOCATE
507	<i>Cocos nucifera</i>	RELOCATE
508	<i>Cocos nucifera</i>	RELOCATE
509	<i>Cocos nucifera</i>	RELOCATE
510	<i>Bursera simaruba</i>	RELOCATE
511	<i>Cocos nucifera</i>	RELOCATE
512	<i>Cocos nucifera</i>	RELOCATE
513	<i>Cocos nucifera</i>	RELOCATE
514	<i>Cocos nucifera</i>	RELOCATE
515	<i>Cocos nucifera</i>	RELOCATE
516	<i>Cocos nucifera</i>	RELOCATE
517	<i>Cocos nucifera</i>	RELOCATE
518	<i>Cocos nucifera</i>	RELOCATE

Number	Scientific name	Action
519	<i>Bursera simaruba</i>	RELOCATE
520	<i>Bursera simaruba</i>	RELOCATE
521	<i>Bursera simaruba</i>	RELOCATE
522	<i>Cocos nucifera</i>	RELOCATE
523	<i>Cocos nucifera</i>	RELOCATE
524	<i>Cocos nucifera</i>	RELOCATE
525	<i>Sideroxylon foetidissimum</i>	PRESERVE
526	<i>Sideroxylon foetidissimum</i>	PRESERVE
527	<i>Sideroxylon foetidissimum</i>	PRESERVE
528	<i>Bursera simaruba</i>	RELOCATE
529	<i>Cocos nucifera</i>	RELOCATE
530	<i>Cocos nucifera</i>	RELOCATE
531	<i>Sideroxylon foetidissimum</i>	PRESERVE
532	<i>Sideroxylon foetidissimum</i>	PRESERVE
533	<i>Bursera simaruba</i>	RELOCATE
534	<i>Sideroxylon foetidissimum</i>	PRESERVE
535	<i>Cocos nucifera</i>	RELOCATE
536	<i>Cocos nucifera</i>	RELOCATE
537	<i>Cocos nucifera</i>	RELOCATE
538	<i>Bursera simaruba</i>	PRESERVE
539	<i>Cocos nucifera</i>	RELOCATE
540	<i>Coccoloba diversifolia</i>	PRESERVE
541	<i>Cocos nucifera</i>	RELOCATE
542	<i>Cocos nucifera</i>	RELOCATE
543	<i>Cocos nucifera</i>	RELOCATE
544	<i>Cocos nucifera</i>	RELOCATE
545	<i>Cocos nucifera</i>	RELOCATE
546	<i>Cocos nucifera</i>	RELOCATE
547	<i>Cocos nucifera</i>	RELOCATE
548	<i>Cocos nucifera</i>	RELOCATE
549	<i>Cocos nucifera</i>	RELOCATE
550	<i>Cocos nucifera</i>	RELOCATE
551	<i>Cocos nucifera</i>	RELOCATE
552	<i>Cocos nucifera</i>	RELOCATE
553	<i>Cocos nucifera</i>	RELOCATE
554	<i>Cocos nucifera</i>	RELOCATE
555	<i>Cocos nucifera</i>	RELOCATE
556	<i>Cocos nucifera</i>	RELOCATE
557	<i>Cocos nucifera</i>	RELOCATE

Figure 44. Site Plan shown in the upper left corner. The magnified view of the area shown in red rectangle is below image of the full site plan. List of species is shown in the tables.



Number	Scientific name	Action
1	<i>Cocos nucifera</i>	RELOCATE
2	<i>Cocos nucifera</i>	RELOCATE
3	<i>Cocos nucifera</i>	RELOCATE
4	<i>Cocos nucifera</i>	RELOCATE
5	<i>Cocos nucifera</i>	RELOCATE
6	<i>Cocos nucifera</i>	RELOCATE
7	<i>Bursera simaruba</i>	RELOCATE
8	<i>Bursera simaruba</i>	RELOCATE
9	<i>Pouteria sapota</i>	REMOVE
10	<i>Bursera simaruba</i>	RELOCATE
11	<i>Coccoloba diversifolia</i>	REMOVE
12	<i>Syzygium cumini</i>	REMOVE
13	<i>Coccoloba diversifolia</i>	RELOCATE
14	<i>Bursera simaruba</i>	RELOCATE
15	<i>Cocos nucifera</i>	RELOCATE
16	<i>Cocos nucifera</i>	RELOCATE
17	<i>Cocos nucifera</i>	RELOCATE
18	<i>Cocos nucifera</i>	RELOCATE
19	<i>Cocos nucifera</i>	RELOCATE
20	<i>Cocos nucifera</i>	RELOCATE
21	<i>Cocos nucifera</i>	RELOCATE
22	<i>Bursera simaruba</i>	RELOCATE
23	<i>Bursera simaruba</i>	RELOCATE
24	<i>Ficus benghalensis</i>	PRESERVE
25	<i>Bursera simaruba</i>	REMOVE
26	<i>Bursera simaruba</i>	RELOCATE
27	<i>Bursera simaruba</i>	RELOCATE
28	<i>Bursera simaruba</i>	RELOCATE
29	<i>Cocos nucifera</i>	RELOCATE
30	<i>Cocos nucifera</i>	REMOVE
31	<i>Cocos nucifera</i>	REMOVE
32	<i>Ficus benghalensis</i>	REMOVE
33	<i>Cocos nucifera</i>	RELOCATE
34	<i>Cocos nucifera</i>	RELOCATE

Number	Scientific name	Action
35	<i>Cocos nucifera</i>	RELOCATE
36	<i>Bursera simaruba</i>	RELOCATE
37	<i>Bursera simaruba</i>	RELOCATE
38	<i>Terminalia catappa</i>	REMOVE
39	<i>Bursera simaruba</i>	REMOVE
40	<i>Pouteria sapota</i>	REMOVE
41	<i>Bursera simaruba</i>	RELOCATE
42	<i>Bursera simaruba</i>	RELOCATE
43	<i>Ficus benghalensis</i>	PRESERVE
44	<i>Ficus benghalensis</i>	PRESERVE
45	<i>Ficus benghalensis</i>	PRESERVE
46	<i>Ficus benghalensis</i>	PRESERVE
47	<i>Ficus benghalensis</i>	REMOVE
48	<i>Ficus benghalensis</i>	REMOVE
49	<i>Bursera simaruba</i>	RELOCATE
50	<i>Coccoloba diversifolia</i>	RELOCATE
51	<i>Bursera simaruba</i>	RELOCATE
52	<i>Mastichodendron foetidissimum</i>	RELOCATE
53	<i>Cocos nucifera</i>	RELOCATE
54	<i>Cocos nucifera</i>	RELOCATE
55	<i>Mastichodendron foetidissimum</i>	RELOCATE
56	<i>Ficus benghalensis</i>	RELOCATE
57	<i>Ficus benghalensis</i>	RELOCATE
58	<i>Ficus benghalensis</i>	RELOCATE
59	<i>Terminalia catappa</i>	PRESERVE
60	<i>Bursera simaruba</i>	PRESERVE
61	<i>Coccoloba diversifolia</i>	PRESERVE
62	<i>Bursera simaruba</i>	PRESERVE
63	<i>Coccoloba diversifolia</i>	PRESERVE
64	<i>Coccoloba diversifolia</i>	PRESERVE
65	<i>Ficus benghalensis</i>	PRESERVE
66	<i>Ficus benghalensis</i>	PRESERVE
67	<i>Ficus benghalensis</i>	REMOVE
68	<i>Ficus benghalensis</i>	REMOVE
69	<i>Bursera simaruba</i>	RELOCATE
70	<i>Bursera simaruba</i>	PRESERVE
71	<i>Bursera simaruba</i>	PRESERVE
72	<i>Bursera simaruba</i>	PRESERVE
73	<i>Bursera simaruba</i>	PRESERVE

Number	Scientific name	Action
74	<i>Bursera simaruba</i>	PRESERVE
75	<i>Bursera simaruba</i>	PRESERVE
76	<i>Bursera simaruba</i>	PRESERVE
77	<i>Bursera simaruba</i>	PRESERVE
78	<i>Bursera simaruba</i>	PRESERVE
79	<i>Bursera simaruba</i>	PRESERVE
80	<i>Bursera simaruba</i>	PRESERVE
81	<i>Bursera simaruba</i>	REMOVE
82	<i>Bursera simaruba</i>	PRESERVE
83	<i>Bursera simaruba</i>	REMOVE
84	<i>Bursera simaruba</i>	PRESERVE
85	<i>Bursera simaruba</i>	PRESERVE
86	<i>Bursera simaruba</i>	PRESERVE
87	<i>Bursera simaruba</i>	RELOCATE
88	<i>Bursera simaruba</i>	RELOCATE
89	<i>Bursera simaruba</i>	RELOCATE
90	<i>Bursera simaruba</i>	RELOCATE
91	<i>Bursera simaruba</i>	RELOCATE
92	<i>Coccoloba diversifolia</i>	PRESERVE
93	<i>Coccoloba diversifolia</i>	PRESERVE
94	<i>Coccoloba diversifolia</i>	PRESERVE
95	<i>Coccoloba diversifolia</i>	PRESERVE
96	<i>Coccoloba diversifolia</i>	PRESERVE
97	<i>Coccoloba diversifolia</i>	PRESERVE
98	<i>Coccoloba diversifolia</i>	PRESERVE
99	<i>Coccoloba diversifolia</i>	PRESERVE
100	<i>Coccoloba diversifolia</i>	PRESERVE
101	<i>Coccoloba diversifolia</i>	PRESERVE
102	<i>Coccoloba diversifolia</i>	PRESERVE
103	<i>Coccoloba diversifolia</i>	PRESERVE
104	<i>Coccoloba diversifolia</i>	PRESERVE
105	<i>Coccoloba diversifolia</i>	PRESERVE
106	<i>Coccoloba diversifolia</i>	PRESERVE
107	<i>Coccoloba diversifolia</i>	PRESERVE
108	<i>Bursera simaruba</i>	REMOVE
109	<i>Sideroxylon foetidissimum</i>	REMOVE
110	<i>Sideroxylon foetidissimum</i>	REMOVE
111	<i>Coccoloba diversifolia</i>	PRESERVE

Number	Scientific name	Action
112	<i>Coccoloba diversifolia</i>	PRESERVE
113	<i>Coccoloba diversifolia</i>	PRESERVE
114	<i>Coccoloba diversifolia</i>	PRESERVE
115	<i>Coccoloba diversifolia</i>	PRESERVE
116	<i>Coccoloba diversifolia</i>	PRESERVE
117	<i>Bursera simaruba</i>	PRESERVE
118	<i>Bursera simaruba</i>	PRESERVE
119	<i>Coccoloba diversifolia</i>	REMOVE
120	<i>Coccoloba diversifolia</i>	REMOVE
121	<i>Coccoloba diversifolia</i>	REMOVE
122	<i>Coccoloba diversifolia</i>	REMOVE
123	<i>Coccoloba diversifolia</i>	REMOVE
124	<i>Coccoloba diversifolia</i>	REMOVE
125	<i>Coccoloba diversifolia</i>	REMOVE
126	<i>Coccoloba diversifolia</i>	REMOVE
127	<i>Coccoloba diversifolia</i>	PRESERVE
128	<i>Coccoloba diversifolia</i>	PRESERVE
129	<i>Sideroxylon foetidissimum</i>	REMOVE
130	<i>Bursera simaruba</i>	REMOVE
131	<i>Bursera simaruba</i>	PRESERVE
132	<i>Bursera simaruba</i>	REMOVE
133	<i>Coccoloba diversifolia</i>	PRESERVE
134	<i>Coccoloba diversifolia</i>	PRESERVE
135	<i>Coccoloba diversifolia</i>	PRESERVE
136	<i>Coccoloba diversifolia</i>	PRESERVE
137	<i>Coccoloba diversifolia</i>	PRESERVE
138	<i>Coccoloba diversifolia</i>	PRESERVE
139	<i>Coccoloba diversifolia</i>	PRESERVE
140	<i>Coccoloba diversifolia</i>	PRESERVE
141	<i>Coccoloba diversifolia</i>	PRESERVE
142	<i>Coccoloba diversifolia</i>	PRESERVE
143	<i>Coccoloba diversifolia</i>	PRESERVE
144	<i>Coccoloba diversifolia</i>	PRESERVE
145	<i>Coccoloba diversifolia</i>	PRESERVE
146	<i>Coccoloba diversifolia</i>	PRESERVE
147	<i>Coccoloba diversifolia</i>	PRESERVE
148	<i>Coccoloba diversifolia</i>	PRESERVE
149	<i>Coccoloba diversifolia</i>	PRESERVE
150	<i>Coccoloba diversifolia</i>	PRESERVE

Number	Scientific name	Action
168	<i>Coccoloba diversifolia</i>	REMOVE
169	<i>Coccoloba diversifolia</i>	REMOVE
170	<i>Coccoloba diversifolia</i>	REMOVE
171	<i>Coccoloba diversifolia</i>	REMOVE
172	<i>Coccoloba diversifolia</i>	REMOVE
173	<i>Coccoloba diversifolia</i>	REMOVE
174	<i>Coccoloba diversifolia</i>	REMOVE
175	<i>Coccoloba diversifolia</i>	REMOVE
176	<i>Coccoloba diversifolia</i>	REMOVE
177	<i>Coccoloba diversifolia</i>	REMOVE
178	<i>Coccoloba diversifolia</i>	PRESERVE
179	<i>Coccoloba diversifolia</i>	PRESERVE
180	<i>Coccoloba diversifolia</i>	PRESERVE
181	<i>Coccoloba diversifolia</i>	PRESERVE
182	<i>Coccoloba diversifolia</i>	PRESERVE
183	<i>Coccoloba diversifolia</i>	REMOVE
184	<i>Coccoloba diversifolia</i>	PRESERVE
185	<i>Coccoloba diversifolia</i>	PRESERVE
186	<i>Coccoloba diversifolia</i>	PRESERVE
187	<i>Coccoloba diversifolia</i>	PRESERVE
188	<i>Coccoloba diversifolia</i>	PRESERVE
189	<i>Coccoloba diversifolia</i>	REMOVE
190	<i>Coccoloba diversifolia</i>	REMOVE
191	<i>Coccoloba diversifolia</i>	REMOVE
192	<i>Coccoloba diversifolia</i>	REMOVE
193	<i>Coccoloba diversifolia</i>	REMOVE

Number	Scientific name	Action
559	<i>Cocos nucifera</i>	RELOCATE
560	<i>Cocos nucifera</i>	RELOCATE
561	<i>Cocos nucifera</i>	RELOCATE
562	<i>Cocos nucifera</i>	RELOCATE
563	<i>Bursera simaruba</i>	RELOCATE
564	<i>Bursera simaruba</i>	RELOCATE
565	<i>Bursera simaruba</i>	RELOCATE
566	<i>Bursera simaruba</i>	RELOCATE
567	<i>Bursera simaruba</i>	RELOCATE
568	<i>Bursera simaruba</i>	RELOCATE
569	<i>Coccoloba diversifolia</i>	REMOVE
570	<i>Sabal palmetto</i>	REMOVE
571	<i>Sideroxylon foetidissimum</i>	REMOVE
572	<i>Bursera simaruba</i>	REMOVE
573	<i>Bursera simaruba</i>	REMOVE
574	<i>Metopium toxiferum</i>	REMOVE
575	<i>Metopium toxiferum</i>	REMOVE
576	<i>Coccoloba diversifolia</i>	REMOVE
577	<i>Bursera simaruba</i>	REMOVE
578	<i>Coccoloba diversifolia</i>	REMOVE
579	<i>Coccoloba diversifolia</i>	REMOVE
580	<i>Bursera simaruba</i>	REMOVE
581	<i>Coccoloba diversifolia</i>	REMOVE
582	<i>Coccoloba diversifolia</i>	REMOVE
583	<i>Coccoloba diversifolia</i>	REMOVE
584	<i>Bursera simaruba</i>	REMOVE
585	<i>Bursera simaruba</i>	REMOVE
586	<i>Bursera simaruba</i>	REMOVE
587	<i>Terminalia catappa</i>	PRESERVE
588	<i>Manikara zapota</i>	PRESERVE
589	<i>Cocos nucifera</i>	PRESERVE
590	<i>Cocos nucifera</i>	PRESERVE
591	<i>Cocos nucifera</i>	PRESERVE
592	<i>Coccoloba diversifolia</i>	PRESERVE
593	<i>Bursera simaruba</i>	REMOVE
594	<i>Bursera simaruba</i>	REMOVE
595	<i>Bursera simaruba</i>	REMOVE
596	<i>Bursera simaruba</i>	REMOVE

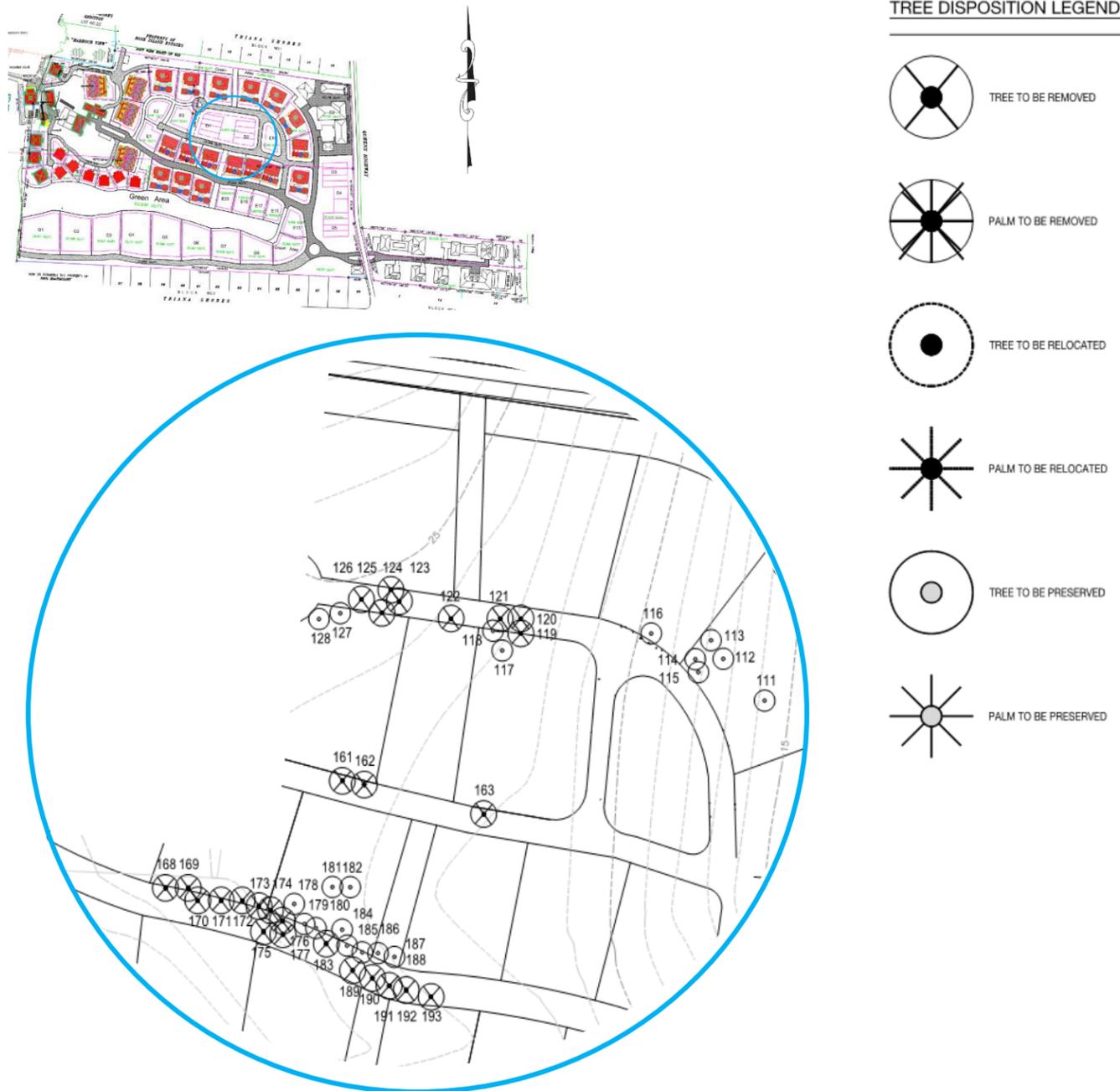
Figure 45. List of species continued from Figure 44. The location of some of the plants listed below are also shown in Figure 46.

Number	Scientific name	Action
597	<i>Bursera simaruba</i>	REMOVE
598	<i>Bursera simaruba</i>	REMOVE
599	<i>Bursera simaruba</i>	REMOVE
600	<i>Coccoloba diversifolia</i>	REMOVE
601	<i>Coccoloba diversifolia</i>	REMOVE
602	<i>Coccoloba diversifolia</i>	REMOVE
603	<i>Coccoloba diversifolia</i>	REMOVE
604	<i>Coccoloba diversifolia</i>	REMOVE
605	<i>Bursera simaruba</i>	REMOVE
606	<i>Bursera simaruba</i>	REMOVE
607	<i>Bursera simaruba</i>	REMOVE
608	<i>Sabal palmetto</i>	REMOVE
609	<i>Metopium toxiferum</i>	REMOVE
610	<i>Bursera simaruba</i>	REMOVE
611	<i>Bursera simaruba</i>	REMOVE
612	<i>Bursera simaruba</i>	REMOVE
613	<i>Bursera simaruba</i>	REMOVE
614	<i>Bursera simaruba</i>	REMOVE
615	<i>Bursera simaruba</i>	REMOVE
616	<i>Coccoloba diversifolia</i>	REMOVE
617	<i>Sideroxylon foetidissimum</i>	REMOVE
618	<i>Coccoloba diversifolia</i>	REMOVE
619	<i>Bursera simaruba</i>	REMOVE
620	<i>Bursera simaruba</i>	REMOVE
621	<i>Bursera simaruba</i>	REMOVE
622	<i>Sideroxylon foetidissimum</i>	REMOVE
623	<i>Bursera simaruba</i>	REMOVE
624	<i>Bursera simaruba</i>	REMOVE
625	<i>Bursera simaruba</i>	REMOVE
626	<i>Bursera simaruba</i>	REMOVE
627	<i>Bursera simaruba</i>	REMOVE
628	<i>Bursera simaruba</i>	REMOVE
629	<i>Bursera simaruba</i>	REMOVE
630	<i>Bursera simaruba</i>	PRESERVE
631	<i>Casuarina equisetifolia</i>	REMOVE
632	<i>Casuarina equisetifolia</i>	REMOVE
633	<i>Casuarina equisetifolia</i>	REMOVE
634	<i>Casuarina equisetifolia</i>	REMOVE

Number	Scientific name	Action
635	<i>Casuarina equisetifolia</i>	REMOVE
636	<i>Casuarina equisetifolia</i>	REMOVE
637	<i>Casuarina equisetifolia</i>	REMOVE
638	<i>Casuarina equisetifolia</i>	REMOVE
639	<i>Casuarina equisetifolia</i>	REMOVE
640	<i>Bursera simaruba</i>	REMOVE
641	<i>Lysikoma sabicu</i>	PRESERVE
642	<i>Coccoloba uvifera</i>	PRESERVE
643	<i>Terminalia catappa</i>	PRESERVE
644	<i>Casuarina equisetifolia</i>	REMOVE
645	<i>Casuarina equisetifolia</i>	REMOVE
646	<i>Casuarina equisetifolia</i>	REMOVE
647	<i>Casuarina equisetifolia</i>	REMOVE
648	<i>Casuarina equisetifolia</i>	REMOVE
649	<i>Casuarina equisetifolia</i>	REMOVE
650	<i>Casuarina equisetifolia</i>	REMOVE
651	<i>Casuarina equisetifolia</i>	REMOVE
652	<i>Casuarina equisetifolia</i>	REMOVE
653	<i>Casuarina equisetifolia</i>	REMOVE
654	<i>Casuarina equisetifolia</i>	REMOVE
655	<i>Lysikoma sabicu</i>	PRESERVE
656	<i>Bursera simaruba</i>	PRESERVE
657	<i>Casuarina equisetifolia</i>	REMOVE
658	<i>Lysikoma sabicu</i>	PRESERVE
659	<i>Terminalia catappa</i>	PRESERVE
660	<i>Terminalia catappa</i>	PRESERVE
661	<i>Casuarina equisetifolia</i>	REMOVE
662	<i>Casuarina equisetifolia</i>	REMOVE
663	<i>Casuarina equisetifolia</i>	REMOVE
664	<i>Coccoloba uvifera</i>	PRESERVE
665	<i>Casuarina equisetifolia</i>	REMOVE
666	<i>Casuarina equisetifolia</i>	REMOVE
667	<i>Casuarina equisetifolia</i>	REMOVE
668	<i>Casuarina equisetifolia</i>	REMOVE
669	<i>Casuarina equisetifolia</i>	REMOVE
670	<i>Casuarina equisetifolia</i>	REMOVE
671	<i>Casuarina equisetifolia</i>	REMOVE
672	<i>Casuarina equisetifolia</i>	REMOVE

Number	Scientific name	Action
673	<i>Coccoloba uvifera</i>	PRESERVE
674	<i>Bursera simaruba</i>	PRESERVE
675	<i>Coccoloba uvifera</i>	PRESERVE
676	<i>Casuarina equisetifolia</i>	REMOVE
677	<i>Casuarina equisetifolia</i>	REMOVE
678	<i>Casuarina equisetifolia</i>	REMOVE
679	<i>Casuarina equisetifolia</i>	REMOVE
680	<i>Casuarina equisetifolia</i>	REMOVE
681	<i>Casuarina equisetifolia</i>	REMOVE
682	<i>Casuarina equisetifolia</i>	REMOVE
683	<i>Casuarina equisetifolia</i>	REMOVE
684	<i>Lysikoma sabicu</i>	PRESERVE
685	<i>Casuarina equisetifolia</i>	REMOVE
686	<i>Casuarina equisetifolia</i>	REMOVE
687	<i>Casuarina equisetifolia</i>	REMOVE
688	<i>Bursera simaruba</i>	PRESERVE
689	<i>Casuarina equisetifolia</i>	REMOVE
690	<i>Casuarina equisetifolia</i>	REMOVE
691	<i>Casuarina equisetifolia</i>	REMOVE
692	<i>Casuarina equisetifolia</i>	REMOVE
693	<i>Casuarina equisetifolia</i>	REMOVE
694	<i>Casuarina equisetifolia</i>	REMOVE
695	<i>Casuarina equisetifolia</i>	REMOVE
696	<i>Casuarina equisetifolia</i>	REMOVE
697	<i>Casuarina equisetifolia</i>	REMOVE
698	<i>Casuarina equisetifolia</i>	REMOVE
699	<i>Casuarina equisetifolia</i>	REMOVE
700	<i>Casuarina equisetifolia</i>	REMOVE

Figure 46. Site Plan shown in the upper left corner. The magnified view of the area shown in blue circle is below image of the full site plan. List of species is shown in the Figures 44 and 45.



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### 13.8 Removal of Invasive Species

Invasive species slated for removal are shown in the Tree Disposition Schedule in Section 13.7.

The area slated for invasive species removal will be sectioned off to prevent the loss of sand as the plants are removed. The Hawaiian Inkberry and the smaller Casuarina trees will be uprooted with hand tools by the project team and disposed of in the solid waste section of the site with the roots facing up. These plants will need to be removed from the site as the seeds may germinate later leading to the spread of the species to other areas on the site. The roots should be facing up to reduce the chance of the plants reattaching and continuing to grow on site. Large Casuarina tree removal will be guided by the Department of Environmental Planning and Protection and the Department of Forestry.

Jumbey, Brazilian Bird Peppers, Castor bean, and Morning glory plants will be cleared with heavy equipment during the land clearing phase. Heavy equipment will not be permitted to drive on the dune. Vegetation will be disposed of at designated location on site and transported to the North Eleuthera dump site via barge.

## 14. CONCLUSION

The additional upland development described for the Project property will increase the economic benefits of the Project described in the previously approved EIA. Environmental benefits of the additional upland development include removing unsightly debris and invasive species from the site. The EMP Addendum will describe in detail appropriate mitigation and management for the additional 79.75 acreage.

## 15 APPENDICES (A – I)

**Caribbean Coastal Services Ltd.**

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APPENDIX A – Permit Issued by the Investments Board

PER/08/97AA



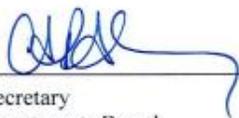
FORM 4  
THE INTERNATIONAL PERSONS LANDHOLDING ACT, 1993  
(S. I. No. 61 of 2007)  
PERMIT  
ISSUED BY THE INVESTMENTS BOARD

TO: 4M HARBOUR ISLAND 2 LTD.

Permission is hereby granted you to acquire/hold the following property to wit: -

FOUR PARCELS OF LAND SITUATE APPROXIMATELY ONE-HALF (1/2) MILE TO THE SOUTH OF DUNMORE TOWN IN THE VICINITY OF MASTIC POINT ON THE ISLAND OF HARBOUR ISLAND ONE OF THE ISLANDS IN THE COMMONWEALTH OF THE BAHAMAS AND COMPRISING (I) 13.227 ACRES MORE OR LESS, (II) 5.252 ACRES MORE OR LESS (III) 1.480 ACRE MORE OR LESS (IV) 1.425 ACRE MORE OR LESS AND (V) 23,871 SQUARE FEET, WHICH SAID PARCELS OF LAND ARE SHOWN ON THE ATTACHED PLAN AND EDGED IN PINK

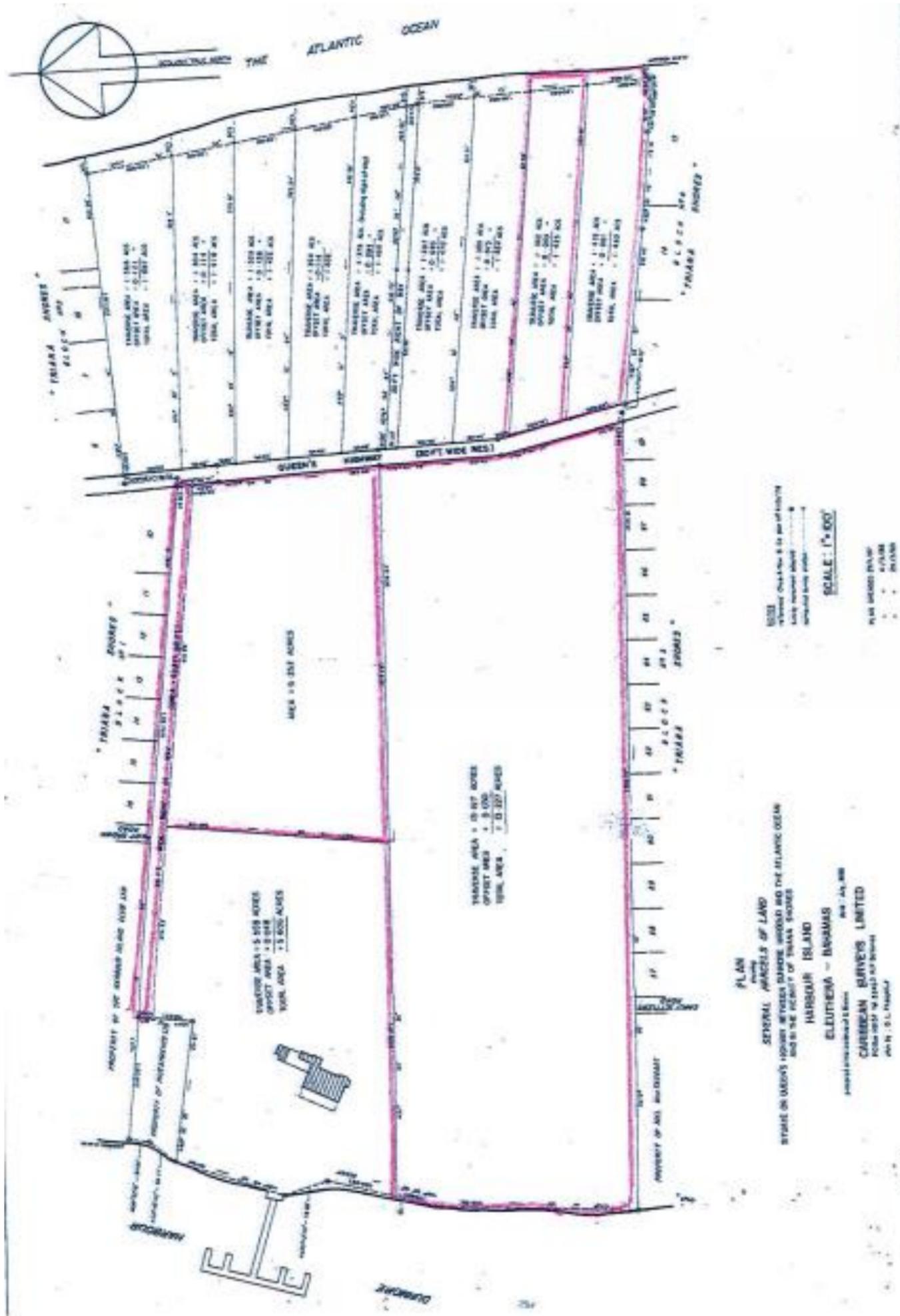
for use as/for: FOR DEVELOPMENT AS A MIXED USE RESORT

  
Secretary  
Investments Board

27<sup>th</sup> March 2019  
DATE

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*[Handwritten Signature]*

**Candia A. P. Ferguson**  
**Secretary**  
**Investments Board**

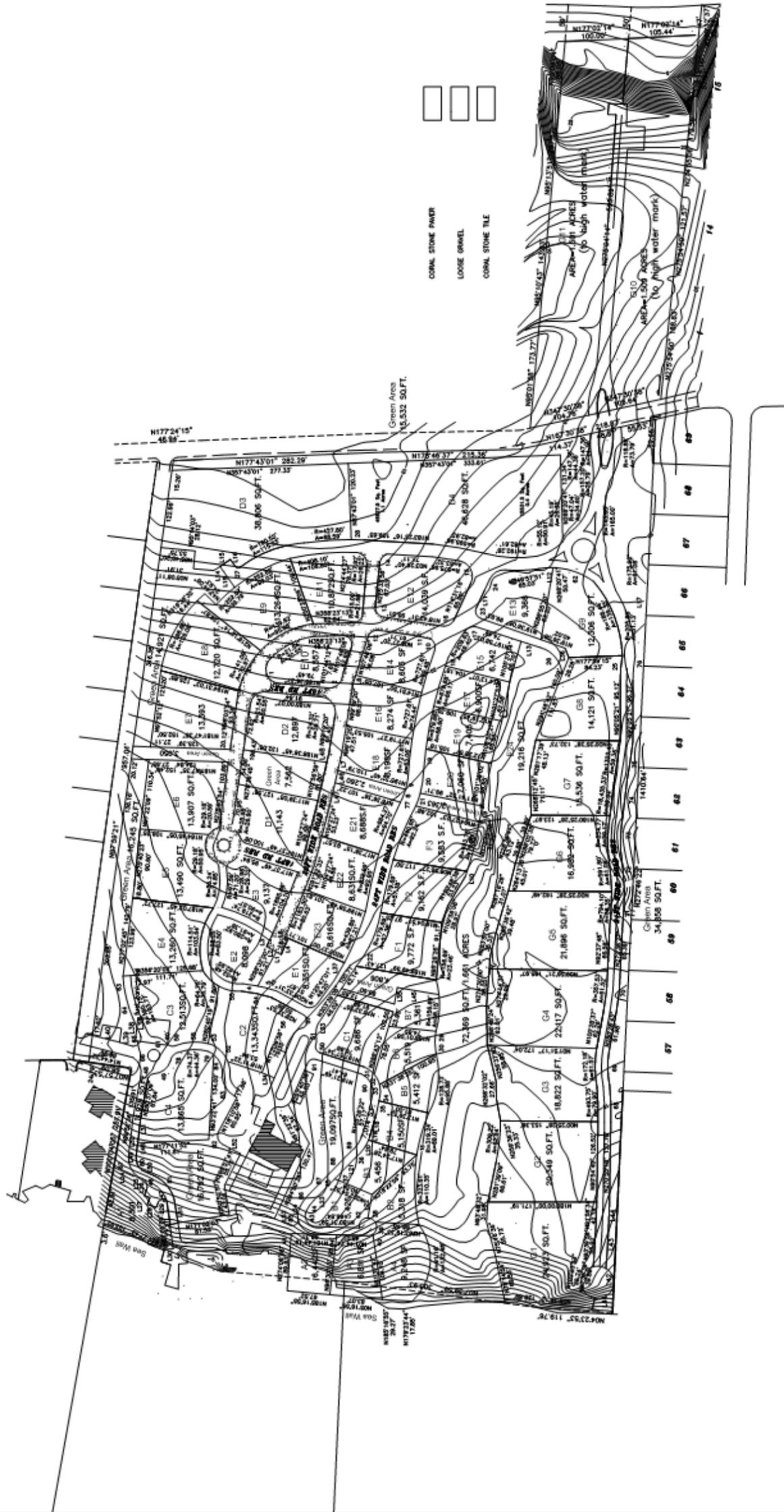
*27<sup>th</sup> March 2019*

**Date**

**Caribbean Coastal Services Ltd.**

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APPENDIX B – Survey & Contour Plan



REVISIONS		DESCRIPTION		DATE	BY

ENGINEER OF RECORD:	ISLAND DIMENSIONS DEVELOPMENT COMPANY Planning, Zoning, Survey & Title Nassau, Bahamas Phone: (242) 327-4981 Fax: (242) 327-4982
PREPARED FOR:	MR MICHAEL WIENER 4M HARBOUR ISLAND LTD. HARBOUR ISLAND, BAHAMAS
DESIGNED BY:	CTI
DRAWN BY:	CTI
CHECKED BY:	PROJECT ENGINEER
PROJECT ENGINEER:	AF

PROPOSED BRILAND RESIDENCES & MARINA	
<b>SURVEY &amp; CONTOUR PLAN</b>	
SCALE: 1 : 80	
DRAWING NO. <b>A-01</b>	

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APPENDIX C – Road Layout, Drainage, Utility & Road Detail Sheets

**Caribbean Coastal Services Ltd.**

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ISLAND DIMENSIONS DEVELOPMENT CO. LTD.  
4M HARBOR ISLAND DEVELOPMENT  
SEWER FLOW CALCULATIONS

<b>DESIGN PARAMETERS:</b>	Units	
Population	persons/lot	<b>5</b>
Average Flowrate	GPD	<b>75</b>
Peaking Factor	constant	<b>2</b>
Mannings #	constant	<b>0.013</b>
Minimum Soil Cover to pipe crown	ft	<b>3.5</b>
Manhole Diameter	ft	<b>4.00</b>
Thickness of Manhole Wall	in	<b>6.00</b>
Drop across the Manhole	ft	<b>0.10</b>

Road 4 - B Sewer Flows from MH21 TO MH27							
Pipe	From Manhole	To Manhole	Length of Pipe	Number of Lots	Population Density	Cum. Design pop.	Avg. unit Flow
			ft	Between Manholes	Persons /lot	Persons/Lot	gal/cap*d
P1	21	22	159.93	2.00	10	10	750
P2	22	23	99.85	2.00	10	20	750
P3	23	24	199.72	0.00	0	20	0
P4	24	25	59.89	2.00	10	30	750
P5	25	26	139.82	0.00	0	30	0
P6	26	27	199.91	2.00	10	40	750
			<b>859.12</b>				

Road 4 - A Sewer Flows from MH-28 to MH-31							
Pipe	From Manhole	To Manhole	Length of Pipe	Number of Lots	Population Density	Cum. Design pop.	Avg. unit Flow
			ft	Between Manholes	Persons /lot	Persons/Lot	gal/cap*d
P7	28	19	139.79	7.00	35	35	2625
P8	19	29	95.95	0.00	0	35	0
P9	29	12	86.30	0.00	0	35	0
P10	12	30	113.68	2.00	10	45	750
P11	30	31	100.06	0.00	0	45	0
			<b>535.78</b>				

Road 3 - Sewer Flows from MH-13 to MH-19							
Pipe	From Manhole	To Manhole	Length of Pipe	Number of Lots	Population Density	Cum. Design pop.	Avg. unit Flow
			ft	Between Manholes	Persons /lot	Persons/Lot	gal/cap*d
P12	13	14	179.39	2.00	10	10	750
P13	14	15	126.71	2.00	10	20	750
P14	15	16	110.96	0.00	0	20	0
P15	16	17	161.97	2.00	10	30	750
P16	17	18	96.14	0.00	0	30	0
P17	18	19	129.05	2.00	10	40	750
			<b>804.22</b>	8.00			

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Cum. Avg. Flow	Peaking Factor	Cum. Peak flow	Cum Peak Flow	Cum. Peak Flow	Pipe DIA	Slope	Flow (full)	Velocity (full)	Rim Elev. Upstream MH	Rim Elevation DownStream MH
gal/d (8x9)		GPD	GPM	ft <sup>3</sup> /s	in	ft/ft	ft <sup>3</sup> /s	ft/s	ft	ft
750.0	2	1500.0	1.0	0.0023	8	0.0050	0.85	2.45	18.34	17.54
1500.0	2	3000.0	2.1	0.0046	8	0.0050	0.85	2.45	17.54	17.04
1500.0	2	3000.0	2.1	0.0046	8	0.0050	0.85	2.45	17.04	16.04
2250.0	2	4500.0	3.1	0.0070	8	0.0050	0.85	2.45	16.04	15.74
2250.0	2	4500.0	3.1	0.0070	8	0.0200	1.71	4.90	15.74	13.34
3000.0	2	6000.0	4.2	0.0093	8	0.0200	1.71	4.90	13.34	9.31

Cum. Avg. Flow	Peaking Factor	Cum. Peak flow	Cum Peak Flow	Cum. Peak Flow	Pipe DIA	Slope	Flow (full)	Velocity (full)	Rim Elev. Upstream MH	Rim Elevation DownStream MH
gal/d (8x9)		GPD	GPM	ft <sup>3</sup> /s	in	ft/ft	ft <sup>3</sup> /s	ft/s	ft	ft
2625.0	2	5250.0	3.6	0.0081	8	0.0230	1.83	5.25	18.55	15.32
2625.0	2	5250.0	3.6	0.0081	8	0.0230	1.83	5.25	15.32	13.11
2625.0	2	5250.0	3.6	0.0081	8	0.0150	1.48	4.24	13.11	11.28
3375.0	2	6750.0	4.7	0.0104	8	0.0040	0.76	2.19	11.28	11.19
3375.0	2	6750.0	4.7	0.0104	8	0.0040	0.76	2.19	11.19	13.59

Cum. Avg. Flow	Peaking Factor	Cum. Peak flow	Cum Peak Flow	Cum. Peak Flow	Pipe DIA	Slope	Flow (full)	Velocity (full)	Rim Elev. Upstream MH	Rim Elevation DownStream MH
gal/d (8x9)		GPD	GPM	ft <sup>3</sup> /s	in	ft/ft	ft <sup>3</sup> /s	ft/s	ft	ft
750.0	2	1500.0	1.0	0.0023	8	0.0040	0.76	2.19	22.46	23.59
1500.0	2	3000.0	2.1	0.0046	8	0.0040	0.76	2.19	23.59	24.17
1500.0	2	3000.0	2.1	0.0046	8	0.0040	0.76	2.19	24.17	23.16
2250.0	2	4500.0	3.1	0.0070	8	0.0040	0.76	2.19	23.16	21.05
2250.0	2	4500.0	3.1	0.0070	8	0.0145	1.45	4.17	21.05	18.64
3000.0	2	6000.0	4.2	0.0093	8	0.0145	1.45	4.17	18.64	15.40

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Cum. Avg. Flow gal/d (8x9)	Peaking Factor	Cum. Peak flow GPD	Cum Peak Flow GPM	Cum. Peak Flow ft <sup>3</sup> /s	Pipe DIA in	Slope ft/ft	Flow (full) ft <sup>3</sup> /s	Velocity (full) ft/s	Rim Elev.	Rim Elevation
									Upstream MH ft	DownStream MH ft
750.0	2	1500.0	1.0	0.0023	8	0.0050	0.85	2.45	18.34	17.54
1500.0	2	3000.0	2.1	0.0046	8	0.0050	0.85	2.45	17.54	17.04
1500.0	2	3000.0	2.1	0.0046	8	0.0050	0.85	2.45	17.04	16.04
2250.0	2	4500.0	3.1	0.0070	8	0.0050	0.85	2.45	16.04	15.74
2250.0	2	4500.0	3.1	0.0070	8	0.0200	1.71	4.90	15.74	13.34
3000.0	2	6000.0	4.2	0.0093	8	0.0200	1.71	4.90	13.34	9.31

Cum. Avg. Flow gal/d (8x9)	Peaking Factor	Cum. Peak flow GPD	Cum Peak Flow GPM	Cum. Peak Flow ft <sup>3</sup> /s	Pipe DIA in	Slope ft/ft	Flow (full) ft <sup>3</sup> /s	Velocity (full) ft/s	Rim Elev.	Rim Elevation
									Upstream MH ft	DownStream MH ft
2625.0	2	5250.0	3.6	0.0081	8	0.0230	1.83	5.25	18.55	15.32
2625.0	2	5250.0	3.6	0.0081	8	0.0230	1.83	5.25	15.32	13.11
2625.0	2	5250.0	3.6	0.0081	8	0.0150	1.48	4.24	13.11	11.28
3375.0	2	6750.0	4.7	0.0104	8	0.0040	0.76	2.19	11.28	11.19
3375.0	2	6750.0	4.7	0.0104	8	0.0040	0.76	2.19	11.19	13.59

Cum. Avg. Flow gal/d (8x9)	Peaking Factor	Cum. Peak flow GPD	Cum Peak Flow GPM	Cum. Peak Flow ft <sup>3</sup> /s	Pipe DIA in	Slope ft/ft	Flow (full) ft <sup>3</sup> /s	Velocity (full) ft/s	Rim Elev.	Rim Elevation
									Upstream MH ft	DownStream MH ft
750.0	2	1500.0	1.0	0.0023	8	0.0040	0.76	2.19	22.46	23.59
1500.0	2	3000.0	2.1	0.0046	8	0.0040	0.76	2.19	23.59	24.17
1500.0	2	3000.0	2.1	0.0046	8	0.0040	0.76	2.19	24.17	23.16
2250.0	2	4500.0	3.1	0.0070	8	0.0040	0.76	2.19	23.16	21.05
2250.0	2	4500.0	3.1	0.0070	8	0.0145	1.45	4.17	21.05	18.64
3000.0	2	6000.0	4.2	0.0093	8	0.0145	1.45	4.17	18.64	15.40

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Invert Elev. Upstream MH	Invert Elev. Downstream MH	MH #	COVER TO TOP OF PIPE	DEPTH TO INVERT
ft	ft		ft	
14.50	13.71	21	3.17	3.84
13.50	13.00	22	3.37	4.04
12.80	11.81	23	3.57	4.24
11.61	11.31	24	3.76	4.43
11.11	8.31	25	3.96	4.63
8.11	4.11	26	4.56	5.23

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Invert Elev. Upstream MH	Invert Elev. Downstream MH	MH #	COVER TO TOP OF PIPE	DEPTH TO INVERT
ft	ft		ft	
13.45	10.24	28	4.43	5.10
10.04	7.83	19	4.61	5.28
7.63	6.34	29	4.81	5.48
6.04	5.59	12	4.57	5.24
5.39	4.99	30	5.13	5.80

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Invert Elev. Upstream MH	Invert Elev. Downstream MH	MH #	COVER TO TOP OF PIPE	DEPTH TO INVERT
ft	ft		ft	
17.26	16.54	13	4.53	5.20
16.34	15.83	14	6.58	7.25
15.63	15.19	15	7.87	8.54
14.99	14.34	16	7.50	8.17
14.14	12.75	17	6.24	6.91
12.55	10.68	18	5.42	6.09

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Road 2 - Sewer Flows from MH-8 to MH-12							
Pipe	From Manhole	To Manhole	Length of Pipe	Number of Lots	Population Density	Cum. Design pop.	Avg. unit Flow
			ft	Between Manholes	Persons /lot	Persons/Lot	gal/cap*d
P18	8	9	132.86	2.00	10	10	750
P19	9	10	155.23	2.00	10	20	750
P20	10	11	117.12	0.00	0	20	0
P21	11	7	107.80	2.00	10	30	750
P22	7	12	129.61	0.00	0	30	0

642.62

Road 1 - Sewer Flows from MH1 TO MH7							
Pipe	From Manhole	To Manhole	Length of Pipe	Number of Lots	Population Density	Cum. Design pop.	Avg. unit Flow
			ft	Between Manholes	Persons /lot	Persons/Lot	gal/cap*d
P23	1	2	34.41	2.00	10	10	750
P24	2	3	79.88	0.00	0	10	0
P25	3	4	250.07	6.00	30	40	2250
P26	4	5	69.21	0.00	0	40	0
P27	5	6	59.48	0.00	0	40	0
P28	6	7	92.56	3.00	225	265	450

585.61

Road 5 - Sewer Flows from MH32 TO MH33							
Pipe	From Manhole	To Manhole	Length of Pipe	Number of Lots	Population Density	Cum. Design pop.	Avg. unit Flow
			ft	Between Manholes	Persons /lot	Persons/Lot	gal/cap*d
P29	32	33	198.00	4.00	20	20	1500
P30	34	33	228.00	4.00	20	40	1500

426.00

Road 6 - Sewer Flows from MH35 TO MH39							
Pipe	From Manhole	To Manhole	Length of Pipe	Number of Lots	Population Density	Cum. Design pop.	Avg. unit Flow
			ft	Between Manholes	Persons /lot	Persons/Lot	gal/cap*d
P31	35	36	85.49	3.00	15	15	1125
P32	36	37	151.23	2.00	10	25	750
P33	37	38	32.88	0.00	0	25	0
P34	38	39	93.28	4.00	20	45	1500

362.88

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Cum. Avg. Flow gal/d (8x9)	Peaking Factor	Cum. Peak flow GPD	Cum Peak Flow GPM	Cum. Peak Flow ft <sup>3</sup> /s	Pipe DIA in	Slope ft/ft	Flow (full) ft <sup>3</sup> /s	Velocity (full) ft/s	Rim Elev. Upstream MH ft	Rim Elevation DownStream MH ft
750.0	2	1500.0	1.0	0.0023	8	0.0101	1.21	3.48	25.43	24.03
1500.0	2	3000.0	2.1	0.0046	8	0.0086	1.12	3.21	24.03	22.48
1500.0	2	3000.0	2.1	0.0046	8	0.0137	1.41	4.05	22.48	19.71
2250.0	2	4500.0	3.1	0.0070	8	0.0369	2.32	6.65	19.71	15.93
2250.0	2	4500.0	3.1	0.0070	8	0.0386	2.37	6.80	15.93	11.38

Cum. Avg. Flow gal/d (8x9)	Peaking Factor	Cum. Peak flow GPD	Cum Peak Flow GPM	Cum. Peak Flow ft <sup>3</sup> /s	Pipe DIA in	Slope ft/ft	Flow (full) ft <sup>3</sup> /s	Velocity (full) ft/s	Rim Elev. Upstream MH ft	Rim Elevation DownStream MH ft
750.0	2	1500.0	1.0	0.0023	8	0.0127	1.36	3.90	26.62	25.96
750.0	2	1500.0	1.0	0.0023	8	0.0130	1.38	3.95	25.96	24.60
3000.0	2	6000.0	4.2	0.0093	8	0.0158	1.52	4.35	24.60	20.53
3000.0	2	6000.0	4.2	0.0093	8	0.0297	2.08	5.97	20.53	18.43
3000.0	2	6000.0	4.2	0.0093	8	0.0184	1.64	4.70	18.43	17.02
3450.0	2	6900.0	4.8	0.0107	8	0.0054	0.89	2.55	17.02	15.94

Cum. Avg. Flow gal/d (8x9)	Peaking Factor	Cum. Peak flow GPD	Cum Peak Flow GPM	Cum. Peak Flow ft <sup>3</sup> /s	Pipe DIA in	Slope ft/ft	Flow (full) ft <sup>3</sup> /s	Velocity (full) ft/s	Rim Elev. Upstream MH ft	Rim Elevation DownStream MH ft
1500.0	2	3000.0	2.1	0.0046	8	0.0141	1.43	4.11	16.17	13.50
3000.0	2	6000.0	4.2	0.0093	8	0.0250	1.91	5.48	21.01	13.50

Cum. Avg. Flow gal/d (8x9)	Peaking Factor	Cum. Peak flow GPD	Cum Peak Flow GPM	Cum. Peak Flow ft <sup>3</sup> /s	Pipe DIA in	Slope ft/ft	Flow (full) ft <sup>3</sup> /s	Velocity (full) ft/s	Rim Elev. Upstream MH ft	Rim Elevation DownStream MH ft
1125.0	2	2250.0	1.6	0.0035	8	0.0040	0.76	2.19	19.02	18.87
1875.0	2	3750.0	2.6	0.0058	8	0.0040	0.76	2.19	18.87	18.92
1875.0	2	3750.0	2.6	0.0058	8	0.0100	1.21	3.46	18.92	17.91
3375.0	2	6750.0	4.7	0.0104	8	0.0300	2.09	6.00	17.91	14.61

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ft	ft		ft	
20.23	18.90	8	4.53	5.20
18.70	17.37	9	4.66	5.33
17.16	15.56	10	4.65	5.32
15.36	11.38	11	3.68	4.35
11.18	6.18	7	4.08	4.75

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Invert Elev. Upstream MH	Invert Elev. Downstream MH	MH #	COVER TO TOP OF PIPE	DEPTH TO INVERT
ft	ft		ft	
21.45	21.01	1	4.50	5.17
20.81	19.77	2	4.48	5.15
19.57	15.62	3	4.36	5.03
15.42	13.37	4	4.44	5.11
13.17	12.07	5	4.60	5.26
11.87	11.37	6	4.48	5.15

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Invert Elev. Upstream MH	Invert Elev. Downstream MH	MH #	COVER TO TOP OF PIPE	DEPTH TO INVERT
ft	ft		ft	
10.60	7.81	32	4.90	5.57
13.30	7.60	34	7.04	7.71

OK  
OK

Invert Elev. Upstream MH	Invert Elev. Downstream MH	MH #	COVER TO TOP OF PIPE	DEPTH TO INVERT
ft	ft		ft	
14.02	13.68	35	4.33	5.00
13.48	12.87	36	4.73	5.39
12.67	12.34	37	5.58	6.25
12.14	9.35	38	5.10	5.77

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Road 7 - Sewer Flows from MH42 TO MH46							
Pipe	From Manhole	To Manhole	Length of Pipe	Number of Lots	Population Density	Cum. Design pop.	Avg. unit Flow
			ft	Between Manholes	Persons /lot	Persons/Lot	gal/cap*d
P35	42	43	167.87	2.00	10	10	750
P36	43	44	26.19	1.00	5	15	375
P37	44	45	44.18	0.00	0	15	0
P38	45	46	56.69	1.00	5	20	375
<b>294.93</b>							

From Marina - Sewer Flows from Docks							
Pipe	From Manhole	To Manhole	Length of Pipe	Number of Lots	Population Density	Cum. Design pop.	Avg. unit Flow
			ft	Between Manholes	Persons /lot	Persons/Lot	gal/cap*d
P39	47	46	19.76	0.00	0	0	0
P40	46	LS	178.00	0.00	0	0	0

Cum. Avg. Flow	Peaking Factor	Cum. Peak flow	Cum Peak Flow	Cum. Peak Flow	Pipe DIA	Slope	Flow (full)	Velocity (full)	Rim Elev.	Rim Elevation
gal/d (8x9)		GPD	GPM	ft <sup>3</sup> /s	in	ft/ft	ft <sup>3</sup> /s	ft/s	Upstream MH	DownStream MH
									ft	ft
750.0	2	1500.0	1.0	0.0023	8	0.0325	2.18	6.24	26.49	18.57
1125.0	2	2250.0	1.6	0.0035	8	0.0325	2.18	6.24	18.57	18.92
1125.0	2	2250.0	1.6	0.0035	8	0.0325	2.18	6.24	17.27	17.91
1500.0	2	3000.0	2.1	0.0046	8	0.0325	2.18	6.24	15.21	12.53

Cum. Avg. Flow	Peaking Factor	Cum. Peak flow	Cum Peak Flow	Cum. Peak Flow	Pipe DIA	Slope	Flow (full)	Velocity (full)	Rim Elev.	Rim Elevation
gal/d (8x9)		GPD	GPM	ft <sup>3</sup> /s	in	ft/ft	ft <sup>3</sup> /s	ft/s	Upstream MH	DownStream MH
									ft	ft
0.0	2	0.0	0.0	0.0000	8	0.0060	0.94	2.68	12.53	12.53
0.0	2	0.0	0.0	0.0000	8	0.0060	0.94	2.68	12.53	20.22

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Invert Elev. Upstream MH	Invert Elev. Downstream MH	MH #	COVER TO TOP OF PIPE	DEPTH TO INVERT
ft	ft		ft	
18.00	12.54	42	7.82	8.49
12.34	11.49	43	5.56	6.23
11.29	9.86	44	5.31	5.98
9.66	7.81	45	4.89	5.55

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OK

Invert Elev. Upstream MH	Invert Elev. Downstream MH	MH #	COVER TO TOP OF PIPE	DEPTH TO INVERT
ft	ft		ft	
7.50	7.38	47	4.36	5.03
7.18	6.11	46	4.68	5.35

OK  
OK

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## APPENDIX E – Geotechnical Investigation Report

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## APPENDIX F – Observed Species

Photo 1. Coconut grove behind the dune ridge



Photo 2. Termite nest affixed to coconut tree



Photo 3. Ratwood



Photo 4. Yellow Elder



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*Photo 5. Mature Gum elemi and Sapodilla trees, with Sapodilla seedlings dominating shrub layer.*



*Photo 6. Low Rattlebox*



*Photo 7. Sapodilla seedlings*



*Photo 8. Wild Indigo in disturbed areas*



*Photo 9. Tamarind*



*Photo 10. Rams Horn (in flower), Sea Grape and Sea Ox Eye Daisy*



*Photo 11. Jumbey dominating previously cleared areas*



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Photo 12. *Agave sp.*



Photo 13. Rice Plant



Photo 14. Narrow leaved Blolly (protected)



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Photo 15. Snake plant (invasive)



Photo 16. Sabal Palm



Photo 17. Mastic seedlings



Photo 18. Heavy Leaf litter and rich humus on forest



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*Photo 19. Bird nest*



*Photo 20. Hermit Crab*



*Photo 21. Interior broadleaf coppice forest*



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Photo 22. Planted Cabbage Palm



Photo 23. Gum Elemi



Photo 24. Pigeon Plum and Gum Elemi



Photo 25. Coppice forest along roadside



Photo 26. Coppice forest along roadside



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*Photo 27. Broad Leaved Blolly, Pigeon Plum and Coconut along roadside*



*Photo 28. Casuarina (invasive) dominated vegetation along old airstrip road*



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Photo 29. *Casuarina* dominated vegetation along old airstrip road



Photo 30. Seagrass beneath *Casuarina* (invasive)



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Photo 31. *Casuarina* (invasive) dominating canopy, Dogwood, Seagrape, *Cinnecod* and *Jumbey* in understory



Photo 32. *Narrow Leaved Blolly* (protected) beneath *Casuarina* (invasive) along old airstrip road.



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*Photo 33. Recently disturbed area with the Casuarina dominated coppice regrown with Jumbe*



*Photo 34. Casuarina and Poincianna dominating canopy, Cinnecord and Seagrape in understory*



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Photo 35. Australian Pine (invasive) along coastline



Photo 36. Invasive Australian Pine and Hawaiian Inkberry



Photo 37. Sand Fly Bush



Photo 38. Seagrape, Sea ox Eye Daisy and Sand Fly Bush



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Photo 39. Hawaiian Inkberry (invasive) and Sand Fly Bush



Photo 40. Beaded Periwinkle



Photo 41. Sea purslane



## APPENDIX G – Avian Survey Report

### **Briland Club avian survey report with notes on plants**

**Observers: Dr. Ancilleno Davis and David Dean**

### 1.0 AVIAN SURVEYS

Avian surveys were conducted on October 1st, 2020 to identify the presence, abundance and habitat utilization of avian species within the boundaries of the Briland Club and Harbour Island.

#### 1.1 Methodology

The assessment comprised four (4) hours of active avian and ecological observations on the Briland Residences property Sept 30<sup>th</sup> through October 1<sup>st</sup>, 2020. Six hours of surveys were conducted in Harbour Island On October 2<sup>nd</sup>, 2020. Morning and afternoon surveys were conducted on between 6:55 AM and 6:18 PM. The species identified in each area of the property were identified and are listed in the table below. Taxonomy is based on *The Clements Checklist of Birds of the World*, August 2019 edition. Status is based on the International Union for Conservation of Nature (IUCN). These results are based on a small sample size and do not represent the total expected diversity at the site. In particular, many migrant warbler species that reside in the Bahamas over the winter were not detected during these surveys but may use the site. several resident species detected on Harbour Island may use the site but were not detected during this survey.

The Birds are described based on their range of occurrence, Conservation and management status and how frequently they were detected during the study. Range is described as Permanent Resident Breeding (PRB) for birds that remain in the Bahamas throughout the year and reproduce; Resident Non-Breeding (RNB) birds occur within the Bahamas throughout the year with the exception of their breeding period; Summer Resident Breeding (SRB) birds only occur in the Bahamas during their breeding season which is during the summer; Winter Resident (WR) birds Occur in the Bahamas throughout the winter months from October to May and leave to breed in North America; Endemic birds (E) occur only within the Bahamas or Caribbean.

Conservation status is based on the International Union for the Conservation of Nature (IUCN) classifications and specific regulations of the species in the Laws of the Bahamas. IUCN classifications include: species of Least Concern (LC) for whom no conservation intervention or management is required and the species is not expected to decline or be lost in the foreseeable future; Near Threatened (NT) species whose populations may decline drastically without significant protection or constant management; Vulnerable (VU) species are likely to become endangered if the risks facing the species in the wild are not addressed; Unassessed (UA) species have not received a formal evaluation from the IUCN and are generally not considered

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species of conservation concern. In addition to the IUCN categories, Species that are specified in the Wild Birds Protection Act Chapter 249 of the Statute Laws of the Bahamas are designated as Managed (MA).

Area of detection is separated into categories of Beach Club (BC) when only detected on the subject property; Harbour Island (HI) when only detected on Harbour Island outside the Briland Club and Both (BO) when detected both inside and outside the boundaries of the property. The results are summarized in the table below.

## 1.2 Results

### 1.2.1 Species Observed

#### 1.2.1.1 Species diversity

A total of thirty-three (33) species were recorded on Harbour Island during the survey period (Table 2) however only twenty-four (24) of those species were detected on the Briland Club property. Nine (9) species recorded on Harbour Island were not found on the Briland Club property and nine species found within the property were not found elsewhere on Harbour Island. There were 15 species that were found both on the property and in other areas of Harbour Island.

The majority of recorded species were Permanent resident species which breed in the islands of the Bahamas and are of low conservation concern. Eighteen of the species detected were permanent resident species which breed in the Bahamas. The Brown Pelican may be found in the Bahamas year-round but has not been known to breed here. Barn Swallows are found in the Bahamas during their migration but do not remain in the country over winter. The other species are winter residents that stay in the Bahamas during the north american winter. The only near-threatened species detected was the White Crowned Pigeon which is managed as a hunted species in the Bahamas.

Table 1 Avifauna survey abbreviations

TABLE KEY:		
RANGE	STATUS	Area of Detection
<b>PRB</b> = Permanent Resident Breeding	<b>LC</b> = Least Concern (IUCN)	<b>BC</b> = Briland Club
<b>RNB</b> = Resident Non-Breeding	<b>NT</b> = Near Threatened (IUCN)	<b>HI</b> = Harbour Island
<b>SRB</b> = Summer Resident Breeding	<b>VU</b> = Vulnerable (IUCN)	<b>BO</b> = Both
<b>WR</b> = Winter Resident	<b>MA</b> = Managed (Regulated – Bahamas)	
<b>E</b> = Endemic (Distribution)	<b>D</b> = Declining	
<b>MI</b> = Migrant	<b>UA</b> = Unassessed	

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*Table 2 Bird species detected on the Harbour Island Sept. 30 to October 2nd 2020 along with geographic range, conservation status and number of observations during the study.*

Common name	Scientific Name	Range	Status	Observations
American Kestrel	<i>Falco sparverius</i>	PRB	LC	BO
American Oystercatcher	<i>Haematopus palliatus</i>	PRB	LC	HI
American Redstart	<i>Setophaga ruticilla</i>	WR	LC	BO
Bahama Woodstar	<i>Nesophlox evelynae</i>	PRB E	LC	BO
Bananaquit	<i>Coereba flaveola</i>	PRB	LC	BO
Barn Swallow	<i>Hirundo rustica</i>	MI	LC	HI
Black-and-White Warbler	<i>Mniotilta varia</i>	WR	LC	HI
Black-bellied Plover	<i>Pluvialis squatarola</i>	WR	LC	HI
Black-throated Blue Warbler	<i>Setophaga caerulescens</i>	WR	LC	HI
Black Whiskered Vireo	<i>Vireo altiloquus</i>	SRB	LC	BC
Brown Pelican	<i>Pelicanus occidentalis</i>	PR	LC	BC
Cape May Warbler	<i>Setophaga tigrina</i>	WR	LC	BO
Common Ground-dove	<i>Columbina passerine</i>	PRB	LC	BO
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	PRB	LC	HI
Gray Kingbird	<i>Tyrannus dominicensis</i>	SRB	LC	BO
Greater Antillean Bullfinch	<i>Melopyrrha violacea</i>	PRB	LC	BO
Green Heron	<i>Butorides virescens</i>	PRB	UA	HI
Hairy Woodpecker	<i>Dryobates villosus</i>	PRB	LC	BC
House Sparrow	<i>Passer domesticus</i>	PRB	LC	HI
Laughing Gull	<i>Leucophaeus atricilla</i>	PRB	LC	BO
Magnificent Frigatebird	<i>Fregata magnificens</i>	PRB	LC	HI
Mangrove Cuckoo	<i>Coccyzus minor</i>	PRB	LC	BC
Northern Mockingbird	<i>Mimus polyglottos</i>	PRB	LC	BO
Northern Parula	<i>Setophaga americana</i>	WR	LC	BC
Pine Warbler	<i>Setophaga pinus</i>	WR	LC	BC
Prairie Warbler	<i>Setophaga discolor</i>	WR	LC	BC
Smooth-billed Ani	<i>Crotophaga ani</i>	PRB	LC	HI
Spotted Sandpiper	<i>Actitis macularius</i>	WR	LC	BC
Thick-billed Vireo	<i>Vireo crassirostris</i>	PRB-E	LC	BO
Western Spindalis	<i>Spindalis zena</i>	PRB-E	LC	BC
White-crowned Pigeon	<i>Patagioenas leucocephala</i>	PRB	NT MA	BC
Yellow-throated Warbler	<i>Setophaga dominica</i>	WR	LC	BO

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#### 1.2.1.2.1 Permanent Resident Breeding

Permanent Resident Breeding species refers to the resident species that live and breed year-round in the Bahama Islands. A total of eighteen (18) species were found in this category during the surveys on Harbour Island.



Figure 1 Common Ground-Dove (*Columbina passerina bahamensis*)

#### 1.2.1.2.2 Summer Resident Breeding

Summer Resident Breeding refers to migrant species that breed in The Bahamas during summer months from April to October and spend the rest of the year in other regions. Two species were found in this category during the surveys. Gray Kingbirds were seen feeding offspring in the large fig trees near “The Haunted House”. These birds will nest on elevated platforms, ladders, trees and buildings. Their fledglings leave within 3 months and nests tend to fall apart on their own over the course of the following year. Black-whiskered Vireos were also only detected in the area near the haunted house. They occurred both in the fig trees as well as the trees along the edge of the area shaded by the fig trees.

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Figure 4 Gray Kingbird (*Tyrannus dominicensis*) (photo taken in New Providence)

#### 1.2.1.2.3 Winter Resident Non-Breeding

Winter Resident Non-breeding species refers to the annual non-breeding fall/winter migrants which pass through the Bahama Islands from North America en route to southern regions or which remain in the Bahamas. Six (6) species in this category were recorded within the Briland Club area with an additional 4 on Harbour Island. Those species found on the Briland Club property include the American Redstart, Cape May Warbler, Northern Parula, Pine Warbler, Prairie Warbler, and Yellow-throated Warbler. These birds are protected internationally via the Migratory Bird Treaty with the United States of America and Canada and locally by the Wild Birds Protection Act.

#### 1.2.1.2.4 Resident non-breeding species

Resident non-breeding birds spend most of their lives in the Bahamas but leave to breed in another location or have not been seen breeding in the Bahamas. The Brown Pelican is the only species detected in this category.

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#### 1.2.1.2.5 Endemic Species

Endemic species are found only in a restricted geographic area. Endemism must be described at scale. Some species are only found in a small area, on a particular island, or within a region like the Caribbean. The Thick-billed Vireo found at the site is a regional endemic that lives year round in the Bahamas and Turks and Caicos, but may migrate to the north coast of Cuba. The Western Spindalis was detected in the Haunted House area. It is endemic to the Bahamas archipelago including the Turks and Caicos Islands and Cuba. The Bahama Woodstar hummingbird is found throughout the Bahamas and occasionally in south Florida. These three species were all found on the Briland Club property, but the Bahama Woodstar was only found in the mature forest areas and not near the Haunted House.

#### 1.2.1.3 Conservation Status

##### 1.2.1.3.1 Protected Species

All of the species observed are protected under the Wild Birds Protection Act (Statute Law of The Bahamas, Chapter 249). In addition to the local laws, all migratory birds listed above are protected under international treaties and conventions such as the Migratory Bird Treaty Act of the United States.

##### 1.2.1.3.2 Species of Concern

"Near Threatened" (NT) by the IUCN classifies a species that may be considered *threatened* with extinction in the *near* future, although it does not currently qualify for the *threatened* status.

White-crowned Pigeons (*Patagioenas leucocephala*), are designated a Near-threatened species by IUCN and are managed as a hunted species in the Bahamas. Hunting is allowed with a permit and limits and regulations are determined by the Government of the Bahamas.

#### 1.2.2 Habitat Utilization

The site surveyed included; rocky coastal edges and blackland coppice areas in the center of the property; a large landscaped area with mature ficus trees called "The Haunted House" a marina and dock currently under construction (unsurveyed); and a small patch of coconut trees adjacent to a mature dune and sandy beach. No permanent or ephemeral wetlands were found in the study area except a cistern which was open and held standing water near the main road that separates the beach strip from the rest of the forested area. Various native fruit trees were present, but there was little fruit to be seen except on the Coccoloba sp.. The fig trees near the haunted house had fruit on the trees and the floor below. These fruit along with insects serve as food resources for the birds throughout the property. The birds detected on the property did not appear to be in transition through the property but were using the property and potentially residing there for most of the day. The exceptions are the Brown Pelican and Laughing Gulls. No

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species were seen at active nests or engaged in nesting behavior, though Gray Kingbirds seldom nest far from foraging areas. It can be assumed that those seen feeding their offspring would have nested nearby in the past few months.

The ficus trees near the Haunted mansion were the most active location on the property, however, that location was low in resident bird diversity. The age of the ficus trees makes them a historically stable “stopover” location for migratory birds. When many such locations are available at various distances between the northern and southern limits of the migration pathway, this creates a “migration corridor”. Although the ficus trees are in fruit now (September, October), it is imperative that the rest of the property is also maintained at a similar level of diversity to support the bird community year round. The other fruit and flowering trees will provide varying but consistent food availability

## 2.0 Vegetation survey

The original work proposal did not include a detailed plant survey, however, a plant list is included below of plant species identified in the surveyed areas. Visual identification of the trees within the study area was conducted during avian surveys. All trees positively identified were listed and classified as Native (NA, 28 species), Nonnative (NN, 11 species), or Invasive (IN, 7 species), based on information in Currie et al. (2019) and the Global Invasive Species Database ([www.iucngisd.org](http://www.iucngisd.org)). A total of forty-six plant species were identified in the study area.

The trees on the Briland Club property are primarily native with a few non-invasive ornamental and invasive plants. The Nonnative species found on the property include decorative horticultural species. These species are not protected or expected to gain protection under the updated laws and appear to have previously been maintained for esthetic purposes. They do not pose an ecological threat to the neighboring biodiversity. Most native plants located on the site are relatively abundant compared to the surrounding area and are not currently of high conservation concern. All species within the native category should be assumed to be afforded some measure of protection via the Forestry Act and the Conservation and Protection of the Physical Landscape of the Bahamas Act. Most of them are also large trees and may require special permits to remove them. Several large mahogany trees in the forested areas are high value trees and cannot be replaced commercially.

Seven invasive plant species are found on the property. Most of the coppice understory was free of invasive species but the previously cleared roads were overgrown with weeds. These invasive species are Indian Almond, Brazilian Pepper, Casuarina, Oyster Plants, Poinciana, Hawaiian Seagrape and Snake Plants. All of the listed invasive species have significant impact on native biodiversity when allowed to proliferate. In general, they do not provide meaningful benefit to native birds or other wildlife and should be removed and destroyed where possible and feasible.

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The native trees listed all have significant importance for wildlife use and in traditional or folkloric medicine. Many trees in the area are listed as protected trees in the Conservation and Protection of the Physical Landscape of the Bahamas Regulations, 1997. The lawful removal of these trees requires a permit by law. The application and permitting process is also included in the regulations.

*Table 3. Plant species identified on the in study site during surveys in May 2020*

Species	Scientific name	Status	Briland Club
Allamanda	Allamanda sp	NN	x
Almond	Terminalia catappa	IN	x
Bougainvilleae	Bougainvilleae	NN	x
Brazilian Pepper	Schinus terebinthifolius	IN	x
Butterfly pea	Centrosema virginianum	NA	x
Castor Plant	Ricinus communis	NA	x
Casuarina	Casuarina sp.	IN	x
Cerasee (bittermelon)	Momordica charantia	NA	x
Cinnecord	Acacia choriophylla	NA	x
Coconut Palm	Cocos nucifera	NN	x
Weeping Fig	Ficus benjamina	NN	x
Wild fig	Ficus Citrifolia	NN	x
Five Finger	Tabebuia bahamensis	NA	x
Gum Elemi (Gumbo Limbo)	Bursera simarouba	NA	x
Hibiscus	Hibiscus sp.	NN	x
Iron Wood	Krugiodendron ferreum	NA	x
Jamaican Dogwood	Piscidia piscipula	NA	x
Broad Leaf Blolly	Guapira obtusata	NA	x
Mango	Mangifera indica	NN	x
Mastic	Sideroxylon foetidissimum	NA	x
Neem	Azadirachta indica	NN	x
Oyster Plant	Tradescantia spathacea	IN	x
Pigeon Plum	Coccoloba diversifolia	NA	x
Poinciana	Delonix regia	IN	x
Poisonwood	Metopium toxiferum	NA	x
Rain Lilly	Zephyranthes primulina	NN	x
Ram's Horn	Pithecellobium keyense	NA	x
Royal Palm	Roystonea borinquena	NN	x
Salve bush	Solanum erianthum	NA	x
Sapodilla	Manilkara zapota	NN	x
Scaevola (Hawaiian)	Scaevola taccada	IN	x
Scaevola (Native Inkberry)	Scaevola plumieri	NA	x
Sea Oxeye	Borrchia arborescens	NA	x
Sea Purslane	Sesuvium portulacastrum	NA	x
Seagrape	Coccoloba uvifera	NA	x
Seaside Mahoe	Thespesia populnia	NA	x

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Seven Year Apple	<i>Genipa clusiifolia</i>	NA	x
Small-leaved blolly	<i>Guapira discolor</i>	NA	x
Snake plant (mother in law's tongue)	<i>Sansevieria trifasciata</i>	IN	x
Snow Berry	<i>Chiococca alba</i>	NA	x
Strong Back	<i>Bouyeria succulenta</i>	NA	x
Thatch palm	<i>Leucothrinax morrisii</i>	NA	x
Wild Thyme	<i>Rachicalis americana</i>	NA	x
bamboo grass	<i>Lasiacis divaricata</i>	NA	x
Wild Tamarind	<i>Lysiloma latisiliquum</i>	NA	x
Woolly Booger	<i>Corchorus hirsutus</i>	NA	x

In addition to these species, I partially reviewed the master plant list provided by Tyler Nielsen via email on October 5th, 2020. I have discussed initial thoughts with Mr. Nielsen. A full desktop evaluation of your plant list can be conducted at a later date if desired.

Thank you for this opportunity. This report constitutes the completion of the proposed work. Please remit final payment upon receipt.

#### 4.0 References

2019. Currie, Dave et al. *The Natural History of the Bahamas: a field guide*. Cornell University Press, Ithaca.

2003. Raffaele, Herbert et al. *Field Guide to the Birds of the West Indies*. Helm Field Guides. Christopher Helm. London

1998. White, Anthony W. *A Birders Guide to the Bahama Islands (including Turks and Caicos)*. American Birding Association, Inc. Colorado, USA.

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## APPENDIX H – Curriculum Vitae

### **FRANKLYN O. HALL**

#### *Curriculum vitae*

Nationality: Bahamian - Date of birth: 07<sup>th</sup> December 1968  
Gender: Male – Contact: Cell: 242-5565135 Home: 242-6770818  
Email: [franklynhall@hotmail.com](mailto:franklynhall@hotmail.com)

Address: 26 St. Albans/Sherman Drive, Cable Beach E. PO Box CB11492, Nassau Bahamas

#### **AREAS OF EXPERTISE**

- Project Management, Horizontal Construction, Infrastructure and Utilities
- Land Use and Development
- Environmental Management, Impact Assessment, Water Resource Management
- GIS Mapping/Marine and Terrestrial Ecosystem Management

#### **SYNOPSIS**

Currently residing in Nassau, Bahamas, I am an innovative professional engineer, environmental and project manager respectively, with a strong background in water resource management and marine ecosystem management. A most recent project involved conducting an environmental reconnaissance survey on the island of Grand Bahama for the recent oil spill, due to hurricane Dorian and an assessment of the structural damage to residential and commercial structures, as a result of the same disaster. I have also worked on many past and recent marine and coastal based projects, where I was the senior person responsible for managing all environmental and marine based activities.

#### **KEY COMPETENCIES**

- Leading and managing complex projects, and identifying key skills necessary for development and execution of tasks and assignments.
- Coordinating and facilitating multi-stakeholder processes.

#### **QUALIFICATIONS**

MA	Social Policy, 2000, University of York (UK). Dissertation: Social Impacts of Tourism in Developing Countries
PG Dip	Environmental Economics and Environmental Management, 1999, University of York (UK).
BSc	Mechanical Engineering Technology, 1996 Savannah State University (Savannah Ga).

#### **LANGUAGES**

English: 1<sup>st</sup> Language  
Spanish: Good.

#### **INSTITUTIONAL MEMBERSHIPS AND ACHIEVEMENTS**

- Member of Society of Operation Engineers (SOE) United Kingdom and registered Incorporated Engineer
- Member of Society of Professional Engineers (UK) and registered Professional Engineer
- Certified Environmental Professional (National Registry of Environmental Professionals). U.S.A.
- Certificate – Principles for Reviewing Environmental Impact Assessments (IDB) 2019

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### COMPREHENSIVE PROFESSIONAL EXPERIENCE

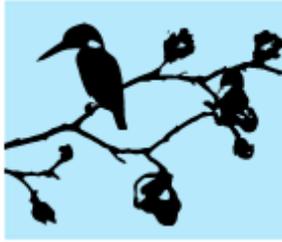
Time frame	Location/ scope	Organization	Position	Description
April 2019 to Present	Harbour Island	4M – Harbour Island Marina	Environmental Consultant of Record	Environmental Management and Consultancy Services, Preparation of EIA, EMP and project documentation
Nov 2018 to Present	West End Grand Bahama	Washington Development Co.	Environmental Consultant of Record	Responsible for EIA and EMP preparation, for development of hotel and marina construction project
December 2017 to 2019	Paradise Island Bahamas	Independent (ISG)	Project Manager	Management of operations for landscape development, chemical application/disposal and irrigation quality control for commercial and residential facilities.
August 2017 to December 2017	Harbour Island, Bahamas	Coastal Systems International	Environmental Consultant	Responsible for preparation of EIA document and environmental site monitoring and reporting
January 2017 to April 2017	South Cat Cay Development	Coastal Systems International	Environmental Consultant	Responsible for environmental site monitoring and report for all marine and terrestrial based activities, and control of EMP document
May 2016 To October 2016	Flamingo Cay Bahamas	Coastal Systems International Miami, Fla	Environmental Consultant	Responsible for designing and carrying out a Terrestrial Environmental Survey for the development of remote island in Southern Bahamas. Collection and processing of GPS data for native flora and fauna survey, and habitat mapping
July 2015 to Sept 2015	Nassau Bahamas	Blue Illusions Ltd	Lead Environmental Consultant	Assessment of marine mammal facility and conducting Environmental Impact Assessment study, for remote island with marine mammal based activities.
January 2013 to October 2015	Nassau Bahamas	Miya Bahamas Ltd	Site and Field Supervisor	Management of all field related activities for rehabilitation and upgrades to water supply, system ( Non-Revenue Water Project. Quality control management for water infrastructure and new installation.
Dec 2010 to Nov 2012	Abaco Bahamas	Abaco Club Ritz Carlton	Manager Utilities/Engineer	Managed water distribution operations, waste water treatment facilities, new construction of infrastructure facilities, inspection and quality control. Staff training, site safety and control. Involved jointly with finance department in development of budgets, and development of system for billing based on water consumption, for residential home owners.
Dec 2005 to Nov 2010	Abaco Bahamas	Abaco Club Ritz Carlton	Project Manager/Infrastructure & Utilities	Management for the installation all horizontal construction works, including water, sewer, electrical and communications. Management of construction to high end residential and commercial structures, quality control and inspections
Jan 2004 to Nov 2005	Nassau Bahamas	Consolidated Water Company Ltd	Asst. Project Manager	Managed proper installation inspection of HDPE water mains, well pumps and disposal well for 12.5 million/gal per day reverse osmosis, salt water desalination plant.

### BOOKS

Hall, F. (2014) Environmental Issues and Challenges in Developing Countries. Kindle Publishing

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**NIELSEN**  
landscape architects



## TYLER NIELSEN

### EDUCATION

Masters of Landscape Architecture  
University of Colorado | Denver, CO

Bachelor of Arts, Fine Arts & Political Science  
University of Colorado | Boulder, CO

### PROJECT EXPERIENCE

Tyler brings expertise of creative planning, urban design, landscape architecture and community outreach experience to Nielsen Landscape Architects. As a LEED accredited professional, his passion for and expertise in sustainable planning and design informs all aspects of the studio's work. Tyler's diverse hospitality and resort planning and design experience includes local experience with the Soni Group, RETI, and the Starwood Group.

Tyler is an expert in creating and implementing beautiful designs in the subtropical Caribbean region. As a part of Tyler's previous experience, he led the effort to enhance and revitalize the Golden Rock Inn located in Nevis Island.

Tyler has a strong horticultural knowledge of subtropical plants. Using this knowledge he successfully design and oversaw the installation of many estate gardens located throughout the Caribbean region. These gardens can be found in Mustique, St. Kitts, and the Bahamas.

### PROFESSIONAL AFFILIATIONS

State of Florida Register Landscape Architect #6667067  
Council of Landscape Architectural Registration Boards  
US Green Building Council LEED accredited professional  
American Society of Landscape Architects member

[www.nielsenlandarch.com](http://www.nielsenlandarch.com)

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## Curriculum Vitae

### **Agnessa L. Lundy, B.A., M.Res.**

### **Candidate**

#### **Senior Environmental Scientist**

Agnessa provides comprehensive environmental management duties for CCS, serving as project leader for the environmental compliance process in the production of environmental baseline studies (EBS), environmental impact assessments (EIA) and environmental management plans (EMP) for regulating and permitting agencies.

### **Representative Experience**

#### **Environmental Assessments**

##### **Caribbean Coastal Services Ltd.**

Marine Lead for environmental team in the preparation and submission of environmental assessments for research and development projects throughout The Bahamas and the Caribbean.

#### **Environmental Management**

##### **Bahamas National Trust, New Providence Office**

Project manager for Community Based Conch Management in the Family Islands pilot in East Grand Bahama; Reversing the Decline of Bahamian Coral Reefs 10-year project; Conchervation Campaign.

Assisting with the development of a sustainable financing for the Science & Policy Department through the BNT Dive Tag Program, Expanding Research Permit fees to all National Parks in The Bahamas, Preparing grant proposals

Support the development of the BNT GIS Unit

Fundraising for the "Conchervation Campaign", "Reversing the Decline of Bahamian Coral Reefs", "Community Based Conch Management in the Family Islands" projects.

Project Advisor for University of the Bahamas student, Ms. Tika Penn, "Mangrove restoration in Adventure Learning Center"

## Profile

#### **Education**

Masters by Research Student,  
Conservation Biology  
Manchester Metropolitan University (UK),  
2017 – present

Queens College Center for Continuing  
Education, Competitive Grant Writing  
2019

Conservation Leadership in the  
Caribbean (CLIC) Fellows Program  
Grenada, 2016

B. Arts, Marine Science, Minor  
Biology, Minor Agriculture  
University of Hawai'i Hilo,  
Hawaii, 2009

Associate of Arts in Biology w/ Agriculture  
College of The Bahamas  
Nassau, Bahamas, 2005

#### **Certifications**

PADI Specialty Diver – Coral Nursery, PADI  
Advanced Open Water Scuba Certification,  
PADI Emergency First Responder, Certified  
Reef Check Eco Diver

Atlantic and Gulf Rapid Assessment Benthic  
Certification (Advanced)

Class B Boat Captain, certified in Standards  
of Training, Certification and Watchkeeping  
for Seafarers (STCW),

Grant writing, Proposal development,  
Drafting contracts

Knowledgeable in Geographic Information  
Systems, Large format printing (HP),  
Proficient in Microsoft Office suite and  
ArcGIS10.1 Software, QGIS Software

#### **Professional Memberships**

Member of the Bahamas Spiny Lobster  
Working Group

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**Agnessa Laurelle Lundy, B.A., M.Res. Candidate**

Senior Environmental Scientist

**The Nature Conservancy Northern Caribbean Program  
Conservation Coordinator**

Project Manager for Fostering Watershed Conservation in the Pine Islands of the Bahamas; Grand Bahama Environmental Project.

Building a National Network of Marine Protected Areas – the Bahamas Pilot demonstration

Incorporating climate change and mangrove restoration into conservation planning

Spatial Data manager for The Bahamas and Turks and Caicos Islands (Northern Caribbean) – GIS

Assisted with the following environmental projects throughout The Bahamas:

- Coral nursery installation and monitoring;
- Implementing a Model Marine Reserve in the South Berry Islands Marine Reserve;
- Expanding Marine Protections Across The Bahamas;
- Mitigating the Threats of Invasive Alien Species - lionfish and casuarina;
- General outreach and education to build support for the expansion of The Bahamas National Protected Areas System;
- Spiny Lobster Fishery Improvement Project

Representative on the following committees.

- National Coastal Awareness Committee;
- National Invasive Species Strategy Committee;
- Biodiversity Committee;
- National Blue Flag Jury;
- National Implementation Support Partnership;
- National Steering Committee

**Atlantis Paradise Island**

As an Aquarist, initiating the mangrove donation program by establishing a black mangrove nursery and initiating the first red and black mangrove donation to the Victoria Pond Restoration project. Assisted with collecting marine life for exhibits and lead tours with the Sea Keeper Adventurer Programs.

Maintained exhibits in the Coral and Beach tower animal exhibits, and the Coral Towers Quarantine.

Assisted with collecting marine life for exhibits and lead tours

**Presentations & Appearances**

Current Status of Conch Salad Conch in The Bahamas  
Community Based Conch Management in the Family Island  
Connecting Coral Resilience with Coral Rehabilitation  
Bahamians in Science and the Environment  
Coral Nurseries and Reef Restoration  
Anyone can work in Conservation Queen Conch and Conservation  
Why expand the Andros West Side National Park?

**Presentations & Appearances**

Ecological spillover from a marine protected area replenishes an over-exploited population across an island chain <https://doi.org/10.1111/csp2.17>

Andrew S. Kough, Carolyn A. Belak, Claire B. Paris, Agnessa Lundy Heather Cronin, Gaya Gnanalingam, Sam Hagedorn, Rachel Skubel, Amanda C. Weiler, Allan W. Stoner

Multiplex microsatellite PCR panels for the neotropical red mangrove, *Rhizophora mangle*: combining efforts towards a cost-effective and modifiable tool to better inform conservation and management <https://doi.org/10.1007/s12686-020-01138-8> John Paul Kennedy, Hayley Craig, Antonella Jara-Cavieres, Agnessa Lundy, Richard F. Preziosi, Jennifer K. Rowntree

Expanding The Bahamas Marine Protected Areas Network To meet The Bahamas 2020 declaration. <https://bit.ly/3nVw4oU> Lakeshia Anderson, Craig Dahlgren, Lindy Knowles, Lashanti Jupp, Shelley Cant-Woodside, Shenique Albury-Smith, Casuarina McKinnery-Lambert, Agnessa Lundy

Bonefish Pond Mangrove "Restoration": Monitoring Bonefish Pond. Poster. Lindy Knowles, Craig Dahlgren, Janeen Bullard, Felicity Burrows, Agnessa Lundy

Power of Her 2020 "Game Changer" Award Receipt

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Curriculum Vitae  
**Mark Daniels, B.Sc., M.Sc.**  
**Associate Principal - Environmental**

Mark provides comprehensive environmental management duties for CCS, serving as project leader for the environmental compliance process in the production of environmental baseline studies (EBS), environmental impact assessments (EIA) and environmental management plans (EMP) for regulating and permitting agencies.

**Representative Experience**  
**Environmental Management**

**Crystal Palace Resort & Casino Demolition**

Environmental consultant for the demolition, implosion and cleanup of the former resort. Project lead for production of Environmental Management Plan and Explosives Safety Plan.

**Enhancing Coastal Protection for Climate Change**

**Resilience:** Conducted field activities for a series of technical baseline studies for Green Climate Fund (GCF) Enhanced Direct Access (EDA) through the Caribbean Community Climate Change Centre (CCCCC) in six pilot countries.

**Baha Mar Main Pier**

Environmental lead for benthic assessments/data collection and production of EBS and EMP for modifications to the Main Pier.

**Long Cay Redevelopment**

Project lead for production of EIA and EMP. Government liaison for permitting process.

**Bahamas Lodge Development**

Terrestrial specialist, government liaison and project leader for production of EIA and EMPs.

**Walker's Cay**

Terrestrial surveys, data collection and habitat mapping. Project lead for production of EBS.

**Davis Harbor**

Habitat mapping and production of EBS for modifications to marina.

**Bird & Cat Cay**

Environmental lead for terrestrial and marine surveys, habitat mapping, and production of EBS, EIA and EMPs.

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**Profile**

**Education**

M. Science, Botany  
Miami University  
Oxford, Ohio,

B. Science, Biochemistry  
University of The West Indies  
Kingston, Jamaica,

AS. Biology w/ Chemistry  
College of The Bahamas  
Nassau, Bahamas,

**Professional Experience**

Caribbean Coastal Services Ltd.  
Nassau, Bahamas  
Associate Principal - Environmental  
Senior Environmental Scientist

The Bahamas National Trust  
Nassau, Bahamas  
Retreat Curator & New Providence  
Parks Manager

Miami University  
Oxford, Ohio  
Research Assistant

Leon Levy Native Plant Preserve  
Eleuthera, Bahamas  
Preserve Manager

The Bahamas National Trust  
Nassau, Bahamas  
New Providence Park Warden

Lucayan Tropical Farms  
Nassau, Bahamas  
Micropropagation Lab Technician

**Mark Daniels, B.Sc., M.Sc.**  
**Associate Principal - Environmental**

**Adelaide Creek**

Terrestrial survey and risk assessment for proposed development within Adelaide Creek system

**Lighthouse Point**

Terrestrial surveying, data collection and production of vegetation maps.

**Little San Salvador**

Terrestrial surveying, data collection, production of vegetation maps and environmental baseline study (EBS).

**Orange Creek**

Terrestrial surveying, data collection and production of vegetation maps.

**Alligator Point**

Terrestrial surveying, data collection and production of vegetation maps.

**Integrated Coastal Zone Management (ICZM) Project - Andros**

Terrestrial specialist for coastal surveys conducted at 7 proposed sites on Andros Island.

**Protected Area Management**

**Mann Island**

Project lead for terrestrial surveys, vegetation mapping, invasive species removal and petroleum waste cleanup.

**Harrold and Wilson Ponds**

Coordinator for invasive cattail (*Typha domingensis*) removal and management.

**Bonefish Pond**

Coordinator and project lead for mangrove cleanup, restoration and monitoring activities.

**Retreat Gardens**

Day to day management of Garden operations and curation of palm collection. Project coordinator for infrastructure development, utility repairs, building renovations, fundraisers, workshops, community meetings and Garden additions.

**Levy Preserve**

Day to day management of Garden operations and curation of native plant collection. Project coordinator for infrastructure [...]

**Professional Experience cont.**

Trauma and Emergency Medical Services Ltd.  
Nassau, Bahamas  
Physician's Assistant/EMT-B

**Professional Memberships**

Bahamas National Trust (Ambassador, Member)

Society for Conservation and Study of Caribbean Birds (SCSCB)

**Certifications**

PADI certified Open Water Diver

Emergency Medical Technician – B

**Continuing Education**

Highly Effective Teams (HET)  
The Nature Conservancy,

Centre for Agriculture and Bioscience International (CABI) – Invasive Species CBA,

Tropical Botany Taxonomy  
Florida International University,

Emergency Medical Technician B  
Florida Medical Training Institute,

**Publications**

Geographical ecology of dry forest tree communities in the West Indies  
Journal of Biogeography

A Floristic Study of a former land bridge in The Bahama Archipelago  
Diss. Miami University

# EIA Addendum · 4M Harbour Island Project · 22 February 2021

## ANCILLEN O RLANDO DAVIS, PhD

P.O. Box FH14101, Nassau, Bahamas | +1 242 826-0405 (mobile) | ancilleno@scienceandperspective.com

### EDUCATION

Miami University, Oxford OH, USA <b>Ph.D. in Ecology, Evolution and Environmental Biology</b> Dissertation: Understanding, enhancing and engaging with citizen science bird monitoring in eBird	2018
Miami University, Oxford OH, USA <b>Graduate Certificate in Advanced Studio Art</b>	2018
Miami University, Oxford OH, USA <b>Graduate Certificate in College Teaching</b>	2018
Miami University, Oxford OH, USA <b>Graduate Certificate in Applied Statistics</b>	2017
University of Maryland Eastern Shore, Princess Anne MD, USA <b>M.Sc. in Marine Estuarine and Environmental Science</b> Thesis: Epifloral and epifaunal assemblage of <i>Fucus vesiculosus</i> L. (Bladder wrack) in Indian River Inlet, Delaware, USA	2006
University of Maryland Eastern Shore, Princess Anne MD, USA <b>B.Sc. Environmental Science</b> Area of Concentration: Marine Science Magna cum Laude	2005
University of The Bahamas, Nassau N.P., Bahamas <b>A.A. Biology with Chemistry</b>	2001

### AWARDS

Lavatus Powell Diversity Award – Graduate Students of All Nations (organization nomination)	January 2016 & January 2017
Lavatus Powell Diversity Award – Graduate student (individual nomination)	January 2016 & January 2017
Future Voices Sustainability Art Contest	May 2015 – December 2015
Marine Estuarine and Environmental Science Fellowship award	August 2005 – December 2006
Kirtland's Warbler Research and Training Program Scholarship	August 2003 – May 2005
Marilu Tolo Scholarship	August 1998 – December 2001

### AVIAN ECOLOGY

New Providence, Bahamas <b>Avian Ecologist - SEV consulting</b> Conducted wild bird surveys for private clientele	2020
Blue Lagoon Island, Salt Cay Important Bird Area, Bahamas <b>Sustainability Coordinator and Ecologist</b> Conducted wild bird surveys regularly. Tripled the bird diversity record for Salt Cay in one year	2019
Science and Perspective, Bahamas <b>CEO/OWNER, Ecologist</b> Conduct environmental surveys and community assessments including over 1000 bird surveys in 2019 using various eBird.org protocols.	December 2018 - present
Miami University, Oxford OH <b>Laboratory Instructor - Ornithology</b> Taught wild bird identification and survey methods, conducted more than one hundred field surveys for wild birds in the Ohio area	2018
Miami University, Oxford, OH, USA	

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<p><b>Primary Investigator – Habitat, observer and bird diversity in eBird records</b>                  Generate habitat maps and analyze citizen-science bird records for the island of Grand Bahama to determine the impact of habitat, observer diversity and avian species occurrence on the biodiversity record.</p> <p>Kingston, Jamaica</p> <p><b>Support instructor - Caribbean Birding Trail professional bird guide training</b>                  Support the training of regional bird guides in bird surveys and ethical guiding and conduct surveys in Trelawny and Kingston Jamaica to assess the bird community</p> <p>BirdsCaribbean, Virginia, USA; Bahamas; Caribbean</p> <p><b>Director-At-Large</b>                  Promote and implement multilingual bird related education, training and conservation throughout the Caribbean; translate and review articles for the Journal of Caribbean Ornithology; Coordinate regional meetings with across political, linguistic and cultural borders with diverse partners</p> <p>The Bahamas National Oil Spill Response Team</p> <p><b>Logistic coordinator/Terrestrial, Avian and Marine Survey Observer</b>                  Collaborated with local and international scientists, government agencies and military personnel to conduct pre-impact ecosystem assessment of the Cay Sal Bank, in response to the Deep Water Horizon Oil Spill. Facilitated research and training meetings for oil spill response team members. Collected data on bird diversity and behavior in the Cay Sal Bank</p>	<p><b>August 2015 – December 2018</b></p> <p><b>June 2015</b></p> <p><b>October 2012 – present</b></p> <p><b>April 2010 – May 2010</b></p>
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TEACHING EXPERIENCE

<p>Miami University, Oxford OH</p> <p><b>Laboratory Instructor – Introductory Biology</b>                  Followed established procedures and format; administered grades</p> <p>Miami University, Oxford OH</p> <p><b>Laboratory Instructor - Ornithology</b>                  Developed teaching materials and examinations, following established format, administered grades</p> <p><b>Laboratory Instructor – Introductory Biology</b>                  Followed established procedures and format, administered grades</p> <p><b>Assistant Instructor – Tropical Marine Ecology</b>                  Delivered ecosystem content and supported student learning and in water safety; trained students in ecosystem survey methods</p> <p><b>Instructor – Social Media 101 (Institute for Learning in Retirement)</b>                  Developed syllabus and adaptive course content to introduce nontraditional students to modern social media</p> <p><b>Instructor – Photography, Conservation and Culture in the Bahamas (Study Abroad, USA – Bahamas)</b>                  Developed syllabus and overall course structure in collaboration with Art faculty; planned, coordinated and lead students on multi-island study abroad workshop</p> <p><b>Teaching Assistant – Tropical Marine Ecology</b>                  Delivered ecosystem content and supported student learning and in water safety; trained students in ecosystem survey methods</p> <p>Bahamas Reef Environment Educational Foundation, San Salvador Island, Bahamas</p> <p><b>Instructor Teacher Training Workshop 2011 – Coral Reef Ecology, Sustainability, and Water Safety</b>                  Developed course content and teaching materials to meet student needs; supported student safety in water</p> <p><b>Instructor Teacher Training Workshop 2009 – Coral Reef Ecology, Terrestrial Ecology, and Water Safety</b>                  Developed course content and teaching materials to meet student needs; supported student safety in water</p>	<p><b>2018</b></p> <p><b>2018</b></p> <p><b>2017</b></p> <p><b>2015</b></p> <p><b>2015</b></p> <p><b>2015</b></p> <p><b>2013</b></p> <p><b>2010</b></p> <p><b>2008</b></p>
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University of the Bahamas, Nassau N.P., Bahamas

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# EIA Addendum · 4M Harbour Island Project · 22 February 2021

ANCILLEND ORLANDO

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<b>Lecturer – Introductory Biology (Non-Majors)</b> Developed course content and teaching materials to meet established curriculum requirements	2010
University of Maryland Eastern Shore, Oxford OH	
<b>Lab Instructor – Marine Botany</b> Taught practical procedures and methods for Marine Botany, administered grades	2006
<b>Instructor - Biology Lab</b> Followed established syllabus and format, administered grades	2005
<b>Supplemental Instructor – Calculus Based Physics</b> Provided alternative teaching methods for physics students	2005
<b>Supplemental Instructor – Economics (Micro/Macro)</b> Provided alternative teaching methods for economics students	2005
Professional Association of Dive Instructors (PADI)	
<b>Open Water SCUBA Instructor/ CPR and First Aid Instructor</b> Safely deliver and evaluate standardized, measures-based content focused on mastery	2009
ReefCheck, Tropical Western Atlantic	
<b>Instructor</b> Taught local groups how to conduct a ReefCheck coral reef ecosystem survey using SCUBA or snorkel gear	2009
Atlantic and Gulf Rapid Reef Assessment (AGRRA)	
<b>Instructor</b> Taught local groups how to conduct AGRRA marine assessments, coral and fish identification	2011

LEADERSHIP EXPERIENCE

BirdsCaribbean, Virginia, USA; Bahamas; Caribbean	
<b>Director-At-Large</b> Promote and implement multilingual bird related education, training and conservation throughout the Caribbean; translate and review articles for the Journal of Caribbean Ornithology; Coordinate regional meetings with across political, linguistic and cultural borders with diverse partners	October 2012 – present
Bahamians Educated in Natural and Geospatial Sciences	
<b>Founder – Primary Coordinator</b> Connect Bahamian students and scientists with educational and professional opportunities in science, locally and internationally; foster an interdisciplinary network of scientists in the Bahamas	February 2011 – present
Graduate Students of All Nations, Miami University, Oxford OH, USA	
<b>Founder - President</b> Support and advocate for international students and scholars’ social, economic, and academic success through collaboration with on-campus support services and local businesses	August 2015 – present
Graduate Council, Miami University, Oxford OH, USA	
<b>Graduate Students of Color/ Graduate Students of All Nations representative</b> Support and advocate for graduate students of color and international students and scholars’ social, economic, and academic success via evaluation of graduate school petitions and discussions of university policy.	August 2015 – present
Center for American and World Cultures Advisory Council, Miami University, Oxford OH, USA	
<b>Member – Graduate Student Representative</b> Support and advocate for international students and scholars’ social, economic, and academic success through collaboration with on-campus support services and local businesses	August 2015 – present
Midwest Ecology and Evolution Conference	
<b>Steering Committee - Social Media and Website Coordinator</b> Developed and coordinated digital website content and integration with social media and email publicity of the event; coordinated transfer of content to subsequent conference committee	May 2015 – May 2016
Biology Graduate Student association, Miami University, Oxford OH, USA	

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## EIA Addendum · 4M Harbour Island Project · 22 February 2021

<p><b>Graduate Student Representative to the Biology department Visibility and Web Committee</b> Support Biology Department use of digital media via web pages and social media, to promote student work and program offerings.</p> <p>Biology Graduate Student association, Miami University, Oxford OH, USA</p>	<p>May 2014 – May 2015</p>
<p><b>Graduate Student Representative to the Biology department faculty meetings</b> Provide Graduate student perspective on topics of concern in faculty meetings and report to Biology Graduate Student Association on topics discussed in the meetings.</p>	<p>May 2014 – May 2015</p>
<p>The Nature Conservancy (TNC) <b>Conservation Coordinator</b> Coordinated conservation capacity building, outreach, and education projects in the Bahamas. Recruited or trained Bahamian researchers to collect ecosystem data in marine environments. Coordinated with National Ministries to deliver appropriate educational content to agents and schools throughout the country.</p>	<p>July 2008 – August 2012</p>
<p>The Kerzner Marine Foundation's (KMF) "The Blue Project" <b>Coordinator</b> Established and monitored appropriate goals, timelines and budgets to improve national capacity for conservation of native coral reefs and associated ecosystems. Coordinated conservation capacity building, outreach, and education projects in the Bahamas. Recruited or trained Bahamian researchers to collect ecosystem data in marine environments. Coordinated with National Ministries to deliver appropriate educational content to agents and schools throughout the country.</p>	<p>July 2008 – August 2012</p>
<p>The College of the Bahamas Job Placement and Career Advisory Committee <b>Science and Environment Industry Representative – Elected Vice Chair (August 2010- June 2011)</b> Established student engagement and training goals, coordinated national career day for college and high school students with interdisciplinary team. Collaborated with industry and government agency leadership to determine national goals for capacity building and education.</p>	<p>September 2009 – June 2011</p>
<p>The Bahamas Million Tree Campaign <b>Coordinator</b> Collaborated with Ministry of Environment, Bahamas National Trust, The Nature Conservancy and Commercial Plant growers to develop a nationwide native plant discount program and collect volunteer data from local groups and individuals that planted native species. Coordinated tree plantings with local government and official opposition ministers in public parks nationwide.</p>	<p>August 2008 – December 2009</p>
<p>The Khaled bin Sultan Living Oceans Foundation (LOF) - Global Reef Expedition <b>Bahamas Coordinator</b> Drafted application for the Bahamas to be the first country on the Global Reef Expedition. Collaborated with The LOF, government ministries, NGO's and commercial partners to develop local itineraries, priorities and best practices for marine research. Coordinated local scientists to participate in data collection including developing training programs where necessary to develop needed capacity. Conducted data collection and entry using AGRRRA protocols. Facilitated import of specialized equipment for visiting scientists.</p>	<p>August 2010 – December 2011</p>
<p>The Bahamas First Coral Nurseries – New Providence, Bahamas <b>Project Leader</b> Assessed and adapted US National Oceanic and Atmospheric Administration and Coral Restoration Foundation techniques and procedures for application in the Bahamas. Used Geospatial Information Systems to determine feasible locations for coral nursery implementation. Collaborated with TNC, KMF, BNT and Bahamas Department of Marine Resources to raise funds for training, supplies and implementation. Coordinated local and international scientists for training and nursery establishment. Maintained nursery records and assessed coral growth.</p>	<p>August 2010 – August 2012</p>
<p>The Bahamas National Coastal Awareness Committee <b>Social Media Chair</b> Represented The Nature Conservancy and scientific community on the committee. Established communication priorities around the selected theme. Developed and coordinated outreach and communication via Social Media.</p>	<p>January 2011 – May 2012</p>
<p>The Bahamas National Biodiversity Sub-committee to the Bahamas Environment Science and Technology (BEST) Commission</p>	

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**Ecologist/ TNC Representative**

January 2011 – May 2012

Represented The Nature Conservancy and scientific community on the committee. Along with the committee evaluated species introductions, infractions against CITES regulations, proposed large-scale agricultural and sustainable energy developments and oil exploration regulations.

The Bahamas National Oil Spill Response Team

**Logistic coordinator/Terrestrial, Avian and Marine Survey Observer**

April 2010 – May 2010

Collaborated with local and international scientists, government agencies and military personnel to conduct pre-impact ecosystem assessment of the Cay Sal Bank, in response to the Deep Water Horizon Oil Spill. Facilitated research and training meetings for oil spill response team members.

Center for American and World Cultures

**Graduate Assistant**

October 2014 – August 2016

Develop and manage media database, social media and website content; develop and distribute event publicity materials to partners and public; compile and share international student feedback when appropriate

RESEARCH EXPERIENCE

Miami University, Oxford, OH, USA

**Primary Investigator – Habitat, observer and bird diversity in eBird records**

August 2015 – December 2019

Generate habitat maps and analyze citizen-science bird records for the island of Grand Bahama to determine the impact of habitat, observer diversity and avian species occurrence on the biodiversity record.

USA; Jamaica; Bahamas

**Study skin preparation**

2001-present

Prepared ornithological specimen skins for scientific study, including species, gender and reproductive state of specimen and teaching students correct mounting procedure.

Community Conch – Berry’s Conch Project - Berry Islands, Bahamas

**Field Technician**

June 2009

Conducted towed snorkeler and SCUBA transect surveys for conch (*Lobatus gigas*) along with biometrics to determine conch population size, distribution and demographics

Kerzner Marine Foundation – August 2008 REA of Coral Reef Communities around New Providence and Rose Island

**AGRRA coral survey scientist**

August 2008

Completed training in field identification of native coral and fish. Conducted surveys of benthic communities while on SCUBA following the AGRRA methodology.

University of Maryland Eastern Shore, Indian River Inlet, DE and Princess Anne, MD

**Researcher - Epifauna and epiflora of *Fucus vesiculosus* in Indian River Inlet.**

August 2005 – December 2006

Conducted water quality analysis and taxonomic identification of macroalgae, microalgae, and crustaceans associated with *Fucus vesiculosus* (Bladder wrack) in the Delmarva Peninsula.

**Field and Lab Technician – UMES Precision Agriculture Project**

August 2005 – December 2006

Conducted drone flights using fixed wing and helicopter style remote controlled aircraft to collect visual data on agricultural fields. Used ArcGIS to orthorectify and classify images for use in precision agriculture studies. Trained graduate and undergraduate students in the use of Unmanned Aerial Vehicles and digital imaging equipment and software. Developed procedure manuals for common lab activities.

Abaco Parrot Project – Abaco Island, Bahamas

**Field and GIS Technician**

May 2003 – August 2004

Worked closely with the endangered, endemic Bahama Parrot (*Amazona leucocephala bahamensis*). Searched for and monitored nests, conducted surveys of nesting activity and assessments of nesting habitat. Used ArcGIS to view maps and plan research activities with lead investigators. Supported international researchers in the identification of native plants and Spanish-English translation of written materials and verbal communication with partners from Puerto Rico.

Kirtland’s Warbler Recovery Effort – Andros and Eleuthera Islands, Bahamas

**Field Technician**

May 2003 – August 2004

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Observation, capture, identification, banding and measurement of native/migrant bird species, specifically the endangered Kirtland's warbler (*Dendroica kirtlandii*) Identification and measurement of native plant species. Data analysis and presentation. Recruitment of new students into the program

United States Fish and Wildlife Service (USFS) – Huron Manistee National Forest, Mio, MI, USA

**Summer Intern**

June 2002 – August 2002

Delivered public lectures on the ecology of the Bahamas. Assisted researchers in radiotelemetry and capture of Massasauga rattlesnakes (*Sistrurus catenatus*) and Box turtles (*Terrapene* sp.). Survey endangered Kirtland's Warblers as part of annual census. Enter survey data into Arc View GIS database.

OTHER EMPLOYMENT EXPERIENCE

Blue Lagoon Island, Salt Cay, Bahamas

**Sustainability coordinator**

January 2019 – Present

Assess and evaluate organizational sustainability to establish targets, develop and implement training to achieve multi-level sustainability goals.

Dolphin Cay, Atlantis, Paradise Island, Bahamas

**Dolphin Trainer**

July 2008 – August 2008

Observe and report on dolphin and sea lion behavior. Prepare food according to animal needs and veterinary staff recommendations.

**SCUBA diver**

April 2007 – July 2008

Maintain safe, hygienic environment in dolphin and sea lion habitats. Small engine maintenance and repair. Forklift operation.

Bahamas Humane Society, Bahamas

**Kennel Care Technician/ Veterinary Assistant**

July 2008 – August 2008

Dog and cat obedience training using positive reinforcement and Least Reinforcing Stimuli. Kennel cleaning and maintenance. Inspect animals for injury and administration of medication. Humane and ethical care of animals was the priority.

PUBLICATIONS

**Davis, A., McCarty J.** (2018). *Combining citizen science and open source geospatial techniques improves habitat knowledge for Bahamian birds. Submitted to Journal of Caribbean Ornithology.*

Rivera-Milán, F. F., Collazo, J. A., Stahala, C., Moore, W. J., **Davis, A.**, Herring, G., ... Bracey, W. (2005). *Estimation of density and population size and recommendations for monitoring trends of Bahama parrots on Great Abaco and Great Inagua. Wildlife Society Bulletin, 33(3).* [https://doi.org/10.2193/0091-7648\(2005\)33\[823:EODAPS\]2.0.CO;2](https://doi.org/10.2193/0091-7648(2005)33[823:EODAPS]2.0.CO;2)

**Davis, Ancilleno.** 2006. *Epifloral and epifaunal assemblage of Fucus vesiculosus L (bladderwrack) in Indian River Inlet, Delaware, USA.* Master's Thesis

Currie, D., J.M. Wunderle, Jr., D.N. Ewert, M. Anderson, **A. Davis,** and J. Turner. 2005. *Winter habitat distribution of birds in central Andros, The Bahamas: implications for management. Caribbean Journal of Science 41:75-87.*

Currie, D., J.M. Wunderle, Jr., D.N. Ewert, **A. Davis,** and Z. McKenzie. 2005. *Winter avian distribution in six terrestrial habitats on southern Eleuthera, The Bahamas. Caribbean Journal of Science 41:88-100.*

Bahamas Reef Environment Educational Foundation. *"Take Care of the Coral Reefs!" (translator/voice actor)*

INVITED TALKS AND PRESENTATIONS

**Davis, Ancilleno** (July 29<sup>th</sup> 2019) *Social media 101 for Conservation engagement. BirdsCaribbean Regional Meeting, July 25<sup>th</sup> to July 29<sup>th</sup> 2019, Gosier, Guadeloupe.*

**Davis, A., Tossas, A.** (July 27<sup>th</sup> 2019) *Mentorship workshop. BirdsCaribbean Regional Meeting, July 25<sup>th</sup> to July 29<sup>th</sup> 2019, Gosier, Guadeloupe.*

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**Davis, A., Meister, K.** (July 26<sup>th</sup> 2019) *Private Island Partnerships for Conservation: Blue Lagoon Case Study.* BirdsCaribbean Regional Meeting, July 25<sup>th</sup> to July 29<sup>th</sup> 2019, Gosier, Guadeloupe.

**Davis, A., Eneas, K.** (July 26<sup>th</sup> 2019) *ABC'S of Engagement with Conservation Data: Dubstep Remix.* BirdsCaribbean Regional Meeting, July 25<sup>th</sup> to July 29<sup>th</sup> 2019, Gosier, Guadeloupe.

**Davis, Ancilleno** (June 3<sup>rd</sup> 2017) *Changing Faces of International Bird Conservation.* The Kirtland's Warbler Festival, Roscommon, MI.

**Davis, Ancilleno** (2017) *Keynote presentation: Preserving "Our Michigan" Birds in the Bahamas, an Overview of Bahamian and Caribbean Conservation and the Importance of Citizen Science.* Detroit Audubon Annual Earth day Celebration and Teach-In: "Soaring to New Heights" April 22<sup>nd</sup> 2017.

**Davis, Ancilleno** (2017) *Lost in transition: Studying working and living across boundaries.* 14<sup>th</sup> annual Miami English Graduate and Adjunct Symposium, Friday March 10 2017. Miami University, Oxford, OH.

**Davis, Ancilleno** (2016) *Transitions: How International Students Experience and Survive American Academia.* Race Class Gender and Sexuality Symposium, Wright State University, Dayton, OH.

**Davis, A., Loring, G.** (2015) *Cornucopia, Utopia, Dystopia: public sculpture and interactive experience.* Miami University, Oxford, OH.  
<https://www.facebook.com/MUCornucopia>; <https://twitter.com/MUCornucopia>

**Davis, Ancilleno** (2015) *The Caribbean Birding Trail: Local Experts Lead the Way.* Miami Valley Audubon, May 11<sup>th</sup> 2015, Oxford, OH

**Palmeri, J., Kashtan, A., Mina, L., Hasan, A., Bui, H., Davis, A. and Cimasko, T.** (2015). *Dead Weight? Addressing On-Campus Racial Politics in the Class room in the Wake of the 'Concerned Faculty Member' Letter.* Race Class Gender and Sexuality Symposium, Miami University, Oxford, OH.

**Davis, Ancilleno** (2014) *A Birder's Migration* (Talk March 7th and Photography Exhibit March 3<sup>rd</sup>-28th) MacMillan Hall, Miami University, Oxford, OH.

**Davis, Ancilleno** (2014) *Local Science, Internationally: Something for Nothing.* 11<sup>th</sup> Annual Miami English Graduate and Adjunct Symposium, March 14<sup>th</sup>, 2014, Miami University, Oxford, OH.

**Davis, A., The Kerzner Marine Foundation, The Nature Conservancy** (2012) *The Blue Project: Coral Conservation, Monitoring and Capacity Building.* Poster presentation at the International Coral Reef Symposium, Cairns Australia, 2012

#### LANGUAGES

English – native language  
Spanish – speak, read and write fluently  
American Sign Language – basic  
Python programming language – intermediate  
R programming language – advanced  
JavaScript – intermediate

#### SOFTWARE

Adobe Suite: Acrobat Pro XI; Photoshop CS6; Adobe Illustrator  
ENVI 5.4  
ESRI Arc Suite: ArcGIS; ArcMap  
Google: Blogger; Docs; Fusion Tables; Google Earth Pro; Hangouts; Sheets; Sites; Slides  
Microsoft Suite: Access; Excel; Outlook; PowerPoint; Publisher; Word  
QGIS

#### MEMBERSHIPS

Bahamians Educated in Natural and Geospatial Sciences - Founder  
BirdsCaribbean – Director-at-Large  
Graduate Students of All Nations – Founder/ President  
PADI – Professional Association of Dive Instructors – Open Water Instructor

#### CERTIFICATIONS

PADI – Open Water SCUBA instructor

### Caribbean Coastal Services Ltd.

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Emergency First Response First aid and CPR instructor  
Reef Resilience Trainer  
ESRI ArcGIS certificate  
Rotomotion UAV pilot certificate  
BirdsCaribbean certified Bird Guide

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## JANEEN MARLO BULLARD

Phone: (242) 357-9262  
Jmbullard2109@gmail.com

25 Turnquest Alley  
Nassau, Bahamas

With over 15 years of experience in the scientific and environmental field I can bring forth a plethora of skill sets that range from multi-tasking, planning and coordination, management of personnel and time as well as confidential handling of sensitive information and resources. I am dedicated and hardworking, with a passion for excellence. I possess skills in project management, educational & public outreach and research & development.

### EDUCATION

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<b>MS</b>	Tuskegee University, Biology (Concentration in Plant and soil Science) Thesis: The Effects of Superoptimal CO <sub>2</sub> on the Growth, Yield, Gas Exchange, Stomatal Conductance and Starch of Sweet Potato and Peanut.	2004
<b>BS</b>	Tuskegee University, Marine Biology	1999

### EXPERIENCE

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#### Environmental Specialist (2011 – Present)

##### Projects

- Adelaide Creek Development Project; Nassau, The Bahamas Environmental Impact Assessment (EIA), Environmental Management Plan (EMP) and Marine Assessment
- Exuma International Airport Infrastructure Project, Exuma, The Bahamas Environmental and Social Baseline Assessment (ESBA)
- Community Based Conch Management in the Family Islands, Establishing community-based management of a marine protected area Stakeholder Management Plan (SMP), EBA
- Rose Island Development; Rose Island, The Bahamas Marine Assessment EIA
- Paradise Island Benthic Assessment, The Bahamas EBA
- Coco Cay Island Development, Coco Cay, The Bahamas Environmental Management (EM), Botanical, Marine and Avian Assessments (EBA)
- Ocean Cay, Bimini, The Bahamas; Environmental Management, Coral Relocation Monitoring, Public Outreach, Rapid Ecological Assessment (REA)
- The Harbor View Marina Project, Nassau, The Bahamas EBA
- The Staniard Creek Bridge and Causeway Replacement Central Andros, The Bahamas, EMP
- Briland Residence and Marina, Harbour Island, The Bahamas, Botanical, Avian and Marine Assessment for EIA

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## EIA Addendum · 4M Harbour Island Project · 22 February 2021

- South Andros Water Improvement Project, EMP, EM
- Barbuda Airport, Antigua and Barbuda, Herpetological Assessments for EIA
- North Windermere Island, Eleuthera, The Bahamas; Botanical, Avian and Marine Assessment for EIA
- The Pointe Marina Development: Nassau, The Bahamas; EMP, EM
- Lynyard's Cay Development; Abaco, The Bahamas; Botanical and Avian Assessment for EIA
- North Abaco Port; Abaco, The Bahamas; Botanical and Avian Assessment for EIA
- Orchid Bay; Abaco, The Bahamas; Botanical, Avian and Marine Assessment for EIA
- Airport Gateway Project, New Providence, The Bahamas; EM
- White Bay Cay, Exuma Cays, The Bahamas; Marine Assessment and Coral Relocation
- White Bay Cay, Exuma Cays, The Bahamas; Landscape Palette
- Normans Cay, Exuma Cays, The Bahamas; Botanical, Avian and Marine Assessment for EIA
- Stocking Island, Exuma Cays, The Bahamas; Botanical, Avian and Marine Assessment for EIA
- February Point, Exuma, The Bahamas; Botanical, Avian, Botanical and Marine Assessments for EIA
- Deep Water Cay, Grand Bahama, The Bahamas; Wetland Assessment
- Matt Lowe Cay, Abaco Cays, The Bahamas; Botanical and Avian Assessment for EIA
- Governor's Harbour Army Base, Eleuthera, The Bahamas; Botanical and Avian for EIA
- Abaco Forestry, Abaco, The Bahamas; Botanical and Avian Assessment for EIA
- The Pointe, New Providence, The Bahamas; Botanical and Marine Assessment for EIA
- Norman's Cay, Exuma Cays, The Bahamas; Botanical and Avian Assessment for EIA
- Ocean Cay, Bimini, The Bahamas, Botanical and Avian Assessment for EIA
- Coco Cay, Berry Islands, The Bahamas; Botanical, Avian and Marine Assessment for EIA
- LNG Pipeline, New Providence, The Bahamas; Botanical Assessment for EIA
- White Bay Cay, Exuma, The Bahamas; Marine Assessment for EIA
- Old Fort Bay Town Center, New Providence, The Bahamas; Avian Assessment, EIA and EMP
- Bimini Bay, Bimini, The Bahamas, Marine Assessment for EIA
- Hurricane Hole Marina, Paradise Island, The Bahamas; Marine and Stakeholder Assessment, EIA
- Sandals, Exuma, The Bahamas, Avian Assessment for EIA
- Finley Cay, New Providence, The Bahamas; Marine Assessment EIA
- Ferguson Road, New Providence, The Bahamas; Botanical Assessment for EIA

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- Elbow Cay, Abaco, The Bahamas, Botanical, Avian and Marine Assessment for EIA
- Hermitage, Exuma, The Bahamas; Botanical and Avian Assessment for EIA
- Governor's Harbour Army Base, Eleuthera, The Bahamas; Avian Assessment for EIA

**Project Coordinator**

- Cane Toad Eradication, Lyford Cay, Nassau, The Bahamas
- Cane Toad Eradication, Marsh Harbour, Abaco, The Bahamas

**Parks Planner and Community Liaison Officer (2006-2011) Bahamas National Trust, Nassau, Bahamas**

**Duties**

- Develop proposals to government for the establishment of new National Parks.
- Grant writing
- Develop General Management Plans for existing National Parks.
- Work with surrounding communities to gain support for the importance of establishing new National Parks.
- Project Management for the establishment of the Leon Levy Native Plant Preserve, Eleuthera, The Bahamas.
- Manage all daily details and education of staff for educational programs.
- Organize all special events for the Education Department.
- Liaise with corporate sponsors in order to further fund educational programs.
- Develop marine education lesson plans and activities (on and off site) for grade levels K-12 and college students.
- Attendance and professional presentations at events both locally and abroad.
- Development of the National High School Marine Science Curriculum.

**Research Assistant (2001-2004) Tuskegee University, Tuskegee, AL**

- Developed and maintained research projects in conjunction with Tuskegee University and NASA.
- Aided in the daily maintenance and running of a greenhouse.
- Organized and taught Environmental and General Biology courses.

**Marine Mammal Trainer (1999-2001) Dolphin Encounters, Blue Lagoon, Bahamas**

- Trained Atlantic Bottlenose Dolphins in educational and interactive programs.
- Assisted in developing marine conservation and educational programs.

**AUTHOR**

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The Bahamas Sixth National Report on Biological Biodiversity to The Convention on Biological Diversity (present)

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Zoning and Management Plan for the East Grand Bahama National Park (present)

Co-Author of the “Andros Sustainable Development Masterplan” (2014)

Author of the “Critical Situation Analysis of Invasive Alien Species for The Bahamas” (2013)

#### **PRESENTATIONS AND INVITED LECTURES**

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Policies, Strategies and Best Practices for Managing Invasive Alien Species (IAS) in the Insular Caribbean March 31st – April 4th 2014 Trinidad. Port of Spain, Trinidad & Tobago.  
The Cane Toad Invasion: Its Origin, Status and The Bahamas’ Response to prevent spread.

Policies, Strategies and Best Practices for Managing Invasive Alien Species (IAS) in the Insular Caribbean March 31st – April 4th 2014 Trinidad. Port of Spain, Trinidad & Tobago.  
Developing a National IAS Strategy focused on IAS prevention – a case study of the Bahamas’ 2003 -2013 experience.

Bahamas Natural History Conference 2016 The Cane Toad Invasion: Its Origin, Status and The Bahamas’ Response to prevent spread

Bahamas Natural History Conference 2018 Citizen Science and Community Involvement can help! Invasive Cane Toads (*Rhinella marina*) control in The Bahamas continues.

#### **PROFESSIONAL TRAINING**

---

2019 IDB Principles of the Review of Environmental Impact Assessments

2019 The Perry Institute of Marine Science, AGRRA Benthic Survey Techniques

2018 Georgia Tech Professional Education Center – OSAHA Approved Trainer

2017 Conservation Training Introduction to Resilience for Development

2017 Inter-American Development Bank Project Management Techniques for Development Professionals

2015 IICA, Efficient use of Rainwater and Runoff in Agricultural Activities, Chitre, Panama

2015 IICA, Agro-Eco Tourism Training Workshop

2014 Commercial Training Center of Department of Commerce, Hainan Province, China  
Climate Change on Tropical Island and Economic Development for Developing Countries

2013 The Nature Conservancy, Coral Reef Restoration

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2013 The Nature Conservancy, AGRRA Coral Surveys

2010 The Bahamas National Trust, Business Writing

2010 The Bahamas National Trust, Public Presentation

2009 The Nature Conservancy, Bush Fire Management

2009 The Nature Conservancy, Invasive Species Management

2009 College of The Bahamas, Mangrove Forest Ecology, Management and Restoration

2008 International Fund for Animal Welfare, Certificate of Completion for Whale Watch Guide Training

2006 National Association of Interpretation, Certified Interpretive Guide 2006 Tuskegee University, 1st Place Graduate Oral Presentation Sigma Xi 2005 Tuskegee University, Certificate of Effective Leadership

1995 Auburn University, NAUI Scuba Certified

#### **PROFESSIONAL AFFILIATIONS**

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SEEDS-Ecological Society of America

Sigma Xi Scientific Research Society

Beta Kappa Chi Honor Society

National Association for Interpretation

National Marine Educators Association Name of Organization

#### **REFERENCES**

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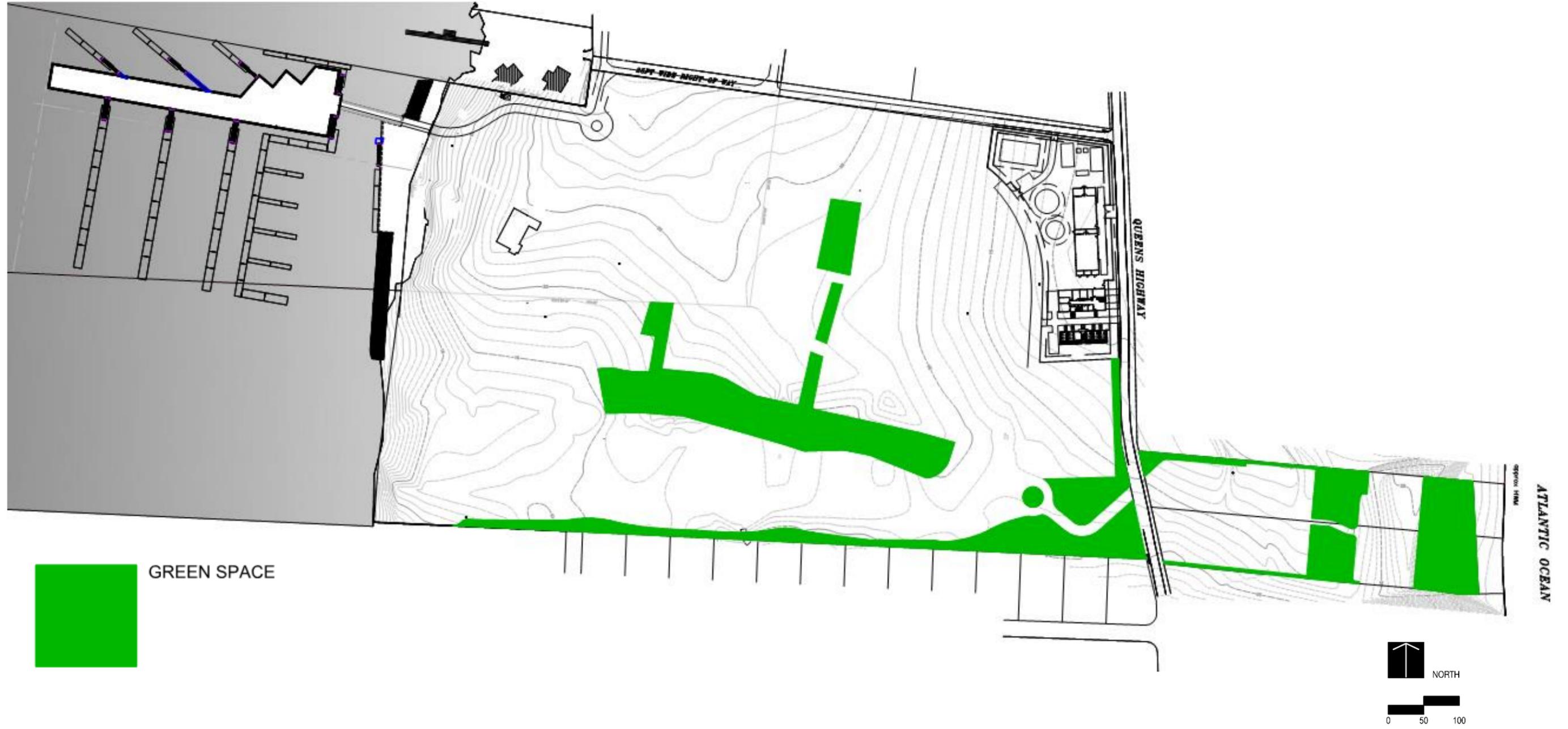
**Available upon request**

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APPENDIX I – Green Space



4M HARBOUR ISLAND LTD. 4M HARBOUR ISLAND 2 LTD. TO SUPPORT MARINA PACKAGE: FOR PERMITTING HARBOUR ISLAND, THE BAHAMAS	DRAWING TITLE : TREE DISPOSITION PLAN	SCALE: AS SHOWN DATE: OCTOBER 03, 2020 JOB NO.: 0000-20	CHECKED: SN DRAWN: JT APPROVED: TN	Island Dimensions & Development Company LTD. Consulting Civil, Structural & Environmental Engineers Project Managers, Cost Engineers Land Planners & Developers, License Contractors	Farrington House, Gladstone Road P. O. Box EE-15036 Nassau, Bahamas Tel#: (242)-341-6318/25 Fax#: (242)-361-6312	SHEET No. <b>L104</b>
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